

# **TRAFFIC IMPACT ANALYSIS**

Harvest Crossing Filing 2

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## I. INTRODUCTION

Harvest Crossing is a planned development encompassing approximately 200 acres east of E-470 in Aurora, Colorado. The site is located in the southeast quadrant of the Harvest Rd / E. Jewell Ave intersection and is directly east of the Murphy Creek East development. The development stretches east to the future Kewaunee Street and south to the future Yale Ave. **Figure 1** shows the site location in relation to major roadways and developments in the area.

The Harvest Crossing development is anticipated to be constructed in several phases. Filing 1 (residential) was approved and is currently under construction with completion anticipated in late 2024. It is located between Pacific Ave and Warren Ave roughly representing the middle third of the site in the north-south direction. Filing 2 (commercial and additional residential) is proposed to be completed in 2026 (after Filing 1) and will be located between Jewell Ave and Pacific Ave immediately north of Filing 1. Filing 3 (residential) is expected to follow as the final phase based on market conditions and includes the area south of Filing 1 between Warren Avenue and Yale Ave.

The proposed Harvest Crossing land uses include:

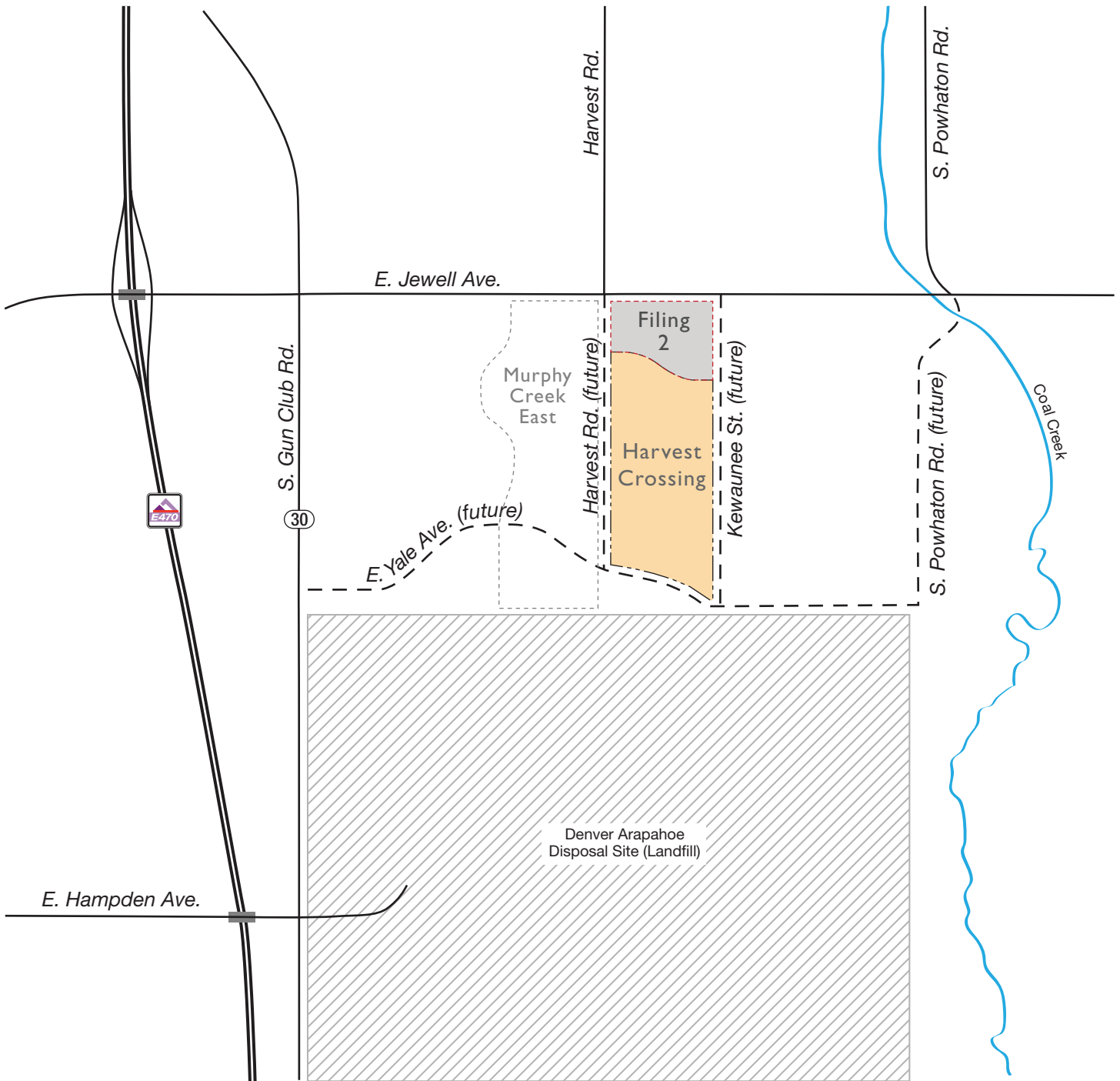
- The previously approved 145 single family dwelling units (DU) in Filing 1
- Filing 2, the subject of this study, currently proposed to include 227 single family DU, but has been analyzed with 230 for the purpose of this study to remain conservative, and 76,500 square feet of commercial
- An additional 449 single family DUs in Filing 3

Hence, the total buildout of Harvest Crossing will include approximately 824 DUs and 76,500 square feet of commercial space. These land uses are anticipated maximums and represent a conservative analysis.

