US-10 Business Route Corridor Study

Midland, Michigan

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1.0 PROJECT BACKGROUND

1.1 Introduction

The US-10 Business Route (BR) Corridor Study was commissioned by the Michigan Department of Transportation (MDOT). The project study is focused on the US-10 BR corridor through the City of Midland (City) from Washington Street to the US-10 and US-10 BR (Eastman Avenue) interchange (Figure 1). US-10 BR is a principal arterial road within the City of Midland, connecting the southeast side of the City with the northern portion of the City. Other arterial roads that intersect US-10 BR include Jefferson Avenue, Rodd Street, Ashman Street, Saginaw Road, and Wackerly Street. From Washington Street to Hines Street, US-10 BR is split into a one-way pair with Indian/Patrick Street traveling westbound and Buttles/Lyon Street traveling eastbound. The one-way pair joins together at Eastman Avenue and runs north and south to the US-10 interchange.

The study included a corridor-wide data collection effort to obtain historical Average Annual Daily Traffic (AADT) volumes, intersection turning movement volumes, traffic signal phasing and timings, crashes, and land uses. Using the traffic volumes, an analysis of key intersections and segments was completed. The crash data was analyzed to identify any crash patterns or locations with high crash rates. Any identified deficiencies in intersection and segment operations or crash patterns were further evaluated to develop mitigation measures to improve the operation or reduce crashes such as the installation of a signal, retiming of an existing traffic signal, lane addition, and/or geometric improvements etc. These mitigation measures were then developed into three unique alternatives.

The report is broken into four main sections, each of which describes an important element of the study:

- Introduction
- Baseline Traffic Analysis
- Road Improvement Alternatives
- Conclusions and Recommendations

1.2 Project Purpose

The purposes of the project are to identify potential corridor improvements to US-10 BR that will:

1. Accommodate the design year (2040) traffic volumes
2. Alleviate current and anticipated traffic congestion at the project area intersections and along the road segments
3. Enhance safety and reduce crashes for all modes of transportation
4. Increase connectivity to Downtown Midland and Discovery Square
5. Improve non-motorized mobility and eliminate barriers for bicyclists/pedestrians with minimal impacts to traffic flow
6. Context Sensitive Design
7. Support economic development within the corridor

1.3 Corridor Characteristics

Due to the varying characteristics in different parts of the corridor, the study was broken out into three individual segments for analysis. The three segments include:

1. Segment 1 – Washington Street to West Hines Street (One-Way Pair Segment)
    - Westbound US-10 BR (Indian Street/Patrick Road)
    - Eastbound US-10 BR (Buttles Street/Lyon Road)
2. Segment 2 – West Hines Street to East Wackerly Street
3. Segment 3 – East Wackerly Street to Airport Road (US-10/US-10 BR Interchange Area)

Within Segment 1, US-10 BR is made up of a one-way pair segment; Indian Street/Patrick Road (westbound) and Buttles Street/Lyon Road (eastbound) with three travel lanes in each direction. From Hines Street to Sugnet Street (Segment 2), the roadway is a four-lane cross section with two travel lanes in each direction, except at the St. Andrews Street and Sugnet Street intersections where northbound and southbound left turn lanes have been added. From Sugnet Street to Wackerly Street, US-10 BR consist of a five-lane roadway with two travel lanes in each direction and a continuous two-way, left-turn lane (TWLTL). Segment 3 is generally a seven-lane cross section consisting of three travel lanes in each direction and a TWLTL.

1.4 Public Involvement

Two meetings were held with the Steering Committee to identify the project purpose and goals, areas of concern, known problems and constraints (e.g., operational deficiencies, safety concerns, pedestrian facilities, etc.), future developments, opportunities within the corridor, non-motorized needs, and potential transportation improvement alternatives. The Steering Committee consisted of staff from the MDOT - Bay Region, MDOT Mt. Pleasant Transportation Service Center (TSC), City of Midland, and Midland Area Transportation Study (MATS).

Stakeholder input was a valuable factor considered as the team carried out the study. As part of the study process, a Stakeholder Committee was engaged to obtain input regarding specific problems or deficiencies, data or reports that would benefit the study, future planned transportation improvements, potential land-use changes, and other topics of interest to each participant. The comments and input received were considered as the study was conducted, including in the selection of a Preferred Alternative. The Stakeholder Committee consisted of representatives from Discovery Square, Momentum Midland, City of Midland Non-Motorized Transportation Committee, Midland Chamber of Commerce, Midland Downtown Development Authority, Midland Tomorrow, and Midland Area Community Foundation.

In addition to the committee meetings noted above, a Public Information Meeting was held on December 14, 2016 to solicit public input regarding the project. The purpose of the meeting was to present the purpose and need of the proposed project, the Preferred Alternative, alternatives that were considered as part of the study, and solicit input from all attendees. The public was informed about methods for providing input, and questions from attendees were answered. Approximately 20 members of the public attended the meeting, with 11 citizens providing written comments. Of the comments provided, seven were in support of the Preferred Alternative. No opposition to the Preferred Alternative was presented. Exhibits and comments from the meeting are included in Appendix H.

1.5 Downtown Midland Streetscape Redevelopment Study

The City of Midland is currently conducting a separate study to identify potential streetscape and non-motorized improvements in their downtown and along other streets that provide access to downtown. This study is referred to as the "Downtown Midland Streetscape Redevelopment Study". As part of this streetscape study, the City has been evaluating how to improve transportation connectivity between US-10 BR and Main Street. Preliminary recommendations from the streetscape study include

converting Rodd Street and Ashman Street to two-way roadways (they are both currently one-way streets) from US-10 BR (Indian Street) south to Main Street. Additionally, McDonald Street has been recommended to include an on-street bicycle facility, making it the main bicycle route connection between downtown and US-10 BR. These recommendations have not received formal approval by the City. Some stakeholders have suggested the City should investigate alternative schemes for non-motorized connections between Main Street and US-10 BR. The City of Midland will be further evaluating this topic before an approved plan is advanced. Regardless, the Preferred Alternative for the US-10 BR corridor will be able to accommodate any improvements which are eventually identified from the City of Midland streetscape project.

2.0 CAPACITY ANALYSIS METHODOLOGY

The Synchro (Version 9) and SimTraffic software programs from Trafficware, which are the most recent version of these softwares, were used for the analysis of operations at each of the study intersections and roadway segments. Synchro is a macroscopic traffic analysis and optimization software tool that supports the *Highway Capacity Manual's* (HCM) methodology for intersection analysis (discussed below). This software tool was chosen for this study as it is widely used in the traffic engineering industry, and is also utilized by MDOT. SimTraffic, a microsimulation program packaged with SYNCHRO, was also utilized to evaluate queuing and blocking issues.

MDOT's existing Synchro model was provided to DLZ by MDOT. This model was used as the starting point for the capacity analysis. The model was updated to reflect the current roadway geometry, intersection traffic control, signal timings, and traffic volumes. Poseyville Road, Cronkright Street, and George Street were added to the model to encompass the entire study area for the purposes of this study.

Roadway segments on US-10 BR were evaluated using Arterial Level-of-Service (LOS). This Measure of Effectiveness (MOE) considers the delay at intersections and the speed on roadway links and gives an assessment of the overall corridor operations in terms of average running speed. Arterial LOS was calculated using the through movement delays at the intersections and the average running time between intersections based on the posted speed limits on US-10 BR. This analysis does not consider the effects of mid block traffic movements (i.e., driveways, minor roadways, medians, turn lanes).

The determination of acceptable traffic operation at an intersection is based on the HCM Level of Service (LOS) calculated based using the methods of the Transportation Research Board *Highway Capacity Manual*, 2010 Edition. The HCM details methodologies for assessing the operational characteristics of various aspects of public roads and non-motorized facilities. These methodologies have been developed over 60 years based on empirical analyses and studies. HCM methodologies were utilized for this project and are based on travel delay experienced by users, which is then converted to LOS. The Federal Highway Administration (FHWA) also requires the use of HCM for projects that could involve Federal funding.

LOS is a qualitative measure that describes the quality of operating conditions within the traffic stream and the perception of motorists. The LOS of an intersection is based on the total delay experienced by vehicles waiting to travel through an intersection. The LOS is defined in terms of this total delay, as measured by the average number of seconds of delay per vehicle. Vehicle delay is a means of measuring factors such as driver comfort and convenience, safety, maneuverability, fuel consumption, and lost travel time. The LOS is based on a scale of "A" to "F", with "A" being the best situation. LOS "A" describes traffic operations with very low delay (i.e., most vehicles stop only the minimum amount necessary before entering the intersection). LOS "F" indicates very high delays with long queues of vehicles. In this case, the volume often exceeds the capacity of the intersection. Traffic is interrupted and impeded to the point that it can become "gridlocked" and the capacity of the road system is greatly diminished.

The Synchro model was used to calculate LOS for this study according to the methods of the HCM. The capacity analyses were completed for five different scenarios: Existing Conditions, Year 2040 No Build

traffic, Alternative 1/1A, Alternative 2, and Alternative 3. The AM Peak and PM Peak hours were evaluated for all scenarios. An intersection operating at LOS D is typically considered to have an acceptable operation. The alternatives under consideration are described below in Section 5.0 Road Improvement Alternatives.

Table 1 summarizes the specific LOS criteria for signalized and unsignalized intersections as well as arterial segments.

Table 1. Level of Service Definitions

Level of Service	Signalized Intersections	Unsignalized Intersections	Arterial Segment
	Average Control Delay (Seconds/Vehicle)		Average Travel Speed as a Percentage of Base Free Flow Speed (percent)
A	≤10	≤ 10	> 85
B	> 10 and ≤ 20	> 10 and ≤ 15	> 67 and < 85
C	> 20 and ≤ 35	> 15 and ≤ 25	> 50 and < 67
D	> 35 and ≤ 55	> 25 and ≤ 35	> 40 and < 50
E	> 55 and ≤ 80	> 35 and ≤ 50	> 30 and < 40
F	> 80	> 50	≤ 30

Source: Transportation Research Board, *Highway Capacity Manual*, 2010

3.0 EXISTING CONDITIONS

Intersection turning movement counts were collected by MDOT at 26 intersections within the project area during the AM and PM peak hours. The counts were provided via the 2013 MDOT Synchro model for the US-10 BR corridor. The following intersections were included in the corridor study:

Segment 1

1. Washington Street/WB US-10 BR
2. Washington Street/EB US-10 BR
3. Bayliss Street/WB US-10 BR
4. Bayliss Street/EB US-10 BR
5. Jefferson Avenue/WB US-10 BR
6. Jefferson Avenue/EB US-10 BR
7. George Street/WB US-10 BR
8. George Street/EB US-10 BR
9. South Poseyville Road/ Ellsworth Street/Cronkright Street
10. South Poseyville Road/ Ellsworth Street/George Street
11. Cronkright Street/WB US-10 BR
12. Cronkright Street/EB US-10 BR
13. Rodd Street/WB US-10 BR
14. Rodd Street/EB US-10 BR
15. Ashman Street/WB US-10 BR
16. Ashman Street/EB US-10 BR
17. Jerome Street/WB US-10 BR
18. Jerome Street/EB US-10 BR

Segment 2

19. St. Andrews Road/US-10 BR
20. Sugnet Road/US-10 BR
21. North Saginaw Road/US-10 BR
22. Dilloway Drive/US-10 BR

Segment 3

23. East Wackerly Street/US-10 BR
24. Eastbound US-10 on ramp/US-10 BR
25. Westbound US-10 on-ramp/US-10 BR
26. Airport Road/US-10 BR

3.1 Capacity Analysis

As described above, the existing MDOT Synchro model was used as the basis for the existing conditions model which included the existing AM and PM peak hour turning movement counts, intersection geometry, and signal timings. Using the 2010 HCM methodology, the existing LOS was determined for the study intersections. Under the existing conditions, the signalized intersections within the study area operate at an overall LOS D or better during the AM and PM peak hours, as shown in Table 2. Despite operating at an acceptable overall LOS, the following movements operate at a failing LOS (LOS E or F) (See Appendix A for Synchro output reports):

- US-10 BR (Eastman Avenue) at North Saginaw Road
    - EBL*, PM – F/101.9 seconds of delay
    - NBL, PM – E/64.6 seconds of delay
    - SBT, PM – F/81.5 seconds of delay
- US-10 BR (Eastman Avenue) at East Wackerly Street
    - EBL, PM – F/96.1 seconds of delay
    - WBT, PM – F/83.2 seconds of delay
- US-10 BR (Eastman Avenue) at Airport Road
    - EBL, PM – E/57.3 seconds of delay
    - WBR, PM – F/92.7 seconds of delay

*NB – Northbound, SB – Southbound, EB – Eastbound, WB – Westbound, L – Left Turn, T – Through Movement, R – Right Turn

Additionally, the unsignalized intersection of Cronkright Street and US-10 BR (Indian Street) operates at failing LOS F with 55.9 seconds of delay per vehicle during the PM peak hour.

The arterial LOS for the segments along US-10 BR under the existing conditions is shown in Table 3. As shown in this table, all segments operate at LOS C or better except for the Segment 3 southbound movement during the AM and PM peak hour, which operates at LOS E/17.2 mph and LOS E/16.7 mph, respectively. Table 4 presents the arterial travel time for the existing conditions for each corridor segment. The arterial travel time shows the time it takes for motorist to travel each segment of the corridor by direction. (See Appendix A for Synchro output reports).

Table 2. US-10 BR Intersection LOS Summary for Alternatives

Intersection	Existing Conditions		No Build 2040		Alternative 1 - Lane Reduction		Alternative 1a - Lane Reduction with Bi-Directional Traffic along Ashman and Rodd		Alternative 2 - US-10BR 5-Lane Cross Section		Alternative 3 - US-10BR 5-Lane Cross Section, Local 3-Lane Cross Section	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Segment 1												
Washington Street/WB US-10 BR Patrick Road	B/14.0 s	B/15.9 s	B/12.3 s	B/13.2 s	B/13.5 s	B/12.9 s	B/13.5 s	B/13.0 s	B/11.4 s	B/13.7 s	D/35.9 s	B/16.2 s
Washington Street/EB US-10 BR Lyon Road	A/5.7 s	A/8.3 s	A/8.6 s	B/12.3 s	A/9.0 s	B/11.1 s	A/9.3 s	B/11.0 s	C/20.9 s	C/29.4 s	C/21.0 s	C/33.9 s
Bayliss Street/WB US-10 BR Patrick Road	B/13.0 s*	C/18.3 s*	B/13.9 s*	C/21.5 s*	D/28.2 s*	C/20.8 s*	D/28.2 s*	C/20.8 s*	A/5.5 s	B/11.6 s	A/5.2 s	A/6.9 s
Bayliss Street/EB US-10 BR Lyon Road	A/6.1 s	A/8.5 s	A/7.0 s	A/9.3 s	A/8.1 s	A/9.0 s	A/8.0 s	A/9.2 s	B/11.2 s	A/9.2 s	B/11.1 s	B/16.3 s
Jefferson Avenue/WB US-10 BR Patrick Road	A/8.8 s	A/7.6 s	A/9.4 s	A/8.8 s	A/8.9 s	A/7.5 s	A/9.0 s	A/7.6 s	A/7.4 s	A/8.7 s	A/7.9 s	A/8.6 s
Jefferson Avenue/EB US-10 BR Lyon Road	A/8.6 s	A/6.2 s	A/4.6 s	A/7.4 s	A/5.5 s	A/7.8 s	A/5.6 s	A/7.7 s	A/7.3 s	B/10.8 s	A/7.9 s	B/10.8 s
George Street/WB US-10 BR Indian Street	A/10.0 s	B/11.9 s	B/7.5 s	A/6.1 s	A/3.9 s	A/6.6 s	A/3.7 s	A/6.4 s	A/3.6 s	A/3.3 s	A/2.7 s	A/2.6 s
George Street/EB US-10 BR Buttles Street	B/14.0 s	A/4.9 s	B/10.9 s	B/11.0 s	A/9.8 s	A/8.0 s	A/9.6 s	A/8.0 s	B/13.5 s	B/10.0 s	B/15.5 s	B/14.9 s
South Poseyville Road/Ellsworth Street/George Street	B/11.3 s	B/11.7 s	A/3.9 s	A/9.6 s	A/5.2 s	A/9.6 s	A/5.2 s	A/9.7 s	A/5. 1 s	A/9.4 s	A/5.1 s	A/9.1 s
South Poseyville Road/Ellsworth Street/Cronkright Street	B/12.8 s	B/16.1 s	A/3.1 s	B/11.2 s	A/3.7 s	B/13.5 s	A/3.7 s	B/13.1 s	A/8.1 s	A/8.9 s	A/6.1 s	A/6.2 s
Cronkright Street/WB US-10 BR Indian Street	C/17.6 s*	F/56.4 s	C/21.0 s*	F/123.2 s*	C/16.6 s*	D/33.2 s*	C/16.6 s*	D/33.2 s*	B/11.4 s	B/15.4 s	B/12.3 s	B/15.4 s
Cronkright Street/EB US-10 BR Buttles Street	A/4.0 s	A/7.8 s	A/6.3 s	B/10.1 s	A/5.5 s	A/8.3 s	A/5.6 s	A/8.6 s	A/4.7 s	B/10.8 s	A/8.9 s	B/17.2 s
Rodd Street/WB US-10 BR Indian Street	A/6.6 s	A/7.1 s	A/5.6 s	A/6.1 s	A/7.1 s	A/8.2 s	B/12.1 s	B/13.7 s	A/5.5 s	A/4.4 s	A/1.8 s	A/2.9 s
Rodd Street/EB US-10 BR Buttles Street	A/1.7 s	A/5.2 s	A/3.4 s	A/5.6 s	A/2.1 s	A/4.8 s	A/5.6 s	A/7.2 s	A/3.1 s	A/5.9 s	A/3.5 s	A/7.9 s
Ashman Street/WB US-10 BR Indian Street	A/5.6 s	A/6.5 s	A/8.9 s	B/11.7 s	A/8.0 s	B/10.4 s	A/8.2 s	A/9.4 s	A/9.1 s	B/11.0 s	A/6.9 s	A/8.6 s
Ashman Street/EB US-10 BR Buttles Street	A/8.2 s	A/8.5 s	A/6.2 s	A/4.3 s	A/7.4 s	A/6.5 s	A/6.9 s	A/7.8 s	A/4.2 s	A/4.6 s	A/7.8 s	A/8.6 s
Jerome Street/WB US-10 BR Indian Street	B/11.6 s	B/12.5 s	B/12.9 s	B/13.5 s	B/10.1 s	B/10.9 s	A/9.9 s	B/10.0 s	B/11.7 s	C/20.6 s	B/17.0 s	C/26.3 s
Jerome Street/EB US-10 BR Buttles Street	A/8.3 s	A/9.7 s	A/12.8 s	B/13.5 s	B/15.3 s	B/16.0 s	B/14.8 s	B/15.7 s	C/23.0 s	C/29.8 s	B/17.1 s	C/27.5 s
US 10-BR Eastman Ave/EB US-10 BR/WB US-10 BR Indian Street	-	-	-	-	-	-	-	-	A/6.8 s	A/8.8 s	A/2.3 s	A/4.2 s
Segment 2												
US 10-BR Eastman Ave/St. Andrews Road	A/4.6 s	B/10.5 s	A/5.3 s	A/7.3 s	A/4.2 s	A/6.5 s	A/4.1 s	A/6.5 s	A/5.3 s	B/11.3 s	A/5.3 s	B/11.3 s
US 10-BR Eastman Ave/Sugnet Road	A/9.2 s	B/11.4 s	B/8.3 s	B/13.4 s	A/8.2 s	A/6.9 s	A/8.3 s	A/6.9 s	A/8.4 s	B/12.3 s	A/8.4 s	B/12.3 s
US 10-BR Eastman Ave/Saginaw Road	C/25.8 s	D/44.0 s	C/25.9 s	D/51.2 s	B/19.5 s	D/43.2 s	B/19.5 s	D/43.2 s	C/30.1 s	D/51.6 s	C/30.1 s	D/51.6 s
US 10-BR Eastman Ave/Dilloway Drive	A/8.6 s	A/7.6 s	A/7.6 s	A/5.3 s	A/7.7 s	A/5.9 s	A/7.7 s	A/5.9 s	A/9.3 s	A/8.9 s	A/9.3 s	A/8.9 s
Segment 3												
US 10-BR Eastman Ave/Wackerly Street	C/29.4 s	D/42.4 s	C/27.2 s	D/52.6 s	B/19.7 s	B/19.1 s	B/19.7 s	B/19.1 s	C/28.3 s	C/27.1 s	C/28.3 s	C/27.1 s
US 10-BR Eastman Ave/Airport Road	C/20.9 s	C/30.7 s	B/15.4 s	D/24.7 s	B/13.6 s	B/17.3 s	B/13.6 s	B/17.3 s	B/19.0 s	C/23.3 s	B/19.0 s	C/23.3 s

*Intersection is unsignalized, LOS & delay listed is for worst performing controlled approach

**Under Alternatives 2 & 3, US-10 BR would have bi-directional traffic and would no longer be designated as eastbound/westbound

Table 3. US-10 BR Road Arterial LOS Summary for Alternatives

SEGMENT	Direction	Existing Conditions		No Build 2040		Alternative 1 - Lane Reduction		Alternative 1A - Lane Reduction with Bi-Directional Traffic along Ashman and Rodd		Alternative 2 - US-10BR 5-Lane Cross Section		Alternative 3 - US-10BR 5-Lane Cross Section, Local 3-Lane Cross Section	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Segment 1- Washington Street to W. Hines Street (Patrick Road)	Eastbound	-	-	-	-	-	-	-	-	B/34.1 mph	B/32.6 mph	C/23.7 mph	C/27.7 mph
	Westbound	B/35.3 mph	B/34.5 mph	A/38.2 mph	A/38.1 mph	A/37.7 mph	A/30.2 mph	A/33.6 mph	A/29.6 mph	B/26.2 mph	C/21.7 mph	C/22.6 mph	B/23.9 mph
Segment 1- Washington Street to W. Hines Street (Indian Street)	Eastbound	-	-	-	-	-	-	-	-	C/20.7 mph	C/20.8 mph	C/22.5 mph	C/17.8 mph
	Westbound	B/27.3 mph	B/25.4 mph	B/27.8 mph	B/25.8 mph	C/27.1 mph	C/24.4 mph	C/26.3 mph	C/23.5 mph	B/26.2 mph	C/21.7 mph	C/22.6 mph	B/23.9 mph
Segment 1- Washington Street to W. Hines Street (Lyon Road)	Eastbound	B/36.9 mph	A/38.7 mph	A/38.5 mph	A/39.1 mph	B/36.8 mph	B/37.3 mph	B/36.9 mph	B/37.5 mph	B/34.8 mph	B/32.1 mph	B/34.8 mph	B/34.1 mph
	Westbound	-	-	-	-	-	-	-	-	B/33.3 mph	C/29.7 mph	B/31.3 mph	C/28.2 mph
Segment 1- Washington Street to W. Hines Street (Buttles Street)	Eastbound	B/26.3 mph	B/24.7 mph	B/26.0 mph	C/23.4 mph	B/25.5 mph	B/24.2 mph	B/25.7 mph	B/24.3 mph	C/21.3 mph	C/20.2 mph	C/20.7 mph	D/15.9 mph
	Westbound	-	-	-	-	-	-	-	-	B/24.8 mph	B/24.3 mph	B/23.9 mph	C/22.4 mph
Segment 2- W. Hines Street to E. Wackerly Street	Northbound	B/37.1 mph	B/35.0 mph	B/35.5 mph	C/26.5 mph	B/36.2 mph	B/32.7 mph	B/35.9 mph	B/32.2 mph	B/35.7 mph	B/32.4 mph	B/35.7 mph	B/32.4 mph
	Southbound	B/36.3 mph	B/33.9 mph	B/36.8 mph	B/31.6 mph	B/36.5 mph	B/32.9 mph	B/36.5 mph	B/33.0 mph	B/36.3 mph	B/33.2 mph	B/36.3 mph	B/33.2 mph
Segment 3-E. Wackerly Street to Airport Road (US-10/US-10BR Interchange Area)	Northbound	C/25.0 mph	C/23.0 mph	C/27.2 mph	C/26.8 mph	B/31.7 mph	C/28.7 mph	B/32.2 mph	C/28.3 mph	B/31.7 mph	C/28.7 mph	B/31.7 mph	C/28.7 mph
	Southbound	E/17.2 mph	E/15.3 mph	D/20.8 mph	E/15.1 mph	D/20.7 mph	D/20.3 mph	D/20.9 mph	D/20.4 mph	D/20.7 mph	D/20.3 mph	D/20.7 mph	D/20.3 mph

Values in red text indicate segment is operating at a unacceptable Level of Service (LOS E or F)

Table 4. US-10 BR Road Arterial Travel Time for Alternatives

SEGMENT	Direction	Existing Conditions		No Build 2040		Alternative 1 - Lane Reduction		Alternative 1A - Lane Reduction with Bi-Directional Traffic along Ashman and Rodd		Alternative 2 - US-10BR 5-Lane Cross Section		Alternative 3 - US-10BR 5-Lane Cross Section, Local 3-Lane Cross Section	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Segment 1- Washington Street to W. Hines Street (Patrick Road/Indian Street)	Eastbound	-	-	-	-	-	-	-	-	4.2 min	4.3 min	5.2 min	5.1 min
	Westbound	3.6 min	3.8 min	3.4 min	4.0 min	3.5 min	4.2 min	3.8 min	4.3 min	3.9 min	4.4 min	4.0 min	3.9 min
Segment 1- Washington Street to W. Hines Street (Lyon Road/Buttles Street)	Eastbound	3.9 min	3.9 min	3.8 min	4.2 min	4.0 min	4.0 min	3.9 min	4.0 min	4.1 min	4.4 min	4.2 min	4.7 min
	Westbound	-	-	-	-	-	-	-	-	4.0 min	4.3 min	4.2 min	4.6 min
Segment 2- W. Hines Street to E. Wackerly Street	Northbound	3.4 min	3.6 min	3.6 min	4.8 min	3.5 min	3.9 min	3.5 min	3.9 min	3.5 min	3.9 min	3.5 min	3.9 min
	Southbound	3.9 min	4.1 min	3.8 min	4.4 min	3.8 min	4.2 min	3.8 min	4.2 min	3.8 min	4.2 min	3.8 min	4.2 min
Segment 3-E. Wackerly Street to Airport Road (US-10/US-10BR Interchange Area)	Northbound	1.7 min	1.8 min	1.5 min	1.8 min	1.3 min	1.5 min	1.3 min	1.5 min	1.3 min	1.5 min	1.3 min	1.5 min
	Southbound	1.4 min	1.6 min	1.2 min	1.6 min	1.2 min	1.2 min	1.1 min	1.2 min	1.2 min	1.2 min	1.2 min	1.2 min

3.2 Non-Motorized Facilities

The US-10 BR corridor was originally designed with a focus on traffic flow and safety, which has historically been a common design approach for state trunkline highways. The one-way street system (Segment 1) was designed to provide high level traffic operations. In addition, one-way streets were viewed as safer and better for rapid movement of traffic for peak shift times for local industries and in case of an emergency.

Over the years, traffic patterns in Midland have changed. Traffic growth is relatively low and is generally stable along US-10 BR. In addition, there has been an increased focus on pedestrian and bike travel, both in the city's policy/plans and from MDOT. Past improvements within part of the US-10 BR right-of-way were made to improve travel for non-motorized users. One example is the median shared use path and landscaping between Washington Street and State Street. Others include the ADA improvements for the sidewalks at some of the intersections.

Existing conditions for non-motorized facilities along the corridor are varying. There is a long stretch of the right-of-way that has a convenient 10' shared use path meandering within the median. This path is well used and connects to the Dow Diamond and to the Pier Marquette Riverfront Trail, but it is not a linear path that is convenient for and efficient travel purposes. It also does not serve the entirety of the corridor.

There is sidewalk along the majority of the corridor running parallel with the street, separated by a grassy curb lawn. Some segments are in varying stages of disrepair and are not up to current width standards, especially in the in the area between Jerome and Cronkright. While some of the intersections have been upgraded with modern ADA compliant curb ramps/crossings, others have not yet been upgraded.

Outside of the median shared pathway along the eastern segment of US-10 BR, there are currently no on-street bicycle facilities, though "sharrows" are used entering the downtown crossing US-10 BR on Ashman and Rodd Streets.

3.3 Crash Analysis

Crash data was analyzed based on existing conditions utilizing five years of crash data (2010-2014) within the study area. Crash data was provided by MDOT. The crash analysis showed a total of 1,231 crashes within the study area over the five-year period. See Table 5 for a summary of all corridor crashes. Of these crashes, there were two fatalities, 316 injury crashes (seven incapacitating injuries (Type-A)), four crashes involving pedestrians, five crashes involving bicyclists, and 1,007 property damage only (PDO) crashes. Twenty-two crashes were alcohol related. None of the alcohol related crashes resulted in fatal or incapacitating injuries. As shown in Tables 5 and 6, rear-end crashes are the highest occurring crash type throughout the corridor, comprising 36 percent of the total crashes. The second highest crash type is angle crashes, comprising 27 percent of the total crashes. The third highest crash type is side-swipe at 19 percent of the total crashes. These crashes predominately occurred within the vicinity of the signalized intersections.

There were two fatal crashes within the US-10 BR corridor. One crash involved a pedestrian along US-10 BR between Wackerly Road and Harcrest Drive. The other was a multi-vehicle crash that was caused by an uncontrolled vehicle crossing the center line and impacting another vehicle and a single unit truck. The crash analysis showed seven Type-A (incapacitating injury) crashes. One crash at US-10 BR and Carpenter Street involved a pedestrian crossing US-10 BR. The other five crashes were caused by driver error and disobeying traffic controls.

Of the 1,231 crashes within the study area, 689 crashes occurred at the intersections. An intersection crash was defined as being with 150 feet of an intersection. The crash data shows rear-end (21 percent) and angle crashes (18 percent) were the highest occurring types of crashes at the intersections. The highest number of crashes occurred at the intersections of Saginaw Road (104 crashes), Ashman Street (82 crashes), Wackerly Street (76 crashes), Jerome street (64 crashes), and Washington Avenue (63 crashes) at US-10 BR.

Of the 1,231 crashes within the study area, 542 crashes occurred within the roadway segments. The segment crash data shows that rear-end (16 percent) and angle crashes (10 percent) are the highest occurring crash types within the project area road segments. The majority of the crashes occurred within the segments of Dilloway Drive to Wackerly Street, Jefferson Avenue to George Street, Jerome Street to Saint Andrews Road, and Saginaw Road to Dilloway Drive.

Table 5: US-10 BR Corridor Crash Summary – Overall

Intersection	Angle Straight	Rear End Straight	Side Swipe Same	Angle Turn	Rear End Drive	Angle Drive	Rear End Left	Rear End Right	Side Swipe Opposite	Backing	Fixed Object	Misc. Single Vehicle	Misc. Multi Vehicle	Head On	Parking	Head On Left	Animal	Pedestrian	Bike	Dual Left	Other Drive	Other Object	Over Turning	Dual Left	Total
Ashman at US10BR	25	10	34	4	0	2	1	0	0	0	1	0	2	0	0	0	0	1	0	1	0	0	0	1	**82**
Bayliss at US10BR	14	3	8	0	1	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**30**
Cronkright at US10BR	14	3	2	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**23**
Dilloway at US10BR	8	15	5	0	1	0	0	0	0	0	0	0	2	0	0	1	1	0	0	1	1	0	0	0	**35**
EB US 10 EB at US10BR	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**5**
George at US10BR	24	5	6	5	0	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	**44**
Jefferson at US10BR	2	5	2	0	0	0	0	0	0	0	11	0	1	0	0	0	0	0	0	0	0	0	0	0	**21**
Jerome at US10BR	8	15	20	5	1	0	0	1	0	2	1	0	2	0	0	0	0	0	1	2	0	1	0	5	**64**
Rodd at US10BR	15	2	5	2	0	0	0	1	1	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	**30**
Saginaw at US10BR	8	42	7	15	3	5	1	1	2	1	1	0	3	1	0	12	0	0	0	0	1	0	0	1	**104**
St. Andrews at US10BR	3	10	4	2	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	**23**
Sugnet at US10BR	4	10	3	2	1	1	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	**25**
Wackerly at US10BR	3	39	6	4	4	7	0	4	2	2	1	0	0	0	1	3	0	0	0	0	0	0	0	0	**76**
Wackerly/EB US 10 at US10BR	0	14	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**18**
Washington at US10BR	19	16	22	1	0	0	0	0	0	0	3	0	1	0	0	0	0	1	0	0	0	0	0	0	**63**
WB loop ramp at US10BR	2	29	8	2	2	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	**46**
TOTAL	**149**	**220**	**135**	**43**	**15**	**16**	**7**	**8**	**5**	**6**	**27**	**0**	**15**	**1**	**2**	**18**	**3**	**3**	**1**	**4**	**2**	**2**	**0**	**7**	**689**

Segment	Angle Straight	Rear End Straight	Side Swipe Same	Angle Turn	Rear End Drive	Angle Drive	Rear End Left	Rear End Right	Side Swipe Opposite	Backing	Fixed Object	Misc. Single Vehicle	Misc. Multi Vehicle	Head On	Parking	Head On Left	Animal	Pedestrian	Bike	Dual Left	Other Drive	Other Object	Over Turning	Dual Left	Total
Ashman to Jerome	0	7	14	0	1	1	1	0	0	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0	**28**
Bayliss to Jefferson	4	6	2	0	0	1	0	0	0	1	13	1	1	0	0	0	0	0	0	0	0	0	1	0	**30**
Crockright to Rodd	3	2	3	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	**10**
Dilloway to Wackerly	2	66	3	2	2	5	0	0	0	2	4	0	1	0	1	2	1	0	0	0	1	1	0	0	**93**
EB ramp to WB loop ramp	2	8	1	0	0	2	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	**17**
Jefferson to George	29	6	16	2	0	0	2	1	0	0	34	0	4	0	0	0	3	1	1	0	0	1	1	0	**101**
Jerome to St. Andrews	0	23	14	5	1	0	2	1	2	1	13	0	3	1	0	3	0	0	1	0	0	0	1	0	**71**
Rodd to Ashman	7	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**13**
Saginaw to Dilloway	9	24	16	9	9	31	0	1	0	0	7	0	0	1	1	0	1	0	1	0	6	2	0	0	**118**
St. Andrews to Sugnet	0	6	3	0	2	1	0	1	1	0	3	0	1	0	0	0	3	0	0	0	0	1	0	0	**22**
Sugnet to Saginaw	0	17	4	0	0	6	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**31**
Washington to Bayliss	0	3	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**8**
TOTAL	**56**	**168**	**84**	**20**	**15**	**47**	**7**	**4**	**5**	**5**	**78**	**1**	**13**	**2**	**2**	**5**	**9**	**1**	**4**	**0**	**7**	**6**	**3**	**0**	**542**

Table 6. US-10 BR Corridor Crash Summary – By Year

CRASH TYPE	NUMBER OF CRASHES					MONTHLY AVERAGE	PERCENTAGE
	2010	2011	2012	2013	2014		
Minor Injuries	59	78	57	67	45	5.1	24.90%
Serious Injury/Fatalities	3	1	6	1	1	0.2	1.00%
Angle Drive	15	14	12	11	11	1.05	5.10%
Angle-Straight	35	39	41	54	36	3.42	16.70%
Angle -Turn	18	16	12	12	5	1.05	5.10%
Animal	7	0	0	2	3	0.2	1.00%
Pedestrian	1	1	1	1	0	0.07	0.30%
Bicycle	2	1	1	0	1	0.08	0.40%
Fixed Object	17	21	19	28	20	1.75	8.50%
Other Object	1	3	1	2	1	0.13	0.60%
Head-On	1	1	0	0	1	0.05	0.20%
Head-On Left Turn	8	4	9	0	2	0.38	1.90%
Rear-End Left Turn	1	7	2	4	0	0.23	1.10%
Rear-End Straight	81	77	87	84	59	6.47	31.50%
Rear End Drive	9	2	4	6	9	0.5	2.40%
Rear-End Right Turn	2	4	2	2	2	0.2	1.00%
Side Swipe Same	43	34	50	50	42	3.65	17.80%
Side Swipe Opp. Dir.	3	2	2	1	2	0.17	0.80%
Backing	1	3	1	4	2	0.18	0.90%
Parking	1	0	2	1	0	0.07	0.30%
Overturned	1	0	1	0	1	0.05	0.20%
Other Drive	1	0	5	2	1	0.15	0.70%
Dual Left Turn	0	1	1	4	1	0.12	0.60%
Dual Right Turn	1	0	2	0	1	0.07	0.30%
Misc. Multi/Single Vehicle	1	10	1	6	11	0.48	2.4%
TOTAL	**250**	**240**	**256**	**274**	**211**		

4.0 FUTURE NO-BUILD CONDITIONS (YEAR 2040)

The "No Build" scenario assumes that normal traffic growth occurs between 2015 and the year 2040, with no capacity modifications to the existing roadway network except for projects that are already identified/planned and likely to be built (note: it was assumed that for the "No Build" scenarios, normal ongoing capital maintenance and road resurfacing/reconstruction projects would still occur consistent with MDOT and the City's capital improvement plan). Reviewing expected traffic operations of the existing network in the year 2040 based on anticipated traffic growth allows identification of potential future infrastructure needs that would not be apparent when only looking at existing traffic volumes. It is anticipated that signal operation modernization and optimization will occur by year 2040, and this is assumed for the No Build scenario.

In order to evaluate the operation of the study intersections and roadway segments for the future conditions (year 2040 No Build), the Synchro model was updated to reflect conditions anticipated to exist in the year 2040. A future traffic volume forecast for the year 2040 No-Build scenario was developed through applying a compound annual growth factor to the existing traffic volumes. In order to develop future growth rates for the project corridor, historic ADT counts, peak hour turning movement counts, local land use and zoning plans, local transportation plans, and information from the existing MDOT travel models for the area were reviewed and evaluated. Upon this review, future growth rates were developed. The growth rate used to develop future (year 2040) traffic volumes was 0.5 percent per year. Therefore, to develop "base" 2040 No Build traffic volumes, the existing traffic volumes were increased by this 0.5 percent per year growth rate for 25 years (2015 to 2040).

4.1 Capacity Analysis

Under the year 2040 No Build conditions, the majority of the study area signalized intersections would operate at an overall LOS D or better during the AM and PM peak hours, as shown in Table 2. Despite operating at an acceptable overall LOS, the following movements would operate at a failing LOS (LOS E or F) (See Appendix B for Synchro outputs):

- US-10 BR (Eastman Avenue) at Saginaw Road
    - EBL, PM – F/73.4 seconds of delay
    - WBT, PM – E/67.7 seconds of delay
    - NBL, PM – F/72.8 seconds of delay
    - SBL, PM – F/68.9 seconds of delay
    - SBT, PM – E/60.0 seconds of delay
- US-10 BR (Eastman Avenue) at East Wackerly Street
    - EBL, PM – F/81.4 seconds of delay
    - WBT, PM – F/101.8 seconds of delay
    - NBT, PM – E/69.7 seconds of delay
    - SBL, PM – E/62.5 seconds of delay

Additionally, the unsignalized intersection of Cronkright Street and US-10 BR (Indian Street) would operate at failing LOS F with 123.2 seconds of delay per vehicle during the PM peak hours.

The arterial LOS for the segments along US-10 BR under the No Build conditions is shown in Table 3. As shown in Table 3, all segments would operate at LOS D or better except for the Segment 3 southbound movement during the PM peak hour, which would operate at LOS E/15.1 mph. Under the 2040 No Build conditions, Table 4 shows an increase in arterial travel time along US-10 BR compared to the existing

conditions. The most significant increase is northbound along Segment 2 which has an increase of 1.2 minutes. This increase is consistent with the delays experienced at North Saginaw Road and East Wackerly Street (See Appendix B for Synchro outputs).

5.0 TRANSPORTATION IMPROVEMENT ALTERNATIVES

This section describes the transportation improvement alternatives that were considered for the US-10 BR corridor study, as well as the process used to develop and evaluate these alternatives. Three potential alternatives were developed through a series of Steering and Stakeholder committee meetings. Early preliminary engineering (EPE) was performed to identify proposed transportation improvements. As part of the EPE process, a traffic analysis was conducted for each alternative. Input and guidance was also received from the Steering and Stakeholder committees. The alternatives were then evaluated based on a variety of criteria as shown in Table 7. The alternatives were analyzed with the horizon year (2040) traffic volumes. The No Build Alternative serves as the baseline against which the other alternatives are compared.

The following describes the proposed transportation improvements, traffic analysis, benefits, and impacts for each alternative.

5.1 Alternative 1

5.1.1 Transportation Improvements

Under this alternative, the existing one-way pair in Segment 1 would be reduced from three to two travel lanes in each direction. Additionally, all signalized intersections would be upgraded and retimed. See Figure 2 for the proposed transportation improvements under Alternative 1. This reduction would result in two westbound/northbound through lanes and two southbound/eastbound through lanes. The lane reduction would reduce the existing three 13-foot travel lanes in each direction to two 12-foot travel lanes in each direction. This reduction could allow for the inclusion of other transportation facilities within the right-of-way. These facilities could include on-street bicycle lanes or cycle tracks with a buffer separating bicyclists from motor vehicular traffic, or multi-use paths.

On-street parking would not be a viable option due the speed limit on Indian Street and the impacts to traffic operations resulting from on-street parking delays.

The proposed improvements for Segment 2 would include signal upgrades, retiming, and the following lane additions:

- North Saginaw Road/US-10 BR (Eastman Avenue) Intersection
    - Install a Southbound Right Turn Lane
    - Install a Northbound Right Turn Lane

For all other intersection and roadway segments and non-motorized facilities, the cross section would remain the same as the existing configurations.

The proposed roadway improvements for Segment 3 would include signal upgrades, retiming, and the following lane additions:

- Airport Road/US-10 BR (Eastman Avenue) Intersection
    - Install a Southbound Right Turn Lane
    - Install a Southbound Through Lane
    - Install an Eastbound Left Turn Lane

- East Wackerly Street/US-10 BR (Eastman Avenue) Intersection
    - Install a Northbound Through Lane
    - Install a Westbound Right Turn Lane

For all other intersection and roadway segments, the cross section would remain the same as the existing configurations.

These improvements described within Segment 3 are consistent with the previous roadway and signal improvement plans prepared by the City in 2008. These plans were previously reviewed and approved by MDOT.

5.1.2 Capacity Analysis

Table 2 shows that under Alternative 1 the lane reduction would provide similar operations at the intersections when compared to the No Build conditions (i.e., three travel lanes in each direction) (See Appendix C for Synchro output reports). Alternative 1 would provide acceptable LOS at all of the intersections except Cronkright Street. At this intersection, southbound Cronkright Street is predicted to operate at LOS F with 71.9 seconds of delay per vehicle. However, this approach is stop-controlled, and southbound drivers would most likely find alternate routes (due to the delay) as there are numerous other routes available. It was estimated that 50 percent of the traffic along Cronkright Street could theoretically divert to George Street and Ashman Street, as a result, LOS and delays at the intersection would improve to LOS C with 16.6 seconds of delay per vehicles (see Table 2). At this intersection, westbound US-10 BR is free flowing and would operate at LOS A.

The US-10 BR (Indian Street) approach at the Jerome Street intersection would still need to be a three-lane cross section with one left turn lane, one thru/left-turn lane, and one thru lane. Furthermore, the US-10 BR (Buttles Street) approach at the Jerome Street intersection would still need to be a three-lane cross section with one right turn lane, one thru/left-turn lane, and one thru lane.

The intersections within Segment 2 would operate at an overall LOS D or better, while the Segment 3 intersections would operate at an overall LOS B or better during the AM and PM peak hours, as shown in Table 2. Despite operating at an acceptable overall LOS, the following movements would operate at a failing LOS (LOS E or F) (See Appendix C for Synchro output reports):

- US-10 BR (Eastman Avenue) at Saginaw Road
    - EBL, PM – E/67.2 seconds of delay
    - SBL, PM – F/61.8 seconds of delay

To achieve optimal progression through the US-10 BR corridor, the signalized intersections along Segment 1 were modeled as fully actuated-coordinated signals operating with an 80 second cycle length during both the AM and PM peak hours. 3.5 second yellow and 2.0 all red clearance intervals were used at each of the study intersections. Similarly, pedestrian intervals of 7.0 seconds for “walk” and 13.5 seconds for “flash don’t walk” were used for each intersection approach. Under these conditions, the splits and offsets of the signalized intersections along Segment 1 were optimized to promote the optimal progression available. Progression along local side streets may need to be evaluated further if this alternative is advanced beyond this study.

The signalized intersections along Segment 2 were modeled as fully actuated-coordinated signals operating with an 80 second cycle length during the AM peak hour. During the PM peak hour, the US-10

BR intersections at Sugnet Road and St. Andrews Road would operate at 50 second cycle lengths, and the Saginaw Road intersection would operate with a 100 second cycle length.

The signalized intersections along Segment 3 were modeled as fully actuated-coordinated signals operating with an 80 second cycle length during the AM peak hour and 100 second cycle lengths in the PM peak hour.

In addition to the intersection analysis, the travel speeds, arterial LOS, and travel time for Alternative 1 were also evaluated and compared against the No Build conditions (i.e., three travel lanes in each direction). As shown in Table 3, within Segment 1 Alternative 1 is expected to provide an acceptable arterial LOS C or better and average speed during both peak hours. Segments 2 and 3 would operate at LOS B and D, respectively with an increase in average arterial travel speeds when compared to the No Build Conditions.

The arterial travel times (Table 4) for Segment 1 show a slight increase, while Segments 2 and 3 show a slight decrease for both northbound and southbound US-10 BR (Eastman Avenue) when compared to the No Build Conditions. This can be attributed to the intersections and signal improvements at the North Saginaw Road, East Wackerly, and Airport Road intersections, which improved overall operations and decreased congestion (See Appendix C for Synchro outputs).

5.1.3 Cost Estimate

The estimated construction cost for Alternative 1 is approximately $10,700,000, in year 2016 dollars. ROW acquisition, design, and construction engineering costs are not included. No ROW acquisition is anticipated to be needed for this alternative.

A cost estimate was developed for implementing the first stage of Alternative 1 within Segment 1 only. Stage 1 would consist of pavement marking, signing, and signal improvements only. Under this Stage 1 scenario, the estimated construction cost is approximately $390,000.

5.2 Alternative 1A

5.2.1 Transportation Improvements

The proposed improvements for Segment 1 are the same as noted above for Alternative 1. However, under this alternative, Ashman Street and Rodd Street would be converted from one-way roadways to bi-directional roadways through the study area, consistent with recommendations from the Downtown Midland Streetscape Redevelopment Study. The Ashman Street and Rodd Street intersections would be upgraded with new signal head for four-way traffic and retimed. See Figure 2 for the proposed transportation improvements under Alternative 1A.

The proposed improvements for Segments 2 and 3 are the same as noted above for Alternative 1.

5.2.2 Capacity Analysis

Under Alternative 1A, the Segment 1 intersections would operate at an overall LOS C or better, with the exception of the US-10 BR (Indian Street) and Cronkright Street intersection operating at LOS D in the PM peak hour (See Appendix D for Synchro outputs).

The Segment 2 and 3 intersections would operate at an overall LOS D or better during the AM and PM peak hours. Despite operating at an acceptable overall LOS, the following movements would operate at a failing LOS (LOS E or F) (See Appendix D for Synchro outputs):

- US-10 BR (Eastman Avenue) at Saginaw Road

- EBL, PM – E/67.2 seconds of delay
- SBL, PM – F/61.8 seconds of delay

Intersection LOS is shown in Table 2 for each Segment.

The signal timings for Alternative 1A are the same as Alternative 1.

As shown in Tables 3 and 4, Alternative 1A is expected to provide similar arterial LOS and travel times to Alternative 1. (See Appendix D for Synchro outputs).

5.2.3 Cost Estimate

The estimated construction cost for Alternative 1A would be the same as Alternative 1, except that additional signal work would be needed at the intersections of Indian Street and Rodd Street, Indian Street and Ashman Street, Buttles and Rodd Street, and Buttles and Rodd Street and Ashman Street. Up to $400,000 in additional funding could be needed to upgrade the signals and infrastructure to accommodate the conversion of Ashman and Rodd Streets to two-way traffic.

5.3 Alternative 2

5.3.1 Transportation Improvements

Under Alternative 2, Segment 1 would consist of converting the existing US-10 BR (Indian Street/Patrick Road and Buttles Street/Lyon Road) one-way pair to two bi-directional roadways. The existing US-10 BR three-lane cross sections would both be converted to a five-lane cross section (two 12-foot travel lanes in each direction and a 12-foot TWLTL. Under this alternative, the Indian Street intersections with Bayliss and Cronkright Streets would be signalized. Additionally, all signalized intersections would be upgraded and retimed. A 10-foot multi-use path would also be constructed on the south side of Buttles Street. See Figure 3 for the proposed transportation improvements under Alternative 2.

The proposed improvements for Segments 2 and 3 are the same as noted above for Alternative 1.

5.3.2 Capacity Analysis

Under Alternative 2, within Segment 1 it was assumed that traffic would utilize Indian Street/Patrick Road and Buttles Street/Lyon Road) equally. This required redistributing the year 2040 No Build peak hour through traffic volumes along both US-10 BR corridors (Indian Street/Patrick Road and Buttles Street/Lyon Road) evenly between the pairs. Fifty percent of the US-10 BR peak hour traffic volume was modeled utilizing Indian Street/Patrick Road, and the remaining 50 percent of the traffic volume was modeled as utilizing Buttles Street/Lyon Road.

Similarly, traffic on the cross street approaches was redistributed based on the same 50 percent/50 percent redistribution split used for the US-10 BR through volumes. Fifty percent of the cross street turning movement traffic was modeled turning onto Indian Street/Patrick Road, and the remaining 50 percent was modeled turning onto Buttles Street/Lyon Road. Additionally, for traffic entering and progressing into the network at the US-10 BR (Patrick Road) and Washington Street intersection, it was assumed that traffic would spread out through the downstream intersections to get onto US-10 BR (Lyon Road). It was assumed that 30 percent of the westbound traffic at the US-10 BR (Patrick Road) and Washington Street intersection would turn left and proceed south to westbound US-10 BR (Lyon Road), then an additional 10 percent of the westbound traffic would make the same turning maneuvers at the US-10 BR (Patrick Road)/Bayliss Road intersection. Finally, the remaining 10 percent would continue to US-10 BR (Lyon Road) from Jefferson Street.

To achieve optimal progression through the US-10 BR corridor, the signalized intersections along Segment 1 were modeled as fully actuated-coordinated signals operating with 80 and 90 second cycle lengths during both the AM and PM peak hours, respectively. A 3.5 second yellow and 2.0 second all red clearance interval were used at each of the study intersections. Similarly, pedestrian intervals of 7.0 seconds for walk and 13.5 seconds for flash don't walk were used for each intersection approach. Along Segment 1, the splits and offsets at each intersection were optimized to the traffic signal detectors, to promote optimal progression. Within Segment 1, Alternative 2 would require the following:

1. Convert US-10 BR (Patrick Road)/Bayliss Street to a fully actuated-coordinated signal utilizing the timing parameters noted above.
2. Convert US-10 BR (Indian Street)/Cronkright Street to a fully actuated-coordinated signal utilizing the timing parameters noted above.
3. Install a new signal where Buttles Street and Indian Street meet Eastman Avenue. This is necessary to ensure the redistributed traffic along the converted roadways can safely enter the Segment 1 network while maintaining corridor progression. The east leg (Indian Street) of the proposed signal) would need dual right turn lanes onto northbound US-10 BR (Eastman Avenue); the south leg (Buttles Street) would require two through lanes onto northbound US-10 BR (Eastman Avenue); the north leg (Eastman Avenue) would need one southbound through lane onto Buttles Street, and one southbound left turn lane onto US-10 BR (Indian Street). This intersection will utilize the signal timing parameters noted above.
4. Dual eastbound right-turn lanes at US-10 BR (Patrick Road)/Washington Street.
5. Dual southbound left-turn lanes at US-10 BR (Lyon Road)/Washington Street.
6. One westbound through and two westbound left turn lanes at US-10 BR (Indian Street)/Jerome Street.
7. One westbound through and two westbound left turn lanes at US-10 BR (Buttles Street)/Jerome Street.

Under Alternative 2, Segment 1 intersections would operate at an overall LOS C or better, while Segment 2 and 3 intersections would operate at an overall LOS D or better during the AM and PM peak hours, as shown in Table 2. The following movements would operate at a failing LOS (LOS E or F) (See Appendix E for Synchro outputs):

- US-10 BR (Lyon) at Washington Street
  - NBL, PM – F/94.1 seconds of delay
- US-10 BR (Lyon) at Jefferson Street
  - NBT, PM – E/60.9 seconds of delay
- US-10 BR (Buttles Street) at Jerome Street
  - WBL, AM – E/60.1 seconds of delay
- US-10 BR (Eastman Avenue) at St. Andrews Road
  - EBL, PM – E/59.7 s
- US-10 BR (Eastman Avenue) at Saginaw Road
  - SBL, AM – F/91.0 s
  - EBL, PM – F/182.4 s
  - NBL. PM – E/77.1 s
  - SBL, PM – F/68.9 s
- US-10 BR (Eastman Avenue) at Airport Road
  - EBL, PM – E/61.3 s
  - WBL, AM – E/57.2 s, PM – E/63.1

- WBT, AM – E/62.7 s

The arterial LOS for each segment is shown in Table 3. As shown in the table, Segment 1 would operate at LOS C or better. Converting Segment 1 to bi-directional roadways, and adding two additional signals at US-10 BR (Patrick Road)/Bayliss Street and US-10 BR (Indian Street)/Cronkright Street would create additional delays which in turn results in a general decrease in average arterial travel speeds when compared to the No Build Conditions. Segment 2 would operate at LOS B with an increase in average arterial travel speeds, while Segment 3 would operate at LOS D with an increase in average arterial travel speeds when compared to the No Build conditions.

The arterial travel times (Table 4) for Segment 1 show an overall increase for both eastbound and westbound traffic along US-10 BR. This can be attributed to the two new signalized intersections needed at US-10 BR (Patrick Road)/Bayliss Street and US-10 BR (Indian Street)/Cronkright Street and converting the one-way roadways to bi-directional roadways, thus creating additional delays that are currently not experienced.

The arterial travel times for Segments 2 and 3 show an overall decrease for both northbound and southbound US-10 BR (Eastman Avenue) when compared to the No Build Conditions. This can be contributed to the intersection improvements done at the North Saginaw Road, East Wackerly Street, and Airport Road intersections which improveoverall operations and decrease congestion.

There were several issues and considerations that arose while performing the Alternative 2 analysis. This included the following:

1. The permitted/protected left turn phases at the US-10 BR (Buttles Road) and Jerome Street intersection were changed from lagging to leading to avoid the potential for a yellow-turn trap situation as well as increase capacity and improve overall operations. This does not exactly follow the MDOT signal optimization guidelines, as the guidelines specify that a permitted/protected left-turn should lag the through movement; however, a leading left turn phase can be used if there is a significant benefit and approved by MDOT. Similarly, several protected left-turn movements were changed from leading to lagging for better progression along the corridor. Furthermore, implementing these changes promotes the best possible progression for the US-10 BR corridor.
2. The new signal at Eastman Avenue/Buttles Street/Indian Street could need a significant amount of right-of-way acquisition to properly construct the appropriate intersection laneage and geometry.
3. There could theoretically be safety implications when converting one-way roadways to bi-directional roadways. The number of conflict points through each intersection is increased which could increase the likelihood of crashes.
4. To mitigate the failing movements and overall intersection operations, the US-10 BR intersections at Jerome Street and Washington Street would be good candidates for two-lane roundabouts. However, a considerable amount of right-of-way would be needed at the Jerome Street intersections.

5.3.3 Cost Estimate

The estimated construction cost for Alternative 2 is approximately $35,680,000, in year 2016 dollars. ROW acquisition, design, and construction engineering costs are not included.

5.4 Alternative 3

5.4.1 Transportation Improvements

Under Alternative 3, the existing US-10 BR one-way pair (Segment 1) would be converted to two bi-directional roadways. The US-10 BR (Indian Street/Patrick Road) corridor would be converted to a five-lane cross section with two 12-foot eastbound and westbound travel lanes and a 12-foot center TWLTL. Under this alternative, Indian Street/Patrick Road would be designated as US-10 BR. Buttles Street/Lyon Road would be converted to a three-lane cross section (one 12-foot eastbound travel lane, one 12-foot westbound travel lane, and a center 12-foot TWLTL) and converted to a local road under the City of Midland's jurisdiction. A 10-foot multi-use path would also be constructed on the south side of Buttles Street. See Figure 4 for the proposed transportation improvements under Alternative 3.

The proposed improvements for Segments 2 and 3 are the same as noted above for Alternatives 1 and 2.

5.4.2 Capacity Analysis

Under Alternative 3, it was assumed that 70 percent of the US-10 BR peak hour through traffic volumes would utilize the US-10 BR (Indian Street/Patrick Road) corridor, and the remaining 30 percent of the traffic volumes would utilize the Buttles Street/Lyon Road corridor. Similarly, traffic on the cross street approaches would be redistributed based on the same 70 percent/30 percent split used for the US-10 BR segment through traffic volumes. Seventy percent of the cross street turning movement traffic was modeled turning onto US-10 BR (Indian Street/Patrick Road), and the remaining 30 percent was modeled turning onto Buttles Street/Lyon Road.

To achieve optimal progression through the US-10 BR corridor, the cycle lengths and timings would be the same as Alternative 2. Within Segment 1, Alternative 3 would require the same signal improvements that are noted for Alternative 2 along Indian Street, while the signal improvements on Buttles Street would be modified as a result of the three-lane cross section.

Under Alternative 3, the study intersections would operate at an overall LOS D or better during AM and PM peak hours, as shown in Table 2. The following movements would operate at a failing LOS (LOS E or F) (See Appendix F for Synchro outputs):

- US-10 BR (Patrick) at Washington Street
  - EBL, AM – F/125.7 seconds of delay
  - NBT, PM – E/67.3 seconds of delay
- US-10 BR (Lyon) at Washington Street
  - NBL, PM – F/76.1 seconds of delay
- US-10 BR (Eastman Avenue) at St. Andrews Road
  - EBL, PM – E/59.7 seconds of delay
- US-10 BR (Eastman Avenue) at Saginaw Road
  - SBL, AM – F/91.0 seconds of delay
  - EBL, PM – F/182.4 seconds of delay
  - NBL. PM – E/77.1 seconds of delay
  - SBL, PM – F/68.9 seconds of delay
- US-10 BR (Eastman Avenue) at Airport Road
  - EBL, PM – E/61.3 seconds of delay
  - WBL, AM – E/57.2 seconds of delay, PM – E/63.1 seconds of delay
  - WBT, AM – E/62.7 seconds of delay

The arterial LOS for Alternative 3 is shown in Table 3. As shown in the table, Segment 1 would operate at LOS C or better. Converting Segment 1 to bi-directional roadways, and adding two additional signals at the US-10 BR (Patrick Road)/Bayliss Street and US-10 BR (Indian Street)/Cronkright Street intersections creates additional delays, which in turn results in a general decrease in average arterial travel speeds when compared to the No Build conditions. The arterial travel times (Table 4) for Segment 1 show an overall increase for both eastbound and westbound traffic along US-10 BR. This can be attributed to the two additional signalized intersections needed at US-10 BR (Patrick Road)/Bayliss Street and US-10 BR (Indian Street)/Cronkright Street and converting one-way roadways to bi-directional roadways, thus creating additional delays that are currently not experienced. Segment 2 shows an overall decrease for both northbound and southbound US-10 BR (Eastman Avenue) when compared to the No Build Conditions for arterial travel times. This can be attributed to the intersections improvements done at the North Saginaw Road and East Wackerly Street intersections.

The arterial LOS and arterial travel times for Segments 2 and 3 would be the same as Alternative 2.

There were several issues and considerations that arose while performing the Alternative 3 analysis.

1. The new signal at Eastman Avenue/Buttles Street/Indian Street would need a significant amount of right-of-way to properly construct the appropriate intersectional laneage and geometry.
2. There are safety concerns when converting one-way roadways to bi-directional roadways. The number of conflict points through the intersection is significantly increased which heightens the likelihood of injury and fatal type crashes.
3. To mitigate the failing movements and overall intersection operations, the US-10 BR intersections at Jerome Street and Washington Street would be good candidates for two-lane roundabouts. However, a considerable amount of right-of-way would be needed at the Jerome Street intersections.

5.4.3 Cost Estimate

The estimated construction cost for Alternative 2 is approximately $26,900,000, in year 2016 dollars. ROW acquisition, design, and construction engineering costs are not included.

5.5 Access Management

Access Management is a process or program intended to ensure the major roadway systems will operate safely and efficiently through reduction of access points (i.e., driveways and curb cuts), spacing of traffic signals, and increasing cross-property connections, while adequately meeting the access need of abutting land uses and businesses along the roadway. The use of access management techniques is intended to increase roadway capacity, manage congestion, and reduce crashes. Access management strategies could be implemented with each alternative described above.

A lack of an access management policy can adversely affect roadway operations and safety by:

- Increasing crash rates
- Aiding in a greater number of conflicts and potential hazards between vehicles, bicycles, and pedestrians
- Diverting through traffic into abutting neighborhoods to avoid congestion
- Increasing congestion with slower travel speeds and delays to arterial traffic

A lack of an access management policy can also result in a decrease in development due to poor aesthetics of the corridor for new business.

Current access spacing along the US-10 BR corridor varies significantly. In some cases, the recommended MDOT guidelines (*MDOT Access Management Guide Book*) are met. There are many examples, especially with more recent development, of well-designed access spacing from intersections and other driveways. However, for most segments with commercial uses, the number of access points and their spacing exceed the MDOT guidelines (Table 7).

Table 7: MDOT Driveway Spacing Guidelines

Speed on Roadway (MPH)	MDOT Spacing Guidelines (feet)
25	130
30	185
35	245
40	300
45	350
50	455
55	455+

One of the goals along the corridor is to bring the access spacing into better conformance with current MDOT guidelines. The strategy is to gradually remove or relocate the access points that are the least conforming. Collaboration between the City of Midland and MDOT toward implementation should include coordination between the City and MDOT regarding any proposed development requiring a break/change in access. A special provision for the US-10 BR corridor in the City's zoning ordinance is also recommended to formalize this process and alert applicants about the MDOT role. This can be accomplished in a number of ways:

1. Voluntary closure by the property owner.
2. Closure as part of an MDOT project – in some cases the owner can be convinced that if they permit the access improvement as part of the MDOT project cost, they can avoid paying for the change that may be required later by the City or MDOT.
3. Access improvement as part of the use or site plan approval for new development, a change in use or expansion that increases traffic.
4. As part of an MDOT access permit review and approval (note the city should notify MDOT of any new development or changes proposed on a commercial site that may increase the amount of traffic or change the traffic pattern at the access point).

Decisions regarding changes to access are based in part on the proposed use and the traffic operations at the time of application. Higher priority access points and potential improvements within the corridor are identified below. This list could be used by the City and MDOT in the review of access as part of road design improvements or site plan/access permit reviews. There may also be other lower priority opportunities that are not listed.

Segment 1

- Terminate the access permits and remove the existing former residential driveways that are not currently used (their presence gives the impression that those access points will remain).

- Promote a shared access system from the existing office building through the vacant lot at the northwest corner of Indian and McDonald.
- Direct all future access to be only from the side streets, especially on Indian and Buttles Streets. For existing parcels in the middle of a block, promote shared access with adjacent properties.

Segment 2

- North of Saginaw Road (south of Sylvan Lane)
    - Close one of the access points to the Chevrolet dealership (consideration is needed for truck access to the bay doors facing the street).
    - The mixed tenant buildings with a scuba shop, salon, etc. – consolidate the access.
    - Close the Eastman Avenue access at the PNC bank which has access to a side street.
    - Eastman Party Store – close the northern access.
    - Mixed use building south of the party store – close the north driveway.
- Close the unused driveway south of Wackerly Street.
- Close the driveway along Eastman Avenue for the building at the northeast corner of Dilloway Drive (site has access to two side streets).

Segment 3

- Close one or both driveways when the former bank south of the Panera redevelops; connect access with uses to the north and/or south.
- Close the Speedway driveway closest to the US 10 interchange ramp (south of Airport Road). Increase the inbound driveway radii so entering traffic has less impact on traffic flow and potential for rear-end collisions.

Table 8. Alternatives Evaluation Matrix

Evaluation Criteria	Comments	Alternatives		
		Alternative 1	**Alternative 2**	**Alternative 3**
Traffic Operations	Overall efficiency of traffic operations. Factors include intersection operations and changes to travel time for US-10 BR.	High All intersections would operate at LOS C or better except for two intersections. When compared to Alternatives 2 and 3, Alternative 1 would have a slightly better arterial LOS and lower travel time through the corridor.	High All intersections would operate at LOS C or better. Alternative 2 would have a slightly better arterial LOS and lower travel time when compared to Alternative 3.	High All intersections would operate at LOS C or better, except for one intersection.
Safety	Degree to which alternatives may reduce total crashes, injury crashes, and conflicts for vehicular and non-motorized users.	Moderate When compared to Alternatives 2 and 3, one-way roadways have fewer crashes than two-way roadways. Pedestrian crossing distance reduced via lane reduction on Indian and Buttles. Bicycle facility would separate on-street bicyclists from vehicular traffic.	Low Two-way traffic and five-lane cross sections would likely increase the number of crashes along the corridor. Pedestrians less safely accommodated than Alternatives 1 & 3 as pedestrians have to travel across five-lanes of traffic and traffic is traveling in two directions.	Low Two-way traffic and five-lane cross section would likely increase the number of crashes along Indian. Would likely have less crashes than Alternative 2 due to the three-lane cross section and local street designation on Buttles. Pedestrians less safely accommodated than Alternative 1 as pedestrians have to travel across more travel lanes and traffic is traveling in two directions.
Non-motorized Facilities – Pedestrians	Degree to which alternatives accommodate pedestrians. Assessment is based upon (1) providing connectively to/from Downtown and (2) presence of paths/sidewalks connecting local streets to US 10 BR paths/sidewalks.	Pedestrians fully accommodated via existing sidewalks and multi-use path, and construction of new sidewalk connections.	Pedestrians fully accommodated via existing sidewalks and multi-use path, and construction of new sidewalk connections, five-foot sidewalk on the north side of Indian, and ten-foot multi-use path on the south side of Buttles.	Pedestrians fully accommodated via existing sidewalks and multi-use path, and construction of new sidewalk connections, five-foot sidewalk on the north side of Indian, and 10-foot multi-use path on the south side of Buttles.
Non-motorized Facilities – Bicyclists	Degree to which alternatives accommodate bicyclists. Assessment is based upon (1) providing connectively to/from Downtown; (2) presence of non-motorized facilities connecting from local streets to US 10 BR non-motorized facilities; and (3) presence of non-motorized facilities along US-10 BR.	Bicyclists fully accommodated via existing multi-use path and construction of new bicycle facility within the US-10 BR ROW. Bicycle facility would physically separate on-street bicyclists from vehicular traffic.	Bicyclists fully accommodated via existing multi-use path, and construction of a ten-foot multi-use path on the south side of Buttles. Some bicyclists would likely remain riding in the roadway on US-10 BR.	Bicyclists fully accommodated via existing multi-use path, and construction of a ten-foot multi-use path on the south side of Buttles. Some bicyclists would likely remain riding in the roadway on US-10 BR.
Right-of-Way Acquisition	Impacts to businesses and residences caused by construction of project.	Low No additional ROW required.	High Potential high impacts to green space between Indian & Buttles, and businesses/residences located along Indian and Buttles between Haley St. and W Union St.	Moderate Moderate impacts to green space between Indian & Buttles, and businesses/residences located along Indian and Buttles between Haley St. and W Union St.
Planning Level Construction Cost	Includes construction cost for improvements to US-10 BR for 20-year time horizon. All estimates in year 2017 dollars. Engineering and Right-of-Way cost not included in estimate.	Segment 1 – $4,610,000 Segment 2 – $4,310,000 Segment 3 – $1,780,000 **TOTAL - $10,700,000**	Segment 1 – $29,590,000 Segment 2 – $4,310,000 Segment 3 – $1,780,000 **TOTAL - $35,680,000**	Segment 1 – $20,810,000 Segment 2 – $4,310,000 Segment 3 – $1,780,000 **TOTAL - $26,900,000**
Long Term Operational Cost	Cost of ongoing operations including electricity (lighting), signal adjustment, bulbs/other equipment, mowing, maintenance, pavement markings, etc.	Moderate	High	Moderate-High
Environmental Impacts	Degree to which alternatives impact surrounding resources (e.g., cultural resources, noise, parks, green space, etc.)	Low	Low to Moderate	Low to Moderate
Context Sensitive Design	Opportunities for aesthetic enhancements.	Modest opportunities for aesthetic enhancement in remaining ROW.	Limited opportunities for aesthetic enhancement in remaining ROW.	Limited opportunities for aesthetic enhancement in remaining ROW.

Notes:

The low/moderate/high rankings provide a qualitative comparison of relative impacts among the alternatives. These rankings were based on the professional judgment of the interdisciplinary project team.

The alternative(s) which best address each individual evaluation criteria are highlighted in green.

6.0 CONCLUSION AND RECOMMENDATIONS

Based on Steering Committee, Stakeholder, and Public meetings, and the information provided in Table 8, the roadway improvements (lane reductions, signal upgrades, turn lane additions) from Alternative 1 were selected to be carried forward as the basis of the Preferred Alternative. It is also recommended that the access management strategies described in Section 5.5 be implemented as part of the Preferred Alternative. Alternative 1 was selected as the basis for the Preferred Alternative because it provides good traffic operations, reduces the number of travel lanes pedestrians need to cross, has the lowest cost, does not generate right-of-way impacts, and provides the best opportunity to accommodate non-motorized users.

The non-motorized improvements proposed as part of Alternative 1 were modified for the Preferred Alternative as a result of the Stakeholder and public involvement process. As shown on Figure 2, within Segment 1, the Preferred Alternative would provide non-motorized facilities on Indian Street and Buttles Street. Currently along Indian and Buttles Streets, there is approximately 22-26 feet of width available to implement the non-motorized options. This width includes the existing outside travel lane to the existing right-of-way line, allowing sufficient room for bike lanes, non-motorized paths, sidewalks, and/or green/buffer strips. The following non-motorized options will be considered by MDOT as the Preferred Alternative design is further developed:

1. Barrier (separating the travel lane from the bike lane), one-way, on-street bike lanes on Indian Street (westbound) and Buttles Street (eastbound), green strip, and five-foot sidewalks. Under this option, the outside travel lane (third lane) would be converted to on-street bike lanes with a four-foot buffer and an eight-foot on street bike lane. See Figure 6 for example bike lane separators.
2. Barrier, bi-directional, ten-foot bike lane along Buttles Street, green strip, and a five-foot sidewalk. Under this scenario, the outside lane along Indian could be a one-way, on-street bike lane, converted to green space, or maintained as a traffic lane.
3. One-way, on-street bike lanes on Indian Street and Buttles Street, green strip, and a ten-foot non-motorized path along Buttles Street. Under this option, typical six-foot on-street bike lanes would be provided along Indian Street and Buttles Street.

With the Preferred Alternative reducing the number of travel lanes (i.e., road diet), MDOT will implement a formal public involvement process to further inform the public of the project, solicit additional comments, and help select the preferred non-motorized option(s).

The Preferred Alternative could be implemented in phases. MDOT is considering the possibility of implementing the first phase in 2017. The first phase would include lane reduction, signal timing adjustments, and one-way, on-street bike lanes from State Street to Jerome Street. This initial phase would also be used a trial period to determine if the lane reduction will accommodate traffic volumes without significantly impacting traffic flow.

Phasing for the Full implementation of Segment 1 and implementation of Segments 2 and 3 has yet to be determined.

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FIGURE 1
STUDY AREA

December 2016

Study Area

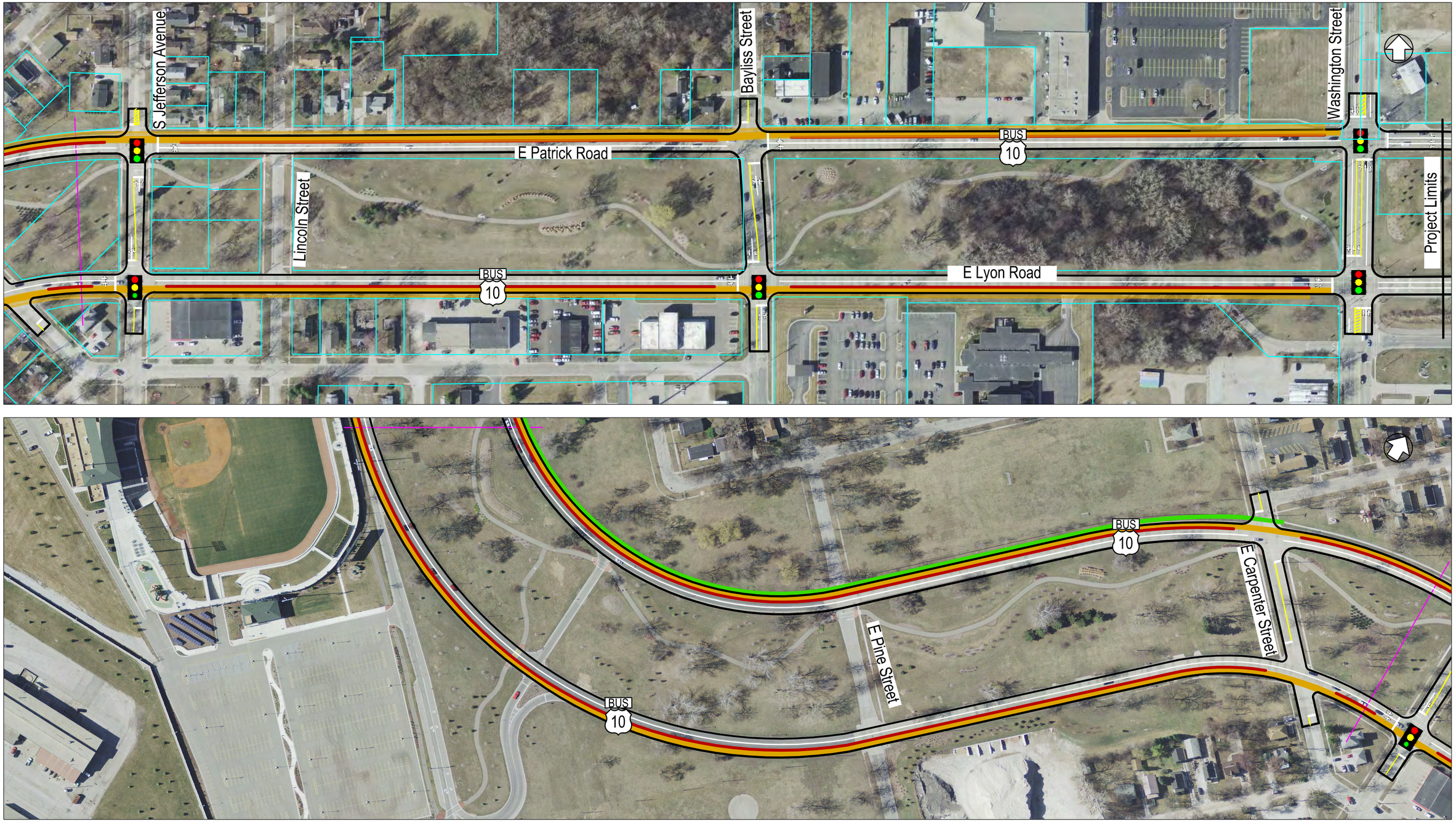

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FIGURE 2
ALTERNATIVE 1

Sheet 1 of 5

December 2016

Legend

- Proposed Curb
  *Curb cuts not shown for minor side streets or driveways.
- Proposed Pavement Markings
- Proposed Sidewalk
- Proposed Bicycle Facility
- Proposed Signalized Intersection
- Proposed Barrier
- Matchline
- Existing Right-of-way

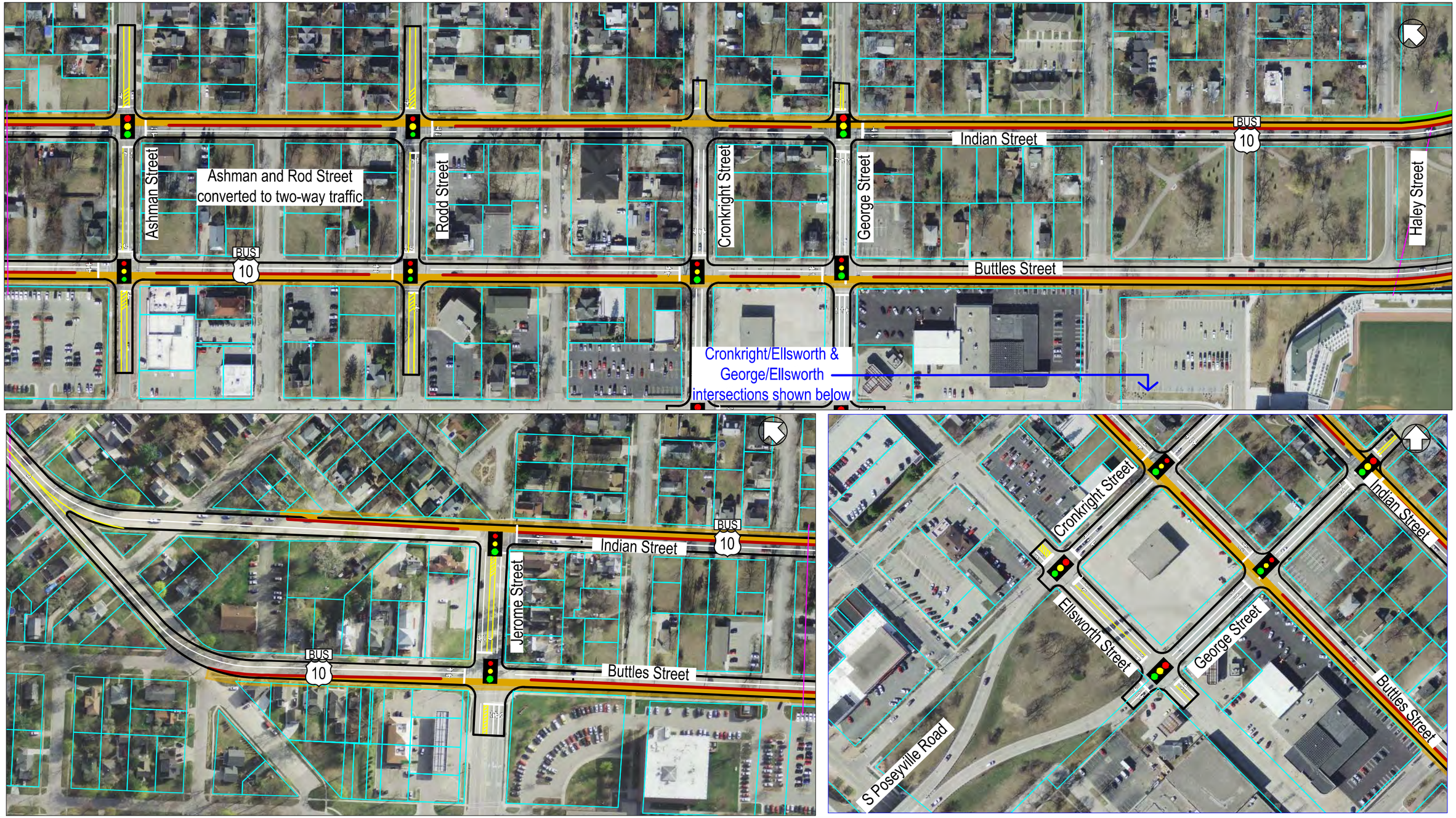

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FIGURE 2
ALTERNATIVE 1

Sheet 2 of 5

December 2016

Legend

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- Proposed Sidewalk
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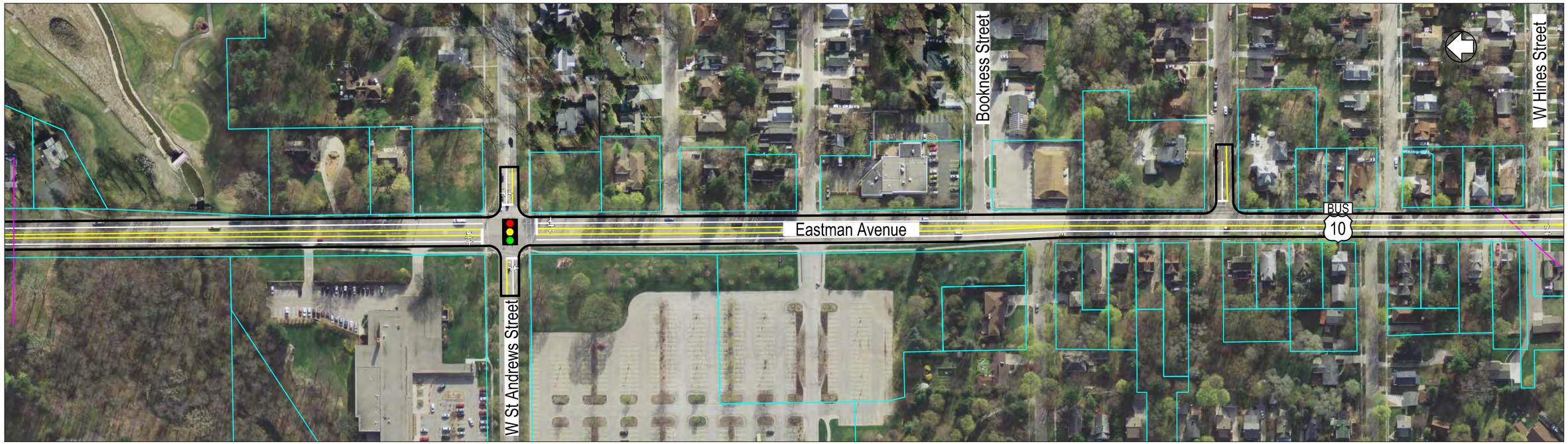
- Proposed Signalized Intersection
- Proposed Barrier
- Matchline
- Existing Right-of-way



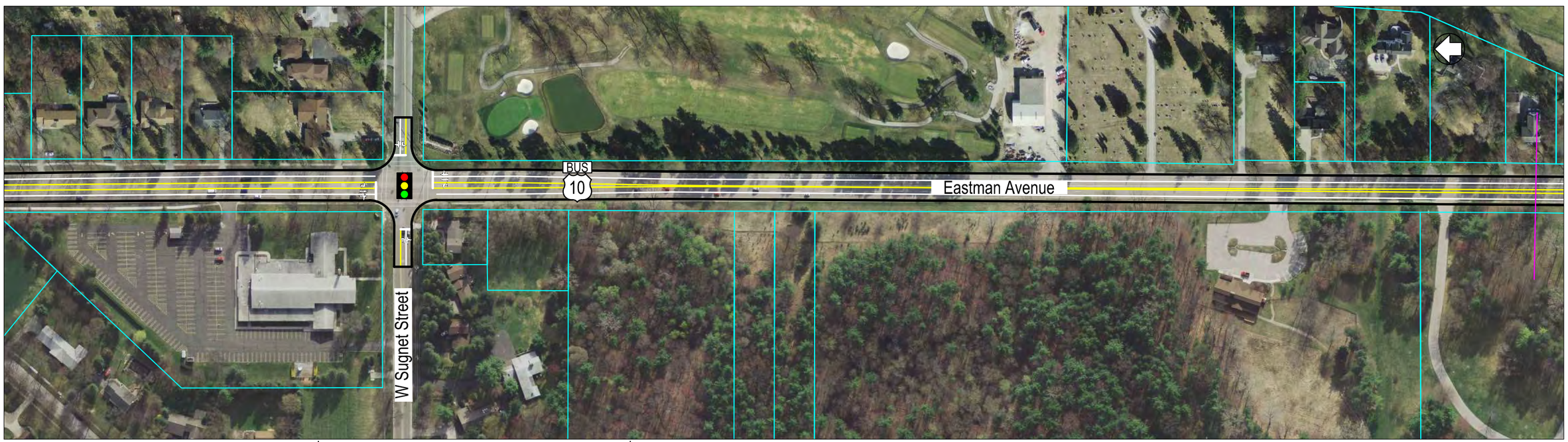


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FIGURE 2
ALTERNATIVE 1

Sheet 3 of 5

December 2016

Legend

Proposed Curb
*Curb cuts not shown for minor side streets or driveways.

Proposed Pavement Markings

Proposed Sidewalk

Proposed Bicycle Facility

Proposed Signalized Intersection

Matchline

Existing Right-of-way

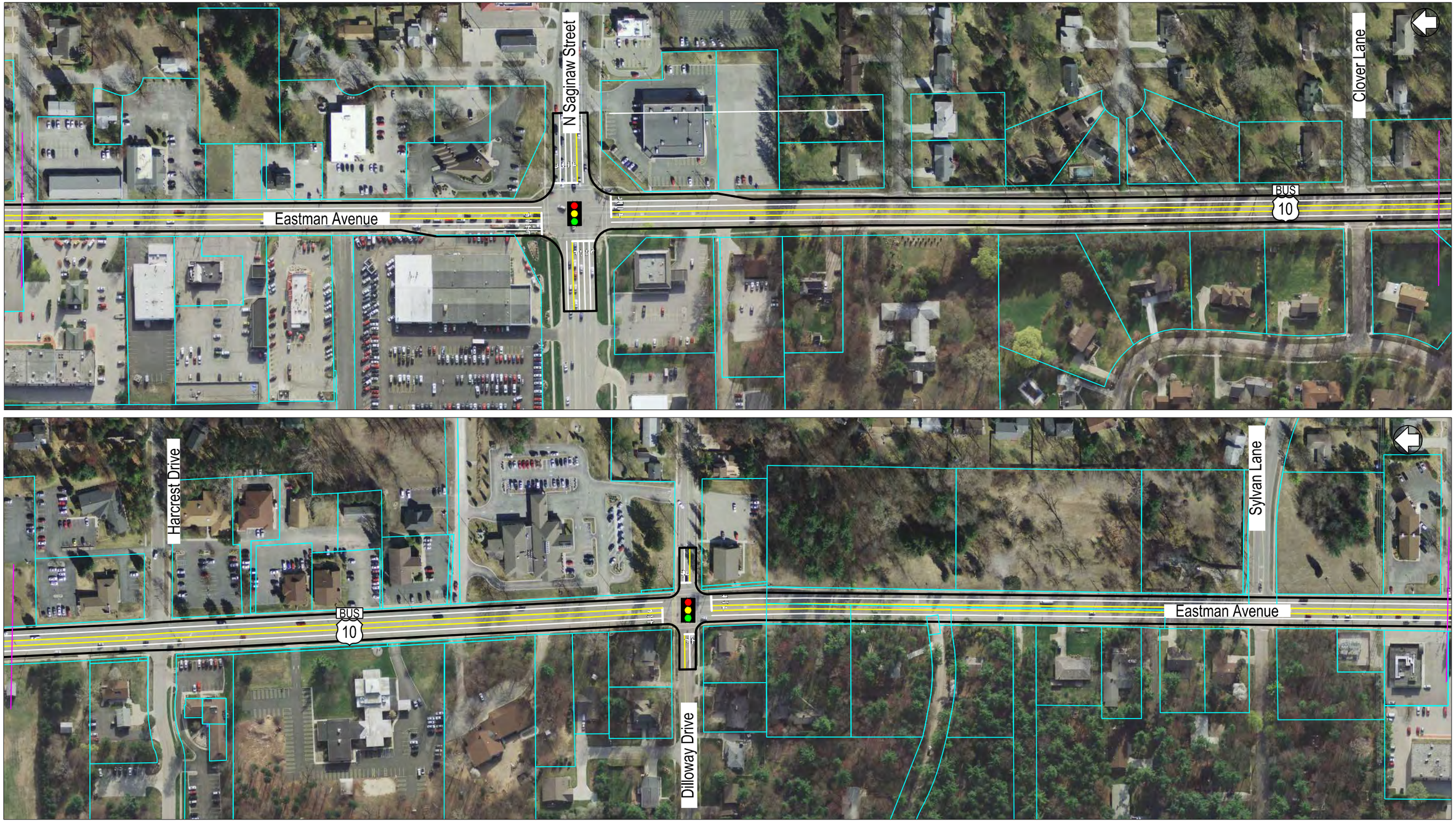

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FIGURE 2
ALTERNATIVE 1

Sheet 4 of 5

December 2016

Legend

Proposed Curb
*Curb cuts not shown for minor side streets or driveways.

Proposed Pavement Markings

Proposed Sidewalk

Proposed Bicycle Facility

Proposed Signalized Intersection

Matchline

Existing Right-of-way

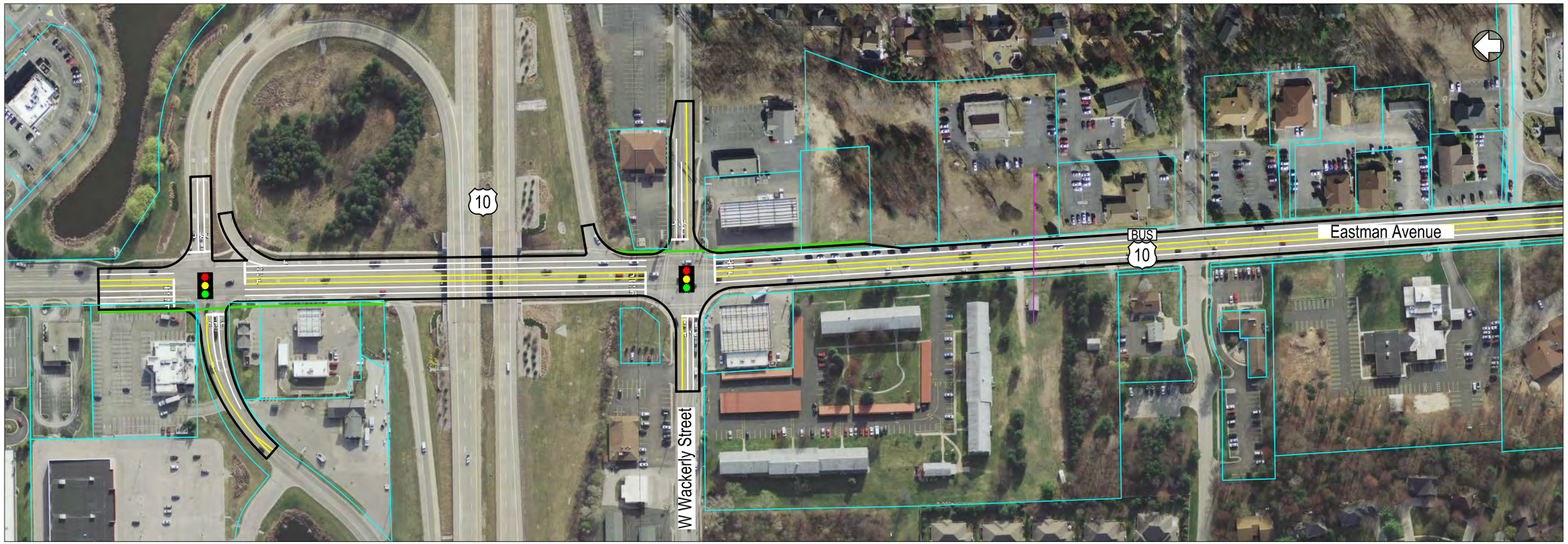

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FIGURE 2
ALTERNATIVE 1

Sheet 5 of 5

December 2016

Legend

Proposed Curb
*Curb cuts not shown for minor side streets or driveways.

Proposed Pavement Markings

Proposed Sidewalk

Proposed Bicycle Facility

Proposed Signalized Intersection

Matchline

Existing Right-of-way

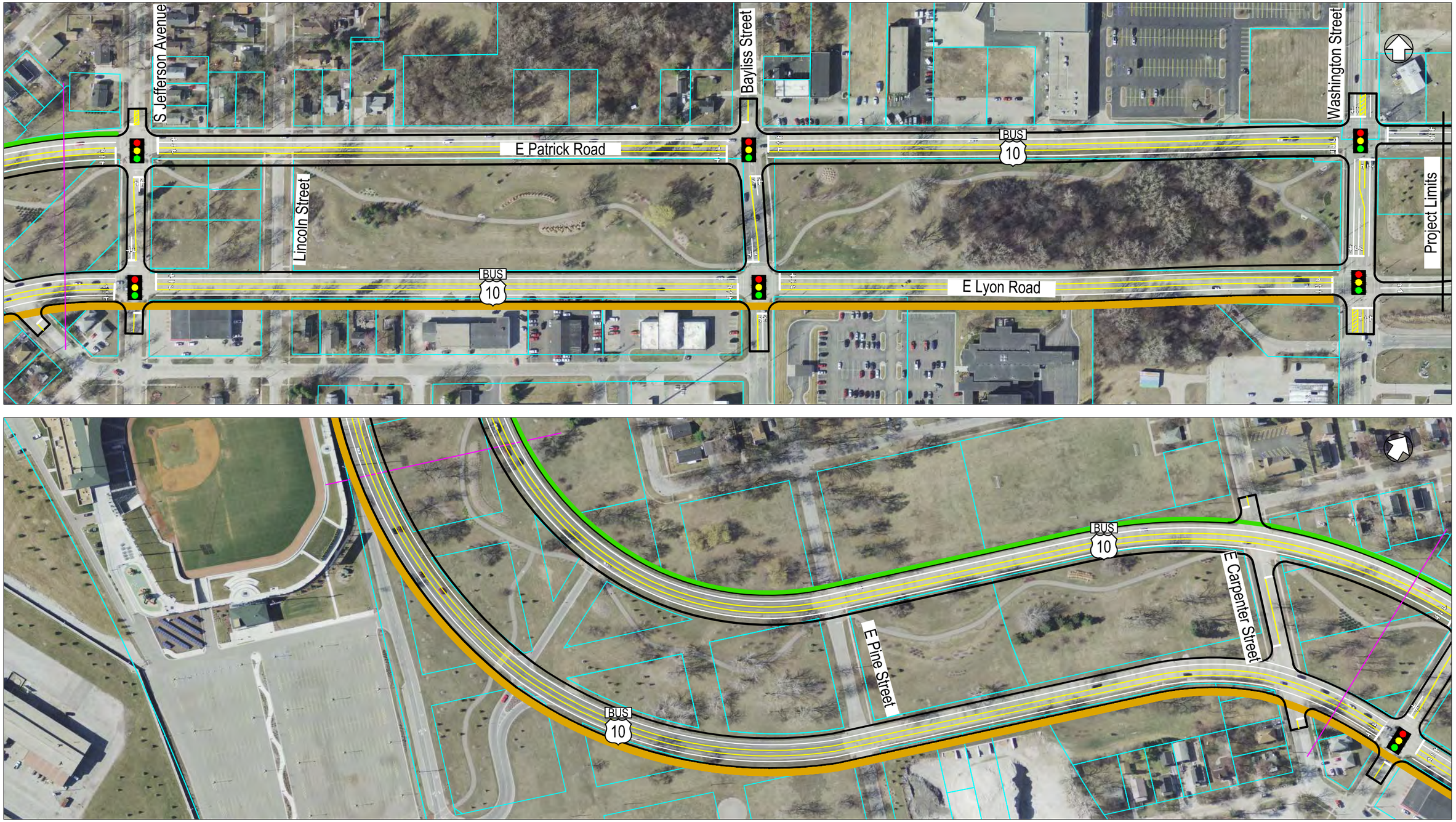

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FIGURE 3
ALTERNATIVE 2

Sheet 1 of 5

December 2016

Legend

- Proposed Curb
  *Curb cuts not shown for minor side streets or driveways.
- Proposed Pavement Markings
- Proposed Sidewalk
- Proposed 10-Foot Multi-Use Path
- Proposed Signalized Intersection
- Matchline
- Existing Right-of-way

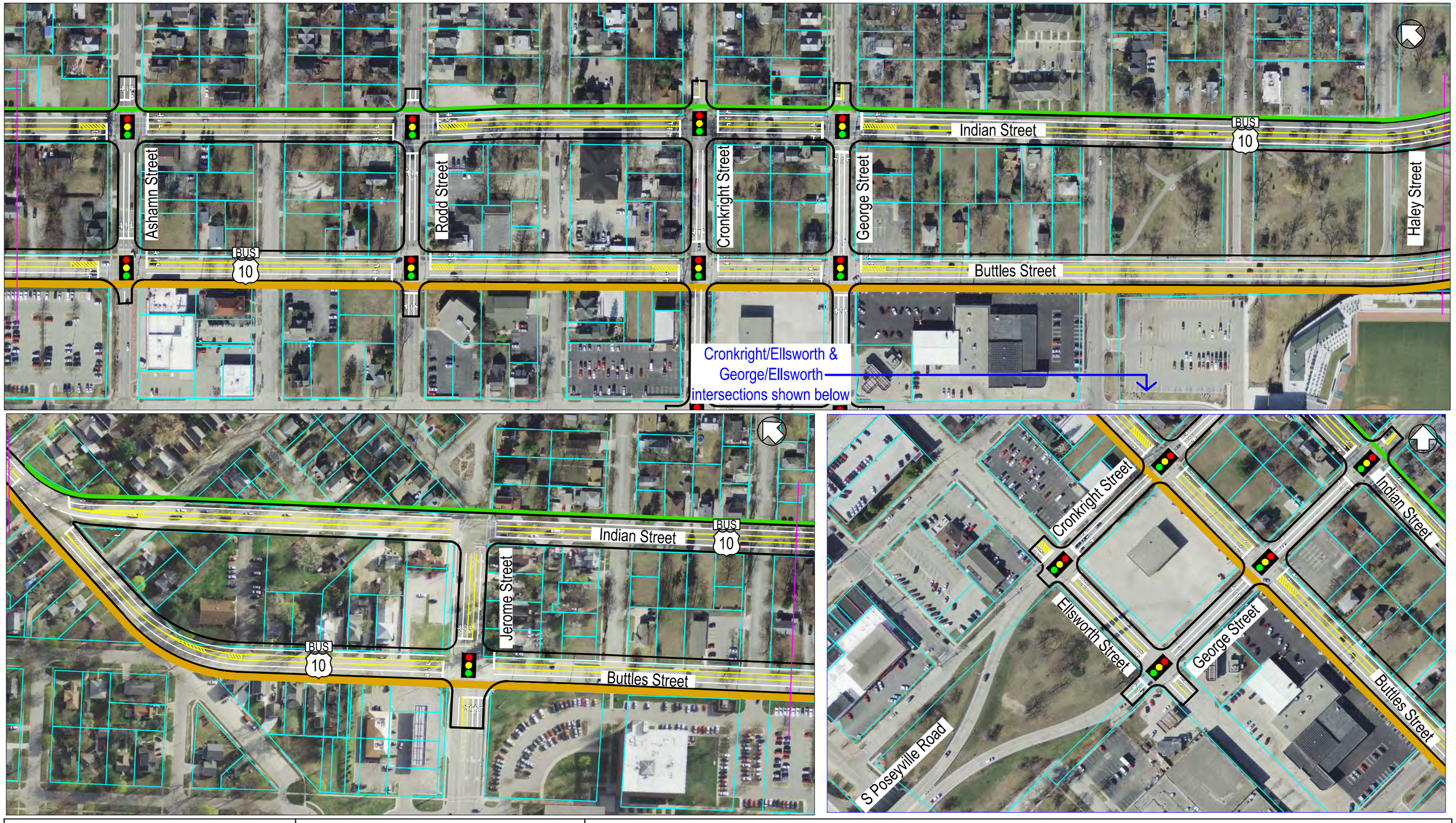

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FIGURE 3
ALTERNATIVE 2

Sheet 2 of 5

December 2016

Legend

Proposed Curb
*Curb cuts not shown for minor side streets or driveways.