Several access points onto the adjacent transportation network will be provided in the short-term. Filing 1 is expected to add a fourth leg to the Pacific Ave / Harvest Rd and Warren Ave / Harvest Rd intersections. These will align with roadways constructed by Murphy Creek East west of Harvest Rd. Filing 2 is expected to add additional site access points to support the remaining development, including two access points onto E. Jewell Ave, two access points on Kewaunee St between E. Pacific Ave and E. Jewell Ave, and one access on Harvest Rd between E. Jewell and E. Pacific Ave. Filing 3 is anticipated to add additional site access points to accommodate the remaining development in the future. **Figure 2** shows the Filing 2 site plan and access points.

Two future planning horizons have been evaluated for the site:

- **Short-Term Future (Filing 2):** The Year 2026 time-period (3-year horizon from the existing conditions analyzed in this study) was chosen to assess traffic related to the proposed Filing 2 development. It includes full buildout of Filing 1 as a background condition.
- **Long-Term Future:** Year 2040 was selected for long-term analyses, consistent with the current long-term planning timeframe used in the 2018 Refresh of the Northeast Area Transportation Study (NEATS). The 2040 time-period was chosen to determine the effects of proposed project-related traffic for the overall buildout of the site (824 DUs plus 76,500 square feet commercial).





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Harvest Crossing - Filing 2 UPDATE 124044-01 4/11/24

## II. EXISTING CONDITIONS

The existing roadway network and local land uses near the proposed Harvest Crossing site are described below.

### II.A. Surrounding Land Use

The area around the Harvest Crossing Filing 2 development is mostly vacant. The site is located approximately 1.5 miles east of E-470 along Jewell Ave. The anticipated Murphy Creek East development is located to the west, and the Denver Arapahoe Disposal Site (DADS) is located directly south of the site. The northern portion of the Murphy Creek East development (generally from Jewell Ave to Warren Ave north-south and between Harvest Rd and S. Flat Rock Trail east-west) has started construction and model homes are open. The roadway network required to support Harvest Crossing Filing 1 is also under construction, and site grading has begun.

### II.B. Other Relevant Studies

Previous traffic analyses were identified as relevant for this evaluation:

- Felsburg Holt & Ullevig (FHU) had previously evaluated the site location for residential development in the *Villages at Murphy Creek Traffic Impact Analysis Report* dated December 2005.
- The *Murphy Creek East Traffic Impact Study* (dated March 2019) analyzed the development site directly to the west of the Harvest Crossing site. Given the lack of existing roadway network and nearby development, the Murphy Creek East study was used to provide background traffic and roadway geometry in the Harvest Crossing area, particularly along Harvest Rd.
- The *Harvest Crossing Traffic Impact Analysis* (dated August 2021) serves as the master traffic study for Harvest Crossing and also evaluated Filing 1 of the proposed development.

### II.C. Transportation Network

The Harvest Crossing development site will be located southeast of the E. Jewell Ave and Harvest Rd intersection. The following roadways exist in the area today.

#### ***E. Jewell Avenue***

E. Jewell Ave, generally an east-west two-lane arterial east of E-470, is the only existing roadway adjacent to the site. A 1-mile segment of E. Jewell Ave between Gun Club Rd and Harvest Rd has been improved to a 6-lane section (in accordance with NEATS), but it is currently striped as a two-lane facility east of S. Flat Rock Trail due to construction in Murphy Creek East. It remains a 2-lane roadway from that point east past the project site to Powhatan Rd. The posted speed limit is 40 miles per hour (mph).

#### ***Harvest Road***

Between E. Mississippi Ave and E. Jewell Ave (north of Harvest Crossing), Harvest Rd has been constructed as a 2-lane roadway. In accordance with NEATS, this will be expanded to a 6-lane major arterial in the future. Harvest Rd is proposed as a 2-lane collector (with turn lanes) between E. Jewell Ave and E. Yale Ave (adjacent to Harvest Crossing). It is currently under construction between E. Jewell Ave and Warren Ave to provide access to Filing 1 and is planned to be extended south to Yale Ave as part of Filing 3.

## II.D. Traffic Volumes

The project team collected intersection and daily counts along E. Jewell Ave in February 2020. The daily count (conducted adjacent to the site / east of Harvest Rd) indicated that E. Jewell Ave is carrying approximately 2,225 vehicles per day on a typical commuter day. At the request of City of Aurora staff, three years of background growth has been applied to these volumes using the 3.6 percent per year growth rate documented in the master traffic impact study. Hence, the volumes were increased by 11.1 percent to approximate current conditions, resulting in a daily volume of 2,475 vehicles per day along E. Jewell Ave.