Proposed Pavement Markings

Proposed Sidewalk

Proposed 10-Foot Multi-Use Path

Proposed Signalized Intersection

Matchline

Existing Right-of-way

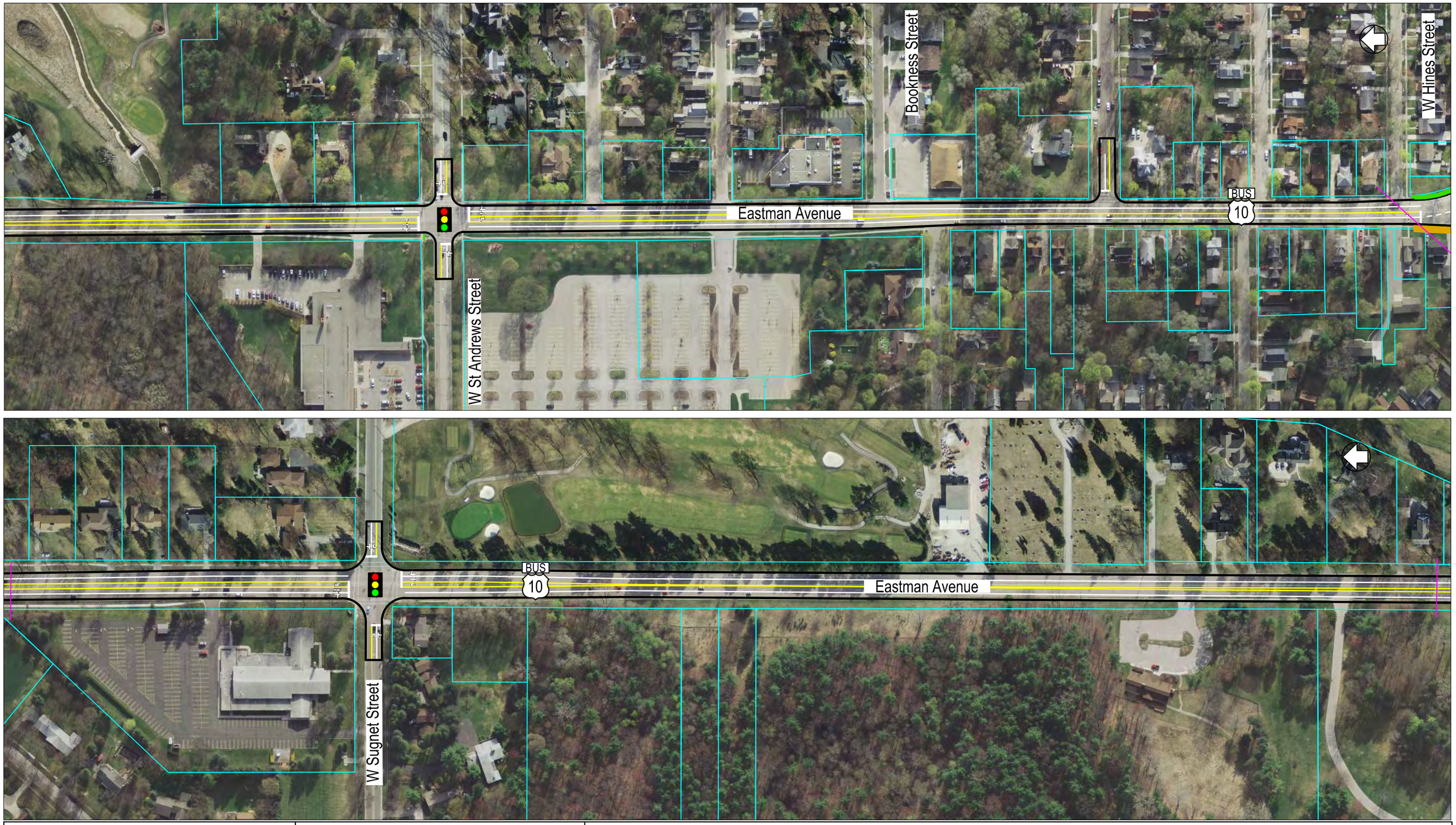

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FIGURE 3
ALTERNATIVE 2

Sheet 3 of 5

December 2016

Legend

Proposed Curb
*Curb cuts not shown for minor side streets or driveways.

Proposed Pavement Markings

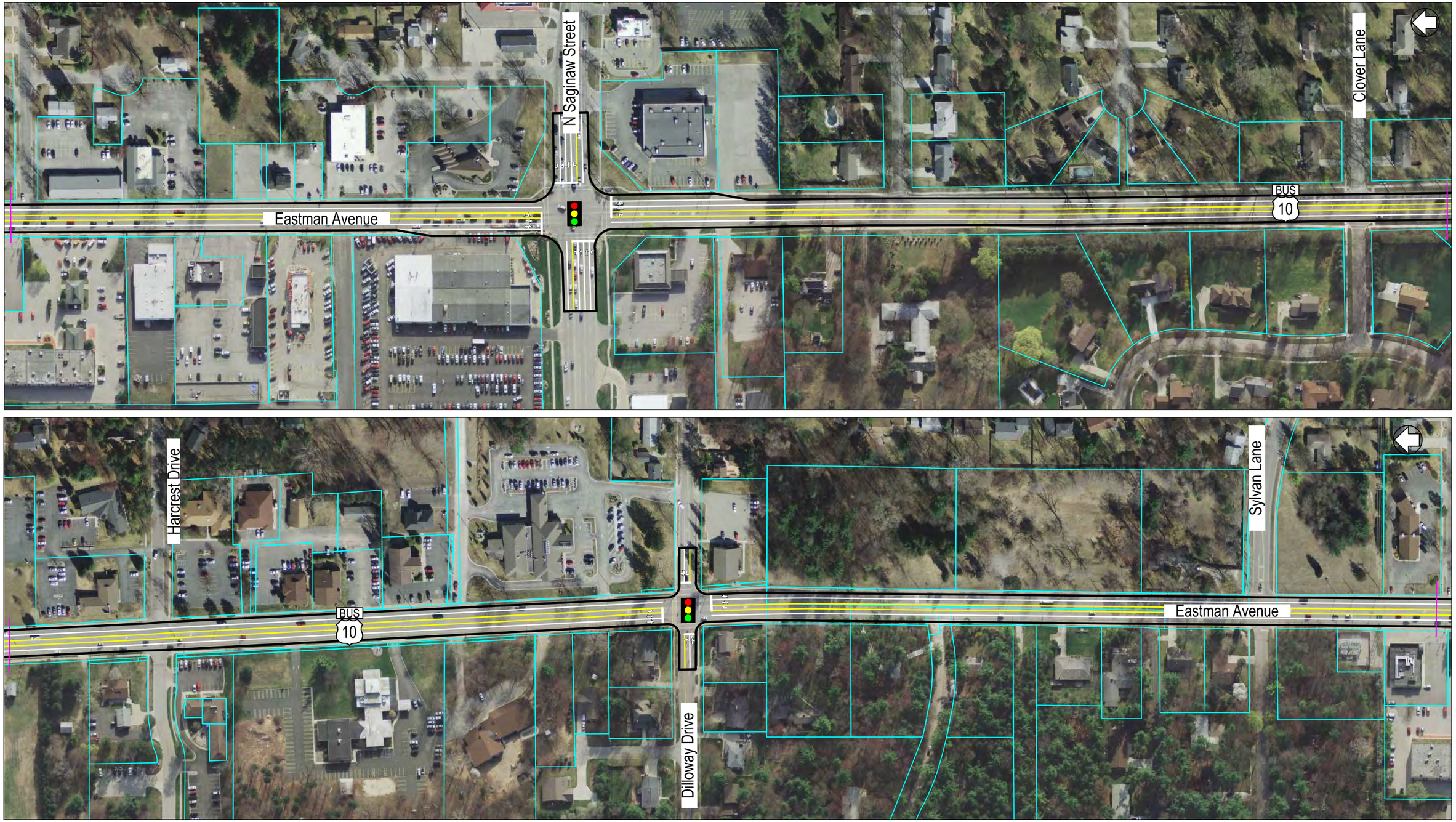
Proposed Sidewalk

Proposed 10-Foot Multi-Use Path

Proposed Signalized Intersection

Matchline

Existing Right-of-way



US-10 Business Route Corridor Study

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FIGURE 3
ALTERNATIVE 2

Sheet 4 of 5

December 2016

Legend

Proposed Curb
*Curb cuts not shown for minor side streets or driveways.

Proposed Pavement Markings

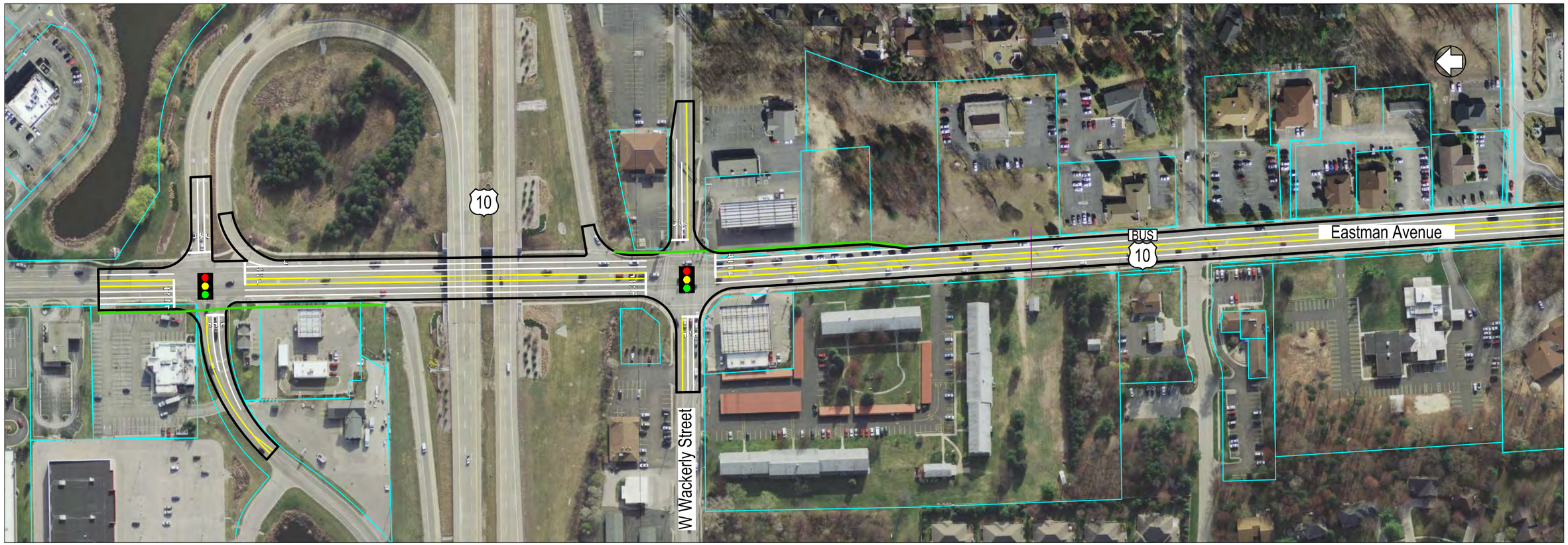
Proposed Sidewalk

Proposed 10-Foot Multi-Use Path

Proposed Signalized Intersection

Matchline

Existing Right-of-way



US-10 Business Route Corridor Study

MDOT Michigan Department of Transportation

DLZ MKSK

FIGURE 3
ALTERNATIVE 2

Sheet 5 of 5

December 2016

Legend

Proposed Curb
*Curb cuts not shown for minor side streets or driveways.

Proposed Pavement Markings

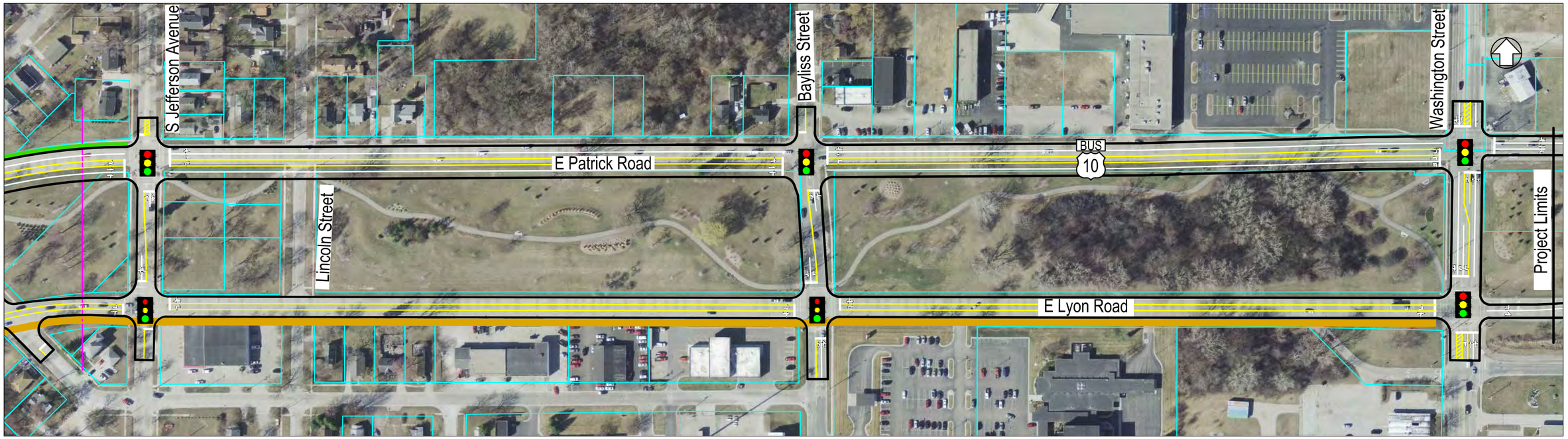
Proposed Sidewalk

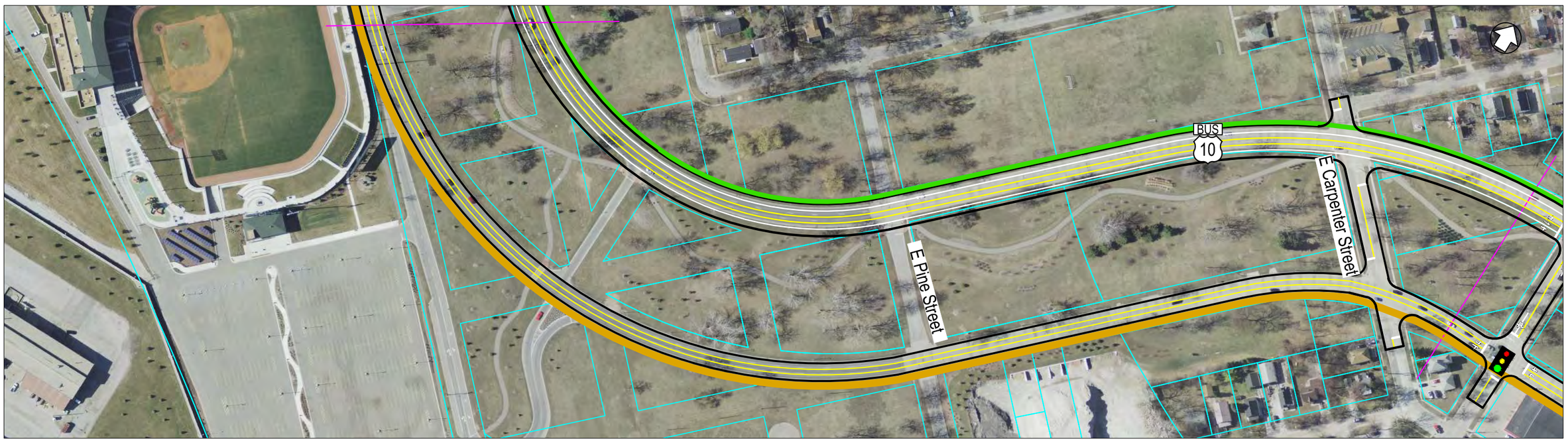
Proposed 10-Foot Multi-Use Path

Proposed Signalized Intersection

Matchline

Existing Right-of-way





US-10 Business Route Corridor Study

MDOT Michigan Department of Transportation

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FIGURE 4
ALTERNATIVE 3

Sheet 1 of 5

December 2016

Legend

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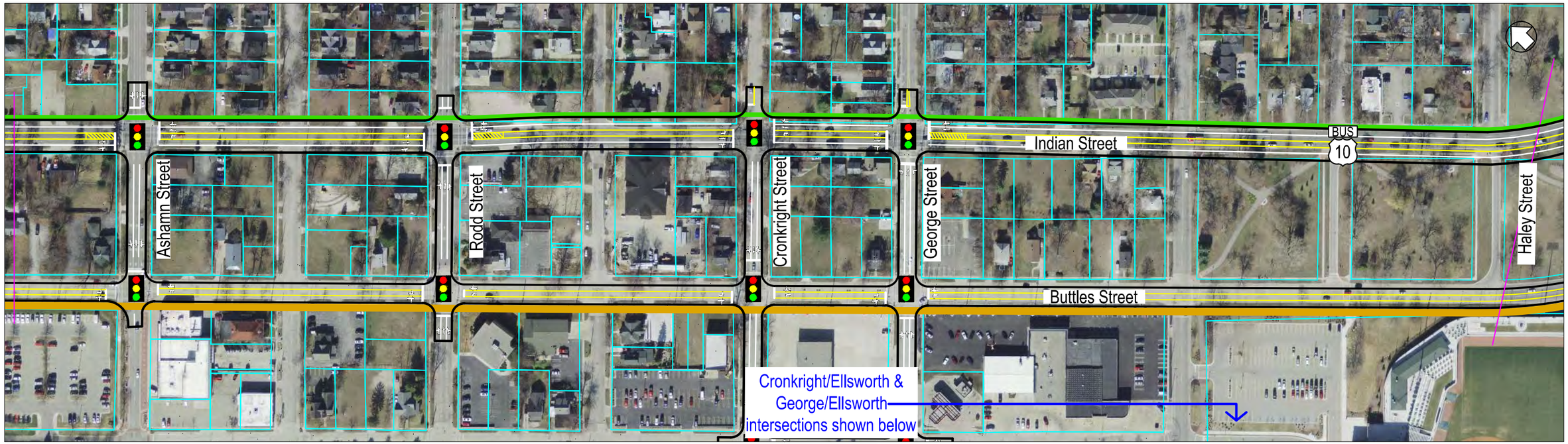
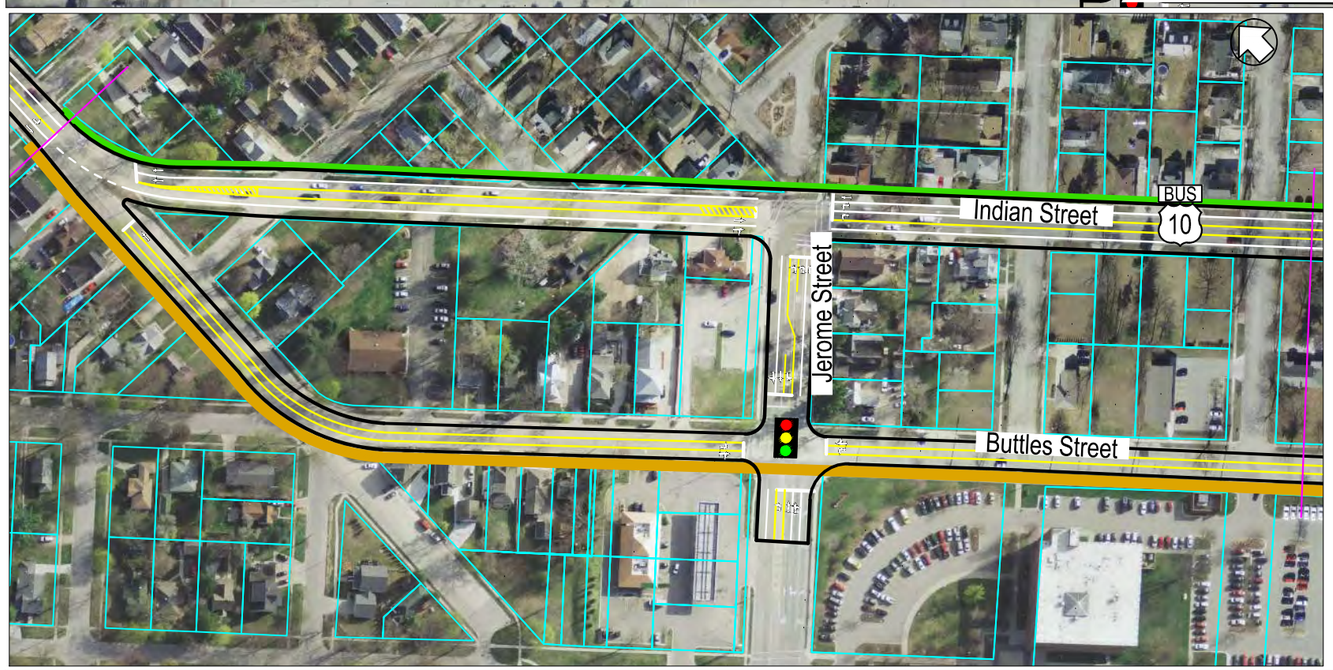
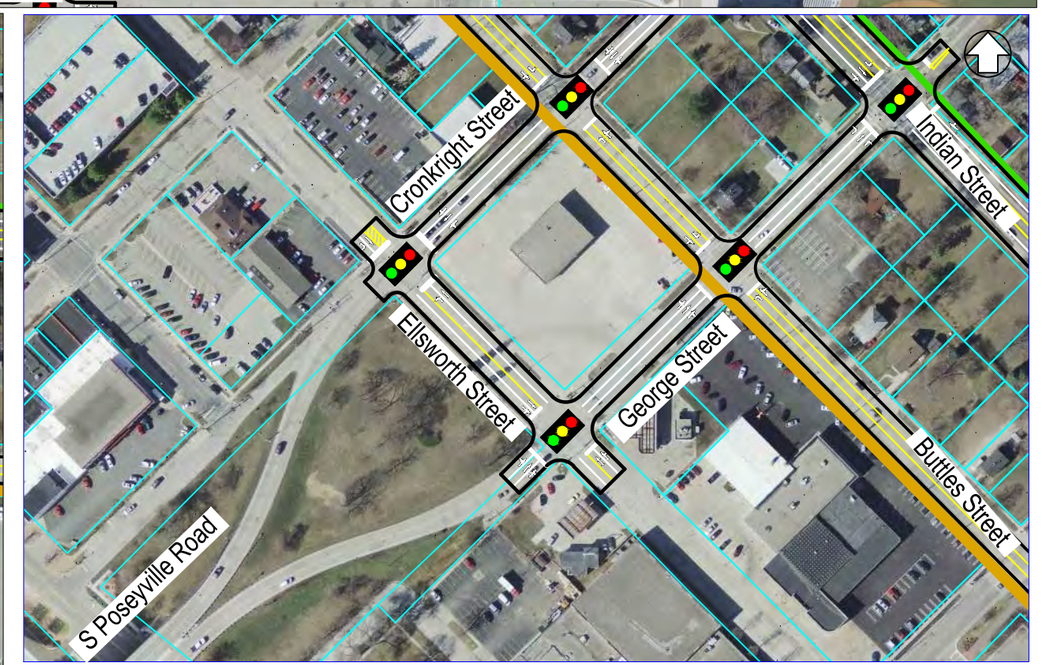
Matchline

Existing Right-of-way







US-10 Business Route Corridor Study

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FIGURE 4
ALTERNATIVE 3

Sheet 2 of 5

December 2016

Legend

- Proposed Curb
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- Proposed Pavement Markings
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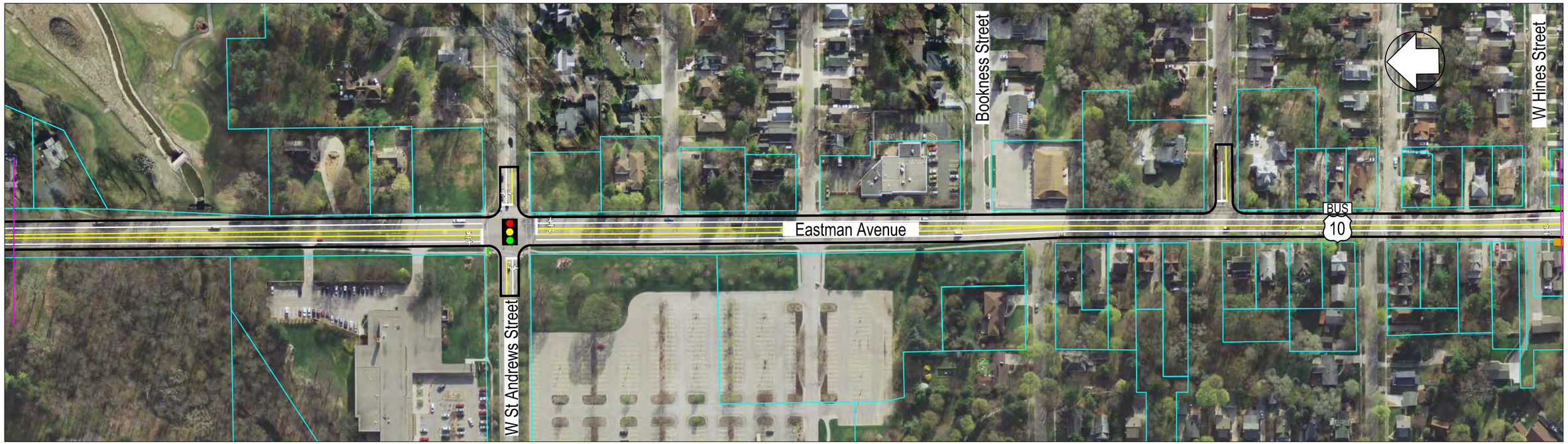
- Proposed 10-Foot Multi-Use Path
- Proposed Signalized Intersection
- Matchline
- Existing Right-of-way



US-10 Business Route Corridor Study

MDOT Michigan Department of Transportation

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FIGURE 4
ALTERNATIVE 3

Sheet 3 of 5

December 2016

Legend

Proposed Curb
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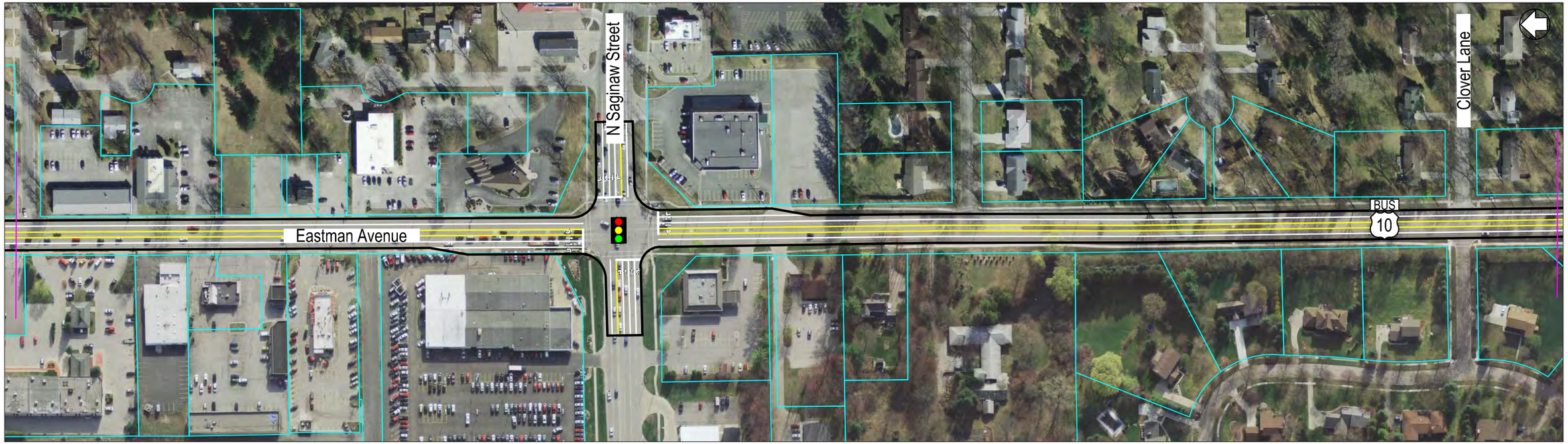
Proposed Sidewalk

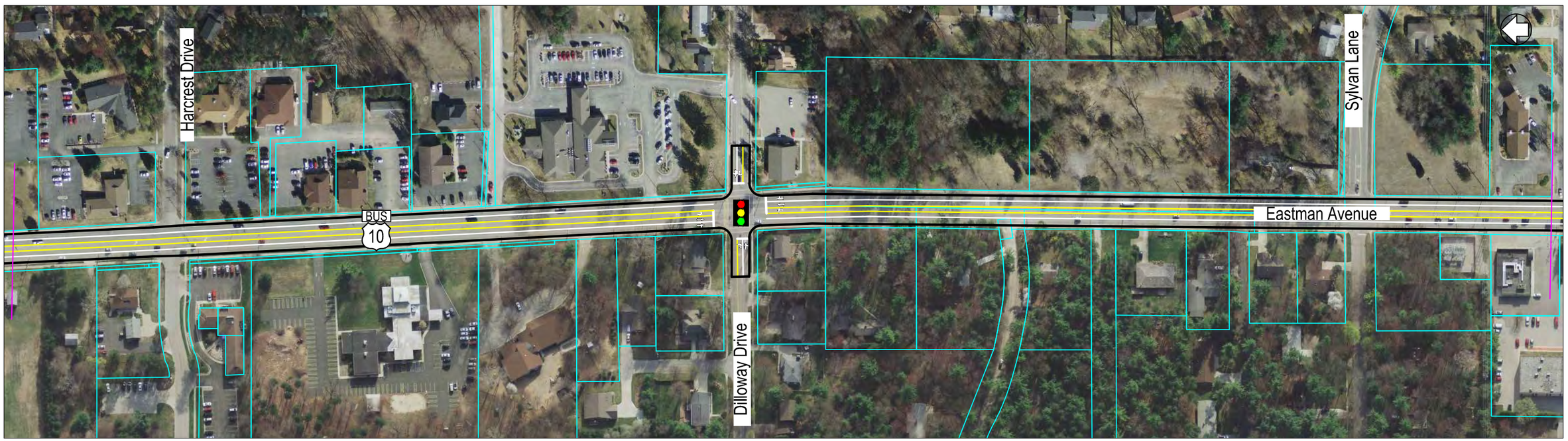
Proposed 10-Foot Multi-Use Path

Proposed Signalized Intersection

Matchline

Existing Right-of-way





US-10 Business Route Corridor Study

MDOT Michigan Department of Transportation

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FIGURE 4
ALTERNATIVE 3

Sheet 4 of 5

December 2016

Legend

Proposed Curb
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Proposed Pavement Markings

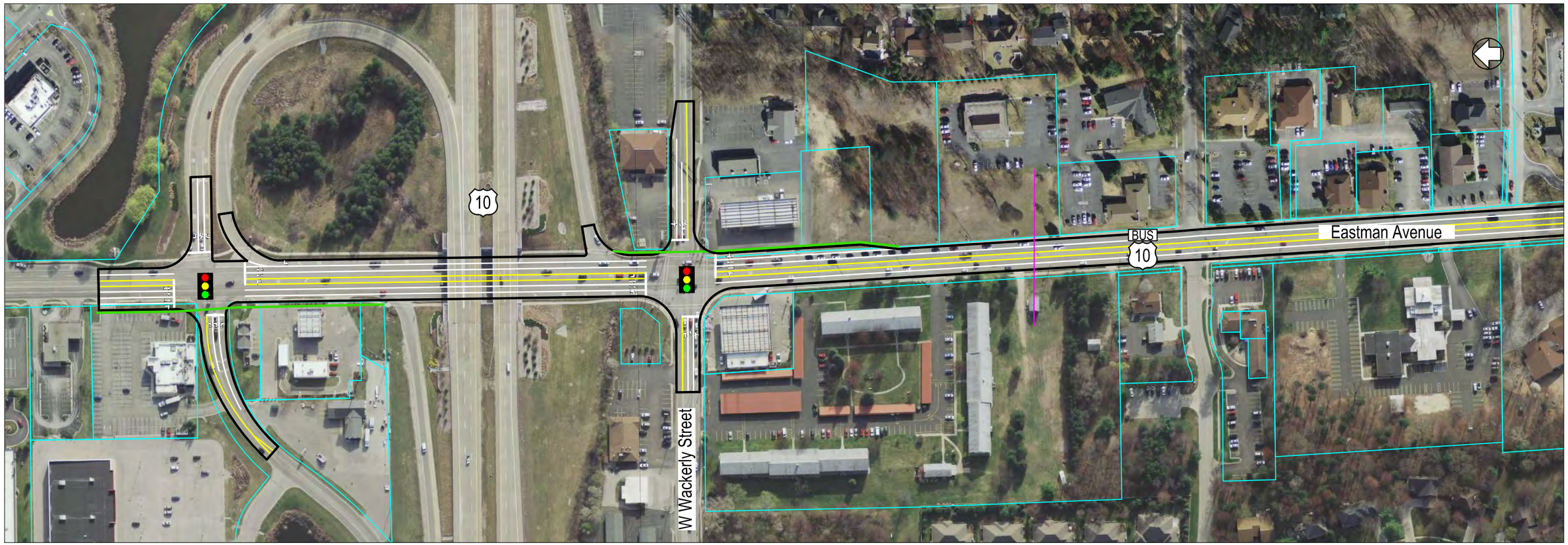
Proposed Sidewalk

Proposed 10-Foot Multi-Use Path

Proposed Signalized Intersection

Matchline

Existing Right-of-way



US-10 Business Route
Corridor Study

MDOT
Michigan Department of Transportation

DLZ MKSK

FIGURE 4
ALTERNATIVE 3

Sheet 5 of 5

December 2016

Legend

Proposed Curb
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Proposed Pavement Markings

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Proposed 10-Foot Multi-Use Path

Proposed Signalized Intersection

Matchline

Existing Right-of-way

10 CONSIDERED ROADWAY ALTERNATIVES

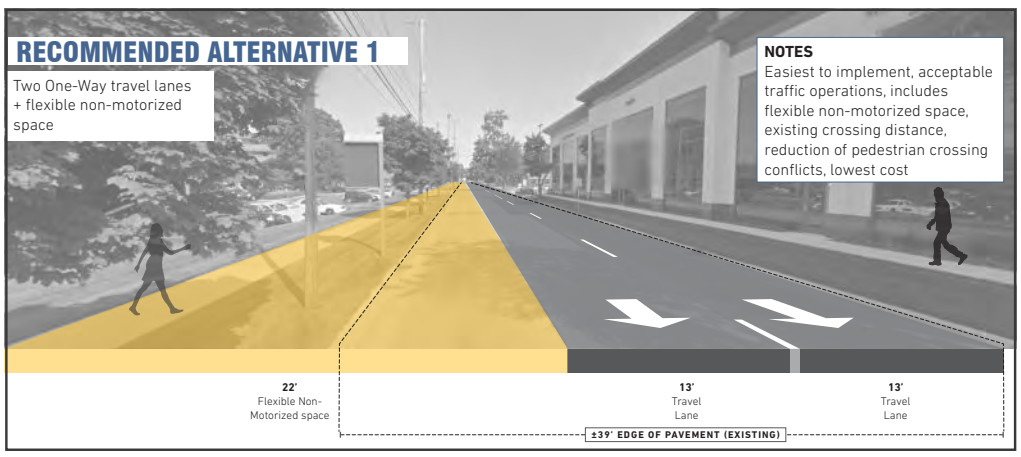
US-10 BR CORRIDOR PLAN
MIDLAND, MICHIGAN

BUTTLES STREET EASTBOUND

RECOMMENDED ALTERNATIVE 1

Two One-Way travel lanes + flexible non-motorized space

NOTES
Easiest to implement, acceptable traffic operations, includes flexible non-motorized space, existing crossing distance, reduction of pedestrian crossing conflicts, lowest cost



ALTERNATIVE 2

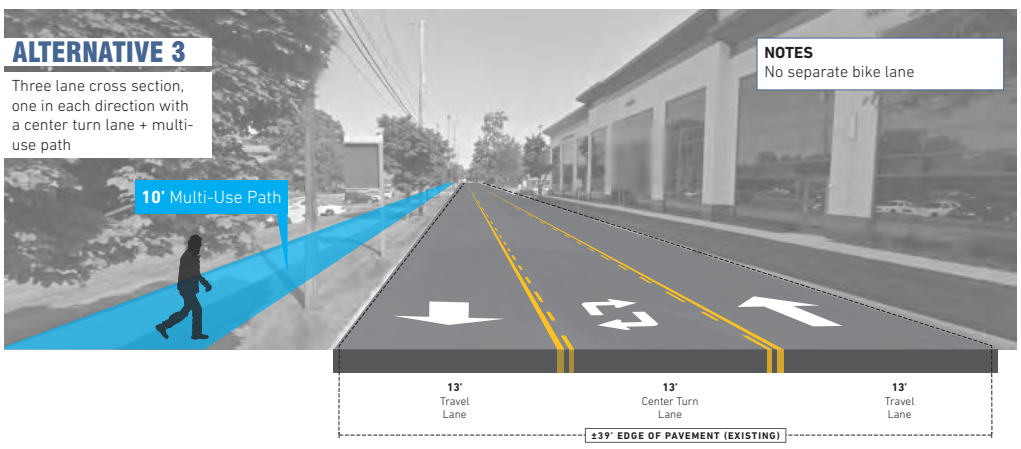
Five lane cross section, two in each direction with a center turn lane + multi-use path

NOTES
Requires ROW acquisition and relocation, expensive, wider crossing, no separate bike lane, highest cost

ALTERNATIVE 3

Three lane cross section, one in each direction with a center turn lane + multi-use path

NOTES
No separate bike lane

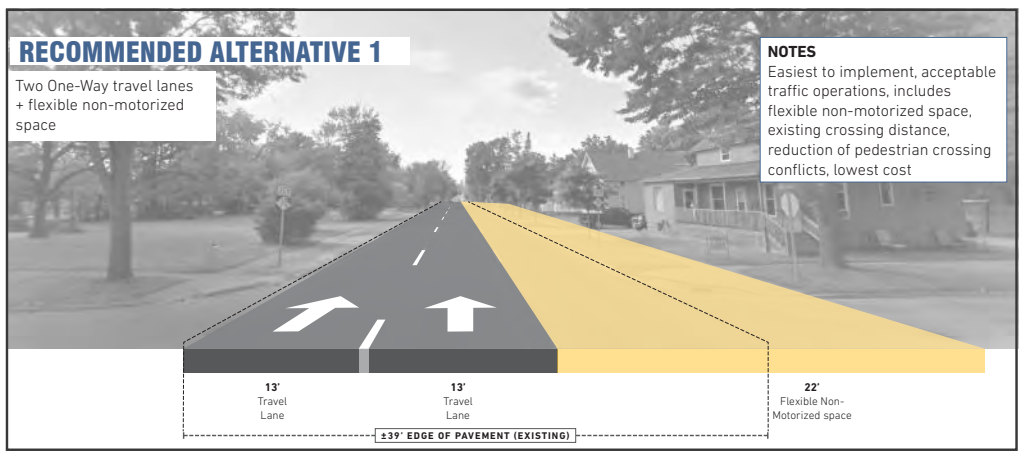


INDIAN STREET WESTBOUND

RECOMMENDED ALTERNATIVE 1

Two One-Way travel lanes + flexible non-motorized space

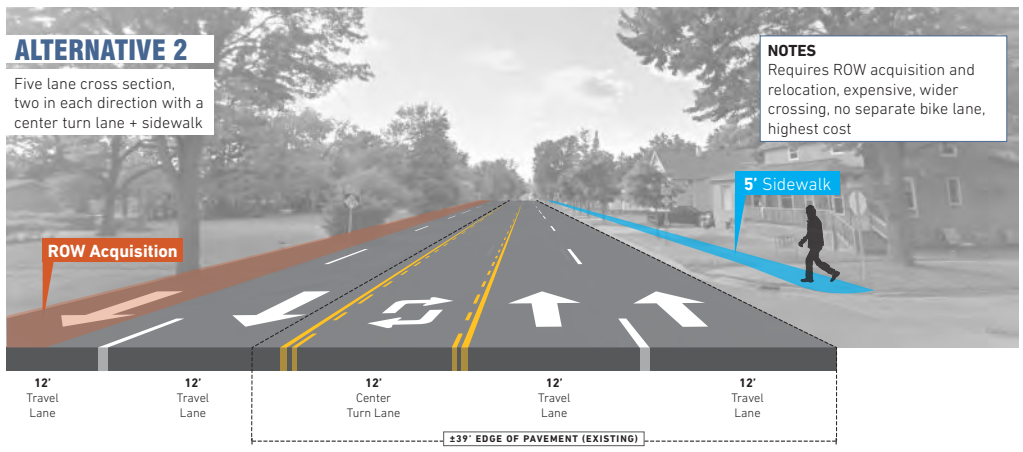
NOTES
Easiest to implement, acceptable traffic operations, includes flexible non-motorized space, existing crossing distance, reduction of pedestrian crossing conflicts, lowest cost



ALTERNATIVE 2

Five lane cross section, two in each direction with a center turn lane + sidewalk

NOTES
Requires ROW acquisition and relocation, expensive, wider crossing, no separate bike lane, highest cost



ALTERNATIVE 3

Five lane cross section, two in each direction with a center turn lane + sidewalk

NOTES
Requires ROW acquisition and relocation, expensive, wider crossing, no separate bike lane

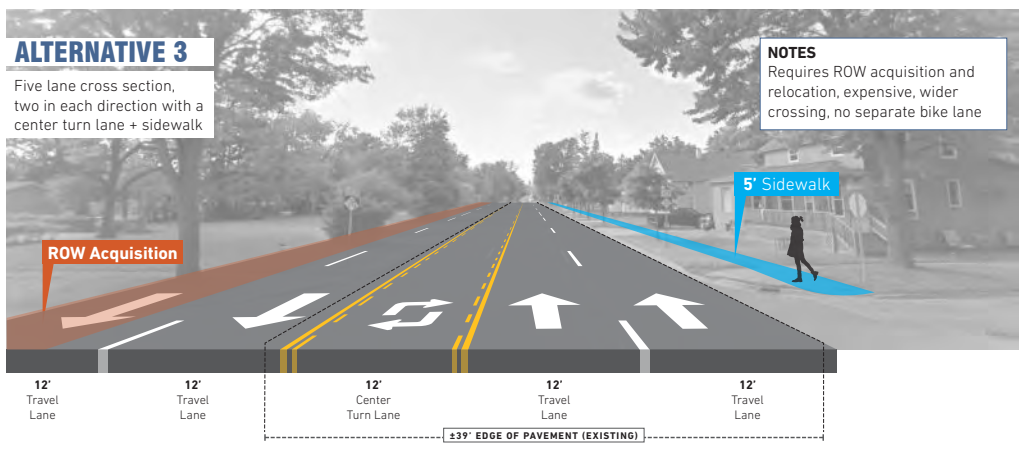


FIGURE 5

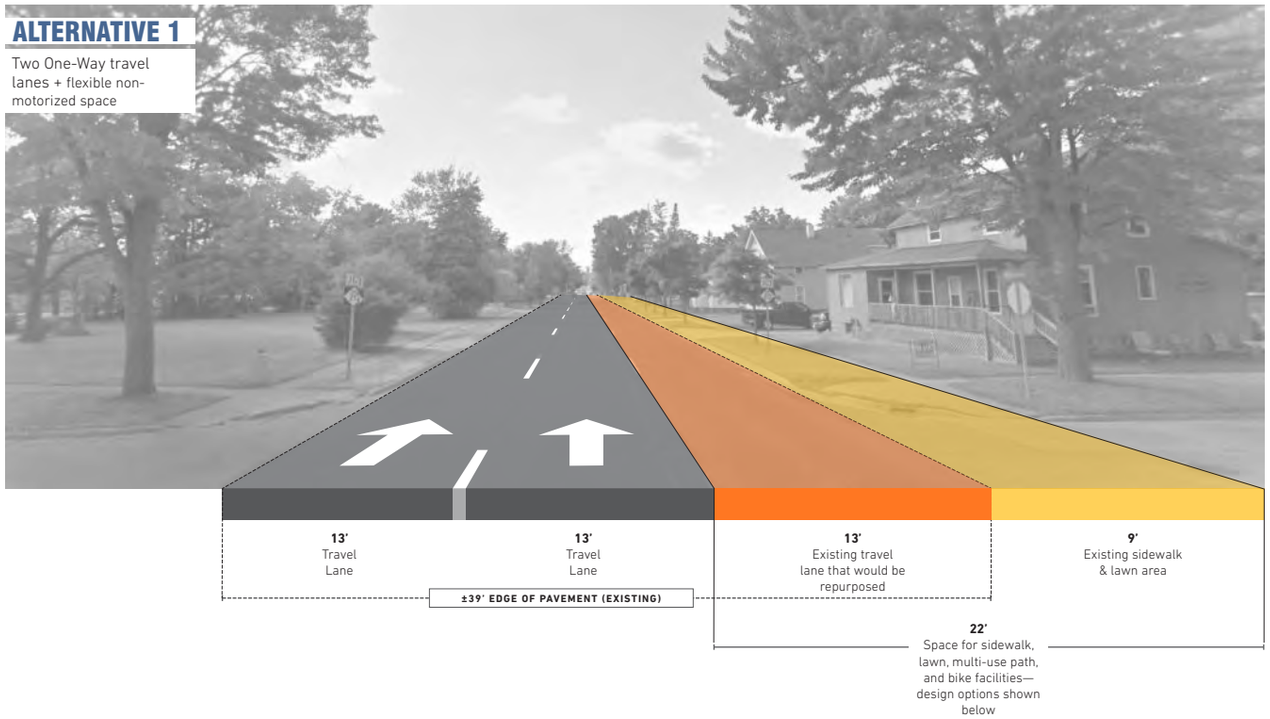
10 OPTIONS FOR NON-MOTORIZED DESIGN

FIGURE 6

US-10 BR CORRIDOR PLAN
MIDLAND, MICHIGAN

BUTTLES STREET EASTBOUND

INDIAN STREET WESTBOUND



BUFFERED MULTI-USE PATH - PLANTED SEPARATOR

BUFFERED BIKE LANE - PAINTED SEPARATOR

BUFFERED BIKE LANE WITH SIDEWALKS - PHYSICAL SEPARATOR

BUFFERED BIKE LANE - TWO-WAY BIKE LANE

Appendix A
Existing Conditions Capacity Analysis

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1	13.6	28.6	0.2	25
Bayliss	3	3.8	23.6	0.2	37
Jefferson	5	7.1	27.1	0.3	33
Carpenter	7	1.5	8.9	0.1	37
	131	0.5	14.7	0.2	44
	208	0.5	15.2	0.2	43
George	9	4.7	22.7	0.2	36
Total		31.7	141.0	1.4	35

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	56	1.7	20.2	0.2	40
	86	1.3	22.5	0.3	42
Carpenter	8	1.5	15.7	0.2	41
Jefferson	6	4.4	8.6	0.1	22
Bayliss	4	2.6	22.8	0.3	40
	207	2.2	13.0	0.1	36
Washington	2	10.1	18.8	0.1	22
Total		23.8	121.5	1.2	36

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	11	1.1	6.1	0.1	31
Rodd	16	2.1	14.1	0.1	31
Ashman	18	4.6	16.5	0.1	24
Jerome #1	20	6.6	24.5	0.2	26
Eastman Ave	164	2.3	22.0	0.2	25
Total		16.7	83.2	0.6	27

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	116	0.3	9.0	0.1	33
Jerome #1	21	9.1	18.8	0.1	19
Ashman	19	5.2	23.3	0.2	27
Rodd	17	2.1	14.4	0.1	28
Cronkright	12	1.6	13.5	0.1	33
George	10	5.3	11.5	0.1	17
Total		23.8	90.4	0.6	26

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	22	-	-	0.2	-
St Andrews	23	3.2	25.4	0.3	39
Sugnet	24	6.5	54.8	0.6	40
Saginaw	25	18.3	57.9	0.5	31
Dilloway	26	7.5	49.2	0.5	39
Wackerly	27	34.4	66.3	0.4	22
Eb On Ramp	28	3.9	6.8	0.0	18
Wb On Ramp	29	1.4	7.6	0.1	35
Wb Ramp	30	4.9	10.5	0.1	23
Mall Off	31	1.3	7.3	0.1	37
Mall Dr South	32	2.3	6.8	0.1	31
North Mall Dr	33	2.6	11.3	0.1	36
Joe Mann	34	6.8	12.7	0.1	21
Total		93.3	316.6	3.0	34

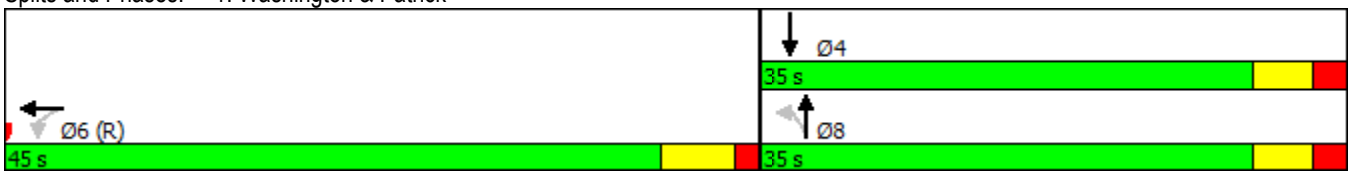
Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	34	7.2	22.6	0.2	31
	33	2.2	8.2	0.1	32
Future Dr	32	2.2	10.9	0.1	37
Saylor Dr	31	1.7	6.5	0.1	33
Airport	30	20.5	26.1	0.1	10
Wb On Ramp	29	4.9	11.0	0.1	23
Eb On Ramp	28	3.7	9.6	0.1	28
Wackerly	27	22.6	25.2	0.0	5
Dilloway	26	12.6	45.0	0.4	33
Saginaw	25	21.2	62.6	0.5	31
Sugnet	24	5.0	44.3	0.5	41
St Andrews	23	3.9	52.8	0.6	42
Carpenter	22	1.6	23.8	0.3	42
Indian	164	1.0	13.6	0.2	41
Total		110.4	362.1	3.2	32

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	630	67	82	218
Future Volume (vph)	630	67	82	218
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	45.0	35.0	35.0	35.0
Total Split (%)	56.3%	43.8%	43.8%	43.8%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.6	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.9	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	38.1	28.3	28.3	28.3
Actuated g/C Ratio	0.48	0.35	0.35	0.35
v/c Ratio	0.36	0.20	0.07	0.26
Control Delay	13.6	15.5	12.6	14.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.6	15.5	12.6	14.9
LOS	B	B	B	B
Approach Delay	13.6		13.9	14.9
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 38 (48%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

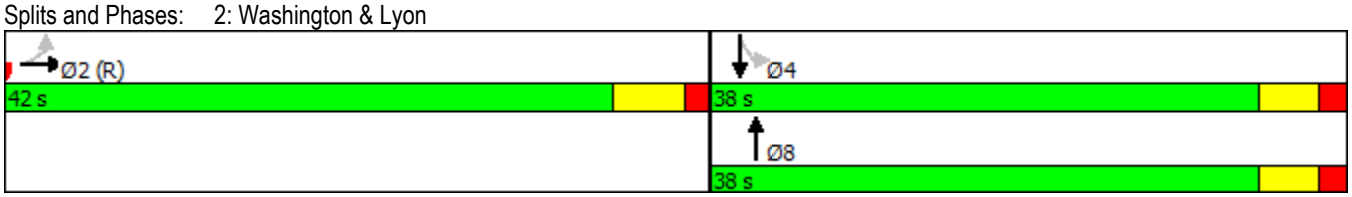
Splits and Phases: 1: Washington & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	868	102	3	337
Future Volume (vph)	868	102	3	337
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	42.0	38.0	38.0	38.0
Total Split (%)	52.5%	47.5%	47.5%	47.5%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.5	1.8	1.8	1.8
Lost Time Adjust (s)	1.0	1.5		1.0
Total Lost Time (s)	6.8	6.8		6.3
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	35.2	31.2		31.7
Actuated g/C Ratio	0.44	0.39		0.40
v/c Ratio	0.45	0.09		0.28
Control Delay	1.9	2.7		13.4
Queue Delay	0.0	1.2		0.0
Total Delay	1.9	4.0		13.4
LOS	A	A		B
Approach Delay	1.9	4.0		13.4
Approach LOS	A	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 30 (38%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 40.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Washington & Lyon



Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	171	598	6	18	32	0	0	13	6
Future Vol, veh/h	0	0	0	171	598	6	18	32	0	0	13	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	186	650	7	20	35	0	0	14	7

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	639	1028	0	1042	1025	327
Stage 1	-	-	-	0	0	-	1025	1025	-
Stage 2	-	-	-	639	1028	-	17	0	-
Critical Hdwy	-	-	-	5.74	6.54	-	5.74	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	468	233	-	296	234	571
Stage 1	-	-	-	-	-	-	233	311	-
Stage 2	-	-	-	444	310	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	468	0	-	296	0	571
Mov Cap-2 Maneuver	-	-	-	468	0	-	296	0	-
Stage 1	-	-	-	-	0	-	233	0	-
Stage 2	-	-	-	444	0	-	-	0	-

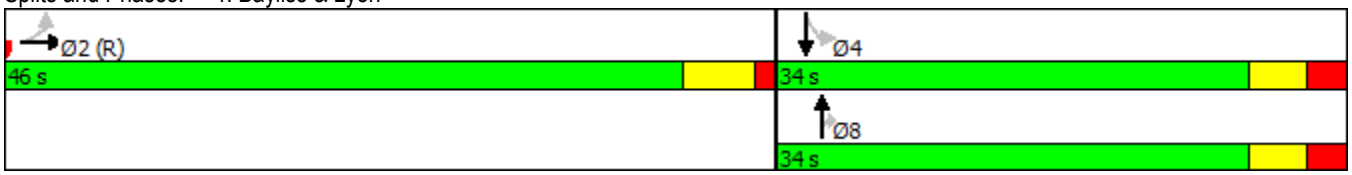
Approach	WB	NB	SB
HCM Control Delay, s			11.5
HCM LOS		-	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	468	-	-	-	-	571
HCM Lane V/C Ratio	0.042	-	-	-	-	0.036
HCM Control Delay (s)	13	-	-	-	-	11.5
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1125	47	13	18	166
Future Volume (vph)	1125	47	13	18	166
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	46.0	34.0	34.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%	42.5%	42.5%
Yellow Time (s)	4.3	3.5	3.5	3.5	3.5
All-Red Time (s)	1.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	1.6	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.3	7.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	53.7	12.0	12.0	12.0	12.0
Actuated g/C Ratio	0.67	0.15	0.15	0.15	0.15
v/c Ratio	0.37	0.18	0.05	0.10	0.65
Control Delay	1.2	29.5	2.9	19.7	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	1.2	29.5	2.9	19.7	32.7
LOS	A	C	A	B	C
Approach Delay	1.2	23.8			31.4
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 54.8%	ICU Level of Service A
Analysis Period (min) 15	

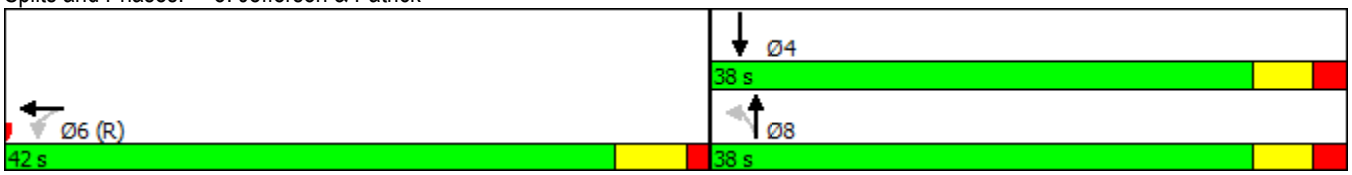
Splits and Phases: 4: Bayliss & Lyon



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	590	12	44	110
Future Volume (vph)	590	12	44	110
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	25.0	26.7	26.7	26.7
Total Split (s)	42.0	38.0	38.0	38.0
Total Split (%)	52.5%	47.5%	47.5%	47.5%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.4	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.7	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	35.3	31.3	31.3	31.3
Actuated g/C Ratio	0.44	0.39	0.39	0.39
v/c Ratio	0.34	0.03	0.07	0.20
Control Delay	7.7	7.3	7.9	16.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.7	7.3	7.9	16.4
LOS	A	A	A	B
Approach Delay	7.7		7.8	16.4
Approach LOS	A		A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.34	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 49.3%	ICU Level of Service A
Analysis Period (min) 15	

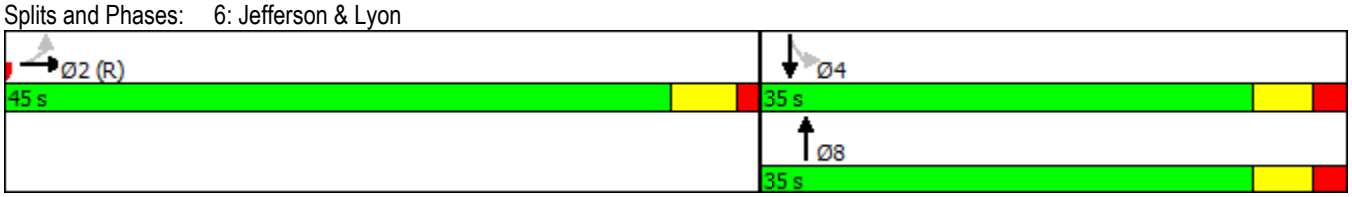
Splits and Phases: 5: Jefferson & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	1074	50	51	74
Future Volume (vph)	1074	50	51	74
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.3	27.3	27.3	27.3
Total Split (s)	45.0	35.0	35.0	35.0
Total Split (%)	56.3%	43.8%	43.8%	43.8%
Yellow Time (s)	3.9	3.5	3.5	3.5
All-Red Time (s)	1.4	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.3	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	38.7	28.3	28.3	28.3
Actuated g/C Ratio	0.48	0.35	0.35	0.35
v/c Ratio	0.49	0.12	0.12	0.12
Control Delay	8.5	13.6	8.8	8.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.5	13.6	8.8	8.7
LOS	A	B	A	A
Approach Delay	8.5	13.6		8.8
Approach LOS	A	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 73 (91%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 49.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Jefferson & Lyon



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	0	0	0	594	15	0	36	13	6	51	0
Future Vol, veh/h	0	0	0	0	594	15	0	36	13	6	51	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	646	16	0	39	14	7	55	0

Major/Minor	Major2			Minor2			Minor1		
Conflicting Flow All	0	0	0	682	654	330	278	662	0
Stage 1	-	-	-	654	654	-	0	0	-
Stage 2	-	-	-	28	0	-	278	662	-
Critical Hdwy	-	-	-	5.74	6.54	7.14	5.74	6.54	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.04	5.54	-
Follow-up Hdwy	-	-	-	3.82	4.02	3.92	3.82	4.02	-
Pot Cap-1 Maneuver	-	-	-	446	385	568	699	381	-
Stage 1	-	-	-	391	461	-	-	-	-
Stage 2	-	-	-	-	-	-	683	457	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	446	0	568	699	0	-
Mov Cap-2 Maneuver	-	-	-	446	0	-	699	0	-
Stage 1	-	-	-	391	0	-	-	0	-
Stage 2	-	-	-	-	0	-	683	0	-

Approach	WB	SE	NW
HCM Control Delay, s	0	12	
HCM LOS		B	-

Minor Lane/Major Mvmt	NWLn1	WBL	WBT	WBR	SELn1
Capacity (veh/h)	-	-	-	-	568
HCM Lane V/C Ratio	-	-	-	-	0.094
HCM Control Delay (s)	-	0	-	-	12
HCM Lane LOS	-	A	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	1087	0	0	0	0	6	30	0	0	57	4
Future Vol, veh/h	0	1087	0	0	0	0	6	30	0	0	57	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1182	0	0	0	0	7	33	0	0	62	4

Major/Minor	Major1			Minor2			Minor1		
Conflicting Flow All	0	0	0	504	1182	0	1198	1182	590
Stage 1	-	-	-	0	0	-	1182	1182	-
Stage 2	-	-	-	504	1182	-	16	0	-
Critical Hdwy	-	-	-	5.74	6.54	-	5.74	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	545	188	-	247	188	386
Stage 1	-	-	-	-	-	-	187	262	-
Stage 2	-	-	-	522	262	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	545	0	-	247	0	386
Mov Cap-2 Maneuver	-	-	-	545	0	-	247	0	-
Stage 1	-	-	-	-	0	-	187	0	-
Stage 2	-	-	-	522	0	-	-	0	-

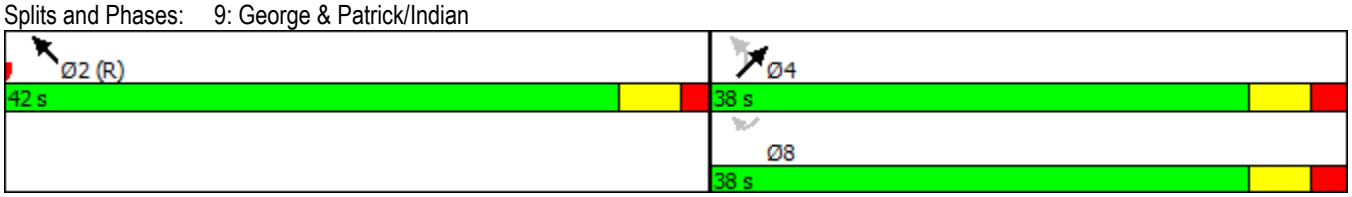
Approach	EB	SE	NW
HCM Control Delay, s	0		16.3
HCM LOS		-	C

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	SELn1
Capacity (veh/h)	386	-	-	-	-
HCM Lane V/C Ratio	0.172	-	-	-	-
HCM Control Delay (s)	16.3	0	-	-	-
HCM Lane LOS	C	A	-	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-	-

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	612	158	105	17
Future Volume (vph)	612	158	105	17
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	25.8	25.8	25.8	25.8
Total Split (s)	42.0	38.0	38.0	38.0
Total Split (%)	52.5%	47.5%	47.5%	47.5%
Yellow Time (s)	3.6	3.6	3.6	3.6
All-Red Time (s)	1.8	2.3	2.3	2.3
Lost Time Adjust (s)	1.5	1.2	1.2	1.2
Total Lost Time (s)	6.9	7.1	7.1	7.1
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	35.1	30.9	30.9	30.9
Actuated g/C Ratio	0.44	0.39	0.39	0.39
v/c Ratio	0.30	0.22	0.16	0.03
Control Delay	2.8	24.3	30.5	0.1
Queue Delay	0.0	0.9	0.0	0.0
Total Delay	2.8	25.2	30.5	0.1
LOS	A	C	C	A
Approach Delay	2.8		27.3	
Approach LOS	A		C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 52 (65%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 10.0	Intersection LOS: A
Intersection Capacity Utilization 44.0%	ICU Level of Service A
Analysis Period (min) 15	

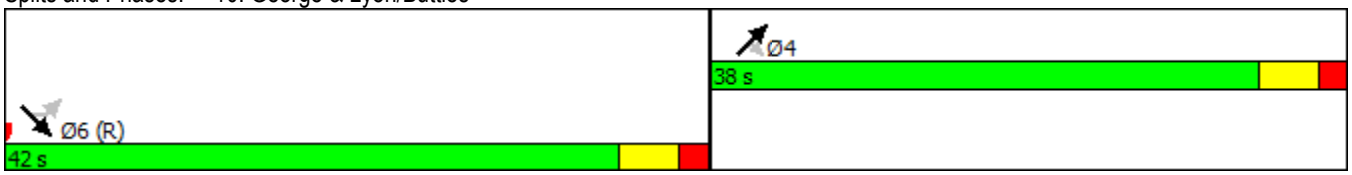
Splits and Phases: 9: George & Patrick/Indian



Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	904	250	183
Future Volume (vph)	904	250	183
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	21.9	21.7	21.7
Total Split (s)	42.0	38.0	38.0
Total Split (%)	52.5%	47.5%	47.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.9	1.8	1.8
Lost Time Adjust (s)	1.6	1.7	1.7
Total Lost Time (s)	7.0	7.0	7.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	35.0	31.0	31.0
Actuated g/C Ratio	0.44	0.39	0.39
v/c Ratio	0.45	0.20	0.31
Control Delay	4.1	35.7	33.9
Queue Delay	0.1	0.0	0.0
Total Delay	4.2	35.7	33.9
LOS	A	D	C
Approach Delay	4.2	34.9	
Approach LOS	A	C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 13 (16%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 44.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: George & Lyon/Buttles



Intersection	
Int Delay, s/veh	4.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Traffic Vol, veh/h	0	0	0	137	637	13	0	0	0	0	61	185
Future Vol, veh/h	0	0	0	137	637	13	0	0	0	0	61	185
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	149	692	14	0	0	0	0	66	201

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	997	997	352
Stage 1	-	-	-	997	997	-
Stage 2	-	-	-	0	0	-
Critical Hdwy	-	-	-	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	257	243	550
Stage 1	-	-	-	200	320	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	257	0	550
Mov Cap-2 Maneuver	-	-	-	257	0	-
Stage 1	-	-	-	200	0	-
Stage 2	-	-	-	-	0	-

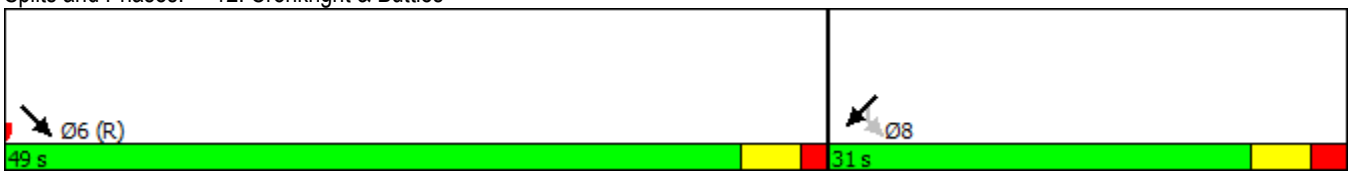
Approach	NW	SW
HCM Control Delay, s		17.6
HCM LOS		C

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	550
HCM Lane V/C Ratio	-	-	-	0.486
HCM Control Delay (s)	-	-	-	17.6
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	2.6

Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	915	196
Future Volume (vph)	915	196
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.3	25.1
Total Split (s)	49.0	31.0
Total Split (%)	61.3%	38.8%
Yellow Time (s)	3.6	3.5
All-Red Time (s)	1.6	2.3
Lost Time Adjust (s)	1.7	1.2
Total Lost Time (s)	6.9	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	42.1	24.0
Actuated g/C Ratio	0.53	0.30
v/c Ratio	0.38	0.14
Control Delay	2.3	12.2
Queue Delay	0.0	0.0
Total Delay	2.3	12.2
LOS	A	B
Approach Delay	2.3	12.2
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 10 (13%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 4.0	Intersection LOS: A
Intersection Capacity Utilization 35.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: Cronkright & Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	3	27	20	424	57
Future Volume (vph)	3	27	20	424	57
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.7	25.8	25.8
Total Split (s)	32.0	32.0	32.0	48.0	48.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3	5.3	5.3	5.3
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max
Act Effct Green (s)		26.7	26.7	42.7	42.7
Actuated g/C Ratio		0.33	0.33	0.53	0.53
v/c Ratio		0.05	0.03	0.31	0.07
Control Delay		30.4	14.9	11.0	2.9
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		30.4	14.9	11.0	2.9
LOS		C	B	B	A
Approach Delay		30.4	14.9	10.2	
Approach LOS		C	B	B	

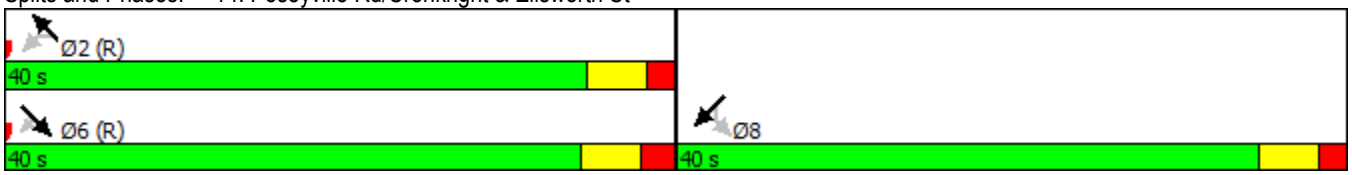
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 29.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Poseyville Rd/George & Ellsworth St

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	19	52	51	80	167
Future Volume (vph)	19	52	51	80	167
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	24.0	24.0	24.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.2	2.2	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.3	5.3	5.3
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max
Act Effct Green (s)	34.3	34.3	34.7	34.7	34.7
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.03	0.08	0.09	0.11	0.11
Control Delay	13.4	4.5	9.3	9.3	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	4.5	9.3	9.3	16.8
LOS	B	A	A	A	B
Approach Delay	6.9			9.3	16.8
Approach LOS	A			A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.11	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 31.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 14: Poseyville Rd/Cronkright & Ellsworth St



Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	794	110
Future Volume (vph)	794	110
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.4	25.4
Total Split (s)	50.0	30.0
Total Split (%)	62.5%	37.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.5	0.7
Total Lost Time (s)	6.0	6.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	44.0	24.0
Actuated g/C Ratio	0.55	0.30
v/c Ratio	0.32	0.08
Control Delay	5.6	13.9
Queue Delay	0.0	0.0
Total Delay	5.6	13.9
LOS	A	B
Approach Delay	5.6	13.9
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 68 (85%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.32	
Intersection Signal Delay: 6.6	Intersection LOS: A
Intersection Capacity Utilization 31.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 16: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	896	43
Future Volume (vph)	896	43
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	35.3	25.9
Total Split (s)	51.0	29.0
Total Split (%)	63.8%	36.3%
Yellow Time (s)	4.3	3.5
All-Red Time (s)	2.0	2.5
Lost Time Adjust (s)	0.7	0.6
Total Lost Time (s)	7.0	6.6
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	44.0	22.4
Actuated g/C Ratio	0.55	0.28
v/c Ratio	0.39	0.07
Control Delay	0.8	12.3
Queue Delay	0.0	0.0
Total Delay	0.8	12.3
LOS	A	B
Approach Delay	0.8	12.3
Approach LOS	A	B

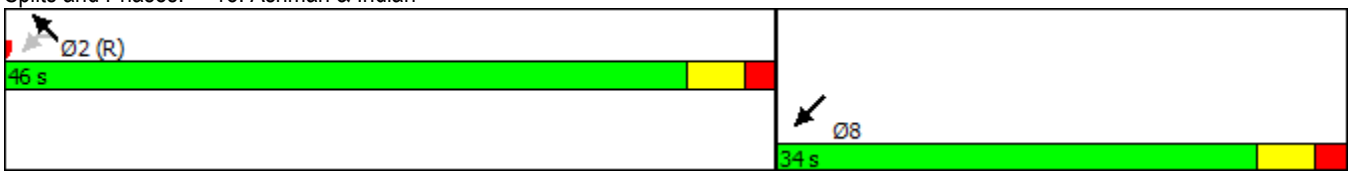
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 1.8	Intersection LOS: A
Intersection Capacity Utilization 36.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 17: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	745	248
Future Volume (vph)	745	248
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.3	24.8
Total Split (s)	46.0	34.0
Total Split (%)	57.5%	42.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.9	2.0
Lost Time Adjust (s)	1.6	1.5
Total Lost Time (s)	7.0	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	39.0	27.0
Actuated g/C Ratio	0.49	0.34
v/c Ratio	0.35	0.20
Control Delay	1.9	14.9
Queue Delay	0.0	0.0
Total Delay	1.9	14.9
LOS	A	B
Approach Delay	1.9	14.9
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 33.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 18: Ashman & Indian



Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	957	36	267
Future Volume (vph)	957	36	267
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	22.7	24.6	24.6
Total Split (s)	47.0	33.0	33.0
Total Split (%)	58.8%	41.3%	41.3%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.9	1.8	1.8
Lost Time Adjust (s)	-1.4	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	43.0	29.0	29.0
Actuated g/C Ratio	0.54	0.36	0.36
v/c Ratio	0.40	0.06	0.23
Control Delay	7.6	1.9	11.5
Queue Delay	0.0	0.0	0.0
Total Delay	7.6	1.9	11.5
LOS	A	A	B
Approach Delay	7.6		10.4
Approach LOS	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 68 (85%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 33.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 19: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	392	424	380
Future Volume (vph)	392	424	380
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	22.2	22.2	21.5
Total Split (s)	46.0	46.0	34.0
Total Split (%)	57.5%	57.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.2	2.2	2.5
Lost Time Adjust (s)	3.0	3.0	3.0
Total Lost Time (s)	8.7	8.7	9.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	37.3	37.3	25.0
Actuated g/C Ratio	0.47	0.47	0.31
v/c Ratio	0.39	0.38	0.39
Control Delay	6.7	5.8	23.6
Queue Delay	0.0	0.0	0.0
Total Delay	6.7	5.8	23.6
LOS	A	A	C
Approach Delay		6.1	23.6
Approach LOS		A	C

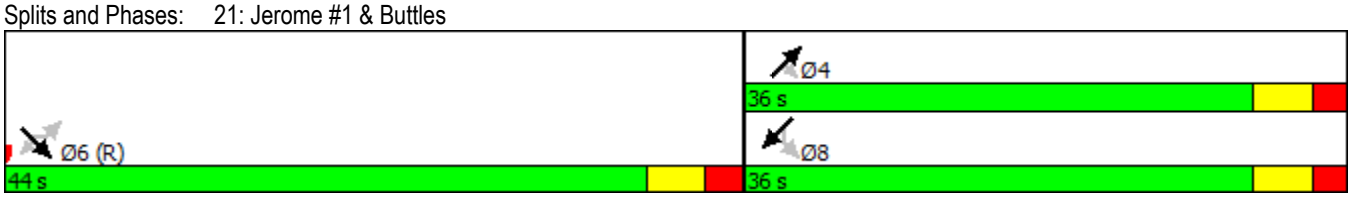
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 9 (11%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	565	81	375	433	2	390
Future Volume (vph)	565	81	375	433	2	390
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	44.0	44.0	36.0	36.0	36.0	36.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.3	2.3	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	-1.8	0.0	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.0	5.8	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	40.0	38.2	32.0	32.0	32.0	32.0
Actuated g/C Ratio	0.50	0.48	0.40	0.40	0.40	0.40
v/c Ratio	0.35	0.11	0.45	0.39	0.01	0.30
Control Delay	7.6	2.3	15.3	5.9	1.0	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	2.3	15.3	5.9	1.0	1.9
LOS	A	A	B	A	A	A
Approach Delay	7.0		12.4			1.9
Approach LOS	A		B			A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 58 (73%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 53.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 21: Jerome #1 & Buttles



Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	6	6	616	188	6	645
Future Vol, veh/h	6	6	616	188	6	645
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	-	-
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	7	7	670	204	7	701

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1136	437	0	0	874	0
Stage 1	772	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	196	567	-	-	768	-
Stage 1	416	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	193	567	-	-	768	-
Mov Cap-2 Maneuver	193	-	-	-	-	-
Stage 1	416	-	-	-	-	-
Stage 2	663	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.9	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	193	567	768	-
HCM Lane V/C Ratio	-	-	0.034	0.012	0.008	-
HCM Control Delay (s)	-	-	24.3	11.4	9.7	0.1
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	6	23	23	51	27	576	34	603
Future Volume (vph)	6	23	23	51	27	576	34	603
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.6	8.6	8.6	8.6	62.7	62.7	62.7	62.7
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.78	0.78	0.78	0.78
v/c Ratio	0.05	0.25	0.17	0.43	0.05	0.23	0.06	0.25
Control Delay	31.5	21.8	34.3	26.6	1.8	1.9	1.8	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	21.8	34.3	26.6	1.8	1.9	1.8	1.6
LOS	C	C	C	C	A	A	A	A
Approach Delay		23.0		28.2		1.9		1.6
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 3 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 4.6	Intersection LOS: A
Intersection Capacity Utilization 46.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 23: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	16	55	38	108	87	497	10	578
Future Volume (vph)	16	55	38	108	87	497	10	578
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	29.0	29.0	29.0	29.0	51.0	51.0	51.0	51.0
Total Split (%)	36.3%	36.3%	36.3%	36.3%	63.8%	63.8%	63.8%	63.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.8	6.8	6.8	6.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	9.6	9.6	9.6	9.6	60.4	60.4	60.4	60.4
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.76	0.76	0.76	0.76
v/c Ratio	0.11	0.43	0.27	0.56	0.17	0.22	0.02	0.25
Control Delay	31.2	24.2	35.0	40.7	6.7	5.2	2.6	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	24.2	35.0	40.7	6.7	5.2	2.6	2.5
LOS	C	C	C	D	A	A	A	A
Approach Delay		25.2		39.3		5.4		2.5
Approach LOS		C		D		A		A

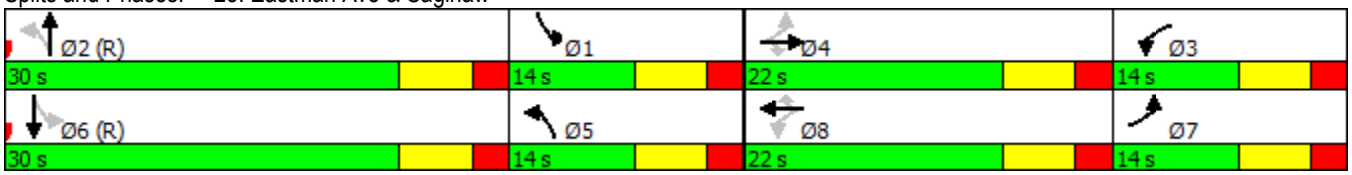
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 35 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 51.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 24: Eastman Ave & Sugnet

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	104	400	108	71	421	170	86	388	280	434
Future Volume (vph)	104	400	108	71	421	170	86	388	280	434
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	11.5	16.5
Total Split (s)	14.0	22.0	22.0	14.0	22.0	22.0	14.0	30.0	14.0	30.0
Total Split (%)	17.5%	27.5%	27.5%	17.5%	27.5%	27.5%	17.5%	37.5%	17.5%	37.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	3.0	0.4	0.4	3.0	0.4	0.4	3.0	0.5	3.0	0.5
Total Lost Time (s)	9.6	7.0	7.0	9.6	7.0	7.0	9.5	7.0	9.5	7.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	15.8	15.0	15.0	15.8	15.0	15.0	28.0	26.4	30.3	29.2
Actuated g/C Ratio	0.20	0.19	0.19	0.20	0.19	0.19	0.35	0.33	0.38	0.36
v/c Ratio	0.63	0.66	0.25	0.41	0.70	0.39	0.37	0.41	0.84	0.51
Control Delay	41.3	35.7	1.2	29.1	36.8	4.9	23.3	17.5	42.7	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	35.7	1.2	29.1	36.8	4.9	23.3	17.5	42.7	17.2
LOS	D	D	A	C	D	A	C	B	D	B
Approach Delay		30.6			27.8			18.5		25.3
Approach LOS		C			C			B		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 25.8	Intersection LOS: C
Intersection Capacity Utilization 72.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 25: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	60	76	41	14	589	60	765
Future Volume (vph)	35	60	76	41	14	589	60	765
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	10.6	10.6	10.6	10.6	60.6	60.6	60.6	60.6
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.76	0.76	0.76	0.76
v/c Ratio	0.22	0.45	0.49	0.40	0.03	0.27	0.12	0.32
Control Delay	32.8	37.4	41.1	18.6	2.9	2.6	5.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	37.4	41.1	18.6	2.9	2.6	5.2	4.8
LOS	C	D	D	B	A	A	A	A
Approach Delay		36.2		28.2		2.6		4.8
Approach LOS		D		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 47 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

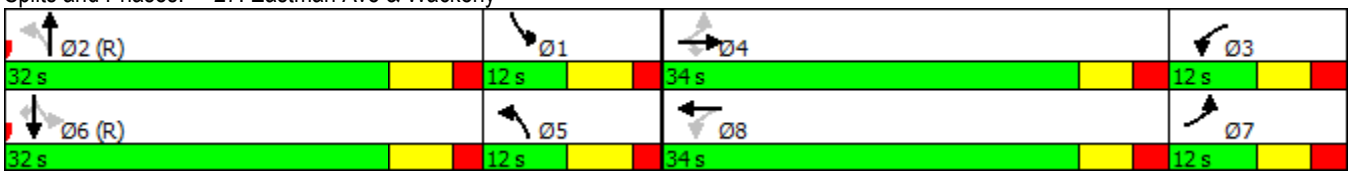
Splits and Phases: 26: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	116	414	80	55	186	40	579	69	716	126
Future Volume (vph)	116	414	80	55	186	40	579	69	716	126
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.1	30.5	30.5	11.1	30.5	11.3	26.0	11.3	26.0	26.0
Total Split (s)	12.0	34.0	34.0	12.0	34.0	12.0	32.0	12.0	32.0	32.0
Total Split (%)	13.3%	37.8%	37.8%	13.3%	37.8%	13.3%	35.6%	13.3%	35.6%	35.6%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	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	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?										
Recall Mode	Min	Max	Max	Min	Max	Min	C-Max	Min	C-Max	C-Max
Act Effct Green (s)	31.8	27.0	27.0	31.8	27.0	29.4	24.8	29.4	24.8	24.8
Actuated g/C Ratio	0.35	0.30	0.30	0.35	0.30	0.33	0.28	0.33	0.28	0.28
v/c Ratio	0.45	0.79	0.14	0.31	0.72	0.23	0.75	0.36	0.77	0.23
Control Delay	25.7	40.8	0.5	22.2	34.4	22.8	34.8	12.5	26.2	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	40.8	0.5	22.2	34.4	22.8	34.8	12.5	26.2	2.5
LOS	C	D	A	C	C	C	C	B	C	A
Approach Delay		32.7			32.5		34.1		21.8	
Approach LOS		C			C		C		C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 86 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 29.4 Intersection LOS: C
Intersection Capacity Utilization 73.9% ICU Level of Service D
Analysis Period (min) 15

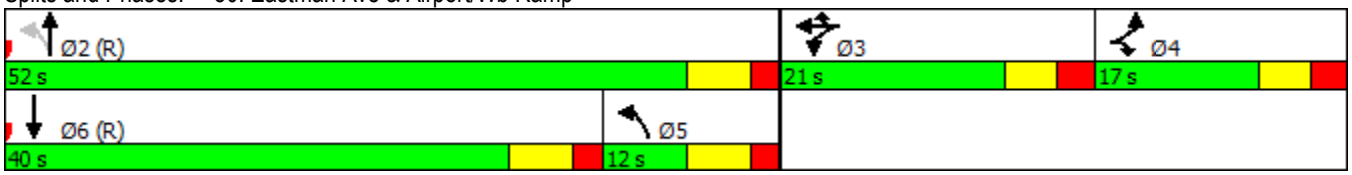
Splits and Phases: 27: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Configurations									
Traffic Volume (vph)	88	40	182	85	148	44	513	73	803
Future Volume (vph)	88	40	182	85	148	44	513	73	803
Turn Type	Prot	Prot	Split	NA	Prot	pm+pt	NA	Free	NA
Protected Phases	4	4	3	3	3	5	2		6
Permitted Phases						2		Free	
Detector Phase	4	4	3	3	3	5	2		6
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6
Total Split (s)	17.0	17.0	21.0	21.0	21.0	12.0	52.0		40.0
Total Split (%)	18.9%	18.9%	23.3%	23.3%	23.3%	13.3%	57.8%		44.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.3	7.3		7.3
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag			Lead
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max
Act Effct Green (s)	8.7	8.7	11.2	11.2	11.2	51.5	51.5	90.0	39.5
Actuated g/C Ratio	0.10	0.10	0.12	0.12	0.12	0.57	0.57	1.00	0.44
v/c Ratio	0.61	0.15	0.69	0.68	0.45	0.15	0.28	0.05	0.58
Control Delay	54.4	0.9	54.3	53.5	7.7	5.9	4.7	0.0	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	0.9	54.3	53.5	7.7	5.9	4.7	0.0	22.6
LOS	D	A	D	D	A	A	A	A	C
Approach Delay				37.4			4.2		22.6
Approach LOS				D			A		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 78 (87%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 20.9	Intersection LOS: C
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 30: Eastman Ave & Airport/Wb Ramp



Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	0	0	0	0	663	86	0	848	24
Future Vol, veh/h	0	0	0	0	0	0	0	663	86	0	848	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	721	93	0	922	26

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1295	1656	474	948	0	0	721	0	0
Stage 1	935	935	-	-	-	-	-	-	-
Stage 2	360	721	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	154	97	537	720	-	-	877	-	-
Stage 1	342	342	-	-	-	-	-	-	-
Stage 2	677	430	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	154	0	537	720	-	-	877	-	-
Mov Cap-2 Maneuver	154	0	-	-	-	-	-	-	-
Stage 1	342	0	-	-	-	-	-	-	-
Stage 2	677	0	-	-	-	-	-	-	-

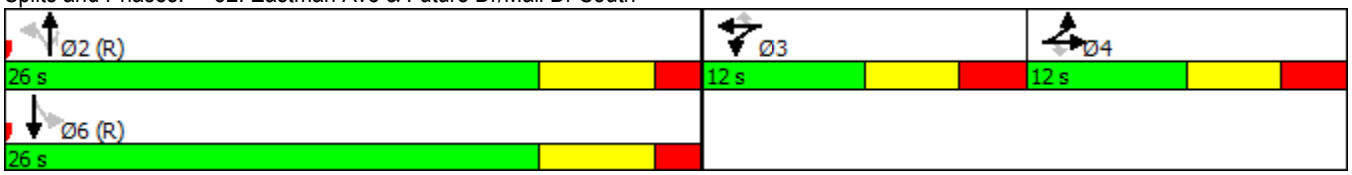
Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	720	-	-	-	877	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	-	-

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	6	19	25	6	12	2	649	12	3	828
Future Volume (vph)	6	19	25	6	12	2	649	12	3	828
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	12.0	12.0	12.0	12.0	12.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	6.1	7.1	7.1	7.1	7.1
Lead/Lag	Lag	Lag	Lead	Lead	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	5.9	5.9	4.8	4.8	4.8	38.0	37.6	37.6	37.6	37.6
Actuated g/C Ratio	0.12	0.12	0.10	0.10	0.10	0.76	0.75	0.75	0.75	0.75
v/c Ratio	0.14	0.06	0.11	0.10	0.04	0.00	0.26	0.01	0.01	0.33
Control Delay	21.5	0.3	22.2	22.1	0.2	8.5	6.9	0.0	6.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	0.3	22.2	22.1	0.2	8.5	6.9	0.0	6.0	5.0
LOS	C	A	C	C	A	A	A	A	A	A
Approach Delay	12.8			16.1			6.8			5.0
Approach LOS	B			B			A			A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 49 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 48.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 32: Eastman Ave & Future Dr/Mall Dr South



Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1	14.8	29.9	0.2	23
Bayliss	3	5.2	25.0	0.2	35
Jefferson	5	7.6	27.6	0.3	33
Carpenter	7	1.6	9.1	0.1	36
	131	0.8	15.1	0.2	42
	208	0.8	15.5	0.2	42
George	9	5.1	23.0	0.2	35
Total		36.0	145.2	1.4	34

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	56	0.9	19.4	0.2	42
	86	0.9	22.1	0.3	43
Carpenter	8	1.3	15.5	0.2	41
Jefferson	6	4.2	8.4	0.1	23
Bayliss	4	2.6	22.8	0.3	40
	207	1.6	12.4	0.1	38
Washington	2	7.6	16.3	0.1	25
Total		19.1	116.8	1.2	37

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	10	1.5	6.5	0.1	30
Rodd	16	5.8	17.8	0.1	25
Ashman	18	5.7	17.6	0.1	22
Jerome #1	20	6.8	24.7	0.2	26
Eastman Ave	164	2.5	22.0	0.2	25
Total		22.2	88.6	0.6	25

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	116	0.4	9.1	0.1	33
Jerome #1	21	16.8	26.4	0.1	13
Ashman	19	3.4	21.5	0.2	29
Rodd	17	5.9	18.0	0.1	22
Cronkright	12	2.8	14.6	0.1	30
George	11	1.7	7.9	0.1	24
Total		31.0	97.5	0.6	24

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	22	-	-	0.2	-
St Andrews	23	5.5	27.7	0.3	36
Sugnet	24	6.4	54.8	0.6	40
Saginaw	25	26.9	66.2	0.5	27
Dilloway	26	9.0	49.7	0.5	39
Wackerly	27	131.2	162.3	0.4	9
Eb On Ramp	28	4.5	7.5	0.0	16
Wb On Ramp	29	2.0	8.2	0.1	33
Wb Ramp	30	8.7	14.3	0.1	17
Mall Off	31	2.2	8.2	0.1	33
Mall Dr South	32	6.7	11.2	0.1	19
North Mall Dr	33	6.3	15.0	0.1	27
Joe Mann	34	6.3	12.2	0.1	21
Total		216.0	437.3	3.0	25

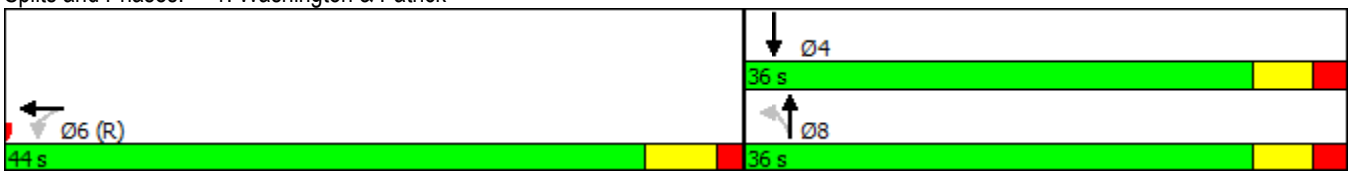
Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	34	10.9	26.3	0.2	27
	33	2.7	8.7	0.1	30
Future Dr	32	9.2	17.8	0.1	23
Saylor Dr	31	5.2	10.1	0.1	21
Airport	30	31.9	37.5	0.1	7
Wb On Ramp	29	5.3	11.3	0.1	22
Eb On Ramp	28	3.3	9.3	0.1	29
Wackerly	27	21.6	24.2	0.0	5
Dilloway	26	8.8	41.2	0.4	36
Saginaw	25	34.2	75.6	0.5	25
Sugnet	24	8.0	47.0	0.5	39
St Andrews	23	6.4	55.4	0.6	40
Carpenter	22	2.5	24.7	0.3	40
Indian	164	1.3	13.8	0.2	41
Total		151.3	402.9	3.2	28

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1057	145	264	35
Future Volume (vph)	1057	145	264	35
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	44.0	36.0	36.0	36.0
Total Split (%)	55.0%	45.0%	45.0%	45.0%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.6	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.9	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	37.1	29.3	29.3	29.3
Actuated g/C Ratio	0.46	0.37	0.37	0.37
v/c Ratio	0.52	0.35	0.22	0.13
Control Delay	16.0	19.0	15.3	12.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.0	19.0	15.3	12.8
LOS	B	B	B	B
Approach Delay	16.0		16.6	12.8
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 56 (70%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 52.7%	ICU Level of Service A
Analysis Period (min) 15	

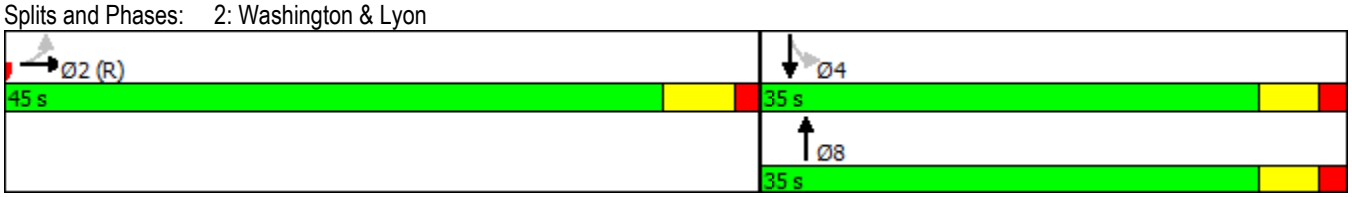
Splits and Phases: 1: Washington & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	856	301	11	34
Future Volume (vph)	856	301	11	34
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	45.0	35.0	35.0	35.0
Total Split (%)	56.3%	43.8%	43.8%	43.8%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.5	1.8	1.8	1.8
Lost Time Adjust (s)	1.0	1.5		1.0
Total Lost Time (s)	6.8	6.8		6.3
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	38.2	28.2		28.7
Actuated g/C Ratio	0.48	0.35		0.36
v/c Ratio	0.44	0.33		0.04
Control Delay	4.4	7.9		12.4
Queue Delay	0.0	1.9		0.0
Total Delay	4.4	9.8		12.4
LOS	A	A		B
Approach Delay	4.4	9.8		12.4
Approach LOS	A	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 42 (53%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Washington & Lyon



Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	115	1111	80	18	91	0	0	13	65
Future Vol, veh/h	0	0	0	115	1111	80	18	91	0	0	13	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	125	1208	87	20	99	0	0	14	71

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	740	1545	0	1550	1501	646
Stage 1	-	-	-	0	0	-	1501	1501	-
Stage 2	-	-	-	740	1545	-	49	0	-
Critical Hdwy	-	-	-	5.74	6.54	-	5.74	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	418	114	-	162	121	355
Stage 1	-	-	-	-	-	-	118	183	-
Stage 2	-	-	-	393	174	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	418	0	-	162	0	355
Mov Cap-2 Maneuver	-	-	-	418	0	-	162	0	-
Stage 1	-	-	-	-	0	-	118	0	-
Stage 2	-	-	-	393	0	-	-	0	-

Approach	WB	NB	SB
HCM Control Delay, s			18.3
HCM LOS		-	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	418	-	-	-	-	355
HCM Lane V/C Ratio	0.047	-	-	-	-	0.239
HCM Control Delay (s)	14	-	-	-	-	18.3
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.9

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	921	94	100	65	63
Future Volume (vph)	921	94	100	65	63
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	50.0	30.0	30.0	30.0	30.0
Total Split (%)	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.3	3.5	3.5	3.5	3.5
All-Red Time (s)	1.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	1.6	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.3	7.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	56.6	9.1	9.1	9.1	9.1
Actuated g/C Ratio	0.71	0.11	0.11	0.11	0.11
v/c Ratio	0.29	0.48	0.42	0.49	0.32
Control Delay	0.7	40.3	15.3	41.8	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.7	40.3	15.3	41.8	34.3
LOS	A	D	B	D	C
Approach Delay	0.7	27.4			38.1
Approach LOS	A	C			D

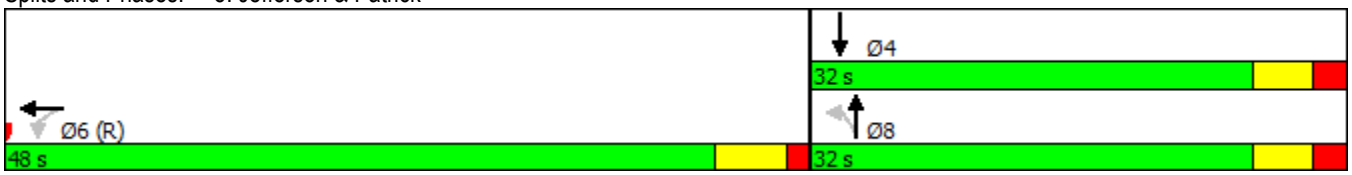
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 32 (40%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 48.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Bayliss & Lyon

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1119	39	79	94
Future Volume (vph)	1119	39	79	94
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	25.0	26.7	26.7	26.7
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.4	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.7	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	41.3	25.3	25.3	25.3
Actuated g/C Ratio	0.52	0.32	0.32	0.32
v/c Ratio	0.55	0.12	0.16	0.23
Control Delay	6.3	9.3	9.6	19.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	9.3	9.6	19.5
LOS	A	A	A	B
Approach Delay	6.3		9.5	19.5
Approach LOS	A		A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 11 (14%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 55.1%	ICU Level of Service B
Analysis Period (min) 15	

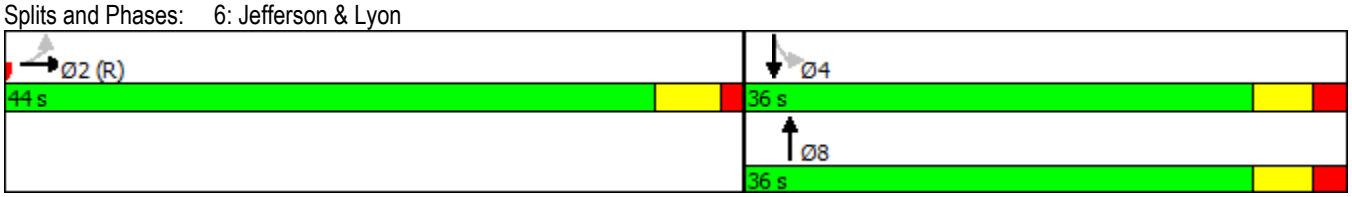
Splits and Phases: 5: Jefferson & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	879	103	47	59
Future Volume (vph)	879	103	47	59
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.3	27.3	27.3	27.3
Total Split (s)	44.0	36.0	36.0	36.0
Total Split (%)	55.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.9	3.5	3.5	3.5
All-Red Time (s)	1.4	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.3	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	37.7	29.3	29.3	29.3
Actuated g/C Ratio	0.47	0.37	0.37	0.37
v/c Ratio	0.41	0.22	0.11	0.09
Control Delay	4.5	15.8	9.1	8.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.5	15.8	9.1	8.8
LOS	A	B	A	A
Approach Delay	4.5	15.8		9.0
Approach LOS	A	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 6 (8%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 55.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Jefferson & Lyon



Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	0	0	0	1175	0	0	36	50	6	51	0
Future Vol, veh/h	0	0	0	0	1175	0	0	36	50	6	51	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	1277	0	0	39	54	7	55	0

Major/Minor	Major2			Minor2			Minor1		
Conflicting Flow All	0	0	0	1305	1277	638	530	1277	0
Stage 1	-	-	-	1277	1277	-	0	0	-
Stage 2	-	-	-	28	0	-	530	1277	-
Critical Hdwy	-	-	-	5.74	6.54	7.14	5.74	6.54	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.04	5.54	-
Follow-up Hdwy	-	-	-	3.82	4.02	3.92	3.82	4.02	-
Pot Cap-1 Maneuver	-	-	-	217	165	359	529	165	-
Stage 1	-	-	-	163	236	-	-	-	-
Stage 2	-	-	-	-	-	-	506	236	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	217	0	359	529	0	-
Mov Cap-2 Maneuver	-	-	-	217	0	-	529	0	-
Stage 1	-	-	-	163	0	-	-	0	-
Stage 2	-	-	-	-	0	-	506	0	-

Approach	WB	SE	NW
HCM Control Delay, s	0	18.5	
HCM LOS		C	-

Minor Lane/Major Mvmt	NWLn1	WBL	WBT	WBR	SELn1
Capacity (veh/h)	-	-	-	-	359
HCM Lane V/C Ratio	-	-	-	-	0.26
HCM Control Delay (s)	-	0	-	-	18.5
HCM Lane LOS	-	A	-	-	C
HCM 95th %tile Q(veh)	-	-	-	-	1

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	895	13	0	0	0	6	16	0	0	57	4
Future Vol, veh/h	0	895	13	0	0	0	6	16	0	0	57	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	973	14	0	0	0	7	17	0	0	62	4

Major/Minor	Major1			Minor2			Minor1		
Conflicting Flow All	0	0	0	420	987	0	989	980	492
Stage 1	-	-	-	0	0	-	980	980	-
Stage 2	-	-	-	420	987	-	9	0	-
Critical Hdwy	-	-	-	5.74	6.54	-	5.74	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	598	246	-	314	248	447
Stage 1	-	-	-	-	-	-	249	326	-
Stage 2	-	-	-	577	324	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	598	0	-	314	0	447
Mov Cap-2 Maneuver	-	-	-	598	0	-	314	0	-
Stage 1	-	-	-	-	0	-	249	0	-
Stage 2	-	-	-	577	0	-	-	0	-

Approach	EB	SE	NW
HCM Control Delay, s	0		14.5
HCM LOS		-	B

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	SELn1
Capacity (veh/h)	447	-	-	-	-
HCM Lane V/C Ratio	0.148	-	-	-	-
HCM Control Delay (s)	14.5	0	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.5	-	-	-	-

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	1227	270	37	23
Future Volume (vph)	1227	270	37	23
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	25.8	25.8	25.8	25.8
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.6	3.6	3.6	3.6
All-Red Time (s)	1.8	2.3	2.3	2.3
Lost Time Adjust (s)	1.5	1.2	1.2	1.2
Total Lost Time (s)	6.9	7.1	7.1	7.1
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	42.1	23.9	23.9	23.9
Actuated g/C Ratio	0.53	0.30	0.30	0.30
v/c Ratio	0.50	0.53	0.07	0.05
Control Delay	5.0	35.8	29.4	5.7
Queue Delay	0.0	6.8	0.0	0.0
Total Delay	5.0	42.6	29.4	5.7
LOS	A	D	C	A
Approach Delay	5.0		41.1	
Approach LOS	A		D	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 69 (86%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: George & Patrick/Indian

Intersection	
Int Delay, s/veh	8.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Traffic Vol, veh/h	0	0	0	289	1225	6	0	0	0	0	181	93
Future Vol, veh/h	0	0	0	289	1225	6	0	0	0	0	181	93
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	314	1332	7	0	0	0	0	197	101

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	1963	1963	668
Stage 1	-	-	-	1963	1963	-
Stage 2	-	-	-	0	0	-
Critical Hdwy	-	-	-	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	67	~ 62	344
Stage 1	-	-	-	41	~ 108	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	67	0	344
Mov Cap-2 Maneuver	-	-	-	67	0	-
Stage 1	-	-	-	41	0	-
Stage 2	-	-	-	-	0	-

Approach	NW	SW
HCM Control Delay, s		55.9
HCM LOS		F

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	344
HCM Lane V/C Ratio	-	-	-	0.866
HCM Control Delay (s)	-	-	-	55.9
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	8.1

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	775	285	133
Future Volume (vph)	775	285	133
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	21.9	21.7	21.7
Total Split (s)	46.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.9	1.8	1.8
Lost Time Adjust (s)	1.6	1.7	1.7
Total Lost Time (s)	7.0	7.0	7.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	39.0	27.0	27.0
Actuated g/C Ratio	0.49	0.34	0.34
v/c Ratio	0.35	0.26	0.24
Control Delay	1.2	15.4	4.2
Queue Delay	0.1	0.0	0.0
Total Delay	1.3	15.4	4.2
LOS	A	B	A
Approach Delay	1.3	11.8	
Approach LOS	A	B	

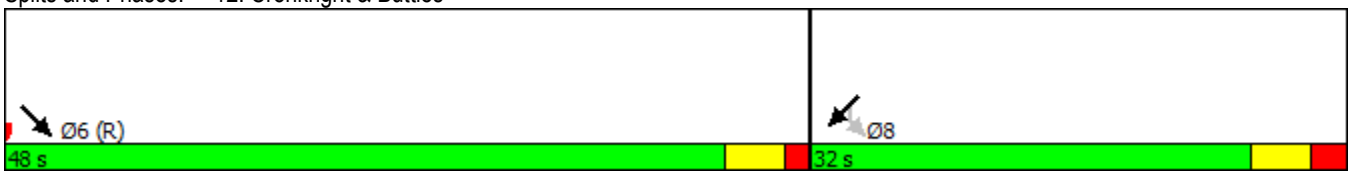
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 25 (31%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: George & Lyon/Buttles

Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	787	460
Future Volume (vph)	787	460
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.3	25.1
Total Split (s)	48.0	32.0
Total Split (%)	60.0%	40.0%
Yellow Time (s)	3.6	3.5
All-Red Time (s)	1.6	2.3
Lost Time Adjust (s)	1.7	1.2
Total Lost Time (s)	6.9	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	41.1	25.0
Actuated g/C Ratio	0.51	0.31
v/c Ratio	0.41	0.32
Control Delay	2.4	19.5
Queue Delay	0.0	0.0
Total Delay	2.4	19.5
LOS	A	B
Approach Delay	2.4	19.5
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 21 (26%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 40.0%	ICU Level of Service A
Analysis Period (min) 15	

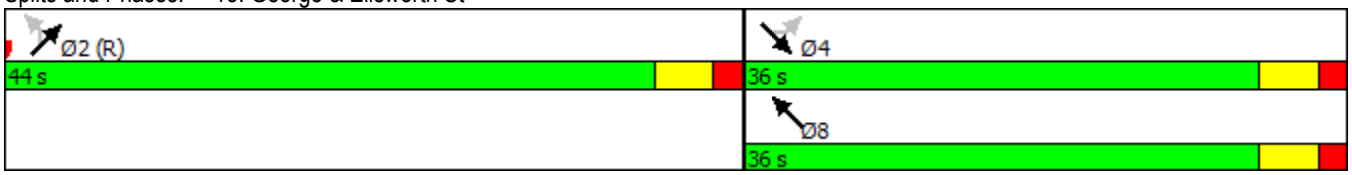
Splits and Phases: 12: Cronkright & Buttles



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	20	24	61	356
Future Volume (vph)	20	24	61	356
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.7	25.8
Total Split (s)	36.0	36.0	36.0	44.0
Total Split (%)	45.0%	45.0%	45.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.3	5.3	5.3
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)		30.7	30.7	38.7
Actuated g/C Ratio		0.38	0.38	0.48
v/c Ratio		0.08	0.09	0.20
Control Delay		16.2	10.1	11.7
Queue Delay		0.0	0.0	0.0
Total Delay		16.2	10.1	11.7
LOS		B	B	B
Approach Delay		16.2	10.1	11.7
Approach LOS		B	B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NETL, Start of Green, Master Intersection	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 26.6%	ICU Level of Service A
Analysis Period (min) 15	

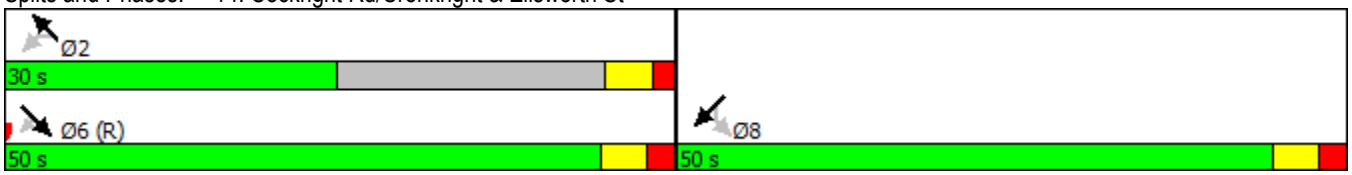
Splits and Phases: 13: George & Ellsworth St



Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	30	197	75	51	611
Future Volume (vph)	30	197	75	51	611
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	24.0	24.0	26.4
Total Split (s)	50.0	50.0	30.0	30.0	50.0
Total Split (%)	50.0%	50.0%	30.0%	30.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.2	2.2	1.8	1.8	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.3	5.3	5.7
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max
Act Effct Green (s)	44.3	44.3	44.7	44.7	44.3
Actuated g/C Ratio	0.44	0.44	0.45	0.45	0.44
v/c Ratio	0.04	0.27	0.13	0.07	0.31
Control Delay	16.1	6.6	17.1	16.1	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.6
Total Delay	16.1	6.6	17.1	16.1	18.9
LOS	B	A	B	B	B
Approach Delay	7.9			16.7	18.9
Approach LOS	A			B	B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 75 (75%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 44.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 14: Cockright Rd/Cronkright & Ellsworth St



Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	51	6	31	392	642	201
Future Vol, veh/h	51	6	31	392	642	201
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
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	55	7	34	426	698	218

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1087	458	916	0	-	0
Stage 1	807	-	-	-	-	-
Stage 2	280	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	211	550	740	-	-	-
Stage 1	399	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	550	740	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	399	-	-	-	-	-
Stage 2	708	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.4	0.7	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	740	-	215	-	-
HCM Lane V/C Ratio	0.046	-	0.288	-	-
HCM Control Delay (s)	10.1	-	28.4	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	1265	238
Future Volume (vph)	1265	238
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.4	25.4
Total Split (s)	51.0	29.0
Total Split (%)	63.8%	36.3%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.5	0.7
Total Lost Time (s)	6.0	6.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	45.0	23.0
Actuated g/C Ratio	0.56	0.29
v/c Ratio	0.50	0.20
Control Delay	5.1	17.2
Queue Delay	0.0	0.0
Total Delay	5.1	17.2
LOS	A	B
Approach Delay	5.1	17.2
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 3 (4%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 7.1	Intersection LOS: A
Intersection Capacity Utilization 41.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 16: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	921	119
Future Volume (vph)	921	119
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	35.6	25.9
Total Split (s)	51.0	29.0
Total Split (%)	63.8%	36.3%
Yellow Time (s)	4.3	3.5
All-Red Time (s)	2.0	2.5
Lost Time Adjust (s)	0.7	0.6
Total Lost Time (s)	7.0	6.6
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	44.0	22.4
Actuated g/C Ratio	0.55	0.28
v/c Ratio	0.41	0.13
Control Delay	3.7	15.1
Queue Delay	0.0	0.0
Total Delay	3.7	15.1
LOS	A	B
Approach Delay	3.7	15.1
Approach LOS	A	B

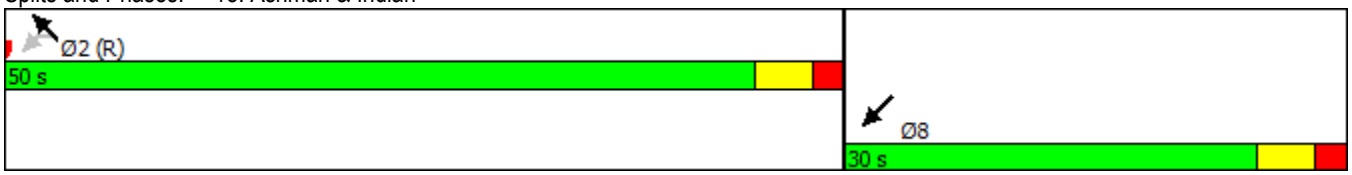
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 5.2	Intersection LOS: A
Intersection Capacity Utilization 38.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 17: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	1232	247
Future Volume (vph)	1232	247
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.3	24.8
Total Split (s)	50.0	30.0
Total Split (%)	62.5%	37.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.9	2.0
Lost Time Adjust (s)	1.6	1.5
Total Lost Time (s)	7.0	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	43.0	23.0
Actuated g/C Ratio	0.54	0.29
v/c Ratio	0.51	0.33
Control Delay	1.8	21.2
Queue Delay	0.0	0.0
Total Delay	1.8	21.2
LOS	A	C
Approach Delay	1.8	21.2
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 10 (13%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 6.6	Intersection LOS: A
Intersection Capacity Utilization 45.4%	ICU Level of Service A
Analysis Period (min) 15	

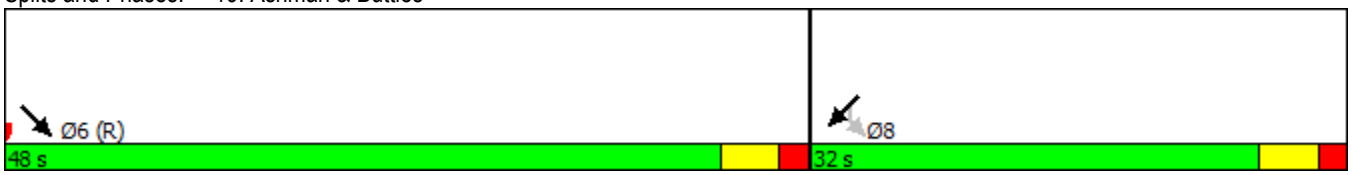
Splits and Phases: 18: Ashman & Indian



Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	1009	61	249
Future Volume (vph)	1009	61	249
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	22.7	24.6	24.6
Total Split (s)	48.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.9	1.8	1.8
Lost Time Adjust (s)	-1.4	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	44.0	28.0	28.0
Actuated g/C Ratio	0.55	0.35	0.35
v/c Ratio	0.41	0.10	0.22
Control Delay	8.4	0.8	10.4
Queue Delay	0.0	0.0	0.0
Total Delay	8.4	0.8	10.4
LOS	A	A	B
Approach Delay	8.4		8.5
Approach LOS	A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 1 (1%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 45.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 19: Ashman & Buttles



Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	907	499	423
Future Volume (vph)	907	499	423
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	22.2	22.2	21.5
Total Split (s)	51.0	51.0	29.0
Total Split (%)	63.8%	63.8%	36.3%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.2	2.2	2.5
Lost Time Adjust (s)	3.0	3.0	3.0
Total Lost Time (s)	8.7	8.7	9.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	42.3	42.3	20.0
Actuated g/C Ratio	0.53	0.53	0.25
v/c Ratio	0.59	0.59	0.54
Control Delay	7.7	6.1	31.8
Queue Delay	0.0	0.0	0.6
Total Delay	7.7	6.1	32.3
LOS	A	A	C
Approach Delay		6.7	32.3
Approach LOS		A	C

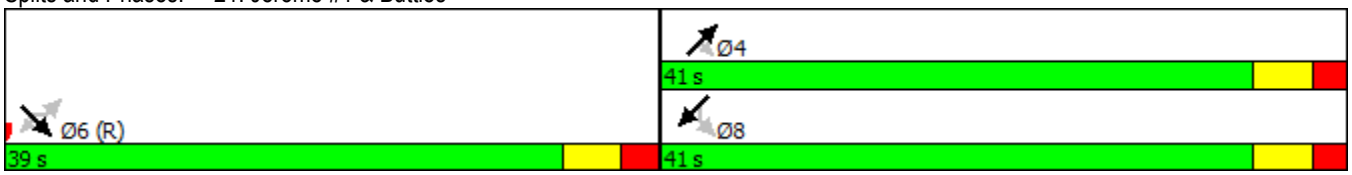
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 22 (28%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 20: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	587	211	412	466	5	902
Future Volume (vph)	587	211	412	466	5	902
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	39.0	39.0	41.0	41.0	41.0	41.0
Total Split (%)	48.8%	48.8%	51.3%	51.3%	51.3%	51.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.3	2.3	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	-1.8	0.0	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.0	5.8	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	35.0	33.2	37.0	37.0	37.0	37.0
Actuated g/C Ratio	0.44	0.42	0.46	0.46	0.46	0.46
v/c Ratio	0.42	0.33	0.42	0.39	0.02	0.60
Control Delay	16.6	12.8	12.5	7.9	1.2	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	16.6	12.8	12.5	7.9	1.2	3.0
LOS	B	B	B	A	A	A
Approach Delay	15.6		11.1			3.0
Approach LOS	B		B			A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 72 (90%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: Jerome #1 & Buttles



Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	6	6	750	172	6	803
Future Vol, veh/h	6	6	750	172	6	803
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	-	-
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	7	7	815	187	7	873

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1358	501	0	0	1002	0
Stage 1	909	-	-	-	-	-
Stage 2	449	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	140	515	-	-	687	-
Stage 1	353	-	-	-	-	-
Stage 2	610	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	137	515	-	-	687	-
Mov Cap-2 Maneuver	137	-	-	-	-	-
Stage 1	353	-	-	-	-	-
Stage 2	598	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.3	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	137	515	687	-
HCM Lane V/C Ratio	-	-	0.048	0.013	0.009	-
HCM Control Delay (s)	-	-	32.6	12.1	10.3	0.1
HCM Lane LOS	-	-	D	B	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	51	67	35	67	47	669	61	716
Future Volume (vph)	51	67	35	67	47	669	61	716
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	36.0	36.0	36.0	36.0	64.0	64.0	64.0	64.0
Total Split (%)	36.0%	36.0%	36.0%	36.0%	64.0%	64.0%	64.0%	64.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.2	11.2	11.2	11.2	76.1	76.1	76.1	76.1
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.76	0.76	0.76	0.76
v/c Ratio	0.48	0.58	0.31	0.62	0.11	0.29	0.13	0.31
Control Delay	54.5	37.7	45.7	37.6	4.5	4.2	3.4	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	37.7	45.7	37.6	4.5	4.2	3.4	3.4
LOS	D	D	D	D	A	A	A	A
Approach Delay		42.6		39.2		4.3		3.4
Approach LOS		D		D		A		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 74 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 23: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	31	122	46	54	43	700	29	691
Future Volume (vph)	31	122	46	54	43	700	29	691
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	40.0	40.0	40.0	40.0	60.0	60.0	60.0	60.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.8	6.8	6.8	6.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	15.2	15.2	15.2	15.2	70.9	70.9	70.9	70.9
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.71	0.71	0.71	0.71
v/c Ratio	0.17	0.75	0.42	0.24	0.10	0.32	0.07	0.31
Control Delay	36.3	49.1	47.5	33.2	4.7	5.2	2.9	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	49.1	47.5	33.2	4.7	5.2	2.9	2.6
LOS	D	D	D	C	A	A	A	A
Approach Delay		47.4		39.2		5.1		2.6
Approach LOS		D		D		A		A

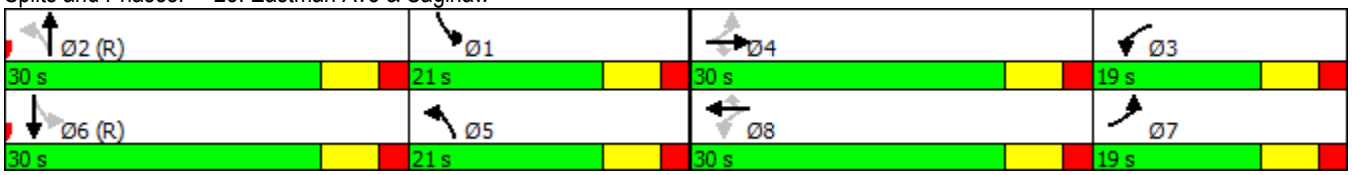
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 24 (24%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 69.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 24: Eastman Ave & Sugnet

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	247	591	129	94	621	380	202	431	227	524
Future Volume (vph)	247	591	129	94	621	380	202	431	227	524
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	11.5	16.5
Total Split (s)	19.0	30.0	30.0	19.0	30.0	30.0	21.0	30.0	21.0	30.0
Total Split (%)	19.0%	30.0%	30.0%	19.0%	30.0%	30.0%	21.0%	30.0%	21.0%	30.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	3.0	0.4	0.4	3.0	0.4	0.4	3.0	0.5	3.0	0.5
Total Lost Time (s)	9.6	7.0	7.0	9.6	7.0	7.0	9.5	7.0	9.5	7.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	33.3	28.4	28.4	30.0	24.6	24.6	30.4	23.0	30.4	23.0
Actuated g/C Ratio	0.33	0.28	0.28	0.30	0.25	0.25	0.30	0.23	0.30	0.23
v/c Ratio	1.03	0.65	0.24	0.44	0.78	0.62	0.87	0.73	0.95	0.87
Control Delay	101.9	37.1	3.2	33.5	43.3	10.2	64.6	34.5	81.5	46.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.9	37.1	3.2	33.5	43.3	10.2	64.6	34.5	81.5	46.6
LOS	F	D	A	C	D	B	E	C	F	D
Approach Delay		49.1			31.0			42.7		55.7
Approach LOS		D			C			D		E

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 75 (75%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 44.0	Intersection LOS: D
Intersection Capacity Utilization 87.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 25: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	27	63	27	23	993	39	772
Future Volume (vph)	38	27	63	27	23	993	39	772
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	24.0	24.0	24.0	24.0	76.0	76.0	76.0	76.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	10.5	10.5	10.5	10.5	80.8	80.8	80.8	80.8
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.81	0.81	0.81	0.81
v/c Ratio	0.30	0.35	0.49	0.38	0.05	0.40	0.12	0.31
Control Delay	45.8	45.9	53.2	21.9	3.0	3.4	4.5	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	45.9	53.2	21.9	3.0	3.4	4.5	3.8
LOS	D	D	D	C	A	A	A	A
Approach Delay		45.9		35.7		3.4		3.8
Approach LOS		D		D		A		A

Intersection Summary

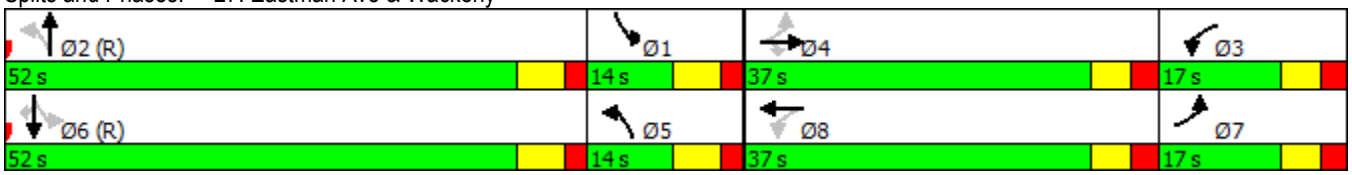
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 14 (14%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 7.6 Intersection LOS: A
Intersection Capacity Utilization 53.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 26: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	184	178	133	126	137	74	922	110	582	236
Future Volume (vph)	184	178	133	126	137	74	922	110	582	236
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.1	30.5	30.5	11.1	30.5	11.3	26.0	11.3	26.0	26.0
Total Split (s)	17.0	37.0	37.0	17.0	37.0	14.0	52.0	14.0	52.0	52.0
Total Split (%)	14.2%	30.8%	30.8%	14.2%	30.8%	11.7%	43.3%	11.7%	43.3%	43.3%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	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	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?										
Recall Mode	Min	Max	Max	Min	Max	Min	C-Max	Min	C-Max	C-Max
Act Effct Green (s)	40.2	30.3	30.3	40.2	30.3	51.0	44.7	51.0	44.7	44.7
Actuated g/C Ratio	0.34	0.25	0.25	0.34	0.25	0.42	0.37	0.42	0.37	0.37
v/c Ratio	0.94	0.40	0.28	0.41	1.01	0.26	0.87	0.75	0.46	0.33
Control Delay	96.1	40.6	7.1	30.4	83.2	21.2	43.1	43.0	22.5	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.1	40.6	7.1	30.4	83.2	21.2	43.1	43.0	22.5	4.2
LOS	F	D	A	C	F	C	D	D	C	A
Approach Delay		52.3			69.5		41.6		20.3	
Approach LOS		D			E		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 42.4	Intersection LOS: D
Intersection Capacity Utilization 89.4%	ICU Level of Service E
Analysis Period (min) 15	

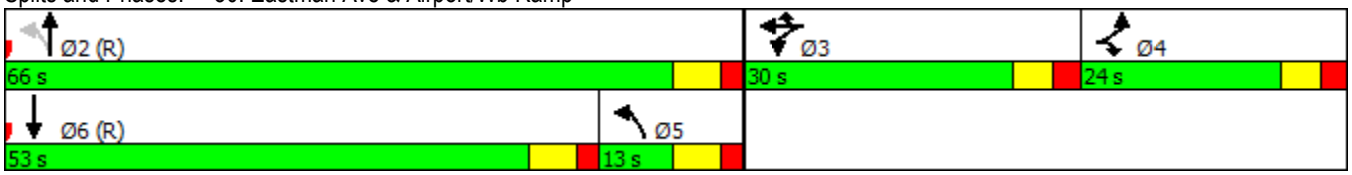
Splits and Phases: 27: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Configurations									
Traffic Volume (vph)	149	69	212	95	266	66	763	200	929
Future Volume (vph)	149	69	212	95	266	66	763	200	929
Turn Type	Prot	Prot	Split	NA	Prot	pm+pt	NA	Free	NA
Protected Phases	4	4	3	3	3	5	2		6
Permitted Phases						2		Free	
Detector Phase	4	4	3	3	3	5	2		6
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6
Total Split (s)	24.0	24.0	30.0	30.0	30.0	13.0	66.0		53.0
Total Split (%)	20.0%	20.0%	25.0%	25.0%	25.0%	10.8%	55.0%		44.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.3	7.3		7.3
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag			Lead
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max
Act Effct Green (s)	14.8	14.8	22.7	22.7	22.7	61.2	61.2	120.0	48.2
Actuated g/C Ratio	0.12	0.12	0.19	0.19	0.19	0.51	0.51	1.00	0.40
v/c Ratio	0.81	0.25	0.51	0.52	0.97	0.38	0.46	0.14	0.80
Control Delay	77.3	2.1	50.0	50.0	92.7	12.5	7.6	0.1	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.3	2.1	50.0	50.0	92.7	12.5	7.6	0.1	28.2
LOS	E	A	D	D	F	B	A	A	C
Approach Delay				69.9			6.5		28.2
Approach LOS				E			A		C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 100 (83%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 30.7	Intersection LOS: C
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 30: Eastman Ave & Airport/Wb Ramp



Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	0	0	0	0	844	334	0	1065	21
Future Vol, veh/h	0	0	0	0	0	0	0	844	334	0	1065	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	917	363	0	1158	23

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1628	2086	590	1180	0	0	917	0	0
Stage 1	1169	1169	-	-	-	-	-	-	-
Stage 2	459	917	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	93	52	451	588	-	-	740	-	-
Stage 1	258	265	-	-	-	-	-	-	-
Stage 2	603	349	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	93	0	451	588	-	-	740	-	-
Mov Cap-2 Maneuver	93	0	-	-	-	-	-	-	-
Stage 1	258	0	-	-	-	-	-	-	-
Stage 2	603	0	-	-	-	-	-	-	-

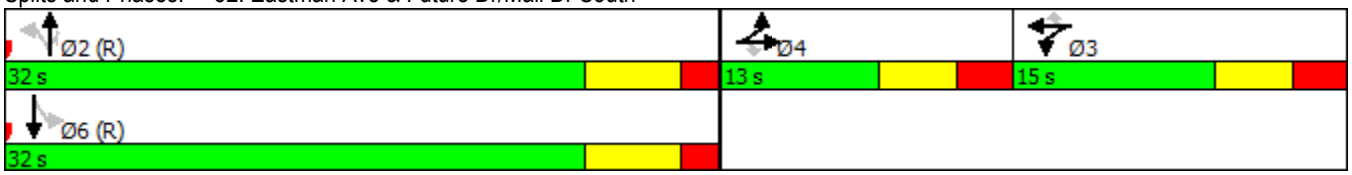
Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	588	-	-	-	740	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	-	-

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	6	19	260	11	29	29	736	79	17	807
Future Volume (vph)	6	19	260	11	29	29	736	79	17	807
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	13.0	13.0	15.0	15.0	15.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	21.7%	21.7%	25.0%	25.0%	25.0%	53.3%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	6.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lead	Lag	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	6.3	6.3	7.7	7.7	7.7	31.5	30.5	30.5	30.5	30.5
Actuated g/C Ratio	0.10	0.10	0.13	0.13	0.13	0.52	0.51	0.51	0.51	0.51
v/c Ratio	0.16	0.07	0.68	0.68	0.09	0.12	0.43	0.09	0.06	0.49
Control Delay	26.2	0.4	43.1	42.7	0.5	10.3	10.7	0.4	11.2	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	0.4	43.1	42.7	0.5	10.3	10.7	0.4	11.2	11.8
LOS	C	A	D	D	A	B	B	A	B	B
Approach Delay	15.6			38.9			9.7			11.8
Approach LOS	B			D			A			B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 57 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 51.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 32: Eastman Ave & Future Dr/Mall Dr South



Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	26	51	0	26	0	498	288	0	770	0
Future Vol, veh/h	0	0	26	51	0	26	0	498	288	0	770	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	28	55	0	28	0	541	313	0	837	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1108	1691	418	1116	1535	427	837	0	0	854	0	0
Stage 1	837	837	-	698	698	-	-	-	-	-	-	-
Stage 2	271	854	-	418	837	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	164	92	584	162	115	576	793	-	-	781	-	-
Stage 1	327	380	-	397	440	-	-	-	-	-	-	-
Stage 2	712	373	-	583	380	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	156	92	584	154	115	576	793	-	-	781	-	-
Mov Cap-2 Maneuver	156	92	-	154	115	-	-	-	-	-	-	-
Stage 1	327	380	-	397	440	-	-	-	-	-	-	-
Stage 2	677	373	-	555	380	-	-	-	-	-	-	-

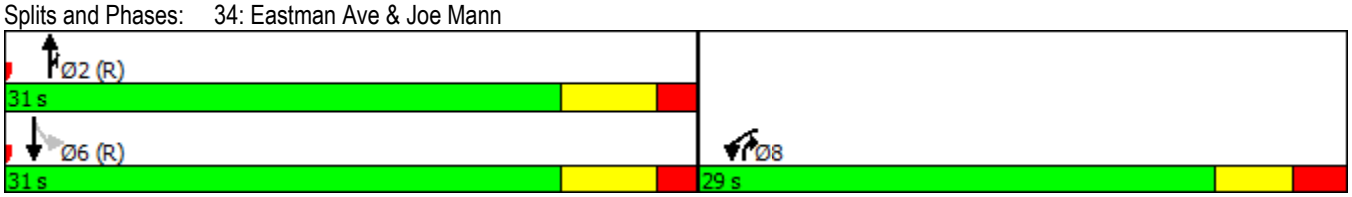
Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	31.1	0	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	793	-	-	584	154	576	781	-	-
HCM Lane V/C Ratio	-	-	-	0.048	0.36	0.049	-	-	-
HCM Control Delay (s)	0	-	-	11.5	41	11.6	0	-	-
HCM Lane LOS	A	-	-	B	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.5	0.2	0	-	-

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	372	231	293	52	398
Future Volume (vph)	372	231	293	52	398
Turn Type	Prot	NA	pt+ov	Perm	NA
Protected Phases	8	2	2 8		6
Permitted Phases				6	
Detector Phase	8	2	2 8	6	6
Switch Phase					
Minimum Initial (s)	7.0	10.0		10.0	10.0
Minimum Split (s)	13.0	16.2		16.2	16.2
Total Split (s)	29.0	31.0		31.0	31.0
Total Split (%)	48.3%	51.7%		51.7%	51.7%
Yellow Time (s)	3.5	4.3		4.3	4.3
All-Red Time (s)	2.5	1.9		1.9	1.9
Lost Time Adjust (s)	1.0	1.0		1.0	1.0
Total Lost Time (s)	7.0	7.2		7.2	7.2
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max		Max	Max
Act Effct Green (s)	22.0	23.8	60.0	23.8	23.8
Actuated g/C Ratio	0.37	0.40	1.00	0.40	0.40
v/c Ratio	0.37	0.17	0.19	0.13	0.31
Control Delay	13.7	6.6	0.3	12.5	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	6.6	0.3	12.5	13.2
LOS	B	A	A	B	B
Approach Delay	13.7	3.0			13.1
Approach LOS	B	A			B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 19 (32%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 47.2%	ICU Level of Service A
Analysis Period (min) 15	

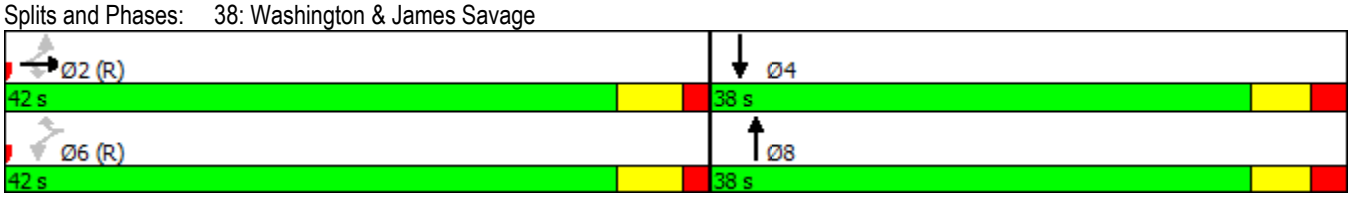
Splits and Phases: 34: Eastman Ave & Joe Mann



Lane Group	EBT	WBL	WBR	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	111	5	79	292	34
Future Volume (vph)	111	5	79	292	34
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	2			8	4
Permitted Phases		6	6		
Detector Phase	2	6	6	8	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	32.2	32.2	32.2	29.1	29.1
Total Split (s)	42.0	42.0	42.0	38.0	38.0
Total Split (%)	52.5%	52.5%	52.5%	47.5%	47.5%
Yellow Time (s)	3.9	3.9	3.9	3.5	3.5
All-Red Time (s)	1.7	1.7	1.7	2.3	2.3
Lost Time Adjust (s)	-1.6	-1.6	-1.6	-1.8	-1.3
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max
Act Effct Green (s)	38.0	38.0	38.0	34.0	33.5
Actuated g/C Ratio	0.48	0.48	0.48	0.42	0.42
v/c Ratio	0.15	0.01	0.11	0.22	0.02
Control Delay	4.7	11.2	3.3	14.8	0.0
Queue Delay	0.1	0.0	0.1	0.0	0.9
Total Delay	4.8	11.2	3.4	14.8	1.0
LOS	A	B	A	B	A
Approach Delay	4.8			14.8	1.0
Approach LOS	A			B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 45 (56%), Referenced to phase 2:EBTL and 6:WBL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.22	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 32.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 38: Washington & James Savage

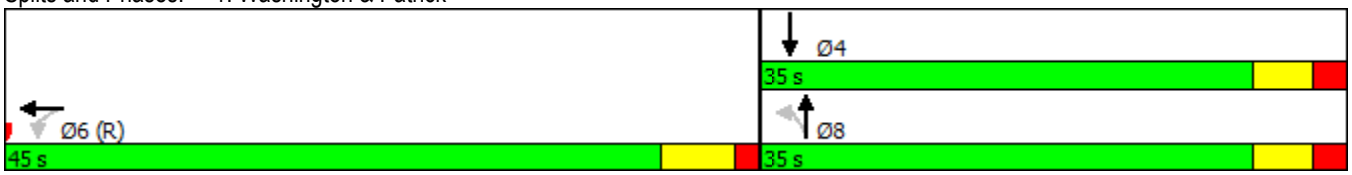


Appendix B
No Build Conditions Capacity Analysis

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	709	76	93	246
Future Volume (vph)	709	76	93	246
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	45.0	35.0	35.0	35.0
Total Split (%)	56.3%	43.8%	43.8%	43.8%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.6	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.9	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	38.1	28.3	28.3	28.3
Actuated g/C Ratio	0.48	0.35	0.35	0.35
v/c Ratio	0.40	0.24	0.08	0.29
Control Delay	14.0	16.8	12.3	15.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.0	16.8	12.3	15.6
LOS	B	B	B	B
Approach Delay	14.0		14.3	15.6
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 38 (48%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

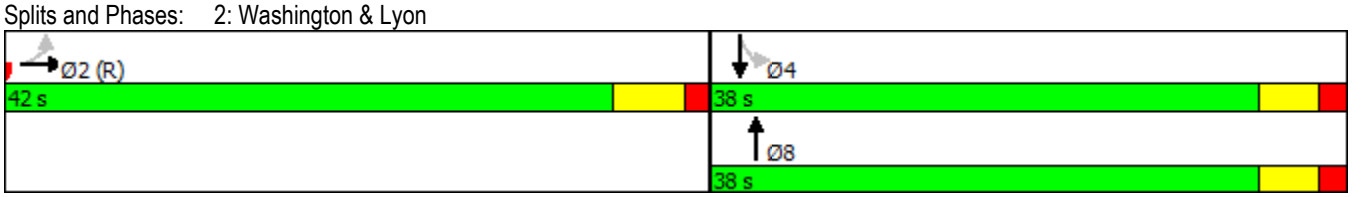
Splits and Phases: 1: Washington & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	977	146	4	380
Future Volume (vph)	977	146	4	380
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	42.0	38.0	38.0	38.0
Total Split (%)	52.5%	47.5%	47.5%	47.5%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.5	1.8	1.8	1.8
Lost Time Adjust (s)	1.0	1.5		1.0
Total Lost Time (s)	6.8	6.8		6.3
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	35.2	31.2		31.7
Actuated g/C Ratio	0.44	0.39		0.40
v/c Ratio	0.50	0.13		0.31
Control Delay	1.9	23.2		13.3
Queue Delay	0.0	79.6		0.0
Total Delay	1.9	102.8		13.3
LOS	A	F		B
Approach Delay	1.9	102.8		13.3
Approach LOS	A	F		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 30 (38%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 44.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Washington & Lyon



Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	193	673	7	21	36	0	0	15	7
Future Vol, veh/h	0	0	0	193	673	7	21	36	0	0	15	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	210	732	8	23	39	0	0	16	8

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	720	1159	0	1175	1155	369
Stage 1	-	-	-	0	0	-	1155	1155	-
Stage 2	-	-	-	720	1159	-	20	0	-
Critical Hdwy	-	-	-	5.74	6.54	-	5.74	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	428	194	-	253	196	536
Stage 1	-	-	-	-	-	-	194	269	-
Stage 2	-	-	-	403	268	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	428	0	-	253	0	536
Mov Cap-2 Maneuver	-	-	-	428	0	-	253	0	-
Stage 1	-	-	-	-	0	-	194	0	-
Stage 2	-	-	-	403	0	-	-	0	-

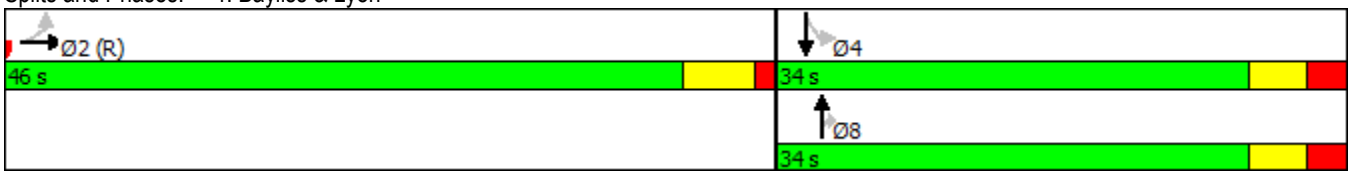
Approach	WB	NB	SB
HCM Control Delay, s			12
HCM LOS		-	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	428	-	-	-	-	536
HCM Lane V/C Ratio	0.053	-	-	-	-	0.045
HCM Control Delay (s)	13.9	-	-	-	-	12
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	-	0.1

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1266	53	15	21	187
Future Volume (vph)	1266	53	15	21	187
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	46.0	34.0	34.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%	42.5%	42.5%
Yellow Time (s)	4.3	3.5	3.5	3.5	3.5
All-Red Time (s)	1.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	1.6	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.3	7.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	52.7	13.0	13.0	13.0	13.0
Actuated g/C Ratio	0.66	0.16	0.16	0.16	0.16
v/c Ratio	0.42	0.19	0.06	0.11	0.67
Control Delay	1.3	28.7	3.5	19.1	32.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	1.3	28.7	3.5	19.1	32.4
LOS	A	C	A	B	C
Approach Delay	1.3	23.2			31.1
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 59.5%	ICU Level of Service B
Analysis Period (min) 15	

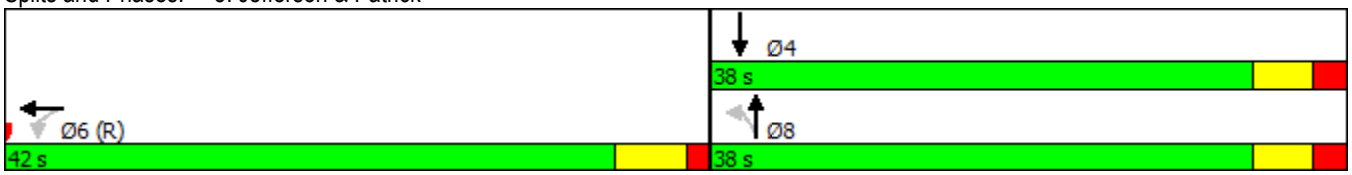
Splits and Phases: 4: Bayliss & Lyon



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	664	14	49	124
Future Volume (vph)	664	14	49	124
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	25.0	26.7	26.7	26.7
Total Split (s)	42.0	38.0	38.0	38.0
Total Split (%)	52.5%	47.5%	47.5%	47.5%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.4	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.7	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	35.3	31.3	31.3	31.3
Actuated g/C Ratio	0.44	0.39	0.39	0.39
v/c Ratio	0.38	0.03	0.08	0.22
Control Delay	8.4	7.1	7.6	16.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.4	7.1	7.6	16.8
LOS	A	A	A	B
Approach Delay	8.4		7.5	16.8
Approach LOS	A		A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

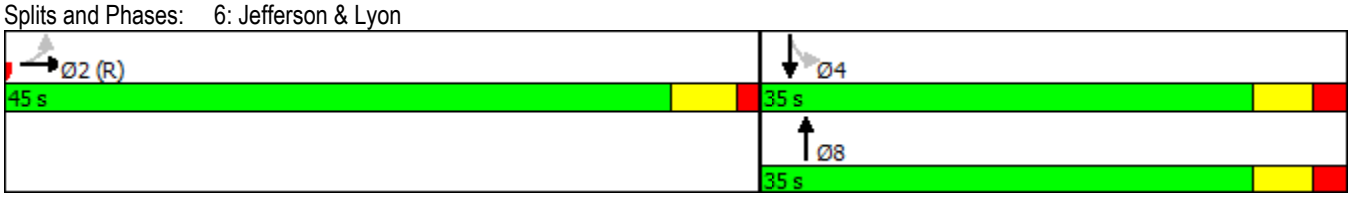
Splits and Phases: 5: Jefferson & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	1209	57	58	83
Future Volume (vph)	1209	57	58	83
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.3	27.3	27.3	27.3
Total Split (s)	45.0	35.0	35.0	35.0
Total Split (%)	56.3%	43.8%	43.8%	43.8%
Yellow Time (s)	3.9	3.5	3.5	3.5
All-Red Time (s)	1.4	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.3	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	38.7	28.3	28.3	28.3
Actuated g/C Ratio	0.48	0.35	0.35	0.35
v/c Ratio	0.55	0.14	0.14	0.14
Control Delay	9.5	13.6	8.8	8.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.5	13.6	8.8	8.7
LOS	A	B	A	A
Approach Delay	9.5	13.6		8.8
Approach LOS	A	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 73 (91%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Jefferson & Lyon



Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	0	0	0	669	17	0	41	15	7	58	0
Future Vol, veh/h	0	0	0	0	669	17	0	41	15	7	58	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	727	18	0	45	16	8	63	0

Major/Minor	Major2			Minor2			Minor1		
Conflicting Flow All	0	0	0	768	736	372	313	746	0
Stage 1	-	-	-	736	736	-	0	0	-
Stage 2	-	-	-	32	0	-	313	746	-
Critical Hdwy	-	-	-	5.74	6.54	7.14	5.74	6.54	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.04	5.54	-
Follow-up Hdwy	-	-	-	3.82	4.02	3.92	3.82	4.02	-
Pot Cap-1 Maneuver	-	-	-	405	345	534	672	340	-
Stage 1	-	-	-	349	423	-	-	-	-
Stage 2	-	-	-	-	-	-	655	419	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	405	0	534	672	0	-
Mov Cap-2 Maneuver	-	-	-	405	0	-	672	0	-
Stage 1	-	-	-	349	0	-	-	0	-
Stage 2	-	-	-	-	0	-	655	0	-

Approach	WB	SE	NW
HCM Control Delay, s	0	12.6	
HCM LOS		B	-

Minor Lane/Major Mvmt	NWLn1	WBL	WBT	WBR	SELn1
Capacity (veh/h)	-	-	-	-	534
HCM Lane V/C Ratio	-	-	-	-	0.114
HCM Control Delay (s)	-	0	-	-	12.6
HCM Lane LOS	-	A	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0.4

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	1223	0	0	0	0	7	34	0	0	65	5
Future Vol, veh/h	0	1223	0	0	0	0	7	34	0	0	65	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1329	0	0	0	0	8	37	0	0	71	5

Major/Minor	Major1			Minor2			Minor1		
Conflicting Flow All	0	0	0	567	1329	0	1347	1329	664
Stage 1	-	-	-	0	0	-	1329	1329	-
Stage 2	-	-	-	567	1329	-	18	0	-
Critical Hdwy	-	-	-	5.74	6.54	-	5.74	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	508	154	-	207	154	346
Stage 1	-	-	-	-	-	-	152	222	-
Stage 2	-	-	-	484	222	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	508	0	-	207	0	346
Mov Cap-2 Maneuver	-	-	-	508	0	-	207	0	-
Stage 1	-	-	-	-	0	-	152	0	-
Stage 2	-	-	-	484	0	-	-	0	-

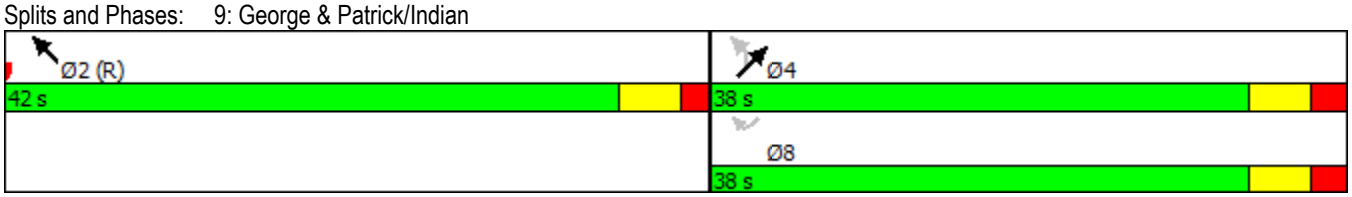
Approach	EB	SE	NW
HCM Control Delay, s	0		18.3
HCM LOS		-	C

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	SELn1
Capacity (veh/h)	346	-	-	-	-
HCM Lane V/C Ratio	0.22	-	-	-	-
HCM Control Delay (s)	18.3	0	-	-	-
HCM Lane LOS	C	A	-	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-	-

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	674	178	120	20
Future Volume (vph)	674	178	120	20
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	25.8	25.8	25.8	25.8
Total Split (s)	42.0	38.0	38.0	38.0
Total Split (%)	52.5%	47.5%	47.5%	47.5%
Yellow Time (s)	3.6	3.6	3.6	3.6
All-Red Time (s)	1.8	2.3	2.3	2.3
Lost Time Adjust (s)	1.5	1.2	1.2	1.2
Total Lost Time (s)	6.9	7.1	7.1	7.1
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	35.1	30.9	30.9	30.9
Actuated g/C Ratio	0.44	0.39	0.39	0.39
v/c Ratio	0.34	0.25	0.18	0.03
Control Delay	2.7	26.9	31.5	0.1
Queue Delay	0.0	1.2	0.0	0.0
Total Delay	2.7	28.2	31.5	0.1
LOS	A	C	C	A
Approach Delay	2.7		29.5	
Approach LOS	A		C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 52 (65%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.34	
Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 46.7%	ICU Level of Service A
Analysis Period (min) 15	

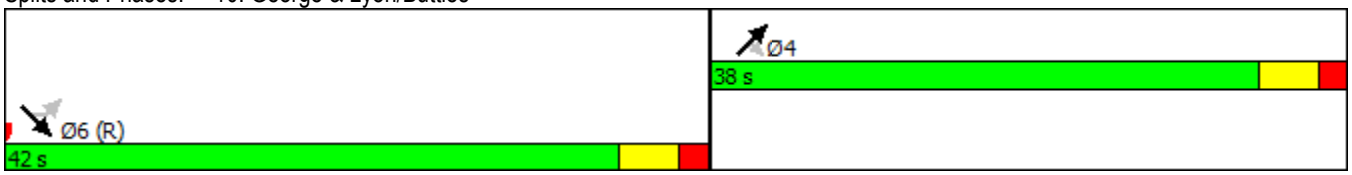
Splits and Phases: 9: George & Patrick/Indian



Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	1017	282	206
Future Volume (vph)	1017	282	206
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	21.9	21.7	21.7
Total Split (s)	42.0	38.0	38.0
Total Split (%)	52.5%	47.5%	47.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.9	1.8	1.8
Lost Time Adjust (s)	1.6	1.7	1.7
Total Lost Time (s)	7.0	7.0	7.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	35.0	31.0	31.0
Actuated g/C Ratio	0.44	0.39	0.39
v/c Ratio	0.50	0.22	0.35
Control Delay	4.0	37.6	38.1
Queue Delay	0.1	0.0	0.0
Total Delay	4.1	37.6	38.1
LOS	A	D	D
Approach Delay	4.1	37.8	
Approach LOS	A	D	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 13 (16%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 46.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: George & Lyon/Buttles



Intersection	
Int Delay, s/veh	5.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Traffic Vol, veh/h	0	0	0	155	717	0	0	0	0	0	69	209
Future Vol, veh/h	0	0	0	155	717	0	0	0	0	0	69	209
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	168	779	0	0	0	0	0	75	227

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	1116	1116	389
Stage 1	-	-	-	1116	1116	-
Stage 2	-	-	-	0	0	-
Critical Hdwy	-	-	-	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	218	206	521
Stage 1	-	-	-	165	281	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	218	0	521
Mov Cap-2 Maneuver	-	-	-	218	0	-
Stage 1	-	-	-	165	0	-
Stage 2	-	-	-	-	0	-

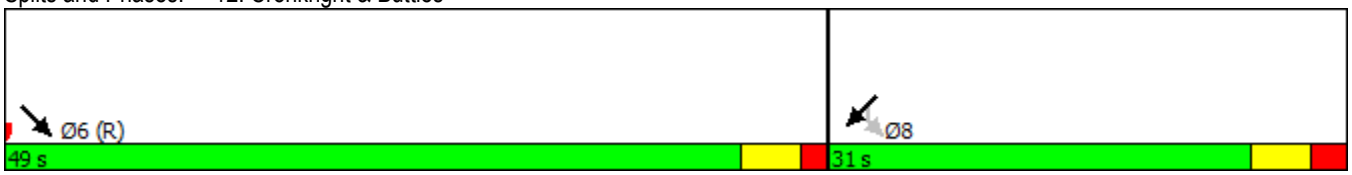
Approach	NW	SW
HCM Control Delay, s		21
HCM LOS		C

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	521
HCM Lane V/C Ratio	-	-	-	0.58
HCM Control Delay (s)	-	-	-	21
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	3.7

Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	1030	221
Future Volume (vph)	1030	221
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.3	25.1
Total Split (s)	49.0	31.0
Total Split (%)	61.3%	38.8%
Yellow Time (s)	3.6	3.5
All-Red Time (s)	1.6	2.3
Lost Time Adjust (s)	1.7	1.2
Total Lost Time (s)	6.9	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	42.1	24.0
Actuated g/C Ratio	0.53	0.30
v/c Ratio	0.43	0.16
Control Delay	2.3	12.3
Queue Delay	0.0	0.0
Total Delay	2.3	12.3
LOS	A	B
Approach Delay	2.3	12.3
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 10 (13%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 4.0	Intersection LOS: A
Intersection Capacity Utilization 37.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 12: Cronkright & Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	4	31	23	477	65
Future Volume (vph)	4	31	23	477	65
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.7	25.8	25.8
Total Split (s)	32.0	32.0	32.0	48.0	48.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3	5.3	5.3	5.3
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max
Act Effct Green (s)		26.7	26.7	42.7	42.7
Actuated g/C Ratio		0.33	0.33	0.53	0.53
v/c Ratio		0.06	0.03	0.30	0.08
Control Delay		27.3	14.9	10.9	2.8
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		27.3	14.9	10.9	2.8
LOS		C	B	B	A
Approach Delay		27.3	14.9	10.0	
Approach LOS		C	B	B	

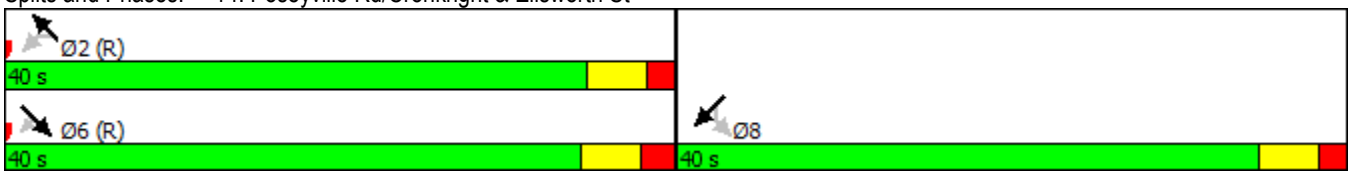
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 11.2	Intersection LOS: B
Intersection Capacity Utilization 29.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 13: Poseyville Rd/George & Ellsworth St

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	22	59	58	15	188
Future Volume (vph)	22	59	58	15	188
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	24.0	24.0	24.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.2	2.2	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.3	5.3	5.3
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max
Act Effct Green (s)	34.3	34.3	34.7	34.7	34.7
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.03	0.09	0.11	0.02	0.12
Control Delay	13.5	4.3	11.5	11.2	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	4.3	11.5	11.2	12.5
LOS	B	A	B	B	B
Approach Delay	6.8			11.5	12.5
Approach LOS	A			B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.12	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 31.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 14: Poseyville Rd/Cronkright & Ellsworth St



Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	56	3	2	536	228	42
Future Vol, veh/h	56	3	2	536	228	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
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	61	3	2	583	248	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	567	147	293	0	-	0
Stage 1	271	-	-	-	-	-
Stage 2	296	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	454	873	1265	-	-	-
Stage 1	750	-	-	-	-	-
Stage 2	729	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	453	873	1265	-	-	-
Mov Cap-2 Maneuver	453	-	-	-	-	-
Stage 1	750	-	-	-	-	-
Stage 2	728	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1265	-	464	-	-
HCM Lane V/C Ratio	0.002	-	0.138	-	-
HCM Control Delay (s)	7.9	-	14	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	894	152
Future Volume (vph)	894	152
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.4	25.4
Total Split (s)	50.0	30.0
Total Split (%)	62.5%	37.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.5	0.7
Total Lost Time (s)	6.0	6.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	44.0	24.0
Actuated g/C Ratio	0.55	0.30
v/c Ratio	0.36	0.11
Control Delay	6.5	15.1
Queue Delay	0.0	0.0
Total Delay	6.5	15.1
LOS	A	B
Approach Delay	6.5	15.1
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 68 (85%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 33.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 16: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	1008	49
Future Volume (vph)	1008	49
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	35.3	25.9
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	4.3	3.5
All-Red Time (s)	2.0	2.5
Lost Time Adjust (s)	0.7	0.6
Total Lost Time (s)	7.0	6.6
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	45.0	21.4
Actuated g/C Ratio	0.56	0.27
v/c Ratio	0.42	0.08
Control Delay	0.9	12.6
Queue Delay	0.0	0.0
Total Delay	0.9	12.6
LOS	A	B
Approach Delay	0.9	12.6
Approach LOS	A	B

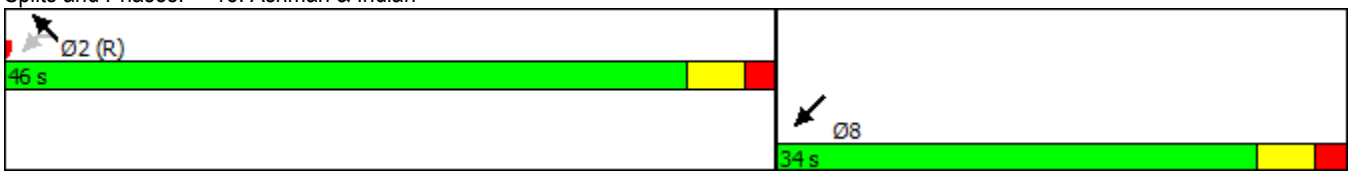
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 1.9	Intersection LOS: A
Intersection Capacity Utilization 38.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 17: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	839	279
Future Volume (vph)	839	279
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.3	24.8
Total Split (s)	46.0	34.0
Total Split (%)	57.5%	42.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.9	2.0
Lost Time Adjust (s)	1.6	1.5
Total Lost Time (s)	7.0	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	39.0	27.0
Actuated g/C Ratio	0.49	0.34
v/c Ratio	0.39	0.23
Control Delay	2.0	15.0
Queue Delay	0.0	0.0
Total Delay	2.0	15.0
LOS	A	B
Approach Delay	2.0	15.0
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 5.7	Intersection LOS: A
Intersection Capacity Utilization 36.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 18: Ashman & Indian



Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	1077	41	300
Future Volume (vph)	1077	41	300
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	22.7	24.6	24.6
Total Split (s)	47.0	33.0	33.0
Total Split (%)	58.8%	41.3%	41.3%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.9	1.8	1.8
Lost Time Adjust (s)	-1.4	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	43.0	29.0	29.0
Actuated g/C Ratio	0.54	0.36	0.36
v/c Ratio	0.45	0.07	0.25
Control Delay	8.3	1.7	11.6
Queue Delay	0.0	0.0	0.0
Total Delay	8.3	1.7	11.6
LOS	A	A	B
Approach Delay	8.3		10.4
Approach LOS	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 68 (85%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 36.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 19: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	472	447	428
Future Volume (vph)	472	447	428
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	22.2	22.2	21.5
Total Split (s)	46.0	46.0	34.0
Total Split (%)	57.5%	57.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.2	2.2	2.5
Lost Time Adjust (s)	3.0	3.0	3.0
Total Lost Time (s)	8.7	8.7	9.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	37.3	37.3	25.0
Actuated g/C Ratio	0.47	0.47	0.31
v/c Ratio	0.43	0.43	0.43
Control Delay	6.7	5.8	24.0
Queue Delay	0.0	0.0	0.9
Total Delay	6.7	5.8	24.8
LOS	A	A	C
Approach Delay		6.1	24.8
Approach LOS		A	C

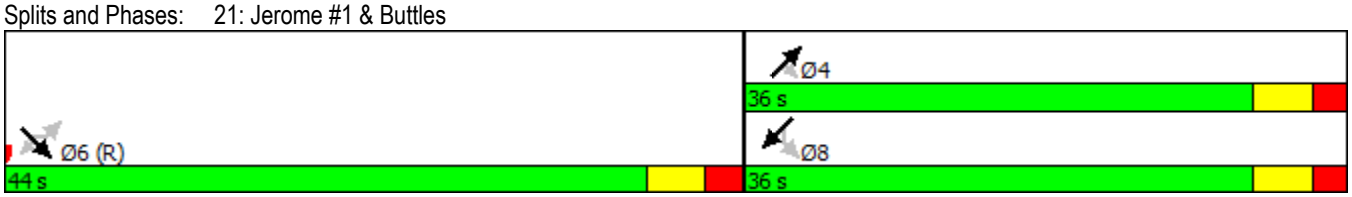
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 9 (11%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 20: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	636	91	422	488	3	469
Future Volume (vph)	636	91	422	488	3	469
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	44.0	44.0	36.0	36.0	36.0	36.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.3	2.3	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	-1.8	0.0	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.0	5.8	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	40.0	38.2	32.0	32.0	32.0	32.0
Actuated g/C Ratio	0.50	0.48	0.40	0.40	0.40	0.40
v/c Ratio	0.39	0.12	0.50	0.45	0.01	0.36
Control Delay	7.0	2.2	16.4	9.6	1.3	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	7.0	2.2	16.4	9.6	1.3	2.4
LOS	A	A	B	A	A	A
Approach Delay	6.4		14.3			2.4
Approach LOS	A		B			A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 58 (73%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 59.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 21: Jerome #1 & Buttles



Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	7	7	639	236	8	726
Future Vol, veh/h	7	7	639	236	8	726
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	-	-
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	8	8	695	257	9	789

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1235	476	0	0	951	0
Stage 1	823	-	-	-	-	-
Stage 2	412	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	169	535	-	-	718	-
Stage 1	392	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	165	535	-	-	718	-
Mov Cap-2 Maneuver	165	-	-	-	-	-
Stage 1	392	-	-	-	-	-
Stage 2	623	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	165	535	718	-
HCM Lane V/C Ratio	-	-	0.046	0.014	0.012	-
HCM Control Delay (s)	-	-	27.9	11.8	10.1	0.1
HCM Lane LOS	-	-	D	B	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	7	26	26	58	25	588	39	679
Future Volume (vph)	7	26	26	58	25	588	39	679
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.9	8.9	8.9	8.9	62.4	62.4	62.4	62.4
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.78	0.78	0.78	0.78
v/c Ratio	0.06	0.28	0.19	0.47	0.05	0.25	0.07	0.28
Control Delay	31.1	21.3	34.2	27.0	1.8	1.8	1.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	21.3	34.2	27.0	1.8	1.8	1.9	1.6
LOS	C	C	C	C	A	A	A	A
Approach Delay		22.4		28.5		1.8		1.6
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 3 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 4.7	Intersection LOS: A
Intersection Capacity Utilization 51.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 23: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	18	62	43	122	47	560	12	651
Future Volume (vph)	18	62	43	122	47	560	12	651
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	29.0	29.0	29.0	29.0	51.0	51.0	51.0	51.0
Total Split (%)	36.3%	36.3%	36.3%	36.3%	63.8%	63.8%	63.8%	63.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.8	6.8	6.8	6.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	10.2	10.2	10.2	10.2	55.9	55.9	55.9	55.9
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.70	0.70	0.70	0.70
v/c Ratio	0.13	0.45	0.29	0.60	0.11	0.26	0.02	0.30
Control Delay	30.8	24.7	34.9	41.5	7.3	6.4	2.6	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	24.7	34.9	41.5	7.3	6.4	2.6	2.9
LOS	C	C	C	D	A	A	A	A
Approach Delay		25.6		39.9		6.5		2.9
Approach LOS		C		D		A		A

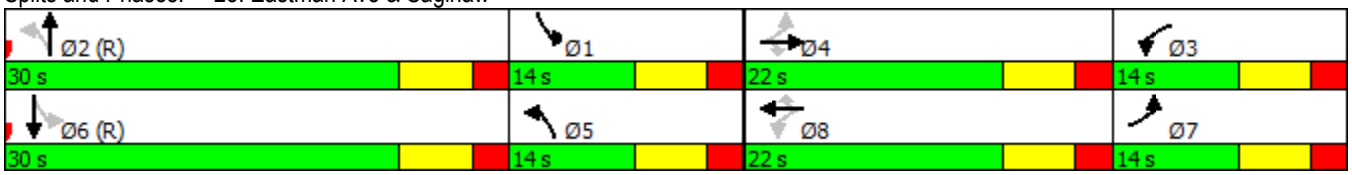
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 35 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 24: Eastman Ave & Sugnet

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	117	450	122	80	474	192	97	437	315	489
Future Volume (vph)	117	450	122	80	474	192	97	437	315	489
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	11.5	16.5
Total Split (s)	14.0	22.0	22.0	14.0	22.0	22.0	14.0	30.0	14.0	30.0
Total Split (%)	17.5%	27.5%	27.5%	17.5%	27.5%	27.5%	17.5%	37.5%	17.5%	37.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	3.0	0.4	0.4	3.0	0.4	0.4	3.0	0.5	3.0	0.5
Total Lost Time (s)	9.6	7.0	7.0	9.6	7.0	7.0	9.5	7.0	9.5	7.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	18.1	17.5	17.5	16.1	15.0	15.0	25.2	23.6	27.5	26.4
Actuated g/C Ratio	0.23	0.22	0.22	0.20	0.19	0.19	0.32	0.30	0.34	0.33
v/c Ratio	0.67	0.64	0.26	0.49	0.78	0.44	0.54	0.52	1.16	0.64
Control Delay	45.5	34.1	1.4	33.1	40.8	6.7	34.2	19.5	127.4	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	34.1	1.4	33.1	40.8	6.7	34.2	19.5	127.4	19.5
LOS	D	C	A	C	D	A	C	B	F	B
Approach Delay		30.2			31.2			21.9		53.8
Approach LOS		C			C			C		D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.16	
Intersection Signal Delay: 36.6	Intersection LOS: D
Intersection Capacity Utilization 78.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 25: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	40	68	86	47	16	663	68	861
Future Volume (vph)	40	68	86	47	16	663	68	861
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.2	11.2	11.2	11.2	56.1	56.1	56.1	56.1
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.70	0.70	0.70	0.70
v/c Ratio	0.24	0.49	0.53	0.42	0.05	0.32	0.16	0.39
Control Delay	32.5	37.6	41.8	18.1	3.1	3.2	6.0	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	37.6	41.8	18.1	3.1	3.2	6.0	5.9
LOS	C	D	D	B	A	A	A	A
Approach Delay		36.2		28.2		3.2		5.9
Approach LOS		D		C		A		A

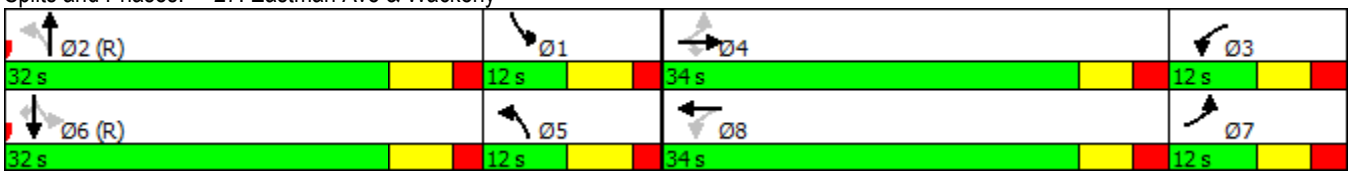
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 47 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 60.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 26: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	131	466	90	62	210	45	652	78	806	142
Future Volume (vph)	131	466	90	62	210	45	652	78	806	142
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.1	30.5	30.5	11.1	30.5	11.3	26.0	11.3	26.0	26.0
Total Split (s)	12.0	34.0	34.0	12.0	34.0	12.0	32.0	12.0	32.0	32.0
Total Split (%)	13.3%	37.8%	37.8%	13.3%	37.8%	13.3%	35.6%	13.3%	35.6%	35.6%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	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	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	31.8	26.9	26.9	31.8	26.9	29.4	24.7	29.4	24.7	24.7
Actuated g/C Ratio	0.35	0.30	0.30	0.35	0.30	0.33	0.27	0.33	0.27	0.27
v/c Ratio	0.60	0.89	0.16	0.43	0.82	0.29	0.85	0.47	0.87	0.26
Control Delay	35.2	50.8	0.6	29.7	40.8	26.5	40.1	17.4	32.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	50.8	0.6	29.7	40.8	26.5	40.1	17.4	32.2	3.9
LOS	D	D	A	C	D	C	D	B	C	A
Approach Delay		41.3			39.1		39.3		27.1	
Approach LOS		D			D		D		C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 86 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

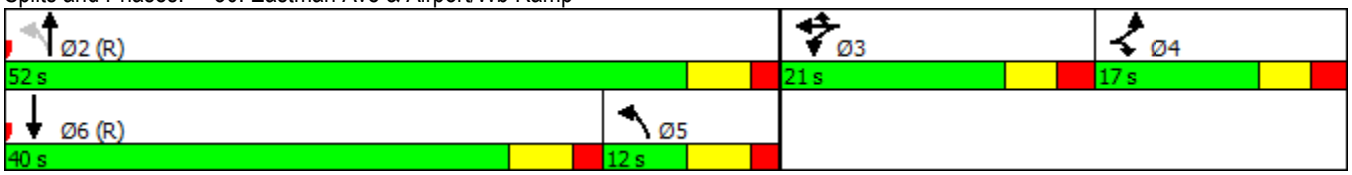
Splits and Phases: 27: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Configurations									
Traffic Volume (vph)	99	45	205	96	167	50	578	81	904
Future Volume (vph)	99	45	205	96	167	50	578	81	904
Turn Type	Prot	Prot	Split	NA	Prot	pm+pt	NA	Free	NA
Protected Phases	4	4	3	3	3	5	2		6
Permitted Phases						2		Free	
Detector Phase	4	4	3	3	3	5	2		6
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6
Total Split (s)	17.0	17.0	21.0	21.0	21.0	12.0	52.0		40.0
Total Split (%)	18.9%	18.9%	23.3%	23.3%	23.3%	13.3%	57.8%		44.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.3	7.3		7.3
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag			Lead
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max
Act Effct Green (s)	8.9	8.9	11.7	11.7	11.7	48.1	48.1	90.0	36.1
Actuated g/C Ratio	0.10	0.10	0.13	0.13	0.13	0.53	0.53	1.00	0.40
v/c Ratio	0.67	0.16	0.74	0.73	0.49	0.21	0.34	0.06	0.71
Control Delay	57.7	1.1	57.2	56.5	9.9	6.6	5.1	0.0	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	1.1	57.2	56.5	9.9	6.6	5.1	0.0	26.7
LOS	E	A	E	E	A	A	A	A	C
Approach Delay				40.0			4.6		26.7
Approach LOS				D			A		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 78 (87%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 23.4	Intersection LOS: C
Intersection Capacity Utilization 63.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 30: Eastman Ave & Airport/Wb Ramp



Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1	15.3	30.2	0.2	23
Bayliss	3	4.0	23.8	0.2	37
Jefferson	5	7.8	27.8	0.3	32
Carpenter	7	1.5	9.0	0.1	36
	131	0.6	14.7	0.2	44
	208	0.5	15.1	0.2	43
George	9	5.0	23.0	0.2	35
Total		34.7	143.7	1.4	34

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	86	1.4	22.6	0.3	42
Carpenter	8	1.7	16.0	0.2	40
Jefferson	6	5.5	9.7	0.1	20
Bayliss	4	12.6	32.7	0.3	28
	207	3.9	14.7	0.1	32
Washington	2	11.6	20.2	0.1	20
Total		36.7	115.9	1.0	31

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	11	1.2	6.1	0.1	31
Rodd	16	3.1	15.1	0.1	29
Ashman	18	5.3	17.3	0.1	23
Jerome #1	20	6.3	24.1	0.2	26
Eastman Ave	164	2.4	22.2	0.2	25
Total		18.3	84.9	0.6	26

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	116	0.4	9.0	0.1	33
Jerome #1	21	9.3	19.0	0.1	19
Ashman	19	5.9	23.9	0.2	26
Rodd	17	9.0	21.2	0.1	19
Cronkright	12	7.9	19.7	0.1	22
George	10	8.0	14.2	0.1	13
Total		40.5	107.0	0.6	22

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	22	0.0	0.4	0.2	1694
St Andrews	23	3.8	26.1	0.3	38
Sugnet	24	6.6	55.1	0.6	40
Saginaw	25	20.6	59.8	0.5	30
Dilloway	26	8.3	49.9	0.5	38
Wackerly	27	43.9	75.6	0.4	19
Eb On Ramp	28	4.1	7.0	0.0	17
Wb On Ramp	29	1.6	7.7	0.1	35
Wb Ramp	30	6.1	11.7	0.1	21
Mall Off	31	1.5	7.5	0.1	36
Mall Dr South	32	3.2	7.7	0.1	28
North Mall Dr	33	3.2	11.9	0.1	34
Joe Mann	34	7.3	13.1	0.1	20
Total		110.2	333.5	3.0	32

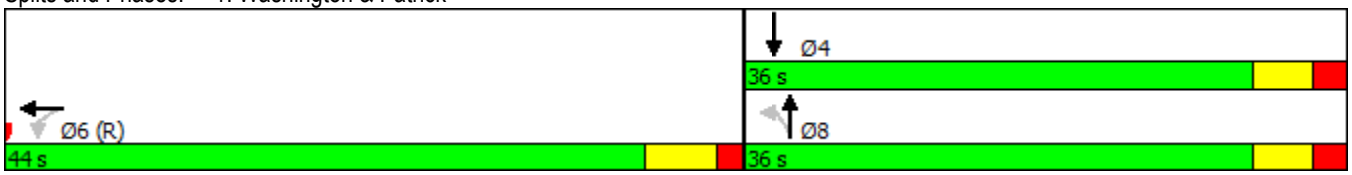
Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	34	7.9	23.2	0.2	31
	33	2.4	8.4	0.1	31
Future Dr	32	3.1	11.7	0.1	34
Saylor Dr	31	2.1	7.0	0.1	31
Airport	30	21.8	27.4	0.1	10
Wb On Ramp	29	5.2	11.3	0.1	22
Eb On Ramp	28	4.2	10.2	0.1	26
Wackerly	27	26.0	28.6	0.0	4
Dilloway	26	13.6	46.0	0.4	32
Saginaw	25	25.6	67.1	0.5	29
Sugnet	24	5.3	44.7	0.5	41
St Andrews	23	4.1	52.6	0.6	42
Carpenter	22	1.7	23.8	0.3	42
Indian	164	1.1	13.6	0.2	41
Total		124.1	375.6	3.2	30

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1190	164	303	40
Future Volume (vph)	1190	164	303	40
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	44.0	36.0	36.0	36.0
Total Split (%)	55.0%	45.0%	45.0%	45.0%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.6	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.9	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	37.1	29.3	29.3	29.3
Actuated g/C Ratio	0.46	0.37	0.37	0.37
v/c Ratio	0.59	0.41	0.25	0.15
Control Delay	16.9	19.9	15.4	14.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.9	19.9	15.4	14.8
LOS	B	B	B	B
Approach Delay	16.9		16.9	14.8
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 56 (70%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

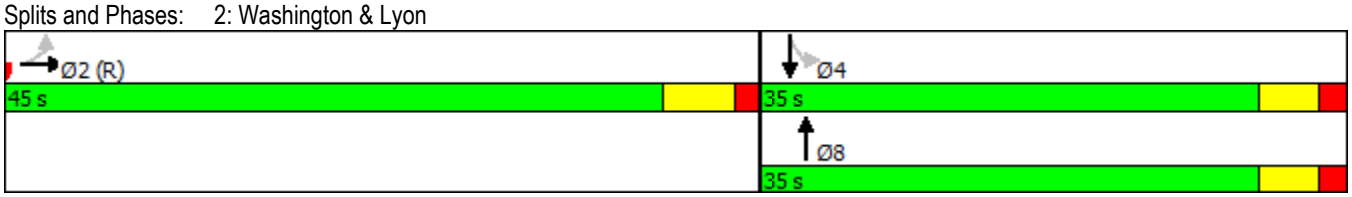
Splits and Phases: 1: Washington & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	963	339	15	39
Future Volume (vph)	963	339	15	39
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	45.0	35.0	35.0	35.0
Total Split (%)	56.3%	43.8%	43.8%	43.8%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.5	1.8	1.8	1.8
Lost Time Adjust (s)	1.0	1.5		1.0
Total Lost Time (s)	6.8	6.8		6.3
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	38.2	28.2		28.7
Actuated g/C Ratio	0.48	0.35		0.36
v/c Ratio	0.49	0.37		0.05
Control Delay	4.9	7.9		11.8
Queue Delay	0.0	1.6		0.0
Total Delay	4.9	9.5		11.8
LOS	A	A		B
Approach Delay	4.9	9.5		11.8
Approach LOS	A	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 42 (53%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 44.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Washington & Lyon



Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	130	1250	91	21	102	0	0	15	74
Future Vol, veh/h	0	0	0	130	1250	91	21	102	0	0	15	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	141	1359	99	23	111	0	0	16	80

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	834	1740	0	1746	1691	728
Stage 1	-	-	-	0	0	-	1691	1691	-
Stage 2	-	-	-	834	1740	-	55	0	-
Critical Hdwy	-	-	-	5.74	6.54	-	5.74	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	376	~ 86	-	128	92	314
Stage 1	-	-	-	-	-	-	90	148	-
Stage 2	-	-	-	350	140	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	376	0	-	128	0	314
Mov Cap-2 Maneuver	-	-	-	376	0	-	128	0	-
Stage 1	-	-	-	-	0	-	90	0	-
Stage 2	-	-	-	350	0	-	-	0	-

Approach	WB	NB	SB
HCM Control Delay, s			21.5
HCM LOS		-	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	376	-	-	-	-	314
HCM Lane V/C Ratio	0.061	-	-	-	-	0.308
HCM Control Delay (s)	15.2	-	-	-	-	21.5
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	-	1.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1037	106	113	74	71
Future Volume (vph)	1037	106	113	74	71
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	50.0	30.0	30.0	30.0	30.0
Total Split (%)	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.3	3.5	3.5	3.5	3.5
All-Red Time (s)	1.4	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	1.6	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.3	7.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	56.1	9.6	9.6	9.6	9.6
Actuated g/C Ratio	0.70	0.12	0.12	0.12	0.12
v/c Ratio	0.33	0.52	0.50	0.52	0.35
Control Delay	0.8	40.4	23.6	52.1	44.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.8	40.4	23.6	52.1	44.0
LOS	A	D	C	D	D
Approach Delay	0.8	31.7			48.1
Approach LOS	A	C			D

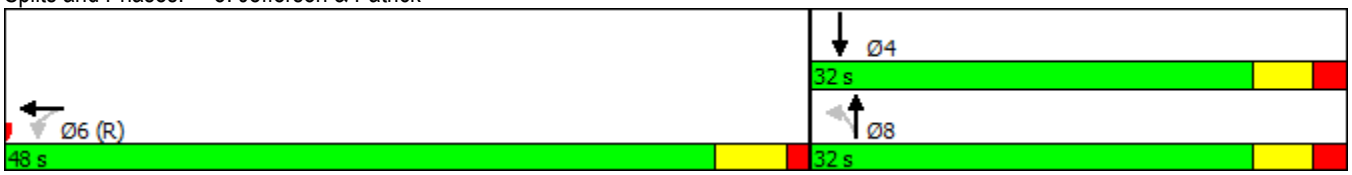
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 32 (40%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 51.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Bayliss & Lyon

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1259	44	89	106
Future Volume (vph)	1259	44	89	106
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	25.0	26.7	26.7	26.7
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.3	3.5	3.5	3.5
All-Red Time (s)	1.4	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.7	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	41.3	25.3	25.3	25.3
Actuated g/C Ratio	0.52	0.32	0.32	0.32
v/c Ratio	0.62	0.14	0.18	0.26
Control Delay	7.9	9.2	9.5	20.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.9	9.2	9.5	20.0
LOS	A	A	A	C
Approach Delay	7.9		9.4	20.0
Approach LOS	A		A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 11 (14%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 59.3%	ICU Level of Service B
Analysis Period (min) 15	

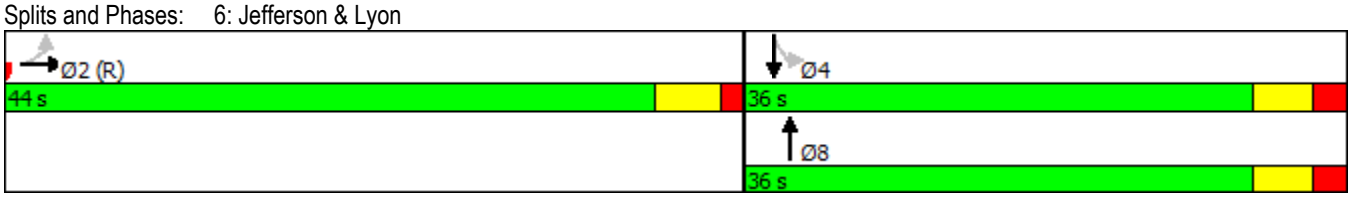
Splits and Phases: 5: Jefferson & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	989	116	53	67
Future Volume (vph)	989	116	53	67
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.3	27.3	27.3	27.3
Total Split (s)	44.0	36.0	36.0	36.0
Total Split (%)	55.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.9	3.5	3.5	3.5
All-Red Time (s)	1.4	2.2	2.2	2.2
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.3	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	37.7	29.3	29.3	29.3
Actuated g/C Ratio	0.47	0.37	0.37	0.37
v/c Ratio	0.46	0.24	0.13	0.11
Control Delay	5.2	16.4	9.0	8.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.2	16.4	9.0	8.7
LOS	A	B	A	A
Approach Delay	5.2	16.4		8.8
Approach LOS	A	B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 6 (8%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 59.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Jefferson & Lyon



Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	0	0	0	1322	1	0	41	57	7	58	0
Future Vol, veh/h	0	0	0	0	1322	1	0	41	57	7	58	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	1437	1	0	45	62	8	63	0

Major/Minor	Major2			Minor2			Minor1		
Conflicting Flow All	0	0	0	1469	1437	718	597	1438	0
Stage 1	-	-	-	1437	1437	-	0	0	-
Stage 2	-	-	-	32	0	-	597	1438	-
Critical Hdwy	-	-	-	5.74	6.54	7.14	5.74	6.54	-
Critical Hdwy Stg 1	-	-	-	6.64	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.04	5.54	-
Follow-up Hdwy	-	-	-	3.82	4.02	3.92	3.82	4.02	-
Pot Cap-1 Maneuver	-	-	-	179	132	319	491	132	-
Stage 1	-	-	-	130	197	-	-	-	-
Stage 2	-	-	-	-	-	-	467	197	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	179	0	319	491	0	-
Mov Cap-2 Maneuver	-	-	-	179	0	-	491	0	-
Stage 1	-	-	-	130	0	-	-	0	-
Stage 2	-	-	-	-	0	-	467	0	-

Approach	WB	SE	NW
HCM Control Delay, s	0	21.8	
HCM LOS		C	-

Minor Lane/Major Mvmt	NWLn1	WBL	WBT	WBR	SELn1
Capacity (veh/h)	-	-	-	-	319
HCM Lane V/C Ratio	-	-	-	-	0.334
HCM Control Delay (s)	-	0	-	-	21.8
HCM Lane LOS	-	A	-	-	C
HCM 95th %tile Q(veh)	-	-	-	-	1.4

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	1007	15	0	0	0	7	18	0	0	65	5
Future Vol, veh/h	0	1007	15	0	0	0	7	18	0	0	65	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1095	16	0	0	0	8	20	0	0	71	5

Major/Minor	Major1			Minor2			Minor1		
Conflicting Flow All	0	0	0	473	1111	0	1113	1103	554
Stage 1	-	-	-	0	0	-	1103	1103	-
Stage 2	-	-	-	473	1111	-	10	0	-
Critical Hdwy	-	-	-	5.74	6.54	-	5.74	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	6.04	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	564	208	-	272	210	408
Stage 1	-	-	-	-	-	-	209	285	-
Stage 2	-	-	-	542	283	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	564	0	-	272	0	408
Mov Cap-2 Maneuver	-	-	-	564	0	-	272	0	-
Stage 1	-	-	-	-	0	-	209	0	-
Stage 2	-	-	-	542	0	-	-	0	-

Approach	EB	SE	NW
HCM Control Delay, s	0		15.8
HCM LOS		-	C

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	SELn1
Capacity (veh/h)	408	-	-	-	-
HCM Lane V/C Ratio	0.186	-	-	-	-
HCM Control Delay (s)	15.8	0	-	-	-
HCM Lane LOS	C	A	-	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-	-

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	1381	247	21	26
Future Volume (vph)	1381	247	21	26
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	25.8	25.8	25.8	25.8
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.6	3.6	3.6	3.6
All-Red Time (s)	1.8	2.3	2.3	2.3
Lost Time Adjust (s)	1.5	1.2	1.2	1.2
Total Lost Time (s)	6.9	7.1	7.1	7.1
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	42.1	23.9	23.9	23.9
Actuated g/C Ratio	0.53	0.30	0.30	0.30
v/c Ratio	0.56	0.49	0.04	0.06
Control Delay	4.1	33.9	28.4	7.2
Queue Delay	0.0	4.3	0.0	0.0
Total Delay	4.1	38.2	28.4	7.2
LOS	A	D	C	A
Approach Delay	4.1		37.4	
Approach LOS	A		D	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 69 (86%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: George & Patrick/Indian

Intersection	
Int Delay, s/veh	19.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Traffic Vol, veh/h	0	0	0	268	1379	7	0	0	0	0	205	105
Future Vol, veh/h	0	0	0	268	1379	7	0	0	0	0	205	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	291	1499	8	0	0	0	0	223	114

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	2085	2085	752
Stage 1	-	-	-	2085	2085	-
Stage 2	-	-	-	0	0	-
Critical Hdwy	-	-	-	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.82	4.02	3.92
Pot Cap-1 Maneuver	-	-	-	56	~ 52	303
Stage 1	-	-	-	33	~ 93	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	56	0	303
Mov Cap-2 Maneuver	-	-	-	56	0	-
Stage 1	-	-	-	33	0	-
Stage 2	-	-	-	-	0	-

Approach	NW	SW
HCM Control Delay, s		123.2
HCM LOS		F

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	303
HCM Lane V/C Ratio	-	-	-	1.112
HCM Control Delay (s)	-	-	-	123.2
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	13.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	872	242	150
Future Volume (vph)	872	242	150
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	21.9	21.7	21.7
Total Split (s)	46.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.9	1.8	1.8
Lost Time Adjust (s)	1.6	1.7	1.7
Total Lost Time (s)	7.0	7.0	7.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	39.0	27.0	27.0
Actuated g/C Ratio	0.49	0.34	0.34
v/c Ratio	0.39	0.22	0.28
Control Delay	1.2	15.0	7.4
Queue Delay	0.1	0.0	0.0
Total Delay	1.3	15.1	7.4
LOS	A	B	A
Approach Delay	1.3	12.1	
Approach LOS	A	B	

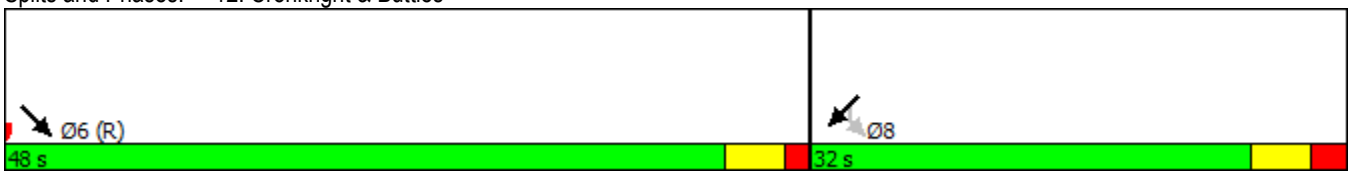
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 25 (31%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 4.6	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 11: George & Lyon/Buttles

Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	886	461
Future Volume (vph)	886	461
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.3	25.1
Total Split (s)	48.0	32.0
Total Split (%)	60.0%	40.0%
Yellow Time (s)	3.6	3.5
All-Red Time (s)	1.6	2.3
Lost Time Adjust (s)	1.7	1.2
Total Lost Time (s)	6.9	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	41.1	25.0
Actuated g/C Ratio	0.51	0.31
v/c Ratio	0.46	0.32
Control Delay	2.5	21.0
Queue Delay	0.0	0.0
Total Delay	2.5	21.0
LOS	A	C
Approach Delay	2.5	21.0
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 21 (26%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 8.1	Intersection LOS: A
Intersection Capacity Utilization 42.5%	ICU Level of Service A
Analysis Period (min) 15	

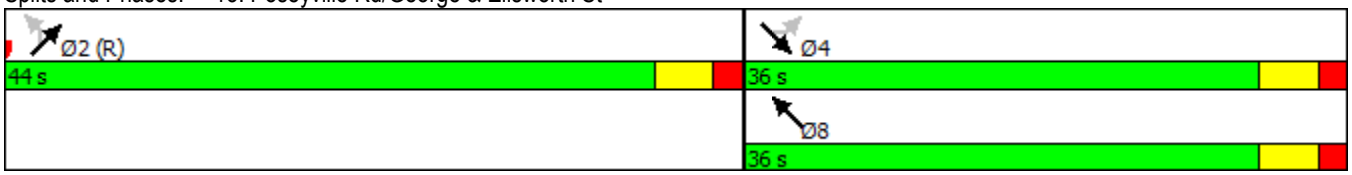
Splits and Phases: 12: Cronkright & Buttles



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	23	27	69	344
Future Volume (vph)	23	27	69	344
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	25.7	25.8
Total Split (s)	36.0	36.0	36.0	44.0
Total Split (%)	45.0%	45.0%	45.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.3	5.3	5.3
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)		30.7	30.7	38.7
Actuated g/C Ratio		0.38	0.38	0.48
v/c Ratio		0.09	0.08	0.20
Control Delay		16.3	12.0	11.6
Queue Delay		0.0	0.0	0.0
Total Delay		16.3	12.0	11.6
LOS		B	B	B
Approach Delay		16.3	12.0	11.6
Approach LOS		B	B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NETL, Start of Green, Master Intersection	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 26.9%	ICU Level of Service A
Analysis Period (min) 15	

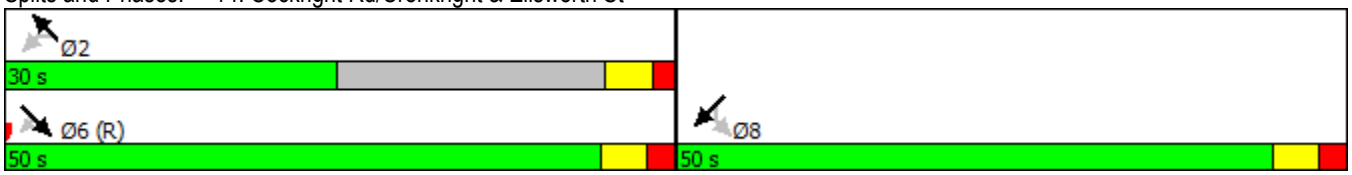
Splits and Phases: 13: Poseyville Rd/George & Ellsworth St



Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	34	234	85	58	631
Future Volume (vph)	34	234	85	58	631
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	24.0	24.0	26.4
Total Split (s)	50.0	50.0	30.0	30.0	50.0
Total Split (%)	50.0%	50.0%	30.0%	30.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.2	2.2	1.8	1.8	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.3	5.3	5.7
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max
Act Effct Green (s)	44.3	44.3	44.7	44.7	44.3
Actuated g/C Ratio	0.44	0.44	0.45	0.45	0.44
v/c Ratio	0.04	0.33	0.15	0.08	0.33
Control Delay	16.1	9.0	17.3	16.2	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.6
Total Delay	16.1	9.0	17.3	16.2	19.1
LOS	B	A	B	B	B
Approach Delay	9.9			16.9	19.1
Approach LOS	A			B	B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 75 (75%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 47.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 14: Cockright Rd/Cronkright & Ellsworth St



Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	1424	268
Future Volume (vph)	1424	268
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.4	25.4
Total Split (s)	51.0	29.0
Total Split (%)	63.8%	36.3%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	1.8
Lost Time Adjust (s)	0.5	0.7
Total Lost Time (s)	6.0	6.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	45.0	23.0
Actuated g/C Ratio	0.56	0.29
v/c Ratio	0.57	0.22
Control Delay	4.6	17.4
Queue Delay	0.0	0.0
Total Delay	4.6	17.4
LOS	A	B
Approach Delay	4.6	17.4
Approach LOS	A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 3 (4%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 44.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 16: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	1037	134
Future Volume (vph)	1037	134
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	35.6	25.9
Total Split (s)	51.0	29.0
Total Split (%)	63.8%	36.3%
Yellow Time (s)	4.3	3.5
All-Red Time (s)	2.0	2.5
Lost Time Adjust (s)	0.7	0.6
Total Lost Time (s)	7.0	6.6
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	44.0	22.4
Actuated g/C Ratio	0.55	0.28
v/c Ratio	0.47	0.15
Control Delay	3.6	15.2
Queue Delay	0.0	0.0
Total Delay	3.6	15.2
LOS	A	B
Approach Delay	3.6	15.2
Approach LOS	A	B

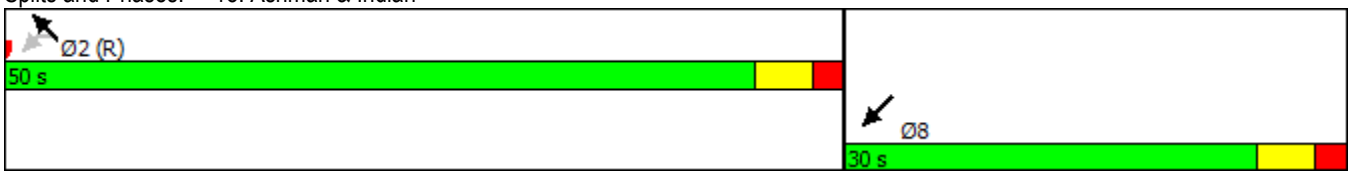
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 5.2	Intersection LOS: A
Intersection Capacity Utilization 40.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 17: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	1386	278
Future Volume (vph)	1386	278
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	25.3	24.8
Total Split (s)	50.0	30.0
Total Split (%)	62.5%	37.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.9	2.0
Lost Time Adjust (s)	1.6	1.5
Total Lost Time (s)	7.0	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	Max	Max
Act Effct Green (s)	43.0	23.0
Actuated g/C Ratio	0.54	0.29
v/c Ratio	0.58	0.37
Control Delay	2.1	22.5
Queue Delay	0.0	0.0
Total Delay	2.1	22.5
LOS	A	C
Approach Delay	2.1	22.5
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 10 (13%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 49.7%	ICU Level of Service A
Analysis Period (min) 15	

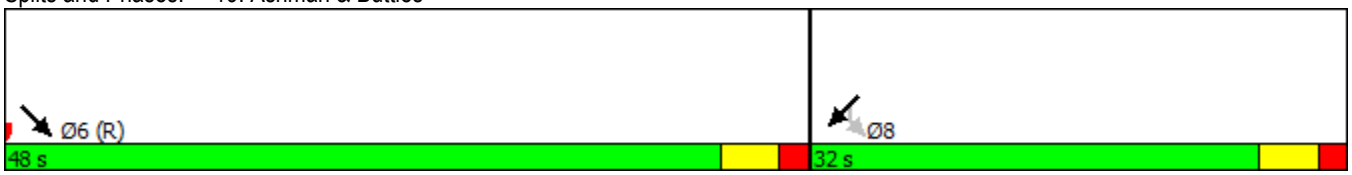
Splits and Phases: 18: Ashman & Indian



Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	1136	69	281
Future Volume (vph)	1136	69	281
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	22.7	24.6	24.6
Total Split (s)	48.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.9	1.8	1.8
Lost Time Adjust (s)	-1.4	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	44.0	28.0	28.0
Actuated g/C Ratio	0.55	0.35	0.35
v/c Ratio	0.47	0.11	0.25
Control Delay	9.3	1.6	10.0
Queue Delay	0.0	0.0	0.0
Total Delay	9.3	1.6	10.0
LOS	A	A	A
Approach Delay	9.3		8.3
Approach LOS	A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 1 (1%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 49.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 19: Ashman & Buttles



Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	1020	562	476
Future Volume (vph)	1020	562	476
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	22.2	22.2	21.5
Total Split (s)	51.0	51.0	29.0
Total Split (%)	63.8%	63.8%	36.3%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.2	2.2	2.5
Lost Time Adjust (s)	3.0	3.0	3.0
Total Lost Time (s)	8.7	8.7	9.0
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	Max
Act Effct Green (s)	42.3	42.3	20.0
Actuated g/C Ratio	0.53	0.53	0.25
v/c Ratio	0.67	0.66	0.60
Control Delay	8.6	6.7	32.7
Queue Delay	0.0	0.0	0.9
Total Delay	8.6	6.7	33.5
LOS	A	A	C
Approach Delay		7.3	33.5
Approach LOS		A	C

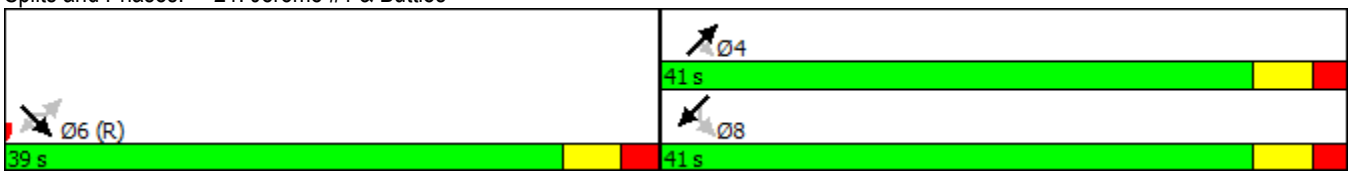
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 22 (28%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	661	237	463	525	6	1014
Future Volume (vph)	661	237	463	525	6	1014
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	39.0	39.0	41.0	41.0	41.0	41.0
Total Split (%)	48.8%	48.8%	51.3%	51.3%	51.3%	51.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.3	2.3	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	-1.8	0.0	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.0	5.8	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	35.0	33.2	37.0	37.0	37.0	37.0
Actuated g/C Ratio	0.44	0.42	0.46	0.46	0.46	0.46
v/c Ratio	0.47	0.38	0.48	0.45	0.03	0.67
Control Delay	17.2	15.3	13.4	11.0	1.2	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	17.2	15.3	13.4	11.0	1.2	3.6
LOS	B	B	B	B	A	A
Approach Delay	16.7		12.7			3.6
Approach LOS	B		B			A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 72 (90%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 21: Jerome #1 & Buttles



Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	7	7	844	194	8	904
Future Vol, veh/h	7	7	844	194	8	904
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	-	-
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	8	8	917	211	9	983

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1532	564	0	0	1128	0
Stage 1	1023	-	-	-	-	-
Stage 2	509	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	107	469	-	-	615	-
Stage 1	308	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	104	469	-	-	615	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	308	-	-	-	-	-
Stage 2	551	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.6	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	104	469	615	-
HCM Lane V/C Ratio	-	-	0.073	0.016	0.014	-
HCM Control Delay (s)	-	-	42.3	12.8	10.9	0.2
HCM Lane LOS	-	-	E	B	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0	0	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	58	76	40	76	53	753	69	806
Future Volume (vph)	58	76	40	76	53	753	69	806
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	36.0	36.0	36.0	36.0	64.0	64.0	64.0	64.0
Total Split (%)	36.0%	36.0%	36.0%	36.0%	64.0%	64.0%	64.0%	64.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.2	12.2	12.2	12.2	75.1	75.1	75.1	75.1
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.75	0.75	0.75	0.75
v/c Ratio	0.57	0.62	0.36	0.65	0.14	0.33	0.17	0.35
Control Delay	59.7	39.3	46.6	39.9	5.3	4.9	3.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	39.3	46.6	39.9	5.3	4.9	3.8	3.6
LOS	E	D	D	D	A	A	A	A
Approach Delay		45.2		41.3		4.9		3.7
Approach LOS		D		D		A		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 74 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 23: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	138	52	61	49	788	33	778
Future Volume (vph)	35	138	52	61	49	788	33	778
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	40.0	40.0	40.0	40.0	60.0	60.0	60.0	60.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.8	6.8	6.8	6.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	16.9	16.9	16.9	16.9	69.2	69.2	69.2	69.2
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.69	0.69	0.69	0.69
v/c Ratio	0.17	0.78	0.49	0.24	0.13	0.38	0.10	0.36
Control Delay	34.8	49.4	49.8	31.9	5.6	6.4	3.3	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	49.4	49.8	31.9	5.6	6.4	3.3	3.7
LOS	C	D	D	C	A	A	A	A
Approach Delay		47.5		39.6		6.4		3.6
Approach LOS		D		D		A		A

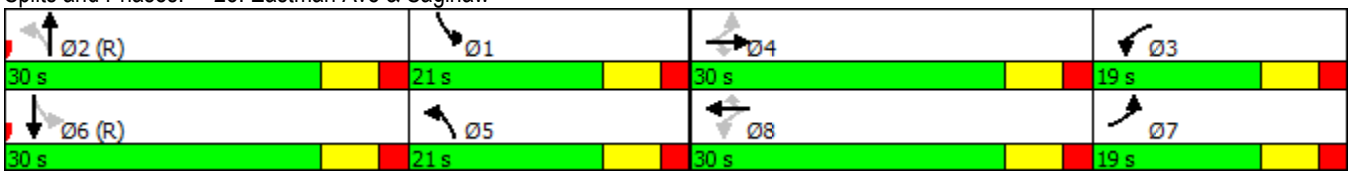
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 24 (24%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 24: Eastman Ave & Sugnet

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	278	665	146	106	699	428	228	485	256	590
Future Volume (vph)	278	665	146	106	699	428	228	485	256	590
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	11.5	16.5
Total Split (s)	19.0	30.0	30.0	19.0	30.0	30.0	21.0	30.0	21.0	30.0
Total Split (%)	19.0%	30.0%	30.0%	19.0%	30.0%	30.0%	21.0%	30.0%	21.0%	30.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	3.0	0.4	0.4	3.0	0.4	0.4	3.0	0.5	3.0	0.5
Total Lost Time (s)	9.6	7.0	7.0	9.6	7.0	7.0	9.5	7.0	9.5	7.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	C-Max
Act Effct Green (s)	29.8	23.0	23.0	29.8	23.0	23.0	32.0	23.0	32.0	23.0
Actuated g/C Ratio	0.30	0.23	0.23	0.30	0.23	0.23	0.32	0.23	0.32	0.23
v/c Ratio	1.27	0.90	0.32	0.48	0.94	0.74	0.90	0.82	1.01	0.97
Control Delay	183.7	52.8	5.3	37.6	59.2	17.1	67.5	37.8	94.3	61.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	183.7	52.8	5.3	37.6	59.2	17.1	67.5	37.8	94.3	61.0
LOS	F	D	A	D	E	B	E	D	F	E
Approach Delay		79.8			42.8			45.9		69.8
Approach LOS		E			D			D		E

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 75 (75%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 59.6	Intersection LOS: E
Intersection Capacity Utilization 95.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 25: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	43	31	71	31	26	1118	44	869
Future Volume (vph)	43	31	71	31	26	1118	44	869
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	24.0	24.0	24.0	24.0	76.0	76.0	76.0	76.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.1	11.1	11.1	11.1	76.2	76.2	76.2	76.2
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.76	0.76	0.76	0.76
v/c Ratio	0.33	0.38	0.52	0.40	0.07	0.47	0.17	0.37
Control Delay	45.7	45.7	53.8	21.7	3.7	4.8	5.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	45.7	53.8	21.7	3.7	4.8	5.7	4.6
LOS	D	D	D	C	A	A	A	A
Approach Delay		45.7		35.8		4.8		4.7
Approach LOS		D		D		A		A

Intersection Summary

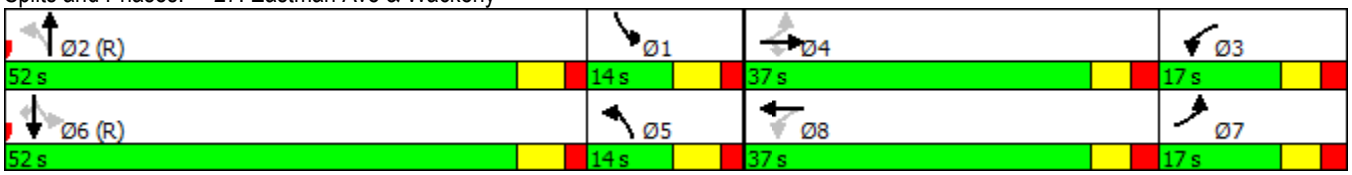
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 14 (14%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 8.7 Intersection LOS: A
Intersection Capacity Utilization 57.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 26: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	207	201	150	142	155	84	1038	124	655	265
Future Volume (vph)	207	201	150	142	155	84	1038	124	655	265
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.1	30.5	30.5	11.1	30.5	11.3	26.0	11.3	26.0	26.0
Total Split (s)	17.0	37.0	37.0	17.0	37.0	14.0	52.0	14.0	52.0	52.0
Total Split (%)	14.2%	30.8%	30.8%	14.2%	30.8%	11.7%	43.3%	11.7%	43.3%	43.3%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	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	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?										
Recall Mode	Min	Max	Max	Min	Max	Min	C-Max	Min	C-Max	C-Max
Act Effct Green (s)	40.0	30.1	30.1	40.0	30.1	51.2	44.7	51.2	44.7	44.7
Actuated g/C Ratio	0.33	0.25	0.25	0.33	0.25	0.43	0.37	0.43	0.37	0.37
v/c Ratio	1.06	0.46	0.31	0.49	1.15	0.32	0.98	0.83	0.52	0.37
Control Delay	124.7	41.9	7.1	33.2	125.5	23.3	57.2	47.6	23.7	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	124.7	41.9	7.1	33.2	125.5	23.3	57.2	47.6	23.7	4.1
LOS	F	D	A	C	F	C	E	D	C	A
Approach Delay		63.2			101.7		54.9		21.6	
Approach LOS		E			F		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 55.6	Intersection LOS: E
Intersection Capacity Utilization 97.7%	ICU Level of Service F
Analysis Period (min) 15	

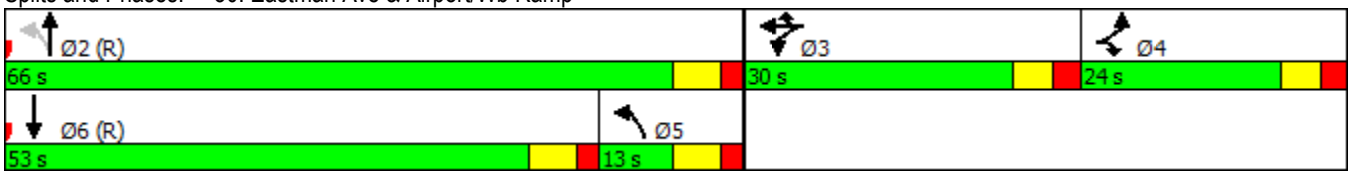
Splits and Phases: 27: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT
Lane Configurations									
Traffic Volume (vph)	168	78	239	107	300	75	859	224	1046
Future Volume (vph)	168	78	239	107	300	75	859	224	1046
Turn Type	Prot	Prot	Split	NA	Prot	pm+pt	NA	Free	NA
Protected Phases	4	4	3	3	3	5	2		6
Permitted Phases						2		Free	
Detector Phase	4	4	3	3	3	5	2		6
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6
Total Split (s)	24.0	24.0	30.0	30.0	30.0	13.0	66.0		53.0
Total Split (%)	20.0%	20.0%	25.0%	25.0%	25.0%	10.8%	55.0%		44.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.3	7.3		7.3
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag			Lead
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max
Act Effct Green (s)	15.6	15.6	23.0	23.0	23.0	60.1	60.1	120.0	47.1
Actuated g/C Ratio	0.13	0.13	0.19	0.19	0.19	0.50	0.50	1.00	0.39
v/c Ratio	0.86	0.28	0.57	0.58	1.08	0.55	0.53	0.16	0.92
Control Delay	83.4	3.8	52.1	51.8	119.5	19.6	7.8	0.0	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.4	3.8	52.1	51.8	119.5	19.6	7.8	0.0	37.0
LOS	F	A	D	D	F	B	A	A	D
Approach Delay				83.3			7.0		37.0
Approach LOS				F			A		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 100 (83%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 37.2	Intersection LOS: D
Intersection Capacity Utilization 72.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 30: Eastman Ave & Airport/Wb Ramp



Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	0	0	0	0	950	377	0	1199	24
Future Vol, veh/h	0	0	0	0	0	0	0	950	377	0	1199	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	1033	410	0	1303	26

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1832	2349	665	1329	0	0	1033	0	0
Stage 1	1316	1316	-	-	-	-	-	-	-
Stage 2	516	1033	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	68	36	403	515	-	-	668	-	-
Stage 1	215	226	-	-	-	-	-	-	-
Stage 2	564	308	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	68	0	403	515	-	-	668	-	-
Mov Cap-2 Maneuver	68	0	-	-	-	-	-	-	-
Stage 1	215	0	-	-	-	-	-	-	-
Stage 2	564	0	-	-	-	-	-	-	-

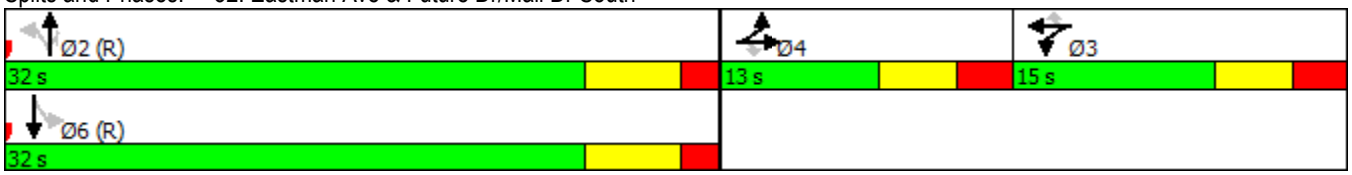
Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	515	-	-	-	668	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	-	-

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	7	22	293	13	33	33	828	89	20	908
Future Volume (vph)	7	22	293	13	33	33	828	89	20	908
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	13.0	13.0	15.0	15.0	15.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	21.7%	21.7%	25.0%	25.0%	25.0%	53.3%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	6.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lead	Lag	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	6.4	6.4	8.0	8.0	8.0	31.2	30.2	30.2	30.2	30.2
Actuated g/C Ratio	0.11	0.11	0.13	0.13	0.13	0.52	0.50	0.50	0.50	0.50
v/c Ratio	0.18	0.08	0.74	0.74	0.10	0.16	0.49	0.11	0.08	0.55
Control Delay	26.5	0.5	47.1	47.2	0.6	10.9	11.0	0.5	11.6	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	0.5	47.1	47.2	0.6	10.9	11.0	0.5	11.6	12.6
LOS	C	A	D	D	A	B	B	A	B	B
Approach Delay	15.7			42.7			10.0			12.6
Approach LOS	B			D			B			B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 57 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 55.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 32: Eastman Ave & Future Dr/Mall Dr South



Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	30	58	0	30	0	561	324	0	867	0
Future Vol, veh/h	0	0	30	58	0	30	0	561	324	0	867	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	33	63	0	33	0	610	352	0	942	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1247	1904	471	1257	1728	481	942	0	0	962	0	0
Stage 1	942	942	-	786	786	-	-	-	-	-	-	-
Stage 2	305	962	-	471	942	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	130	68	539	128	88	531	724	-	-	711	-	-
Stage 1	283	340	-	351	401	-	-	-	-	-	-	-
Stage 2	680	332	-	542	340	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	122	68	539	120	88	531	724	-	-	711	-	-
Mov Cap-2 Maneuver	122	68	-	120	88	-	-	-	-	-	-	-
Stage 1	283	340	-	351	401	-	-	-	-	-	-	-
Stage 2	638	332	-	509	340	-	-	-	-	-	-	-

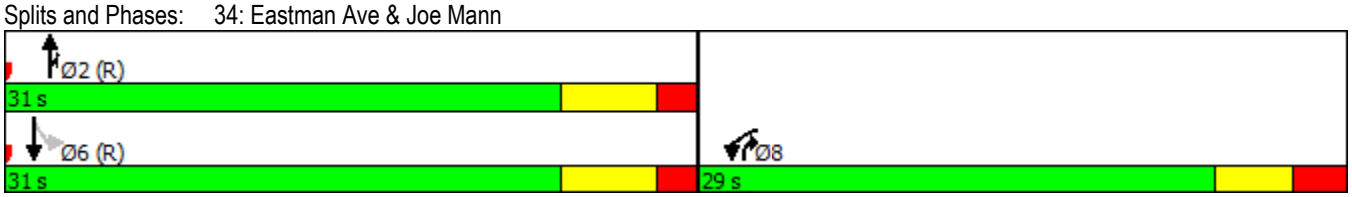
Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	46.5	0	0
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	724	-	-	539	120	531	711	-	-
HCM Lane V/C Ratio	-	-	-	0.06	0.525	0.061	-	-	-
HCM Control Delay (s)	0	-	-	12.1	64.2	12.2	0	-	-
HCM Lane LOS	A	-	-	B	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.5	0.2	0	-	-

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	419	260	331	59	448
Future Volume (vph)	419	260	331	59	448
Turn Type	Prot	NA	pt+ov	Perm	NA
Protected Phases	8	2	2 8		6
Permitted Phases				6	
Detector Phase	8	2	2 8	6	6
Switch Phase					
Minimum Initial (s)	7.0	10.0		10.0	10.0
Minimum Split (s)	13.0	16.2		16.2	16.2
Total Split (s)	29.0	31.0		31.0	31.0
Total Split (%)	48.3%	51.7%		51.7%	51.7%
Yellow Time (s)	3.5	4.3		4.3	4.3
All-Red Time (s)	2.5	1.9		1.9	1.9
Lost Time Adjust (s)	1.0	1.0		1.0	1.0
Total Lost Time (s)	7.0	7.2		7.2	7.2
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max		Max	Max
Act Effct Green (s)	22.0	23.8	60.0	23.8	23.8
Actuated g/C Ratio	0.37	0.40	1.00	0.40	0.40
v/c Ratio	0.42	0.20	0.22	0.15	0.34
Control Delay	14.4	6.4	0.3	12.8	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	6.4	0.3	12.8	13.5
LOS	B	A	A	B	B
Approach Delay	14.4	3.0			13.4
Approach LOS	B	A			B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 19 (32%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 9.9	Intersection LOS: A
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	

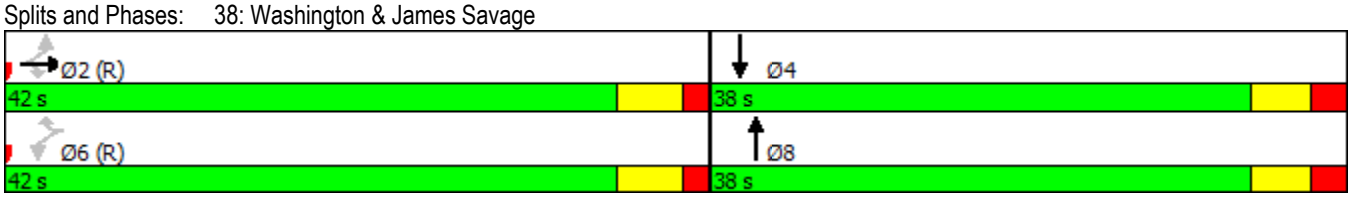
Splits and Phases: 34: Eastman Ave & Joe Mann



Lane Group	EBT	EBR	WBL	WBR	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	111	15	5	79	339	39
Future Volume (vph)	111	15	5	79	339	39
Turn Type	NA	Perm	Perm	Perm	NA	NA
Protected Phases	2				8	4
Permitted Phases		2	6	6		
Detector Phase	2	2	6	6	8	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	32.2	32.2	32.2	32.2	29.1	29.1
Total Split (s)	42.0	42.0	42.0	42.0	38.0	38.0
Total Split (%)	52.5%	52.5%	52.5%	52.5%	47.5%	47.5%
Yellow Time (s)	3.9	3.9	3.9	3.9	3.5	3.5
All-Red Time (s)	1.7	1.7	1.7	1.7	2.3	2.3
Lost Time Adjust (s)	-1.6	-1.6	-1.6	-1.6	-1.8	-1.3
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	38.0	38.0	38.0	38.0	34.0	33.5
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.42	0.42
v/c Ratio	0.15	0.02	0.01	0.11	0.26	0.03
Control Delay	4.7	0.2	11.2	3.3	15.2	0.0
Queue Delay	0.1	0.0	0.0	0.1	0.0	1.0
Total Delay	4.8	0.2	11.2	3.4	15.2	1.0
LOS	A	A	B	A	B	A
Approach Delay	4.3				15.2	1.0
Approach LOS	A				B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 45 (56%), Referenced to phase 2:EBTL and 6:WBL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.26	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 34.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 38: Washington & James Savage



Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1	16.0	31.0	0.2	23
Bayliss	3	4.4	29.6	0.2	30
Jefferson	5	10.6	31.3	0.3	29
Carpenter	7	2.0	9.5	0.1	35
	131	0.9	15.2	0.2	42
	208	0.9	15.6	0.2	42
George	9	6.3	24.2	0.2	33
Total		41.2	156.5	1.4	31

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	56	1.0	19.6	0.2	41
	86	0.9	22.1	0.3	43
Carpenter	8	1.4	15.7	0.2	41
Jefferson	6	4.2	8.4	0.1	23
Bayliss	4	2.7	22.9	0.3	40
	207	1.9	12.7	0.1	37
Washington	2	8.4	17.1	0.1	24
Total		20.6	118.5	1.2	37

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	10	1.4	7.0	0.1	27
Rodd	16	6.3	18.4	0.1	24
Ashman	18	6.3	18.2	0.1	22
Jerome #1	20	7.3	25.2	0.2	25
Eastman Ave	164	2.7	22.4	0.2	25
Total		24.0	91.2	0.6	24

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	116	0.4	9.1	0.1	33
Jerome #1	21	16.5	26.1	0.1	13
Ashman	19	3.6	21.6	0.2	29
Rodd	17	6.6	18.8	0.1	22
Cronkright	12	3.1	15.0	0.1	29
George	11	1.9	8.1	0.1	23
Total		32.1	98.7	0.6	23

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	22	0.4	0.7	0.2	860
St Andrews	23	6.0	28.2	0.3	35
Sugnet	24	7.3	55.7	0.6	40
Saginaw	25	31.8	70.9	0.5	26
Dilloway	26	65.0	102.4	0.5	19
Wackerly	27	270.5	304.4	0.4	5
Eb On Ramp	28	4.6	7.5	0.0	16
Wb On Ramp	29	2.1	8.3	0.1	32
Wb Ramp	30	10.5	16.1	0.1	15
Mall Off	31	2.6	8.6	0.1	31
Mall Dr South	32	8.2	12.6	0.1	17
North Mall Dr	33	7.2	15.9	0.1	25
Joe Mann	34	6.0	11.8	0.1	22
Total		422.2	643.1	3.0	17

Arterial Level of Service: SB Eastman Ave

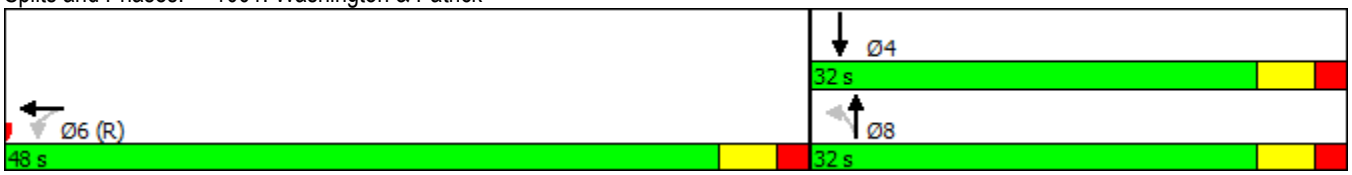
Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	34	11.3	26.7	0.2	27
	33	2.9	8.9	0.1	29
Future Dr	32	15.3	24.0	0.1	17
Saylor Dr	31	14.3	19.2	0.1	11
Airport	30	45.3	52.2	0.1	5
Wb On Ramp	29	5.8	11.8	0.1	21
Eb On Ramp	28	3.9	9.8	0.1	27
Wackerly	27	24.1	26.7	0.0	5
Dilloway	26	10.4	42.6	0.4	34
Saginaw	25	43.1	84.5	0.5	23
Sugnet	24	9.0	48.1	0.5	38
St Andrews	23	7.2	56.1	0.6	39
Carpenter	22	2.9	25.1	0.3	40
Indian	164	1.4	13.8	0.2	40
Total		196.7	449.5	3.2	26

Appendix C
Alternative 1 Capacity Analysis

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	709	76	123	246
Future Volume (vph)	709	76	123	246
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	55.6	13.4	13.4	13.4
Actuated g/C Ratio	0.70	0.17	0.17	0.17
v/c Ratio	0.40	0.61	0.23	0.58
Control Delay	6.3	32.9	14.6	27.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	32.9	14.6	27.8
LOS	A	C	B	C
Approach Delay	6.3		21.6	27.8
Approach LOS	A		C	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 24 (30%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1001: Washington & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	977	146	4	380
Future Volume (vph)	977	146	4	380
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5		5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.4	15.6		15.6
Actuated g/C Ratio	0.67	0.20		0.20
v/c Ratio	0.48	0.25		0.64
Control Delay	1.3	25.4		22.5
Queue Delay	0.0	0.0		0.0
Total Delay	1.3	25.4		22.5
LOS	A	C		C
Approach Delay	1.3	25.4		22.5
Approach LOS	A	C		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 24 (30%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 51.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1266	53	15	21	187
Future Volume (vph)	1266	53	15	21	187
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	56.0	24.0	24.0	24.0	24.0
Total Split (%)	70.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	55.2	13.8	13.8	13.8	13.8
Actuated g/C Ratio	0.69	0.17	0.17	0.17	0.17
v/c Ratio	0.58	0.18	0.05	0.10	0.63
Control Delay	4.0	28.0	4.3	22.4	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	28.0	4.3	22.4	34.9
LOS	A	C	A	C	C
Approach Delay	4.0	22.8			33.6
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 77 (96%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	664	14	50	124
Future Volume (vph)	664	14	50	124
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.7	26.7	26.7
Total Split (s)	47.0	33.0	33.0	33.0
Total Split (%)	58.8%	41.3%	41.3%	41.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.7	12.3	12.3	12.3
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.31	0.08	0.19	0.50
Control Delay	5.7	14.3	17.6	34.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.7	14.3	17.6	34.6
LOS	A	B	B	C
Approach Delay	5.7		16.9	34.6
Approach LOS	A		B	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 74 (93%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1006: Jefferson & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	1209	57	58	83
Future Volume (vph)	1209	57	58	83
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.5	27.3	27.3	27.3
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	61.5	11.1	11.1	11.1
Actuated g/C Ratio	0.77	0.14	0.14	0.14
v/c Ratio	0.49	0.33	0.35	0.35
Control Delay	3.1	24.4	13.8	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.1	24.4	13.8	12.3
LOS	A	C	B	B
Approach Delay	3.1	24.4		12.9
Approach LOS	A	C		B

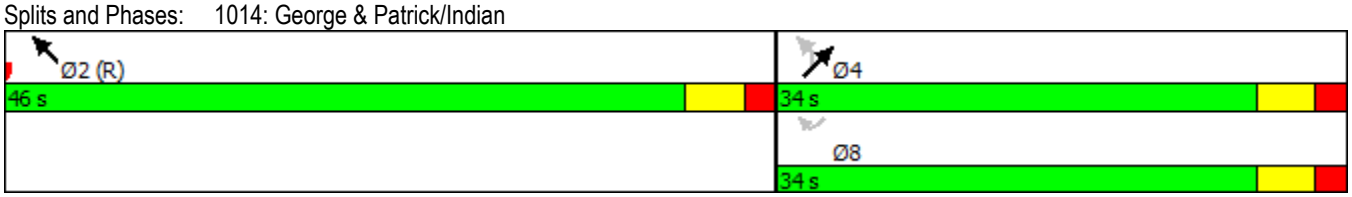
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 72 (90%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 5.2	Intersection LOS: A
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1007: Jefferson & Lyon

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	674	178	120	20
Future Volume (vph)	674	178	120	20
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	46.0	34.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	57.0	12.0	12.0	12.0
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.30	0.48	0.46	0.06
Control Delay	2.8	4.6	9.8	0.3
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	2.8	4.7	9.8	0.3
LOS	A	A	A	A
Approach Delay	2.8		6.8	
Approach LOS	A		A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 32 (40%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 3.9	Intersection LOS: A
Intersection Capacity Utilization 50.5%	ICU Level of Service A
Analysis Period (min) 15	

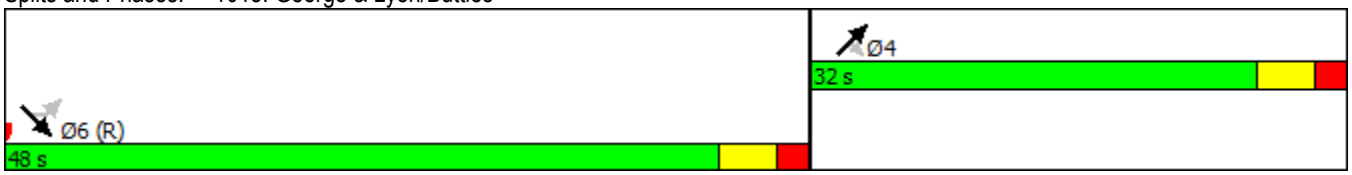
Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	1017	282	206
Future Volume (vph)	1017	282	206
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	48.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	54.0	15.0	15.0
Actuated g/C Ratio	0.68	0.19	0.19
v/c Ratio	0.47	0.46	0.64
Control Delay	2.6	26.9	24.9
Queue Delay	0.1	0.0	0.0
Total Delay	2.7	26.9	24.9
LOS	A	C	C
Approach Delay	2.7	26.0	
Approach LOS	A	C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 24 (30%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 50.5%	ICU Level of Service A
Analysis Period (min) 15	

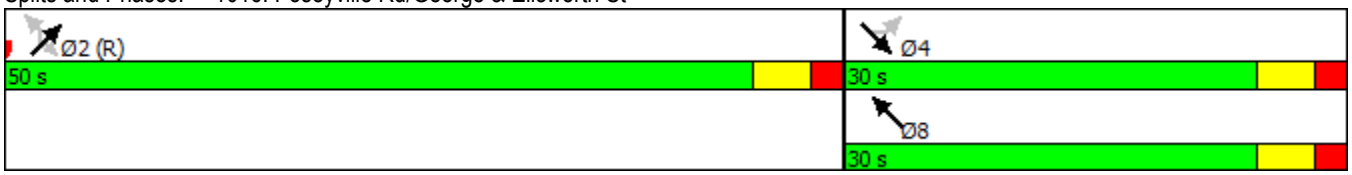
Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	4	31	23	477	65
Future Volume (vph)	4	31	23	477	65
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0
Total Split (s)	30.0	30.0	30.0	50.0	50.0
Total Split (%)	37.5%	37.5%	37.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)		9.9	9.9	66.3	66.3
Actuated g/C Ratio		0.12	0.12	0.83	0.83
v/c Ratio		0.17	0.08	0.23	0.05
Control Delay		24.4	23.3	3.5	1.6
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		24.4	23.3	3.5	1.6
LOS		C	C	A	A
Approach Delay		24.4	23.3	3.3	
Approach LOS		C	C	A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 46 (58%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.23	
Intersection Signal Delay: 5.2	Intersection LOS: A
Intersection Capacity Utilization 31.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St



Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	1030	221
Future Volume (vph)	1030	221
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	58.3	10.7
Actuated g/C Ratio	0.73	0.13
v/c Ratio	0.45	0.34
Control Delay	1.2	26.8
Queue Delay	0.0	0.0
Total Delay	1.2	26.8
LOS	A	C
Approach Delay	1.2	26.8
Approach LOS	A	C

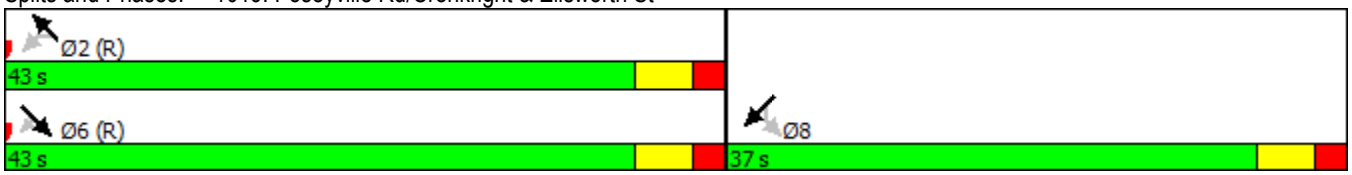
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 22 (28%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 5.7	Intersection LOS: A
Intersection Capacity Utilization 44.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1018: Cronkright & Buttles

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	22	59	58	90	188
Future Volume (vph)	22	59	58	90	188
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	26.0	26.0	26.0
Total Split (s)	43.0	43.0	43.0	43.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	None
Act Effct Green (s)	58.1	58.1	58.1	58.1	10.9
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.14
v/c Ratio	0.02	0.05	0.06	0.07	0.38
Control Delay	4.5	1.7	3.8	3.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	1.7	3.8	3.7	4.4
LOS	A	A	A	A	A
Approach Delay	2.5			3.8	4.4
Approach LOS	A			A	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 38 (48%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 3.9	Intersection LOS: A
Intersection Capacity Utilization 31.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1019: Poseyville Rd/Cronkright & Ellsworth St



Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	894	152
Future Volume (vph)	894	152
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	58.9	10.1
Actuated g/C Ratio	0.74	0.13
v/c Ratio	0.39	0.26
Control Delay	3.8	23.3
Queue Delay	0.0	0.0
Total Delay	3.8	23.3
LOS	A	C
Approach Delay	3.8	23.3
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 58 (73%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 40.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	1008	49
Future Volume (vph)	1008	49
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	62.9	9.7
Actuated g/C Ratio	0.79	0.12
v/c Ratio	0.44	0.17
Control Delay	1.0	16.9
Queue Delay	0.0	0.0
Total Delay	1.0	16.9
LOS	A	B
Approach Delay	1.0	16.9
Approach LOS	A	B

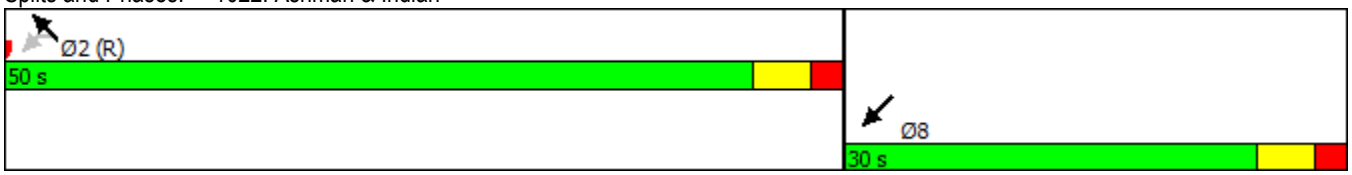
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 7 (9%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 2.3	Intersection LOS: A
Intersection Capacity Utilization 46.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	839	279
Future Volume (vph)	839	279
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	50.0	30.0
Total Split (%)	62.5%	37.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	57.2	11.8
Actuated g/C Ratio	0.72	0.15
v/c Ratio	0.39	0.49
Control Delay	0.8	25.4
Queue Delay	0.0	0.0
Total Delay	0.8	25.4
LOS	A	C
Approach Delay	0.8	25.4
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 71 (89%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian



Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	1077	41	300
Future Volume (vph)	1077	41	300
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	55.5	13.5	13.5
Actuated g/C Ratio	0.69	0.17	0.17
v/c Ratio	0.50	0.13	0.55
Control Delay	5.2	1.3	18.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.2	1.3	18.2
LOS	A	A	B
Approach Delay	5.2		16.2
Approach LOS	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	472	447	428
Future Volume (vph)	472	447	428
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	46.0	46.0	34.0
Total Split (%)	57.5%	57.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	52.8	52.8	16.2
Actuated g/C Ratio	0.66	0.66	0.20
v/c Ratio	0.30	0.31	0.67
Control Delay	5.2	4.8	20.1
Queue Delay	0.0	0.0	0.0
Total Delay	5.2	4.8	20.2
LOS	A	A	C
Approach Delay		4.9	20.2
Approach LOS		A	C

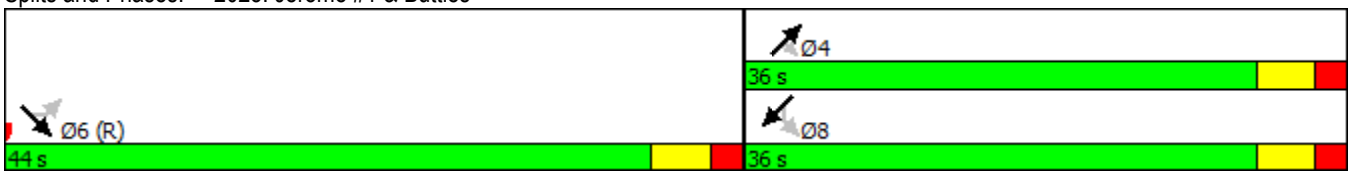
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 66 (83%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 9.8	Intersection LOS: A
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SET	NET	NER	SWL	SWT
Lane Configurations					
Traffic Volume (vph)	636	422	488	3	469
Future Volume (vph)	636	422	488	3	469
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	6	4			8
Permitted Phases			4	8	
Detector Phase	6	4	4	8	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	29.8	29.8	29.8	29.8
Total Split (s)	44.0	36.0	36.0	36.0	36.0
Total Split (%)	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	46.1	22.9	22.9	22.9	22.9
Actuated g/C Ratio	0.58	0.29	0.29	0.29	0.29
v/c Ratio	0.40	0.68	0.58	0.03	0.50
Control Delay	2.7	24.1	14.6	9.7	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.3
Total Delay	2.7	24.1	14.6	9.7	16.4
LOS	A	C	B	A	B
Approach Delay	2.7	21.1			16.3
Approach LOS	A	C			B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 47 (59%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	7	26	26	58	25	588	39	679
Future Volume (vph)	7	26	26	58	25	588	39	679
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.9	8.9	8.9	8.9	62.4	62.4	62.4	62.4
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.78	0.78	0.78	0.78
v/c Ratio	0.06	0.28	0.19	0.47	0.05	0.25	0.07	0.28
Control Delay	31.1	21.3	34.2	27.0	3.6	3.4	1.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	21.3	34.2	27.0	3.6	3.4	1.9	1.6
LOS	C	C	C	C	A	A	A	A
Approach Delay		22.4		28.5		3.4		1.6
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 3 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 5.3	Intersection LOS: A
Intersection Capacity Utilization 51.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2029: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	18	62	43	122	47	560	12	651
Future Volume (vph)	18	62	43	122	47	560	12	651
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	29.0	29.0	29.0	29.0	51.0	51.0	51.0	51.0
Total Split (%)	36.3%	36.3%	36.3%	36.3%	63.8%	63.8%	63.8%	63.8%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.8	6.8	6.8	6.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	10.2	10.2	10.2	10.2	55.9	55.9	55.9	55.9
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.70	0.70	0.70	0.70
v/c Ratio	0.13	0.45	0.29	0.60	0.11	0.26	0.02	0.30
Control Delay	30.8	24.7	34.9	41.5	3.3	2.7	2.2	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	24.7	34.9	41.5	3.3	2.7	2.2	2.6
LOS	C	C	C	D	A	A	A	A
Approach Delay		25.6		39.9		2.7		2.6
Approach LOS		C		D		A		A

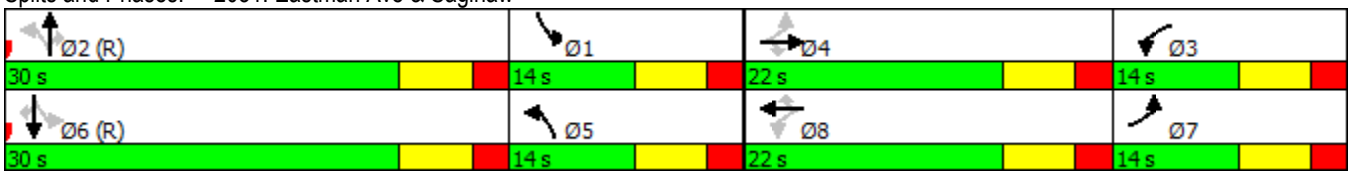
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 35 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2030: Eastman Ave & Sugnet

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	450	122	80	474	192	97	437	53	315	489	185
Future Volume (vph)	117	450	122	80	474	192	97	437	53	315	489	185
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	16.5	11.5	16.5	16.5
Total Split (s)	14.0	22.0	22.0	14.0	22.0	22.0	14.0	30.0	30.0	14.0	30.0	30.0
Total Split (%)	17.5%	27.5%	27.5%	17.5%	27.5%	27.5%	17.5%	37.5%	37.5%	17.5%	37.5%	37.5%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	3.0	0.4	0.4	3.0	0.4	0.4	3.0	0.5	3.0	3.0	0.5	3.0
Total Lost Time (s)	9.6	7.0	7.0	9.6	7.0	7.0	9.5	7.0	9.5	9.5	7.0	9.5
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	18.1	17.5	17.5	16.1	15.0	15.0	25.2	23.6	21.1	27.5	26.4	23.9
Actuated g/C Ratio	0.23	0.22	0.22	0.20	0.19	0.19	0.32	0.30	0.26	0.34	0.33	0.30
v/c Ratio	0.67	0.64	0.26	0.49	0.78	0.44	0.42	0.46	0.10	1.06	0.50	0.31
Control Delay	45.5	34.1	1.4	33.1	40.8	6.7	15.1	14.3	0.6	91.0	19.4	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	34.1	1.4	33.1	40.8	6.7	15.1	14.3	0.6	91.0	19.4	1.8
LOS	D	C	A	C	D	A	B	B	A	F	B	A
Approach Delay		30.2			31.2			13.2			39.2	
Approach LOS		C			C			B			D	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 30.1	Intersection LOS: C
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2031: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	40	68	86	47	16	663	68	861
Future Volume (vph)	40	68	86	47	16	663	68	861
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	27.0	27.0	27.0	27.0	53.0	53.0	53.0	53.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%	66.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.2	11.2	11.2	11.2	56.1	56.1	56.1	56.1
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.70	0.70	0.70	0.70
v/c Ratio	0.24	0.49	0.53	0.42	0.05	0.32	0.16	0.39
Control Delay	32.5	37.6	41.8	18.1	3.1	3.2	6.0	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	37.6	41.8	18.1	3.1	3.2	6.0	5.9
LOS	C	D	D	B	A	A	A	A
Approach Delay		36.2		28.2		3.2		5.9
Approach LOS		D		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 47 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 60.7%	ICU Level of Service B
Analysis Period (min) 15	

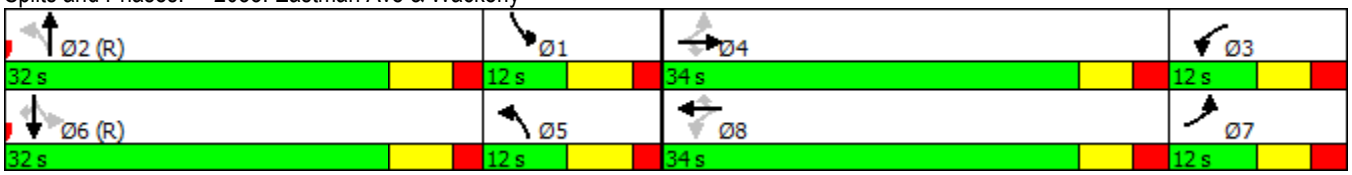
Splits and Phases: 2032: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	131	466	90	62	210	126	45	652	78	806	141
Future Volume (vph)	131	466	90	62	210	126	45	652	78	806	141
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.1	30.5	30.5	11.1	30.5	30.5	11.3	26.0	11.3	26.0	26.0
Total Split (s)	12.0	34.0	34.0	12.0	34.0	34.0	12.0	32.0	12.0	32.0	32.0
Total Split (%)	13.3%	37.8%	37.8%	13.3%	37.8%	37.8%	13.3%	35.6%	13.3%	35.6%	35.6%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	3.1	1.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1	9.2	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	Min	Max	Max	Min	Max	Max	Min	C-Max	Min	C-Max	C-Max
Act Effct Green (s)	31.8	27.0	27.0	31.8	27.0	24.9	29.4	24.8	29.4	24.8	24.8
Actuated g/C Ratio	0.35	0.30	0.30	0.35	0.30	0.28	0.33	0.28	0.33	0.28	0.28
v/c Ratio	0.38	0.89	0.16	0.43	0.50	0.29	0.29	0.59	0.37	0.87	0.26
Control Delay	21.2	50.4	0.6	29.5	29.8	4.4	26.7	29.4	12.8	29.1	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	50.4	0.6	29.5	29.8	4.4	26.7	29.4	12.8	29.1	1.6
LOS	C	D	A	C	C	A	C	C	B	C	A
Approach Delay		38.3			21.7			29.2		24.1	
Approach LOS		D			C			C		C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 86 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 28.3 Intersection LOS: C
Intersection Capacity Utilization 79.1% ICU Level of Service D
Analysis Period (min) 15

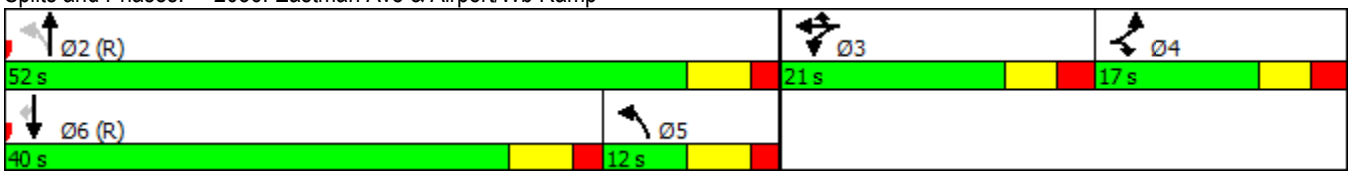
Splits and Phases: 2033: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	99	45	205	96	167	50	578	81	904	50
Future Volume (vph)	99	45	205	96	167	50	578	81	904	50
Turn Type	Prot	Prot	Split	NA	Prot	pm+pt	NA	Free	NA	Perm
Protected Phases	4	4	3	3	3	5	2		6	
Permitted Phases						2		Free		6
Detector Phase	4	4	3	3	3	5	2		6	6
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6	35.6
Total Split (s)	17.0	17.0	21.0	21.0	21.0	12.0	52.0		40.0	40.0
Total Split (%)	18.9%	18.9%	23.3%	23.3%	23.3%	13.3%	57.8%		44.4%	44.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	3.3
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.3	7.3		7.3	9.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag			Lead	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max	C-Max
Act Effct Green (s)	7.4	7.4	11.7	11.7	11.7	52.2	52.2	90.0	40.2	37.9
Actuated g/C Ratio	0.08	0.08	0.13	0.13	0.13	0.58	0.58	1.00	0.45	0.42
v/c Ratio	0.41	0.17	0.74	0.73	0.49	0.16	0.31	0.06	0.42	0.07
Control Delay	43.4	1.2	57.2	56.5	9.9	5.6	4.4	0.1	19.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	1.2	57.2	56.5	9.9	5.6	4.4	0.1	19.2	0.2
LOS	D	A	E	E	A	A	A	A	B	A
Approach Delay				40.0			4.0		18.2	
Approach LOS				D			A		B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 78 (87%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 19.0	Intersection LOS: B
Intersection Capacity Utilization 54.5%	ICU Level of Service A
Analysis Period (min) 15	

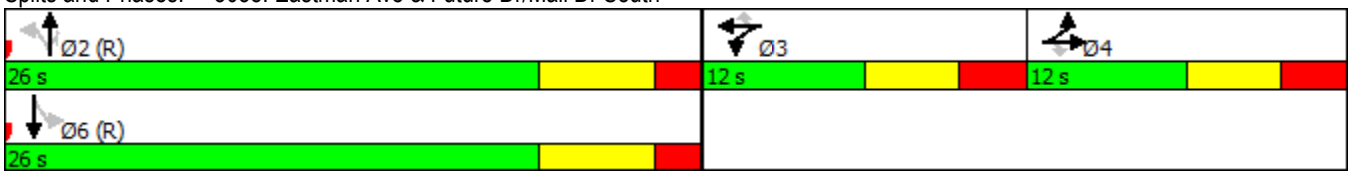
Splits and Phases: 2036: Eastman Ave & Airport/Wb Ramp



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	7	22	29	7	14	3	731	12	4	932
Future Volume (vph)	7	22	29	7	14	3	731	12	4	932
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	12.0	12.0	12.0	12.0	12.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	6.1	7.1	7.1	7.1	7.1
Lead/Lag	Lag	Lag	Lead	Lead	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	5.8	5.8	4.8	4.8	4.8	31.9	31.3	31.3	31.3	31.3
Actuated g/C Ratio	0.12	0.12	0.10	0.10	0.10	0.64	0.63	0.63	0.63	0.63
v/c Ratio	0.16	0.07	0.12	0.12	0.05	0.01	0.35	0.01	0.01	0.45
Control Delay	21.8	0.4	22.3	22.4	0.3	9.3	9.8	0.0	6.5	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	0.4	22.3	22.4	0.3	9.3	9.8	0.0	6.5	7.4
LOS	C	A	C	C	A	A	A	A	A	A
Approach Delay	13.0			16.2			9.6			7.4
Approach LOS	B			B			A			A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 49 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 8.7	Intersection LOS: A
Intersection Capacity Utilization 51.0%	ICU Level of Service A
Analysis Period (min) 15	

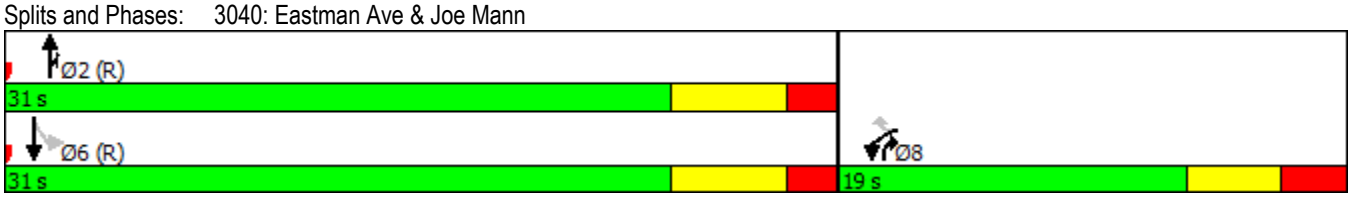
Splits and Phases: 3038: Eastman Ave & Future Dr/Mall Dr South



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	175	23	406	219	38	679
Future Volume (vph)	175	23	406	219	38	679
Turn Type	Prot	Perm	NA	pt+ov	Perm	NA
Protected Phases	8		2	2 8		6
Permitted Phases		8			6	
Detector Phase	8	8	2	2 8	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		10.0	10.0
Minimum Split (s)	11.0	11.0	16.2		16.2	16.2
Total Split (s)	19.0	19.0	31.0		31.0	31.0
Total Split (%)	38.0%	38.0%	62.0%		62.0%	62.0%
Yellow Time (s)	3.5	3.5	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	1.9		1.9	1.9
Lost Time Adjust (s)	1.0	3.0	1.0		1.0	1.0
Total Lost Time (s)	7.0	9.0	7.2		7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max		Max	Max
Act Effct Green (s)	12.0	10.0	23.8	50.0	23.8	23.8
Actuated g/C Ratio	0.24	0.20	0.48	1.00	0.48	0.48
v/c Ratio	0.23	0.07	0.25	0.15	0.09	0.43
Control Delay	16.2	8.6	14.8	0.2	7.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	8.6	14.8	0.2	7.9	9.7
LOS	B	A	B	A	A	A
Approach Delay	15.3		9.7			9.6
Approach LOS	B		A			A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 35 (70%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 42.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3040: Eastman Ave & Joe Mann



Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	193	673	7	21	36	0	0	15	7
Future Vol, veh/h	0	0	0	193	673	7	21	36	0	0	15	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	210	732	8	23	39	0	0	16	8

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	793	1159	0	1175	1155	369
Stage 1	-	-	-	0	0	-	1155	1155	-
Stage 2	-	-	-	793	1159	-	20	0	-
Critical Hdwy	-	-	-	6.84	6.54	-	6.84	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	5.54	-
Critical Hdwy Stg 2	-	-	-	5.84	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.52	4.02	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	326	194	-	185	196	628
Stage 1	-	-	-	-	-	-	262	269	-
Stage 2	-	-	-	406	268	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	326	0	-	185	0	628
Mov Cap-2 Maneuver	-	-	-	326	0	-	185	0	-
Stage 1	-	-	-	-	0	-	262	0	-
Stage 2	-	-	-	406	0	-	-	0	-

Approach	WB	NB	SB
HCM Control Delay, s			11
HCM LOS		-	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	326	-	-	-	-	628
HCM Lane V/C Ratio	0.07	-	-	-	-	0.038
HCM Control Delay (s)	16.9	-	-	-	-	11
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	0	0	0	669	17	0	41	15	7	58	0
Future Vol, veh/h	0	0	0	0	669	17	0	41	15	7	58	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	727	18	0	45	16	8	63	0

Major/Minor	Major2			Minor2			Minor1		
Conflicting Flow All	0	0	0	768	736	372	386	746	0
Stage 1	-	-	-	736	736	-	0	0	-
Stage 2	-	-	-	32	0	-	386	746	-
Critical Hdwy	-	-	-	6.84	6.54	6.94	6.84	6.54	-
Critical Hdwy Stg 1	-	-	-	5.84	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.84	5.54	-
Follow-up Hdwy	-	-	-	3.52	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	338	345	625	590	340	-
Stage 1	-	-	-	435	423	-	-	-	-
Stage 2	-	-	-	-	-	-	656	419	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	338	0	625	590	0	-
Mov Cap-2 Maneuver	-	-	-	338	0	-	590	0	-
Stage 1	-	-	-	435	0	-	-	0	-
Stage 2	-	-	-	-	0	-	656	0	-

Approach	WB	SE	NW
HCM Control Delay, s	0	11.4	
HCM LOS		B	-

Minor Lane/Major Mvmt	NWLn1	WBL	WBT	WBR	SELn1
Capacity (veh/h)	-	-	-	-	625
HCM Lane V/C Ratio	-	-	-	-	0.097
HCM Control Delay (s)	-	0	-	-	11.4
HCM Lane LOS	-	A	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	1223	0	0	0	0	7	34	0	0	65	5
Future Vol, veh/h	0	1223	0	0	0	0	7	34	0	0	65	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1329	0	0	0	0	8	37	0	0	71	5

Major/Minor	Major1			Minor2			Minor1		
Conflicting Flow All	0	0	0	700	1329	0	1347	1329	664
Stage 1	-	-	-	0	0	-	1329	1329	-
Stage 2	-	-	-	700	1329	-	18	0	-
Critical Hdwy	-	-	-	6.84	6.54	-	6.84	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	5.54	-
Critical Hdwy Stg 2	-	-	-	5.84	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.52	4.02	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	374	154	-	142	154	403
Stage 1	-	-	-	-	-	-	212	222	-
Stage 2	-	-	-	454	222	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	374	0	-	142	0	403
Mov Cap-2 Maneuver	-	-	-	374	0	-	142	0	-
Stage 1	-	-	-	-	0	-	212	0	-
Stage 2	-	-	-	454	0	-	-	0	-

Approach	EB	SE	NW
HCM Control Delay, s	0		16
HCM LOS		-	C

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	SELn1
Capacity (veh/h)	403	-	-	-	-
HCM Lane V/C Ratio	0.189	-	-	-	-
HCM Control Delay (s)	16	0	-	-	-
HCM Lane LOS	C	A	-	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-	-

Intersection	
Int Delay, s/veh	4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Traffic Vol, veh/h	0	0	0	155	717	0	0	0	0	0	69	209
Future Vol, veh/h	0	0	0	155	717	0	0	0	0	0	69	209
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	168	779	0	0	0	0	0	75	227

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	1116	1116	389
Stage 1	-	-	-	1116	1116	-
Stage 2	-	-	-	0	0	-
Critical Hdwy	-	-	-	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	162	206	610
Stage 1	-	-	-	221	281	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	162	0	610
Mov Cap-2 Maneuver	-	-	-	162	0	-
Stage 1	-	-	-	221	0	-
Stage 2	-	-	-	-	0	-

Approach	NW	SW
HCM Control Delay, s		16.6
HCM LOS		C

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	610
HCM Lane V/C Ratio	-	-	-	0.495
HCM Control Delay (s)	-	-	-	16.6
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	2.7

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	7	7	639	236	8	726
Future Vol, veh/h	7	7	639	236	8	726
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	-	-
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	8	8	695	257	9	789

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1235	476	0	0	951	0
Stage 1	823	-	-	-	-	-
Stage 2	412	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	169	535	-	-	718	-
Stage 1	392	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	165	535	-	-	718	-
Mov Cap-2 Maneuver	165	-	-	-	-	-
Stage 1	392	-	-	-	-	-
Stage 2	623	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	165	535	718	-
HCM Lane V/C Ratio	-	-	0.046	0.014	0.012	-
HCM Control Delay (s)	-	-	27.9	11.8	10.1	0.1
HCM Lane LOS	-	-	D	B	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	0	0	0	0	746	98	0	954	29
Future Vol, veh/h	0	0	0	0	0	0	0	746	98	0	954	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	811	107	0	1037	32

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1458	1864	534	1068	0	0	811	0	0
Stage 1	1053	1053	-	-	-	-	-	-	-
Stage 2	405	811	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	120	72	491	648	-	-	811	-	-
Stage 1	297	301	-	-	-	-	-	-	-
Stage 2	642	391	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	120	0	491	648	-	-	811	-	-
Mov Cap-2 Maneuver	120	0	-	-	-	-	-	-	-
Stage 1	297	0	-	-	-	-	-	-	-
Stage 2	642	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	648	-	-	-	811	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	30	58	0	0	0	625	144	0	854	0
Future Vol, veh/h	0	0	30	58	0	0	0	625	144	0	854	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	33	63	0	0	0	679	157	0	928	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1268	1764	464	1222	1686	418	928	0	0	836	0	0
Stage 1	928	928	-	758	758	-	-	-	-	-	-	-
Stage 2	340	836	-	464	928	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	125	83	545	136	93	584	733	-	-	794	-	-
Stage 1	288	345	-	365	413	-	-	-	-	-	-	-
Stage 2	648	381	-	548	345	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	125	83	545	128	93	584	733	-	-	794	-	-
Mov Cap-2 Maneuver	125	83	-	128	93	-	-	-	-	-	-	-
Stage 1	288	345	-	365	413	-	-	-	-	-	-	-
Stage 2	648	381	-	515	345	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	57.8	0	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	733	-	-	545	128	-	794	-	-
HCM Lane V/C Ratio	-	-	-	0.06	0.493	-	-	-	-
HCM Control Delay (s)	0	-	-	12	57.8	0	0	-	-
HCM Lane LOS	A	-	-	B	F	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.3	-	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	56	3	2	611	228	42
Future Vol, veh/h	56	3	2	611	228	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
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	61	3	2	664	248	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	607	147	293	0	-	0
Stage 1	271	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	428	873	1265	-	-	-
Stage 1	750	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	427	873	1265	-	-	-
Mov Cap-2 Maneuver	427	-	-	-	-	-
Stage 1	750	-	-	-	-	-
Stage 2	695	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1265	-	438	-	-
HCM Lane V/C Ratio	0.002	-	0.146	-	-
HCM Control Delay (s)	7.9	-	14.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	10.1	25.2	0.2	28
Bayliss	9004	4.0	23.9	0.2	37
Jefferson	1006	3.5	23.6	0.3	38
Carpenter	9008	1.4	8.8	0.1	37
	9010	0.7	14.9	0.2	43
	9012	0.7	15.2	0.2	43
George	1014	4.4	22.4	0.2	36
Total		24.7	134.0	1.4	37

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	2.0	20.6	0.2	39
	9011	1.5	22.6	0.3	42
Carpenter	9009	1.9	16.1	0.2	40
Jefferson	1007	4.5	8.8	0.1	22
Bayliss	1005	9.0	29.2	0.3	31
	9003	4.1	14.9	0.1	32
Washington	1002	6.0	14.7	0.1	28
Total		29.1	126.9	1.2	34

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	9017	1.2	6.9	0.1	28
Rodd	1020	3.5	15.6	0.1	28
Ashman	1022	4.2	16.2	0.1	24
Jerome #1	2024	7.8	25.6	0.2	25
Eastman Ave	9027	2.8	22.5	0.2	25
Total		19.4	86.8	0.6	26

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.8	7.6	0.1	39
Jerome #1	2025	12.3	21.9	0.1	16
Ashman	1023	6.7	24.8	0.2	25
Rodd	1021	3.4	15.6	0.1	26
Cronkright	1018	2.1	14.0	0.1	31
George	1015	3.1	9.2	0.1	21
Total		28.5	93.1	0.6	25

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	-	-	0.2	-
St Andrews	2029	2.9	25.1	0.3	40
Sugnet	2030	7.4	56.0	0.6	39
Saginaw	2031	20.1	59.6	0.5	30
Dilloway	2032	9.1	50.7	0.5	38
Wackerly	2033	28.5	60.3	0.4	24
Eb On Ramp	9034	3.1	6.0	0.0	20
Wb On Ramp	9035	1.1	7.3	0.1	37
Wb Ramp	2036	4.3	9.9	0.1	25
Mall Off	9037	1.4	7.5	0.1	36
Mall Dr South	3038	3.2	7.6	0.1	28
North Mall Dr	9039	3.3	12.0	0.1	34
Joe Mann	3040	7.6	13.5	0.1	19
Total		92.2	315.5	3.0	34

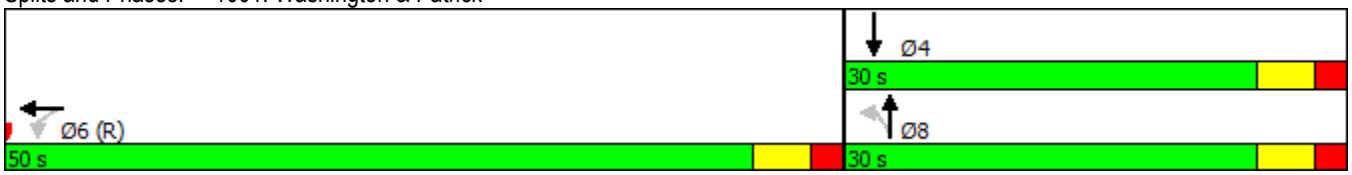
Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	7.5	22.8	0.2	31
	9039	2.4	8.5	0.1	31
Future Dr	3038	3.1	11.8	0.1	34
Saylor Dr	9037	1.7	6.6	0.1	32
Airport	2036	17.5	22.9	0.1	12
Wb On Ramp	9035	4.1	10.3	0.1	24
Eb On Ramp	9034	3.8	9.7	0.1	28
Wackerly	2033	20.8	23.4	0.0	5
Dilloway	2032	13.5	46.2	0.4	32
Saginaw	2031	24.3	65.9	0.5	29
Sugnet	2030	5.2	44.7	0.5	41
St Andrews	2029	3.9	52.5	0.6	42
Carpenter	9028	1.7	23.9	0.3	42
Indian	9027	0.7	13.2	0.2	42
Total		110.4	362.3	3.2	32

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1190	164	303	40
Future Volume (vph)	1190	164	303	40
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	50.0	30.0	30.0	30.0
Total Split (%)	62.5%	37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.5	6.5	6.5	6.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	50.6	16.4	16.4	16.4
Actuated g/C Ratio	0.63	0.20	0.20	0.20
v/c Ratio	0.62	0.73	0.46	0.25
Control Delay	11.4	29.9	14.3	18.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.4	29.9	14.3	18.7
LOS	B	C	B	B
Approach Delay	11.4		19.8	18.7
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 28 (35%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	

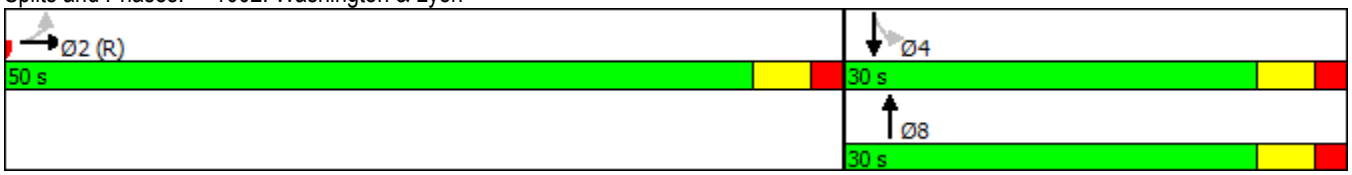
Splits and Phases: 1001: Washington & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	963	339	13	41
Future Volume (vph)	963	339	13	41
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	50.0	30.0	30.0	30.0
Total Split (%)	62.5%	37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	1.0	1.5		1.0
Total Lost Time (s)	6.5	7.0		6.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	52.3	14.2		14.7
Actuated g/C Ratio	0.65	0.18		0.18
v/c Ratio	0.52	0.72		0.11
Control Delay	3.7	34.6		22.0
Queue Delay	0.0	0.0		0.0
Total Delay	3.7	34.6		22.0
LOS	A	C		C
Approach Delay	3.7	34.6		22.0
Approach LOS	A	C		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 22 (28%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 53.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon



Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1037	106	113	74	71
Future Volume (vph)	1037	106	113	74	71
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	57.0	23.0	23.0	23.0	23.0
Total Split (%)	71.3%	28.8%	28.8%	28.8%	28.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	1.6	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	6.5	6.5	6.5	6.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	56.8	9.6	9.6	9.6	9.6
Actuated g/C Ratio	0.71	0.12	0.12	0.12	0.12
v/c Ratio	0.47	0.52	0.44	0.53	0.35
Control Delay	2.5	40.4	15.2	38.0	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	40.4	15.2	38.0	30.0
LOS	A	D	B	D	C
Approach Delay	2.5	27.4			34.1
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 8 (10%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 59.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1259	44	89	106
Future Volume (vph)	1259	44	89	106
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.2	26.7	26.7	26.7
Total Split (s)	53.0	27.0	27.0	27.0
Total Split (%)	66.3%	33.8%	33.8%	33.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.5	6.5	6.5	6.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.0	11.0	11.0	11.0
Actuated g/C Ratio	0.70	0.14	0.14	0.14
v/c Ratio	0.59	0.28	0.38	0.53
Control Delay	4.3	29.5	32.2	35.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.3	29.5	32.2	35.2
LOS	A	C	C	D
Approach Delay	4.3		31.3	35.2
Approach LOS	A		C	D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 65 (81%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 66.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1006: Jefferson & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	989	116	53	67
Future Volume (vph)	989	116	53	67
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.3	27.3	27.3	27.3
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.5	6.5	6.5	6.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	55.4	11.6	11.6	11.6
Actuated g/C Ratio	0.69	0.14	0.14	0.14
v/c Ratio	0.45	0.59	0.34	0.27
Control Delay	2.2	35.8	13.9	11.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.2	35.8	13.9	11.2
LOS	A	D	B	B
Approach Delay	2.2	35.8		12.4
Approach LOS	A	D		B

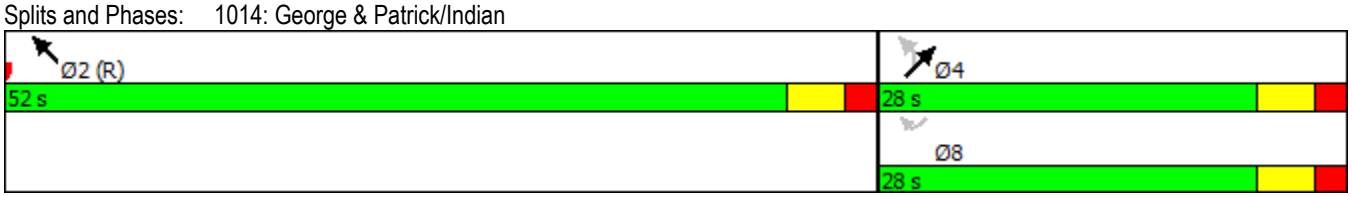
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 70 (88%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 7.1	Intersection LOS: A
Intersection Capacity Utilization 66.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1007: Jefferson & Lyon

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	1381	247	21	26
Future Volume (vph)	1381	247	21	26
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.4	26.4	26.4
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	1.5	1.2	1.2	1.2
Total Lost Time (s)	7.0	6.7	6.7	6.7
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	51.5	14.8	14.8	14.8
Actuated g/C Ratio	0.64	0.18	0.18	0.18
v/c Ratio	0.66	0.75	0.07	0.09
Control Delay	5.2	26.9	11.0	8.2
Queue Delay	0.0	0.7	0.0	0.0
Total Delay	5.2	27.6	11.0	8.2
LOS	A	C	B	A
Approach Delay	5.2		26.3	
Approach LOS	A		C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 38 (48%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

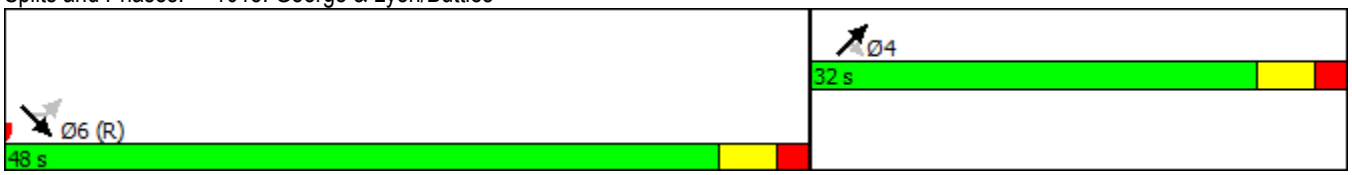
Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	872	242	150
Future Volume (vph)	872	242	150
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	48.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	1.6	1.7	1.7
Total Lost Time (s)	7.1	7.2	7.2
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	54.7	11.0	11.0
Actuated g/C Ratio	0.68	0.14	0.14
v/c Ratio	0.40	0.54	0.55
Control Delay	2.2	31.5	17.1
Queue Delay	0.2	0.0	0.0
Total Delay	2.4	31.5	17.1
LOS	A	C	B
Approach Delay	2.4	26.0	
Approach LOS	A	C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 24 (30%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	23	27	69	344	25
Future Volume (vph)	23	27	69	344	25
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0
Total Split (s)	35.0	35.0	35.0	45.0	45.0
Total Split (%)	43.8%	43.8%	43.8%	56.3%	56.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)		10.4	10.4	62.2	62.2
Actuated g/C Ratio		0.13	0.13	0.78	0.78
v/c Ratio		0.28	0.22	0.17	0.02
Control Delay		36.4	23.0	3.9	1.8
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		36.4	23.0	3.9	1.8
LOS		D	C	A	A
Approach Delay		36.4	23.0	3.7	
Approach LOS		D	C	A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.28	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 30.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St

Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	886	461
Future Volume (vph)	886	461
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.3
Total Split (s)	51.0	29.0
Total Split (%)	63.8%	36.3%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	1.7	1.2
Total Lost Time (s)	7.2	6.7
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	53.2	12.9
Actuated g/C Ratio	0.66	0.16
v/c Ratio	0.52	0.60
Control Delay	4.9	27.5
Queue Delay	0.0	0.0
Total Delay	4.9	27.5
LOS	A	C
Approach Delay	4.9	27.5
Approach LOS	A	C

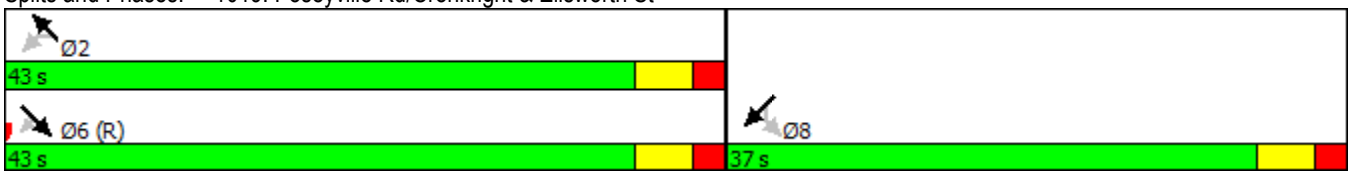
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 8 (10%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1018: Cronkright & Buttles

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	34	234	85	58	631
Future Volume (vph)	34	234	85	58	631
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	26.0	26.0	26.4
Total Split (s)	43.0	43.0	43.0	43.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	None
Act Effct Green (s)	50.2	50.2	50.2	50.2	18.8
Actuated g/C Ratio	0.63	0.63	0.63	0.63	0.24
v/c Ratio	0.03	0.25	0.11	0.05	0.61
Control Delay	6.9	4.9	5.9	5.5	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	4.9	5.9	5.5	14.0
LOS	A	A	A	A	B
Approach Delay	5.1			5.7	14.0
Approach LOS	A			A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 18 (23%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 10.7	Intersection LOS: B
Intersection Capacity Utilization 47.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1019: Poseyville Rd/Cronkright & Ellsworth St



Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	1424	268
Future Volume (vph)	1424	268
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.5	0.7
Total Lost Time (s)	6.0	6.2
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	56.9	10.9
Actuated g/C Ratio	0.71	0.14
v/c Ratio	0.64	0.46
Control Delay	3.7	28.8
Queue Delay	0.0	0.0
Total Delay	3.7	28.8
LOS	A	C
Approach Delay	3.7	28.8
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 52 (65%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	1037	134
Future Volume (vph)	1037	134
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.3
Total Lost Time (s)	4.1	4.2
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	60.2	11.5
Actuated g/C Ratio	0.75	0.14
v/c Ratio	0.49	0.28
Control Delay	1.3	20.8
Queue Delay	0.0	0.0
Total Delay	1.3	20.8
LOS	A	C
Approach Delay	1.3	20.8
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 4 (5%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 4.0	Intersection LOS: A
Intersection Capacity Utilization 46.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	1386	278
Future Volume (vph)	1386	278
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	1.6	1.5
Total Lost Time (s)	7.1	7.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	52.9	13.0
Actuated g/C Ratio	0.66	0.16
v/c Ratio	0.68	0.64
Control Delay	4.5	32.5
Queue Delay	0.1	0.0
Total Delay	4.6	32.5
LOS	A	C
Approach Delay	4.6	32.5
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 66 (83%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian

Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	1136	69	281
Future Volume (vph)	1136	69	281
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.3	-1.3
Total Lost Time (s)	4.1	4.2	4.2
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	57.0	14.7	14.7
Actuated g/C Ratio	0.71	0.18	0.18
v/c Ratio	0.52	0.20	0.47
Control Delay	4.6	1.0	11.8
Queue Delay	0.0	0.0	0.0
Total Delay	4.6	1.0	11.8
LOS	A	A	B
Approach Delay	4.6		9.6
Approach LOS	A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 74 (93%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 5.7	Intersection LOS: A
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	1020	562	476
Future Volume (vph)	1020	562	476
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	26.2	26.2	26.5
Total Split (s)	52.9	52.9	27.1
Total Split (%)	66.1%	66.1%	33.9%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	3.0	3.0	3.0
Total Lost Time (s)	8.5	8.5	8.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	48.8	48.8	14.2
Actuated g/C Ratio	0.61	0.61	0.18
v/c Ratio	0.58	0.57	0.85
Control Delay	5.6	4.5	42.0
Queue Delay	0.6	0.1	0.1
Total Delay	6.2	4.6	42.1
LOS	A	A	D
Approach Delay		5.1	42.1
Approach LOS		A	D

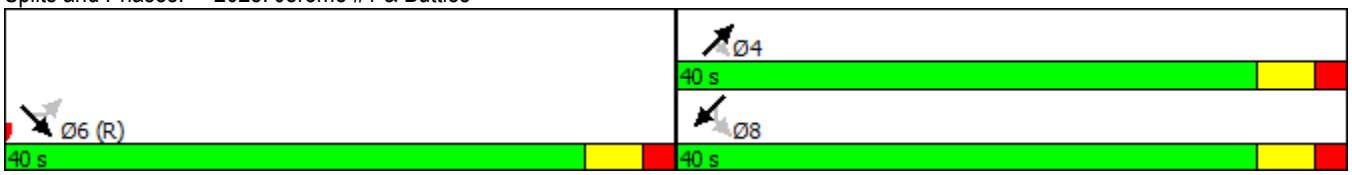
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 2 (3%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 91.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SET	NET	NER	SWL	SWT
Lane Configurations					
Traffic Volume (vph)	661	463	525	6	1014
Future Volume (vph)	661	463	525	6	1014
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	6	4			8
Permitted Phases			4	8	
Detector Phase	6	4	4	8	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	29.8	29.8	29.8	29.8
Total Split (s)	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.8	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	3.7	3.8	3.8	3.8	3.8
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	39.1	33.4	33.4	33.4	33.4
Actuated g/C Ratio	0.49	0.42	0.42	0.42	0.42
v/c Ratio	0.59	0.53	0.49	0.04	0.75
Control Delay	16.4	15.5	11.8	2.0	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.3
Total Delay	16.4	15.5	11.8	2.0	12.4
LOS	B	B	B	A	B
Approach Delay	16.4	14.4			12.3
Approach LOS	B	B			B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 56 (70%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	58	76	40	76	53	753	69	806
Future Volume (vph)	58	76	40	76	53	753	69	806
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	36.0	36.0	36.0	36.0	64.0	64.0	64.0	64.0
Total Split (%)	36.0%	36.0%	36.0%	36.0%	64.0%	64.0%	64.0%	64.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.2	12.2	12.2	12.2	75.1	75.1	75.1	75.1
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.75	0.75	0.75	0.75
v/c Ratio	0.57	0.62	0.36	0.65	0.14	0.33	0.17	0.35
Control Delay	59.7	39.3	46.6	39.9	5.3	4.9	3.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	39.3	46.6	39.9	5.3	4.9	3.8	3.6
LOS	E	D	D	D	A	A	A	A
Approach Delay		45.2		41.3		4.9		3.6
Approach LOS		D		D		A		A

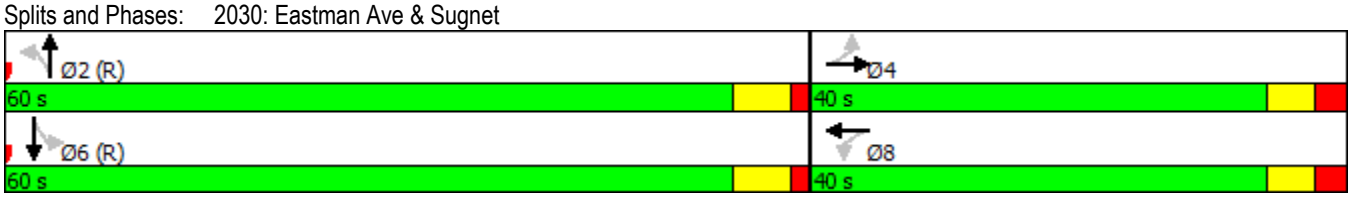
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 99 (99%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2029: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	138	52	61	49	788	33	778
Future Volume (vph)	35	138	52	61	49	788	33	778
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	40.0	40.0	40.0	40.0	60.0	60.0	60.0	60.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	6.8	6.8	6.8	6.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	16.9	16.9	16.9	16.9	69.2	69.2	69.2	69.2
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.69	0.69	0.69	0.69
v/c Ratio	0.17	0.78	0.49	0.24	0.13	0.38	0.10	0.36
Control Delay	34.8	49.4	49.8	31.9	5.6	6.4	3.2	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	49.4	49.8	31.9	5.6	6.4	3.2	3.6
LOS	C	D	D	C	A	A	A	A
Approach Delay		47.5		39.6		6.4		3.6
Approach LOS		D		D		A		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 49 (49%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

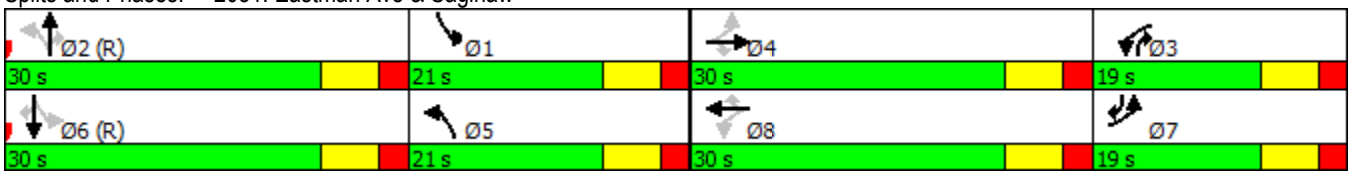
Splits and Phases: 2030: Eastman Ave & Sugnet



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	665	146	106	699	428	228	485	119	256	590	129
Future Volume (vph)	278	665	146	106	699	428	228	485	119	256	590	129
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	11.6	11.5	16.5	11.6
Total Split (s)	19.0	30.0	30.0	19.0	30.0	30.0	21.0	30.0	19.0	21.0	30.0	19.0
Total Split (%)	19.0%	30.0%	30.0%	19.0%	30.0%	30.0%	21.0%	30.0%	19.0%	21.0%	30.0%	19.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.3
Lost Time Adjust (s)	3.0	0.4	0.4	3.0	0.4	0.4	3.0	0.5	3.0	3.0	0.5	3.0
Total Lost Time (s)	9.6	7.0	7.0	9.6	7.0	7.0	9.5	7.0	9.6	9.5	7.0	9.6
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?												
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	30.5	23.7	23.7	30.5	23.7	23.7	31.3	23.0	39.4	31.3	23.0	39.4
Actuated g/C Ratio	0.30	0.24	0.24	0.30	0.24	0.24	0.31	0.23	0.39	0.31	0.23	0.39
v/c Ratio	1.26	0.87	0.31	0.48	0.91	0.73	0.95	0.65	0.19	0.92	0.85	0.20
Control Delay	182.4	49.6	5.2	37.7	54.4	16.7	77.1	32.7	2.0	68.9	45.8	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	182.4	49.6	5.2	37.7	54.4	16.7	77.1	32.7	2.0	68.9	45.8	3.4
LOS	F	D	A	D	D	B	E	C	A	E	D	A
Approach Delay		77.5			39.9			40.5			46.8	
Approach LOS		E			D			D			D	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 51.6	Intersection LOS: D
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2031: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	43	31	71	31	26	1118	44	869
Future Volume (vph)	43	31	71	31	26	1118	44	869
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	24.0	24.0	24.0	24.0	76.0	76.0	76.0	76.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.7	6.7	6.7	6.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.1	11.1	11.1	11.1	76.2	76.2	76.2	76.2
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.76	0.76	0.76	0.76
v/c Ratio	0.33	0.38	0.52	0.40	0.07	0.47	0.17	0.37
Control Delay	45.7	45.7	53.8	21.7	3.6	5.3	5.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	45.7	53.8	21.7	3.6	5.3	5.7	4.6
LOS	D	D	D	C	A	A	A	A
Approach Delay		45.7		35.8		5.2		4.7
Approach LOS		D		D		A		A

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 57.7%	ICU Level of Service B
Analysis Period (min) 15	

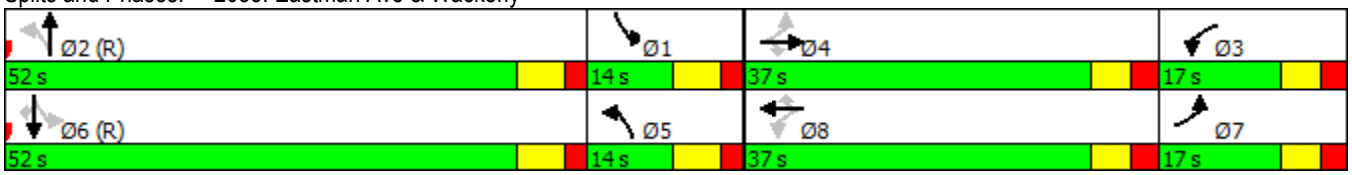
Splits and Phases: 2032: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	207	201	150	142	155	251	84	1038	123	655	266
Future Volume (vph)	207	201	150	142	155	251	84	1038	123	655	266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.1	30.5	30.5	11.1	30.5	30.5	11.3	26.0	11.3	26.0	26.0
Total Split (s)	17.0	37.0	37.0	17.0	37.0	37.0	14.0	52.0	14.0	52.0	52.0
Total Split (%)	14.2%	30.8%	30.8%	14.2%	30.8%	30.8%	11.7%	43.3%	11.7%	43.3%	43.3%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	3.1	1.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	7.1	7.1	7.1	7.1	7.1	9.2	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lead
Lead-Lag Optimize?											
Recall Mode	Min	Max	Max	Min	Max	Max	Min	C-Max	Min	C-Max	C-Max
Act Effct Green (s)	36.5	30.5	30.5	36.5	30.5	28.4	54.7	48.6	54.7	48.6	48.6
Actuated g/C Ratio	0.30	0.25	0.25	0.30	0.25	0.24	0.46	0.40	0.46	0.40	0.40
v/c Ratio	0.64	0.45	0.31	0.56	0.44	0.64	0.29	0.63	0.69	0.48	0.35
Control Delay	41.6	41.6	7.1	38.1	41.2	23.4	20.7	30.0	35.7	20.9	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	41.6	7.1	38.1	41.2	23.4	20.7	30.0	35.7	20.9	3.2
LOS	D	D	A	D	D	C	C	C	D	C	A
Approach Delay		32.3			32.3			29.3		18.2	
Approach LOS		C			C			C		B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 101 (84%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 27.1 Intersection LOS: C
Intersection Capacity Utilization 72.7% ICU Level of Service C
Analysis Period (min) 15

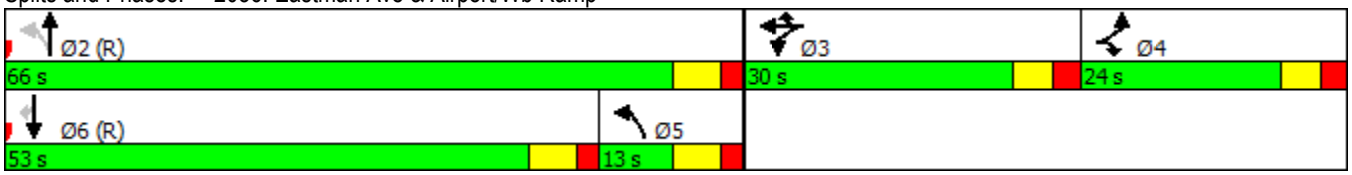
Splits and Phases: 2033: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	168	78	239	107	300	75	859	224	1046	153
Future Volume (vph)	168	78	239	107	300	75	859	224	1046	153
Turn Type	Prot	Prot	Split	NA	Prot	pm+pt	NA	Free	NA	Perm
Protected Phases	4	4	3	3	3	5	2		6	
Permitted Phases						2		Free		6
Detector Phase	4	4	3	3	3	5	2		6	6
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6	35.6
Total Split (s)	24.0	24.0	30.0	30.0	30.0	13.0	66.0		53.0	53.0
Total Split (%)	20.0%	20.0%	25.0%	25.0%	25.0%	10.8%	55.0%		44.2%	44.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	3.3
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.3	7.3		7.3	9.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag			Lead	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max	C-Max
Act Effct Green (s)	11.0	11.0	18.5	18.5	18.5	69.2	69.2	120.0	56.2	53.9
Actuated g/C Ratio	0.09	0.09	0.15	0.15	0.15	0.58	0.58	1.00	0.47	0.45
v/c Ratio	0.63	0.34	0.71	0.72	0.90	0.29	0.46	0.16	0.46	0.20
Control Delay	61.3	5.0	63.1	62.7	54.6	9.3	7.3	0.2	17.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.3	5.0	63.1	62.7	54.6	9.3	7.3	0.2	17.9	5.4
LOS	E	A	E	E	D	A	A	A	B	A
Approach Delay				59.0			6.0		16.3	
Approach LOS				E			A		B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 100 (83%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

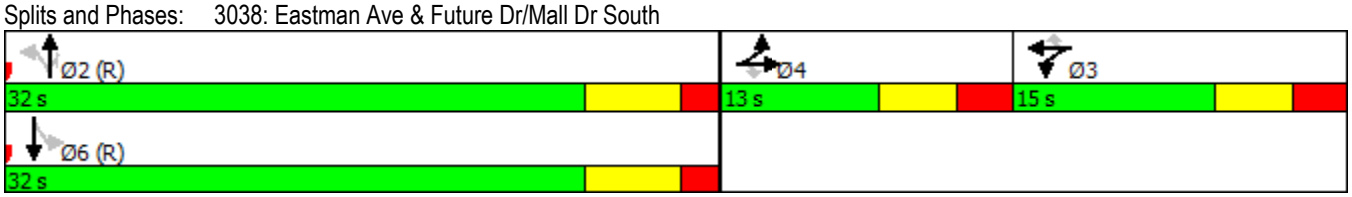
Splits and Phases: 2036: Eastman Ave & Airport/Wb Ramp



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	7	22	293	13	33	33	828	89	20	908
Future Volume (vph)	7	22	293	13	33	33	828	89	20	908
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	13.0	13.0	15.0	15.0	15.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	21.7%	21.7%	25.0%	25.0%	25.0%	53.3%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	6.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lead	Lag	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	6.4	6.4	8.0	8.0	8.0	31.2	30.2	30.2	30.2	30.2
Actuated g/C Ratio	0.11	0.11	0.13	0.13	0.13	0.52	0.50	0.50	0.50	0.50
v/c Ratio	0.18	0.08	0.74	0.74	0.10	0.16	0.49	0.11	0.08	0.55
Control Delay	26.5	0.5	47.1	47.2	0.6	12.1	11.7	1.3	11.2	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	0.5	47.1	47.2	0.6	12.1	11.7	1.3	11.2	12.4
LOS	C	A	D	D	A	B	B	A	B	B
Approach Delay	15.7			42.7			10.8			12.4
Approach LOS	B			D			B			B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 57 (95%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 55.3%	ICU Level of Service B
Analysis Period (min) 15	

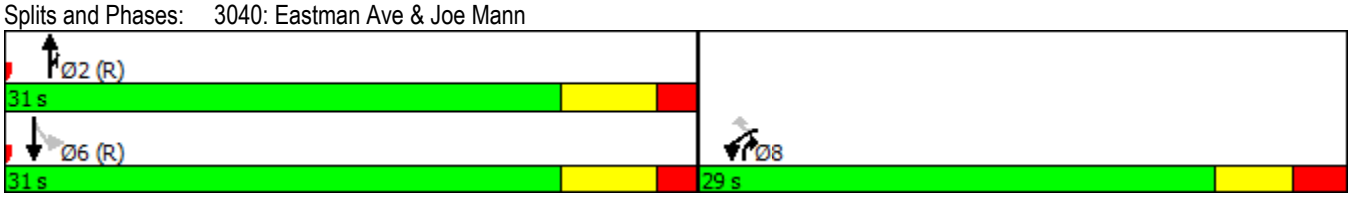
Splits and Phases: 3038: Eastman Ave & Future Dr/Mall Dr South



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	419	74	260	331	59	448
Future Volume (vph)	419	74	260	331	59	448
Turn Type	Prot	Perm	NA	pt+ov	Perm	NA
Protected Phases	8		2	2 8		6
Permitted Phases		8			6	
Detector Phase	8	8	2	2 8	6	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	10.0		10.0	10.0
Minimum Split (s)	13.0	13.0	16.2		16.2	16.2
Total Split (s)	29.0	29.0	31.0		31.0	31.0
Total Split (%)	48.3%	48.3%	51.7%		51.7%	51.7%
Yellow Time (s)	3.5	3.5	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	1.9		1.9	1.9
Lost Time Adjust (s)	1.0	3.0	1.0		1.0	1.0
Total Lost Time (s)	7.0	9.0	7.2		7.2	7.2
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max		Max	Max
Act Effct Green (s)	22.0	20.0	23.8	60.0	23.8	23.8
Actuated g/C Ratio	0.37	0.33	0.40	1.00	0.40	0.40
v/c Ratio	0.36	0.14	0.20	0.22	0.15	0.34
Control Delay	14.9	4.8	5.9	0.3	12.8	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	4.8	5.9	0.3	12.8	13.5
LOS	B	A	A	A	B	B
Approach Delay	13.4		2.8			13.4
Approach LOS	B		A			B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 19 (32%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 46.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3040: Eastman Ave & Joe Mann



Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	130	1250	91	21	101	0	0	15	74
Future Vol, veh/h	0	0	0	130	1250	91	21	101	0	0	15	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	141	1359	99	23	110	0	0	16	80

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	970	1740	0	1746	1691	728
Stage 1	-	-	-	0	0	-	1691	1691	-
Stage 2	-	-	-	970	1740	-	55	0	-
Critical Hdwy	-	-	-	6.84	6.54	-	6.84	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	5.54	-
Critical Hdwy Stg 2	-	-	-	5.84	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.52	4.02	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	251	~ 86	-	77	92	366
Stage 1	-	-	-	-	-	-	135	148	-
Stage 2	-	-	-	328	140	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	251	0	-	77	0	366
Mov Cap-2 Maneuver	-	-	-	251	0	-	77	0	-
Stage 1	-	-	-	-	0	-	135	0	-
Stage 2	-	-	-	328	0	-	-	0	-

Approach	WB	NB	SB
HCM Control Delay, s			18.3
HCM LOS		-	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	251	-	-	-	-	366
HCM Lane V/C Ratio	0.091	-	-	-	-	0.264
HCM Control Delay (s)	20.8	-	-	-	-	18.3
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	-	1

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	0	0	0	1322	1	0	41	57	7	58	0
Future Vol, veh/h	0	0	0	0	1322	1	0	41	57	7	58	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	1437	1	0	45	62	8	63	0

Major/Minor	Major2			Minor2			Minor1		
Conflicting Flow All	0	0	0	1469	1437	718	741	1438	0
Stage 1	-	-	-	1437	1437	-	0	0	-
Stage 2	-	-	-	32	0	-	741	1438	-
Critical Hdwy	-	-	-	6.84	6.54	6.94	6.84	6.54	-
Critical Hdwy Stg 1	-	-	-	5.84	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.84	5.54	-
Follow-up Hdwy	-	-	-	3.52	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	118	132	371	352	132	-
Stage 1	-	-	-	185	197	-	-	-	-
Stage 2	-	-	-	-	-	-	432	197	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	118	0	371	352	0	-
Mov Cap-2 Maneuver	-	-	-	118	0	-	352	0	-
Stage 1	-	-	-	185	0	-	-	0	-
Stage 2	-	-	-	-	0	-	432	0	-

Approach	WB	SE	NW
HCM Control Delay, s	0	18.6	
HCM LOS		C	-

Minor Lane/Major Mvmt	NWLn1	WBL	WBT	WBR	SELn1
Capacity (veh/h)	-	-	-	-	371
HCM Lane V/C Ratio	-	-	-	-	0.287
HCM Control Delay (s)	-	0	-	-	18.6
HCM Lane LOS	-	A	-	-	C
HCM 95th %tile Q(veh)	-	-	-	-	1.2

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	0	1007	15	0	0	0	7	34	0	0	65	5
Future Vol, veh/h	0	1007	15	0	0	0	7	34	0	0	65	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1095	16	0	0	0	8	37	0	0	71	5

Major/Minor	Major1			Minor2			Minor1		
Conflicting Flow All	0	0	0	583	1111	0	1121	1103	554
Stage 1	-	-	-	0	0	-	1103	1103	-
Stage 2	-	-	-	583	1111	-	18	0	-
Critical Hdwy	-	-	-	6.84	6.54	-	6.84	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	5.84	5.54	-
Critical Hdwy Stg 2	-	-	-	5.84	5.54	-	-	-	-
Follow-up Hdwy	-	-	-	3.52	4.02	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	443	208	-	200	210	476
Stage 1	-	-	-	-	-	-	279	285	-
Stage 2	-	-	-	521	283	-	-	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	443	0	-	200	0	476
Mov Cap-2 Maneuver	-	-	-	443	0	-	200	0	-
Stage 1	-	-	-	-	0	-	279	0	-
Stage 2	-	-	-	521	0	-	-	0	-

Approach	EB	SE	NW
HCM Control Delay, s	0		14
HCM LOS		-	B

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	SELn1
Capacity (veh/h)	476	-	-	-	-
HCM Lane V/C Ratio	0.16	-	-	-	-
HCM Control Delay (s)	14	0	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-	-

Intersection	
Int Delay, s/veh	11.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Traffic Vol, veh/h	0	0	0	268	1379	7	0	0	0	0	205	105
Future Vol, veh/h	0	0	0	268	1379	7	0	0	0	0	205	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	291	1499	8	0	0	0	0	223	114

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	2085	2085	752
Stage 1	-	-	-	2085	2085	-
Stage 2	-	-	-	0	0	-
Critical Hdwy	-	-	-	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	30	~ 52	353
Stage 1	-	-	-	54	~ 93	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	30	0	353
Mov Cap-2 Maneuver	-	-	-	30	0	-
Stage 1	-	-	-	54	0	-
Stage 2	-	-	-	-	0	-

Approach	NW	SW
HCM Control Delay, s		71.9
HCM LOS		F

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	353
HCM Lane V/C Ratio	-	-	-	0.955
HCM Control Delay (s)	-	-	-	71.9
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	10.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	7	7	844	194	8	904
Future Vol, veh/h	7	7	844	194	8	904
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	-	-
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	8	8	917	211	9	983

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1532	564	0	0	1128	0
Stage 1	1023	-	-	-	-	-
Stage 2	509	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	107	469	-	-	615	-
Stage 1	308	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	104	469	-	-	615	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	308	-	-	-	-	-
Stage 2	551	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.6	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	104	469	615	-
HCM Lane V/C Ratio	-	-	0.073	0.016	0.014	-
HCM Control Delay (s)	-	-	42.3	12.8	10.9	0.2
HCM Lane LOS	-	-	E	B	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	0	0	0	0	950	377	0	1199	24
Future Vol, veh/h	0	0	0	0	0	0	0	950	377	0	1199	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	1033	410	0	1303	26

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1832	2349	665	1329	0	0	1033	0	0
Stage 1	1316	1316	-	-	-	-	-	-	-
Stage 2	516	1033	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	68	36	403	515	-	-	668	-	-
Stage 1	215	226	-	-	-	-	-	-	-
Stage 2	564	308	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	68	0	403	515	-	-	668	-	-
Mov Cap-2 Maneuver	68	0	-	-	-	-	-	-	-
Stage 1	215	0	-	-	-	-	-	-	-
Stage 2	564	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	515	-	-	-	668	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	-	-
HCM Lane LOS	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	30	58	0	30	0	561	324	0	867	0
Future Vol, veh/h	0	0	30	58	0	30	0	561	324	0	867	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	33	63	0	33	0	610	352	0	942	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1247	1904	471	1257	1728	481	942	0	0	962	0	0
Stage 1	942	942	-	786	786	-	-	-	-	-	-	-
Stage 2	305	962	-	471	942	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	130	68	539	128	88	531	724	-	-	711	-	-
Stage 1	283	340	-	351	401	-	-	-	-	-	-	-
Stage 2	680	332	-	542	340	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	122	68	539	120	88	531	724	-	-	711	-	-
Mov Cap-2 Maneuver	122	68	-	120	88	-	-	-	-	-	-	-
Stage 1	283	340	-	351	401	-	-	-	-	-	-	-
Stage 2	638	332	-	509	340	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	46.5	0	0
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	724	-	-	539	120	531	711	-	-
HCM Lane V/C Ratio	-	-	-	0.06	0.525	0.061	-	-	-
HCM Control Delay (s)	0	-	-	12.1	64.2	12.2	0	-	-
HCM Lane LOS	A	-	-	B	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.5	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	58	7	35	385	723	227
Future Vol, veh/h	58	7	35	385	723	227
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
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	63	8	38	418	786	247

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1194	516	1033	0	-	0
Stage 1	909	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	179	504	668	-	-	-
Stage 1	353	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	169	504	668	-	-	-
Mov Cap-2 Maneuver	169	-	-	-	-	-
Stage 1	353	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	36.8	0.9	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	668	-	182	-	-
HCM Lane V/C Ratio	0.057	-	0.388	-	-
HCM Control Delay (s)	10.7	-	36.8	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0.2	-	1.7	-	-

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	11.4	26.5	0.2	27
Bayliss	9004	7.1	26.8	0.2	33
Jefferson	1006	8.0	27.9	0.3	32
Carpenter	9008	2.2	9.7	0.1	34
	9010	1.2	15.5	0.2	41
	9012	1.3	15.9	0.2	41
George	1014	7.6	25.6	0.2	32
Total		38.8	147.8	1.4	33

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	2.0	20.6	0.2	39
	9011	1.3	22.5	0.3	42
Carpenter	9009	1.7	15.9	0.2	40
Jefferson	1007	4.5	8.7	0.1	22
Bayliss	1005	4.6	24.8	0.3	37
	9003	2.8	13.5	0.1	35
Washington	1002	8.5	17.2	0.1	24
Total		25.4	123.1	1.2	36

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	9017	2.1	7.8	0.1	25
Rodd	1020	6.8	18.9	0.1	23
Ashman	1022	6.9	18.9	0.1	21
Jerome #1	2024	5.3	23.2	0.2	28
Eastman Ave	9027	2.7	22.0	0.2	25
Total		23.9	90.8	0.6	25

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.6	9.3	0.1	32
Jerome #1	2025	18.9	28.6	0.1	12
Ashman	1023	4.9	22.7	0.2	28
Rodd	1021	4.0	16.1	0.1	25
Cronkright	1018	6.2	18.0	0.1	24
George	1015	2.9	9.1	0.1	21
Total		37.5	103.8	0.6	22

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	0.5	0.9	0.2	635
St Andrews	2029	6.5	28.8	0.3	35
Sugnet	2030	7.7	55.6	0.6	40
Saginaw	2031	26.8	66.2	0.5	27
Dilloway	2032	10.8	50.4	0.5	38
Wackerly	2033	33.4	64.9	0.4	23
Eb On Ramp	9034	3.3	6.1	0.0	20
Wb On Ramp	9035	1.7	7.9	0.1	34
Wb Ramp	2036	8.7	14.2	0.1	17
Mall Off	9037	2.9	9.0	0.1	30
Mall Dr South	3038	6.9	11.3	0.1	19
North Mall Dr	9039	7.2	15.9	0.1	25
Joe Mann	3040	6.9	12.8	0.1	20
Total		123.2	344.0	3.0	31

Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	11.6	26.8	0.2	26
	9039	2.9	9.0	0.1	29
Future Dr	3038	10.1	18.7	0.1	22
Saylor Dr	9037	3.3	8.1	0.1	26
Airport	2036	22.4	27.9	0.1	10
Wb On Ramp	9035	4.7	10.9	0.1	23
Eb On Ramp	9034	3.3	9.2	0.1	29
Wackerly	2033	16.5	18.9	0.0	6
Dilloway	2032	10.6	42.6	0.4	34
Saginaw	2031	35.9	77.4	0.5	25
Sugnet	2030	9.2	48.0	0.5	38
St Andrews	2029	7.1	55.5	0.6	40
Carpenter	9028	2.6	24.6	0.3	40
Indian	9027	1.5	14.0	0.2	40
Total		141.6	391.7	3.2	29

Appendix D
Alternative 1A Capacity Analysis

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	9.1	24.1	0.2	29
Bayliss	9004	4.0	23.8	0.2	37
Jefferson	1006	3.5	23.6	0.3	38
Carpenter	9008	1.3	8.7	0.1	38
	9010	0.7	14.9	0.2	43
	9012	0.7	15.2	0.2	43
George	1014	4.5	22.4	0.2	36
Total		23.8	132.8	1.4	37

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	1.8	20.3	0.2	40
	9011	1.5	22.7	0.3	42
Carpenter	9009	1.8	16.0	0.2	40
Jefferson	1007	4.5	8.7	0.1	22
Bayliss	1005	6.3	26.5	0.3	34
	9003	3.7	14.5	0.1	32
Washington	1002	5.2	13.9	0.1	29
Total		24.9	122.6	1.2	36

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	9017	1.2	6.8	0.1	28
Rodd	1020	5.5	18.0	0.1	25
Ashman	1022	3.4	14.7	0.1	27
Jerome #1	2024	6.9	25.1	0.2	25
Eastman Ave	9027	2.8	22.5	0.2	25
Total		19.8	87.1	0.6	26

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.8	7.5	0.1	39
Jerome #1	2025	10.8	20.4	0.1	17
Ashman	1023	6.7	24.9	0.2	25
Rodd	1021	4.3	15.9	0.1	25
Cronkright	1018	2.4	14.5	0.1	30
George	1015	1.9	8.1	0.1	24
Total		26.9	91.4	0.6	25

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	-	-	0.2	-
St Andrews	2029	4.5	26.6	0.3	37
Sugnet	2030	7.2	55.4	0.6	40
Saginaw	2031	23.4	62.6	0.5	29
Dilloway	2032	7.6	49.0	0.5	39
Wackerly	2033	15.4	47.4	0.4	31
Eb On Ramp	9034	1.9	4.8	0.0	25
Wb On Ramp	9035	0.8	7.0	0.1	39
Wb Ramp	2036	4.1	9.6	0.1	26
Mall Off	9037	1.7	7.7	0.1	35
Mall Dr South	3038	3.2	7.7	0.1	28
North Mall Dr	9039	3.3	12.0	0.1	34
Joe Mann	3040	7.6	13.6	0.1	19
Total		80.8	303.4	3.0	35

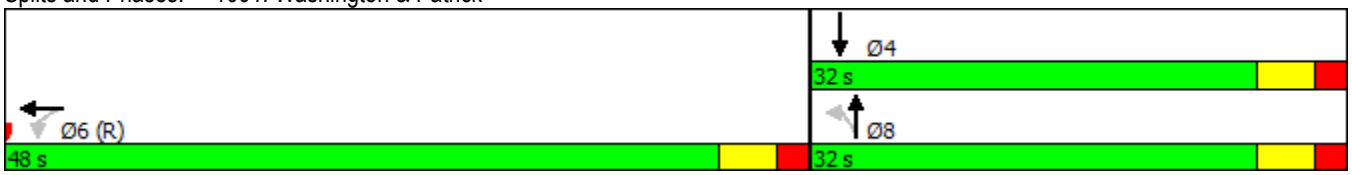
Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	7.7	23.0	0.2	31
	9039	2.5	8.6	0.1	30
Future Dr	3038	2.6	11.3	0.1	36
Saylor Dr	9037	1.6	6.4	0.1	33
Airport	2036	14.0	19.5	0.1	14
Wb On Ramp	9035	3.7	9.9	0.1	25
Eb On Ramp	9034	2.9	8.8	0.1	30
Wackerly	2033	16.2	18.7	0.0	6
Dilloway	2032	9.1	41.3	0.4	36
Saginaw	2031	18.4	59.8	0.5	32
Sugnet	2030	5.3	45.0	0.5	40
St Andrews	2029	7.8	56.4	0.6	39
Carpenter	9028	2.3	24.5	0.3	40
Indian	9027	0.6	13.1	0.2	43
Total		94.7	346.4	3.2	33

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	709	76	123	246
Future Volume (vph)	709	76	123	246
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	55.6	13.4	13.4	13.4
Actuated g/C Ratio	0.70	0.17	0.17	0.17
v/c Ratio	0.40	0.61	0.23	0.58
Control Delay	6.3	33.2	14.9	27.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	33.2	14.9	27.8
LOS	A	C	B	C
Approach Delay	6.3		21.9	27.8
Approach LOS	A		C	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 27 (34%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1001: Washington & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	977	146	4	380
Future Volume (vph)	977	146	4	380
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5		5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.6	15.4		15.4
Actuated g/C Ratio	0.67	0.19		0.19
v/c Ratio	0.47	0.25		0.64
Control Delay	1.3	25.5		22.9
Queue Delay	0.0	0.0		0.0
Total Delay	1.3	25.5		22.9
LOS	A	C		C
Approach Delay	1.3	25.5		22.9
Approach LOS	A	C		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 26 (33%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 51.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	193	673	7	21	36	0	0	15	7
Future Vol, veh/h	0	0	0	193	673	7	21	36	0	0	15	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	210	732	8	23	39	0	0	16	8

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	793	1159	-	-	1155	370
Stage 1	-	-	-	0	0	-	-	1155	-
Stage 2	-	-	-	793	1159	-	-	0	-
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	279	194	0	0	196	627
Stage 1	-	-	-	-	-	0	0	269	-
Stage 2	-	-	-	348	268	0	0	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	258	194	-	-	196	627
Mov Cap-2 Maneuver	-	-	-	258	194	-	-	196	-
Stage 1	-	-	-	-	-	-	-	269	-
Stage 2	-	-	-	323	268	-	-	-	-

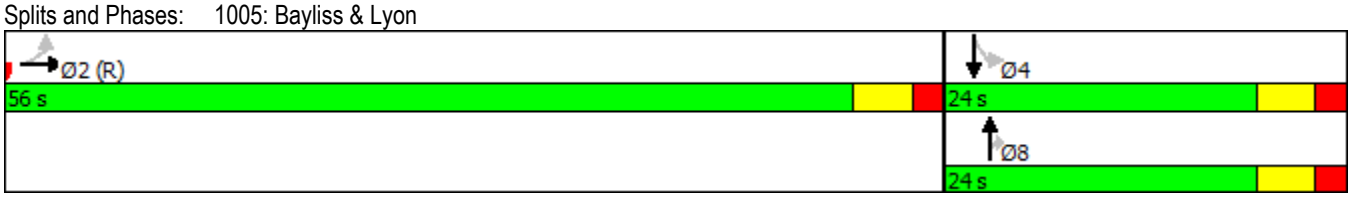
Approach	WB	NB	SB
HCM Control Delay, s		25.3	20.8
HCM LOS		D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	258	194	-	-	-	251
HCM Lane V/C Ratio	0.088	0.202	-	-	-	0.095
HCM Control Delay (s)	20.3	28.2	-	-	-	20.8
HCM Lane LOS	C	D	-	-	-	C
HCM 95th %tile Q(veh)	0.3	0.7	-	-	-	0.3

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1266	53	15	21	187
Future Volume (vph)	1266	53	15	21	187
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	56.0	24.0	24.0	24.0	24.0
Total Split (%)	70.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	55.2	13.8	13.8	13.8	13.8
Actuated g/C Ratio	0.69	0.17	0.17	0.17	0.17
v/c Ratio	0.58	0.18	0.05	0.10	0.63
Control Delay	3.2	28.0	4.3	22.3	34.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.2	28.0	4.3	22.3	34.8
LOS	A	C	A	C	C
Approach Delay	3.2	22.8			33.5
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 79 (99%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 8.1	Intersection LOS: A
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	664	14	50	124
Future Volume (vph)	664	14	50	124
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.7	26.7	26.7
Total Split (s)	46.0	34.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.7	12.3	12.3	12.3
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.31	0.08	0.19	0.50
Control Delay	3.3	14.3	17.6	34.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.3	14.3	17.6	34.6
LOS	A	B	B	C
Approach Delay	3.3		16.9	34.6
Approach LOS	A		B	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 68 (85%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1006: Jefferson & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	1209	57	58	83
Future Volume (vph)	1209	57	58	83
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.5	27.3	27.3	27.3
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	61.5	11.1	11.1	11.1
Actuated g/C Ratio	0.77	0.14	0.14	0.14
v/c Ratio	0.49	0.33	0.35	0.35
Control Delay	3.4	24.4	13.6	12.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.4	24.4	13.6	12.2
LOS	A	C	B	B
Approach Delay	3.4	24.4		12.8
Approach LOS	A	C		B

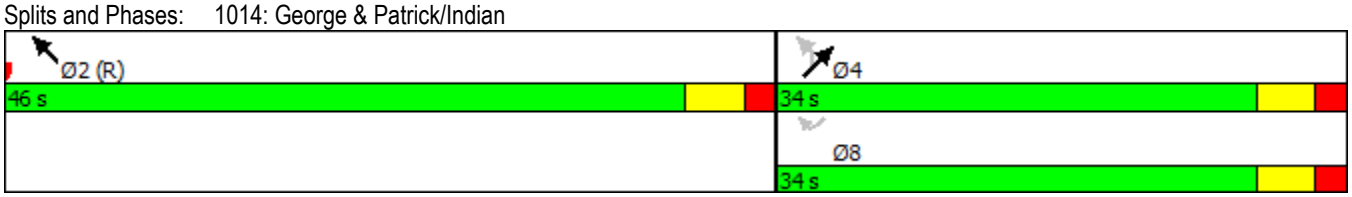
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 65 (81%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 5.5	Intersection LOS: A
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1007: Jefferson & Lyon

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	674	178	120	20
Future Volume (vph)	674	178	120	20
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	46.0	34.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	57.0	12.0	12.0	12.0
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.30	0.48	0.46	0.06
Control Delay	2.9	4.6	9.0	0.3
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	2.9	4.7	9.0	0.3
LOS	A	A	A	A
Approach Delay	2.9		6.4	
Approach LOS	A		A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 29 (36%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 3.9	Intersection LOS: A
Intersection Capacity Utilization 50.5%	ICU Level of Service A
Analysis Period (min) 15	

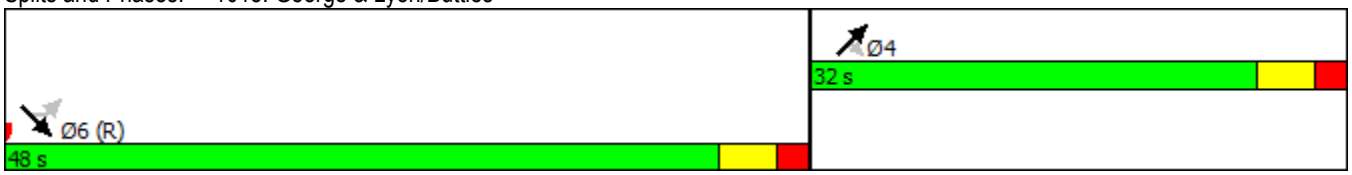
Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	1017	282	206
Future Volume (vph)	1017	282	206
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	48.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	54.9	14.1	14.1
Actuated g/C Ratio	0.69	0.18	0.18
v/c Ratio	0.46	0.49	0.67
Control Delay	1.2	28.2	27.0
Queue Delay	0.1	0.0	0.0
Total Delay	1.3	28.2	27.0
LOS	A	C	C
Approach Delay	1.3	27.7	
Approach LOS	A	C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 21 (26%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 9.8	Intersection LOS: A
Intersection Capacity Utilization 50.5%	ICU Level of Service A
Analysis Period (min) 15	

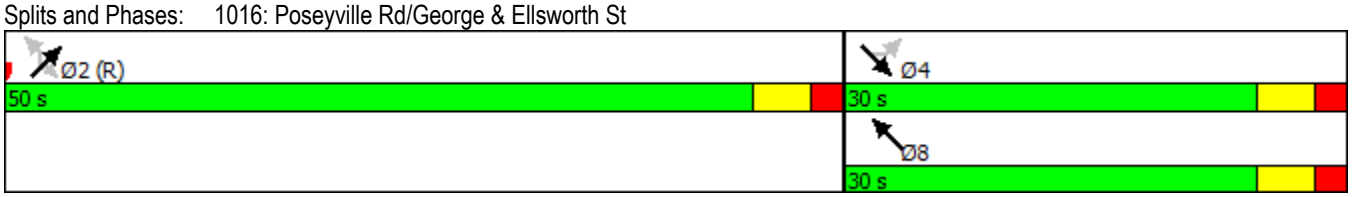
Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	4	31	23	477	65
Future Volume (vph)	4	31	23	477	65
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0
Total Split (s)	30.0	30.0	30.0	50.0	50.0
Total Split (%)	37.5%	37.5%	37.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)		9.9	9.9	66.3	66.3
Actuated g/C Ratio		0.12	0.12	0.83	0.83
v/c Ratio		0.17	0.08	0.23	0.05
Control Delay		25.6	23.3	3.5	1.6
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		25.6	23.3	3.5	1.6
LOS		C	C	A	A
Approach Delay		25.6	23.3	3.3	
Approach LOS		C	C	A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.23	
Intersection Signal Delay: 5.2	Intersection LOS: A
Intersection Capacity Utilization 31.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St



Intersection	
Int Delay, s/veh	4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	155	717	0	0	0	0	0	69	209
Future Vol, veh/h	0	0	0	155	717	0	0	0	0	0	69	209
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	168	779	0	0	0	0	0	75	227

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	-	1116	390
Stage 1	-	-	-	-	1116	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.14	-	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	0	206	609
Stage 1	-	-	-	0	281	-
Stage 2	-	-	-	0	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	0	609
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-

Approach	NW	SW
HCM Control Delay, s		16.6
HCM LOS		C

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	609
HCM Lane V/C Ratio	-	-	-	0.496
HCM Control Delay (s)	-	-	-	16.6
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	2.8

Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	1030	221
Future Volume (vph)	1030	221
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	58.3	10.7
Actuated g/C Ratio	0.73	0.13
v/c Ratio	0.45	0.34
Control Delay	1.1	26.5
Queue Delay	0.0	0.0
Total Delay	1.1	26.5
LOS	A	C
Approach Delay	1.1	26.5
Approach LOS	A	C

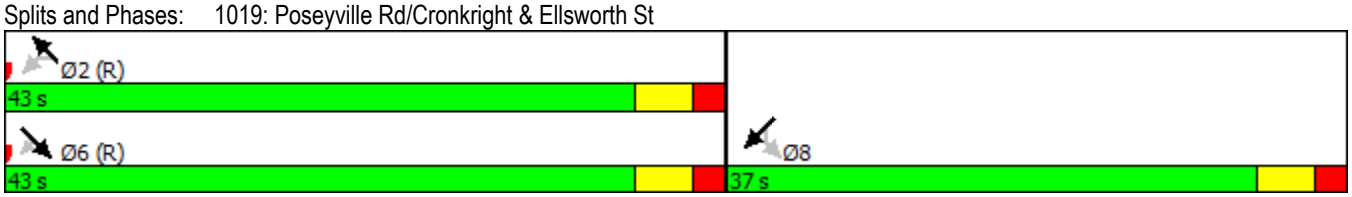
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 13 (16%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 5.5	Intersection LOS: A
Intersection Capacity Utilization 44.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1018: Cronkright & Buttles

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	22	59	58	90	188
Future Volume (vph)	22	59	58	90	188
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	26.0	26.0	26.0
Total Split (s)	43.0	43.0	43.0	43.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	None
Act Effct Green (s)	58.1	58.1	58.1	58.1	10.9
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.14
v/c Ratio	0.02	0.05	0.06	0.07	0.38
Control Delay	4.5	1.7	3.8	3.7	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	1.7	3.8	3.7	4.2
LOS	A	A	A	A	A
Approach Delay	2.5			3.8	4.2
Approach LOS	A			A	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 29 (36%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 31.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1019: Poseyville Rd/Cronkright & Ellsworth St



Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	894	152
Future Volume (vph)	894	152
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	58.9	10.1
Actuated g/C Ratio	0.74	0.13
v/c Ratio	0.39	0.26
Control Delay	4.1	24.2
Queue Delay	0.0	0.0
Total Delay	4.1	24.2
LOS	A	C
Approach Delay	4.1	24.2
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 54 (68%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 7.1	Intersection LOS: A
Intersection Capacity Utilization 40.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	1008	49
Future Volume (vph)	1008	49
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	62.9	9.7
Actuated g/C Ratio	0.79	0.12
v/c Ratio	0.44	0.17
Control Delay	0.8	16.9
Queue Delay	0.0	0.0
Total Delay	0.8	16.9
LOS	A	B
Approach Delay	0.8	16.9
Approach LOS	A	B

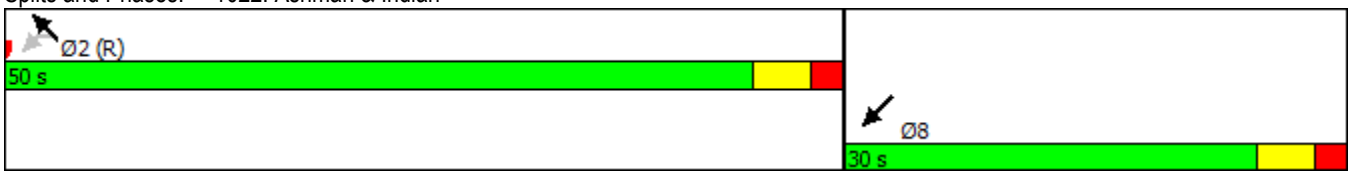
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 79 (99%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 2.1	Intersection LOS: A
Intersection Capacity Utilization 46.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	839	279
Future Volume (vph)	839	279
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	50.0	30.0
Total Split (%)	62.5%	37.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	57.2	11.8
Actuated g/C Ratio	0.72	0.15
v/c Ratio	0.39	0.49
Control Delay	1.0	25.4
Queue Delay	0.0	0.0
Total Delay	1.0	25.4
LOS	A	C
Approach Delay	1.0	25.4
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 67 (84%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian



Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	1077	41	300
Future Volume (vph)	1077	41	300
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	55.5	13.5	13.5
Actuated g/C Ratio	0.69	0.17	0.17
v/c Ratio	0.50	0.13	0.55
Control Delay	5.2	1.3	16.5
Queue Delay	0.0	0.0	0.0
Total Delay	5.2	1.3	16.5
LOS	A	A	B
Approach Delay	5.2		14.6
Approach LOS	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 69 (86%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	472	447	428
Future Volume (vph)	472	447	428
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	46.0	46.0	34.0
Total Split (%)	57.5%	57.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	52.8	52.8	16.2
Actuated g/C Ratio	0.66	0.66	0.20
v/c Ratio	0.30	0.31	0.67
Control Delay	5.7	5.2	20.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.7	5.2	20.2
LOS	A	A	C
Approach Delay		5.3	20.2
Approach LOS		A	C

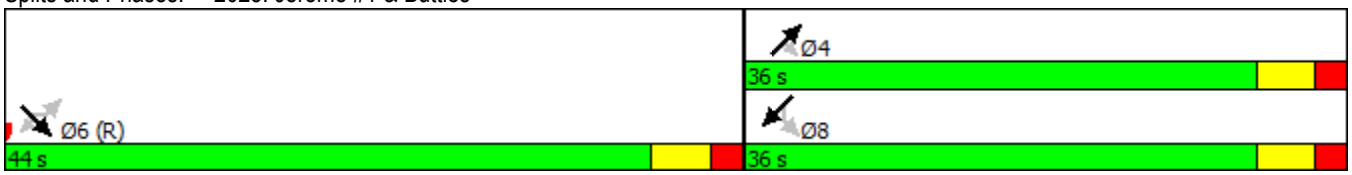
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 60 (75%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 10.1	Intersection LOS: B
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	636	91	422	488	3	469
Future Volume (vph)	636	91	422	488	3	469
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	44.0	44.0	36.0	36.0	36.0	36.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	47.8	47.8	21.2	21.2	21.2	21.2
Actuated g/C Ratio	0.60	0.60	0.26	0.26	0.26	0.26
v/c Ratio	0.33	0.10	0.73	0.61	0.03	0.55
Control Delay	4.1	0.8	26.9	16.4	10.7	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	4.1	0.8	26.9	16.4	10.7	17.2
LOS	A	A	C	B	B	B
Approach Delay	3.7		23.6			17.1
Approach LOS	A		C			B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 41 (51%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	7	26	26	58	25	588	39	679
Future Volume (vph)	7	26	26	58	25	588	39	679
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	26.0	26.0	26.0	26.0	54.0	54.0	54.0	54.0
Total Split (%)	32.5%	32.5%	32.5%	32.5%	67.5%	67.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	9.0	9.0	9.0	9.0	63.0	63.0	63.0	63.0
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.79	0.79	0.79	0.79
v/c Ratio	0.06	0.27	0.19	0.47	0.05	0.24	0.07	0.28
Control Delay	30.9	21.0	33.9	27.0	1.0	1.1	1.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	21.0	33.9	27.0	1.0	1.1	1.6	1.2
LOS	C	C	C	C	A	A	A	A
Approach Delay		22.2		28.4		1.1		1.3
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 62 (78%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2029: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	18	62	43	122	47	560	12	651
Future Volume (vph)	18	62	43	122	47	560	12	651
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	28.0	28.0	28.0	28.0	52.0	52.0	52.0	52.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.3	11.3	11.3	11.3	56.8	56.8	56.8	56.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.71	0.71	0.71	0.71
v/c Ratio	0.11	0.42	0.26	0.54	0.10	0.26	0.02	0.30
Control Delay	29.6	23.0	32.9	37.7	3.9	3.6	2.2	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	23.0	32.9	37.7	3.9	3.6	2.2	2.3
LOS	C	C	C	D	A	A	A	A
Approach Delay		23.9		36.5		3.6		2.3
Approach LOS		C		D		A		A

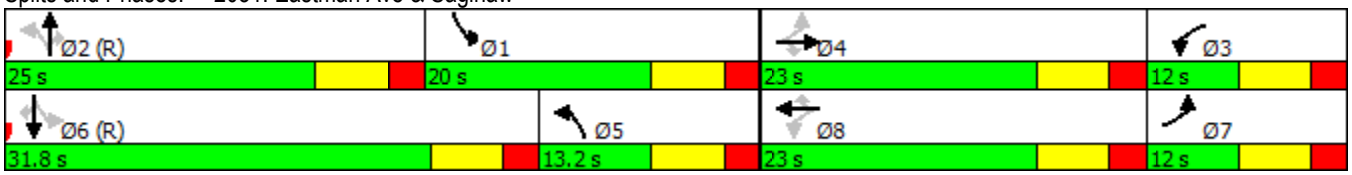
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 45 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 56.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2030: Eastman Ave & Sugnet

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	450	122	80	474	192	97	437	53	315	489	185
Future Volume (vph)	117	450	122	80	474	192	97	437	53	315	489	185
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	16.5	11.5	16.5	16.5
Total Split (s)	12.0	23.0	23.0	12.0	23.0	23.0	13.2	25.0	25.0	20.0	31.8	31.8
Total Split (%)	15.0%	28.8%	28.8%	15.0%	28.8%	28.8%	16.5%	31.3%	31.3%	25.0%	39.8%	39.8%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	20.7	15.2	15.2	21.2	15.4	15.4	29.9	23.6	23.6	41.8	31.5	31.5
Actuated g/C Ratio	0.26	0.19	0.19	0.26	0.19	0.19	0.37	0.30	0.30	0.52	0.39	0.39
v/c Ratio	0.55	0.73	0.24	0.35	0.76	0.38	0.32	0.46	0.08	0.62	0.42	0.26
Control Delay	33.5	37.5	1.0	25.1	38.5	2.4	8.3	16.2	0.3	16.3	7.6	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	37.5	1.0	25.1	38.5	2.4	8.3	16.2	0.3	16.3	7.6	1.1
LOS	C	D	A	C	D	A	A	B	A	B	A	A
Approach Delay		30.4			27.8			13.5			9.3	
Approach LOS		C			C			B			A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2031: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	40	68	86	47	16	663	68	861
Future Volume (vph)	40	68	86	47	16	663	68	861
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	26.0	26.0	26.0	26.0	54.0	54.0	54.0	54.0
Total Split (%)	32.5%	32.5%	32.5%	32.5%	67.5%	67.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.4	11.4	11.4	11.4	56.9	56.9	56.9	56.9
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.71	0.71	0.71	0.71
v/c Ratio	0.24	0.48	0.52	0.41	0.05	0.32	0.16	0.39
Control Delay	32.1	37.2	41.1	17.9	3.4	3.6	1.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	37.2	41.1	17.9	3.4	3.6	1.4	2.3
LOS	C	D	D	B	A	A	A	A
Approach Delay		35.9		27.8		3.6		2.3
Approach LOS		D		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 41 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 59.0%	ICU Level of Service B
Analysis Period (min) 15	

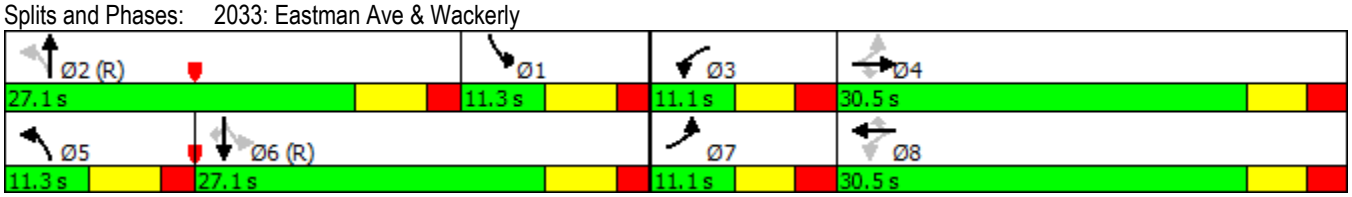
Splits and Phases: 2032: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	131	466	90	62	210	126	45	652	78	806	141
Future Volume (vph)	131	466	90	62	210	126	45	652	78	806	141
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.1	30.5	30.5	11.1	30.5	30.5	11.3	26.0	11.3	26.0	26.0
Total Split (s)	11.1	30.5	30.5	11.1	30.5	30.5	11.3	27.1	11.3	27.1	27.1
Total Split (%)	13.9%	38.1%	38.1%	13.9%	38.1%	38.1%	14.1%	33.9%	14.1%	33.9%	33.9%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	28.0	24.0	24.0	26.8	21.8	21.8	25.7	25.7	28.0	28.0	28.0
Actuated g/C Ratio	0.35	0.30	0.30	0.34	0.27	0.27	0.32	0.32	0.35	0.35	0.35
v/c Ratio	0.39	0.89	0.14	0.41	0.55	0.26	0.24	0.50	0.29	0.69	0.21
Control Delay	18.3	47.0	0.4	19.7	28.7	1.0	11.5	11.0	16.7	19.2	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	47.0	0.4	19.7	28.7	1.0	11.5	11.0	16.7	19.2	0.9
LOS	B	D	A	B	C	A	B	B	B	B	A
Approach Delay		35.4			18.5			11.1		16.5	
Approach LOS		D			B			B		B	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 5 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 75.8% ICU Level of Service D
Analysis Period (min) 15

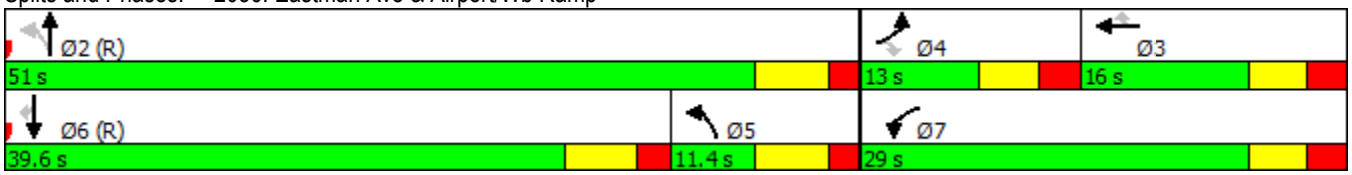
Splits and Phases: 2033: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	99	45	205	96	167	50	578	81	904	50
Future Volume (vph)	99	45	205	96	167	50	578	81	904	50
Turn Type	Prot	Perm	Prot	NA	Perm	pm+pt	NA	Free	NA	Perm
Protected Phases	4		7	3		5	2		6	
Permitted Phases		4			3	2		Free		6
Detector Phase	4	4	7	3	3	5	2		6	6
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6	35.6
Total Split (s)	13.0	13.0	29.0	16.0	16.0	11.4	51.0		39.6	39.6
Total Split (%)	16.3%	16.3%	36.3%	20.0%	20.0%	14.3%	63.8%		49.5%	49.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.3	6.3		6.3	6.3
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes	Yes
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max	C-Max
Act Effct Green (s)	7.0	7.0	21.2	21.2	10.8	46.5	46.5	80.0	35.1	35.1
Actuated g/C Ratio	0.09	0.09	0.26	0.26	0.14	0.58	0.58	1.00	0.44	0.44
v/c Ratio	0.39	0.16	0.36	0.36	0.46	0.15	0.31	0.06	0.43	0.07
Control Delay	38.6	1.0	26.7	26.6	7.5	5.0	4.9	0.1	16.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.6	1.0	26.7	26.6	7.5	5.0	4.9	0.1	16.3	0.2
LOS	D	A	C	C	A	A	A	A	B	A
Approach Delay				19.8			4.3		15.4	
Approach LOS				B			A		B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 77 (96%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

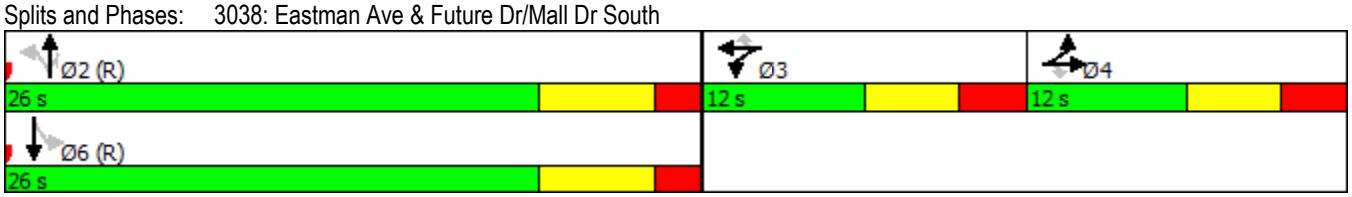
Splits and Phases: 2036: Eastman Ave & Airport/Wb Ramp



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	7	22	29	7	14	3	731	12	4	932
Future Volume (vph)	7	22	29	7	14	3	731	12	4	932
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	12.0	12.0	12.0	12.0	12.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lag	Lag	Lead	Lead	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	5.8	5.8	5.8	5.8	5.8	31.9	31.9	31.9	31.9	31.9
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.64	0.64	0.64	0.64	0.64
v/c Ratio	0.16	0.07	0.10	0.10	0.04	0.01	0.34	0.01	0.01	0.44
Control Delay	21.8	0.4	20.9	20.9	0.2	9.3	9.1	0.0	6.2	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	0.4	20.9	20.9	0.2	9.3	9.1	0.0	6.2	7.1
LOS	C	A	C	C	A	A	A	A	A	A
Approach Delay	13.0			15.2			9.0			7.1
Approach LOS	B			B			A			A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 49 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

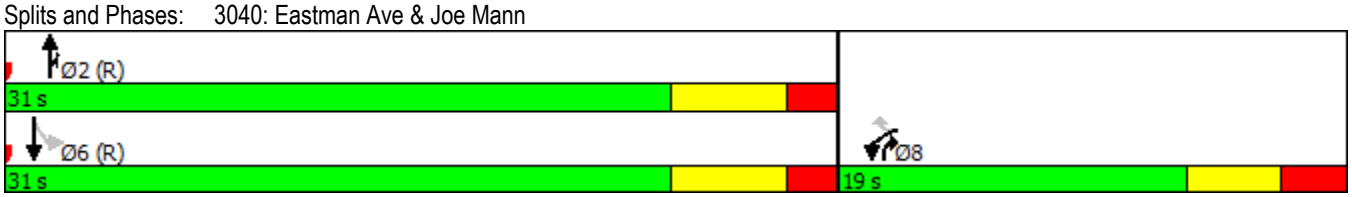
Splits and Phases: 3038: Eastman Ave & Future Dr/Mall Dr South



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	175	23	406	219	38	679
Future Volume (vph)	175	23	406	219	38	679
Turn Type	Prot	Perm	NA	pt+ov	Perm	NA
Protected Phases	8		2	2 8		6
Permitted Phases		8			6	
Detector Phase	8	8	2	2 8	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		10.0	10.0
Minimum Split (s)	11.0	11.0	16.2		16.2	16.2
Total Split (s)	19.0	19.0	31.0		31.0	31.0
Total Split (%)	38.0%	38.0%	62.0%		62.0%	62.0%
Yellow Time (s)	3.5	3.5	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	1.9		1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.2		6.2	6.2
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max		Max	Max
Act Effct Green (s)	13.0	13.0	24.8	50.0	24.8	24.8
Actuated g/C Ratio	0.26	0.26	0.50	1.00	0.50	0.50
v/c Ratio	0.21	0.06	0.24	0.15	0.09	0.42
Control Delay	15.3	7.2	14.5	0.2	7.3	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	7.2	14.5	0.2	7.3	8.9
LOS	B	A	B	A	A	A
Approach Delay	14.3		9.5			8.8
Approach LOS	B		A			A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 35 (70%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 9.8	Intersection LOS: A
Intersection Capacity Utilization 39.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3040: Eastman Ave & Joe Mann



Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	9.5	24.5	0.2	29
Bayliss	9004	3.9	23.7	0.2	37
Jefferson	1006	3.0	23.0	0.3	39
Carpenter	9008	1.1	8.6	0.1	38
	9010	0.6	14.9	0.2	43
	9012	0.7	15.1	0.2	43
George	1014	4.6	22.5	0.2	36
Total		23.4	132.3	1.4	37

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	1.9	20.5	0.2	40
	9011	1.5	22.7	0.3	42
Carpenter	9009	1.8	16.0	0.2	40
Jefferson	1007	4.3	8.6	0.1	22
Bayliss	1005	6.4	26.6	0.3	34
	9003	3.8	14.6	0.1	32
Washington	1002	5.5	14.2	0.1	29
Total		25.2	123.2	1.2	35

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	9017	1.2	6.8	0.1	28
Rodd	1020	3.4	15.5	0.1	29
Ashman	1022	4.1	16.1	0.1	24
Jerome #1	2024	6.3	24.1	0.2	26
Eastman Ave	9027	2.8	22.4	0.2	25
Total		17.7	85.0	0.6	26

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.8	7.5	0.1	39
Jerome #1	2025	10.8	20.4	0.1	17
Ashman	1023	7.7	25.8	0.2	25
Rodd	1021	3.7	15.9	0.1	25
Cronkright	1018	2.3	14.2	0.1	31
George	1015	2.2	8.4	0.1	23
Total		27.5	92.2	0.6	25

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	-	-	0.2	-
St Andrews	2029	5.1	27.4	0.3	36
Sugnet	2030	7.1	55.8	0.6	40
Saginaw	2031	21.0	60.2	0.5	30
Dilloway	2032	7.7	49.1	0.5	39
Wackerly	2033	14.5	46.7	0.4	31
Eb On Ramp	9034	1.9	4.8	0.0	25
Wb On Ramp	9035	0.8	7.0	0.1	38
Wb Ramp	2036	4.0	9.5	0.1	26
Mall Off	9037	1.7	7.8	0.1	35
Mall Dr South	3038	3.4	7.9	0.1	27
North Mall Dr	9039	3.4	12.1	0.1	33
Joe Mann	3040	7.7	13.6	0.1	19
Total		78.1	301.9	3.0	36

Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	7.5	22.8	0.2	31
	9039	2.4	8.5	0.1	31
Future Dr	3038	2.9	11.5	0.1	35
Saylor Dr	9037	1.6	6.5	0.1	33
Airport	2036	14.2	19.7	0.1	14
Wb On Ramp	9035	3.8	9.9	0.1	25
Eb On Ramp	9034	2.8	8.7	0.1	31
Wackerly	2033	15.7	18.2	0.0	7
Dilloway	2032	8.8	41.0	0.4	36
Saginaw	2031	18.6	60.2	0.5	32
Sugnet	2030	5.3	44.8	0.5	40
St Andrews	2029	7.7	56.4	0.6	39
Carpenter	9028	2.3	24.5	0.3	41
Indian	9027	0.7	13.2	0.2	42
Total		94.2	345.9	3.2	33

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1190	164	303	40
Future Volume (vph)	1190	164	303	40
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	51.0	29.0	29.0	29.0
Total Split (%)	63.8%	36.3%	36.3%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	52.2	16.8	16.8	16.8
Actuated g/C Ratio	0.65	0.21	0.21	0.21
v/c Ratio	0.60	0.71	0.44	0.24
Control Delay	10.2	27.3	14.3	17.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	27.3	14.3	17.4
LOS	B	C	B	B
Approach Delay	10.2		18.9	17.4
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 24 (30%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1001: Washington & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	963	339	13	41
Future Volume (vph)	963	339	13	41
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5		5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.6	15.4		15.4
Actuated g/C Ratio	0.67	0.19		0.19
v/c Ratio	0.50	0.66		0.11
Control Delay	2.9	31.6		16.8
Queue Delay	0.0	0.0		0.0
Total Delay	2.9	31.6		16.8
LOS	A	C		B
Approach Delay	2.9	31.6		16.8
Approach LOS	A	C		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 23 (29%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 51.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon

Intersection	
Int Delay, s/veh	18.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	130	1250	91	21	101	0	0	15	74
Future Vol, veh/h	0	0	0	130	1250	91	21	101	0	0	15	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	141	1359	99	23	110	0	0	16	80

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	970	1740	-	-	1691	729
Stage 1	-	-	-	0	0	-	-	1691	-
Stage 2	-	-	-	970	1740	-	-	0	-
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	208	~ 86	0	0	92	365
Stage 1	-	-	-	-	-	0	0	148	-
Stage 2	-	-	-	272	140	0	0	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	140	~ 86	-	-	92	365
Mov Cap-2 Maneuver	-	-	-	140	~ 86	-	-	92	-
Stage 1	-	-	-	-	-	-	-	148	-
Stage 2	-	-	-	189	140	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		234.8	29.3
HCM LOS		F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	140	86	-	-	-	243
HCM Lane V/C Ratio	0.163	1.277	-	-	-	0.398
HCM Control Delay (s)	35.7	276.2	-	-	-	29.3
HCM Lane LOS	E	F	-	-	-	D
HCM 95th %tile Q(veh)	0.6	8.1	-	-	-	1.8

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1037	106	113	74	71
Future Volume (vph)	1037	106	113	74	71
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	56.0	24.0	24.0	24.0	24.0
Total Split (%)	70.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	58.4	10.6	10.6	10.6	10.6
Actuated g/C Ratio	0.73	0.13	0.13	0.13	0.13
v/c Ratio	0.46	0.47	0.41	0.47	0.31
Control Delay	2.8	37.4	13.5	34.5	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	37.4	13.5	34.5	28.2
LOS	A	D	B	C	C
Approach Delay	2.8	25.1			31.4
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 59.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1259	44	89	106
Future Volume (vph)	1259	44	89	106
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.7	26.7	26.7
Total Split (s)	52.6	27.4	27.4	27.4
Total Split (%)	65.8%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	57.0	12.0	12.0	12.0
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.58	0.26	0.35	0.48
Control Delay	4.1	16.6	17.3	32.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.1	16.6	17.3	32.8
LOS	A	B	B	C
Approach Delay	4.1		17.0	32.8
Approach LOS	A		B	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 61 (76%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1006: Jefferson & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	989	116	53	67
Future Volume (vph)	989	116	53	67
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.5	27.3	27.3	27.3
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.4	12.6	12.6	12.6
Actuated g/C Ratio	0.70	0.16	0.16	0.16
v/c Ratio	0.44	0.55	0.34	0.25
Control Delay	3.4	33.1	15.2	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.4	33.1	15.2	12.3
LOS	A	C	B	B
Approach Delay	3.4	33.1		13.6
Approach LOS	A	C		B

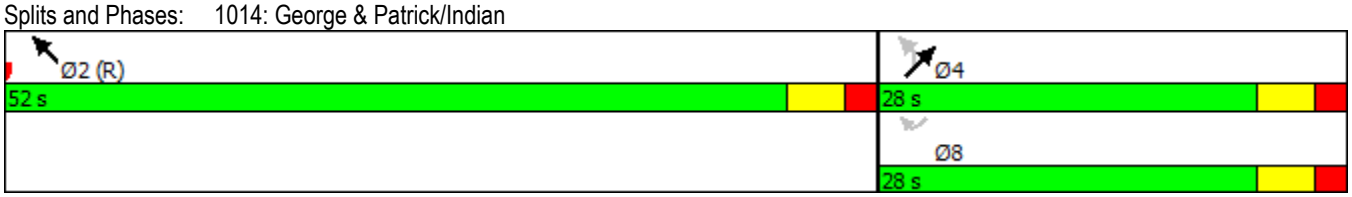
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 64 (80%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1007: Jefferson & Lyon

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	1381	247	21	54
Future Volume (vph)	1381	247	21	54
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.1	15.9	15.9	15.9
Actuated g/C Ratio	0.66	0.20	0.20	0.20
v/c Ratio	0.64	0.71	0.06	0.17
Control Delay	4.2	17.5	5.9	14.1
Queue Delay	0.0	0.7	0.0	0.0
Total Delay	4.2	18.3	5.9	14.1
LOS	A	B	A	B
Approach Delay	4.2		17.3	
Approach LOS	A		B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 28 (35%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 6.6	Intersection LOS: A
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

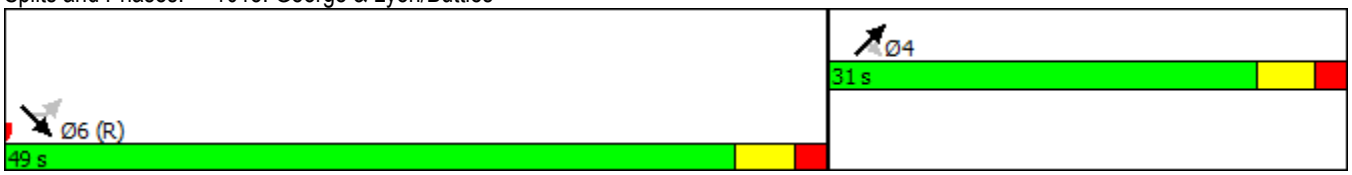
Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	872	242	150
Future Volume (vph)	872	242	150
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	49.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	56.5	12.5	12.5
Actuated g/C Ratio	0.71	0.16	0.16
v/c Ratio	0.39	0.48	0.48
Control Delay	1.5	29.0	12.4
Queue Delay	0.1	0.0	0.0
Total Delay	1.6	29.0	12.4
LOS	A	C	B
Approach Delay	1.6	22.7	
Approach LOS	A	C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	23	27	69	344	25
Future Volume (vph)	23	27	69	344	25
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0
Total Split (s)	33.0	33.0	33.0	47.0	47.0
Total Split (%)	41.3%	41.3%	41.3%	58.8%	58.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)		10.4	10.4	62.2	62.2
Actuated g/C Ratio		0.13	0.13	0.78	0.78
v/c Ratio		0.28	0.22	0.17	0.02
Control Delay		37.1	23.0	3.9	1.8
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		37.1	23.0	3.9	1.8
LOS		D	C	A	A
Approach Delay		37.1	23.0	3.7	
Approach LOS		D	C	A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 78 (98%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.28	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 30.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St

Intersection	
Int Delay, s/veh	3.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	268	1407	7	0	0	0	0	154	53
Future Vol, veh/h	0	0	0	268	1407	7	0	0	0	0	154	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	291	1529	8	0	0	0	0	167	58

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	-	2116	768
Stage 1	-	-	-	-	2116	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.14	-	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	0	~ 50	344
Stage 1	-	-	-	0	~ 90	-
Stage 2	-	-	-	0	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	0	344
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-

Approach	NW	SW
HCM Control Delay, s		33.2
HCM LOS		D

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	344
HCM Lane V/C Ratio	-	-	-	0.654
HCM Control Delay (s)	-	-	-	33.2
HCM Lane LOS	-	-	-	D
HCM 95th %tile Q(veh)	-	-	-	4.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	886	410
Future Volume (vph)	886	410
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	55.8	13.2
Actuated g/C Ratio	0.70	0.16
v/c Ratio	0.52	0.53
Control Delay	1.9	25.7
Queue Delay	0.0	0.0
Total Delay	1.9	25.7
LOS	A	C
Approach Delay	1.9	25.7
Approach LOS	A	C

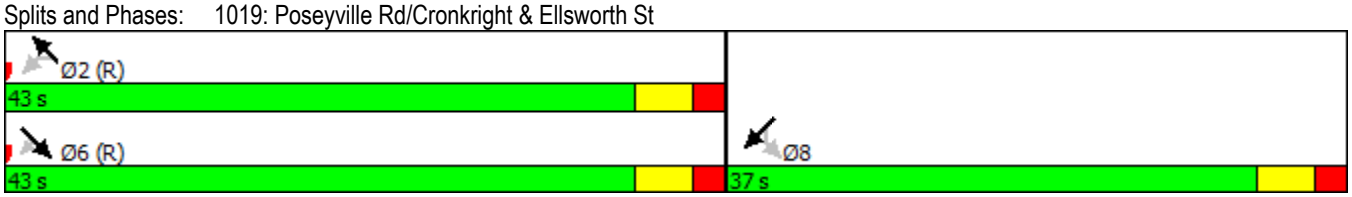
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 8 (10%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 50.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1018: Cronkright & Buttles

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	34	234	85	58	631
Future Volume (vph)	34	234	85	58	631
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	26.0	26.0	26.0
Total Split (s)	43.0	43.0	43.0	43.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	None
Act Effct Green (s)	51.8	51.8	51.8	51.8	17.2
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.22
v/c Ratio	0.03	0.24	0.10	0.05	0.67
Control Delay	6.0	4.3	5.1	4.7	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	4.3	5.1	4.7	18.9
LOS	A	A	A	A	B
Approach Delay	4.5			5.0	18.9
Approach LOS	A			A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 18 (23%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 47.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1019: Poseyville Rd/Cronkright & Ellsworth St



Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	1424	268
Future Volume (vph)	1424	268
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	57.4	11.6
Actuated g/C Ratio	0.72	0.14
v/c Ratio	0.63	0.43
Control Delay	3.9	28.9
Queue Delay	0.0	0.0
Total Delay	3.9	28.9
LOS	A	C
Approach Delay	3.9	28.9
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 42 (53%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	1088	134
Future Volume (vph)	1088	134
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	58.8	10.2
Actuated g/C Ratio	0.74	0.13
v/c Ratio	0.53	0.31
Control Delay	2.2	21.9
Queue Delay	0.0	0.0
Total Delay	2.2	21.9
LOS	A	C
Approach Delay	2.2	21.9
Approach LOS	A	C

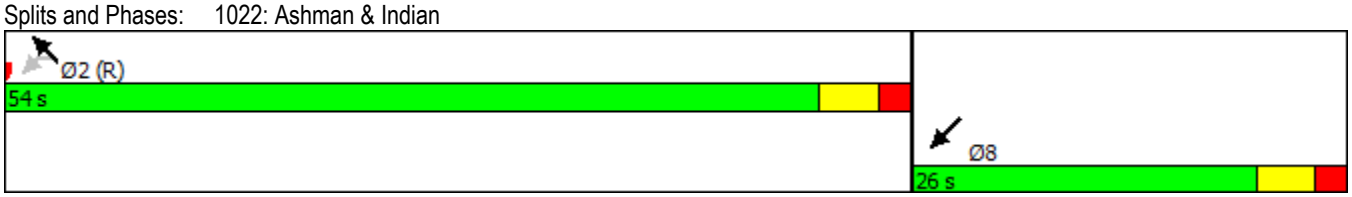
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 74 (93%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 4.8	Intersection LOS: A
Intersection Capacity Utilization 50.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	1386	329
Future Volume (vph)	1386	329
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	54.2	14.8
Actuated g/C Ratio	0.68	0.18
v/c Ratio	0.66	0.62
Control Delay	3.1	30.7
Queue Delay	0.0	0.0
Total Delay	3.2	30.7
LOS	A	C
Approach Delay	3.2	30.7
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 54 (68%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian



Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	1136	120	281
Future Volume (vph)	1136	120	281
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	55.8	13.2	13.2
Actuated g/C Ratio	0.70	0.16	0.16
v/c Ratio	0.53	0.38	0.52
Control Delay	5.3	3.5	12.9
Queue Delay	0.0	0.0	0.0
Total Delay	5.3	3.5	12.9
LOS	A	A	B
Approach Delay	5.3		10.1
Approach LOS	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 64 (80%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	1020	562	476
Future Volume (vph)	1020	562	476
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	52.0	52.0	28.0
Total Split (%)	65.0%	65.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	51.8	51.8	17.2
Actuated g/C Ratio	0.65	0.65	0.22
v/c Ratio	0.54	0.54	0.70
Control Delay	5.2	4.3	30.9
Queue Delay	0.6	0.1	0.2
Total Delay	5.8	4.4	31.0
LOS	A	A	C
Approach Delay		4.8	31.0
Approach LOS		A	C

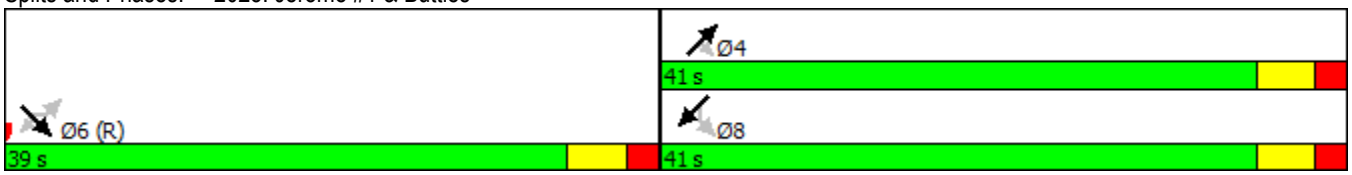
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 66 (83%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	661	237	463	525	6	1014
Future Volume (vph)	661	237	463	525	6	1014
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	39.0	39.0	41.0	41.0	41.0	41.0
Total Split (%)	48.8%	48.8%	51.3%	51.3%	51.3%	51.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	38.0	38.0	31.0	31.0	31.0	31.0
Actuated g/C Ratio	0.48	0.48	0.39	0.39	0.39	0.39
v/c Ratio	0.44	0.33	0.56	0.53	0.04	0.80
Control Delay	15.7	13.6	17.3	14.7	3.7	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	15.7	13.6	17.3	14.7	3.7	16.3
LOS	B	B	B	B	A	B
Approach Delay	15.1		16.5			16.2
Approach LOS	B		B			B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	58	76	40	76	53	753	69	806
Future Volume (vph)	58	76	40	76	53	753	69	806
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	16.0	16.0	16.0	16.0	34.0	34.0	34.0	34.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	33.8	33.8	33.8	33.8
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.68	0.68	0.68	0.68
v/c Ratio	0.32	0.45	0.21	0.47	0.16	0.36	0.19	0.39
Control Delay	22.3	15.2	20.1	14.8	6.4	5.5	3.4	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	15.2	20.1	14.8	6.4	5.5	3.4	3.1
LOS	C	B	C	B	A	A	A	A
Approach Delay		17.2		15.9		5.5		3.1
Approach LOS		B		B		A		A

Intersection Summary

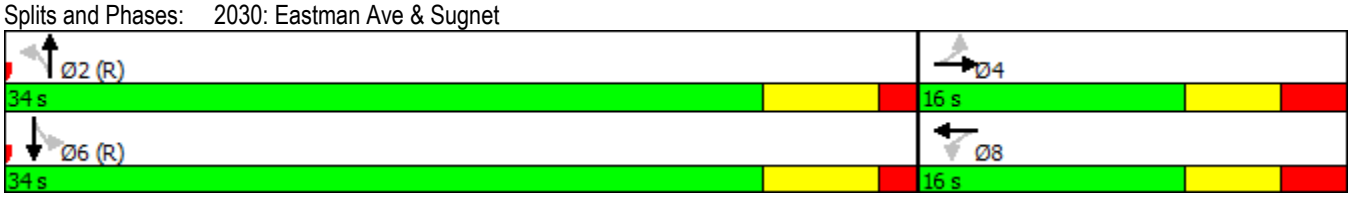
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 39 (78%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 6.5 Intersection LOS: A
Intersection Capacity Utilization 66.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2029: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	138	52	61	49	788	33	778
Future Volume (vph)	35	138	52	61	49	788	33	778
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	16.0	16.0	16.0	16.0	34.0	34.0	34.0	34.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	9.1	9.1	9.1	9.1	29.0	29.0	29.0	29.0
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.58	0.58	0.58	0.58
v/c Ratio	0.16	0.68	0.30	0.22	0.16	0.45	0.11	0.43
Control Delay	18.5	25.2	21.8	17.0	3.2	3.9	2.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	25.2	21.8	17.0	3.2	3.9	2.1	2.7
LOS	B	C	C	B	A	A	A	A
Approach Delay		24.3		19.1		3.9		2.7
Approach LOS		C		B		A		A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 38 (76%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 70.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2030: Eastman Ave & Sugnet

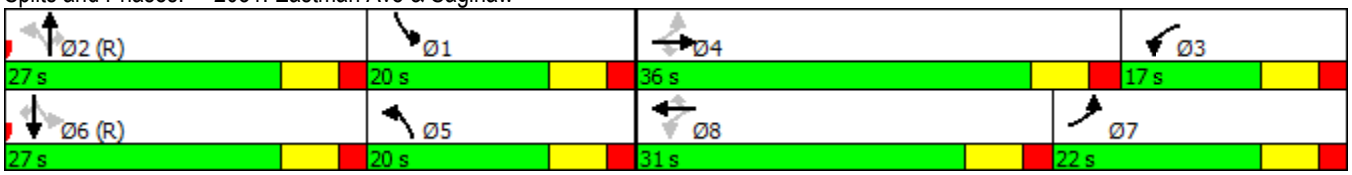


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	665	146	106	699	428	228	485	119	256	590	129
Future Volume (vph)	278	665	146	106	699	428	228	485	119	256	590	129
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	16.5	11.5	16.5	16.5
Total Split (s)	22.0	36.0	36.0	17.0	31.0	31.0	20.0	27.0	27.0	20.0	27.0	27.0
Total Split (%)	22.0%	36.0%	36.0%	17.0%	31.0%	31.0%	20.0%	27.0%	27.0%	20.0%	27.0%	27.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	40.5	25.7	25.7	37.3	24.1	24.1	34.9	22.3	22.3	34.9	22.3	22.3
Actuated g/C Ratio	0.40	0.26	0.26	0.37	0.24	0.24	0.35	0.22	0.22	0.35	0.22	0.22
v/c Ratio	0.91	0.80	0.30	0.38	0.90	0.70	0.84	0.67	0.26	0.81	0.87	0.27
Control Delay	67.2	41.9	4.5	30.6	51.8	13.1	53.4	47.2	10.1	61.8	54.6	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	41.9	4.5	30.6	51.8	13.1	53.4	47.2	10.1	61.8	54.6	9.9
LOS	E	D	A	C	D	B	D	D	B	E	D	A
Approach Delay		43.3			36.5			43.6			51.2	
Approach LOS		D			D			D			D	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 43.2 Intersection LOS: D
Intersection Capacity Utilization 86.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2031: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	43	31	71	31	26	1118	44	869
Future Volume (vph)	43	31	71	31	26	1118	44	869
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	25.0	25.0	25.0	25.0	75.0	75.0	75.0	75.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.3	11.3	11.3	11.3	77.0	77.0	77.0	77.0
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.77	0.77	0.77	0.77
v/c Ratio	0.32	0.37	0.52	0.40	0.07	0.47	0.17	0.36
Control Delay	45.3	45.3	53.1	21.5	1.2	1.6	2.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	45.3	53.1	21.5	1.2	1.6	2.7	1.7
LOS	D	D	D	C	A	A	A	A
Approach Delay		45.3		35.4		1.6		1.7
Approach LOS		D		D		A		A

Intersection Summary

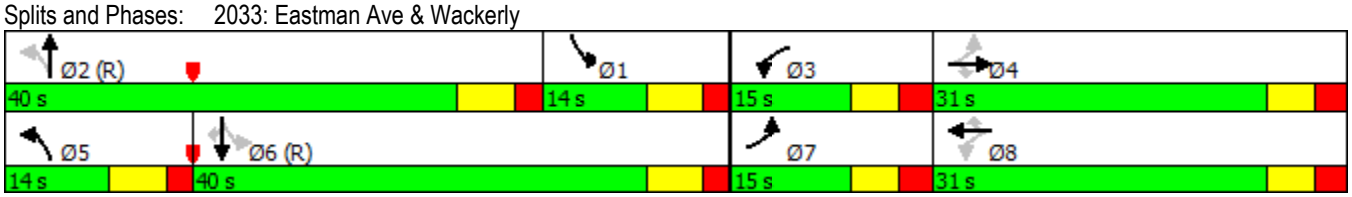
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 97 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 5.9 Intersection LOS: A
Intersection Capacity Utilization 56.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2032: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	207	201	150	142	155	251	84	1038	123	655	266
Future Volume (vph)	207	201	150	142	155	251	84	1038	123	655	266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	4.7	7.0	7.0	4.7	7.0	7.0	4.7	10.0	4.7	10.0	10.0
Minimum Split (s)	11.0	31.0	31.0	11.0	31.0	31.0	11.0	26.0	11.0	26.0	26.0
Total Split (s)	15.0	31.0	31.0	15.0	31.0	31.0	14.0	40.0	14.0	40.0	40.0
Total Split (%)	15.0%	31.0%	31.0%	15.0%	31.0%	31.0%	14.0%	40.0%	14.0%	40.0%	40.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	25.7	16.8	16.8	25.7	16.8	16.8	41.8	41.8	43.6	43.6	43.6
Actuated g/C Ratio	0.26	0.17	0.17	0.26	0.17	0.17	0.42	0.42	0.44	0.44	0.44
v/c Ratio	0.74	0.69	0.34	0.65	0.66	0.71	0.33	0.61	0.48	0.45	0.33
Control Delay	42.9	50.0	2.7	37.0	48.8	18.8	14.0	13.6	20.6	9.7	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	50.0	2.7	37.0	48.8	18.8	14.0	13.6	20.6	9.7	1.5
LOS	D	D	A	D	D	B	B	B	C	A	A
Approach Delay		34.6			32.0			13.6		8.9	
Approach LOS		C			C			B		A	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 76 (76%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	

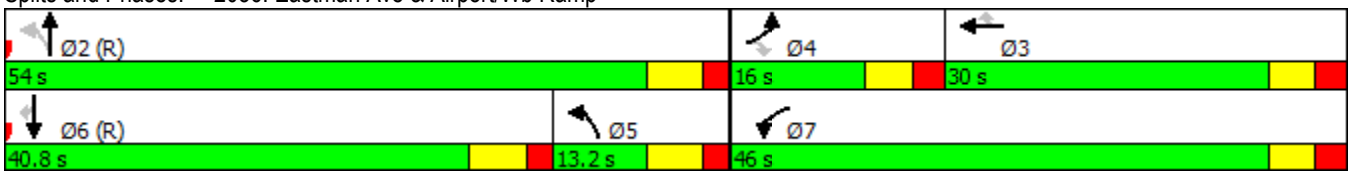
Splits and Phases: 2033: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	168	78	239	107	300	75	859	224	1046	153
Future Volume (vph)	168	78	239	107	300	75	859	224	1046	153
Turn Type	Prot	Perm	Prot	NA	Perm	pm+pt	NA	Free	NA	Perm
Protected Phases	4		7	3		5	2		6	
Permitted Phases		4			3	2		Free		6
Detector Phase	4	4	7	3	3	5	2		6	6
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6	35.6
Total Split (s)	16.0	16.0	46.0	30.0	30.0	13.2	54.0		40.8	40.8
Total Split (%)	16.0%	16.0%	46.0%	30.0%	30.0%	13.2%	54.0%		40.8%	40.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.3	6.3		6.3	6.3
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes	Yes
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max	C-Max
Act Effct Green (s)	9.6	9.6	31.5	31.5	16.0	56.2	56.2	100.0	43.0	43.0
Actuated g/C Ratio	0.10	0.10	0.32	0.32	0.16	0.56	0.56	1.00	0.43	0.43
v/c Ratio	0.60	0.30	0.35	0.35	0.83	0.27	0.47	0.16	0.50	0.21
Control Delay	51.6	2.5	26.7	26.7	35.8	8.5	6.0	0.2	19.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	2.5	26.7	26.7	35.8	8.5	6.0	0.2	19.7	5.3
LOS	D	A	C	C	D	A	A	A	B	A
Approach Delay				30.9			5.1		17.9	
Approach LOS				C			A		B	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 66 (66%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 60.7%	ICU Level of Service B
Analysis Period (min) 15	

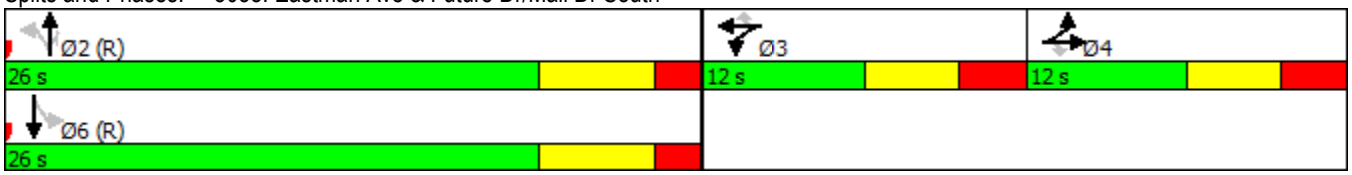
Splits and Phases: 2036: Eastman Ave & Airport/Wb Ramp



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	7	22	293	13	33	33	828	89	20	908
Future Volume (vph)	7	22	293	13	33	33	828	89	20	908
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	12.0	12.0	12.0	12.0	12.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lag	Lag	Lead	Lead	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	5.8	5.8	6.0	6.0	6.0	24.7	24.7	24.7	24.7	24.7
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.49	0.49	0.49	0.49	0.49
v/c Ratio	0.16	0.07	0.82	0.81	0.10	0.18	0.50	0.11	0.08	0.56
Control Delay	21.8	0.4	56.6	55.9	0.5	10.5	8.9	0.7	10.1	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	0.4	56.6	55.9	0.5	10.5	8.9	0.7	10.1	11.9
LOS	C	A	E	E	A	B	A	A	B	B
Approach Delay	13.0			50.9			8.2			11.9
Approach LOS	B			D			A			B

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 21 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 53.7%	ICU Level of Service A
Analysis Period (min) 15	

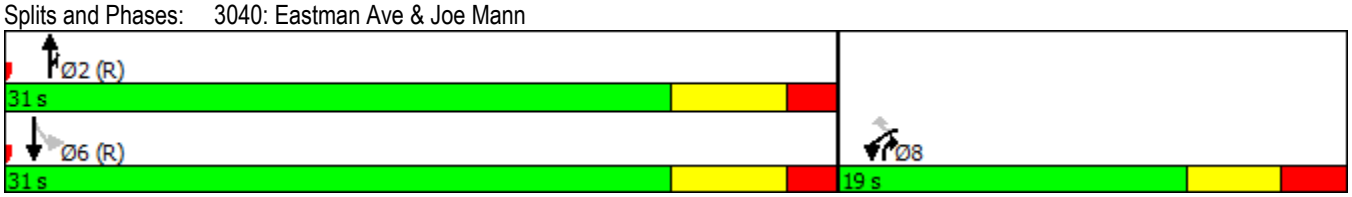
Splits and Phases: 3038: Eastman Ave & Future Dr/Mall Dr South



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	419	74	260	331	59	448
Future Volume (vph)	419	74	260	331	59	448
Turn Type	Prot	Perm	NA	pt+ov	Perm	NA
Protected Phases	8		2	2 8		6
Permitted Phases		8			6	
Detector Phase	8	8	2	2 8	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		10.0	10.0
Minimum Split (s)	11.0	11.0	16.2		16.2	16.2
Total Split (s)	19.0	19.0	31.0		31.0	31.0
Total Split (%)	38.0%	38.0%	62.0%		62.0%	62.0%
Yellow Time (s)	3.5	3.5	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	1.9		1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.2		6.2	6.2
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max		Max	Max
Act Effct Green (s)	13.0	13.0	24.8	50.0	24.8	24.8
Actuated g/C Ratio	0.26	0.26	0.50	1.00	0.50	0.50
v/c Ratio	0.51	0.17	0.16	0.22	0.12	0.27
Control Delay	18.1	5.5	12.4	0.3	7.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	5.5	12.4	0.3	7.5	7.9
LOS	B	A	B	A	A	A
Approach Delay	16.2		5.6			7.8
Approach LOS	B		A			A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 7 (14%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 44.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3040: Eastman Ave & Joe Mann



Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	9.9	25.0	0.2	28
Bayliss	9004	6.5	26.3	0.2	34
Jefferson	1006	7.0	27.0	0.3	33
Carpenter	9008	2.0	9.5	0.1	35
	9010	1.2	15.4	0.2	42
	9012	1.2	15.8	0.2	41
George	1014	8.7	26.7	0.2	30
Total		36.5	145.8	1.4	34

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	1.6	20.0	0.2	40
	9011	1.2	22.4	0.3	42
Carpenter	9009	1.6	15.7	0.2	40
Jefferson	1007	4.1	8.4	0.1	23
Bayliss	1005	4.7	24.9	0.3	37
	9003	3.1	13.9	0.1	34
Washington	1002	7.2	15.9	0.1	26
Total		23.5	121.1	1.2	36

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	9017	2.5	8.2	0.1	23
Rodd	1020	6.3	18.4	0.1	24
Ashman	1022	7.3	19.3	0.1	20
Jerome #1	2024	6.2	24.1	0.2	26
Eastman Ave	9027	2.8	22.6	0.2	25
Total		25.1	92.7	0.6	24

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.4	9.0	0.1	33
Jerome #1	2025	14.8	24.4	0.1	14
Ashman	1023	6.3	24.2	0.2	26
Rodd	1021	4.3	16.5	0.1	25
Cronkright	1018	4.7	16.5	0.1	27
George	1015	2.1	8.3	0.1	23
Total		32.6	98.9	0.6	23

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	0.3	0.8	0.2	724
St Andrews	2029	5.8	28.0	0.3	35
Sugnet	2030	7.3	55.8	0.6	40
Saginaw	2031	37.1	76.2	0.5	24
Dilloway	2032	12.7	53.7	0.5	36
Wackerly	2033	19.0	51.0	0.4	29
Eb On Ramp	9034	2.9	5.8	0.0	21
Wb On Ramp	9035	1.6	7.8	0.1	34
Wb Ramp	2036	8.7	14.2	0.1	17
Mall Off	9037	3.1	9.1	0.1	30
Mall Dr South	3038	7.6	12.1	0.1	18
North Mall Dr	9039	7.3	16.1	0.1	25
Joe Mann	3040	8.2	14.1	0.1	18
Total		121.5	344.8	3.0	31

Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	6.9	22.2	0.2	32
	9039	2.3	8.4	0.1	31
Future Dr	3038	6.1	14.8	0.1	27
Saylor Dr	9037	2.8	7.6	0.1	28
Airport	2036	21.3	26.9	0.1	10
Wb On Ramp	9035	4.9	11.1	0.1	22
Eb On Ramp	9034	2.9	8.8	0.1	31
Wackerly	2033	9.9	12.3	0.0	10
Dilloway	2032	4.5	36.6	0.4	40
Saginaw	2031	40.8	82.4	0.5	23
Sugnet	2030	11.1	50.4	0.5	36
St Andrews	2029	8.7	57.4	0.6	38
Carpenter	9028	2.6	24.6	0.3	40
Indian	9027	1.2	13.7	0.2	41
Total		126.0	377.4	3.2	30

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	9.5	24.5	0.2	29
Bayliss	9004	3.9	23.7	0.2	37
Jefferson	1006	3.0	23.0	0.3	39
Carpenter	9008	1.1	8.6	0.1	38
	9010	0.6	14.9	0.2	43
	9012	0.7	15.1	0.2	43
George	1014	4.6	22.5	0.2	36
Total		23.4	132.3	1.4	37

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	1.9	20.5	0.2	40
	9011	1.5	22.7	0.3	42
Carpenter	9009	1.8	16.0	0.2	40
Jefferson	1007	4.3	8.6	0.1	22
Bayliss	1005	6.4	26.6	0.3	34
	9003	3.8	14.6	0.1	32
Washington	1002	5.5	14.2	0.1	29
Total		25.2	123.2	1.2	35

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	9017	1.2	6.8	0.1	28
Rodd	1020	3.4	15.5	0.1	29
Ashman	1022	4.1	16.1	0.1	24
Jerome #1	2024	6.3	24.1	0.2	26
Eastman Ave	9027	2.8	22.4	0.2	25
Total		17.7	85.0	0.6	26

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.8	7.5	0.1	39
Jerome #1	2025	10.8	20.4	0.1	17
Ashman	1023	7.7	25.8	0.2	25
Rodd	1021	3.7	15.9	0.1	25
Cronkright	1018	2.3	14.2	0.1	31
George	1015	2.2	8.4	0.1	23
Total		27.5	92.2	0.6	25

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	-	-	0.2	-
St Andrews	2029	5.1	27.4	0.3	36
Sugnet	2030	7.1	55.8	0.6	40
Saginaw	2031	21.0	60.2	0.5	30
Dilloway	2032	7.7	49.1	0.5	39
Wackerly	2033	14.5	46.7	0.4	31
Eb On Ramp	9034	1.9	4.8	0.0	25
Wb On Ramp	9035	0.8	7.0	0.1	38
Wb Ramp	2036	4.0	9.5	0.1	26
Mall Off	9037	1.7	7.8	0.1	35
Mall Dr South	3038	3.4	7.9	0.1	27
North Mall Dr	9039	3.4	12.1	0.1	33
Joe Mann	3040	7.7	13.6	0.1	19
Total		78.1	301.9	3.0	36

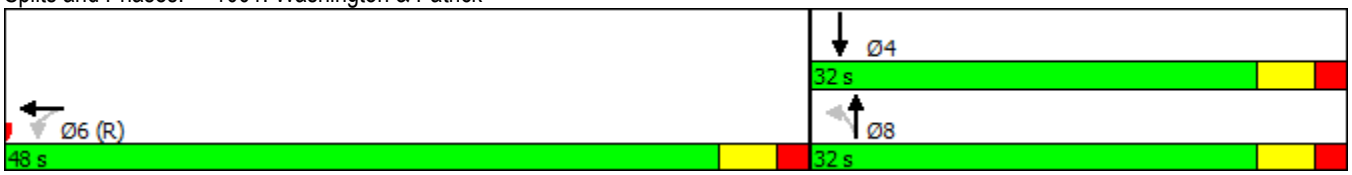
Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	7.5	22.8	0.2	31
	9039	2.4	8.5	0.1	31
Future Dr	3038	2.9	11.5	0.1	35
Saylor Dr	9037	1.6	6.5	0.1	33
Airport	2036	14.2	19.7	0.1	14
Wb On Ramp	9035	3.8	9.9	0.1	25
Eb On Ramp	9034	2.8	8.7	0.1	31
Wackerly	2033	15.7	18.2	0.0	7
Dilloway	2032	8.8	41.0	0.4	36
Saginaw	2031	18.6	60.2	0.5	32
Sugnet	2030	5.3	44.8	0.5	40
St Andrews	2029	7.7	56.4	0.6	39
Carpenter	9028	2.3	24.5	0.3	41
Indian	9027	0.7	13.2	0.2	42
Total		94.2	345.9	3.2	33

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	709	76	123	246
Future Volume (vph)	709	76	123	246
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	55.6	13.4	13.4	13.4
Actuated g/C Ratio	0.70	0.17	0.17	0.17
v/c Ratio	0.40	0.61	0.23	0.58
Control Delay	6.3	33.1	14.7	27.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	33.1	14.7	27.8
LOS	A	C	B	C
Approach Delay	6.3		21.7	27.8
Approach LOS	A		C	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 27 (34%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1001: Washington & Patrick



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	977	146	4	380
Future Volume (vph)	977	146	4	380
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5		5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.6	15.4		15.4
Actuated g/C Ratio	0.67	0.19		0.19
v/c Ratio	0.47	0.25		0.64
Control Delay	1.4	25.5		23.8
Queue Delay	0.0	0.0		0.0
Total Delay	1.4	25.5		23.8
LOS	A	C		C
Approach Delay	1.4	25.5		23.8
Approach LOS	A	C		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 25 (31%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 51.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	193	673	7	21	36	0	0	15	7
Future Vol, veh/h	0	0	0	193	673	7	21	36	0	0	15	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	210	732	8	23	39	0	0	16	8

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	793	1159	-	-	1155	370
Stage 1	-	-	-	0	0	-	-	1155	-
Stage 2	-	-	-	793	1159	-	-	0	-
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	279	194	0	0	196	627
Stage 1	-	-	-	-	-	0	0	269	-
Stage 2	-	-	-	348	268	0	0	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	258	194	-	-	196	627
Mov Cap-2 Maneuver	-	-	-	258	194	-	-	196	-
Stage 1	-	-	-	-	-	-	-	269	-
Stage 2	-	-	-	323	268	-	-	-	-

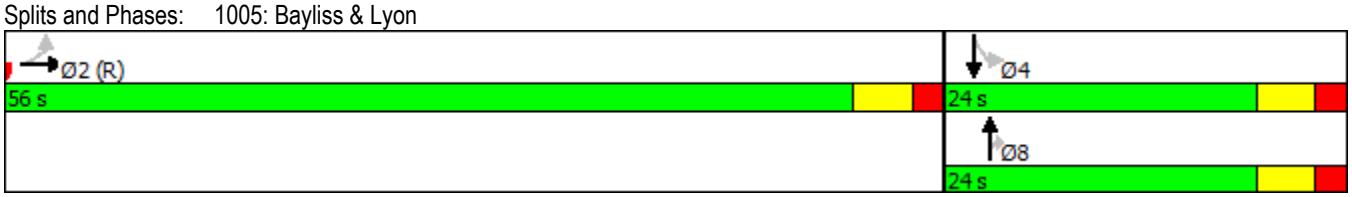
Approach	WB	NB	SB
HCM Control Delay, s		25.3	20.8
HCM LOS		D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	258	194	-	-	-	251
HCM Lane V/C Ratio	0.088	0.202	-	-	-	0.095
HCM Control Delay (s)	20.3	28.2	-	-	-	20.8
HCM Lane LOS	C	D	-	-	-	C
HCM 95th %tile Q(veh)	0.3	0.7	-	-	-	0.3

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1266	53	15	21	187
Future Volume (vph)	1266	53	15	21	187
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	56.0	24.0	24.0	24.0	24.0
Total Split (%)	70.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	55.2	13.8	13.8	13.8	13.8
Actuated g/C Ratio	0.69	0.17	0.17	0.17	0.17
v/c Ratio	0.58	0.18	0.05	0.10	0.63
Control Delay	3.2	28.0	4.3	22.2	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.2	28.0	4.3	22.2	34.5
LOS	A	C	A	C	C
Approach Delay	3.2	22.8			33.3
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 77 (96%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	664	14	50	124
Future Volume (vph)	664	14	50	124
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.7	26.7	26.7
Total Split (s)	46.0	34.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.7	12.3	12.3	12.3
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.31	0.08	0.19	0.50
Control Delay	3.5	14.3	17.5	34.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.5	14.3	17.5	34.6
LOS	A	B	B	C
Approach Delay	3.5		16.8	34.6
Approach LOS	A		B	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 64 (80%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1006: Jefferson & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	1209	57	58	83
Future Volume (vph)	1209	57	58	83
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.5	27.3	27.3	27.3
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	61.5	11.1	11.1	11.1
Actuated g/C Ratio	0.77	0.14	0.14	0.14
v/c Ratio	0.49	0.33	0.35	0.35
Control Delay	3.6	24.4	13.6	12.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	24.4	13.6	12.1
LOS	A	C	B	B
Approach Delay	3.6	24.4		12.7
Approach LOS	A	C		B

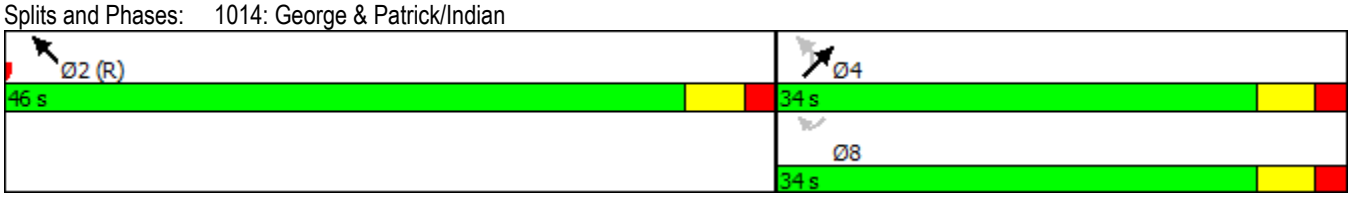
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 61 (76%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 59.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1007: Jefferson & Lyon

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	674	178	120	20
Future Volume (vph)	674	178	120	20
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	46.0	34.0	34.0	34.0
Total Split (%)	57.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	57.0	12.0	12.0	12.0
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.30	0.48	0.46	0.06
Control Delay	2.4	5.4	9.0	0.3
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	2.4	5.5	9.0	0.3
LOS	A	A	A	A
Approach Delay	2.4		6.9	
Approach LOS	A		A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 29 (36%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 50.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1014: George & Patrick/Indian



Intersection	
Int Delay, s/veh	4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	155	717	0	0	0	0	0	69	209
Future Vol, veh/h	0	0	0	155	717	0	0	0	0	0	69	209
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	168	779	0	0	0	0	0	75	227

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	-	1116	390
Stage 1	-	-	-	-	1116	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.14	-	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	0	206	609
Stage 1	-	-	-	0	281	-
Stage 2	-	-	-	0	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	0	609
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-

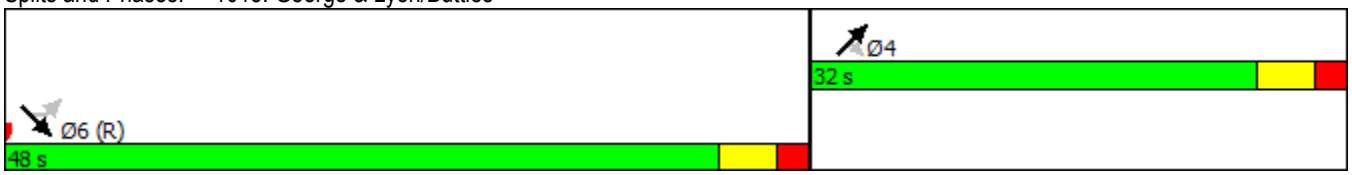
Approach	NW	SW
HCM Control Delay, s		16.6
HCM LOS		C

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	609
HCM Lane V/C Ratio	-	-	-	0.496
HCM Control Delay (s)	-	-	-	16.6
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	2.8

Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	1017	282	206
Future Volume (vph)	1017	282	206
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	48.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	54.9	14.1	14.1
Actuated g/C Ratio	0.69	0.18	0.18
v/c Ratio	0.46	0.49	0.67
Control Delay	0.9	28.2	27.0
Queue Delay	0.1	0.0	0.0
Total Delay	1.0	28.2	27.0
LOS	A	C	C
Approach Delay	1.0	27.7	
Approach LOS	A	C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 50.5%	ICU Level of Service A
Analysis Period (min) 15	

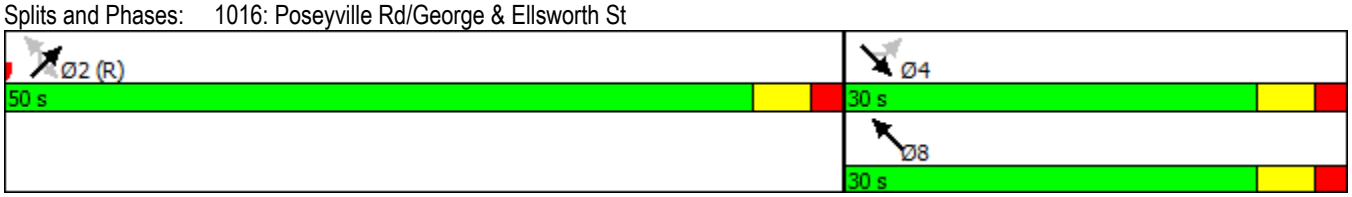
Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	4	31	23	477	65
Future Volume (vph)	4	31	23	477	65
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0
Total Split (s)	30.0	30.0	30.0	50.0	50.0
Total Split (%)	37.5%	37.5%	37.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)		9.9	9.9	66.3	66.3
Actuated g/C Ratio		0.12	0.12	0.83	0.83
v/c Ratio		0.17	0.08	0.23	0.05
Control Delay		25.5	23.3	3.5	1.6
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		25.5	23.3	3.5	1.6
LOS		C	C	A	A
Approach Delay		25.5	23.3	3.3	
Approach LOS		C	C	A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 42 (53%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.23	
Intersection Signal Delay: 5.2	Intersection LOS: A
Intersection Capacity Utilization 31.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St



Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	1030	221
Future Volume (vph)	1030	221
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	58.3	10.7
Actuated g/C Ratio	0.73	0.13
v/c Ratio	0.45	0.34
Control Delay	1.2	26.1
Queue Delay	0.0	0.0
Total Delay	1.2	26.1
LOS	A	C
Approach Delay	1.2	26.1
Approach LOS	A	C

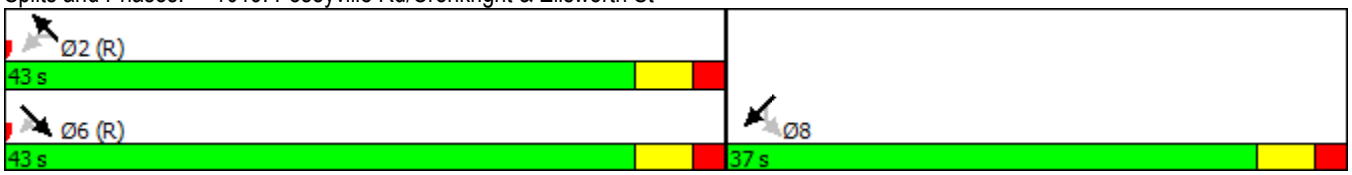
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 11 (14%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 44.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1018: Cronkright & Buttles

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	22	59	58	90	188
Future Volume (vph)	22	59	58	90	188
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	26.0	26.0	26.0
Total Split (s)	43.0	43.0	43.0	43.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	None
Act Effct Green (s)	58.1	58.1	58.1	58.1	10.9
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.14
v/c Ratio	0.02	0.05	0.06	0.07	0.38
Control Delay	4.5	1.7	3.8	3.7	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	1.7	3.8	3.7	4.1
LOS	A	A	A	A	A
Approach Delay	2.5			3.8	4.1
Approach LOS	A			A	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 27 (34%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 31.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1019: Poseyville Rd/Cronkright & Ellsworth St



Lane Group	NWT	NEL	NET	SWT
Lane Configurations				
Traffic Volume (vph)	879	4	76	139
Future Volume (vph)	879	4	76	139
Turn Type	NA	Perm	NA	NA
Protected Phases	2		4	8
Permitted Phases		4		
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	55.4	13.6	13.6	13.6
Actuated g/C Ratio	0.69	0.17	0.17	0.17
v/c Ratio	0.41	0.02	0.26	0.60
Control Delay	6.2	26.2	30.2	34.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.2	26.2	30.2	34.7
LOS	A	C	C	C
Approach Delay	6.2		30.1	34.7
Approach LOS	A		C	C