The intersection traffic count was collected at the existing E. Jewell Ave / Harvest Rd intersection in 15-minute increments during the hours of 6:30 AM to 8:30 AM and from 4:00 PM to 6:00 PM. The counts were compiled and evaluated to determine peak hours. The morning peak hour was determined to be 6:45 AM to 7:45 AM, and the evening peak hour was determined to be 4:30 PM to 5:30 PM. These peak hour volumes have also been increased based on three years of background growth.

**Figure 3** shows the existing traffic volumes, and **Appendix A** includes the traffic count data.

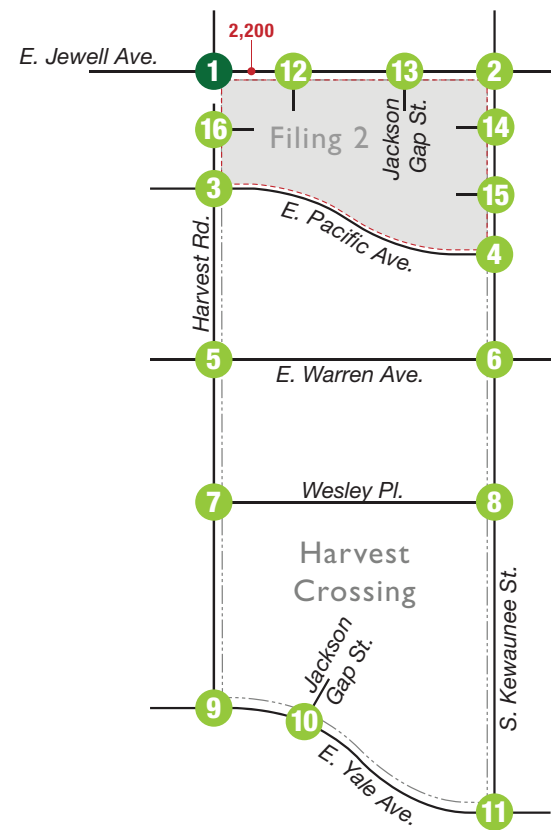
## II.E. Traffic Operations

Existing operational conditions were analyzed at the existing E. Jewell Ave / Harvest Rd intersection near the project site. The analysis is based on procedures documented in the *Highway Capacity Manual*. This analysis procedure provides a Level of Service (LOS), a qualitative measure based on the average delay per vehicle at a controlled intersection described by a letter ranging from “A” to “F.” LOS A represents minimal delay, while LOS F represents excessive congestion and delay. The City uses a target LOS D (indicative of an average of 35 seconds or 55 seconds [or less] of delay for vehicles passing through an unsignalized intersection or a signalized intersection, respectively) during the peak hours to determine acceptable vehicular delays. The signalized intersection analysis reports a LOS rating for the entire intersection, while the unsignalized analysis reports a movement LOS for left-turn movements and stop-controlled movements. Trafficware’s Synchro traffic analysis software (Version 11.1) was used to perform the LOS calculations.

The existing conditions analysis evaluated the current intersection control. The individual movements at the unsignalized E. Jewell Ave with Harvest Rd intersection currently operate at LOS A, as shown in **Appendix B. Figure 3** shows existing traffic operations.