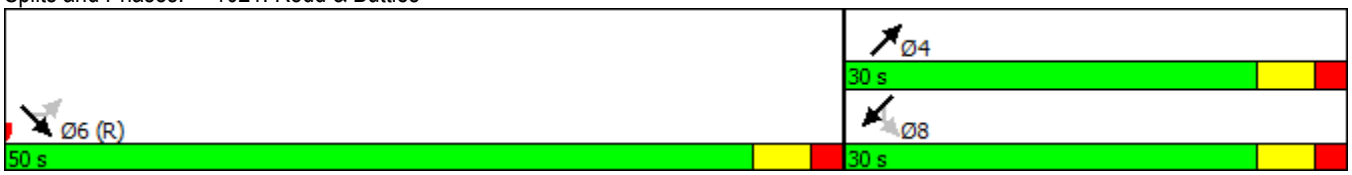
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 58 (73%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 55.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian

Lane Group	SET	NET	SWL	SWT
Lane Configurations				
Traffic Volume (vph)	1012	25	20	150
Future Volume (vph)	1012	25	20	150
Turn Type	NA	NA	Perm	NA
Protected Phases	6	4		8
Permitted Phases			8	
Detector Phase	6	4	8	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	50.0	30.0	30.0	30.0
Total Split (%)	62.5%	37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.0	13.0	13.0	13.0
Actuated g/C Ratio	0.70	0.16	0.16	0.16
v/c Ratio	0.48	0.18	0.10	0.54
Control Delay	1.9	17.0	18.2	26.8
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	1.9	17.0	18.2	26.9
LOS	A	B	B	C
Approach Delay	1.9	17.0		25.9
Approach LOS	A	B		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 1 (1%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 55.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles



Lane Group	NWT	NEL	NET	SWT
Lane Configurations				
Traffic Volume (vph)	876	3	76	140
Future Volume (vph)	876	3	76	140
Turn Type	NA	Perm	NA	NA
Protected Phases	2		4	8
Permitted Phases		4		
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	48.0	32.0	32.0	32.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	55.4	13.6	13.6	13.6
Actuated g/C Ratio	0.69	0.17	0.17	0.17
v/c Ratio	0.41	0.02	0.26	0.60
Control Delay	1.5	22.3	26.4	34.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.5	22.3	26.4	34.7
LOS	A	C	C	C
Approach Delay	1.5		26.3	34.7
Approach LOS	A		C	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 69 (86%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian

Lane Group	SET	NET	SWL	SWT
Lane Configurations				
Traffic Volume (vph)	1047	24	21	150
Future Volume (vph)	1047	24	21	150
Turn Type	NA	NA	Perm	NA
Protected Phases	6	4		8
Permitted Phases			8	
Detector Phase	6	4	8	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	51.0	29.0	29.0	29.0
Total Split (%)	63.8%	36.3%	36.3%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.0	13.0	13.0	13.0
Actuated g/C Ratio	0.70	0.16	0.16	0.16
v/c Ratio	0.50	0.17	0.11	0.54
Control Delay	5.0	17.0	10.8	17.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.0	17.0	10.8	17.2
LOS	A	B	B	B
Approach Delay	5.0	17.0		16.4
Approach LOS	A	B		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 71 (89%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	472	447	428
Future Volume (vph)	472	447	428
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	46.0	46.0	34.0
Total Split (%)	57.5%	57.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	52.8	52.8	16.2
Actuated g/C Ratio	0.66	0.66	0.20
v/c Ratio	0.30	0.31	0.67
Control Delay	5.4	4.9	20.2
Queue Delay	0.0	0.0	0.0
Total Delay	5.4	4.9	20.2
LOS	A	A	C
Approach Delay		5.1	20.2
Approach LOS		A	C

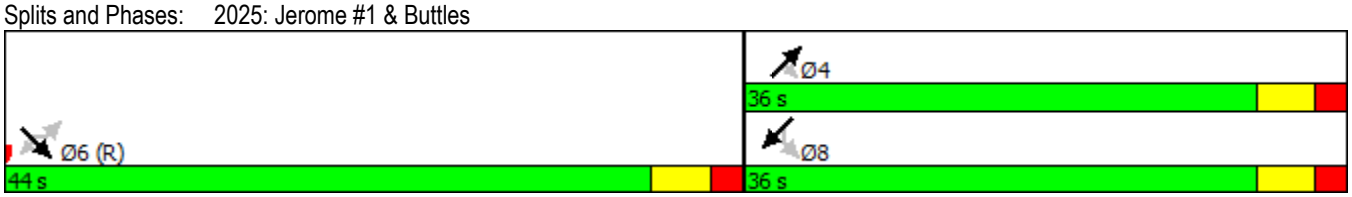
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 61 (76%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 9.9	Intersection LOS: A
Intersection Capacity Utilization 69.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	636	91	422	488	3	469
Future Volume (vph)	636	91	422	488	3	469
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	44.0	44.0	36.0	36.0	36.0	36.0
Total Split (%)	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	47.8	47.8	21.2	21.2	21.2	21.2
Actuated g/C Ratio	0.60	0.60	0.26	0.26	0.26	0.26
v/c Ratio	0.33	0.10	0.73	0.61	0.03	0.55
Control Delay	4.0	0.8	26.9	16.4	9.3	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	4.0	0.8	26.9	16.4	9.3	15.2
LOS	A	A	C	B	A	B
Approach Delay	3.6		23.6			15.1
Approach LOS	A		C			B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 42 (53%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	7	26	26	58	25	588	39	679
Future Volume (vph)	7	26	26	58	25	588	39	679
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	26.0	26.0	26.0	26.0	54.0	54.0	54.0	54.0
Total Split (%)	32.5%	32.5%	32.5%	32.5%	67.5%	67.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	9.0	9.0	9.0	9.0	63.0	63.0	63.0	63.0
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.79	0.79	0.79	0.79
v/c Ratio	0.06	0.27	0.19	0.47	0.05	0.24	0.07	0.28
Control Delay	30.9	21.0	33.9	27.0	0.7	0.7	1.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	21.0	33.9	27.0	0.7	0.7	1.6	1.2
LOS	C	C	C	C	A	A	A	A
Approach Delay		22.2		28.4		0.7		1.3
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 62 (78%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 4.1	Intersection LOS: A
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2029: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	18	62	43	122	47	560	12	651
Future Volume (vph)	18	62	43	122	47	560	12	651
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	28.0	28.0	28.0	28.0	52.0	52.0	52.0	52.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.3	11.3	11.3	11.3	56.8	56.8	56.8	56.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.71	0.71	0.71	0.71
v/c Ratio	0.11	0.42	0.26	0.54	0.10	0.26	0.02	0.30
Control Delay	29.6	23.0	32.9	37.7	4.1	3.8	2.2	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	23.0	32.9	37.7	4.1	3.8	2.2	2.3
LOS	C	C	C	D	A	A	A	A
Approach Delay		23.9		36.5		3.9		2.3
Approach LOS		C		D		A		A

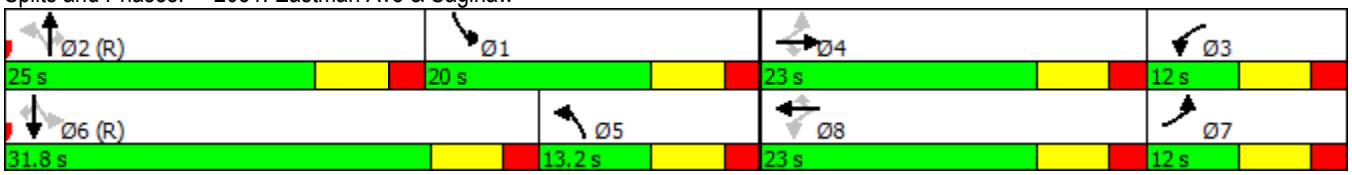
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 45 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 56.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2030: Eastman Ave & Sugnet

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	450	122	80	474	192	97	437	53	315	489	185
Future Volume (vph)	117	450	122	80	474	192	97	437	53	315	489	185
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	16.5	11.5	16.5	16.5
Total Split (s)	12.0	23.0	23.0	12.0	23.0	23.0	13.2	25.0	25.0	20.0	31.8	31.8
Total Split (%)	15.0%	28.8%	28.8%	15.0%	28.8%	28.8%	16.5%	31.3%	31.3%	25.0%	39.8%	39.8%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	20.7	15.2	15.2	21.2	15.4	15.4	29.9	23.6	23.6	41.8	31.5	31.5
Actuated g/C Ratio	0.26	0.19	0.19	0.26	0.19	0.19	0.37	0.30	0.30	0.52	0.39	0.39
v/c Ratio	0.55	0.73	0.24	0.35	0.76	0.38	0.32	0.46	0.08	0.62	0.42	0.26
Control Delay	33.5	37.5	1.0	25.1	38.5	2.4	8.3	16.3	0.3	16.3	7.6	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	37.5	1.0	25.1	38.5	2.4	8.3	16.3	0.3	16.3	7.6	1.1
LOS	C	D	A	C	D	A	A	B	A	B	A	A
Approach Delay		30.4			27.8			13.5			9.3	
Approach LOS		C			C			B			A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2031: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	40	68	86	47	16	663	68	861
Future Volume (vph)	40	68	86	47	16	663	68	861
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	26.0	26.0	26.0	26.0	54.0	54.0	54.0	54.0
Total Split (%)	32.5%	32.5%	32.5%	32.5%	67.5%	67.5%	67.5%	67.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.4	11.4	11.4	11.4	56.9	56.9	56.9	56.9
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.71	0.71	0.71	0.71
v/c Ratio	0.24	0.48	0.52	0.41	0.05	0.32	0.16	0.39
Control Delay	32.1	37.2	41.1	17.9	3.4	3.6	1.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	37.2	41.1	17.9	3.4	3.6	1.4	2.3
LOS	C	D	D	B	A	A	A	A
Approach Delay		35.9		27.8		3.6		2.3
Approach LOS		D		C		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 41 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 59.0%	ICU Level of Service B
Analysis Period (min) 15	

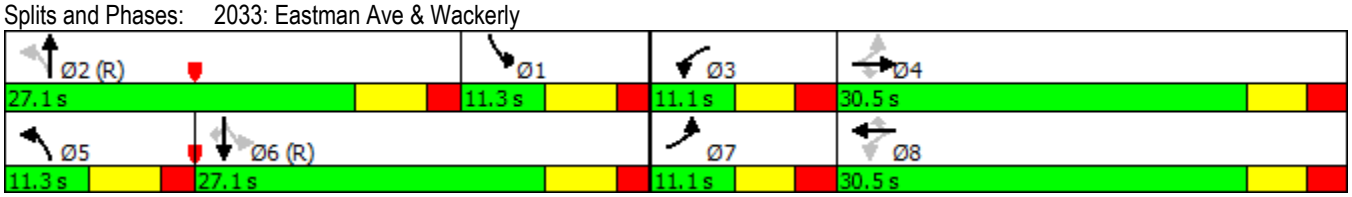
Splits and Phases: 2032: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	131	466	90	62	210	126	45	652	78	806	141
Future Volume (vph)	131	466	90	62	210	126	45	652	78	806	141
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.1	30.5	30.5	11.1	30.5	30.5	11.3	26.0	11.3	26.0	26.0
Total Split (s)	11.1	30.5	30.5	11.1	30.5	30.5	11.3	27.1	11.3	27.1	27.1
Total Split (%)	13.9%	38.1%	38.1%	13.9%	38.1%	38.1%	14.1%	33.9%	14.1%	33.9%	33.9%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	28.0	24.0	24.0	26.8	21.8	21.8	25.7	25.7	28.0	28.0	28.0
Actuated g/C Ratio	0.35	0.30	0.30	0.34	0.27	0.27	0.32	0.32	0.35	0.35	0.35
v/c Ratio	0.39	0.89	0.14	0.41	0.55	0.26	0.24	0.50	0.29	0.69	0.21
Control Delay	18.3	47.0	0.4	19.7	28.7	1.0	11.5	11.0	16.7	19.2	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	47.0	0.4	19.7	28.7	1.0	11.5	11.0	16.7	19.2	0.9
LOS	B	D	A	B	C	A	B	B	B	B	A
Approach Delay		35.4			18.5			11.1		16.5	
Approach LOS		D			B			B		B	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 5 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 75.8% ICU Level of Service D
Analysis Period (min) 15

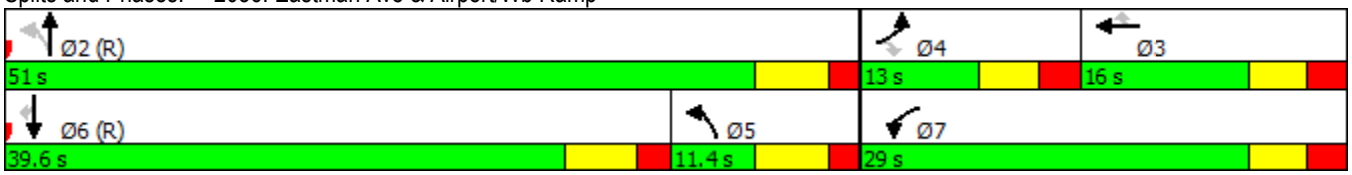
Splits and Phases: 2033: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	99	45	205	96	167	50	578	81	904	50
Future Volume (vph)	99	45	205	96	167	50	578	81	904	50
Turn Type	Prot	Perm	Prot	NA	Perm	pm+pt	NA	Free	NA	Perm
Protected Phases	4		7	3		5	2		6	
Permitted Phases		4			3	2		Free		6
Detector Phase	4	4	7	3	3	5	2		6	6
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6	35.6
Total Split (s)	13.0	13.0	29.0	16.0	16.0	11.4	51.0		39.6	39.6
Total Split (%)	16.3%	16.3%	36.3%	20.0%	20.0%	14.3%	63.8%		49.5%	49.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.3	6.3		6.3	6.3
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes	Yes
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max	C-Max
Act Effct Green (s)	7.0	7.0	21.2	21.2	10.8	46.5	46.5	80.0	35.1	35.1
Actuated g/C Ratio	0.09	0.09	0.26	0.26	0.14	0.58	0.58	1.00	0.44	0.44
v/c Ratio	0.39	0.16	0.36	0.36	0.46	0.15	0.31	0.06	0.43	0.07
Control Delay	38.6	1.0	26.7	26.6	7.5	5.0	4.9	0.1	16.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.6	1.0	26.7	26.6	7.5	5.0	4.9	0.1	16.3	0.2
LOS	D	A	C	C	A	A	A	A	B	A
Approach Delay				19.8			4.3		15.4	
Approach LOS				B			A		B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 77 (96%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2036: Eastman Ave & Airport/Wb Ramp



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1190	164	303	40
Future Volume (vph)	1190	164	303	40
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	51.0	29.0	29.0	29.0
Total Split (%)	63.8%	36.3%	36.3%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	52.2	16.8	16.8	16.8
Actuated g/C Ratio	0.65	0.21	0.21	0.21
v/c Ratio	0.60	0.71	0.44	0.24
Control Delay	10.2	27.6	14.2	17.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	27.6	14.2	17.4
LOS	B	C	B	B
Approach Delay	10.2		18.9	17.4
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 26 (33%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1001: Washington & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	963	339	13	41
Future Volume (vph)	963	339	13	41
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5		5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.6	15.4		15.4
Actuated g/C Ratio	0.67	0.19		0.19
v/c Ratio	0.50	0.66		0.11
Control Delay	2.8	31.6		16.9
Queue Delay	0.0	0.0		0.0
Total Delay	2.8	31.6		16.9
LOS	A	C		B
Approach Delay	2.8	31.6		16.9
Approach LOS	A	C		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 24 (30%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.0	Intersection LOS: B
Intersection Capacity Utilization 51.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon

Intersection	
Int Delay, s/veh	18.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	130	1250	91	21	101	0	0	15	74
Future Vol, veh/h	0	0	0	130	1250	91	21	101	0	0	15	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	141	1359	99	23	110	0	0	16	80

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	970	1740	-	-	1691	729
Stage 1	-	-	-	0	0	-	-	1691	-
Stage 2	-	-	-	970	1740	-	-	0	-
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	208	~ 86	0	0	92	365
Stage 1	-	-	-	-	-	0	0	148	-
Stage 2	-	-	-	272	140	0	0	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	140	~ 86	-	-	92	365
Mov Cap-2 Maneuver	-	-	-	140	~ 86	-	-	92	-
Stage 1	-	-	-	-	-	-	-	148	-
Stage 2	-	-	-	189	140	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		234.8	29.3
HCM LOS		F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	140	86	-	-	-	243
HCM Lane V/C Ratio	0.163	1.277	-	-	-	0.398
HCM Control Delay (s)	35.7	276.2	-	-	-	29.3
HCM Lane LOS	E	F	-	-	-	D
HCM 95th %tile Q(veh)	0.6	8.1	-	-	-	1.8

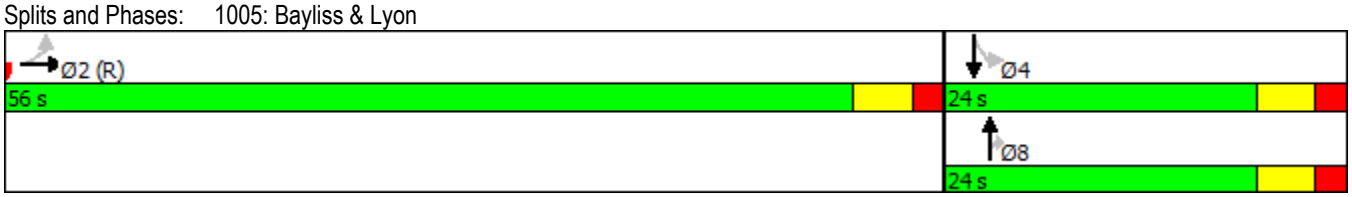
Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1037	106	113	74	71
Future Volume (vph)	1037	106	113	74	71
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	56.0	24.0	24.0	24.0	24.0
Total Split (%)	70.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	58.4	10.6	10.6	10.6	10.6
Actuated g/C Ratio	0.73	0.13	0.13	0.13	0.13
v/c Ratio	0.46	0.47	0.41	0.47	0.31
Control Delay	3.0	37.4	13.5	34.8	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	37.4	13.5	34.8	28.4
LOS	A	D	B	C	C
Approach Delay	3.0	25.1			31.6
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 6 (8%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 59.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1259	44	89	106
Future Volume (vph)	1259	44	89	106
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.7	26.7	26.7
Total Split (s)	52.6	27.4	27.4	27.4
Total Split (%)	65.8%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	57.0	12.0	12.0	12.0
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.58	0.26	0.35	0.48
Control Delay	4.3	16.7	17.3	32.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.3	16.7	17.3	32.8
LOS	A	B	B	C
Approach Delay	4.3		17.1	32.8
Approach LOS	A		B	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 61 (76%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1006: Jefferson & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	989	116	53	67
Future Volume (vph)	989	116	53	67
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.5	27.3	27.3	27.3
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.4	12.6	12.6	12.6
Actuated g/C Ratio	0.70	0.16	0.16	0.16
v/c Ratio	0.44	0.55	0.34	0.25
Control Delay	3.3	33.1	15.2	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.3	33.1	15.2	12.3
LOS	A	C	B	B
Approach Delay	3.3	33.1		13.6
Approach LOS	A	C		B

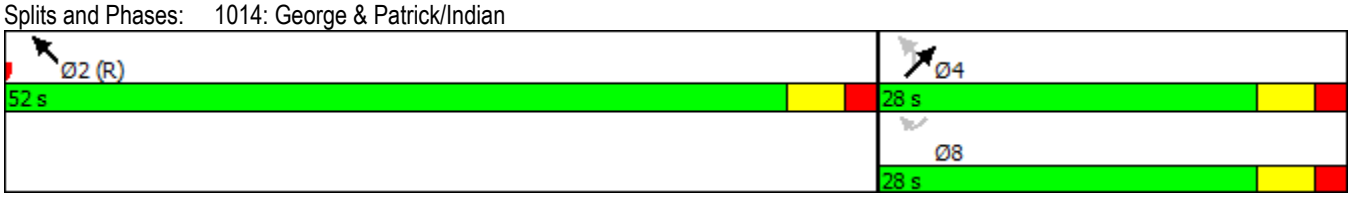
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 64 (80%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1007: Jefferson & Lyon

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	1381	247	21	54
Future Volume (vph)	1381	247	21	54
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.1	15.9	15.9	15.9
Actuated g/C Ratio	0.66	0.20	0.20	0.20
v/c Ratio	0.64	0.71	0.06	0.17
Control Delay	4.4	15.9	5.0	14.1
Queue Delay	0.0	0.5	0.0	0.0
Total Delay	4.4	16.4	5.0	14.1
LOS	A	B	A	B
Approach Delay	4.4		15.5	
Approach LOS	A		B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 26 (33%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1014: George & Patrick/Indian



Intersection	
Int Delay, s/veh	3.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	268	1407	7	0	0	0	0	154	53
Future Vol, veh/h	0	0	0	268	1407	7	0	0	0	0	154	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	291	1529	8	0	0	0	0	167	58

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	-	2116	768
Stage 1	-	-	-	-	2116	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.14	-	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	0	~ 50	344
Stage 1	-	-	-	0	~ 90	-
Stage 2	-	-	-	0	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	0	344
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-

Approach	NW	SW
HCM Control Delay, s		33.2
HCM LOS		D

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	344
HCM Lane V/C Ratio	-	-	-	0.654
HCM Control Delay (s)	-	-	-	33.2
HCM Lane LOS	-	-	-	D
HCM 95th %tile Q(veh)	-	-	-	4.4

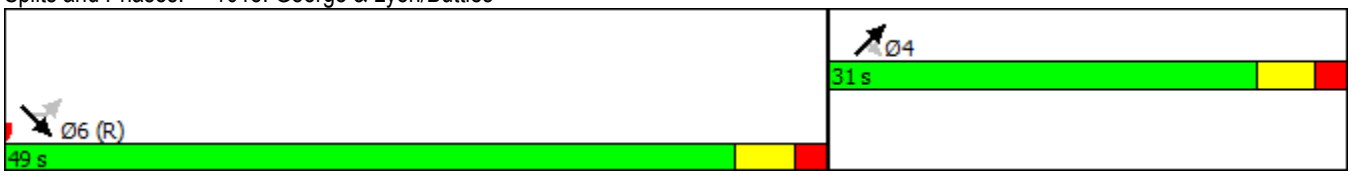
Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	872	242	150
Future Volume (vph)	872	242	150
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	49.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	56.5	12.5	12.5
Actuated g/C Ratio	0.71	0.16	0.16
v/c Ratio	0.39	0.48	0.48
Control Delay	1.5	29.0	12.4
Queue Delay	0.1	0.0	0.0
Total Delay	1.6	29.0	12.4
LOS	A	C	B
Approach Delay	1.6	22.6	
Approach LOS	A	C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

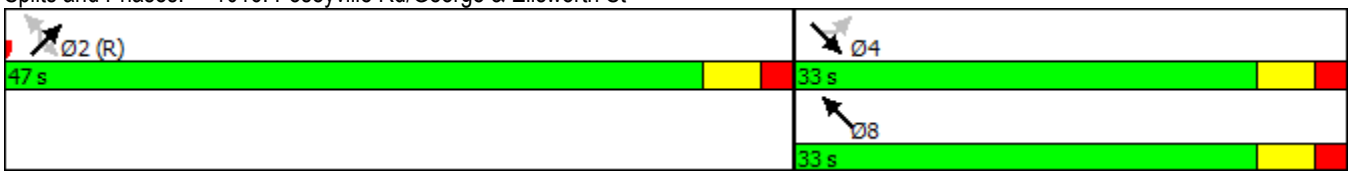
Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	23	27	69	344	25
Future Volume (vph)	23	27	69	344	25
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0
Total Split (s)	33.0	33.0	33.0	47.0	47.0
Total Split (%)	41.3%	41.3%	41.3%	58.8%	58.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)		10.4	10.4	62.2	62.2
Actuated g/C Ratio		0.13	0.13	0.78	0.78
v/c Ratio		0.28	0.22	0.17	0.02
Control Delay		37.4	23.0	3.9	1.8
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		37.4	23.0	3.9	1.8
LOS		D	C	A	A
Approach Delay		37.4	23.0	3.7	
Approach LOS		D	C	A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.28	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 30.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St



Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	886	410
Future Volume (vph)	886	410
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	55.8	13.2
Actuated g/C Ratio	0.70	0.16
v/c Ratio	0.51	0.53
Control Delay	2.2	25.8
Queue Delay	0.0	0.0
Total Delay	2.2	25.8
LOS	A	C
Approach Delay	2.2	25.8
Approach LOS	A	C

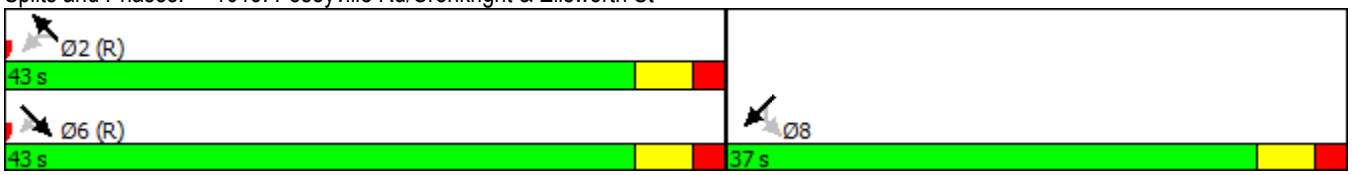
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 8 (10%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1018: Cronkright & Buttles

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	34	234	85	58	607
Future Volume (vph)	34	234	85	58	607
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	26.0	26.0	26.0
Total Split (s)	43.0	43.0	43.0	43.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	None
Act Effct Green (s)	52.3	52.3	52.3	52.3	16.7
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.21
v/c Ratio	0.03	0.24	0.10	0.05	0.66
Control Delay	5.8	3.9	4.9	4.5	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	3.9	4.9	4.5	18.6
LOS	A	A	A	A	B
Approach Delay	4.2			4.8	18.6
Approach LOS	A			A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 46.7%	ICU Level of Service A
Analysis Period (min) 15	

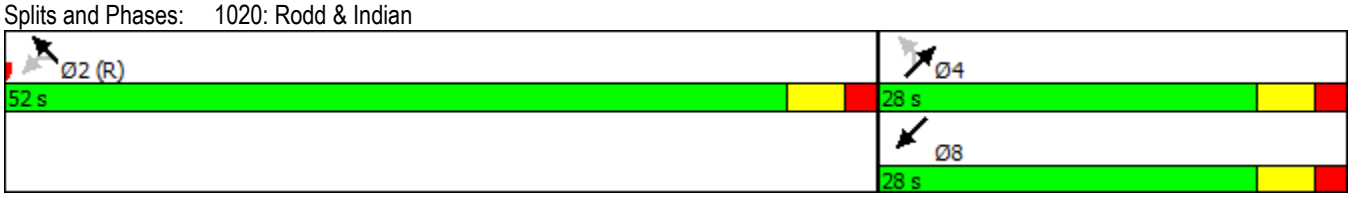
Splits and Phases: 1019: Poseyville Rd/Cronkright & Ellsworth St



Lane Group	NWT	NEL	NET	SWT
Lane Configurations				
Traffic Volume (vph)	1418	17	134	190
Future Volume (vph)	1418	17	134	190
Turn Type	NA	Perm	NA	NA
Protected Phases	2		4	8
Permitted Phases		4		
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	51.4	17.6	17.6	17.6
Actuated g/C Ratio	0.64	0.22	0.22	0.22
v/c Ratio	0.70	0.14	0.36	0.76
Control Delay	7.2	28.1	30.3	38.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.2	28.1	30.3	38.0
LOS	A	C	C	D
Approach Delay	7.2		30.0	38.0
Approach LOS	A		C	D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 43 (54%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 76.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian



Lane Group	SET	NET	SWL	SWT
Lane Configurations				
Traffic Volume (vph)	1032	67	61	141
Future Volume (vph)	1032	67	61	141
Turn Type	NA	NA	Perm	NA
Protected Phases	6	4		8
Permitted Phases			8	
Detector Phase	6	4	8	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.3	12.7	12.7	12.7
Actuated g/C Ratio	0.70	0.16	0.16	0.16
v/c Ratio	0.50	0.35	0.33	0.52
Control Delay	2.0	24.0	26.3	29.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.0	24.0	26.3	29.5
LOS	A	C	C	C
Approach Delay	2.0	24.0		28.5
Approach LOS	A	C		C

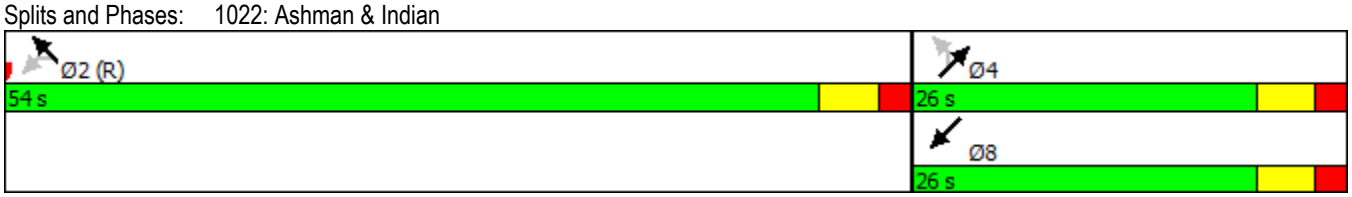
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 76.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles

Lane Group	NWT	NEL	NET	SWT
Lane Configurations				
Traffic Volume (vph)	1467	17	134	139
Future Volume (vph)	1467	17	134	139
Turn Type	NA	Perm	NA	NA
Protected Phases	2		4	8
Permitted Phases		4		
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	54.0	26.0	26.0	26.0
Total Split (%)	67.5%	32.5%	32.5%	32.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.6	15.4	15.4	15.4
Actuated g/C Ratio	0.67	0.19	0.19	0.19
v/c Ratio	0.71	0.13	0.41	0.71
Control Delay	2.7	30.3	34.6	37.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.7	30.3	34.6	37.0
LOS	A	C	C	D
Approach Delay	2.7		34.1	37.0
Approach LOS	A		C	D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 52 (65%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian



Lane Group	SET	NET	SWL	SWT
Lane Configurations				
Traffic Volume (vph)	1080	67	35	140
Future Volume (vph)	1080	67	35	140
Turn Type	NA	NA	Perm	NA
Protected Phases	6	4		8
Permitted Phases			8	
Detector Phase	6	4	8	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.3	12.7	12.7	12.7
Actuated g/C Ratio	0.70	0.16	0.16	0.16
v/c Ratio	0.52	0.34	0.19	0.52
Control Delay	5.1	24.2	12.7	18.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.1	24.2	12.7	18.1
LOS	A	C	B	B
Approach Delay	5.1	24.2		17.0
Approach LOS	A	C		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 64 (80%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	1020	562	476
Future Volume (vph)	1020	562	476
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	52.0	52.0	28.0
Total Split (%)	65.0%	65.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	51.8	51.8	17.2
Actuated g/C Ratio	0.65	0.65	0.22
v/c Ratio	0.54	0.54	0.70
Control Delay	3.8	3.0	31.6
Queue Delay	0.4	0.1	0.2
Total Delay	4.2	3.1	31.8
LOS	A	A	C
Approach Delay		3.5	31.8
Approach LOS		A	C

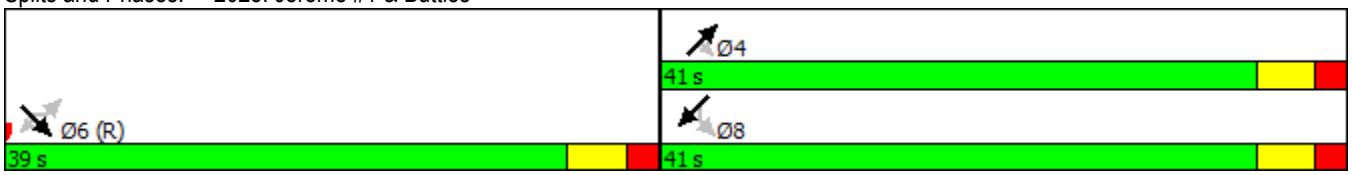
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 67 (84%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	661	237	463	525	6	1014
Future Volume (vph)	661	237	463	525	6	1014
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	39.0	39.0	41.0	41.0	41.0	41.0
Total Split (%)	48.8%	48.8%	51.3%	51.3%	51.3%	51.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	38.0	38.0	31.0	31.0	31.0	31.0
Actuated g/C Ratio	0.48	0.48	0.39	0.39	0.39	0.39
v/c Ratio	0.44	0.33	0.56	0.53	0.04	0.80
Control Delay	15.7	13.6	17.3	14.7	3.5	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	15.7	13.6	17.3	14.7	3.5	15.4
LOS	B	B	B	B	A	B
Approach Delay	15.1		16.5			15.3
Approach LOS	B		B			B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	58	76	40	76	53	753	69	806
Future Volume (vph)	58	76	40	76	53	753	69	806
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	16.0	16.0	16.0	16.0	34.0	34.0	34.0	34.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	33.8	33.8	33.8	33.8
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.68	0.68	0.68	0.68
v/c Ratio	0.32	0.45	0.21	0.47	0.16	0.36	0.19	0.39
Control Delay	22.3	15.2	20.1	14.8	6.4	5.5	3.4	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	15.2	20.1	14.8	6.4	5.5	3.4	3.1
LOS	C	B	C	B	A	A	A	A
Approach Delay		17.2		15.9		5.5		3.1
Approach LOS		B		B		A		A

Intersection Summary

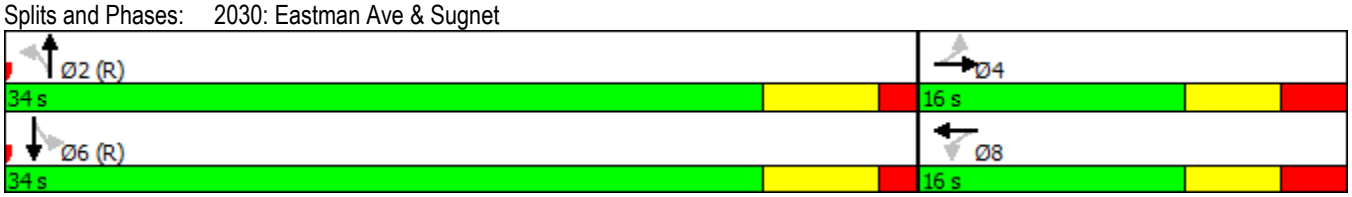
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 39 (78%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 6.5 Intersection LOS: A
Intersection Capacity Utilization 66.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2029: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	138	52	61	49	788	33	778
Future Volume (vph)	35	138	52	61	49	788	33	778
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	16.0	16.0	16.0	16.0	34.0	34.0	34.0	34.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	9.1	9.1	9.1	9.1	29.0	29.0	29.0	29.0
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.58	0.58	0.58	0.58
v/c Ratio	0.16	0.68	0.30	0.22	0.16	0.45	0.11	0.43
Control Delay	18.5	25.2	21.8	17.0	3.2	3.9	2.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	25.2	21.8	17.0	3.2	3.9	2.1	2.7
LOS	B	C	C	B	A	A	A	A
Approach Delay		24.3		19.1		3.9		2.7
Approach LOS		C		B		A		A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 38 (76%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 70.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2030: Eastman Ave & Sugnet

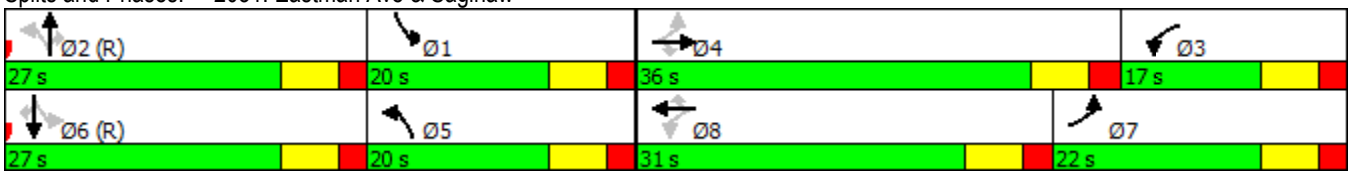


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	665	146	106	699	428	228	485	119	256	590	129
Future Volume (vph)	278	665	146	106	699	428	228	485	119	256	590	129
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	16.5	11.5	16.5	16.5
Total Split (s)	22.0	36.0	36.0	17.0	31.0	31.0	20.0	27.0	27.0	20.0	27.0	27.0
Total Split (%)	22.0%	36.0%	36.0%	17.0%	31.0%	31.0%	20.0%	27.0%	27.0%	20.0%	27.0%	27.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	40.5	25.7	25.7	37.3	24.1	24.1	34.9	22.3	22.3	34.9	22.3	22.3
Actuated g/C Ratio	0.40	0.26	0.26	0.37	0.24	0.24	0.35	0.22	0.22	0.35	0.22	0.22
v/c Ratio	0.91	0.80	0.30	0.38	0.90	0.70	0.84	0.67	0.26	0.81	0.87	0.27
Control Delay	67.2	41.9	4.5	30.6	51.8	13.1	53.4	47.2	10.1	61.8	54.6	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	41.9	4.5	30.6	51.8	13.1	53.4	47.2	10.1	61.8	54.6	10.0
LOS	E	D	A	C	D	B	D	D	B	E	D	A
Approach Delay		43.3			36.5			43.6			51.2	
Approach LOS		D			D			D			D	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 43.2 Intersection LOS: D
Intersection Capacity Utilization 86.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2031: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	43	31	71	31	26	1118	44	869
Future Volume (vph)	43	31	71	31	26	1118	44	869
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	25.0	25.0	25.0	25.0	75.0	75.0	75.0	75.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.3	11.3	11.3	11.3	77.0	77.0	77.0	77.0
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.77	0.77	0.77	0.77
v/c Ratio	0.32	0.37	0.52	0.40	0.07	0.47	0.17	0.36
Control Delay	45.3	45.3	53.1	21.5	1.2	1.6	2.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	45.3	53.1	21.5	1.2	1.6	2.7	1.7
LOS	D	D	D	C	A	A	A	A
Approach Delay		45.3		35.4		1.6		1.7
Approach LOS		D		D		A		A

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 97 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 5.9 Intersection LOS: A
Intersection Capacity Utilization 56.9% ICU Level of Service B
Analysis Period (min) 15

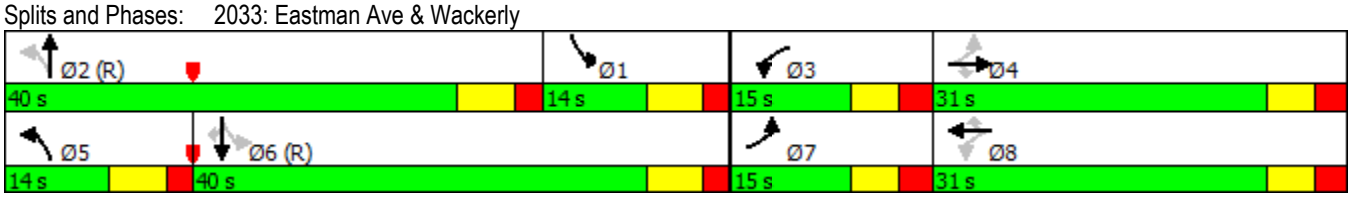
Splits and Phases: 2032: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	207	201	150	142	155	251	84	1038	123	655	266
Future Volume (vph)	207	201	150	142	155	251	84	1038	123	655	266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	4.7	7.0	7.0	4.7	7.0	7.0	4.7	10.0	4.7	10.0	10.0
Minimum Split (s)	11.0	31.0	31.0	11.0	31.0	31.0	11.0	26.0	11.0	26.0	26.0
Total Split (s)	15.0	31.0	31.0	15.0	31.0	31.0	14.0	40.0	14.0	40.0	40.0
Total Split (%)	15.0%	31.0%	31.0%	15.0%	31.0%	31.0%	14.0%	40.0%	14.0%	40.0%	40.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	25.7	16.8	16.8	25.7	16.8	16.8	41.8	41.8	43.6	43.6	43.6
Actuated g/C Ratio	0.26	0.17	0.17	0.26	0.17	0.17	0.42	0.42	0.44	0.44	0.44
v/c Ratio	0.74	0.69	0.34	0.65	0.66	0.71	0.33	0.61	0.48	0.45	0.33
Control Delay	42.9	50.0	2.7	37.0	48.8	18.8	14.0	13.6	21.0	10.0	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	50.0	2.7	37.0	48.8	18.8	14.0	13.6	21.0	10.0	1.5
LOS	D	D	A	D	D	B	B	B	C	B	A
Approach Delay		34.6			32.0			13.6		9.1	
Approach LOS		C			C			B		A	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 76 (76%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 19.1 Intersection LOS: B
Intersection Capacity Utilization 69.3% ICU Level of Service C
Analysis Period (min) 15

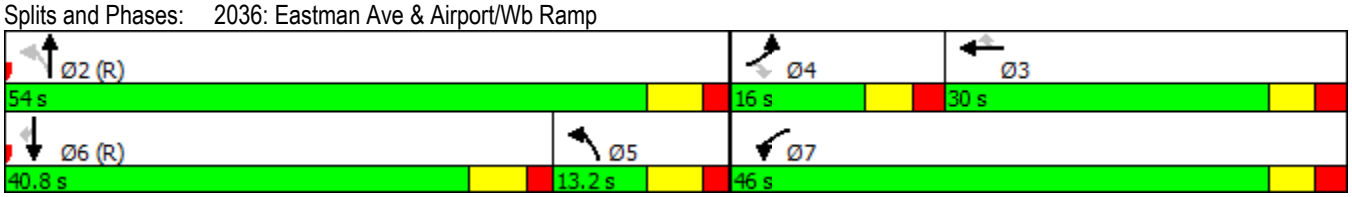
Splits and Phases: 2033: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	168	78	239	107	300	75	859	224	1046	153
Future Volume (vph)	168	78	239	107	300	75	859	224	1046	153
Turn Type	Prot	Perm	Prot	NA	Perm	pm+pt	NA	Free	NA	Perm
Protected Phases	4		7	3		5	2		6	
Permitted Phases		4			3	2		Free		6
Detector Phase	4	4	7	3	3	5	2		6	6
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6	35.6
Total Split (s)	16.0	16.0	46.0	30.0	30.0	13.2	54.0		40.8	40.8
Total Split (%)	16.0%	16.0%	46.0%	30.0%	30.0%	13.2%	54.0%		40.8%	40.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.3	6.3		6.3	6.3
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes	Yes
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max	C-Max
Act Effct Green (s)	9.6	9.6	31.5	31.5	16.0	56.2	56.2	100.0	43.0	43.0
Actuated g/C Ratio	0.10	0.10	0.32	0.32	0.16	0.56	0.56	1.00	0.43	0.43
v/c Ratio	0.60	0.30	0.35	0.35	0.83	0.27	0.47	0.16	0.50	0.21
Control Delay	51.6	2.5	26.7	26.7	35.8	8.5	6.0	0.2	19.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	2.5	26.7	26.7	35.8	8.5	6.0	0.2	19.6	5.2
LOS	D	A	C	C	D	A	A	A	B	A
Approach Delay				30.9			5.1		17.8	
Approach LOS				C			A		B	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 66 (66%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 60.7%	ICU Level of Service B
Analysis Period (min) 15	

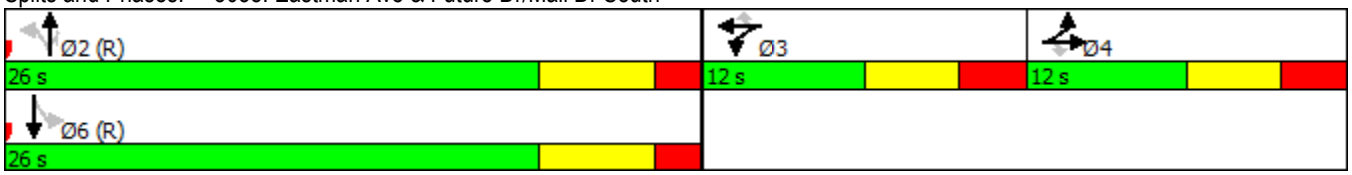
Splits and Phases: 2036: Eastman Ave & Airport/Wb Ramp



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	7	22	293	13	33	33	828	89	20	908
Future Volume (vph)	7	22	293	13	33	33	828	89	20	908
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	12.0	12.0	12.0	12.0	12.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lag	Lag	Lead	Lead	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	5.8	5.8	6.0	6.0	6.0	24.7	24.7	24.7	24.7	24.7
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.49	0.49	0.49	0.49	0.49
v/c Ratio	0.16	0.07	0.82	0.81	0.10	0.18	0.50	0.11	0.08	0.56
Control Delay	21.8	0.4	56.6	55.9	0.5	10.5	8.9	0.7	10.1	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	0.4	56.6	55.9	0.5	10.5	8.9	0.7	10.1	11.9
LOS	C	A	E	E	A	B	A	A	B	B
Approach Delay	13.0			50.9			8.2			11.9
Approach LOS	B			D			A			B

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 22 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 53.7%	ICU Level of Service A
Analysis Period (min) 15	

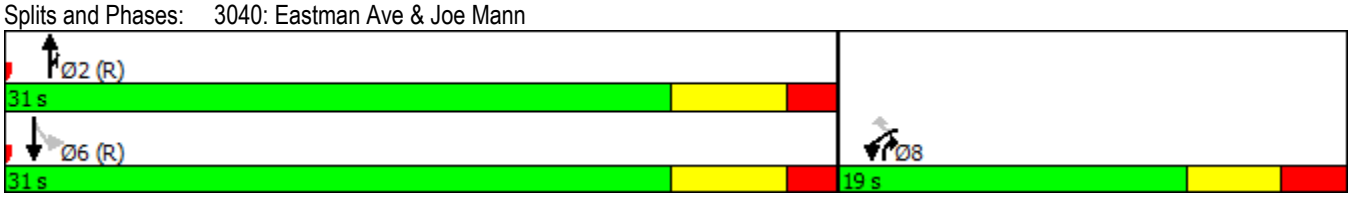
Splits and Phases: 3038: Eastman Ave & Future Dr/Mall Dr South



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	419	74	260	331	59	448
Future Volume (vph)	419	74	260	331	59	448
Turn Type	Prot	Perm	NA	pt+ov	Perm	NA
Protected Phases	8		2	2 8		6
Permitted Phases		8			6	
Detector Phase	8	8	2	2 8	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		10.0	10.0
Minimum Split (s)	11.0	11.0	16.2		16.2	16.2
Total Split (s)	19.0	19.0	31.0		31.0	31.0
Total Split (%)	38.0%	38.0%	62.0%		62.0%	62.0%
Yellow Time (s)	3.5	3.5	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	1.9		1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.2		6.2	6.2
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max		Max	Max
Act Effct Green (s)	13.0	13.0	24.8	50.0	24.8	24.8
Actuated g/C Ratio	0.26	0.26	0.50	1.00	0.50	0.50
v/c Ratio	0.51	0.17	0.16	0.22	0.12	0.27
Control Delay	18.1	5.5	12.5	0.3	7.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	5.5	12.5	0.3	7.5	7.9
LOS	B	A	B	A	A	A
Approach Delay	16.2		5.7			7.8
Approach LOS	B		A			A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 8 (16%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 44.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3040: Eastman Ave & Joe Mann



Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	10.4	25.4	0.2	28
Bayliss	9004	6.7	26.5	0.2	33
Jefferson	1006	7.3	27.3	0.3	33
Carpenter	9008	2.1	9.5	0.1	35
	9010	1.1	15.4	0.2	42
	9012	1.2	15.8	0.2	42
George	1014	8.1	26.1	0.2	31
Total		36.9	145.9	1.4	34

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	1.7	20.2	0.2	40
	9011	1.3	22.4	0.3	42
Carpenter	9009	1.6	15.8	0.2	40
Jefferson	1007	4.2	8.5	0.1	23
Bayliss	1005	4.6	24.7	0.3	37
	9003	2.8	13.6	0.1	35
Washington	1002	6.4	15.0	0.1	27
Total		22.6	120.1	1.2	36

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	9017	2.3	8.0	0.1	24
Rodd	1020	9.5	22.0	0.1	20
Ashman	1022	7.5	18.8	0.1	21
Jerome #1	2024	6.0	24.2	0.2	26
Eastman Ave	9027	2.7	22.3	0.2	25
Total		28.0	95.2	0.6	23

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.4	9.0	0.1	33
Jerome #1	2025	14.6	24.1	0.1	15
Ashman	1023	6.1	24.3	0.2	26
Rodd	1021	4.1	15.7	0.1	26
Cronkright	1018	3.9	16.0	0.1	27
George	1015	2.4	8.5	0.1	22
Total		31.3	97.6	0.6	24

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	-	-	0.2	-
St Andrews	2029	5.8	27.9	0.3	36
Sugnet	2030	7.6	56.3	0.6	39
Saginaw	2031	38.7	77.9	0.5	23
Dilloway	2032	14.9	56.0	0.5	34
Wackerly	2033	19.6	51.7	0.4	28
Eb On Ramp	9034	2.9	5.8	0.0	21
Wb On Ramp	9035	1.7	7.9	0.1	34
Wb Ramp	2036	8.9	14.4	0.1	17
Mall Off	9037	3.1	9.2	0.1	29
Mall Dr South	3038	7.3	11.8	0.1	18
North Mall Dr	9039	7.0	15.7	0.1	26
Joe Mann	3040	8.1	14.0	0.1	19
Total		125.5	348.7	3.0	31

Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	6.8	22.1	0.2	32
	9039	2.4	8.5	0.1	31
Future Dr	3038	6.0	14.7	0.1	27
Saylor Dr	9037	2.8	7.6	0.1	28
Airport	2036	21.3	26.9	0.1	10
Wb On Ramp	9035	4.9	11.1	0.1	22
Eb On Ramp	9034	2.8	8.7	0.1	31
Wackerly	2033	9.7	12.1	0.0	10
Dilloway	2032	4.4	36.6	0.4	40
Saginaw	2031	40.1	81.6	0.5	23
Sugnet	2030	11.2	50.5	0.5	36
St Andrews	2029	8.5	57.2	0.6	39
Carpenter	9028	2.7	24.7	0.3	40
Indian	9027	1.2	13.6	0.2	41
Total		124.7	376.0	3.2	30

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1190	164	303	40
Future Volume (vph)	1190	164	303	40
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	26.4	26.4	26.4
Total Split (s)	51.0	29.0	29.0	29.0
Total Split (%)	63.8%	36.3%	36.3%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	52.2	16.8	16.8	16.8
Actuated g/C Ratio	0.65	0.21	0.21	0.21
v/c Ratio	0.60	0.71	0.44	0.24
Control Delay	10.2	27.3	14.3	17.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	27.3	14.3	17.4
LOS	B	C	B	B
Approach Delay	10.2		18.9	17.4
Approach LOS	B		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 24 (30%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1001: Washington & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	963	339	13	41
Future Volume (vph)	963	339	13	41
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.1	29.1	29.1
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5		5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.6	15.4		15.4
Actuated g/C Ratio	0.67	0.19		0.19
v/c Ratio	0.50	0.66		0.11
Control Delay	2.9	31.6		16.8
Queue Delay	0.0	0.0		0.0
Total Delay	2.9	31.6		16.8
LOS	A	C		B
Approach Delay	2.9	31.6		16.8
Approach LOS	A	C		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 23 (29%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 51.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon

Intersection	
Int Delay, s/veh	18.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	130	1250	91	21	101	0	0	15	74
Future Vol, veh/h	0	0	0	130	1250	91	21	101	0	0	15	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	141	1359	99	23	110	0	0	16	80

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	970	1740	-	-	1691	729
Stage 1	-	-	-	0	0	-	-	1691	-
Stage 2	-	-	-	970	1740	-	-	0	-
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	208	~ 86	0	0	92	365
Stage 1	-	-	-	-	-	0	0	148	-
Stage 2	-	-	-	272	140	0	0	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	140	~ 86	-	-	92	365
Mov Cap-2 Maneuver	-	-	-	140	~ 86	-	-	92	-
Stage 1	-	-	-	-	-	-	-	148	-
Stage 2	-	-	-	189	140	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		234.8	29.3
HCM LOS		F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	140	86	-	-	-	243
HCM Lane V/C Ratio	0.163	1.277	-	-	-	0.398
HCM Control Delay (s)	35.7	276.2	-	-	-	29.3
HCM Lane LOS	E	F	-	-	-	D
HCM 95th %tile Q(veh)	0.6	8.1	-	-	-	1.8

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1037	106	113	74	71
Future Volume (vph)	1037	106	113	74	71
Turn Type	NA	NA	Perm	Perm	NA
Protected Phases	2	8			4
Permitted Phases			8	4	
Detector Phase	2	8	8	4	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.3	13.0	13.0	13.0	13.0
Total Split (s)	56.0	24.0	24.0	24.0	24.0
Total Split (%)	70.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	58.4	10.6	10.6	10.6	10.6
Actuated g/C Ratio	0.73	0.13	0.13	0.13	0.13
v/c Ratio	0.46	0.47	0.41	0.47	0.31
Control Delay	2.8	37.4	13.5	34.5	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	37.4	13.5	34.5	28.2
LOS	A	D	B	C	C
Approach Delay	2.8	25.1			31.4
Approach LOS	A	C			C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 59.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon

Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1259	44	89	106
Future Volume (vph)	1259	44	89	106
Turn Type	NA	Perm	NA	NA
Protected Phases	6		8	4
Permitted Phases		8		
Detector Phase	6	8	8	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.7	26.7	26.7
Total Split (s)	52.6	27.4	27.4	27.4
Total Split (%)	65.8%	34.3%	34.3%	34.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	57.0	12.0	12.0	12.0
Actuated g/C Ratio	0.71	0.15	0.15	0.15
v/c Ratio	0.58	0.26	0.35	0.48
Control Delay	4.1	16.6	17.3	32.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.1	16.6	17.3	32.8
LOS	A	B	B	C
Approach Delay	4.1		17.0	32.8
Approach LOS	A		B	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 61 (76%), Referenced to phase 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1006: Jefferson & Patrick

Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	989	116	53	67
Future Volume (vph)	989	116	53	67
Turn Type	NA	NA	Perm	NA
Protected Phases	2	8		4
Permitted Phases			4	
Detector Phase	2	8	4	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.5	27.3	27.3	27.3
Total Split (s)	49.0	31.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	56.4	12.6	12.6	12.6
Actuated g/C Ratio	0.70	0.16	0.16	0.16
v/c Ratio	0.44	0.55	0.34	0.25
Control Delay	3.4	33.1	15.2	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.4	33.1	15.2	12.3
LOS	A	C	B	B
Approach Delay	3.4	33.1		13.6
Approach LOS	A	C		B

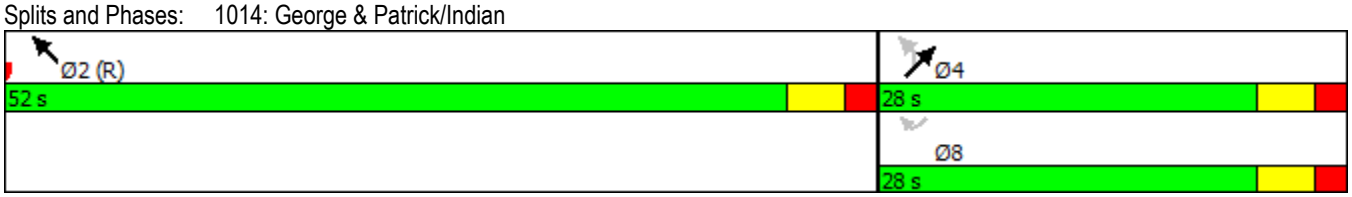
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 64 (80%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1007: Jefferson & Lyon

Lane Group	NWT	NEL	NET	SWR
Lane Configurations				
Traffic Volume (vph)	1381	247	21	54
Future Volume (vph)	1381	247	21	54
Turn Type	NA	Perm	NA	Perm
Protected Phases	2		4	
Permitted Phases		4		8
Detector Phase	2	4	4	8
Switch Phase				
Minimum Initial (s)	10.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	None	None	None
Act Effct Green (s)	53.1	15.9	15.9	15.9
Actuated g/C Ratio	0.66	0.20	0.20	0.20
v/c Ratio	0.64	0.71	0.06	0.17
Control Delay	4.2	17.5	5.9	14.1
Queue Delay	0.0	0.7	0.0	0.0
Total Delay	4.2	18.3	5.9	14.1
LOS	A	B	A	B
Approach Delay	4.2		17.3	
Approach LOS	A		B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 28 (35%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 6.6	Intersection LOS: A
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

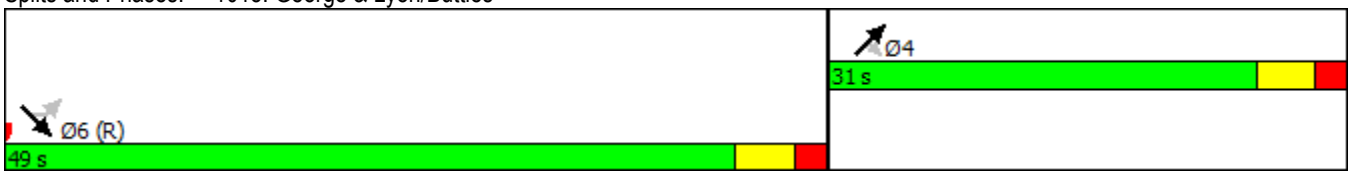
Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SET	NET	NER
Lane Configurations			
Traffic Volume (vph)	872	242	150
Future Volume (vph)	872	242	150
Turn Type	NA	NA	Perm
Protected Phases	6	4	
Permitted Phases			4
Detector Phase	6	4	4
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	49.0	31.0	31.0
Total Split (%)	61.3%	38.8%	38.8%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	56.5	12.5	12.5
Actuated g/C Ratio	0.71	0.16	0.16
v/c Ratio	0.39	0.48	0.48
Control Delay	1.5	29.0	12.4
Queue Delay	0.1	0.0	0.0
Total Delay	1.6	29.0	12.4
LOS	A	C	B
Approach Delay	1.6	22.7	
Approach LOS	A	C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 20 (25%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET	NER
Lane Configurations					
Traffic Volume (vph)	23	27	69	344	25
Future Volume (vph)	23	27	69	344	25
Turn Type	Perm	NA	NA	NA	Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0
Total Split (s)	33.0	33.0	33.0	47.0	47.0
Total Split (%)	41.3%	41.3%	41.3%	58.8%	58.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)		10.4	10.4	62.2	62.2
Actuated g/C Ratio		0.13	0.13	0.78	0.78
v/c Ratio		0.28	0.22	0.17	0.02
Control Delay		37.1	23.0	3.9	1.8
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		37.1	23.0	3.9	1.8
LOS		D	C	A	A
Approach Delay		37.1	23.0	3.7	
Approach LOS		D	C	A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 78 (98%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.28	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 30.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St

Intersection	
Int Delay, s/veh	3.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	268	1407	7	0	0	0	0	154	53
Future Vol, veh/h	0	0	0	268	1407	7	0	0	0	0	154	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	291	1529	8	0	0	0	0	167	58

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	-	2116	768
Stage 1	-	-	-	-	2116	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.14	-	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	0	~ 50	344
Stage 1	-	-	-	0	~ 90	-
Stage 2	-	-	-	0	-	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	0	344
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-

Approach	NW	SW
HCM Control Delay, s		33.2
HCM LOS		D

Minor Lane/Major Mvmt	NWL	NWT	NWR	SWLn1
Capacity (veh/h)	-	-	-	344
HCM Lane V/C Ratio	-	-	-	0.654
HCM Control Delay (s)	-	-	-	33.2
HCM Lane LOS	-	-	-	D
HCM 95th %tile Q(veh)	-	-	-	4.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	SET	SWT
Lane Configurations		
Traffic Volume (vph)	886	410
Future Volume (vph)	886	410
Turn Type	NA	NA
Protected Phases	6	8
Permitted Phases		
Detector Phase	6	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	52.0	28.0
Total Split (%)	65.0%	35.0%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	55.8	13.2
Actuated g/C Ratio	0.70	0.16
v/c Ratio	0.52	0.53
Control Delay	1.9	25.7
Queue Delay	0.0	0.0
Total Delay	1.9	25.7
LOS	A	C
Approach Delay	1.9	25.7
Approach LOS	A	C

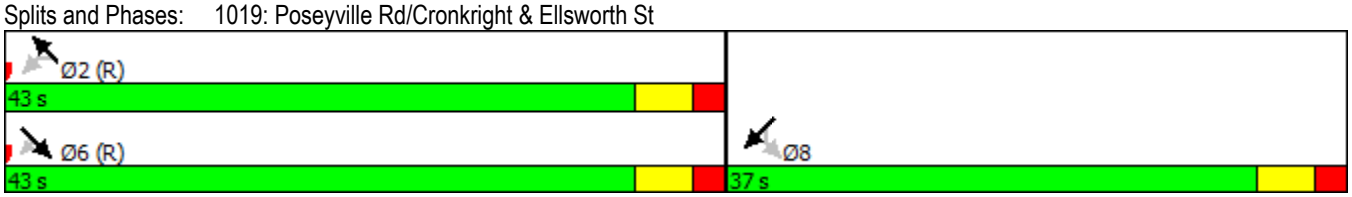
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 8 (10%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 50.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1018: Cronkright & Buttles

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	34	234	85	58	631
Future Volume (vph)	34	234	85	58	631
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	26.4	26.4	26.0	26.0	26.0
Total Split (s)	43.0	43.0	43.0	43.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	C-Max	None
Act Effct Green (s)	51.8	51.8	51.8	51.8	17.2
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.22
v/c Ratio	0.03	0.24	0.10	0.05	0.67
Control Delay	6.0	4.3	5.1	4.7	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	4.3	5.1	4.7	18.9
LOS	A	A	A	A	B
Approach Delay	4.5			5.0	18.9
Approach LOS	A			A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 18 (23%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 47.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1019: Poseyville Rd/Cronkright & Ellsworth St



Lane Group	NWT	NET
Lane Configurations		
Traffic Volume (vph)	1424	268
Future Volume (vph)	1424	268
Turn Type	NA	NA
Protected Phases	2	4
Permitted Phases		
Detector Phase	2	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	57.4	11.6
Actuated g/C Ratio	0.72	0.14
v/c Ratio	0.63	0.43
Control Delay	3.9	28.9
Queue Delay	0.0	0.0
Total Delay	3.9	28.9
LOS	A	C
Approach Delay	3.9	28.9
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 42 (53%), Referenced to phase 2:NWT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian

Lane Group	SET	NET
Lane Configurations		
Traffic Volume (vph)	1088	134
Future Volume (vph)	1088	134
Turn Type	NA	NA
Protected Phases	6	4
Permitted Phases		
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	58.8	10.2
Actuated g/C Ratio	0.74	0.13
v/c Ratio	0.53	0.31
Control Delay	2.2	21.9
Queue Delay	0.0	0.0
Total Delay	2.2	21.9
LOS	A	C
Approach Delay	2.2	21.9
Approach LOS	A	C

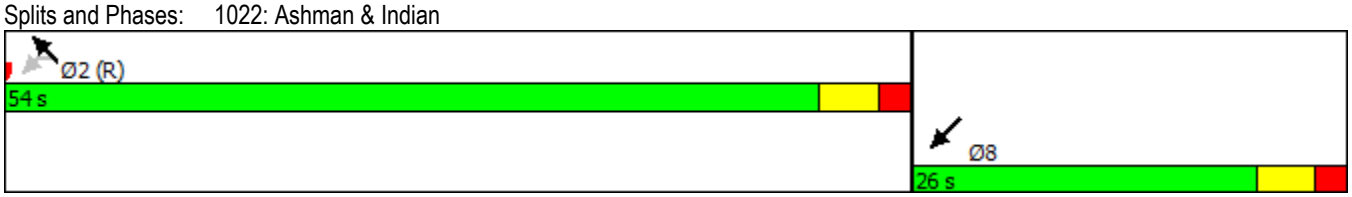
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 74 (93%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 4.8	Intersection LOS: A
Intersection Capacity Utilization 50.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles

Lane Group	NWT	SWT
Lane Configurations		
Traffic Volume (vph)	1386	329
Future Volume (vph)	1386	329
Turn Type	NA	NA
Protected Phases	2	8
Permitted Phases		
Detector Phase	2	8
Switch Phase		
Minimum Initial (s)	10.0	7.0
Minimum Split (s)	26.0	26.0
Total Split (s)	54.0	26.0
Total Split (%)	67.5%	32.5%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.5	5.5
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	C-Max	None
Act Effct Green (s)	54.2	14.8
Actuated g/C Ratio	0.68	0.18
v/c Ratio	0.66	0.62
Control Delay	3.1	30.7
Queue Delay	0.0	0.0
Total Delay	3.2	30.7
LOS	A	C
Approach Delay	3.2	30.7
Approach LOS	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 54 (68%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian



Lane Group	SET	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	1136	120	281
Future Volume (vph)	1136	120	281
Turn Type	NA	Perm	NA
Protected Phases	6		8
Permitted Phases		8	
Detector Phase	6	8	8
Switch Phase			
Minimum Initial (s)	10.0	7.0	7.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	52.0	28.0	28.0
Total Split (%)	65.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	None	None
Act Effct Green (s)	55.8	13.2	13.2
Actuated g/C Ratio	0.70	0.16	0.16
v/c Ratio	0.53	0.38	0.52
Control Delay	5.3	3.5	12.9
Queue Delay	0.0	0.0	0.0
Total Delay	5.3	3.5	12.9
LOS	A	A	B
Approach Delay	5.3		10.1
Approach LOS	A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 64 (80%), Referenced to phase 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles

Lane Group	NWL	NWT	NEL
Lane Configurations			
Traffic Volume (vph)	1020	562	476
Future Volume (vph)	1020	562	476
Turn Type	Perm	NA	Prot
Protected Phases		2	4
Permitted Phases	2		
Detector Phase	2	2	4
Switch Phase			
Minimum Initial (s)	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0
Total Split (s)	52.0	52.0	28.0
Total Split (%)	65.0%	65.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	C-Max	C-Max	None
Act Effct Green (s)	51.8	51.8	17.2
Actuated g/C Ratio	0.65	0.65	0.22
v/c Ratio	0.54	0.54	0.70
Control Delay	5.2	4.3	30.9
Queue Delay	0.6	0.1	0.2
Total Delay	5.8	4.4	31.0
LOS	A	A	C
Approach Delay		4.8	31.0
Approach LOS		A	C

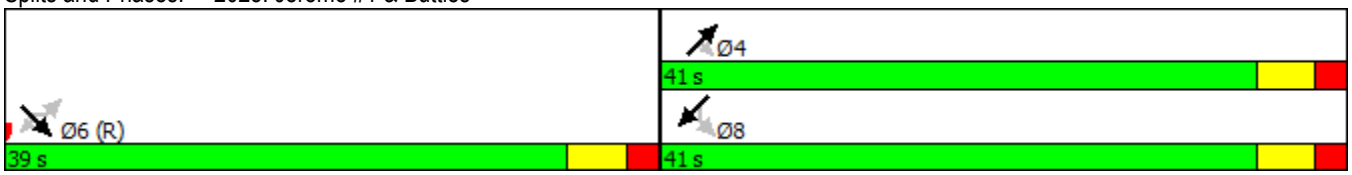
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 66 (83%), Referenced to phase 2:NWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	661	237	463	525	6	1014
Future Volume (vph)	661	237	463	525	6	1014
Turn Type	NA	Perm	NA	Perm	Perm	NA
Protected Phases	6		4			8
Permitted Phases		6		4	8	
Detector Phase	6	6	4	4	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.8	36.8	29.8	29.8	29.8	29.8
Total Split (s)	39.0	39.0	41.0	41.0	41.0	41.0
Total Split (%)	48.8%	48.8%	51.3%	51.3%	51.3%	51.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	38.0	38.0	31.0	31.0	31.0	31.0
Actuated g/C Ratio	0.48	0.48	0.39	0.39	0.39	0.39
v/c Ratio	0.44	0.33	0.56	0.53	0.04	0.80
Control Delay	15.7	13.6	17.3	14.7	3.7	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	15.7	13.6	17.3	14.7	3.7	16.3
LOS	B	B	B	B	A	B
Approach Delay	15.1		16.5			16.2
Approach LOS	B		B			B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 44 (55%), Referenced to phase 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	58	76	40	76	53	753	69	806
Future Volume (vph)	58	76	40	76	53	753	69	806
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	23.4	23.4	23.4	23.4
Total Split (s)	16.0	16.0	16.0	16.0	34.0	34.0	34.0	34.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	33.8	33.8	33.8	33.8
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.68	0.68	0.68	0.68
v/c Ratio	0.32	0.45	0.21	0.47	0.16	0.36	0.19	0.39
Control Delay	22.3	15.2	20.1	14.8	6.4	5.5	3.4	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	15.2	20.1	14.8	6.4	5.5	3.4	3.1
LOS	C	B	C	B	A	A	A	A
Approach Delay		17.2		15.9		5.5		3.1
Approach LOS		B		B		A		A

Intersection Summary

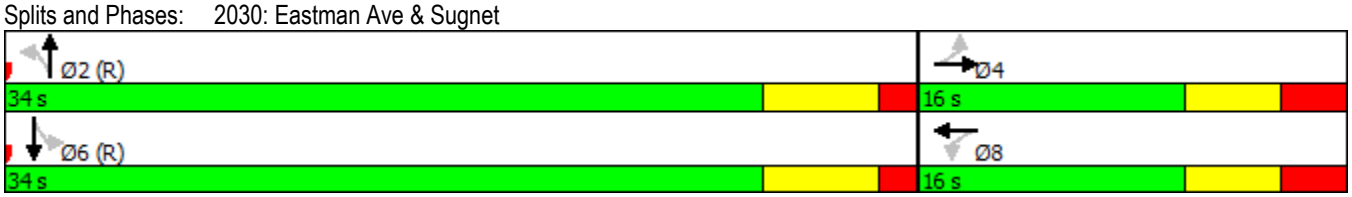
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 39 (78%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 6.5 Intersection LOS: A
Intersection Capacity Utilization 66.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2029: Eastman Ave & St Andrews

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	138	52	61	49	788	33	778
Future Volume (vph)	35	138	52	61	49	788	33	778
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.1	13.1	13.1	13.1	32.8	32.8	32.8	32.8
Total Split (s)	16.0	16.0	16.0	16.0	34.0	34.0	34.0	34.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	5.8	5.8	5.8	5.8
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	9.1	9.1	9.1	9.1	29.0	29.0	29.0	29.0
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.58	0.58	0.58	0.58
v/c Ratio	0.16	0.68	0.30	0.22	0.16	0.45	0.11	0.43
Control Delay	18.5	25.2	21.8	17.0	3.2	3.9	2.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	25.2	21.8	17.0	3.2	3.9	2.1	2.7
LOS	B	C	C	B	A	A	A	A
Approach Delay		24.3		19.1		3.9		2.7
Approach LOS		C		B		A		A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 38 (76%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 70.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2030: Eastman Ave & Sugnet

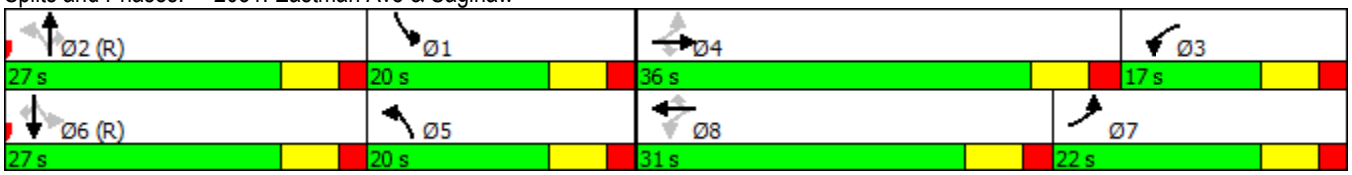


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	665	146	106	699	428	228	485	119	256	590	129
Future Volume (vph)	278	665	146	106	699	428	228	485	119	256	590	129
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	13.6	13.6	11.6	13.6	13.6	11.5	16.5	16.5	11.5	16.5	16.5
Total Split (s)	22.0	36.0	36.0	17.0	31.0	31.0	20.0	27.0	27.0	20.0	27.0	27.0
Total Split (%)	22.0%	36.0%	36.0%	17.0%	31.0%	31.0%	20.0%	27.0%	27.0%	20.0%	27.0%	27.0%
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	40.5	25.7	25.7	37.3	24.1	24.1	34.9	22.3	22.3	34.9	22.3	22.3
Actuated g/C Ratio	0.40	0.26	0.26	0.37	0.24	0.24	0.35	0.22	0.22	0.35	0.22	0.22
v/c Ratio	0.91	0.80	0.30	0.38	0.90	0.70	0.84	0.67	0.26	0.81	0.87	0.27
Control Delay	67.2	41.9	4.5	30.6	51.8	13.1	53.4	47.2	10.1	61.8	54.6	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	41.9	4.5	30.6	51.8	13.1	53.4	47.2	10.1	61.8	54.6	9.9
LOS	E	D	A	C	D	B	D	D	B	E	D	A
Approach Delay		43.3			36.5			43.6			51.2	
Approach LOS		D			D			D			D	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 43.2 Intersection LOS: D
Intersection Capacity Utilization 86.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2031: Eastman Ave & Saginaw



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	43	31	71	31	26	1118	44	869
Future Volume (vph)	43	31	71	31	26	1118	44	869
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	25.4	25.4	25.4	25.4
Total Split (s)	25.0	25.0	25.0	25.0	75.0	75.0	75.0	75.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	75.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.3	11.3	11.3	11.3	77.0	77.0	77.0	77.0
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.77	0.77	0.77	0.77
v/c Ratio	0.32	0.37	0.52	0.40	0.07	0.47	0.17	0.36
Control Delay	45.3	45.3	53.1	21.5	1.2	1.6	2.7	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	45.3	53.1	21.5	1.2	1.6	2.7	1.7
LOS	D	D	D	C	A	A	A	A
Approach Delay		45.3		35.4		1.6		1.7
Approach LOS		D		D		A		A

Intersection Summary

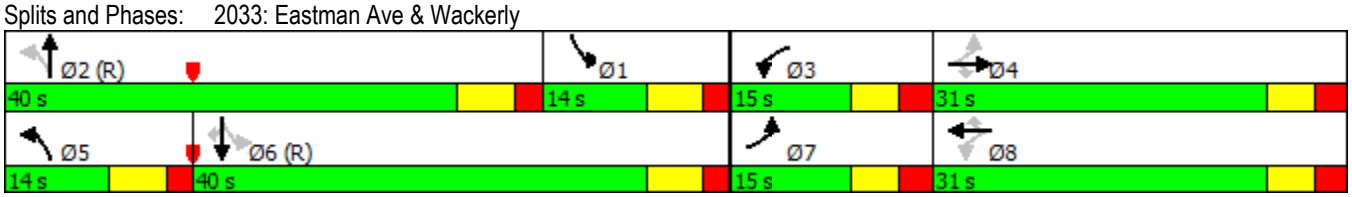
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 97 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 5.9 Intersection LOS: A
Intersection Capacity Utilization 56.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2032: Eastman Ave & Dilloway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	207	201	150	142	155	251	84	1038	123	655	266
Future Volume (vph)	207	201	150	142	155	251	84	1038	123	655	266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	4.7	7.0	7.0	4.7	7.0	7.0	4.7	10.0	4.7	10.0	10.0
Minimum Split (s)	11.0	31.0	31.0	11.0	31.0	31.0	11.0	26.0	11.0	26.0	26.0
Total Split (s)	15.0	31.0	31.0	15.0	31.0	31.0	14.0	40.0	14.0	40.0	40.0
Total Split (%)	15.0%	31.0%	31.0%	15.0%	31.0%	31.0%	14.0%	40.0%	14.0%	40.0%	40.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	25.7	16.8	16.8	25.7	16.8	16.8	41.8	41.8	43.6	43.6	43.6
Actuated g/C Ratio	0.26	0.17	0.17	0.26	0.17	0.17	0.42	0.42	0.44	0.44	0.44
v/c Ratio	0.74	0.69	0.34	0.65	0.66	0.71	0.33	0.61	0.48	0.45	0.33
Control Delay	42.9	50.0	2.7	37.0	48.8	18.8	14.0	13.6	20.6	9.7	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	50.0	2.7	37.0	48.8	18.8	14.0	13.6	20.6	9.7	1.5
LOS	D	D	A	D	D	B	B	B	C	A	A
Approach Delay		34.6			32.0			13.6		8.9	
Approach LOS		C			C			B		A	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 76 (76%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	

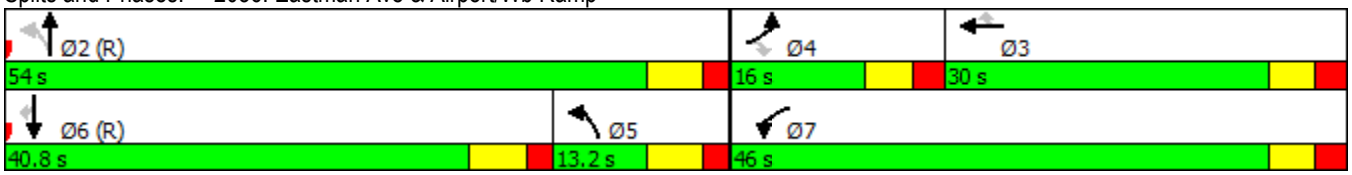
Splits and Phases: 2033: Eastman Ave & Wackerly



Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	168	78	239	107	300	75	859	224	1046	153
Future Volume (vph)	168	78	239	107	300	75	859	224	1046	153
Turn Type	Prot	Perm	Prot	NA	Perm	pm+pt	NA	Free	NA	Perm
Protected Phases	4		7	3		5	2		6	
Permitted Phases		4			3	2		Free		6
Detector Phase	4	4	7	3	3	5	2		6	6
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0		10.0	10.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	11.3	16.3		35.6	35.6
Total Split (s)	16.0	16.0	46.0	30.0	30.0	13.2	54.0		40.8	40.8
Total Split (%)	16.0%	16.0%	46.0%	30.0%	30.0%	13.2%	54.0%		40.8%	40.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.3	6.3		6.3	6.3
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes	Yes
Recall Mode	None	None	None	None	None	Min	C-Max		C-Max	C-Max
Act Effct Green (s)	9.6	9.6	31.5	31.5	16.0	56.2	56.2	100.0	43.0	43.0
Actuated g/C Ratio	0.10	0.10	0.32	0.32	0.16	0.56	0.56	1.00	0.43	0.43
v/c Ratio	0.60	0.30	0.35	0.35	0.83	0.27	0.47	0.16	0.50	0.21
Control Delay	51.6	2.5	26.7	26.7	35.8	8.5	6.0	0.2	19.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	2.5	26.7	26.7	35.8	8.5	6.0	0.2	19.7	5.3
LOS	D	A	C	C	D	A	A	A	B	A
Approach Delay				30.9			5.1		17.9	
Approach LOS				C			A		B	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 66 (66%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 60.7%	ICU Level of Service B
Analysis Period (min) 15	

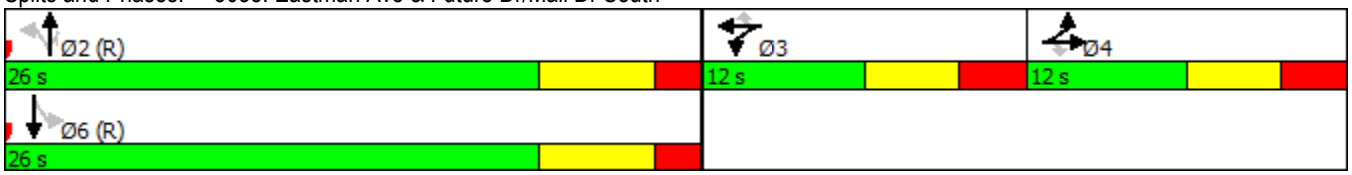
Splits and Phases: 2036: Eastman Ave & Airport/Wb Ramp



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	7	22	293	13	33	33	828	89	20	908
Future Volume (vph)	7	22	293	13	33	33	828	89	20	908
Turn Type	NA	Perm	Split	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases	4		3	3			2			6
Permitted Phases		4			3	2		2	6	
Detector Phase	4	4	3	3	3	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	16.1	16.1	16.1	16.1	16.1
Total Split (s)	12.0	12.0	12.0	12.0	12.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	24.0%	24.0%	24.0%	24.0%	24.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3	4.3	4.3
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	1.8	1.8	1.8	1.8	1.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lag	Lag	Lead	Lead	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	5.8	5.8	6.0	6.0	6.0	24.7	24.7	24.7	24.7	24.7
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.49	0.49	0.49	0.49	0.49
v/c Ratio	0.16	0.07	0.82	0.81	0.10	0.18	0.50	0.11	0.08	0.56
Control Delay	21.8	0.4	56.6	55.9	0.5	10.5	8.9	0.7	10.1	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	0.4	56.6	55.9	0.5	10.5	8.9	0.7	10.1	11.9
LOS	C	A	E	E	A	B	A	A	B	B
Approach Delay	13.0			50.9			8.2			11.9
Approach LOS	B			D			A			B

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 21 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 53.7%	ICU Level of Service A
Analysis Period (min) 15	

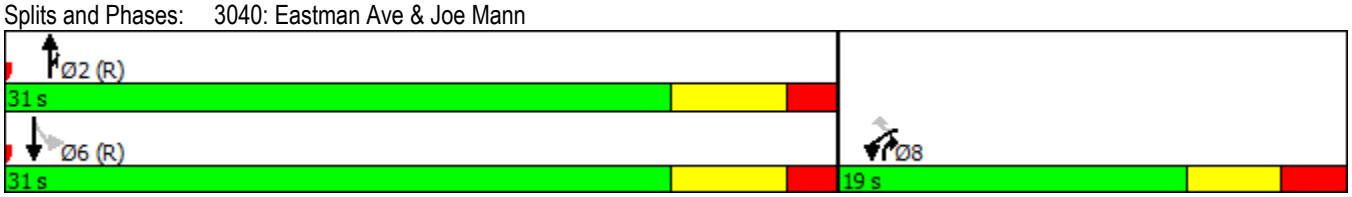
Splits and Phases: 3038: Eastman Ave & Future Dr/Mall Dr South



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	419	74	260	331	59	448
Future Volume (vph)	419	74	260	331	59	448
Turn Type	Prot	Perm	NA	pt+ov	Perm	NA
Protected Phases	8		2	2 8		6
Permitted Phases		8			6	
Detector Phase	8	8	2	2 8	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0		10.0	10.0
Minimum Split (s)	11.0	11.0	16.2		16.2	16.2
Total Split (s)	19.0	19.0	31.0		31.0	31.0
Total Split (%)	38.0%	38.0%	62.0%		62.0%	62.0%
Yellow Time (s)	3.5	3.5	4.3		4.3	4.3
All-Red Time (s)	2.5	2.5	1.9		1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.2		6.2	6.2
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max		Max	Max
Act Effct Green (s)	13.0	13.0	24.8	50.0	24.8	24.8
Actuated g/C Ratio	0.26	0.26	0.50	1.00	0.50	0.50
v/c Ratio	0.51	0.17	0.16	0.22	0.12	0.27
Control Delay	18.1	5.5	12.4	0.3	7.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	5.5	12.4	0.3	7.5	7.9
LOS	B	A	B	A	A	A
Approach Delay	16.2		5.6			7.8
Approach LOS	B		A			A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 7 (14%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 44.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3040: Eastman Ave & Joe Mann



Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	9.9	25.0	0.2	28
Bayliss	9004	6.5	26.3	0.2	34
Jefferson	1006	7.0	27.0	0.3	33
Carpenter	9008	2.0	9.5	0.1	35
	9010	1.2	15.4	0.2	42
	9012	1.2	15.8	0.2	41
George	1014	8.7	26.7	0.2	30
Total		36.5	145.8	1.4	34

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	1.6	20.0	0.2	40
	9011	1.2	22.4	0.3	42
Carpenter	9009	1.6	15.7	0.2	40
Jefferson	1007	4.1	8.4	0.1	23
Bayliss	1005	4.7	24.9	0.3	37
	9003	3.1	13.9	0.1	34
Washington	1002	7.2	15.9	0.1	26
Total		23.5	121.1	1.2	36

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	9017	2.5	8.2	0.1	23
Rodd	1020	6.3	18.4	0.1	24
Ashman	1022	7.3	19.3	0.1	20
Jerome #1	2024	6.2	24.1	0.2	26
Eastman Ave	9027	2.8	22.6	0.2	25
Total		25.1	92.7	0.6	24

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.4	9.0	0.1	33
Jerome #1	2025	14.8	24.4	0.1	14
Ashman	1023	6.3	24.2	0.2	26
Rodd	1021	4.3	16.5	0.1	25
Cronkright	1018	4.7	16.5	0.1	27
George	1015	2.1	8.3	0.1	23
Total		32.6	98.9	0.6	23

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	0.3	0.8	0.2	724
St Andrews	2029	5.8	28.0	0.3	35
Sugnet	2030	7.3	55.8	0.6	40
Saginaw	2031	37.1	76.2	0.5	24
Dilloway	2032	12.7	53.7	0.5	36
Wackerly	2033	19.0	51.0	0.4	29
Eb On Ramp	9034	2.9	5.8	0.0	21
Wb On Ramp	9035	1.6	7.8	0.1	34
Wb Ramp	2036	8.7	14.2	0.1	17
Mall Off	9037	3.1	9.1	0.1	30
Mall Dr South	3038	7.6	12.1	0.1	18
North Mall Dr	9039	7.3	16.1	0.1	25
Joe Mann	3040	8.2	14.1	0.1	18
Total		121.5	344.8	3.0	31

Arterial Level of Service: SB Eastman Ave

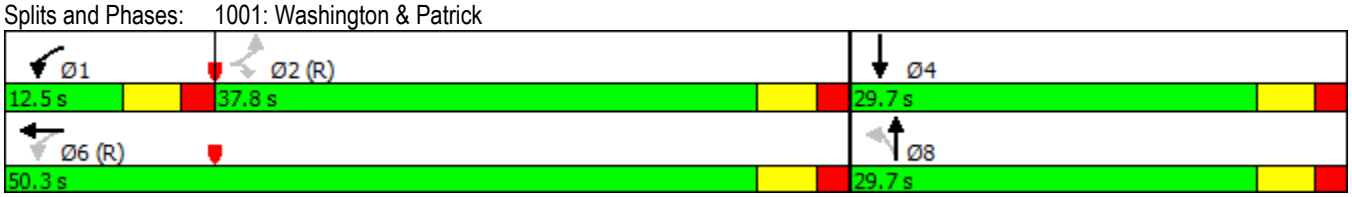
Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	6.9	22.2	0.2	32
	9039	2.3	8.4	0.1	31
Future Dr	3038	6.1	14.8	0.1	27
Saylor Dr	9037	2.8	7.6	0.1	28
Airport	2036	21.3	26.9	0.1	10
Wb On Ramp	9035	4.9	11.1	0.1	22
Eb On Ramp	9034	2.9	8.8	0.1	31
Wackerly	2033	9.9	12.3	0.0	10
Dilloway	2032	4.5	36.6	0.4	40
Saginaw	2031	40.8	82.4	0.5	23
Sugnet	2030	11.1	50.4	0.5	36
St Andrews	2029	8.7	57.4	0.6	38
Carpenter	9028	2.6	24.6	0.3	40
Indian	9027	1.2	13.7	0.2	41
Total		126.0	377.4	3.2	30

Appendix E
Alternative 2 Capacity Analysis

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	300	350	212	494	39	123	77
Future Volume (vph)	300	350	212	494	39	123	77
Turn Type	Perm	Perm	pm+pt	NA	Perm	NA	NA
Protected Phases			1	6		8	4
Permitted Phases	2	2	6		8		
Detector Phase	2	2	1	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	30.9	12.5	30.9	29.7	29.7	29.7
Total Split (s)	37.8	37.8	12.5	50.3	29.7	29.7	29.7
Total Split (%)	47.3%	47.3%	15.6%	62.9%	37.1%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	43.4	43.4	57.6	57.6		11.4	11.4
Actuated g/C Ratio	0.54	0.54	0.72	0.72		0.14	0.14
v/c Ratio	0.74	0.23	0.18	0.23		0.42	0.26
Control Delay	27.2	2.7	4.8	4.5		25.6	19.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	27.2	2.7	4.9	4.5		25.6	19.7
LOS	C	A	A	A		C	B
Approach Delay				4.6		25.6	19.7
Approach LOS				A		C	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 32 (40%), Referenced to phase 2:EBL and 6:WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

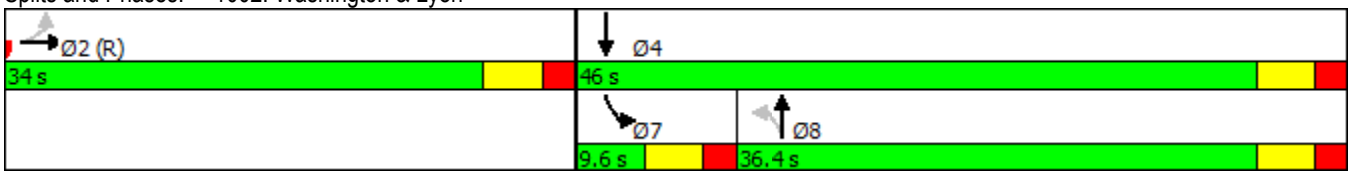
Splits and Phases: 1001: Washington & Patrick



Lane Group	EBL	EBT	NBL	NBT	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	27	625	38	135	4	377
Future Volume (vph)	27	625	38	135	4	377
Turn Type	Perm	NA	Perm	NA	Prot	NA
Protected Phases		2		8	7	4
Permitted Phases	2		8			
Detector Phase	2	2	8	8	7	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	7.0	4.0	7.0
Minimum Split (s)	32.2	32.2	29.5	29.5	9.5	29.5
Total Split (s)	34.0	34.0	36.4	36.4	9.6	46.0
Total Split (%)	42.5%	42.5%	45.5%	45.5%	12.0%	57.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	33.8	33.8	33.3	33.3	4.1	35.2
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.05	0.44
v/c Ratio	0.04	0.45	0.22	0.11	0.02	0.86
Control Delay	13.0	12.3	17.9	12.8	32.2	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	3.4
Total Delay	13.0	12.3	17.9	12.8	32.2	31.8
LOS	B	B	B	B	C	C
Approach Delay		12.3		13.8		31.8
Approach LOS		B		B		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 8 (10%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 20.9	Intersection LOS: C
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

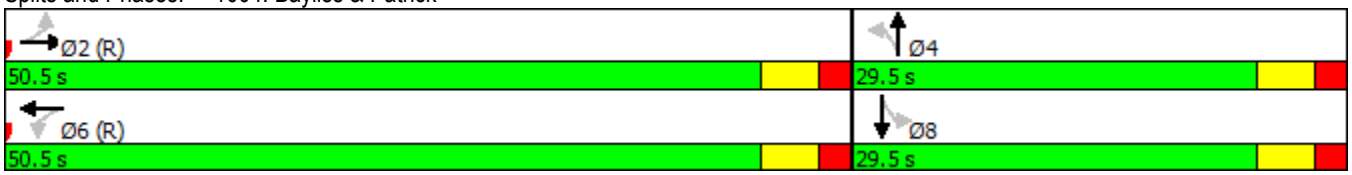
Splits and Phases: 1002: Washington & Lyon



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	1	633	168	405	11	36	10	93
Future Volume (vph)	1	633	168	405	11	36	10	93
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)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	50.5	50.5	50.5	50.5	29.5	29.5	29.5	29.5
Total Split (%)	63.1%	63.1%	63.1%	63.1%	36.9%	36.9%	36.9%	36.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	60.6	60.6	60.6	60.6	12.6	12.6		12.6
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.16	0.16		0.16
v/c Ratio	0.00	0.26	0.34	0.17	0.06	0.16		0.41
Control Delay	1.0	1.3	7.5	3.7	10.5	8.3		33.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	1.0	1.3	7.5	3.7	10.5	8.3		33.3
LOS	A	A	A	A	B	A		C
Approach Delay		1.3		4.8		8.7		33.3
Approach LOS		A		A		A		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 6 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 5.5	Intersection LOS: A
Intersection Capacity Utilization 53.3%	ICU Level of Service A
Analysis Period (min) 15	

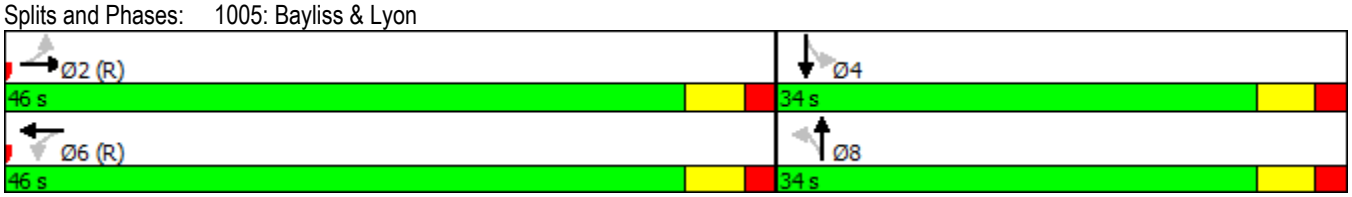
Splits and Phases: 1004: Bayliss & Patrick



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	2	633	96	197	10	49	11	187
Future Volume (vph)	2	633	96	197	10	49	11	187
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.7	29.7	26.0	26.0	26.0	26.0
Total Split (s)	46.0	46.0	46.0	46.0	34.0	34.0	34.0	34.0
Total Split (%)	57.5%	57.5%	57.5%	57.5%	42.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	51.9	51.9	51.9	51.9	17.1	17.1	17.1	17.1
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.21	0.21	0.21	0.21
v/c Ratio	0.00	0.31	0.23	0.09	0.07	0.16	0.04	0.70
Control Delay	5.0	4.6	7.1	3.7	23.2	21.4	17.5	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	5.0	4.6	7.1	3.7	23.2	21.4	17.5	31.8
LOS	A	A	A	A	C	C	B	C
Approach Delay		4.6		4.8		21.6		31.2
Approach LOS		A		A		C		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 11.2	Intersection LOS: B
Intersection Capacity Utilization 54.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon

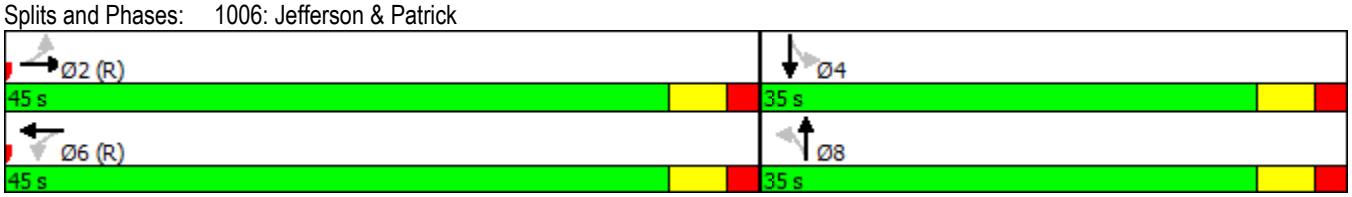


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	3	604	79	332	7	64	29	98
Future Volume (vph)	3	604	79	332	7	64	29	98
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7
Total Split (s)	45.0	45.0	45.0	45.0	35.0	35.0	35.0	35.0
Total Split (%)	56.3%	56.3%	56.3%	56.3%	43.8%	43.8%	43.8%	43.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	56.2	56.2	56.2	56.2	12.8	12.8		12.8
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.16	0.16		0.16
v/c Ratio	0.00	0.27	0.17	0.15	0.04	0.27		0.55
Control Delay	2.7	2.6	5.9	4.3	11.1	9.7		37.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	2.7	2.6	5.9	4.3	11.1	9.7		37.2
LOS	A	A	A	A	B	A		D
Approach Delay		2.6		4.6		9.8		37.2
Approach LOS		A		A		A		D