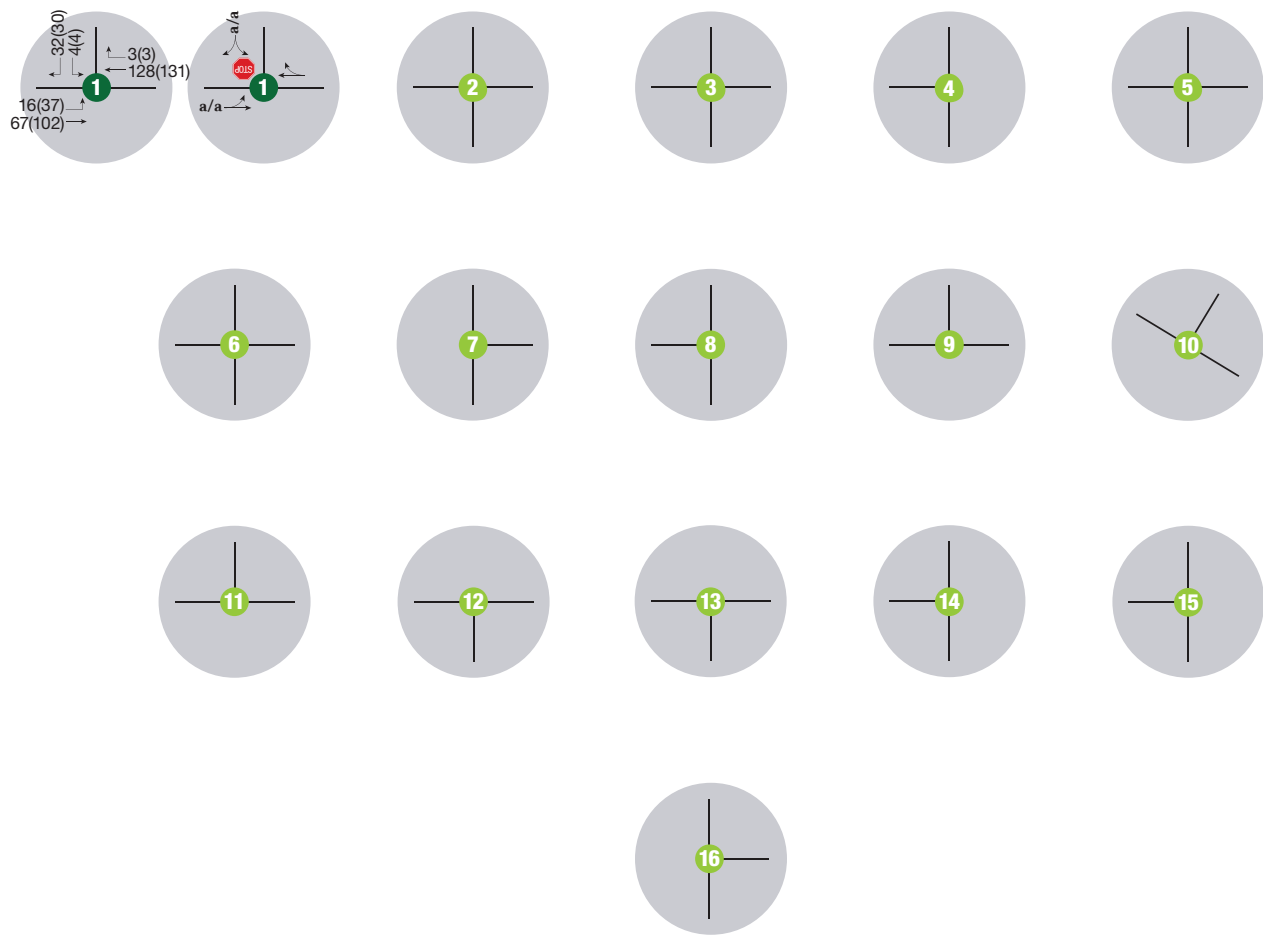


KEY MAP



- LEGEND**
- xxx(xxx) = AM(PM) Peak Hour Traffic Volumes
  - XXXX = Daily Traffic Volumes
  - X = Future Intersection

NOTE: Drawing Not to Scale



### III. FUTURE ROADWAY NETWORK

As noted previously, the existing roadway network in the project area is limited. The conceptual future roadway network in the Harvest Crossing area was evaluated in the master traffic impact analysis. It examined the NEATS Refresh Study and other Aurora planning documents and traffic impact studies for nearby developments. Since the Murphy Creek East study was the most recent effort, the master traffic impact analysis maintained consistency with that report. The following sections detail internal Harvest Crossing roadways and site-related intersections (including any changes since the master traffic impact analysis).

As noted previously, Harvest Rd is anticipated to be constructed from E. Jewell Ave south to E. Yale Ave as a 2-lane collector. The northerly portion (from E. Jewell Ave to E. Warren Ave) is currently under construction and will be completed this year to provide access to Harvest Crossing Filing 1. Internal roadways needed to support Filing 1 are also under construction, as is Kewaunee St between Warren Ave and Pacific Ave.

#### III.A. Filing 2

The development of Harvest Crossing Filing 2 will include a supporting roadway network that was not evaluated in detail in the master traffic impact analysis. The site plan presented on **Figure 2** shows the roadway layout. The proposed Filing 2 roadway network includes the following boundary facilities:

- E. Pacific Ave is being constructed in Filing 1 and forms the southern boundary of Filing 2. No changes are proposed as part of Filing 2.
- Kewaunee St is being constructed between E. Pacific Ave and E. Warren Ave as part of Filing 1. Filing 2 will extend Kewaunee St north to E. Jewell Ave to form the eastern Filing 2 boundary, in accordance with the master traffic impact analysis.
- E. Jewell Ave exists today and forms the northern boundary of Filing 2. It will be widened to the south to complete the southerly half of the ultimate 6-lane cross-section in accordance with the master traffic impact analysis. The northerly half will be constructed by others.
- Harvest Rd is being constructed between E. Warren Ave and E. Jewell Ave in Filing 1 and forms the western boundary of Filing 2. No changes are proposed as part of Filing 2.

In addition, the following internal roadways are proposed:

- Road A is a local road that will extend east-west from Harvest Rd to Kewaunee St.
- Road B is a local road that will extend east-west from Road C (Irvington St) to Kewaunee St.
- Road C is the local road extension of Irvington St in Filing 1 north through Filing 2 to E. Jewell Ave.
- Road E is the local road extension of Jackson Gap St in Filing 1 north through Filing 2 to E. Jewell Ave. This connection was anticipated in the master traffic impact analysis.

Note: The master traffic impact analysis assumed a  $\frac{3}{4}$ -movement access along E. Jewell Ave at Jackson Gap St, between Harvest Rd and Kewaunee St. Based on discussions with City staff since completion of the master traffic impact analysis, Filing 2 is now planned to have Road E (Jackson Gap St) meet E. Jewell Ave at a right-in / right-out intersection. A second full-movement access is proposed at Road C, approximately 660 feet east of Harvest Rd. This intersection may be signalized in the future if signal warrants are met.

#### III.B. Filing 3

Filing 3 of the development is expected to extend Harvest Rd and Kewaunee St south to Yale Ave and complete Yale Ave in accordance with the master traffic impact analysis. These connections are included in the Filing 2 long-term future analysis based on the assumptions in the master traffic impact analysis.

## IV. BACKGROUND TRAFFIC CONDITIONS

Background traffic has been estimated for the short-term and long-term timeframes and accounts for existing traffic already using the transportation system, expected growth in the study area, and the addition of anticipated trips from surrounding developments. It does not include traffic generated from the Harvest Crossing Filing 2 development.

### IV.A. Short-Term Background Projections and Operations

The short-term background traffic reflects traffic growth to the year 2026, which is the year that Filing 2 of the Harvest Crossing development is anticipated to be completed. In general, traffic volumes at Harvest Rd and E. Jewell Ave were estimated to increase by approximately 11 percent (3.6 percent per year) over existing conditions. In addition to the projected growth, site generated trips from the Murphy Creek developments, as well as the Harvest Crossing Filing 1 development, were added to the site. Harvest Crossing Filing 1 volumes have been distributed to the network in accordance with the short-term distribution in the approved Harvest Crossing master traffic impact analysis. **Figure 4** shows the final short-term background volumes.

The short-term background scenario would add several intersections to the study area, in addition to the existing Jewell Ave & Harvest Rd intersection. The anticipated roadway geometry used at each intersection is based on the master traffic impact analysis and is described as follows:

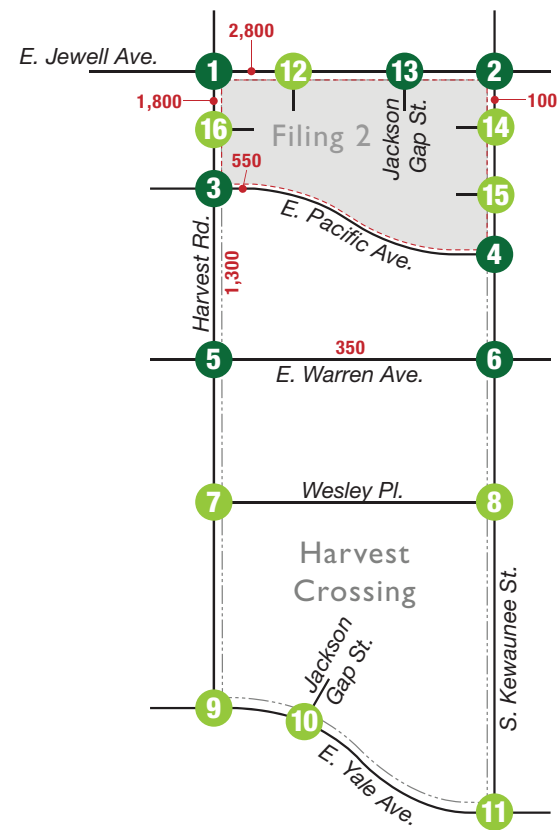
- **E. Jewell Ave & Harvest Rd** is an unsignalized four-leg intersection with two-way stop control on the north-south approaches. The southbound and westbound approaches each have one shared left/through/right lane, while the eastbound approach has an exclusive left turn lane and the northbound approach has both an exclusive left and right turn lane. Note: The eastbound approach has been built to its final 6-lane cross-section as part of Murphy Creek. Since the roadway to the east is not assumed to be complete in the Harvest Crossing short-term background scenario, single eastbound and westbound through lanes have been assumed. Further, due to a significant reduction in commercial square footage from the master study, the northbound approach has been reduced from double left turn lanes to a single left turn lane.
- **Harvest Rd & Pacific Dr** is an unsignalized four-leg intersection with two-way stop control on the east and west approaches. The east and westbound approaches share a single lane for all movements, while the north and southbound approaches each have an exclusive left turn lane.
- **Harvest Rd & Warren Ave** is an unsignalized four-leg intersection with two-way stop control on the east and west approaches. The east and westbound approaches share a single lane for all movements, while the north and southbound approaches each have an exclusive left turn lane.

Although Kewaunee St will be constructed between E. Pacific Ave and E. Jewell Ave as part of Filing 2, some background traffic from Filing 1 will use this connection once it is opened. Hence, it is included in the short-term background analysis to appropriately reflect Filing 1 trips. Similarly, Jackson Gap Street will be built with Filing 2, but has been included in the background to accurately reflect Filing 1 trips.

- **E Jewell Ave & Kewaunee St** is an unsignalized three leg intersection with a stop sign on the northbound approach. All approaches are assumed to have one shared lane for each movement.
- **Kewaunee & Pacific Ave** is an unsignalized T intersection with all approaches sharing a single lane.
- **Kewaunee St & Warren Ave** is an unsignalized three leg intersection with each approach sharing a single lane.