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 72 (90%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 7.4 Intersection LOS: A
Intersection Capacity Utilization 53.2% ICU Level of Service A
Analysis Period (min) 15

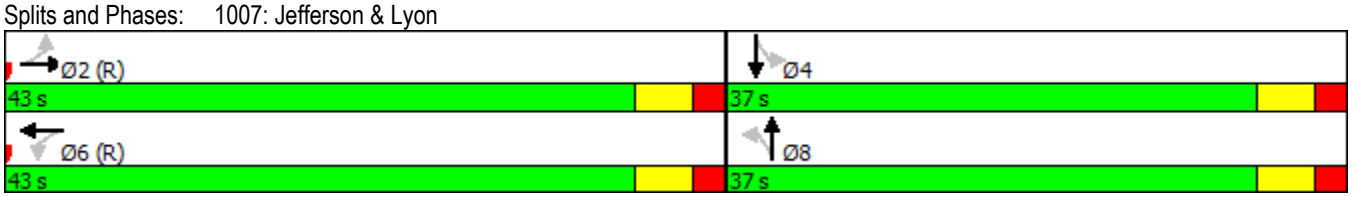
Splits and Phases: 1006: Jefferson & Patrick



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	605	7	264	5	69	29	83
Future Volume (vph)	4	605	7	264	5	69	29	83
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.7	29.7	29.7	29.7
Total Split (s)	43.0	43.0	43.0	43.0	37.0	37.0	37.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.3%	46.3%	46.3%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	57.3	57.3	57.3	57.3		11.7	11.7	11.7
Actuated g/C Ratio	0.72	0.72	0.72	0.72		0.15	0.15	0.15
v/c Ratio	0.01	0.26	0.02	0.12		0.34	0.15	0.55
Control Delay	3.8	3.8	3.0	2.0		28.1	20.7	16.5
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	3.8	3.8	3.0	2.0		28.1	20.7	16.5
LOS	A	A	A	A		C	C	B
Approach Delay		3.8		2.1		28.1		17.2
Approach LOS		A		A		C		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 35.1%	ICU Level of Service A
Analysis Period (min) 15	

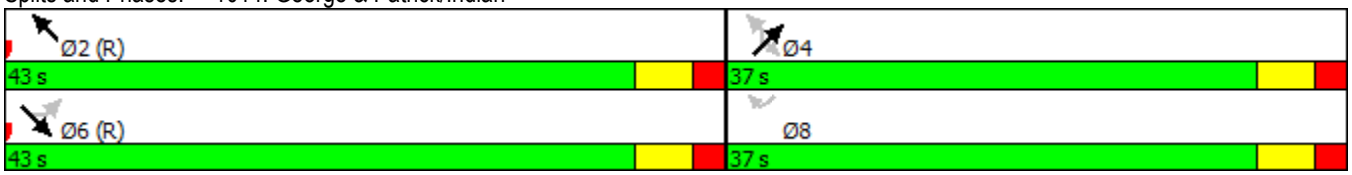
Splits and Phases: 1007: Jefferson & Lyon



Lane Group	SEL	SET	NWT	NEL	NET	NER	SWR
Lane Configurations							
Traffic Volume (vph)	7	508	337	89	120	103	10
Future Volume (vph)	7	508	337	89	120	103	10
Turn Type	Perm	NA	NA	Perm	NA	Perm	Perm
Protected Phases		6	2		4		
Permitted Phases	6			4		4	8
Detector Phase	6	6	2	4	4	4	8
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.9	29.9	29.9	29.9
Total Split (s)	43.0	43.0	43.0	37.0	37.0	37.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	46.3%	46.3%	46.3%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	56.9	56.9	56.9	12.1	12.1	12.1	12.1
Actuated g/C Ratio	0.71	0.71	0.71	0.15	0.15	0.15	0.15
v/c Ratio	0.01	0.22	0.15	0.36	0.46	0.34	0.02
Control Delay	1.1	1.3	2.0	10.7	12.9	3.1	0.1
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	1.4	2.0	10.7	12.9	3.1	0.1
LOS	A	A	A	B	B	A	A
Approach Delay		1.4	2.0		9.0		
Approach LOS		A	A		A		

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 12 (15%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 3.6	Intersection LOS: A
Intersection Capacity Utilization 35.1%	ICU Level of Service A
Analysis Period (min) 15	

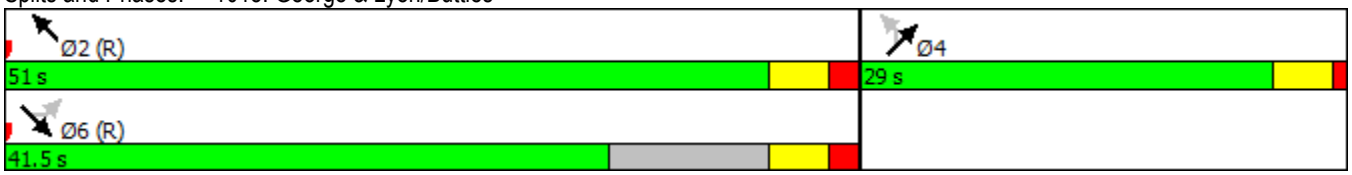
Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	9	509	337	296
Future Volume (vph)	9	509	337	296
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	5.0
Minimum Split (s)	29.5	29.5	29.5	22.5
Total Split (s)	41.5	41.5	51.0	29.0
Total Split (%)	51.9%	51.9%	63.8%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	56.4	56.4	56.4	13.6
Actuated g/C Ratio	0.70	0.70	0.70	0.17
v/c Ratio	0.01	0.22	0.15	0.60
Control Delay	6.7	7.9	4.1	25.6
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	6.7	8.1	4.1	25.6
LOS	A	A	A	C
Approach Delay		8.0	4.1	25.6
Approach LOS		A	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 42.6%	ICU Level of Service A
Analysis Period (min) 15	

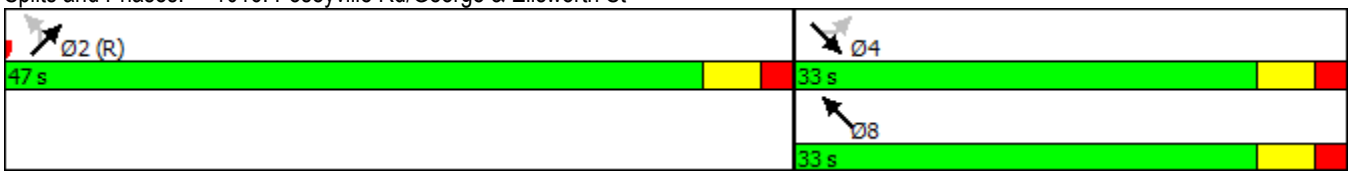
Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	4	31	23	477
Future Volume (vph)	4	31	23	477
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	33.0	33.0	33.0	47.0
Total Split (%)	41.3%	41.3%	41.3%	58.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Max
Act Effct Green (s)		9.9	9.9	66.3
Actuated g/C Ratio		0.12	0.12	0.83
v/c Ratio		0.17	0.10	0.18
Control Delay		27.1	19.7	3.1
Queue Delay		0.0	0.0	0.0
Total Delay		27.1	19.7	3.1
LOS		C	B	A
Approach Delay		27.1	19.7	3.1
Approach LOS		C	B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 30 (38%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.18	
Intersection Signal Delay: 5.1	Intersection LOS: A
Intersection Capacity Utilization 28.2%	ICU Level of Service A
Analysis Period (min) 15	

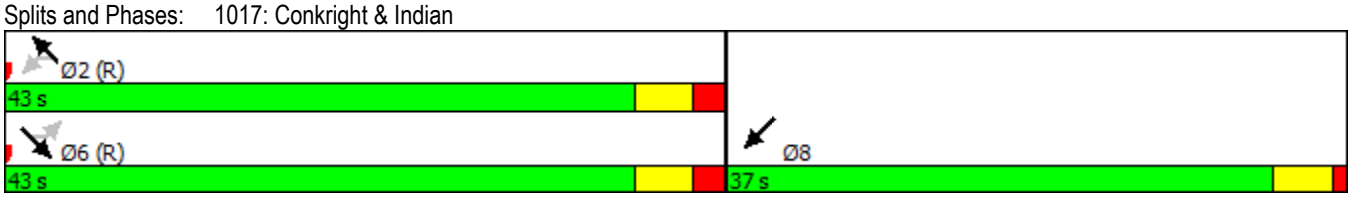
Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St



Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	515	77	359	174
Future Volume (vph)	515	77	359	174
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	29.5	29.5	29.5	22.5
Total Split (s)	43.0	43.0	43.0	37.0
Total Split (%)	53.8%	53.8%	53.8%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0
Total Lost Time (s)	5.5		5.5	4.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	52.6		52.6	17.4
Actuated g/C Ratio	0.66		0.66	0.22
v/c Ratio	0.25		0.26	0.72
Control Delay	3.2		6.7	33.8
Queue Delay	0.0		0.2	0.0
Total Delay	3.2		6.9	33.8
LOS	A		A	C
Approach Delay	3.2		6.9	33.8
Approach LOS	A		A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 10 (13%), Referenced to phase 2:NWTL and 6:SETL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 55.3%	ICU Level of Service B
Analysis Period (min) 15	

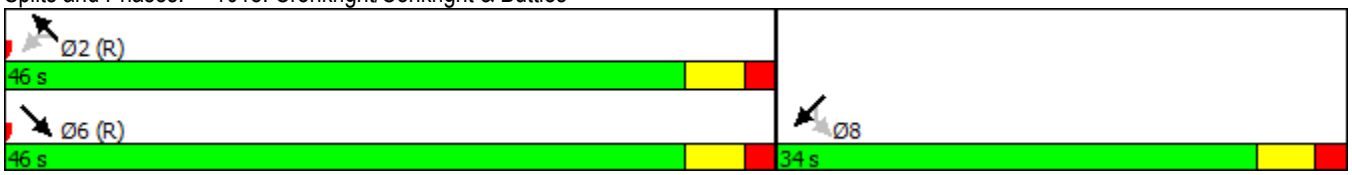
Splits and Phases: 1017: Conkright & Indian



Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	515	77	358	157
Future Volume (vph)	515	77	358	157
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.8
Total Split (s)	46.0	46.0	46.0	34.0
Total Split (%)	57.5%	57.5%	57.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	58.5	58.5	58.5	10.5
Actuated g/C Ratio	0.73	0.73	0.73	0.13
v/c Ratio	0.22	0.14	0.15	0.40
Control Delay	1.0	6.9	5.5	10.2
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	1.0	6.9	5.7	10.2
LOS	A	A	A	B
Approach Delay	1.0		5.9	10.2
Approach LOS	A		A	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 18 (23%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 4.7	Intersection LOS: A
Intersection Capacity Utilization 42.6%	ICU Level of Service A
Analysis Period (min) 15	

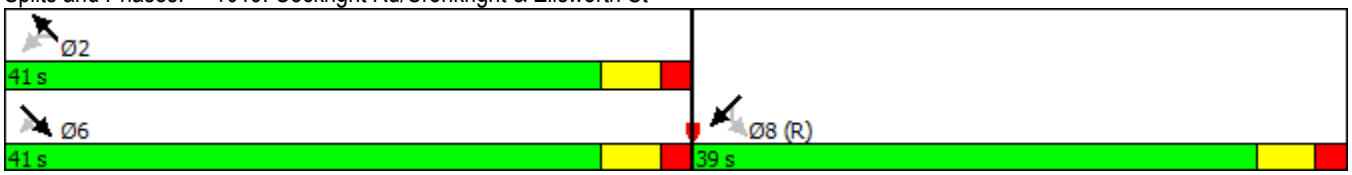
Splits and Phases: 1018: Cronkright/Conkright & Buttles



Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	22	59	58	90	188
Future Volume (vph)	22	59	58	90	188
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.5	29.5	29.7
Total Split (s)	41.0	41.0	41.0	41.0	39.0
Total Split (%)	51.3%	51.3%	51.3%	51.3%	48.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	None	None	C-Max
Act Effct Green (s)	35.5	35.5	35.5	35.5	33.5
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.42
v/c Ratio	0.03	0.09	0.10	0.12	0.13
Control Delay	12.8	4.1	12.0	12.1	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	4.1	12.0	12.1	6.3
LOS	B	A	B	B	A
Approach Delay	6.4			12.1	6.3
Approach LOS	A			B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 75 (94%), Referenced to phase 8:SWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.13	
Intersection Signal Delay: 8.1	Intersection LOS: A
Intersection Capacity Utilization 31.3%	ICU Level of Service A
Analysis Period (min) 15	

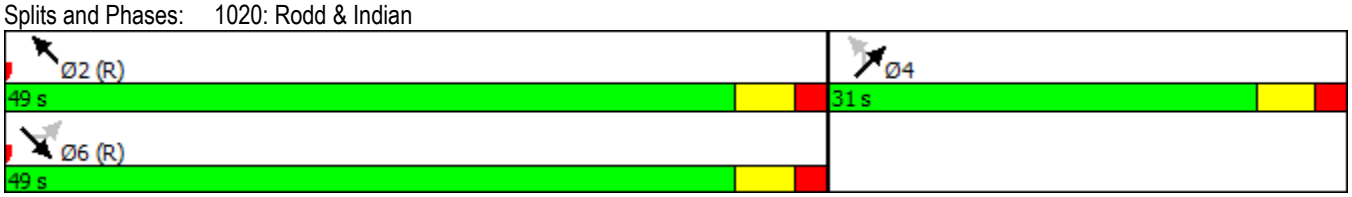
Splits and Phases: 1019: Cockright Rd/Cronkright & Ellsworth St



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	54	504	447	92
Future Volume (vph)	54	504	447	92
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	49.0	49.0	49.0	31.0
Total Split (%)	61.3%	61.3%	61.3%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	62.7	62.7	62.7	9.9
Actuated g/C Ratio	0.78	0.78	0.78	0.12
v/c Ratio	0.09	0.20	0.18	0.21
Control Delay	6.8	5.1	1.5	22.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.8	5.1	1.5	22.7
LOS	A	A	A	C
Approach Delay		5.2	1.5	22.7
Approach LOS		A	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 70 (88%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.21	
Intersection Signal Delay: 5.5	Intersection LOS: A
Intersection Capacity Utilization 44.9%	ICU Level of Service A
Analysis Period (min) 15	

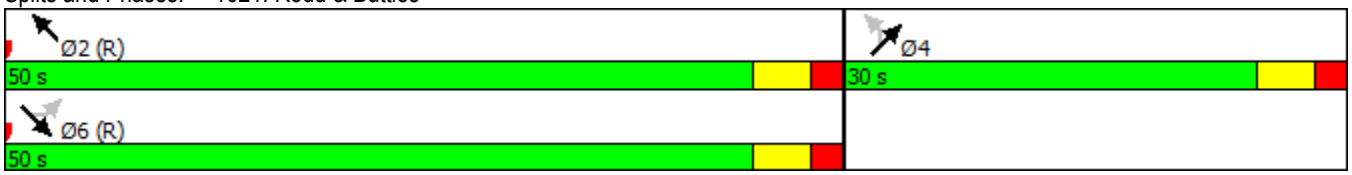
Splits and Phases: 1020: Rodd & Indian



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	56	504	447	49
Future Volume (vph)	56	504	447	49
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	50.0	50.0	50.0	30.0
Total Split (%)	62.5%	62.5%	62.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	62.9	62.9	62.9	9.7
Actuated g/C Ratio	0.79	0.79	0.79	0.12
v/c Ratio	0.09	0.20	0.18	0.14
Control Delay	1.8	1.5	2.1	21.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.8	1.5	2.1	21.5
LOS	A	A	A	C
Approach Delay		1.5	2.1	21.5
Approach LOS		A	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 2 (3%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 47.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles



Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	538	31	420	305
Future Volume (vph)	538	31	420	305
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	45.0	45.0	45.0	35.0
Total Split (%)	56.3%	56.3%	56.3%	43.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	56.4	56.4	56.4	12.6
Actuated g/C Ratio	0.70	0.70	0.70	0.16
v/c Ratio	0.25	0.06	0.18	0.49
Control Delay	2.5	0.7	0.7	29.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.5	0.7	0.7	29.8
LOS	A	A	A	C
Approach Delay	2.5		0.7	29.8
Approach LOS	A		A	C

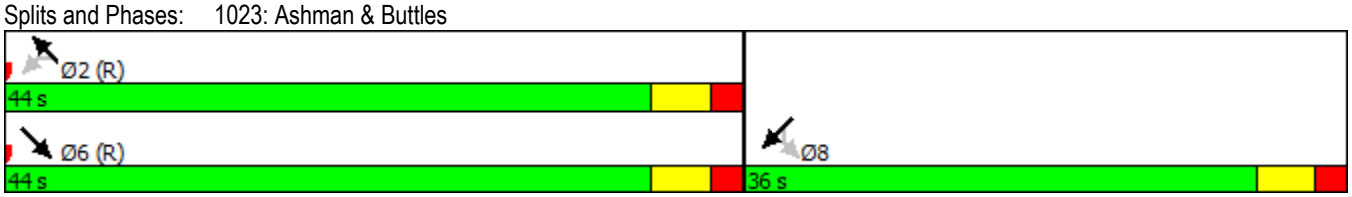
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 44.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian

Lane Group	SET	NWL	NWT	SWL	SWT
Lane Configurations					
Traffic Volume (vph)	539	31	419	21	299
Future Volume (vph)	539	31	419	21	299
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	6		2		8
Permitted Phases		2		8	
Detector Phase	6	2	2	8	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5
Total Split (s)	44.0	44.0	44.0	36.0	36.0
Total Split (%)	55.0%	55.0%	55.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	54.8	54.8	54.8	14.2	14.2
Actuated g/C Ratio	0.68	0.68	0.68	0.18	0.18
v/c Ratio	0.26	0.06	0.19	0.07	0.58
Control Delay	2.0	2.9	2.6	6.8	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	2.9	2.6	6.8	9.7
LOS	A	A	A	A	A
Approach Delay	2.0		2.6		9.5
Approach LOS	A		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 47.3%	ICU Level of Service A
Analysis Period (min) 15	

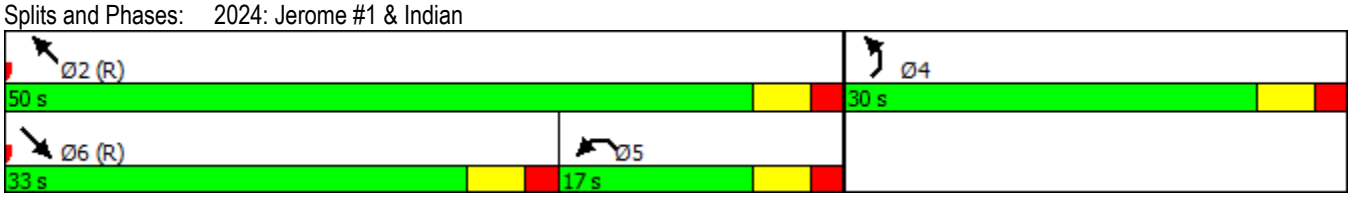
Splits and Phases: 1023: Ashman & Buttles



Lane Group	SET	NWL	NWT	NEL
Lane Configurations				
Traffic Volume (vph)	318	236	224	214
Future Volume (vph)	318	236	224	214
Turn Type	NA	Prot	NA	Prot
Protected Phases	6	5	2	4
Permitted Phases				
Detector Phase	6	5	2	4
Switch Phase				
Minimum Initial (s)	10.0	4.0	10.0	10.0
Minimum Split (s)	29.5	9.5	29.5	30.0
Total Split (s)	33.0	17.0	50.0	30.0
Total Split (%)	41.3%	21.3%	62.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	38.8	11.5	55.8	13.2
Actuated g/C Ratio	0.48	0.14	0.70	0.16
v/c Ratio	0.21	0.52	0.19	0.66
Control Delay	12.9	27.1	2.5	7.3
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	12.9	27.1	2.5	7.4
LOS	B	C	A	A
Approach Delay	12.9		15.1	7.4
Approach LOS	B		B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 11 (14%), Referenced to phase 2:NWT and 6:SET, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 43.4%	ICU Level of Service A
Analysis Period (min) 15	

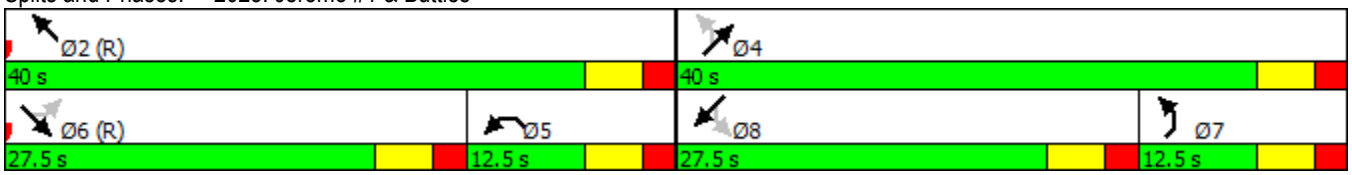
Splits and Phases: 2024: Jerome #1 & Indian



Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Configurations								
Traffic Volume (vph)	6	318	236	223	214	452	3	242
Future Volume (vph)	6	318	236	223	214	452	3	242
Turn Type	Perm	NA	Prot	NA	pm+pt	NA	Perm	NA
Protected Phases		6	5	2	7	4		8
Permitted Phases	6				4		8	
Detector Phase	6	6	5	2	7	4	8	8
Switch Phase								
Minimum Initial (s)	10.0	10.0	7.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	27.5	27.5	12.5	27.5	12.5	27.5	27.5	27.5
Total Split (s)	27.5	27.5	12.5	40.0	12.5	40.0	27.5	27.5
Total Split (%)	34.4%	34.4%	15.6%	50.0%	15.6%	50.0%	34.4%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead	Lag		Lag		Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	32.3	32.3	7.0	44.8	24.2	24.2	13.0	13.0
Actuated g/C Ratio	0.40	0.40	0.09	0.56	0.30	0.30	0.16	0.16
v/c Ratio	0.02	0.31	0.86	0.23	0.62	0.67	0.03	0.48
Control Delay	17.3	16.4	60.1	10.8	32.4	21.8	1.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	16.4	60.1	10.8	32.4	21.8	1.7	4.5
LOS	B	B	E	B	C	C	A	A
Approach Delay		16.4		36.2		24.3		4.5
Approach LOS		B		D		C		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 8 (10%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 23.0	Intersection LOS: C
Intersection Capacity Utilization 67.0%	ICU Level of Service C
Analysis Period (min) 15	

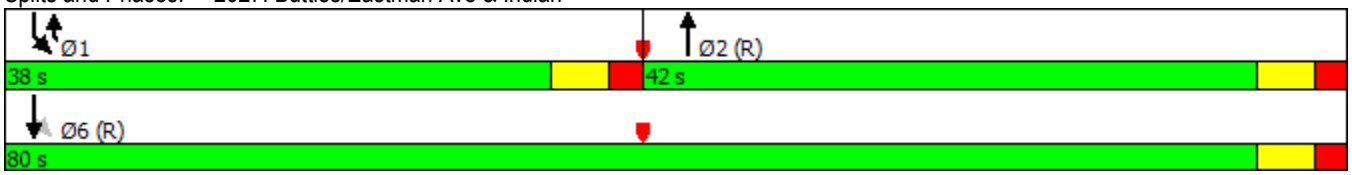
Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	NBT	SBL	SBT	NWR
Lane Configurations				
Traffic Volume (vph)	437	327	406	438
Future Volume (vph)	437	327	406	438
Turn Type	NA	pm+pt	NA	Over
Protected Phases	2	1	6	1
Permitted Phases		6		1
Detector Phase	2	1	6	1
Switch Phase				
Minimum Initial (s)	10.0	5.0	10.0	5.0
Minimum Split (s)	29.5	12.5	29.5	12.5
Total Split (s)	42.0	38.0	80.0	38.0
Total Split (%)	52.5%	47.5%	100.0%	47.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	51.5	74.5	80.0	17.5
Actuated g/C Ratio	0.64	0.93	1.00	0.22
v/c Ratio	0.21	0.37	0.24	0.66
Control Delay	6.5	1.3	0.3	17.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.5	1.3	0.3	17.3
LOS	A	A	A	B
Approach Delay	6.5		0.8	
Approach LOS	A		A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 50 (63%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 39.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2027: Buttles/Eastman Ave & Indian



Arterial Level of Service: EB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9012	1.4	20.1	0.2	40
	9010	0.6	15.3	0.2	43
Carpenter	9008	0.9	15.3	0.2	42
Jefferson	1006	5.7	13.0	0.1	26
Bayliss	1004	3.7	23.7	0.3	38
Washington	1001	23.4	46.5	0.2	19
Total		35.7	133.8	1.2	32

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	7.1	22.4	0.2	32
Bayliss	1004	6.7	26.3	0.2	33
Jefferson	1006	7.7	27.7	0.3	33
Carpenter	9008	2.1	9.6	0.1	34
	9010	0.5	14.8	0.2	43
	9012	0.4	14.9	0.2	44
George	1014	4.7	22.8	0.2	36
Total		29.1	138.5	1.4	36

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	2.3	20.8	0.2	39
	9011	0.9	22.1	0.3	43
Carpenter	9009	1.4	15.7	0.2	40
Jefferson	1007	4.9	9.1	0.1	21
Bayliss	1005	5.5	25.7	0.3	35
Washington	1002	17.9	37.3	0.2	24
Total		32.9	130.6	1.2	33

Arterial Level of Service: WB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Bayliss	1005	-	-	0.2	-
Jefferson	1007	5.9	26.0	0.3	35
Carpenter	9009	1.1	5.6	0.1	34
	9011	0.3	14.5	0.2	44
	9013	0.4	21.4	0.3	44
George	1015	5.2	22.8	0.2	35
Total		13.0	90.4	1.2	48

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Conkright	1017	7.5	13.2	0.1	15
Rodd	1020	2.9	15.0	0.1	29
Ashman	1022	3.8	15.8	0.1	25
Jerome #1	2024	3.2	21.0	0.2	30
Eastman Ave	2027	6.1	26.4	0.2	21
Total		23.5	91.6	0.6	24

Arterial Level of Service: SE Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Jerome #1	2024	-	-	0.2	-
Ashman	1022	7.8	26.0	0.2	25
Rodd	1020	4.3	16.3	0.1	24
Conkright	1017	4.8	16.8	0.1	26
George	1014	2.6	8.7	0.1	22
Total		19.6	67.9	0.6	33

Arterial Level of Service: NW Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Conkright	1018	3.9	10.1	0.1	19
Rodd	1021	2.2	14.0	0.1	31
Ashman	1023	4.2	16.4	0.1	25
Jerome #1	2025	15.1	32.8	0.2	19
	9026	1.6	12.1	0.1	29
Indian	2027	8.4	15.2	0.1	19
Total		35.4	100.6	0.6	23

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.1	8.4	0.1	35
Jerome #1	2025	21.7	31.7	0.1	11
Ashman	1023	4.8	22.6	0.2	28
Rodd	1021	2.7	14.9	0.1	27
Cronkright	1018	3.8	15.7	0.1	28
George	1015	6.7	12.9	0.1	15
Total		39.8	106.0	0.6	22

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	3.3	17.0	0.2	33
St Andrews	2029	3.4	25.7	0.3	39
Sugnet	2030	5.2	53.7	0.6	41
Saginaw	2031	23.6	62.9	0.5	29
Dilloway	2032	10.1	51.0	0.5	38
Wackerly	2033	27.7	59.4	0.4	25
Eb On Ramp	9034	2.8	5.7	0.0	21
Wb On Ramp	9035	1.1	7.3	0.1	37
Wb Ramp	2036	3.2	8.8	0.1	28
Mall Off	9037	1.2	7.3	0.1	37
Mall Dr South	3038	2.5	7.0	0.1	30
North Mall Dr	9039	3.0	11.7	0.1	34
Joe Mann	3040	8.9	14.9	0.1	17
Total		96.2	332.2	3.0	32

Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	12.5	27.8	0.2	26
	9039	3.1	9.2	0.1	28
Future Dr	3038	3.9	12.6	0.1	32
Saylor Dr	9037	2.0	6.8	0.1	31
Airport	2036	16.4	21.9	0.1	12
Wb On Ramp	9035	3.4	9.5	0.1	26
Eb On Ramp	9034	2.6	8.5	0.1	32
Wackerly	2033	13.2	15.6	0.0	8
Dilloway	2032	12.0	44.6	0.4	33
Saginaw	2031	22.1	63.3	0.5	30
Sugnet	2030	6.6	45.5	0.5	40
St Andrews	2029	5.0	53.9	0.6	41
Carpenter	9028	2.6	24.6	0.3	40
Indian	2027	0.8	13.3	0.2	42
Total		106.1	357.2	3.2	32

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	55	567	355	834	82	322	99
Future Volume (vph)	55	567	355	834	82	322	99
Turn Type	Perm	Perm	pm+pt	NA	Perm	NA	NA
Protected Phases			1	6		8	4
Permitted Phases	2	2	6		8		
Detector Phase	2	2	1	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	30.9	12.5	30.9	29.7	29.7	29.7
Total Split (s)	40.0	40.0	20.0	60.0	30.0	30.0	30.0
Total Split (%)	44.4%	44.4%	22.2%	66.7%	33.3%	33.3%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	41.6	41.6	60.2	60.2		18.8	18.8
Actuated g/C Ratio	0.46	0.46	0.67	0.67		0.21	0.21
v/c Ratio	0.24	0.38	0.33	0.42		0.71	0.23
Control Delay	21.0	6.4	7.9	7.9		39.1	18.0
Queue Delay	0.0	0.0	0.0	0.0		0.1	0.0
Total Delay	21.0	6.4	7.9	7.9		39.3	18.0
LOS	C	A	A	A		D	B
Approach Delay				7.9		39.3	18.0
Approach LOS				A		D	B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 25 (28%), Referenced to phase 2:EBL and 6:WBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1001: Washington & Patrick

Lane Group	EBL	EBT	NBL	NBT	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	65	548	96	339	580	41
Future Volume (vph)	65	548	96	339	580	41
Turn Type	Perm	NA	Perm	NA	Prot	NA
Protected Phases		2		8	7	4
Permitted Phases	2		8			
Detector Phase	2	2	8	8	7	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	7.0	4.0	7.0
Minimum Split (s)	32.2	32.2	29.5	29.5	9.5	29.5
Total Split (s)	33.0	33.0	57.0	57.0	9.5	57.0
Total Split (%)	33.2%	33.2%	57.3%	57.3%	9.5%	57.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag			Lead	Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	28.0	28.0	21.5	21.5	33.5	60.5
Actuated g/C Ratio	0.28	0.28	0.22	0.22	0.34	0.61
v/c Ratio	0.14	0.60	0.89	0.59	0.55	0.42
Control Delay	27.7	33.9	94.4	33.5	31.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.4
Total Delay	27.7	33.9	94.4	33.5	31.0	3.9
LOS	C	C	F	C	C	A
Approach Delay		33.2		44.7		19.3
Approach LOS		C		D		B

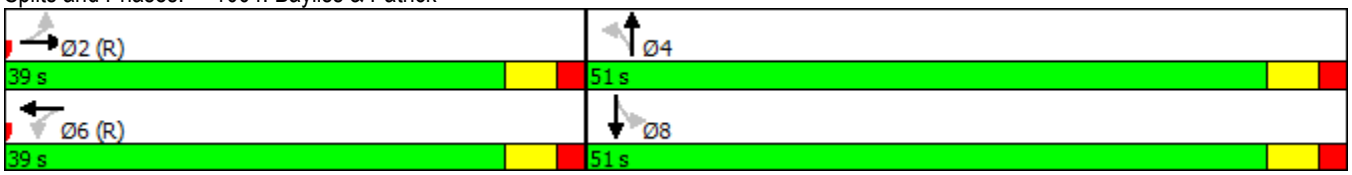
Intersection Summary	
Cycle Length: 99.5	
Actuated Cycle Length: 99.5	
Offset: 88 (88%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 29.4	Intersection LOS: C
Intersection Capacity Utilization 61.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	8	509	183	746	11	101	37	68
Future Volume (vph)	8	509	183	746	11	101	37	68
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)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	39.0	39.0	39.0	39.0	51.0	51.0	51.0	51.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	65.3	65.3	65.3	65.3	13.7	13.7		13.7
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.15	0.15		0.15
v/c Ratio	0.02	0.22	0.34	0.34	0.08	0.61		0.77
Control Delay	2.5	2.3	8.0	6.1	31.0	31.9		54.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	2.5	2.3	8.0	6.1	31.0	31.9		54.5
LOS	A	A	A	A	C	C		D
Approach Delay		2.3		6.4		31.9		54.5
Approach LOS		A		A		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 63 (70%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

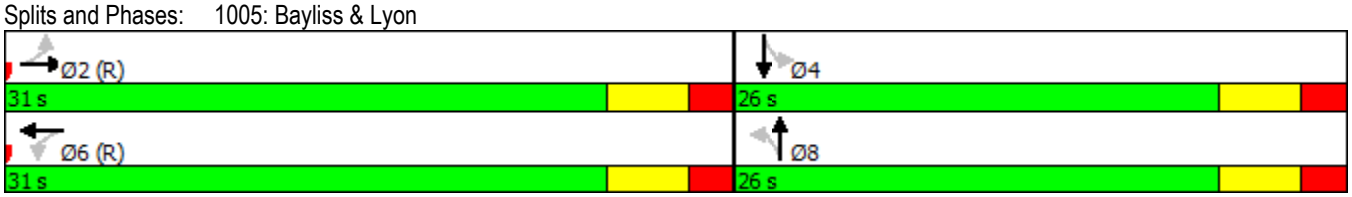
Splits and Phases: 1004: Bayliss & Patrick



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	8	519	65	386	10	135	37	71
Future Volume (vph)	8	519	65	386	10	135	37	71
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.7	29.7	26.0	26.0	26.0	26.0
Total Split (s)	31.0	31.0	31.0	31.0	26.0	26.0	26.0	26.0
Total Split (%)	54.4%	54.4%	54.4%	54.4%	45.6%	45.6%	45.6%	45.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	34.0	34.0	34.0	34.0	12.0	12.0	12.0	12.0
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.21	0.21	0.21	0.21
v/c Ratio	0.02	0.27	0.15	0.22	0.05	0.51	0.17	0.51
Control Delay	7.2	6.9	8.1	6.4	15.3	19.1	17.6	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	7.2	6.9	8.1	6.4	15.3	19.1	17.6	10.1
LOS	A	A	A	A	B	B	B	B
Approach Delay		6.9		6.6		18.9		11.2
Approach LOS		A		A		B		B

Intersection Summary	
Cycle Length: 57	
Actuated Cycle Length: 57	
Offset: 12 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	

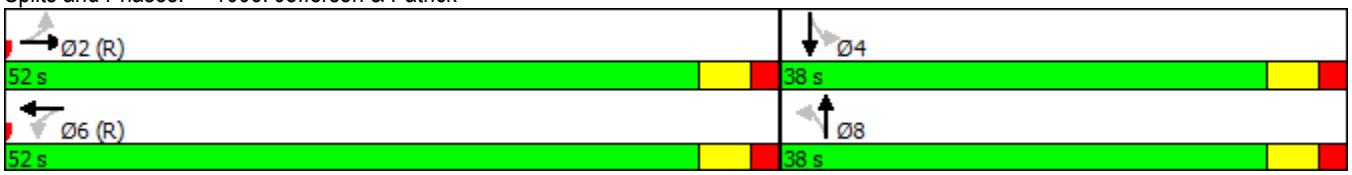
Splits and Phases: 1005: Bayliss & Lyon



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	7	494	128	630	22	89	26	91
Future Volume (vph)	7	494	128	630	22	89	26	91
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7
Total Split (s)	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	66.0	66.0	66.0	66.0	13.0	13.0		13.0
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.14	0.14		0.14
v/c Ratio	0.02	0.21	0.23	0.28	0.15	0.40		0.56
Control Delay	1.9	1.7	4.1	3.3	34.9	38.4		42.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	1.9	1.7	4.1	3.3	34.9	38.4		42.3
LOS	A	A	A	A	C	D		D
Approach Delay		1.7		3.4		37.8		42.3
Approach LOS		A		A		D		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 38 (42%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 8.7	Intersection LOS: A
Intersection Capacity Utilization 54.1%	ICU Level of Service A
Analysis Period (min) 15	

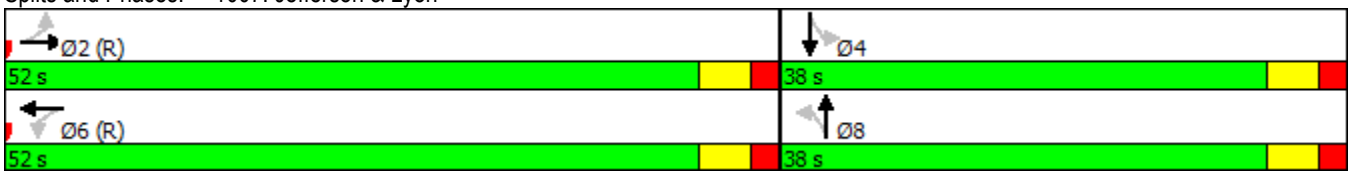
Splits and Phases: 1006: Jefferson & Patrick



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	9	495	7	508	22	75	27	67
Future Volume (vph)	9	495	7	508	22	75	27	67
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.7	29.7	29.7	29.7
Total Split (s)	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	66.6	66.6	66.6	66.6		12.4	12.4	12.4
Actuated g/C Ratio	0.74	0.74	0.74	0.74		0.14	0.14	0.14
v/c Ratio	0.02	0.21	0.01	0.23		0.76	0.19	0.64
Control Delay	3.3	3.0	4.7	4.4		60.9	24.3	17.4
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	3.3	3.0	4.7	4.4		60.9	24.3	17.4
LOS	A	A	A	A		E	C	B
Approach Delay		3.0		4.4		60.9		18.3
Approach LOS		A		A		E		B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 40 (44%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 46.8%	ICU Level of Service A
Analysis Period (min) 15	

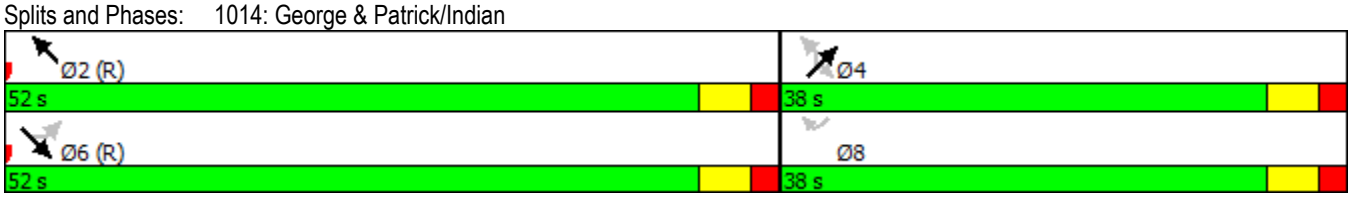
Splits and Phases: 1007: Jefferson & Lyon



Lane Group	SEL	SET	NWT	NEL	NET	NER	SWR
Lane Configurations							
Traffic Volume (vph)	7	436	691	124	26	75	26
Future Volume (vph)	7	436	691	124	26	75	26
Turn Type	Perm	NA	NA	Perm	NA	Perm	Perm
Protected Phases		6	2		4		
Permitted Phases	6			4		4	8
Detector Phase	6	6	2	4	4	4	8
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.9	29.9	29.9	29.9
Total Split (s)	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	66.1	66.1	66.1	12.9	12.9	12.9	12.9
Actuated g/C Ratio	0.73	0.73	0.73	0.14	0.14	0.14	0.14
v/c Ratio	0.02	0.18	0.29	0.53	0.10	0.28	0.08
Control Delay	0.3	0.3	1.7	22.2	11.8	2.4	0.4
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	0.3	0.4	1.7	22.2	11.8	2.4	0.4
LOS	A	A	A	C	B	A	A
Approach Delay		0.4	1.7		14.4		
Approach LOS		A	A		B		

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 89 (99%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 3.3	Intersection LOS: A
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

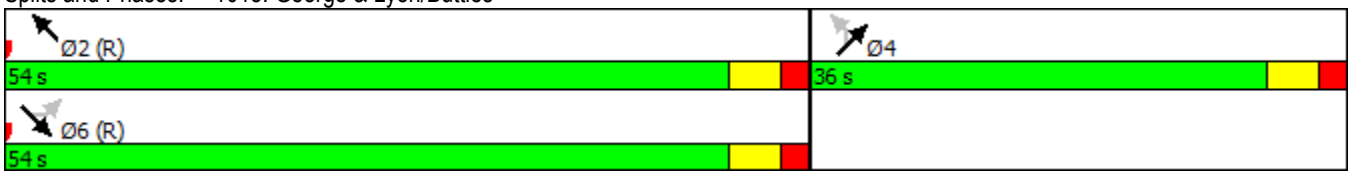
Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	19	436	690	204
Future Volume (vph)	19	436	690	204
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	54.0	54.0	54.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	65.7	65.7	65.7	13.3
Actuated g/C Ratio	0.73	0.73	0.73	0.15
v/c Ratio	0.04	0.18	0.29	0.55
Control Delay	3.9	3.9	3.6	28.2
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	3.9	4.1	3.6	28.2
LOS	A	A	A	C
Approach Delay		4.1	3.6	28.2
Approach LOS		A	A	C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 87 (97%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 49.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	23	27	69	344
Future Volume (vph)	23	27	69	344
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	39.0	39.0	39.0	51.0
Total Split (%)	43.3%	43.3%	43.3%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Max
Act Effct Green (s)		10.5	10.5	72.1
Actuated g/C Ratio		0.12	0.12	0.80
v/c Ratio		0.31	0.24	0.12
Control Delay		32.7	26.6	3.1
Queue Delay		0.0	0.0	0.0
Total Delay		32.7	26.6	3.1
LOS		C	C	A
Approach Delay		32.7	26.6	3.1
Approach LOS		C	C	A

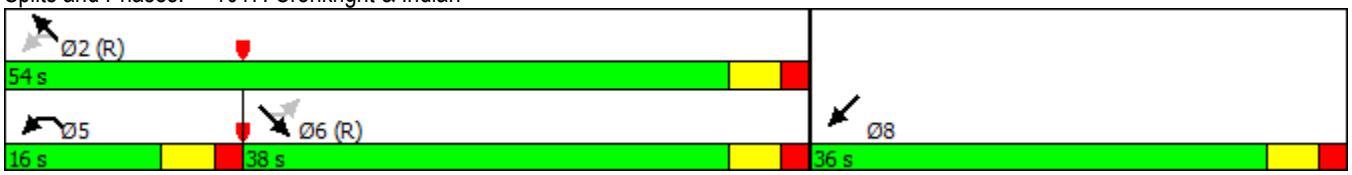
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 66 (73%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 27.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St

Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	443	144	690	247
Future Volume (vph)	443	144	690	247
Turn Type	NA	pm+pt	NA	NA
Protected Phases	6	5	2	8
Permitted Phases		2		
Detector Phase	6	5	2	8
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	29.5	9.5	29.5	29.5
Total Split (s)	38.0	16.0	54.0	36.0
Total Split (%)	42.2%	17.8%	60.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	43.6	58.0	58.0	21.0
Actuated g/C Ratio	0.48	0.64	0.64	0.23
v/c Ratio	0.35	0.30	0.33	0.75
Control Delay	10.0	10.4	9.2	41.2
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	10.0	10.4	9.5	41.2
LOS	B	B	A	D
Approach Delay	10.0		9.6	41.2
Approach LOS	B		A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 89 (99%), Referenced to phase 2:NWTL and 6:SETL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 53.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1017: Cronkright & Indian



Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	443	114	689	432
Future Volume (vph)	443	114	689	432
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.8
Total Split (s)	53.0	53.0	53.0	37.0
Total Split (%)	58.9%	58.9%	58.9%	41.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	63.5	63.5	63.5	15.5
Actuated g/C Ratio	0.71	0.71	0.71	0.17
v/c Ratio	0.24	0.22	0.30	0.61
Control Delay	3.0	3.9	3.4	30.9
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	3.0	3.9	3.6	30.9
LOS	A	A	A	C
Approach Delay	3.0		3.6	30.9
Approach LOS	A		A	C

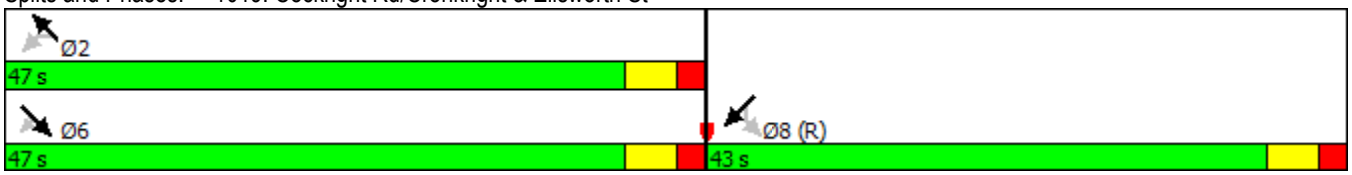
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 1 (1%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 49.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1018: Cronkright & Buttles

Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	34	254	85	58	611
Future Volume (vph)	34	254	85	58	611
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.5	29.5	29.7
Total Split (s)	47.0	47.0	47.0	47.0	43.0
Total Split (%)	52.2%	52.2%	52.2%	52.2%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	None	None	C-Max
Act Effct Green (s)	41.5	41.5	41.5	41.5	37.5
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.42
v/c Ratio	0.04	0.34	0.15	0.07	0.34
Control Delay	13.6	9.1	12.0	11.3	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	9.1	12.0	11.3	8.0
LOS	B	A	B	B	A
Approach Delay	9.6			11.7	8.0
Approach LOS	A			B	A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 61 (68%), Referenced to phase 8:SWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.34	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 48.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1019: Cockright Rd/Cronkright & Ellsworth St



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	84	518	712	202
Future Volume (vph)	84	518	712	202
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	57.0	57.0	57.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	67.6	67.6	67.6	11.4
Actuated g/C Ratio	0.75	0.75	0.75	0.13
v/c Ratio	0.19	0.21	0.31	0.41
Control Delay	2.4	1.4	1.5	19.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.4	1.4	1.5	19.7
LOS	A	A	A	B
Approach Delay		1.5	1.5	19.7
Approach LOS		A	A	B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 81 (90%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 48.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian

Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	84	519	712	136
Future Volume (vph)	84	519	712	136
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	58.0	58.0	58.0	32.0
Total Split (%)	64.4%	64.4%	64.4%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	68.4	68.4	68.4	10.6
Actuated g/C Ratio	0.76	0.76	0.76	0.12
v/c Ratio	0.19	0.21	0.30	0.33
Control Delay	3.3	2.3	2.6	30.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.3	2.3	2.6	30.7
LOS	A	A	A	C
Approach Delay		2.4	2.6	30.7
Approach LOS		A	A	C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 79 (88%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 49.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles

Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	568	36	693	350
Future Volume (vph)	568	36	693	350
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	53.0	53.0	53.0	37.0
Total Split (%)	58.9%	58.9%	58.9%	41.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	64.3	64.3	64.3	14.7
Actuated g/C Ratio	0.71	0.71	0.71	0.16
v/c Ratio	0.26	0.07	0.30	0.60
Control Delay	4.0	2.8	2.6	32.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.0	2.8	2.6	32.2
LOS	A	A	A	C
Approach Delay	4.0		2.6	32.2
Approach LOS	A		A	C

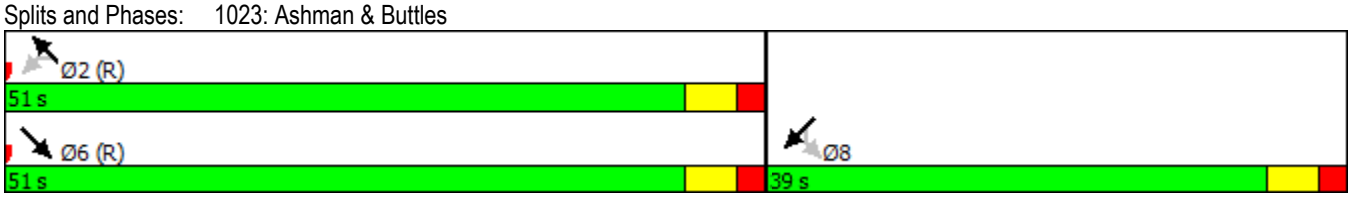
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 84 (93%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 11.0	Intersection LOS: B
Intersection Capacity Utilization 48.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1022: Ashman & Indian

Lane Group	SET	NWL	NWT	SWL	SWT
Lane Configurations					
Traffic Volume (vph)	568	36	693	35	277
Future Volume (vph)	568	36	693	35	277
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	6		2		8
Permitted Phases		2		8	
Detector Phase	6	2	2	8	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5
Total Split (s)	51.0	51.0	51.0	39.0	39.0
Total Split (%)	56.7%	56.7%	56.7%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	63.9	63.9	63.9	15.1	15.1
Actuated g/C Ratio	0.71	0.71	0.71	0.17	0.17
v/c Ratio	0.26	0.07	0.30	0.13	0.65
Control Delay	1.9	2.4	2.3	12.3	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	2.4	2.3	12.3	12.6
LOS	A	A	A	B	B
Approach Delay	1.9		2.3		12.6
Approach LOS	A		A		B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 88 (98%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 4.6	Intersection LOS: A
Intersection Capacity Utilization 49.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles



Lane Group	SET	NWL	NWT	NEL
Lane Configurations				
Traffic Volume (vph)	330	510	281	238
Future Volume (vph)	330	510	281	238
Turn Type	NA	Prot	NA	Prot
Protected Phases	6	5	2	4
Permitted Phases				
Detector Phase	6	5	2	4
Switch Phase				
Minimum Initial (s)	10.0	4.0	10.0	10.0
Minimum Split (s)	29.5	9.5	29.5	30.0
Total Split (s)	32.0	28.0	60.0	30.0
Total Split (%)	35.6%	31.1%	66.7%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	39.8	19.7	65.0	14.0
Actuated g/C Ratio	0.44	0.22	0.72	0.16
v/c Ratio	0.24	0.74	0.23	0.73
Control Delay	20.9	26.8	4.2	23.2
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	20.9	26.8	4.2	23.4
LOS	C	C	A	C
Approach Delay	20.9		18.8	23.4
Approach LOS	C		B	C

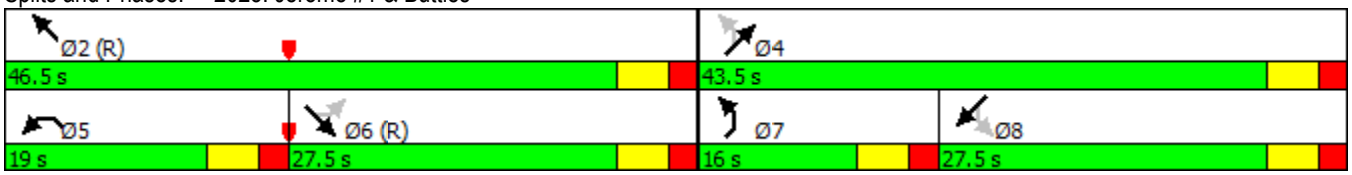
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 55 (61%), Referenced to phase 2:NWT and 6:SET, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 20.6	Intersection LOS: C
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Configurations								
Traffic Volume (vph)	13	331	510	281	238	487	6	522
Future Volume (vph)	13	331	510	281	238	487	6	522
Turn Type	Perm	NA	Prot	NA	pm+pt	NA	Perm	NA
Protected Phases		6	5	2	7	4		8
Permitted Phases	6				4		8	
Detector Phase	6	6	5	2	7	4	8	8
Switch Phase								
Minimum Initial (s)	10.0	10.0	7.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	27.5	27.5	12.5	27.5	12.5	27.5	27.5	27.5
Total Split (s)	27.5	27.5	19.0	46.5	16.0	43.5	27.5	27.5
Total Split (%)	30.6%	30.6%	21.1%	51.7%	17.8%	48.3%	30.6%	30.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	22.0	22.0	16.2	43.7	35.3	35.3	19.3	19.3
Actuated g/C Ratio	0.24	0.24	0.18	0.49	0.39	0.39	0.21	0.21
v/c Ratio	0.05	0.64	0.90	0.34	0.85	0.58	0.05	0.75
Control Delay	26.8	25.2	50.2	18.0	46.6	19.1	34.8	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	25.2	50.2	18.0	46.6	19.1	34.8	28.6
LOS	C	C	D	B	D	B	C	C
Approach Delay		25.2		38.8		25.7		28.7
Approach LOS		C		D		C		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 59 (66%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 29.8	Intersection LOS: C
Intersection Capacity Utilization 79.3%	ICU Level of Service D
Analysis Period (min) 15	

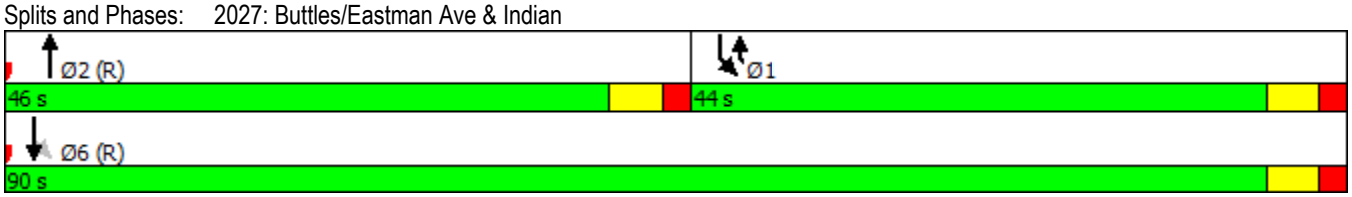
Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	NBT	SBL	SBT	NWR
Lane Configurations				
Traffic Volume (vph)	519	348	563	519
Future Volume (vph)	519	348	563	519
Turn Type	NA	pm+pt	NA	Over
Protected Phases	2	1	6	1
Permitted Phases		6		1
Detector Phase	2	1	6	1
Switch Phase				
Minimum Initial (s)	10.0	7.0	10.0	7.0
Minimum Split (s)	29.5	12.5	29.5	12.5
Total Split (s)	46.0	44.0	90.0	44.0
Total Split (%)	51.1%	48.9%	100.0%	48.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag		Lag
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	40.5	84.5	90.0	38.5
Actuated g/C Ratio	0.45	0.94	1.00	0.43
v/c Ratio	0.35	0.33	0.33	0.44
Control Delay	24.6	1.2	0.5	7.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.6	1.2	0.5	7.0
LOS	C	A	A	A
Approach Delay	24.6		0.8	
Approach LOS	C		A	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 42.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2027: Buttles/Eastman Ave & Indian



Arterial Level of Service: EB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9012	0.8	19.6	0.2	42
	9010	0.5	15.1	0.2	43
Carpenter	9008	0.7	15.0	0.2	43
Jefferson	1006	4.8	12.0	0.1	27
Bayliss	1004	6.7	26.7	0.3	34
Washington	1001	28.9	52.0	0.2	17
Total		42.4	140.3	1.2	30

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	9.7	25.2	0.2	28
Bayliss	1004	10.8	30.4	0.2	29
Jefferson	1006	9.9	29.8	0.3	30
Carpenter	9008	1.7	9.2	0.1	36
	9010	0.7	14.9	0.2	43
	9012	0.7	15.2	0.2	43
George	1014	5.9	23.8	0.2	34
Total		39.4	148.6	1.4	33

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	1.0	19.5	0.2	42
	9011	0.7	21.8	0.3	43
Carpenter	9009	1.0	15.3	0.2	42
Jefferson	1007	6.5	10.7	0.1	18
Bayliss	1005	8.9	29.3	0.3	31
Washington	1002	27.0	46.4	0.2	19
Total		45.2	142.9	1.2	31

Arterial Level of Service: WB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Bayliss	1005	0.5	2.0	0.2	453
Jefferson	1007	8.1	28.3	0.3	32
Carpenter	9009	1.6	6.1	0.1	32
	9011	0.6	14.8	0.2	43
	9013	0.8	21.8	0.3	43
George	1015	5.5	23.1	0.2	35
Total		17.0	96.1	1.2	46

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	1017	8.5	14.1	0.1	14
Rodd	1020	3.4	15.5	0.1	29
Ashman	1022	3.8	15.8	0.1	25
Jerome #1	2024	6.2	24.1	0.2	26
Eastman Ave	2027	16.1	37.4	0.2	15
Total		38.0	106.9	0.6	21

Arterial Level of Service: SE Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Jerome #1	2024	-	-	0.2	-
Ashman	1022	8.0	26.0	0.2	25
Rodd	1020	4.3	16.2	0.1	24
Cronkright	1017	7.8	19.8	0.1	22
George	1014	1.4	7.4	0.1	26
Total		21.5	69.4	0.6	32

Arterial Level of Service: NW Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	1018	2.8	9.0	0.1	21
Rodd	1021	4.2	16.1	0.1	27
Ashman	1023	5.4	17.7	0.1	23
Jerome #1	2025	14.9	32.5	0.2	19
	9026	1.9	12.4	0.1	28
Indian	2027	5.2	12.0	0.1	25
Total		34.4	99.6	0.6	23

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.2	8.4	0.1	35
Jerome #1	2025	30.0	39.8	0.1	9
Ashman	1023	5.5	23.5	0.2	27
Rodd	1021	3.5	15.6	0.1	26
Cronkright	1018	3.7	15.6	0.1	28
George	1015	2.5	8.6	0.1	22
Total		45.3	111.6	0.6	21

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	3.0	16.8	0.2	33
St Andrews	2029	6.4	28.7	0.3	35
Sugnet	2030	8.0	56.5	0.6	39
Saginaw	2031	28.0	67.2	0.5	27
Dilloway	2032	11.0	51.4	0.5	37
Wackerly	2033	31.9	63.7	0.4	23
Eb On Ramp	9034	3.2	6.1	0.0	20
Wb On Ramp	9035	1.7	7.9	0.1	34
Wb Ramp	2036	8.2	13.8	0.1	18
Mall Off	9037	2.9	9.0	0.1	30
Mall Dr South	3038	7.8	12.2	0.1	17
North Mall Dr	9039	7.2	15.9	0.1	25
Joe Mann	3040	6.0	11.9	0.1	22
Total		125.4	361.2	3.0	30

Arterial Level of Service: SB Eastman Ave

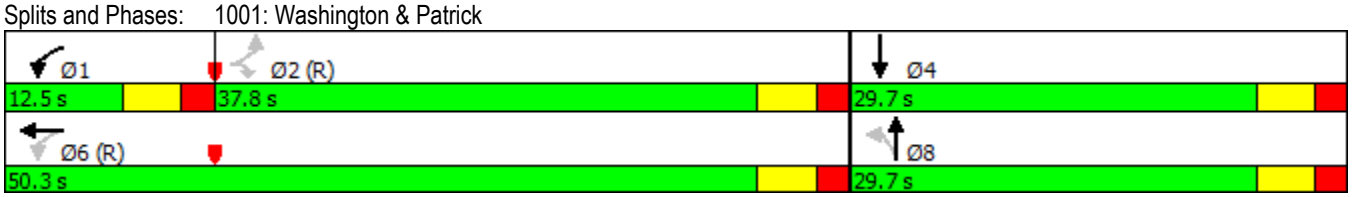
Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	10.8	26.0	0.2	27
	9039	2.7	8.8	0.1	30
Future Dr	3038	10.6	19.3	0.1	21
Saylor Dr	9037	3.5	8.3	0.1	26
Airport	2036	21.4	26.9	0.1	10
Wb On Ramp	9035	4.5	10.6	0.1	23
Eb On Ramp	9034	3.1	9.0	0.1	30
Wackerly	2033	16.9	19.4	0.0	6
Dilloway	2032	9.6	42.3	0.4	35
Saginaw	2031	34.4	75.7	0.5	25
Sugnet	2030	9.5	48.9	0.5	37
St Andrews	2029	7.2	56.2	0.6	39
Carpenter	9028	3.5	25.5	0.3	39
Indian	2027	1.1	13.6	0.2	41
Total		138.7	390.5	3.2	29

Appendix F
Alternative 3 Capacity Analysis

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	470	438	178	528	39	116	77
Future Volume (vph)	470	438	178	528	39	116	77
Turn Type	Perm	Perm	pm+pt	NA	Perm	NA	NA
Protected Phases			1	6		8	4
Permitted Phases	2	2	6		8		
Detector Phase	2	2	1	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	30.9	12.5	30.9	29.7	29.7	29.7
Total Split (s)	37.8	37.8	12.5	50.3	29.7	29.7	29.7
Total Split (%)	47.3%	47.3%	15.6%	62.9%	37.1%	37.1%	37.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	43.8	43.8	57.6	57.6		11.4	11.4
Actuated g/C Ratio	0.55	0.55	0.72	0.72		0.14	0.14
v/c Ratio	1.20	0.27	0.15	0.24		0.40	0.26
Control Delay	127.5	0.7	4.7	4.6		19.9	19.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	127.5	0.8	4.7	4.6		19.9	19.7
LOS	F	A	A	A		B	B
Approach Delay				4.6		19.9	19.7
Approach LOS				A		B	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 30 (38%), Referenced to phase 2:EBL and 6:WBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 35.9	Intersection LOS: D
Intersection Capacity Utilization 70.6%	ICU Level of Service C
Analysis Period (min) 15	

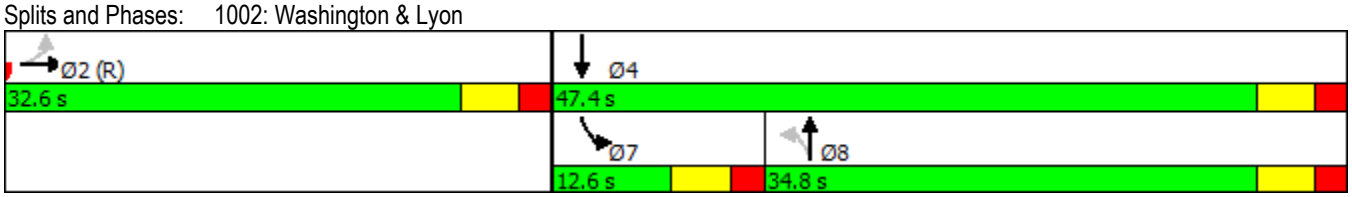
Splits and Phases: 1001: Washington & Patrick



Lane Group	EBT	NBL	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	483	38	135	92	377
Future Volume (vph)	483	38	135	92	377
Turn Type	NA	Perm	NA	Prot	NA
Protected Phases	2		8	7	4
Permitted Phases		8			
Detector Phase	2	8	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.5	29.5	12.5	29.5
Total Split (s)	32.6	34.8	34.8	12.6	47.4
Total Split (%)	40.8%	43.5%	43.5%	15.8%	59.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	34.4	24.6	24.6	7.1	34.6
Actuated g/C Ratio	0.43	0.31	0.31	0.09	0.43
v/c Ratio	0.36	0.26	0.15	0.33	0.82
Control Delay	13.1	24.6	18.1	30.5	25.0
Queue Delay	0.0	0.0	0.0	0.0	1.7
Total Delay	13.1	24.6	18.1	30.5	26.7
LOS	B	C	B	C	C
Approach Delay	13.1		19.4		27.2
Approach LOS	B		B		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 8 (10%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 62.5%	ICU Level of Service B
Analysis Period (min) 15	

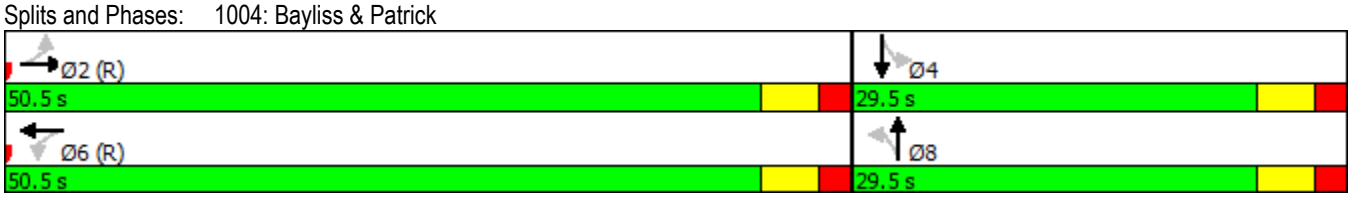
Splits and Phases: 1002: Washington & Lyon



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	3	886	135	471	15	30	15	93
Future Volume (vph)	3	886	135	471	15	30	15	93
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	26.0	26.0
Total Split (s)	50.5	50.5	50.5	50.5	29.5	29.5	29.5	29.5
Total Split (%)	63.1%	63.1%	63.1%	63.1%	36.9%	36.9%	36.9%	36.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	60.7	60.7	60.7	60.7	11.9	11.9		11.8
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.15	0.15		0.15
v/c Ratio	0.00	0.36	0.37	0.19	0.09	0.15		0.47
Control Delay	1.3	1.4	10.1	3.8	9.1	5.9		34.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	1.3	1.4	10.1	3.8	9.1	5.9		34.8
LOS	A	A	B	A	A	A		C
Approach Delay		1.4		5.2		6.8		34.8
Approach LOS		A		A		A		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 5.2	Intersection LOS: A
Intersection Capacity Utilization 58.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1004: Bayliss & Patrick



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	1	412	58	202	10	49	83	144
Future Volume (vph)	1	412	58	202	10	49	83	144
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.7	29.7	13.0	13.0	13.0	13.0
Total Split (s)	53.0	53.0	53.0	53.0	27.0	27.0	27.0	27.0
Total Split (%)	66.3%	66.3%	66.3%	66.3%	33.8%	33.8%	33.8%	33.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	56.9	56.9	56.9	56.9	12.1	12.1	12.1	12.1
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.15	0.15	0.15	0.15
v/c Ratio	0.00	0.34	0.10	0.17	0.07	0.22	0.45	0.57
Control Delay	3.0	3.1	4.2	4.5	27.8	26.8	28.1	29.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	3.1	4.2	4.5	27.8	26.8	28.1	29.5
LOS	A	A	A	A	C	C	C	C
Approach Delay		3.1		4.4		27.0		29.0
Approach LOS		A		A		C		C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 2 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

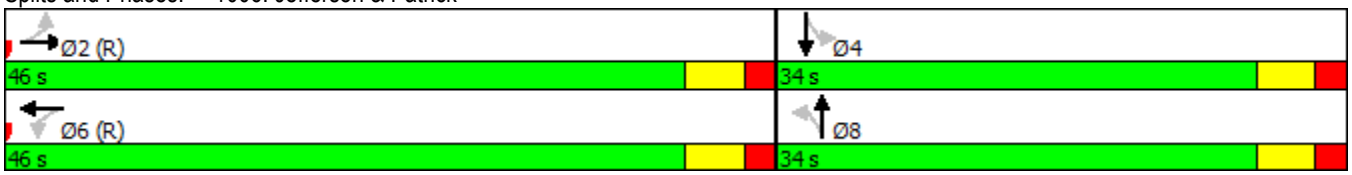
Splits and Phases: 1005: Bayliss & Lyon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	5	846	12	465	10	64	41	128
Future Volume (vph)	5	846	12	465	10	64	41	128
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7
Total Split (s)	46.0	46.0	46.0	46.0	34.0	34.0	34.0	34.0
Total Split (%)	57.5%	57.5%	57.5%	57.5%	42.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	54.5	54.5	54.5	54.5	14.5	14.5		14.5
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.18	0.18		0.18
v/c Ratio	0.01	0.39	0.04	0.22	0.06	0.22		0.64
Control Delay	2.6	2.6	4.8	5.2	11.7	12.7		39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	2.6	2.6	4.8	5.2	11.7	12.7		39.4
LOS	A	A	A	A	B	B		D
Approach Delay		2.6		5.2		12.6		39.4
Approach LOS		A		A		B		D

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 71 (89%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 7.9 Intersection LOS: A
Intersection Capacity Utilization 49.1% ICU Level of Service A
Analysis Period (min) 15

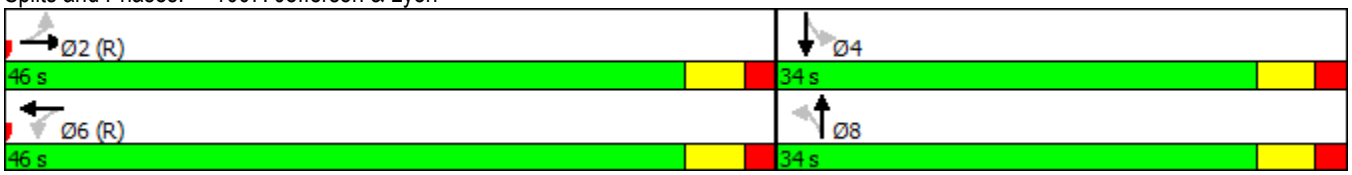
Splits and Phases: 1006: Jefferson & Patrick



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	2	363	9	199	7	69	17	136
Future Volume (vph)	2	363	9	199	7	69	17	136
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.7	29.7	29.7	29.7
Total Split (s)	46.0	46.0	46.0	46.0	34.0	34.0	34.0	34.0
Total Split (%)	57.5%	57.5%	57.5%	57.5%	42.5%	42.5%	42.5%	42.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	56.4	56.4	56.4	56.4		12.6	12.6	12.6
Actuated g/C Ratio	0.70	0.70	0.70	0.70		0.16	0.16	0.16
v/c Ratio	0.00	0.31	0.01	0.17		0.42	0.10	0.51
Control Delay	2.5	3.7	2.0	1.7		24.7	9.4	14.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	2.5	3.7	2.0	1.7		24.7	9.4	14.7
LOS	A	A	A	A		C	A	B
Approach Delay		3.7		1.7		24.7		14.2
Approach LOS		A		A		C		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 75 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 7.9	Intersection LOS: A
Intersection Capacity Utilization 40.7%	ICU Level of Service A
Analysis Period (min) 15	

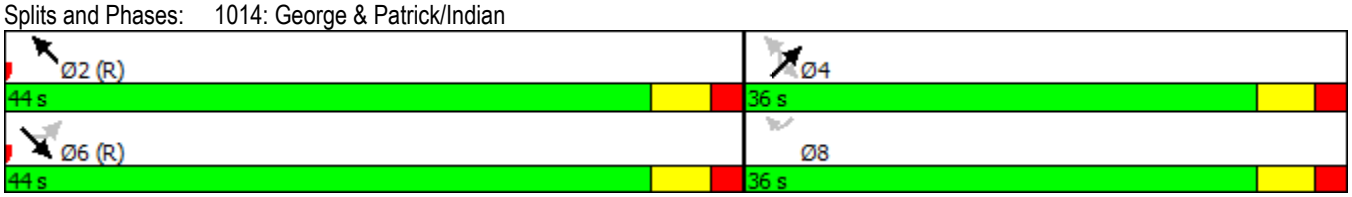
Splits and Phases: 1007: Jefferson & Lyon



Lane Group	SEL	SET	NWT	NEL	NET	NER	SWR
Lane Configurations							
Traffic Volume (vph)	9	712	472	125	119	144	14
Future Volume (vph)	9	712	472	125	119	144	14
Turn Type	Perm	NA	NA	Perm	NA	Perm	Perm
Protected Phases		6	2		4		
Permitted Phases	6			4		4	8
Detector Phase	6	6	2	4	4	4	8
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.9	29.9	29.9	29.9
Total Split (s)	44.0	44.0	44.0	36.0	36.0	36.0	36.0
Total Split (%)	55.0%	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	56.4	56.4	56.4	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.70	0.70	0.70	0.16	0.16	0.16	0.16
v/c Ratio	0.02	0.31	0.21	0.49	0.44	0.44	0.03
Control Delay	0.4	0.5	2.3	10.0	8.6	3.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.4	0.6	2.3	10.0	8.6	3.9	0.1
LOS	A	A	A	A	A	A	A
Approach Delay		0.6	2.3		7.3		
Approach LOS		A	A		A		

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 9 (11%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 2.7	Intersection LOS: A
Intersection Capacity Utilization 39.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	7	305	202	376
Future Volume (vph)	7	305	202	376
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	45.0	45.0	45.0	35.0
Total Split (%)	56.3%	56.3%	56.3%	43.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	54.4	54.4	54.4	14.6
Actuated g/C Ratio	0.68	0.68	0.68	0.18
v/c Ratio	0.01	0.26	0.18	0.58
Control Delay	6.3	5.5	2.1	27.2
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	6.3	5.8	2.1	27.2
LOS	A	A	A	C
Approach Delay		5.8	2.1	27.2
Approach LOS		A	A	C

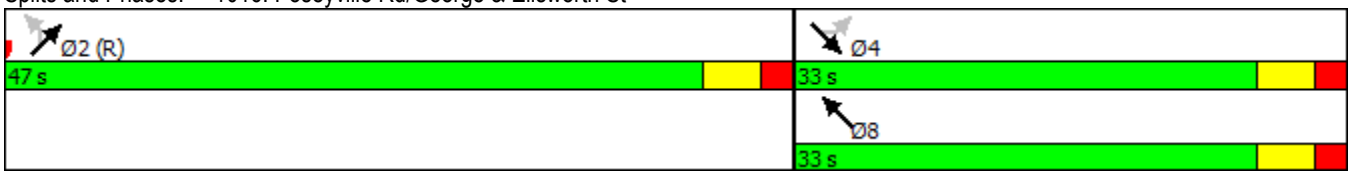
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 2 (3%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 44.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1015: George & Lyon/Buttles

Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	4	31	23	477
Future Volume (vph)	4	31	23	477
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	33.0	33.0	33.0	47.0
Total Split (%)	41.3%	41.3%	41.3%	58.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Max
Act Effct Green (s)		9.9	9.9	66.3
Actuated g/C Ratio		0.12	0.12	0.83
v/c Ratio		0.17	0.10	0.18
Control Delay		28.8	19.7	3.1
Queue Delay		0.0	0.0	0.0
Total Delay		28.8	19.7	3.1
LOS		C	B	A
Approach Delay		28.8	19.7	3.1
Approach LOS		C	B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 25 (31%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.18	
Intersection Signal Delay: 5.1	Intersection LOS: A
Intersection Capacity Utilization 28.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St



Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	721	109	502	132
Future Volume (vph)	721	109	502	132
Turn Type	NA	pm+pt	NA	NA
Protected Phases	6	5	2	8
Permitted Phases		2		
Detector Phase	6	5	2	8
Switch Phase				
Minimum Initial (s)	10.0	5.0	10.0	7.0
Minimum Split (s)	29.5	12.5	29.5	29.5
Total Split (s)	36.0	13.0	49.0	31.0
Total Split (%)	45.0%	16.3%	61.3%	38.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	41.9	52.7	52.7	16.3
Actuated g/C Ratio	0.52	0.66	0.66	0.20
v/c Ratio	0.44	0.27	0.23	0.74
Control Delay	6.8	11.5	8.8	32.8
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	6.8	11.5	9.0	32.8
LOS	A	B	A	C
Approach Delay	6.8		9.5	32.8
Approach LOS	A		A	C

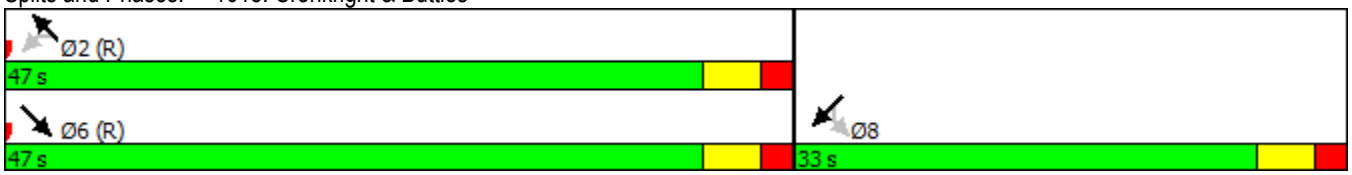
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 12 (15%), Referenced to phase 2:NWTL and 6:SETL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 56.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1017: Cronkright & Indian

Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	309	46	215	194
Future Volume (vph)	309	46	215	194
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.8
Total Split (s)	47.0	47.0	47.0	33.0
Total Split (%)	58.8%	58.8%	58.8%	41.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	58.2	58.2	58.2	10.8
Actuated g/C Ratio	0.73	0.73	0.73	0.14
v/c Ratio	0.26	0.07	0.17	0.39
Control Delay	1.3	5.2	5.8	21.1
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	1.3	5.2	6.3	21.1
LOS	A	A	A	C
Approach Delay	1.3		6.1	21.1
Approach LOS	A		A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 10 (13%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 44.7%	ICU Level of Service A
Analysis Period (min) 15	

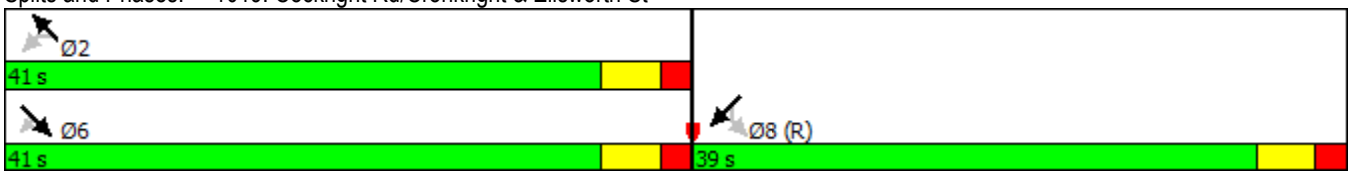
Splits and Phases: 1018: Cronkright & Buttles



Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	22	59	58	90	188
Future Volume (vph)	22	59	58	90	188
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.5	29.5	29.7
Total Split (s)	41.0	41.0	41.0	41.0	39.0
Total Split (%)	51.3%	51.3%	51.3%	51.3%	48.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	None	None	C-Max
Act Effct Green (s)	35.5	35.5	35.5	35.5	33.5
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.42
v/c Ratio	0.03	0.09	0.10	0.12	0.13
Control Delay	12.8	4.1	11.6	11.7	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	4.1	11.6	11.7	2.7
LOS	B	A	B	B	A
Approach Delay	6.4			11.6	2.7
Approach LOS	A			B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 65 (81%), Referenced to phase 8:SWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.13	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 31.3%	ICU Level of Service A
Analysis Period (min) 15	

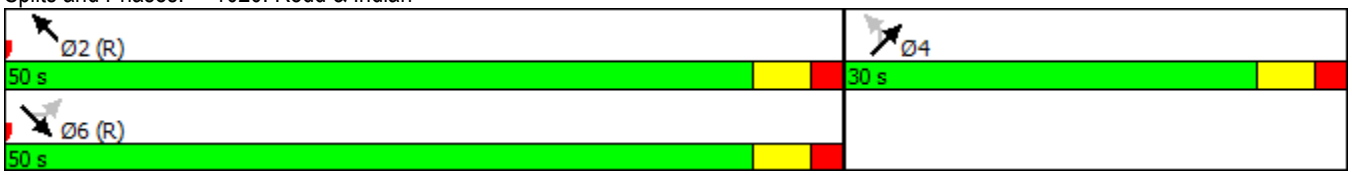
Splits and Phases: 1019: Cockright Rd/Cronkright & Ellsworth St



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	77	706	626	54
Future Volume (vph)	77	706	626	54
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	50.0	50.0	50.0	30.0
Total Split (%)	62.5%	62.5%	62.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	62.9	62.9	62.9	9.7
Actuated g/C Ratio	0.79	0.79	0.79	0.12
v/c Ratio	0.15	0.28	0.25	0.16
Control Delay	2.3	1.7	0.7	9.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.3	1.7	0.7	9.6
LOS	A	A	A	A
Approach Delay		1.8	0.7	9.6
Approach LOS		A	A	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 68 (85%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.28	
Intersection Signal Delay: 1.8	Intersection LOS: A
Intersection Capacity Utilization 51.7%	ICU Level of Service A
Analysis Period (min) 15	

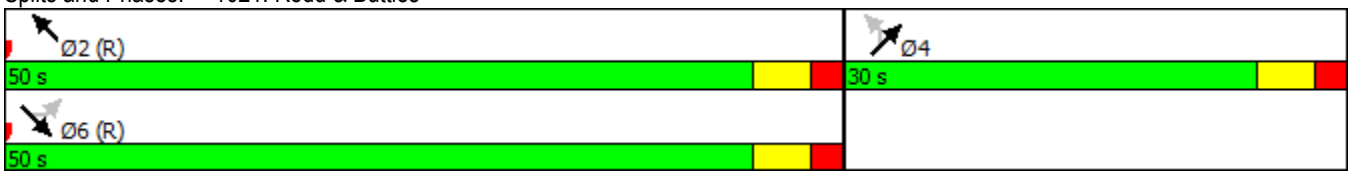
Splits and Phases: 1020: Rodd & Indian



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	33	302	268	49
Future Volume (vph)	33	302	268	49
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	50.0	50.0	50.0	30.0
Total Split (%)	62.5%	62.5%	62.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	62.9	62.9	62.9	9.7
Actuated g/C Ratio	0.79	0.79	0.79	0.12
v/c Ratio	0.04	0.22	0.21	0.12
Control Delay	1.7	1.6	0.7	24.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.7	1.6	0.7	24.2
LOS	A	A	A	C
Approach Delay		1.7	0.7	24.2
Approach LOS		A	A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 68 (85%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.22	
Intersection Signal Delay: 3.5	Intersection LOS: A
Intersection Capacity Utilization 50.4%	ICU Level of Service A
Analysis Period (min) 15	

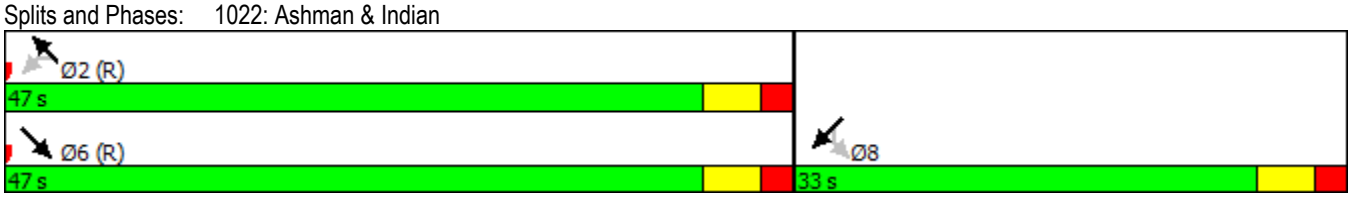
Splits and Phases: 1021: Rodd & Buttles



Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	754	43	587	305
Future Volume (vph)	754	43	587	305
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	47.0	47.0	47.0	33.0
Total Split (%)	58.8%	58.8%	58.8%	41.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	56.1	56.1	56.1	12.9
Actuated g/C Ratio	0.70	0.70	0.70	0.16
v/c Ratio	0.35	0.11	0.26	0.51
Control Delay	0.9	1.1	0.8	28.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.9	1.1	0.8	28.8
LOS	A	A	A	C
Approach Delay	0.9		0.8	28.8
Approach LOS	A		A	C

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 75 (94%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 51.7%	ICU Level of Service A
Analysis Period (min) 15	

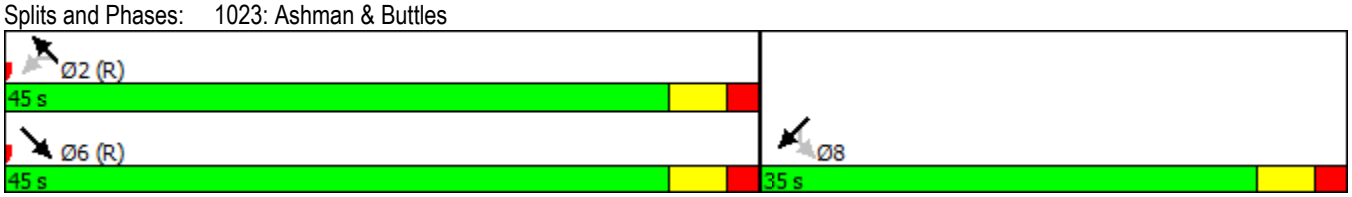
Splits and Phases: 1022: Ashman & Indian



Lane Group	SET	NWL	NWT	SWL	SWT
Lane Configurations					
Traffic Volume (vph)	323	19	252	12	345
Future Volume (vph)	323	19	252	12	345
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	6		2		8
Permitted Phases		2		8	
Detector Phase	6	2	2	8	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5
Total Split (s)	45.0	45.0	45.0	35.0	35.0
Total Split (%)	56.3%	56.3%	56.3%	43.8%	43.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	54.1	54.1	54.1	14.9	14.9
Actuated g/C Ratio	0.68	0.68	0.68	0.19	0.19
v/c Ratio	0.29	0.03	0.22	0.04	0.61
Control Delay	5.9	2.7	2.5	9.0	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	2.7	2.5	9.0	13.3
LOS	A	A	A	A	B
Approach Delay	5.9		2.5		13.2
Approach LOS	A		A		B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 50.4%	ICU Level of Service A
Analysis Period (min) 15	

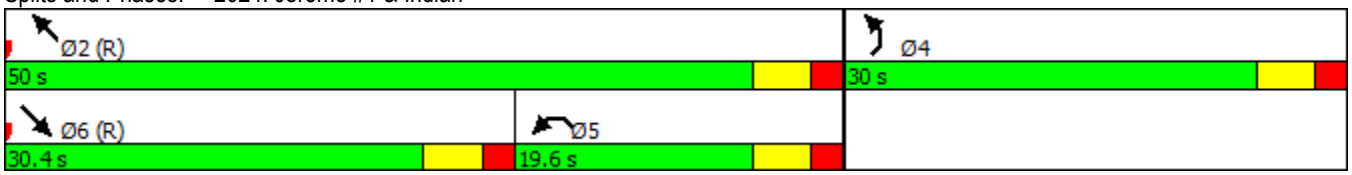
Splits and Phases: 1023: Ashman & Buttles



Lane Group	SET	NWL	NWT	NEL
Lane Configurations				
Traffic Volume (vph)	445	330	313	300
Future Volume (vph)	445	330	313	300
Turn Type	NA	Prot	NA	Prot
Protected Phases	6	5	2	4
Permitted Phases				
Detector Phase	6	5	2	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	10.0	10.0
Minimum Split (s)	29.5	12.5	29.5	30.0
Total Split (s)	30.4	19.6	50.0	30.0
Total Split (%)	38.0%	24.5%	62.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	34.4	14.1	54.0	15.0
Actuated g/C Ratio	0.43	0.18	0.68	0.19
v/c Ratio	0.33	0.59	0.27	0.77
Control Delay	16.8	37.1	10.1	9.7
Queue Delay	0.0	0.0	0.0	0.5
Total Delay	16.8	37.1	10.1	10.2
LOS	B	D	B	B
Approach Delay	16.8		24.0	10.2
Approach LOS	B		C	B

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 72 (90%), Referenced to phase 2:NWT and 6:SET, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 17.0	Intersection LOS: B
Intersection Capacity Utilization 55.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2024: Jerome #1 & Indian

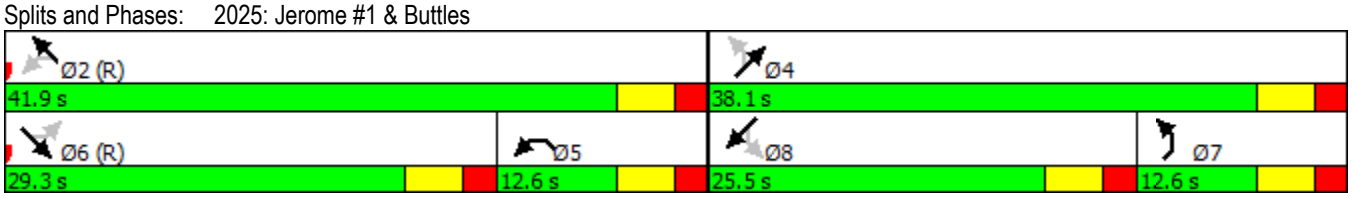


Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Configurations								
Traffic Volume (vph)	6	191	142	134	128	636	3	345
Future Volume (vph)	6	191	142	134	128	636	3	345
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases		6	5	2	7	4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	5	2	7	4	8	8
Switch Phase								
Minimum Initial (s)	10.0	10.0	7.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	27.5	27.5	12.5	27.5	12.5	25.5	25.5	25.5
Total Split (s)	29.3	29.3	12.6	41.9	12.6	38.1	25.5	25.5
Total Split (%)	36.6%	36.6%	15.8%	52.4%	15.8%	47.6%	31.9%	31.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead	Lag		Lag		Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	C-Max	C-Max	Max	C-Max	None	Max	Max	Max
Act Effct Green (s)	23.8	23.8	36.4	36.4	32.6	32.6	20.0	20.0
Actuated g/C Ratio	0.30	0.30	0.46	0.46	0.41	0.41	0.25	0.25
v/c Ratio	0.02	0.52	0.32	0.17	0.32	0.60	0.03	0.44
Control Delay	20.2	25.4	18.2	15.1	19.5	19.7	2.0	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	20.2	25.4	18.2	15.1	19.5	19.8	2.0	4.1
LOS	C	C	B	B	B	B	A	A
Approach Delay		25.3		16.7		19.7		4.1
Approach LOS		C		B		B		A

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 67 (84%), Referenced to phase 2:NWTL and 6:SETL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 17.1 Intersection LOS: B
Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15

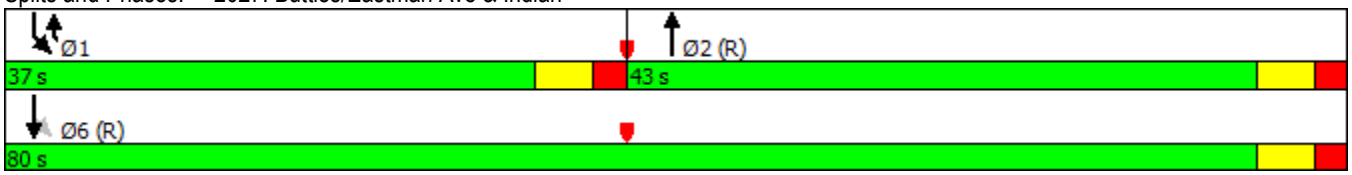
Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	NBT	SBL	SBT	NWR
Lane Configurations				
Traffic Volume (vph)	262	463	270	613
Future Volume (vph)	262	463	270	613
Turn Type	NA	pm+pt	NA	Over
Protected Phases	2	1	6	1
Permitted Phases		6		1
Detector Phase	2	1	6	1
Switch Phase				
Minimum Initial (s)	10.0	7.0	10.0	7.0
Minimum Split (s)	29.5	12.5	29.5	12.5
Total Split (s)	43.0	37.0	80.0	37.0
Total Split (%)	53.8%	46.3%	100.0%	46.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	57.6	74.5	80.0	11.4
Actuated g/C Ratio	0.72	0.93	1.00	0.14
v/c Ratio	0.21	0.25	0.16	0.58
Control Delay	3.3	0.5	0.2	4.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.3	0.5	0.2	4.1
LOS	A	A	A	A
Approach Delay	3.3		0.4	
Approach LOS	A		A	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 22 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 2.3	Intersection LOS: A
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2027: Buttles/Eastman Ave & Indian



Arterial Level of Service: EB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9012	1.6	20.2	0.2	40
	9010	0.9	15.5	0.2	42
Carpenter	9008	1.2	15.6	0.2	41
Jefferson	1006	4.8	12.0	0.1	28
Bayliss	1004	4.0	24.0	0.3	38
Washington	1001	88.6	111.7	0.2	8
Total		101.1	199.0	1.2	21

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	7.3	22.6	0.2	31
Bayliss	1004	6.5	26.2	0.2	34
Jefferson	1006	8.9	29.0	0.3	31
Carpenter	9008	2.4	9.9	0.1	33
	9010	0.6	14.8	0.2	43
	9012	0.5	15.0	0.2	44
George	1014	7.8	25.8	0.2	31
Total		34.0	143.3	1.4	34

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	2.2	20.7	0.2	39
	9011	1.2	22.4	0.3	42
Carpenter	9009	1.6	15.9	0.2	40
Jefferson	1007	4.2	8.3	0.1	23
Bayliss	1005	4.7	24.9	0.3	36
	9003	1.5	12.1	0.1	39
Washington	1002	17.6	26.5	0.1	15
Total		33.0	130.9	1.2	33

Arterial Level of Service: WB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9003	-	-	0.1	-
Bayliss	1005	2.7	13.1	0.1	36
Jefferson	1007	6.7	26.9	0.3	34
Carpenter	9009	1.4	5.8	0.1	33
	9011	0.7	15.0	0.2	42
	9013	0.9	22.0	0.3	43
George	1015	7.2	24.9	0.2	33
Total		19.5	107.7	1.2	41

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	1017	7.4	13.1	0.1	15
Rodd	1020	2.8	14.9	0.1	30
Ashman	1022	5.0	17.0	0.1	23
Jerome #1	2024	9.7	27.5	0.2	23
Eastman Ave	2027	8.8	29.0	0.2	19
Total		33.7	101.4	0.6	22

Arterial Level of Service: SE Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Jerome #1	2024	-	-	0.2	-
Ashman	1022	3.6	21.8	0.2	29
Rodd	1020	3.1	15.0	0.1	26
Cronkright	1017	8.0	20.0	0.1	22
George	1014	2.6	8.6	0.1	22
Total		17.2	65.3	0.6	34

Arterial Level of Service: NW Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	1018	2.5	8.6	0.1	22
Rodd	1021	3.4	15.2	0.1	29
Ashman	1023	4.7	16.8	0.1	24
Jerome #1	2025	18.2	35.8	0.2	18
	9026	2.5	13.2	0.1	27
Indian	2027	12.4	19.7	0.1	15
Total		43.7	109.2	0.6	21

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	0.2	8.4	0.1	35
Jerome #1	2025	25.0	34.8	0.1	10
Ashman	1023	3.7	21.7	0.2	29
Rodd	1021	3.3	15.4	0.1	26
Cronkright	1018	2.3	14.1	0.1	31
George	1015	8.2	14.4	0.1	13
Total		42.8	108.9	0.6	21

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	3.4	16.8	0.2	33
St Andrews	2029	3.7	25.9	0.3	38
Sugnet	2030	5.1	53.6	0.6	41
Saginaw	2031	23.8	63.3	0.5	29
Dilloway	2032	9.7	50.5	0.5	38
Wackerly	2033	26.7	58.7	0.4	25
Eb On Ramp	9034	2.7	5.6	0.0	21
Wb On Ramp	9035	1.0	7.2	0.1	37
Wb Ramp	2036	3.6	9.1	0.1	27
Mall Off	9037	1.3	7.3	0.1	37
Mall Dr South	3038	2.7	7.2	0.1	29
North Mall Dr	9039	3.3	11.9	0.1	34
Joe Mann	3040	9.0	14.9	0.1	17
Total		96.0	332.1	3.0	32

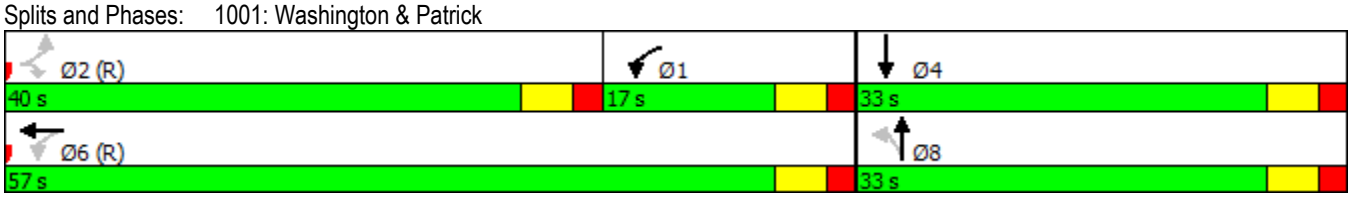
Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	12.2	27.5	0.2	26
	9039	3.1	9.2	0.1	28
Future Dr	3038	4.3	13.0	0.1	31
Saylor Dr	9037	2.1	6.9	0.1	31
Airport	2036	17.1	22.6	0.1	12
Wb On Ramp	9035	3.4	9.5	0.1	26
Eb On Ramp	9034	2.4	8.3	0.1	32
Wackerly	2033	12.4	14.9	0.0	8
Dilloway	2032	11.3	44.0	0.4	33
Saginaw	2031	23.1	64.3	0.5	30
Sugnet	2030	6.7	46.2	0.5	39
St Andrews	2029	4.9	53.8	0.6	41
Carpenter	9028	2.5	24.6	0.3	40
Indian	2027	0.7	13.4	0.2	42
Total		106.3	358.2	3.2	32