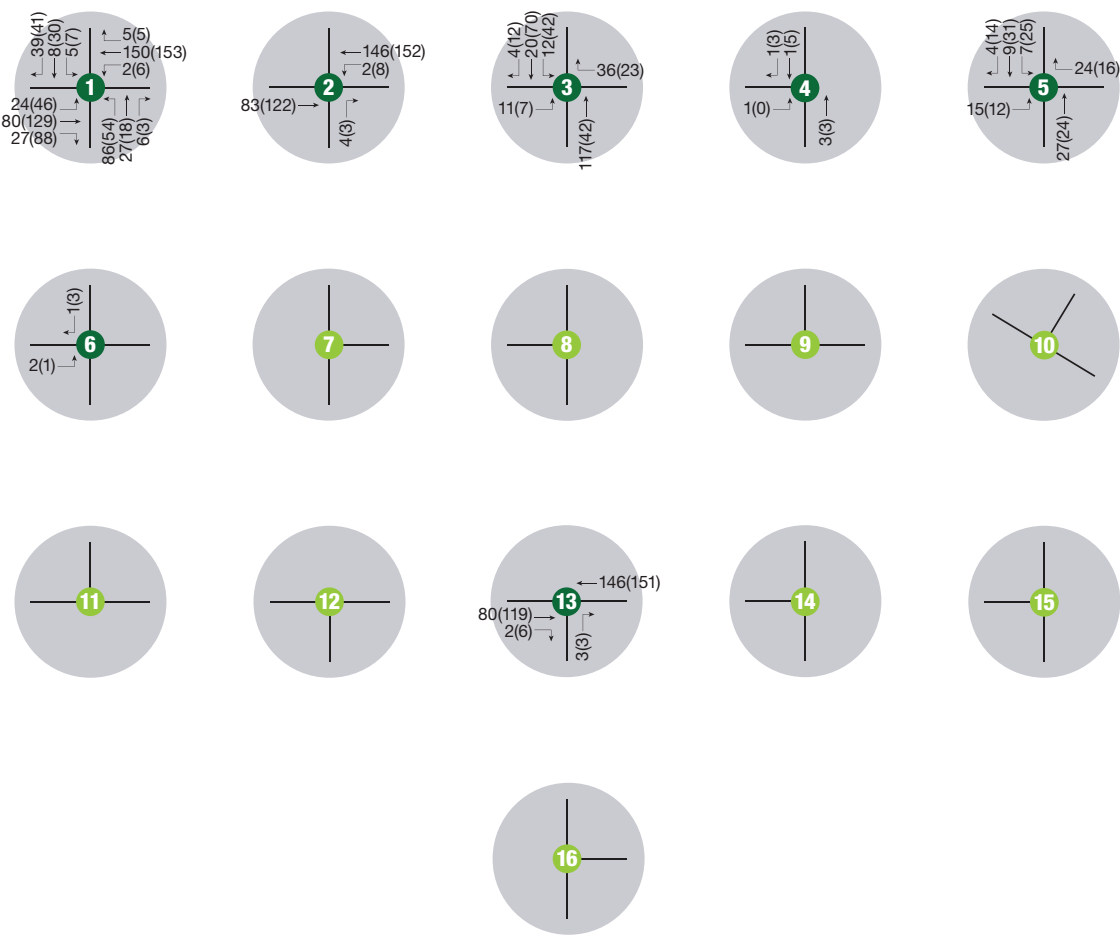
**Figure 5** presents the intersection operational results for the short-term background traffic projections. The individual movements at the unsignalized intersections all operate at LOS C or better.