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	55	763	297	907	82	322	99
Future Volume (vph)	55	763	297	907	82	322	99
Turn Type	Perm	Perm	pm+pt	NA	Perm	NA	NA
Protected Phases			1	6		8	4
Permitted Phases	2	2	6		8		
Detector Phase	2	2	1	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0	7.0
Minimum Split (s)	30.9	30.9	12.5	30.9	29.7	29.7	29.7
Total Split (s)	40.0	40.0	17.0	57.0	33.0	33.0	33.0
Total Split (%)	44.4%	44.4%	18.9%	63.3%	36.7%	36.7%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5
Lead/Lag	Lead	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	43.1	43.1	60.1	60.1		18.9	18.9
Actuated g/C Ratio	0.48	0.48	0.67	0.67		0.21	0.21
v/c Ratio	0.30	0.47	0.27	0.45		0.70	0.23
Control Delay	20.3	5.0	7.5	8.3		61.2	17.9
Queue Delay	0.0	0.1	0.1	0.0		0.1	0.0
Total Delay	20.3	5.1	7.5	8.3		61.3	17.9
LOS	C	A	A	A		E	B
Approach Delay				8.1		61.3	17.9
Approach LOS				A		E	B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 81 (90%), Referenced to phase 2:EBL and 6:WBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 64.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1001: Washington & Patrick



Lane Group	EBT	NBL	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	312	96	339	776	41
Future Volume (vph)	312	96	339	776	41
Turn Type	NA	Perm	NA	Prot	NA
Protected Phases	2		8	7	4
Permitted Phases		8			
Detector Phase	2	8	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	32.2	29.5	29.5	12.5	29.5
Total Split (s)	32.5	29.5	29.5	28.0	57.5
Total Split (%)	36.1%	32.8%	32.8%	31.1%	63.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag		Lead	Lead	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	C-Max	None	None	None	None
Act Effct Green (s)	29.4	18.6	18.6	25.5	49.6
Actuated g/C Ratio	0.33	0.21	0.21	0.28	0.55
v/c Ratio	0.36	0.82	0.62	0.87	0.39
Control Delay	26.8	76.1	33.2	40.2	3.6
Queue Delay	0.0	0.0	0.0	7.3	0.2
Total Delay	26.8	76.1	33.2	47.5	3.7
LOS	C	E	C	D	A
Approach Delay	26.8		41.1		33.0
Approach LOS	C		D		C

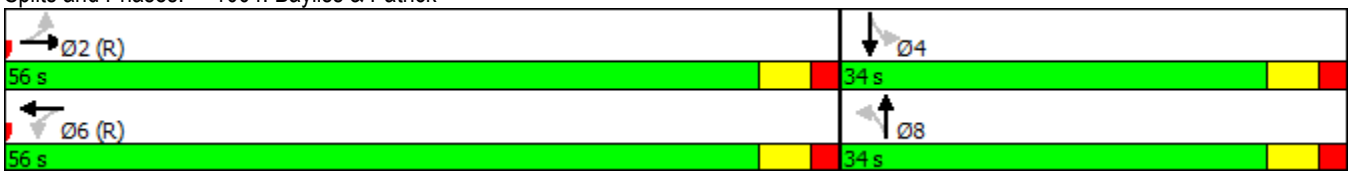
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 33 (37%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 33.9	Intersection LOS: C
Intersection Capacity Utilization 58.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1002: Washington & Lyon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	705	91	893	11	77	37	68
Future Volume (vph)	11	705	91	893	11	77	37	68
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	4.0	4.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5	29.5	26.0	26.0
Total Split (s)	56.0	56.0	56.0	56.0	34.0	34.0	34.0	34.0
Total Split (%)	62.2%	62.2%	62.2%	62.2%	37.8%	37.8%	37.8%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	65.7	65.7	65.7	65.7	13.3	13.3		13.3
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.15	0.15		0.15
v/c Ratio	0.03	0.30	0.21	0.41	0.08	0.55		0.74
Control Delay	1.2	3.2	3.5	2.8	13.7	10.8		51.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	1.2	3.2	3.5	2.8	13.7	10.9		51.8
LOS	A	A	A	A	B	B		D
Approach Delay		3.2		2.8		11.0		51.8
Approach LOS		A		A		B		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 8 (9%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1004: Bayliss & Patrick



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	5	283	39	375	10	135	37	119
Future Volume (vph)	5	283	39	375	10	135	37	119
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.7	29.7	13.0	13.0	13.0	13.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	64.2	64.2	64.2	64.2	14.8	14.8	14.8	14.8
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.16	0.16	0.16	0.16
v/c Ratio	0.01	0.24	0.06	0.33	0.06	0.67	0.30	0.49
Control Delay	5.8	6.3	2.8	3.5	29.6	41.2	37.2	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	5.8	6.3	2.8	3.5	29.6	41.2	37.2	37.1
LOS	A	A	A	A	C	D	D	D
Approach Delay		6.3		3.5		40.6		37.1
Approach LOS		A		A		D		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1005: Bayliss & Lyon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	12	692	10	881	31	58	37	116
Future Volume (vph)	12	692	10	881	31	58	37	116
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7
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%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	64.3	64.3	64.3	64.3	14.7	14.7		14.7
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.16	0.16		0.16
v/c Ratio	0.04	0.30	0.02	0.40	0.22	0.22		0.65
Control Delay	4.8	3.9	2.1	4.1	26.6	25.0		44.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	4.8	3.9	2.1	4.1	26.6	25.0		44.9
LOS	A	A	A	A	C	C		D
Approach Delay		4.0		4.0		25.5		44.9
Approach LOS		A		A		C		D

Intersection Summary

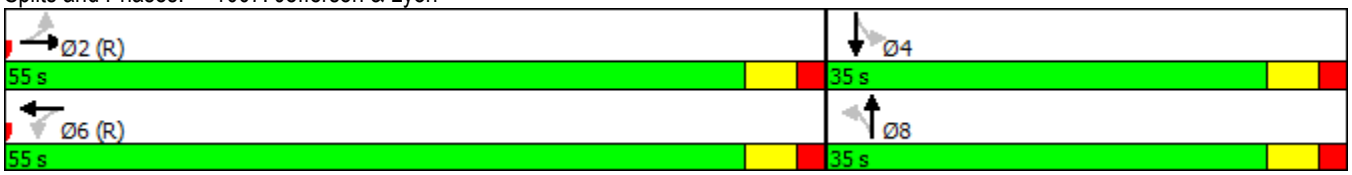
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 37 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 8.6 Intersection LOS: A
Intersection Capacity Utilization 50.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1006: Jefferson & Patrick

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	5	278	4	378	22	65	16	113
Future Volume (vph)	5	278	4	378	22	65	16	113
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.7	29.7	29.7	29.7
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%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5		5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	66.6	66.6	66.6	66.6		12.4	12.4	12.4
Actuated g/C Ratio	0.74	0.74	0.74	0.74		0.14	0.14	0.14
v/c Ratio	0.01	0.22	0.01	0.32		0.43	0.09	0.51
Control Delay	6.2	4.7	3.8	7.6		39.3	9.5	14.9
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	6.2	4.7	3.8	7.6		39.3	9.5	14.9
LOS	A	A	A	A		D	A	B
Approach Delay		4.7		7.6		39.3		14.3
Approach LOS		A		A		D		B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 42 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 41.8%	ICU Level of Service A
Analysis Period (min) 15	

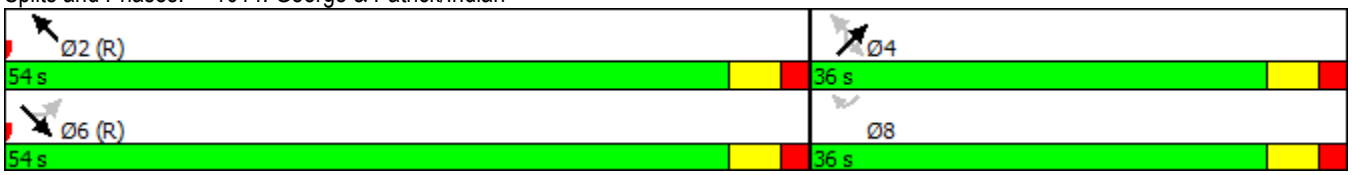
Splits and Phases: 1007: Jefferson & Lyon



Lane Group	SEL	SET	NWT	NEL	NET	NER	SWR
Lane Configurations							
Traffic Volume (vph)	10	610	967	173	30	105	20
Future Volume (vph)	10	610	967	173	30	105	20
Turn Type	Perm	NA	NA	Perm	NA	Perm	Perm
Protected Phases		6	2		4		
Permitted Phases	6			4		4	8
Detector Phase	6	6	2	4	4	4	8
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.9	29.9	29.9	29.9
Total Split (s)	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	64.0	64.0	64.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.71	0.71	0.71	0.17	0.17	0.17	0.17
v/c Ratio	0.03	0.26	0.42	0.64	0.11	0.32	0.07
Control Delay	0.3	0.4	2.4	12.3	2.0	2.3	0.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	0.3	0.5	2.4	12.3	2.0	2.3	0.3
LOS	A	A	A	B	A	A	A
Approach Delay		0.5	2.4		7.9		
Approach LOS		A	A		A		

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 2 (2%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 2.6	Intersection LOS: A
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

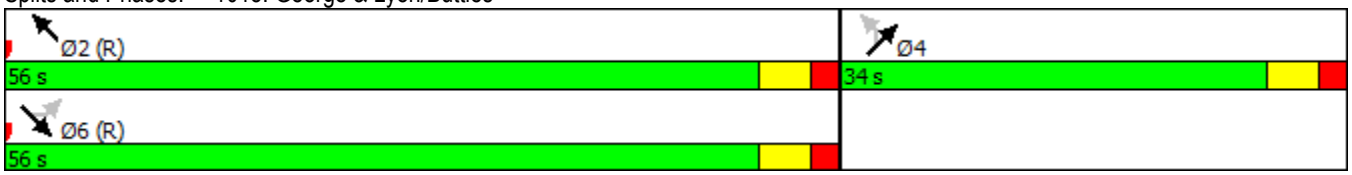
Splits and Phases: 1014: George & Patrick/Indian



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	8	270	414	299
Future Volume (vph)	8	270	414	299
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	56.0	56.0	56.0	34.0
Total Split (%)	62.2%	62.2%	62.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	65.0	65.0	65.0	14.0
Actuated g/C Ratio	0.72	0.72	0.72	0.16
v/c Ratio	0.01	0.22	0.34	0.54
Control Delay	7.1	7.9	2.2	32.9
Queue Delay	0.0	0.5	0.0	0.0
Total Delay	7.1	8.4	2.2	32.9
LOS	A	A	A	C
Approach Delay		8.3	2.2	32.9
Approach LOS		A	A	C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 85 (94%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 51.6%	ICU Level of Service A
Analysis Period (min) 15	

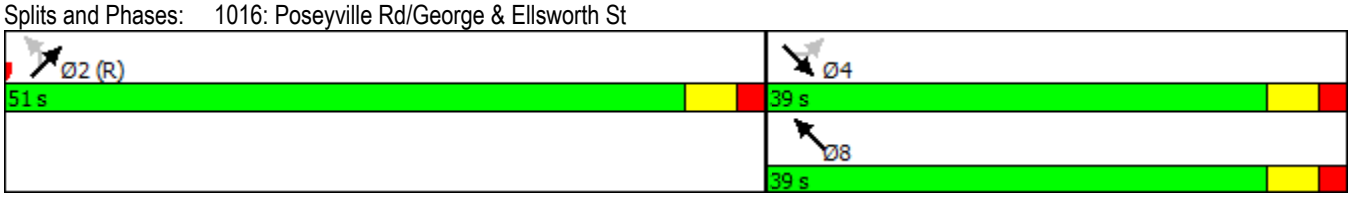
Splits and Phases: 1015: George & Lyon/Buttles



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	23	27	69	344
Future Volume (vph)	23	27	69	344
Turn Type	Perm	NA	NA	NA
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	39.0	39.0	39.0	51.0
Total Split (%)	43.3%	43.3%	43.3%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	C-Max
Act Effct Green (s)		10.5	10.5	72.1
Actuated g/C Ratio		0.12	0.12	0.80
v/c Ratio		0.31	0.24	0.12
Control Delay		29.9	26.6	3.1
Queue Delay		0.0	0.0	0.0
Total Delay		29.9	26.6	3.1
LOS		C	C	A
Approach Delay		29.9	26.6	3.1
Approach LOS		C	C	A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 68 (76%), Referenced to phase 2:NETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 27.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1016: Poseyville Rd/George & Ellsworth St



Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	620	188	965	216
Future Volume (vph)	620	188	965	216
Turn Type	NA	pm+pt	NA	NA
Protected Phases	6	5	2	8
Permitted Phases		2		
Detector Phase	6	5	2	8
Switch Phase				
Minimum Initial (s)	10.0	5.0	10.0	7.0
Minimum Split (s)	29.5	12.5	29.5	29.5
Total Split (s)	37.0	21.0	58.0	32.0
Total Split (%)	41.1%	23.3%	64.4%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	43.6	59.0	59.0	20.0
Actuated g/C Ratio	0.48	0.66	0.66	0.22
v/c Ratio	0.50	0.47	0.46	0.76
Control Delay	20.5	10.8	4.1	42.4
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	20.5	10.8	4.2	42.4
LOS	C	B	A	D
Approach Delay	20.5		5.3	42.4
Approach LOS	C		A	D

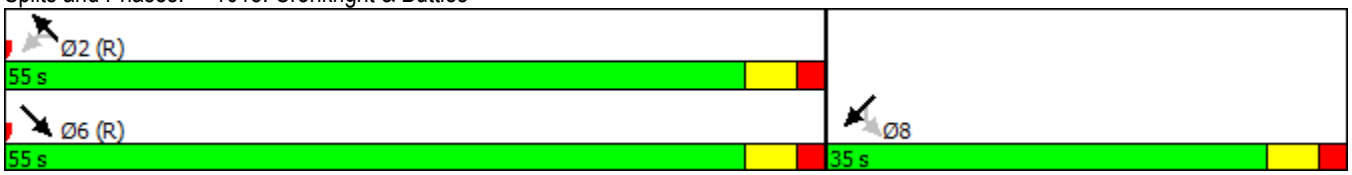
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 8 (9%), Referenced to phase 2:NWTL and 6:SETL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1017: Cronkright & Indian

Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	266	80	414	508
Future Volume (vph)	266	80	414	508
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.8
Total Split (s)	55.0	55.0	55.0	35.0
Total Split (%)	61.1%	61.1%	61.1%	38.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	62.0	62.0	62.0	17.0
Actuated g/C Ratio	0.69	0.69	0.69	0.19
v/c Ratio	0.28	0.13	0.35	0.62
Control Delay	3.0	3.6	5.7	35.7
Queue Delay	0.0	0.0	0.7	0.0
Total Delay	3.0	3.6	6.4	35.7
LOS	A	A	A	D
Approach Delay	3.0		5.9	35.7
Approach LOS	A		A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 13 (14%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 51.6%	ICU Level of Service A
Analysis Period (min) 15	

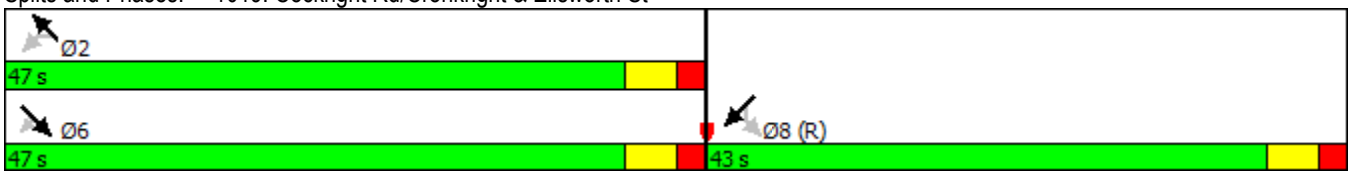
Splits and Phases: 1018: Cronkright & Buttles



Lane Group	SET	SER	NWL	NWT	SWT
Lane Configurations					
Traffic Volume (vph)	34	254	85	58	611
Future Volume (vph)	34	254	85	58	611
Turn Type	NA	Perm	Perm	NA	NA
Protected Phases	6			2	8
Permitted Phases		6	2		
Detector Phase	6	6	2	2	8
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	29.7	29.7	29.5	29.5	29.7
Total Split (s)	47.0	47.0	47.0	47.0	43.0
Total Split (%)	52.2%	52.2%	52.2%	52.2%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	None	None	C-Max
Act Effct Green (s)	41.5	41.5	41.5	41.5	37.5
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.42
v/c Ratio	0.04	0.34	0.15	0.07	0.34
Control Delay	13.6	9.1	9.4	8.6	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	9.1	9.4	8.6	4.2
LOS	B	A	A	A	A
Approach Delay	9.6			9.0	4.2
Approach LOS	A			A	A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 73 (81%), Referenced to phase 8:SWTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.34	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 48.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1019: Cockright Rd/Cronkright & Ellsworth St



Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	117	726	997	139
Future Volume (vph)	117	726	997	139
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	60.5	60.5	60.5	29.5
Total Split (%)	67.2%	67.2%	67.2%	32.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	68.3	68.3	68.3	10.7
Actuated g/C Ratio	0.76	0.76	0.76	0.12
v/c Ratio	0.39	0.29	0.42	0.36
Control Delay	7.2	2.3	1.2	11.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.2	2.3	1.2	11.1
LOS	A	A	A	B
Approach Delay		3.0	1.2	11.1
Approach LOS		A	A	B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 86 (96%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 2.9	Intersection LOS: A
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1020: Rodd & Indian

Lane Group	SEL	SET	NWT	NET
Lane Configurations				
Traffic Volume (vph)	50	311	427	136
Future Volume (vph)	50	311	427	136
Turn Type	Perm	NA	NA	NA
Protected Phases		6	2	4
Permitted Phases	6			
Detector Phase	6	6	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	58.0	58.0	58.0	32.0
Total Split (%)	64.4%	64.4%	64.4%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	68.5	68.5	68.5	10.5
Actuated g/C Ratio	0.76	0.76	0.76	0.12
v/c Ratio	0.08	0.24	0.34	0.30
Control Delay	3.2	3.1	2.7	32.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.2	3.1	2.7	32.3
LOS	A	A	A	C
Approach Delay		3.1	2.7	32.3
Approach LOS		A	A	C

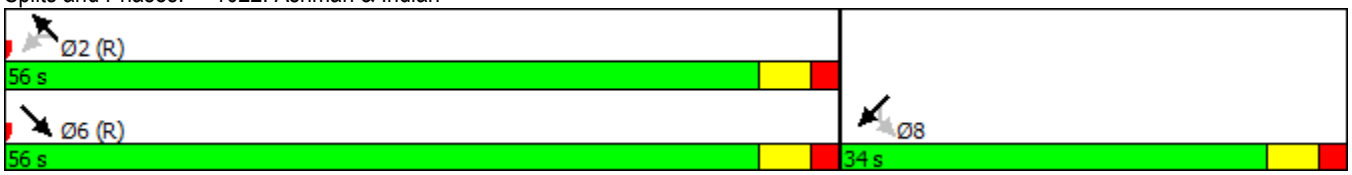
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 87 (97%), Referenced to phase 2:NWT and 6:SETL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.34	
Intersection Signal Delay: 7.9	Intersection LOS: A
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1021: Rodd & Buttles

Lane Group	SET	NWL	NWT	SWT
Lane Configurations				
Traffic Volume (vph)	795	51	970	350
Future Volume (vph)	795	51	970	350
Turn Type	NA	Perm	NA	NA
Protected Phases	6		2	8
Permitted Phases		2		
Detector Phase	6	2	2	8
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5
Total Split (s)	56.0	56.0	56.0	34.0
Total Split (%)	62.2%	62.2%	62.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	C-Max	None
Act Effct Green (s)	63.3	63.3	63.3	15.7
Actuated g/C Ratio	0.70	0.70	0.70	0.17
v/c Ratio	0.36	0.14	0.42	0.63
Control Delay	1.0	3.1	2.8	31.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.0	3.1	2.8	31.6
LOS	A	A	A	C
Approach Delay	1.0		2.8	31.6
Approach LOS	A		A	C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 1 (1%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

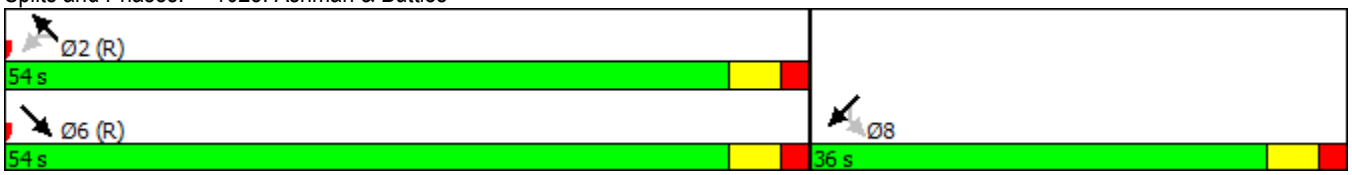
Splits and Phases: 1022: Ashman & Indian



Lane Group	SET	NWL	NWT	SWL	SWT
Lane Configurations					
Traffic Volume (vph)	341	21	416	20	357
Future Volume (vph)	341	21	416	20	357
Turn Type	NA	Perm	NA	Perm	NA
Protected Phases	6		2		8
Permitted Phases		2		8	
Detector Phase	6	2	2	8	8
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	29.5	29.5	29.5	29.5	29.5
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%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	61.7	61.7	61.7	17.3	17.3
Actuated g/C Ratio	0.69	0.69	0.69	0.19	0.19
v/c Ratio	0.31	0.04	0.35	0.06	0.66
Control Delay	7.5	2.0	3.0	10.8	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	2.0	3.0	10.8	15.5
LOS	A	A	A	B	B
Approach Delay	7.5		2.9		15.3
Approach LOS	A		A		B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 7 (8%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1023: Ashman & Buttles



Lane Group	SET	NWL	NWT	NEL
Lane Configurations				
Traffic Volume (vph)	463	714	393	333
Future Volume (vph)	463	714	393	333
Turn Type	NA	Prot	NA	Prot
Protected Phases	6	5	2	4
Permitted Phases				
Detector Phase	6	5	2	4
Switch Phase				
Minimum Initial (s)	10.0	7.0	10.0	10.0
Minimum Split (s)	29.5	12.5	29.5	30.0
Total Split (s)	30.0	30.0	60.0	30.0
Total Split (%)	33.3%	33.3%	66.7%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	29.8	24.5	59.8	19.2
Actuated g/C Ratio	0.33	0.27	0.66	0.21
v/c Ratio	0.49	0.83	0.34	0.82
Control Delay	26.2	31.8	4.1	29.8
Queue Delay	0.0	1.1	0.0	2.4
Total Delay	26.2	32.9	4.1	32.2
LOS	C	C	A	C
Approach Delay	26.2		22.7	32.2
Approach LOS	C		C	C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 8 (9%), Referenced to phase 2:NWT and 6:SET, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

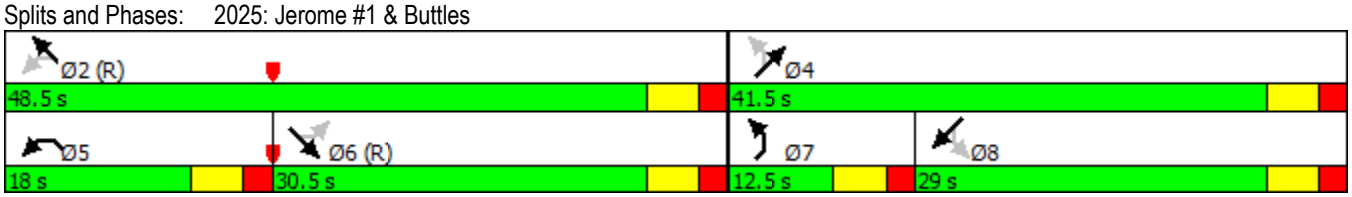
Splits and Phases: 2024: Jerome #1 & Indian

Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Configurations								
Traffic Volume (vph)	13	198	306	169	143	687	6	768
Future Volume (vph)	13	198	306	169	143	687	6	768
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases		6	5	2	7	4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	5	2	7	4	8	8
Switch Phase								
Minimum Initial (s)	10.0	10.0	7.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	27.5	27.5	12.5	27.5	12.5	25.5	25.5	25.5
Total Split (s)	30.5	30.5	18.0	48.5	12.5	41.5	29.0	29.0
Total Split (%)	33.9%	33.9%	20.0%	53.9%	13.9%	46.1%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	C-Max	C-Max	Max	C-Max	None	Max	Max	Max
Act Effct Green (s)	25.0	25.0	43.0	43.0	36.0	36.0	23.5	23.5
Actuated g/C Ratio	0.28	0.28	0.48	0.48	0.40	0.40	0.26	0.26
v/c Ratio	0.04	0.79	0.90	0.21	0.70	0.66	0.05	0.90
Control Delay	24.3	39.0	53.3	15.2	37.4	23.8	6.5	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.6
Total Delay	24.3	39.0	53.3	15.2	37.4	24.2	6.5	16.4
LOS	C	D	D	B	D	C	A	B
Approach Delay		38.5		39.8		26.1		16.4
Approach LOS		D		D		C		B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 89 (99%), Referenced to phase 2:NWTL and 6:SETL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 27.5 Intersection LOS: C
Intersection Capacity Utilization 88.9% ICU Level of Service E
Analysis Period (min) 15

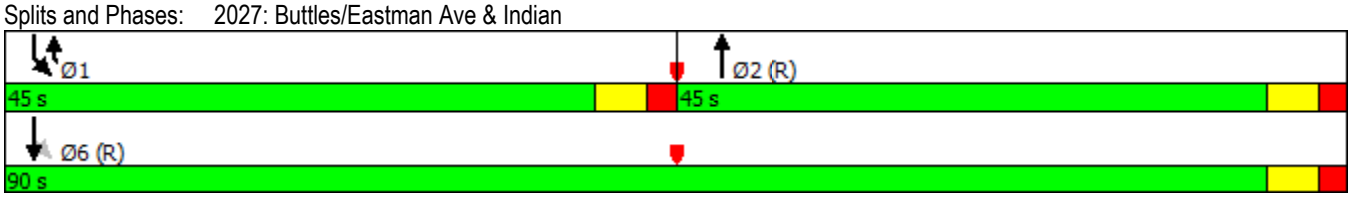
Splits and Phases: 2025: Jerome #1 & Buttles



Lane Group	NBT	SBL	SBT	NWR
Lane Configurations				
Traffic Volume (vph)	312	523	388	726
Future Volume (vph)	312	523	388	726
Turn Type	NA	pm+pt	NA	Over
Protected Phases	2	1	6	1
Permitted Phases		6		1
Detector Phase	2	1	6	1
Switch Phase				
Minimum Initial (s)	10.0	7.0	10.0	7.0
Minimum Split (s)	29.5	12.5	29.5	12.5
Total Split (s)	45.0	45.0	90.0	45.0
Total Split (%)	50.0%	50.0%	100.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5
Lead/Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes	Yes		Yes
Recall Mode	C-Max	None	C-Max	None
Act Effct Green (s)	61.2	84.5	90.0	17.8
Actuated g/C Ratio	0.68	0.94	1.00	0.20
v/c Ratio	0.27	0.28	0.23	0.71
Control Delay	3.8	0.6	0.3	9.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.8	0.6	0.3	9.1
LOS	A	A	A	A
Approach Delay	3.8		0.4	
Approach LOS	A		A	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 60 (67%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 51.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2027: Buttles/Eastman Ave & Indian



Arterial Level of Service: EB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9012	1.2	20.0	0.2	41
	9010	0.7	15.3	0.2	43
Carpenter	9008	1.0	15.3	0.2	42
Jefferson	1006	4.2	11.4	0.1	29
Bayliss	1004	10.4	30.5	0.3	30
Washington	1001	52.5	75.3	0.2	12
Total		70.0	167.9	1.2	25

Arterial Level of Service: WB Patrick

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Washington	1001	10.1	25.6	0.2	28
Bayliss	1004	10.4	30.2	0.2	29
Jefferson	1006	4.9	24.9	0.3	36
Carpenter	9008	1.3	8.7	0.1	38
	9010	0.9	15.2	0.2	42
	9012	0.9	15.5	0.2	42
George	1014	5.2	23.2	0.2	35
Total		33.7	143.2	1.4	34

Arterial Level of Service: EB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9013	2.3	20.8	0.2	39
	9011	1.1	22.3	0.3	43
Carpenter	9009	1.1	15.3	0.2	42
Jefferson	1007	3.6	7.8	0.1	25
Bayliss	1005	9.6	29.8	0.3	31
Washington	1002	18.1	37.6	0.2	23
Total		35.8	133.6	1.2	33

Arterial Level of Service: WB Lyon

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Bayliss	1005	4.6	7.8	0.2	117
Jefferson	1007	7.8	28.2	0.3	32
Carpenter	9009	2.1	6.5	0.1	30
	9011	1.1	15.2	0.2	42
	9013	1.4	22.5	0.3	42
George	1015	3.9	21.7	0.2	37
Total		20.9	101.9	1.2	43

Arterial Level of Service: NW Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	1017	6.9	12.6	0.1	15
Rodd	1020	3.5	15.7	0.1	28
Ashman	1022	6.7	18.7	0.1	21
Jerome #1	2024	5.7	23.6	0.2	27
Eastman Ave	2027	5.7	25.4	0.2	22
Total		28.5	96.0	0.6	23

Arterial Level of Service: SE Indian

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Jerome #1	2024	-	-	0.2	-
Ashman	1022	4.5	22.9	0.2	28
Rodd	1020	4.4	16.4	0.1	24
Cronkright	1017	15.9	27.8	0.1	16
George	1014	2.7	8.7	0.1	22
Total		27.5	75.9	0.6	29

Arterial Level of Service: NW Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cronkright	1018	3.1	9.2	0.1	21
Rodd	1021	5.1	16.9	0.1	26
Ashman	1023	7.2	19.4	0.1	21
Jerome #1	2025	19.3	36.6	0.2	17
	9026	2.3	13.0	0.1	27
Indian	2027	10.0	17.3	0.1	17
Total		47.0	112.5	0.6	21

Arterial Level of Service: SE Buttles

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	9026	1.3	9.4	0.1	31
Jerome #1	2025	52.7	62.4	0.1	6
Ashman	1023	3.6	21.8	0.2	29
Rodd	1021	4.3	16.5	0.1	25
Cronkright	1018	4.5	16.4	0.1	27
George	1015	9.1	15.2	0.1	13
Total		75.4	141.7	0.6	16

Arterial Level of Service: NB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Carpenter	9028	2.7	16.0	0.2	35
St Andrews	2029	6.4	28.6	0.3	35
Sugnet	2030	7.8	56.2	0.6	39
Saginaw	2031	27.7	67.0	0.5	27
Dilloway	2032	10.8	51.1	0.5	38
Wackerly	2033	32.6	64.5	0.4	23
Eb On Ramp	9034	3.4	6.3	0.0	19
Wb On Ramp	9035	1.8	8.0	0.1	34
Wb Ramp	2036	8.3	13.9	0.1	18
Mall Off	9037	2.9	8.9	0.1	30
Mall Dr South	3038	7.8	12.3	0.1	17
North Mall Dr	9039	7.3	16.0	0.1	25
Joe Mann	3040	6.8	12.7	0.1	20
Total		126.3	361.5	3.0	30

Arterial Level of Service: SB Eastman Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Joe Mann	3040	11.2	26.5	0.2	27
	9039	2.8	8.9	0.1	29
Future Dr	3038	10.1	18.8	0.1	21
Saylor Dr	9037	3.4	8.2	0.1	26
Airport	2036	22.2	27.7	0.1	10
Wb On Ramp	9035	4.5	10.7	0.1	23
Eb On Ramp	9034	2.8	8.7	0.1	31
Wackerly	2033	15.5	18.1	0.0	7
Dilloway	2032	9.5	42.1	0.4	35
Saginaw	2031	34.7	75.9	0.5	25
Sugnet	2030	9.3	48.5	0.5	37
St Andrews	2029	7.2	56.2	0.6	39
Carpenter	9028	3.0	25.2	0.3	39
Indian	2027	1.0	13.6	0.2	41
Total		137.2	389.1	3.2	29

Appendix G
Cost Estimates

MDOT US-10 BR Corridor Study

Planning Level Opinion of Cost - August 4, 2016

Alternative 1 - Segment 1 (Washington to W Hines) - Short Term

Pavement Markings, Signing, Curb (Barrier), and Signal Improvements Only

DETAIL ITEM		QTY	UNIT	PRICE	COST
4" Curb (Barrier)		15,858	FT	$25.00	$396,450.00
Pavement Markings		35,681	FT	$1.50	$53,520.75
DETAILED ITEM TOTAL					**$449,970.75**
Signal Removal		1	LS	$10,000.00	$10,000.00
Signal, Move Head		13	LS	$5,000.00	$65,000.00
Signal Modernization		1	LS	$100,000.00	$100,000.00
Signage		1	LS	$30,000.00	$30,000.00
SESC	2%	1	LS	$8,999.42	$8,999.42
Mobilization	10%	1	LS	$75,397.02	$75,397.02
MOT	20%	1	LS	$90,000.00	$90,000.00
Contingency	30%	1	LS	$248,810.15	$248,810.15
TOTAL					**$1,078,200.00**

These construction cost opinions are intended to be used only for planning purposes and are not based on actual engineering design, since such design work has not yet been undertaken.
The cost opinion includes numerous assumptions that underlie these estimates. These assumptions include the following:

-Drainage along 4" Curb (Barrier) to outlet through notches to existing catchbasins along the existing outer curbline
-All costs for restoration included in cost for "Signal Modernization, 4 Leg"
-Signage does not include full upgrade of the corridor, only minimum changes required to accommodate conversion of travel lane to bicycle facility
-No specialized drainage features (detention ponds, etc.) required
-No specialized geotechnical design needed/No soil issues present
-Utility relocations (if any) to be completed by others at no cost to project
-Includes basic turf restoration, not decorative landscaping
-ROW acquisition not anticipated
-Design and Construction Engineering cost not included
-Construction costs include a basic maintenance of traffic scheme
-No retaining walls or other structural elements included
-No pavement treatments included
-Does not include specialized pavement markings for bicycle facility

MDOT US-10 BR Corridor Study

Planning Level Opinion of Cost - August 4, 2016

Alternative 1 - Segment 1 (Washington to W Hines) - Short Term

Pavement Markings, Signing, , and Signal Improvements Only (No Barrier)

DETAIL ITEM		QTY	UNIT	PRICE	COST
Corridor Length		15,858	FT		
Pavement Markings		35,681	FT	$1.50	$53,520.75
DETAILED ITEM TOTAL					**$53,520.75**
Signal Removal		1	LS	$10,000.00	$10,000.00
Signal, Move Head		13	LS	$5,000.00	$65,000.00
Signal Modernization		1	LS	$100,000.00	$100,000.00
Signage		1	LS	$30,000.00	$30,000.00
SESC	2%	1	LS	$1,070.42	$1,070.42
Mobilization	10%	1	LS	$27,059.12	$27,059.12
MOT	20%	1	LS	$11,000.00	$11,000.00
Contingency	30%	1	LS	$89,295.08	$89,295.08
TOTAL					**$386,950.00**

These construction cost opinions are intended to be used only for planning purposes and are not based on actual engineering design, since such design work has not yet been undertaken.
The cost opinion includes numerous assumptions that underlie these estimates. These assumptions include the following:

-Drainage along 4" Curb (Barrier) to outlet through notches to existing catchbasins along the existing outer curbline
-All costs for restoration included in cost for "Signal Modernization, 4 Leg"
-Signage does not include full upgrade of the corridor, only minimum changes required to accommodate conversion of travel lane to bicycle facility
-No specialized drainage features (detention ponds, etc.) required
-No specialized geotechnical design needed/No soil issues present
-Utility relocations (if any) to be completed by others at no cost to project
-Includes basic turf restoration, not decorative landscaping
-ROW acquisition not anticipated
-Design and Construction Engineering cost not included
-Construction costs include a basic maintenance of traffic scheme
-No retaining walls or other structural elements included
-No pavement treatments included
-Does not include specialized pavement markings for bicycle facility

MDOT US-10 BR Corridor Study

Planning Level Opinion of Cost - August 4, 2016

Alternative 1 - Segment 1 (Washington to W Hines) - Long- Term

HMA Composite Pavement Resurfacing, Concrete Pavement Repairs, Sidewalk, Sidewalk Curb, Pavement Markings, Signing, and Signal Work

DETAIL ITEM		QTY	UNIT	PRICE	COST
Station Grading		1,850	Ft	$30.00	$55,500.00
HMA Composite Pavt Repair		453,026	Sft	$1.67	$758,577.23
HMA	Depth= 3''	453,026	Sft	$1.47	$664,438.13
Conc Pavt Repair		61,254	Sft	$10.00	$612,543.75
4" Curb (Barrier)		15,858	Ft	$25.00	$396,450.00
Sidewalk, Conc, 4 inch		9,250	Sft	$5.00	$46,250.00
Pavement Markings		75,200	Ft	$1.50	$112,800.00
Restoration		37,000	Sft	$0.56	$20,720.00
DETAILED ITEM TOTAL					**$2,667,279.11**
Signal Removal		1	LS	$10,000.00	$10,000.00
Signal, Move Head		13	LS	$5,000.00	$65,000.00
Signal Modernization, 4 Leg		1	LS	$100,000.00	$100,000.00
Signage		1	LS	$60,000.00	$60,000.00
SESC	2%	1	LS	$53,345.58	$53,345.58
Mobilization	10%	1	LS	$322,262.47	$322,262.47
MOT	10%	1	LS	$267,000.00	$267,000.00
Contingency	30%	1	LS	$1,063,466.15	$1,063,466.15
TOTAL					**$4,608,400.00**

These construction cost opinions are intended to be used only for planning purposes and are not based on actual engineering design, since such design work has not yet been undertaken.

The cost opinion includes numerous assumptions that underlie these estimates. These assumptions include the following:

-Drainage along 4" Curb (Barrier) to outlet through notches to existing catchbasins along the existing outer curbline
-All costs for restoration included in cost for "Signal Modernization, 4 Leg"
-Station Grading includes all required excavation, embankment, removal of miscellaneous features (posts, stumps, landscaping, small trees, etc.), and manipulation of earthwork measured along each roadway alignment
- HMA Composite Pavt Repair includes Cold Milling, Det 7/8 Repairs
- Conc Pavt Repair includes joint repairs and concrete patching
- 4" Curb (Barrier) includes sawcutting and removal of existing pavement and placing a 4" concrete curb
-Signage does not include full upgrade of the corridor, only minimum changes required to accommodate conversion of travel lane to bicycle facility
-Assumes profiles/grades are such that tie-ins for all legs can be accomplished within horizontal limits shown on concept drawing
-No specialized drainage features (detention ponds, etc.) required
-No specialized geotechnical design needed/No soil issues present
-Utility relocations (if any) to be completed by others at no cost to project
-Includes basic turf restoration, not decorative landscaping
-ROW acquisition not anticipated
-Design and Construction Engineering cost not included
-Construction costs include a basic maintenance of traffic scheme
-No retaining walls or other structural elements included
-Does not include specialized pavement markings for bicycle facility

MDOT US-10 BR Corridor Study

Planning Level Opinion of Cost - August 4, 2016

Alternative 2 - Segment 1 (Washington to W Hines)

Full Reconstruction and Widening to 5-Lanes with Concrete

ITEM		QTY	UNIT	PRICE	COST
Pavement Removal		978,491	Sft	$0.78	$761,048.56
Station Grading		33,395	Ft	$30.00	$1,001,850.00
Curb and Gutter, Conc		48,118	Ft	$25.00	$1,202,950.00
Subbase (12")		1,991,900	Sft	$0.56	$1,106,611.11
Open-Graded Drainage Course (6")		1,876,400	Sft	$1.11	$2,084,888.89
Conc, Pavt, Nonreinf, 9 inch		1,443,312	Sft	$6.70	$9,670,190.40
Sidewalk, Conc, 4 inch		113,840	Sft	$5.00	$569,200.00
Pavement Markings		253,395	Ft	$1.50	$380,092.50
Restoration		1,001,900	Sft	$0.56	$561,064.00
DETAILED ITEM TOTAL					**$17,337,895.46**
Signal Removal		17	LS	$10,000.00	$170,000.00
Signal Modernization		17	LS	$100,000.00	$1,700,000.00
Signage		1	LS	$100,000.00	$100,000.00
SESC	2%	1	LS	$346,757.91	$346,757.91
Mobilization	10%	1	LS	$2,069,492.71	$2,069,492.71
Drainage	3%	1	LS	$520,136.86	$520,136.86
MOT	3%	1	LS	$520,136.86	$520,136.86
Contingency	30%	1	LS	$6,829,325.94	$6,829,325.94
TOTAL					**$29,593,750.00**

These construction cost opinions are intended to be used only for planning purposes and are not based on actual engineering design, since such design work has not yet been undertaken.

The cost opinion includes numerous assumptions that underlie these estimates. These assumptions include the following:

-Drainage includes complete storm sewer replacement
-Station Grading includes all required excavation, embankment, removal of miscellaneous features (posts, stumps, and manipulation of earthwork measured along each roadway alignment
-Signage includes replacement of all signs in reconstruction area
-Assumes profiles/grades are such that tie-ins for all legs can be accomplished within horizontal limits shown on concept drawing
-No specialized drainage features (detention ponds, etc.) required
-No specialized geotechnical design needed/No soil issues present
-Utility relocations (if any) to be completed by others at no cost to project
-Includes basic turf restoration, not decorative landscaping
-ROW acquisition is not included in cost estimate
-Design and Construction Engineering cost not included
-Construction costs include a basic maintenance of traffic scheme
-No retaining walls or other structural elements included

MDOT US-10 BR Corridor Study

Planning Level Opinion of Cost - August 4, 2016

Alternative 3 - Segment 1 (Washington to W Hines)

Full Reconstruction Indian Street

Mill and Resurface Buttles w/Joint Repair

ITEM		QTY	UNIT	PRICE	COST
Buttles					
HMA Composite Pavt Repair		184,143	Sft	$1.97	$362,904.88
Conc Pavt Repair		34,121	Sft	$10.00	$341,213.00
HMA	Depth= 3''	184,143	Sft	$1.47	$270,076.40
Indian					
Pavement Removal		453,135	Sft	$0.78	$352,438.33
Station Grading		51,210	Ft	$30.00	$1,536,300.00
Subbase (12")		956,000	Sft	$0.56	$531,111.11
Open-Graded Drainage Course (6")		899,200	Sft	$1.11	$999,111.11
Curb and Gutter, Conc		23,666	Ft	$25.00	$591,650.00
Conc, Pavt, Nonreinf, 9 inch		690,111	Sft	$6.70	$4,623,743.70
General					
Sidewalk, Conc, 4 inch		118,920	Sft	$4.00	$475,680.00
Pavement Markings		328,595	Ft	$1.50	$492,892.50
Restoration		1,536,300	Sft	$0.56	$860,328.00
DETAILED ITEM TOTAL					**$11,437,449.04**
Signal Removal		17	LS	$10,000.00	$170,000.00
Signal Modernization		17	LS	$100,000.00	$1,700,000.00
Signage		1	LS	$100,000.00	$100,000.00
SESC	2%	1	LS	$228,748.98	$228,748.98
Mobilization	10%	1	LS	$1,455,119.39	$1,455,119.39
Drainage	3%	1	LS	$343,123.47	$343,123.47
MOT	5%	1	LS	$571,872.45	$571,872.45
Contingency	30%	1	LS	$4,801,894.00	$4,801,894.00
TOTAL					**$20,808,250.00**

These construction cost opinions are intended to be used only for planning purposes and are not based on actual engineering design, since such design work has not yet been undertaken.

The cost opinion includes numerous assumptions that underlie these estimates. These assumptions include the following:

- -Drainage includes complete storm sewer replacement
- -Station Grading includes all required excavation, embankment, removal of miscellaneous features (posts, stumps, landscaping, small trees, etc.), and manipulation of earthwork measured along each roadway alignment
- - HMA Composite Pavt Repair includes Cold Milling, Det 7/8 Repairs
- - Conc Pavt Repair Includes joint repairs and concrete patching
- -Signage includes replacement of all signs in reconstruction area
- -Assumes profiles/grades are such that tie-ins for all legs can be accomplished within horizontal limits shown on concept drawing
- -No specialized drainage features (detention ponds, etc.) required
- -No specialized geotechnical design needed/No soil issues present
- -Utility relocations (if any) to be completed by others at no cost to project
- -Includes basic turf restoration, not decorative landscaping
- -ROW acquisition is not included in cost estimate
- -Design and Construction Engineering cost not included
- -Construction costs include a basic maintenance of traffic scheme
- -No retaining walls or other structural elements included

MDOT US-10 BR Corridor Study

Planning Level Opinion of Cost - August 4, 2016

Alternatives 1, 2, & 3 - Segment 2 (W Hines - Wackerly)

Full Reconstruction - Saginaw to E. Wackerly

Mill and Resurface w/ Joint Repair - W. Hines to Saginaw

ITEM		QTY	UNIT	PRICE	COST
Hines to Saginaw - HMA Resurfacing					
Cold Milling		647,045	Sft	$0.24	$158,166.56
HMA	Depth= 3.5''	647,045	Sft	$1.71	$1,107,165.89
Saginaw to Wackerly - Reconstruction					
HMA Surface Removal		175,466	Sft	$0.56	$97,481.11
Curb and Gutter Removal		6,202	Ft	$10.00	$62,020.00
Station Grading		3,233	Ft	$30.00	$96,990.00
Curb and Gutter, Conc		6,202	Ft	$25.00	$155,050.00
Subbase (12")		209000	Sft	$0.56	$116,111.11
Aggregate Base, 6 inch		194,100	Sft	$1.11	$215,666.67
HMA	Depth= 7''	175,466	Sft	$3.42	$600,483.64
Restoration		97000	Sft	$0.56	$54,320.00
General					
Pavement Markings		9,699	Ft	$1.50	$14,548.50
DETAILED ITEM TOTAL					**$2,678,003.48**
Signage		1	LS	$50,000.00	$50,000.00
SESC	2%	1	LS	$53,560.07	$53,560.07
Mobilization	5%	1	LS	$157,824.20	$157,824.20
Drainage	6%	1	LS	$160,680.21	$160,680.21
MOT	8%	1	LS	$214,240.28	$214,240.28
Contingency	30%	1	LS	$994,292.47	$994,292.47
TOTAL					**$4,308,650.00**

These construction cost opinions are intended to be used only for planning purposes and are not based on actual engineering design, since such design work has not yet been undertaken.

The cost opinion includes numerous assumptions that underlie these estimates. These assumptions include the following:

- -Drainage includes complete storm sewer replacement from Saginaw to Wackerly
- -Station Grading includes all required excavation, embankment, removal of miscellaneous features (posts, stumps, landscaping, small trees, etc.), and manipulation of earthwork measured along each roadway alignment
- -Signage includes replacement of all signs in reconstruction area
- -Assumes profiles/grades are such that tie-ins for all legs can be accomplished within horizontal limits shown on concept drawing
- -No specialized drainage features (detention ponds, etc.) required
- -No specialized geotechnical design needed/No soil issues present
- -Utility relocations (if any) to be completed by others at no cost to project
- -Includes basic turf restoration, not decorative landscaping
- -ROW acquisition not anticipated
- -Design and Construction Engineering cost not included
- -Construction costs include a basic maintenance of traffic scheme
- -No retaining walls or other structural elements included

MDOT US-10 BR Corridor Study

Planning Level Opinion of Cost - August 4, 2016

Alternatives 1, 2, & 3 - Segment 3 (US-10 Interchange Area)

Full Reconstruction - E. Wackerly to Airport

ITEM		QTY	UNIT	PRICE	COST
Curb and Gutter, Rem		3254	Ft	$5.00	$16,270.00
HMA Surface, Rem		105579	Sft	$0.56	$58,655.00
Station Grading		1578	Ft	$30.00	$47,340.00
Subbase (12")		144270	Sft	$0.56	$80,150.00
Aggregate Base, 6 inch		136460	Sft	$1.11	$151,622.22
Curb and Gutter		3254	Ft	$25.00	$81,350.00
HMA	Depth= 7''	105579	Sft	$3.42	$361,314.80
Sidewalk, Conc, 4 inch		4810	Sft	$3.50	$16,835.00
Pavement Markings		9468	Ft	$1.50	$14,202.00
Restoration		47400	Sft	$0.56	$26,544.00
DETAILED ITEM TOTAL					**$854,283.02**
Signal Modernization		2	LS	$100,000.00	$200,000.00
SESC	2%	1	LS	$17,085.66	$17,085.66
Mobilization	10%	1	LS	$124,222.53	$124,222.53
Drainage	10%	1	LS	$85,428.30	$85,428.30
MOT	10%	1	LS	$85,428.30	$85,428.30
Contingency	30%	1	LS	$409,934.34	$409,934.34
TOTAL					**$1,776,400.00**

These construction cost opinions are intended to be used only for planning purposes and are not based on actual engineering design, since such design work has not yet been undertaken.

The cost opinion includes numerous assumptions that underlie these estimates. These assumptions include the following:

- -Drainage includes complete storm sewer replacement from Wackerly to Airport
- -Station Grading includes all required excavation, embankment, removal of miscellaneous features (posts, stumps, landscaping, small trees, etc.), and manipulation of earthwork measured along each roadway alignment
- -Signage includes replacement of all signs in reconstruction area
- -Assumes profiles/grades are such that tie-ins for all legs can be accomplished within horizontal limits shown on concept drawing
- -No specialized drainage features (detention ponds, etc.) required
- -No specialized geotechnical design needed/No soil issues present
- -Utility relocations (if any) to be completed by others at no cost to project
- -Includes basic turf restoration, not decorative landscaping
- -ROW acquisition is not included in cost estimate
- -Design and Construction Engineering cost not included
- -Construction costs include a basic maintenance of traffic scheme

Appendix H
Public Information Meeting
Exhibits & Comments

Welcome to
The US-10 Business Route
Corridor Study

Public Information Meeting

December 14, 2016

MDOT
Michigan Department of Transportation

DLZ MKSK

How to Provide Your Input

- Fill out and submit comment form at tonight's meeting
- Speak with members of the project team at tonight's meeting
- Send email to:

  Jay Reithel
  Bay Region Planner
  ReithelJ@michigan.gov

MDOT Michigan Department of Transportation

DLZ MKSK

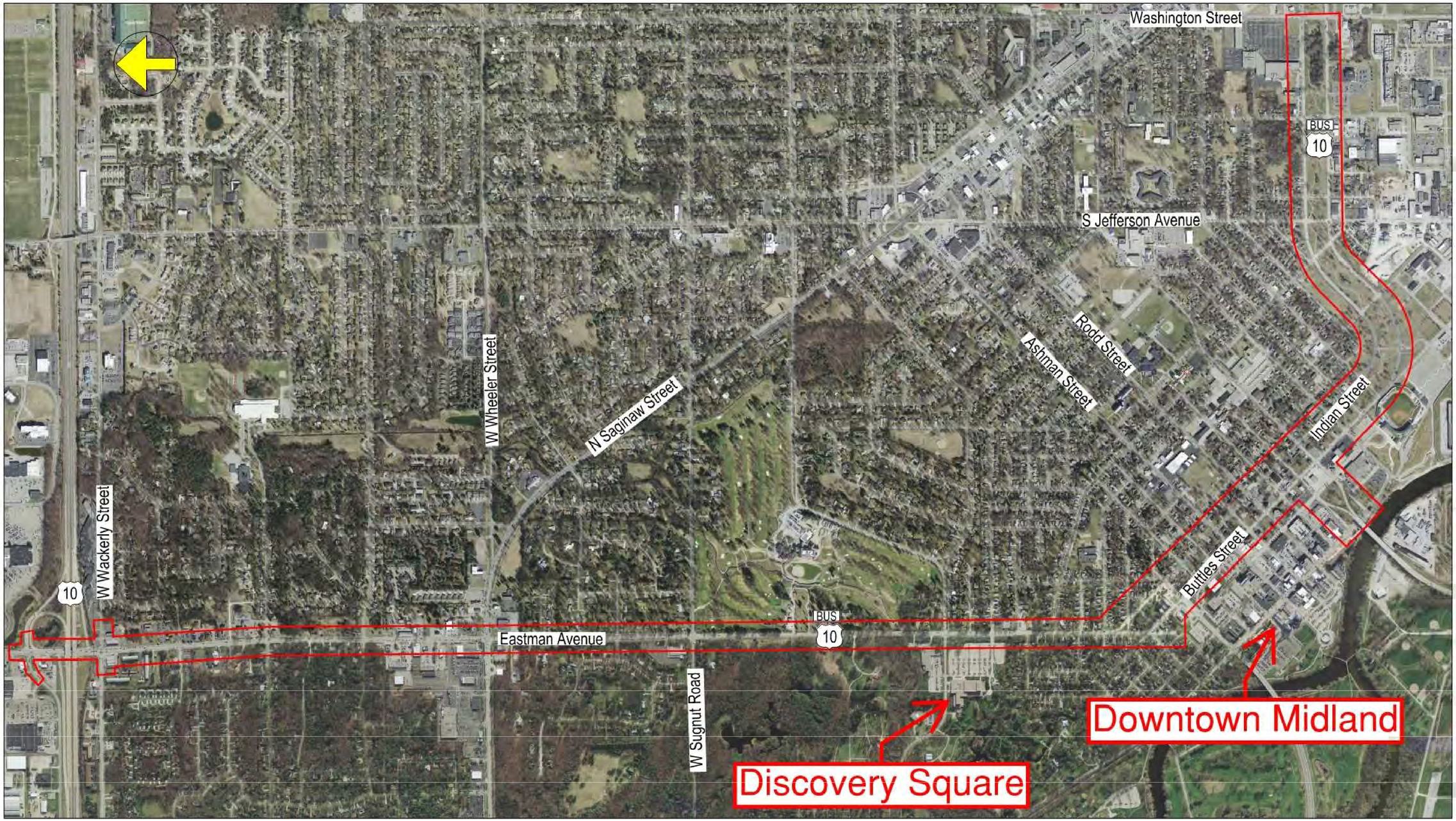
PROJECT GOALS

1. Accommodate the design year (2040) traffic volumes
2. Alleviate current and anticipated traffic congestion at intersections and along road segments
3. Enhance safety and reduce crashes for all modes of transportation
4. Increase connectivity to Downtown Midland & Discovery Square
5. Improve non-motorized mobility and eliminate barriers for bicyclist/pedestrians with minimal impacts to traffic flow
6. Context Sensitive Design
7. Support economic development within the corridor

MDOT Michigan Department of Transportation

DLZ MKSK

Study Area



MDOT
Michigan Department of Transportation

DLZ MKSK

Other Alternatives Considered

- Alternative 2
  - Convert Indian and Buttles from one-way pair to two bi-directional roadways
  - Five-lane cross section - two eastbound & two westbound travel lanes and a center left-turn lane
  - Bayliss and Cronkright Streets signalized
  - All signalized intersections upgraded and retimed
- Alternative 3
  - Convert Indian and Buttles from one-way pair to two bi-directional roadways
  - US-10 BR (Indian) converted to a five-lane cross section
  - Buttles converted to three-lane cross section - one eastbound travel lane, one westbound travel lane, and a center left-turn lane)
  - Buttles converted to local road under City of Midland's jurisdiction
- West Hines Street to Airport Road same as Preferred Alternative

MDOT Michigan Department of Transportation

DLZ MKSK

Alternatives Evaluation

Evaluation Criteria	Comments	Alternatives		
		Alternative 1	Alternative 2	Alternative 3
Traffic Operations	Overall efficiency of traffic operations. Factors include intersection operations and changes to travel time for US-10 BR.	**High** All intersections would operate at LOS C or better except for two intersections. When compared to Alternatives 2 and 3, Alternative 1 would have a slightly better arterial LOS and lower travel time through the corridor.	**High** All intersections would operate at LOS C or better. Alternative 2 would have a slightly better arterial LOS and lower travel time when compared to Alternative 3.	**High** All intersections would operate at LOS C or better, except for one intersection.
Safety	Degree to which alternatives may reduce total crashes, injury crashes, and conflicts for vehicular and non-motorized users.	Moderate When compared to Alternatives 2 and 3, one-way roadways have fewer crashes than two-way roadways. Pedestrian crossing distance reduced via lane reduction on Indian and Buttles. Bicycle facility would separate on-street bicyclists from vehicular traffic.	Low Two-way traffic and five-lane cross sections would likely increase the number of crashes along the corridor. Pedestrians less safely accommodated than Alternatives 1 & 3 as pedestrians have to travel across five-lanes of traffic and traffic is traveling in two directions.	Low Two-way traffic and five-lane cross section would likely increase the number of crashes along Indian. Would likely have less crashes than Alternative 2 due to the three-lane cross section and local street designation on Buttles. Pedestrians less safely accommodated than Alternative 1 as pedestrians have to travel across more travel lanes and traffic is traveling in two directions.
Non-motorized Facilities – Pedestrians	Degree to which alternatives accommodate pedestrians. Assessment is based upon (1) providing connectively to/from Downtown and (2) presence of paths/sidewalks connecting local streets to US 10 BR paths/sidewalks.	Pedestrians fully accommodated via existing sidewalks and multi-use path, and construction of new sidewalk connections.	Pedestrians fully accommodated via existing sidewalks and multi-use path, and construction of new sidewalk connections, five-foot sidewalk on the north side of Indian, and ten-foot multi-use path on the south side of Buttles.	Pedestrians fully accommodated via existing sidewalks and multi-use path, and construction of new sidewalk connections, five-foot sidewalk on the north side of Indian, and 10-foot multi-use path on the south side of Buttles.
Non-motorized Facilities – Bicyclists	Degree to which alternatives accommodate bicyclists. Assessment is based upon (1) providing connectively to/from Downtown; (2) presence of non-motorized facilities connecting from local streets to US 10 BR non-motorized facilities; and (3) presence of non-motorized facilities along US-10 BR.	Bicyclists fully accommodated via existing multi-use path and construction of new bicycle facility within the US-10 BR ROW. Bicycle facility would physically separate on-street bicyclists from vehicular traffic.	Bicyclists fully accommodated via existing multi-use path, and construction of a ten-foot multi-use path on the south side of Buttles. Some bicyclists would likely remain riding in the roadway on US-10 BR.	Bicyclists fully accommodated via existing multi-use path, and construction of a ten-foot multi-use path on the south side of Buttles. Some bicyclists would likely remain riding in the roadway on US-10 BR.
Right-of-Way Acquisition	Impacts to businesses and residences caused by construction of project.	Low No additional ROW required.	High Potential high impacts to green space between Indian & Buttles, and businesses/residences located along Indian and Buttles between Haley St. and W Union St.	Moderate Moderate impacts to green space between Indian & Buttles, and businesses/residences located along Indian and Buttles between Haley St. and W Union St.
Planning Level Construction Cost	Includes construction cost for improvements to US-10 BR for 20-year time horizon. All estimates in year 2017 dollars. Engineering and Right-of-Way cost not included in estimate.	Segment 1 – $4,610,000 Segment 2 – $4,310,000 Segment 3 – $1,780,000 **TOTAL - $10,700,000**	Segment 1 – $29,590,000 Segment 2 – $4,310,000 Segment 3 – $1,780,000 **TOTAL - $35,680,000**	Segment 1 – $20,810,000 Segment 2 – $4,310,000 Segment 3 – $1,780,000 **TOTAL - $26,900,000**
Long Term Operational Cost	Cost of ongoing operations including electricity (lighting), signal adjustment, bulbs/other equipment, mowing, maintenance, pavement markings, etc.	Moderate	High	Moderate-High
Environmental Impacts	Degree to which alternatives impact surrounding resources (e.g., cultural resources, noise, parks, green space, etc.)	Low	Low to Moderate	Low to Moderate
Context Sensitive Design	Opportunities for aesthetic enhancements.	Modest opportunities for aesthetic enhancement in remaining ROW.	Limited opportunities for aesthetic enhancement in remaining ROW.	Limited opportunities for aesthetic enhancement in remaining ROW.

MDOT Michigan Department of Transportation

DLZ MKSK

Implementation & Next Steps

- MDOT "Road Diet" Process for Preferred Alternative
- Additional Public Involvement
- Phased Implementation Under Consideration
  - 1st Phase - 2017
    - State Street to Jerome Street
    - Lane reduction – pavement markings & signing changes
    - On-street non-motorized facility
    - Signal retiming
    - Trial period - Determine if lane reduction accommodates traffic volumes
  - 2nd Phase - TBD
    - Construct multi-use path/sidewalk/bike lane
    - Installation of a physical barrier
    - Relocate signal heads
    - Implement Access Management Strategies

US-10 BR Corridor Study

Public Open House December 14, 2016

COMMENT FORM

GET INVOLVED! Your comments are important.

*** PLEASE PRINT CLEARLY***

Name: Thoralf Brecht E-mail: TJFB52@charter.net

Address: 4114 E. Old Pine Trl

City: Midland State: MI Zip code: 48642

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

I like the Preferred Alternative 1. It provides good non-motorized access at the lowest cost of the three options.

Nice presentation.

Please return this form before you leave or mail, e-mail or fax to:

Jay Reithel
MDOT/ Bay Region
5859 Sherman Rd.
Saginaw, MI 48604
Fax: 989-754-8122
reithelj@michigan.gov

US-10 BR Corridor Study

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*** PLEASE PRINT CLEARLY***

Name: Carol Arnosky E-mail: MISBGALORE@SBCGLOBAL.NET

Address: 2518 Brookwood

City: Mid State: MI Zip code:

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

I like the Indian / Buttles staying as one way.

I like the NMT lanes with the planters so pedestrians and ~~bicyclists~~ bicyclists can use it —

Very nice & clear presentation —
I am excited for the NMT advances

And thank you MDOT for paying for it!!

Please return this form before you leave or mail, e-mail or fax to:

Jay Reithel
MDOT/ Bay Region
5859 Sherman Rd.
Saginaw, MI 48604
Fax: 989-754-8122
reithelj@michigan.gov

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*** PLEASE PRINT CLEARLY***

Name: MATT JANSON E-mail: JOMATT38@YAHOO.COM

Address: 8010 VANCE RD

City: MIDLAND State: MI Zip code: 48640

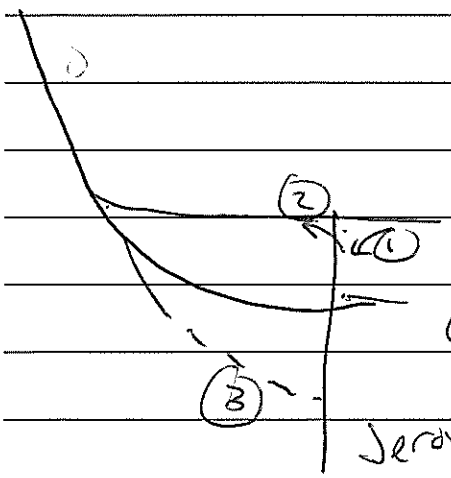
TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

Jerome Street (1) look at a sweep curve from Indian onto Jerome

(2) if 2 lanes on Indian, need to keep a wider radii for trucks turning left from Jerome onto Indian.

(3) any consideration to realign Jerome to reconnect w/ Eastman?



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COMMENT FORM

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*** PLEASE PRINT CLEARLY***

Name: Tom Palmer E-mail: manch37@gmail.com

Address: 1509 crane ct.

City: midland State: mi Zip code: 48640

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

Alt. 1 + Have a by pass ~~From~~ For m20 ~~to~~ ~~And from~~ ~~South~~. South east of Midland + ~~Bus~~ m 20 from mt. Pleasant take m30 Meridan Rd North to US 10. (Bus 20)

Alt 2 - Make Buttles, Indian one ways with 2 lanes and bike, pedesdrian lane one lane

- No Rt Turn on Red ~~on~~ on Eastman/Saginaw and Eastman and Wackely. Protect bike, Ped.

Please return this form before you leave or mail, e-mail or fax to:

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reithelj@michigan.gov

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Public Open House December 14, 2016

COMMENT FORM

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*** PLEASE PRINT CLEARLY*** Cont

Name: Tom Palmer E-mail:

Address:

City: State: Zip code:

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

Include City of Midland (Fandation) to help finance $

Please return this form before you leave or mail, e-mail or fax to:

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Saginaw, MI 48604
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reithelj@michigan.gov

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Public Open House December 14, 2016

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*** PLEASE PRINT CLEARLY***

Name: Chelsea Rowley E-mail: crowley@momentum-midland.or

Address:

City: State: Zip code:

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

* Rerouting trucks / Alternate truck route

* Love round-abouts as gateway features – Please consider at end of Indian & Buttles/Eastman.

* Non-motorized traffic/bike lanes all the way down Eastman/Discovery Square

Great work!!

Please return this form before you leave or mail, e-mail or fax to:

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MDOT/ Bay Region
5859 Sherman Rd.
Saginaw, MI 48604
Fax: 989-754-8122
reithelj@michigan.gov

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Public Open House December 14, 2016

COMMENT FORM

GET INVOLVED! Your comments are important.

*** PLEASE PRINT CLEARLY***

Name: Donald Yopp E-mail: donald.yopp@yahoo.com

Address: 2021 Forestwood Ct.

City: Midland State: MI Zip code: 48642

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

- Traffic flow for the intersections of Indian St, Buttles St, & Jerome St is slow due to ~~not~~ multiple signals & left turn
Action Convert these intersections to a roundabout.

- Traffic ~~at~~ on Eastman & Airport Rd & US-10 entry & exit ramps moves slowly, especially exiting the mall area
Action - Convert those intersections to roundabouts
  - Left turn allowed at roundabouts
- Add road from Mall Dr to exit road that goes from US-10 to Eastman Ave.

Please return this form before you leave or mail, e-mail or fax to:

Jay Reithel
MDOT/ Bay Region
5859 Sherman Rd.
Saginaw, MI 48604
Fax: 989-754-8122
reithelj@michigan.gov

US-10 BR Corridor Study

Public Open House December 14, 2016

COMMENT FORM

GET INVOLVED! Your comments are important.

*** PLEASE PRINT CLEARLY***

Name: John Muste E-mail: johnmuste@hotmail.co

Address: 4900 Oakridge Dr.

City: Midland State: MI Zip code: 48640

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

(1) I support the road diet & bike lanes for Indian & Buttles

(2) An alternate route for M-20 traffic around rather than through Midland should be identified, perhaps using M20 & US 10.

(3) Another interchange for US 10 between Eastman & Waldo is needed to

(4) Right turns on red should not be allowed coming off Wackerly onto Eastman. I have had numerous close calls crossing Eastman going east on Wackerly.

Please return this form before you leave or mail, e-mail or fax to:

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Saginaw, MI 48604
Fax: 989-754-8122
reithelj@michigan.gov

US-10 BR Corridor Study

Public Open House December 14, 2016

COMMENT FORM

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*** PLEASE PRINT CLEARLY***

Name: Paul Barbeau E-mail: pbarbeau@loonis.com

Address: 2101 Norwood Dr

City: Midland State: MI Zip code: 48640

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

fully support lane reduction in downtown area and addition of bike lanes. Bike lanes should be part of larger vision for bike network including north/south on Eastman and along ~~End~~ Ashman/Rodd

Also would explore options to calm Jerome from Main St to Indian.

Please return this form before you leave or mail, e-mail or fax to:

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Saginaw, MI 48604
Fax: 989-754-8122
reithelj@michigan.gov

US-10 BR Corridor Study

Public Open House December 14, 2016

COMMENT FORM

GET INVOLVED! Your comments are important.

*** PLEASE PRINT CLEARLY***

Name: MIKE HAYES E-mail: dubhages@charterme

Address: 919 E. PARK DRIVE

City: MIDLAND State: MICH Zip code: 48640

TELL US WHAT YOU THINK.

Please use the space below and additional pages if necessary. Turn your comment form in at the public meeting. If you wish, you may mail, fax or e-mail them (see below).

THE DOWNTOWN ROAD DIET IS AN OUTSTANDING AND LONG OVERDUE CHANGE. BRINGING THE CHARACTER OF DOWNTOWN BACK TO THE LEVEL THAT TODAY'S CITIZENS WANT WILL REQUIRE THE INDIAN/BUTTLES CORRIDOR TO BE "CALMED" ALLOWING ENHANCED CONNECTIVITY TO ADJACENT NEIGHBORHOODS.

Please return this form before you leave or mail, e-mail or fax to:

Jay Reithel
MDOT/ Bay Region
5859 Sherman Rd.
Saginaw, MI 48604
Fax: 989-754-8122
reithelj@michigan.gov

US-10 Business Route

Corridor Study

12/9/2016 Donald Yopp

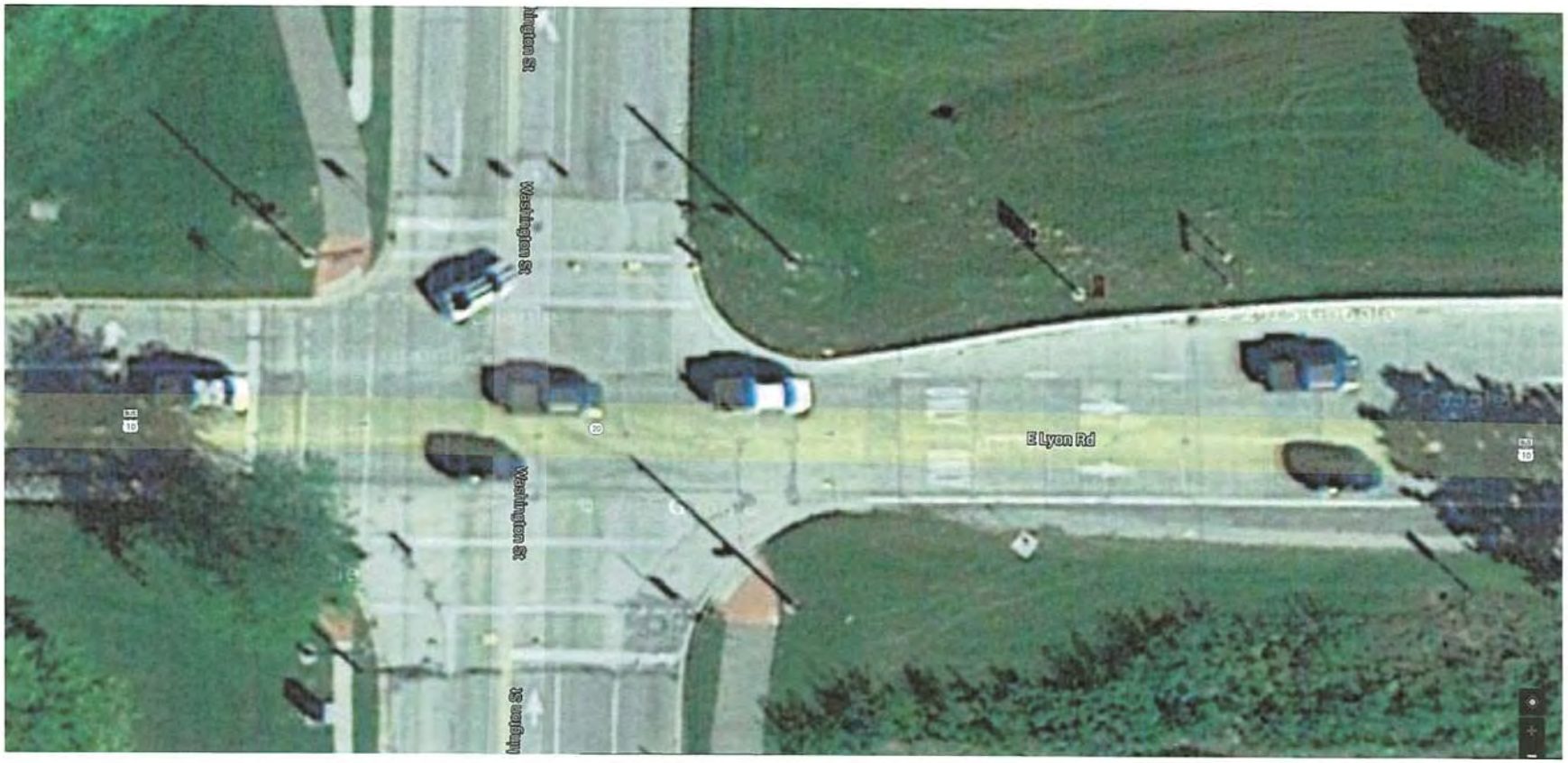
Design Alternatives

- US-10 Business Route/Lyon Road exit to Roundabout
- Poseyville Road/Mark Putnam Bridge
- Financial & Professional District
- West Indian St, West Buttles St, Jerome St Intersection
- Midland Mall Area Traffic

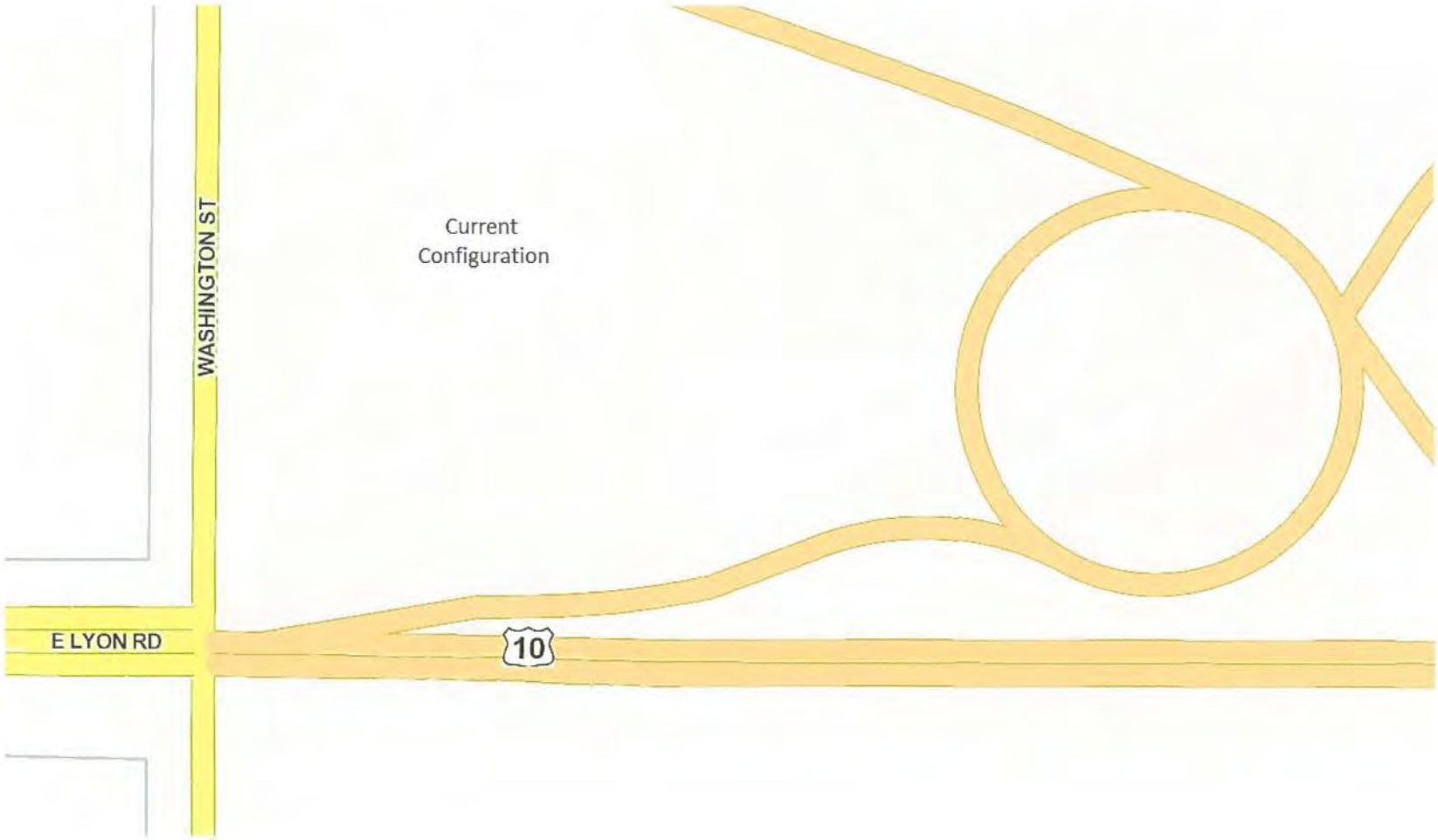
US-10 Business Route/Lyon Road exit to Roundabout

- Background
  - US-10 BR/Lyon Rd is 3 lanes up to the Washington St intersection
  - Left lane is dedicated to left turn onto Washington St
  - Center lane
    - Thru lane for US-10 BR
    - Exit to roundabout
- Problem Statement
  - Approach to roundabout is unsafe
    - Traffic in left lane must merge into center lane in order to exit into the roundabout
      - Merge right presents visibility problems to the motorist, especially in dense traffic
      - Merge increases congestion of center lane
      - Merge creates a “pinch point”

Aerial View – Lyon Rd (US-10 BR) exit to Roundabout



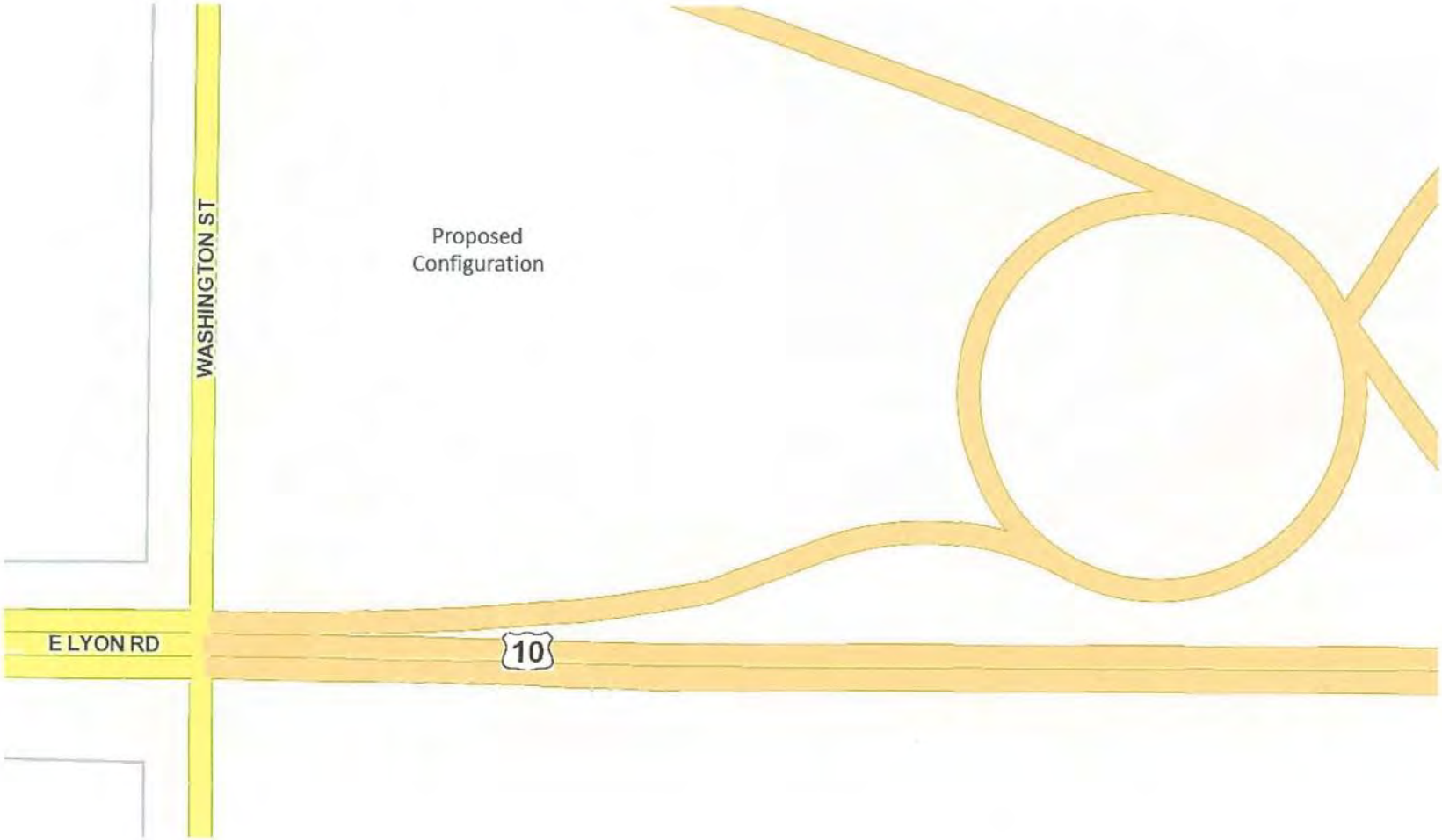
Map – US-10 Business Route/ Lyon Road exit to Roundabout



US-10 Business Route/Lyon Road exit to Roundabout

- Action
  - Allow traffic to enter roundabout from left lane instead of center lane
    - Extend left lane to roundabout
    - Block traffic in center lane from exiting to roundabout

Map – US-10 Business Route/ Lyon Road exit to Roundabout



12/9/2016 Donald Yopp

Poseyville Rd & Mark Putnam Bridge

- Problem Statement - Mark Putnam Bridge
  - Inhibits the expansion of downtown Midland
  - Separates core downtown from East End
- Action
  - Remove the Mark Putnam Bridge
    - Remove Cronkright/George St. approach
  - Leave Poseyville Rd West Indian St, West Buttles St, Eastman Ave, Jerome St Intersection
  - approach, enhancing it for
    - River overlook
    - Parking lot for a new park
  - Reroute Poseyville Rd to join Isabella St (M-20)
    - Utilize an <u>enhanced</u> Whitman Dr for part of the route
    - Determine rest of route, including intersection point on Isabella St (M-20)

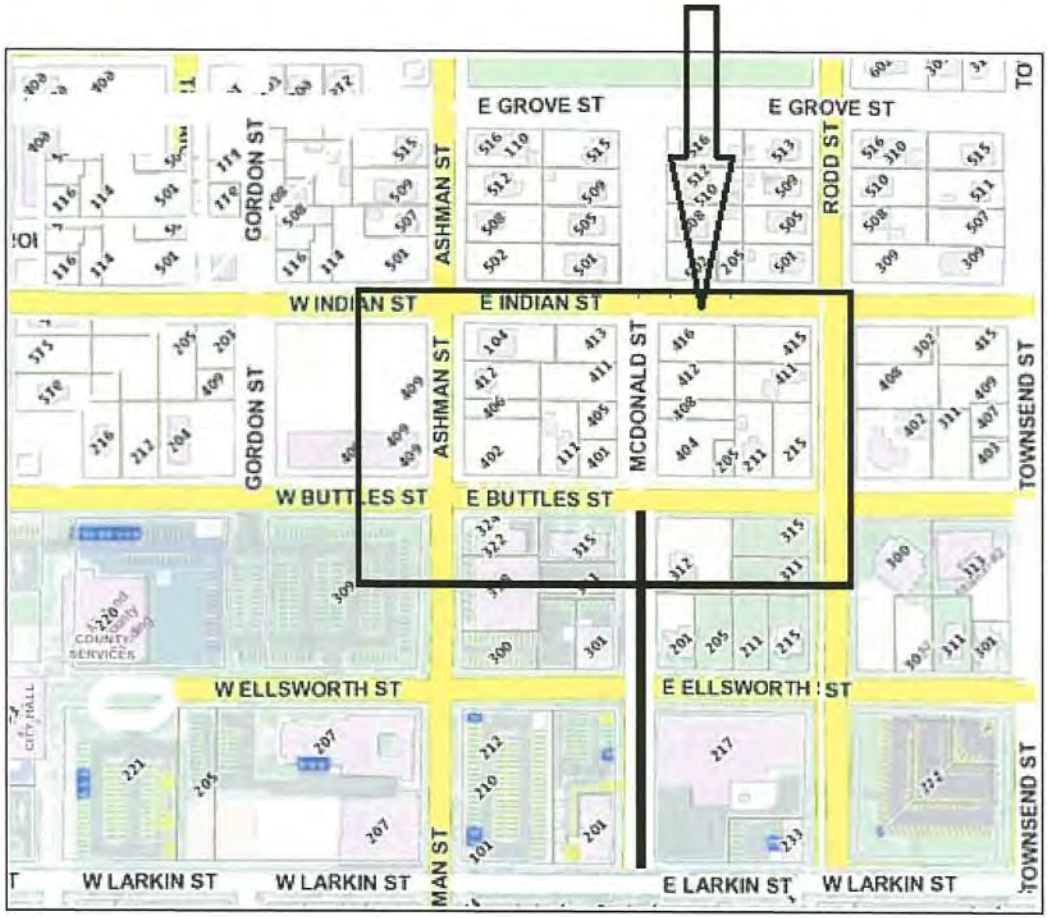
Map – Mark Putnam Bridge

Map – Poseyville Rd
Isabella St (M-20)

US-10 Business Route
Downtown Financial & Professional District

- Objective – Dedicate core downtown to PERS:
  - Pubs, Eateries, Retail Shops (PERS)
- Problem Statement – Financial & Professional businesses fragment core downtown
- Actions
  - Establish a Financial & Professional District near downtown but separate from core downtown
    - District is bordered by:
      - Ashman St & Rodd St
      - Indian St & Buttles St
    - Includes businesses south of Buttles St
  - Offer incentives to financial & professional businesses to move from core downtown to the district
  - Eliminate McDonald St between Larkin St & Buttles St
    - Construct a walkway connecting those streets

Map - US-10 Business Route
Downtown Financial & Professional District



West Indian St, West Buttles St, Eastman Ave, Jerome St Intersection

- Problem Statement
  - Traffic flow thru these intersections is slow
    - Multiple signals, left turns
- Action
  - Convert the intersections into a roundabout

Map – West Indian St, W Buttles St, Jerome St Roundabout

Mall Area Traffic

- Problem Statement
  - Traffic in the mall area moves very slowly, especially when exiting the area.
- Guiding Principles
  - Eastman Ave, Joe Mann Blvd & Jefferson Ave
    - No left turn onto these streets, except at traffic signals/roundabouts
    - Maximize the number of lanes, especially lanes exiting the mall area.
    - Minimize the number of traffic signals/roundabouts.
- Objectives
  - Improve traffic flow to and from the Mall area
  - Provide easy travel from sector to sector.

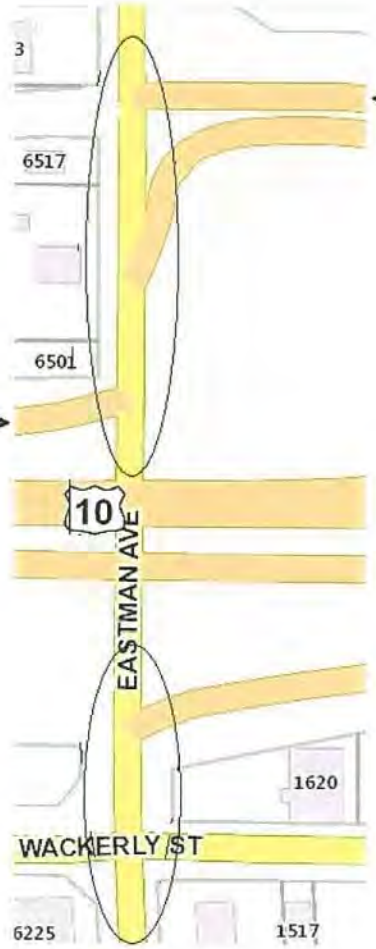
Actions – Eastman Ave at Airport Rd & US-10 exit road to Eastman Ave

- Add road from Mall Dr to US-10 exit road to Eastman Ave
- Build a roundabout for the intersection of Eastman Ave with
  - Exit from US-10
  - Airport Rd
- Build a roundabout for the intersection of Eastman Ave with Wackerly St

Map – Eastman Ave (cont'd)
Exit From Mall Dr

Map Eastman Ave Roundabouts (cont'd)

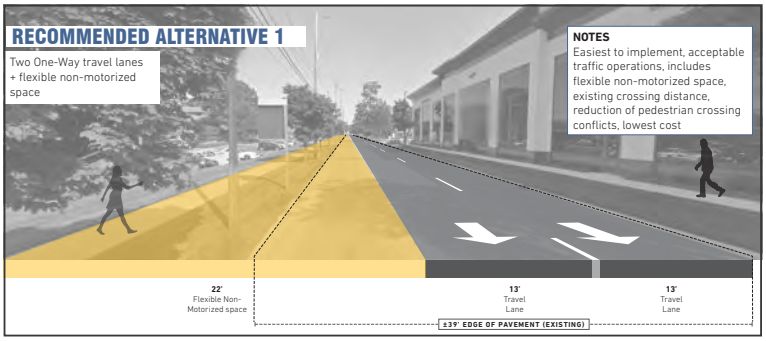
- Build a roundabout for the intersection of Eastman Ave with
  - exit from US-10
  - Airport Rd
- Build a roundabout for the intersection of Eastman Ave with Wackerly St

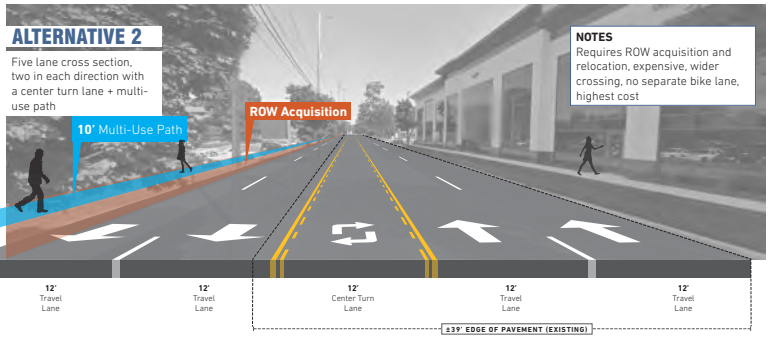


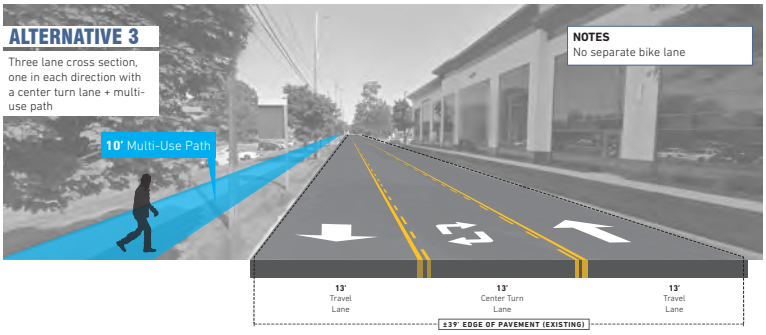
10 CONSIDERED ROADWAY ALTERNATIVES

US-10 BR CORRIDOR PLAN
MIDLAND, MICHIGAN

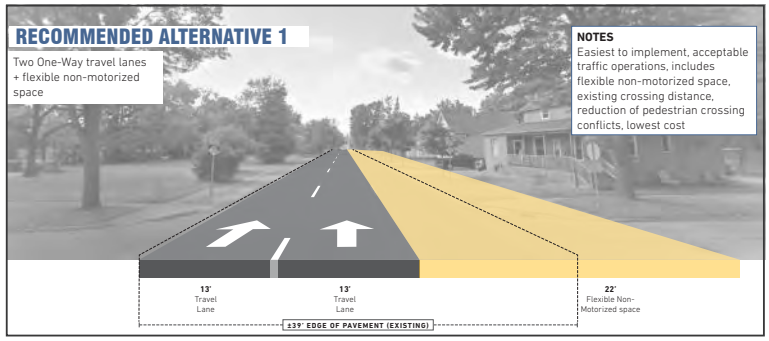
BUTTLES STREET EASTBOUND

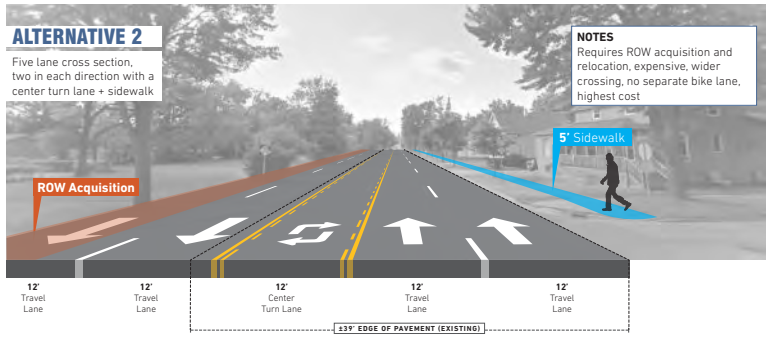


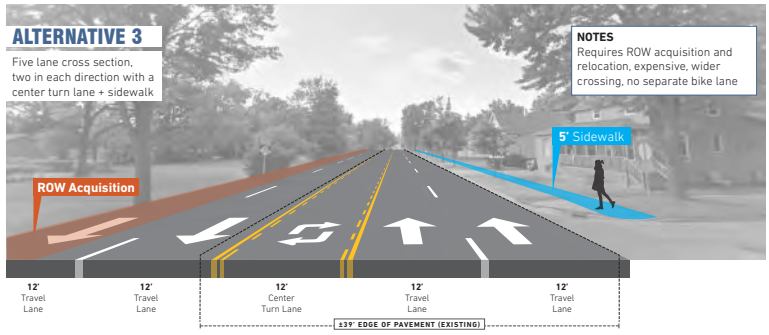




INDIAN STREET WESTBOUND



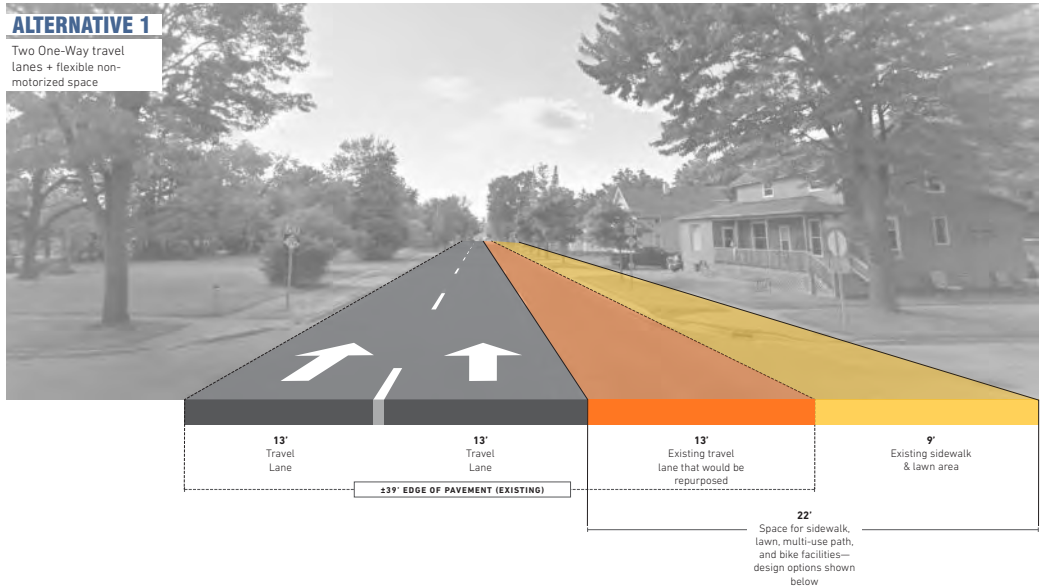




OPTIONS FOR NON-MOTORIZED DESIGN

BUTTLES STREET EASTBOUND

INDIAN STREET WESTBOUND



BUFFERED MULTI-USE PATH - PLANTED SEPARATOR

BUFFERED BIKE LANE - PAINTED SEPARATOR

BUFFERED BIKE LANE WITH SIDEWALKS - PHYSICAL SEPARATOR

BUFFERED BIKE LANE - TWO-WAY BIKE LANE