KEY MAP

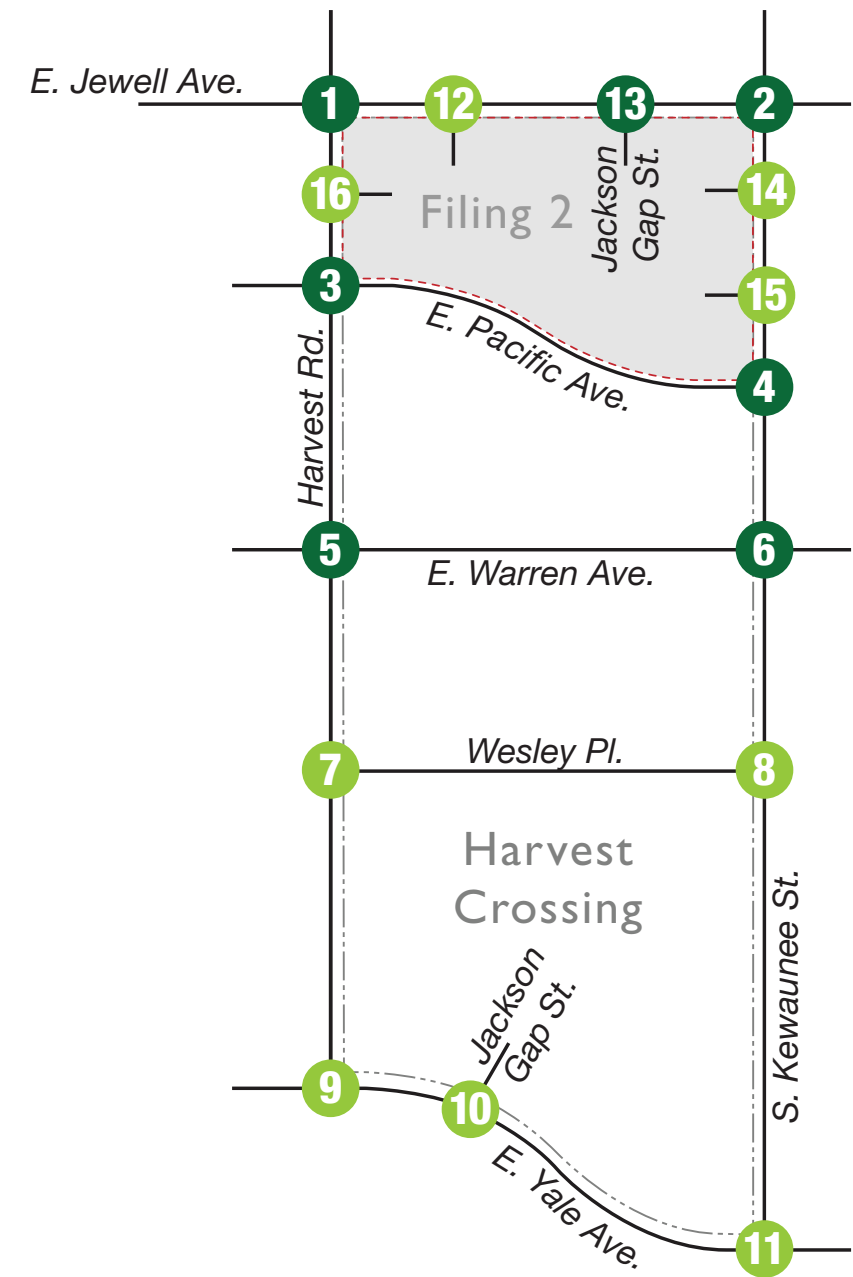


- LEGEND**
- xxx(xxx) = AM(PM) Peak Hour Traffic Volumes
  - XXXX = Daily Traffic Volumes
  - X = Future Intersection

NOTE: Drawing Not to Scale



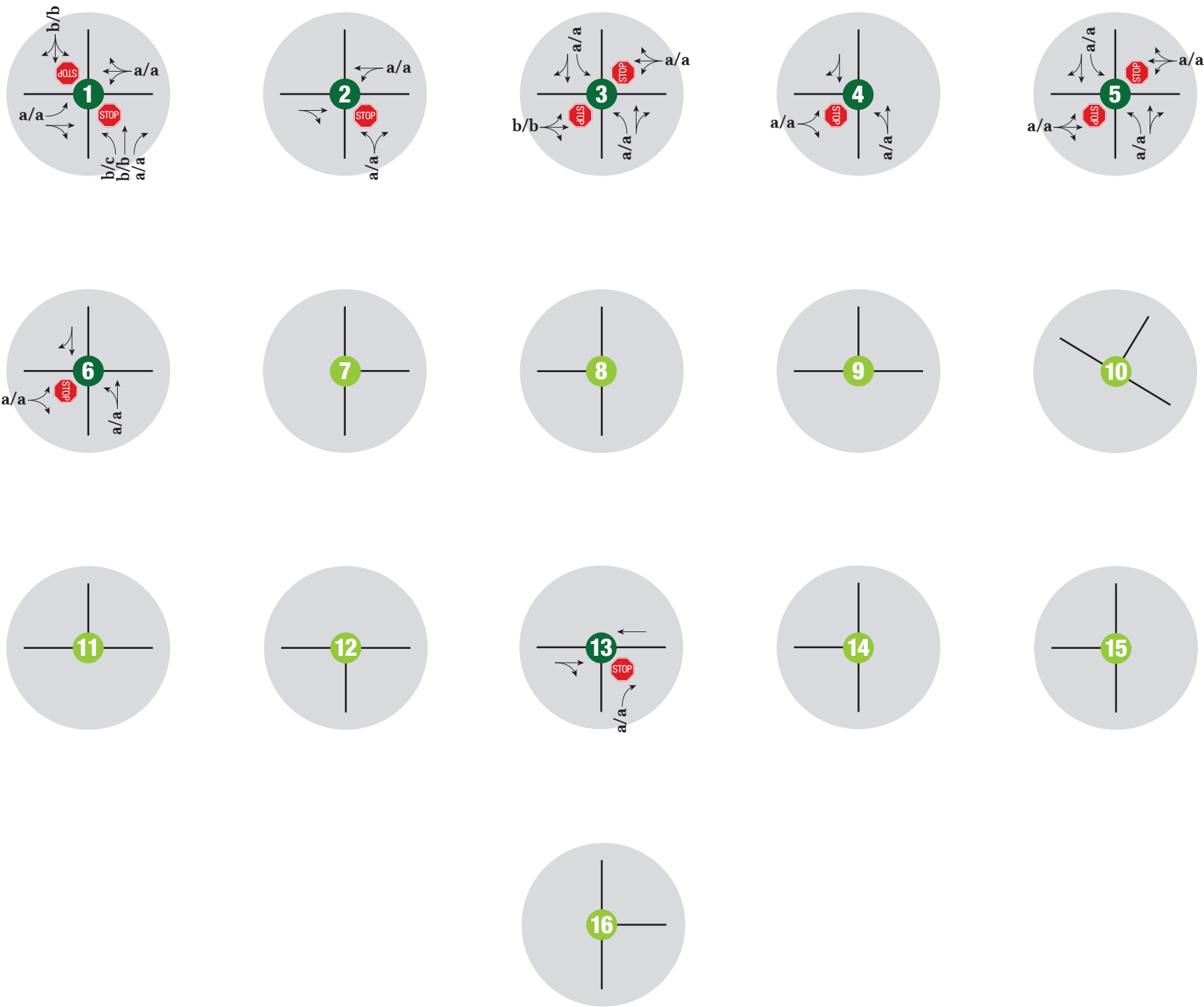
KEY MAP



**LEGEND**

- X/X = AM/PM Peak Hour Signalized Intersection Level of Service
- x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service
- STOP = Stop Sign
- Traffic Signal Icon = Traffic Signal
- X = Future Intersection

NOTE: Drawing Not to Scale



## IV.B. Long-Term Background Projections and Operations

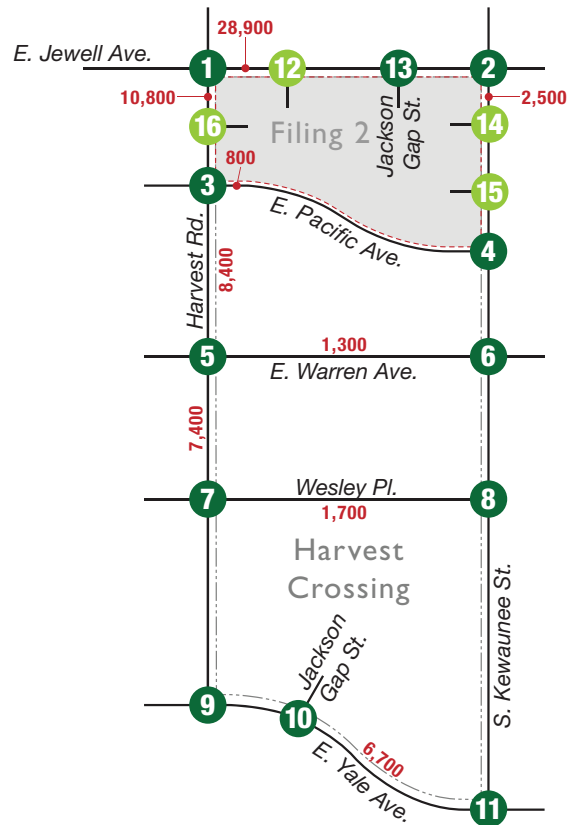
The long-term background traffic reflects traffic growth to the year 2040. The full buildout of the Harvest Crossing development is anticipated to be completed before 2040. Background volumes were extracted from the Harvest Crossing master traffic impact analysis, and then site generated trips from Murphy Creek East, Harvest Crossing Filing 1, and Harvest Crossing Filing 3 were added to represent projected 2040 conditions. The long-term background volumes are shown on **Figure 6**.

Similar to the short-term condition, both Filing 1 and Filing 3 volumes have been distributed through the network in accordance with the long-term distribution in the approved Harvest Crossing master traffic impact analysis.

The anticipated long-term background geometry used at the intersections along Harvest Rd south of Jewell Avenue was obtained from the master traffic impact analysis. Kewaunee St was assumed to be a 2-lane local street per the master traffic impact analysis. The various long-term geometric conditions are described as follows:

- **E. Jewell Ave and Harvest Rd** is a signalized four-leg intersection with the following geometry. The eastbound approach has two left turn lanes, two thru lanes, and a shared thru/right lane. The westbound approach has one left turn lane, three thru lanes, and a right turn lane. The northbound approach has a left turn lane, a thru lane, and a right turn lane. The southbound approach has two left turn lanes, a thru lane, and a right turn lane. It should be noted that due to a significant reduction in commercial square footage from the master study, the northbound approach has been reduced from double left turn lanes to a single left turn lane.
- **Harvest Rd and Pacific Dr** is an unsignalized four-leg intersection with two-way stop control on the east and west approaches. All approaches have a single left/thru/right lane.
- **Harvest Rd and Warren Ave** is an unsignalized four-leg intersection with two-way stop control on the east and west approaches. All approaches have a single left/thru/right lane.
- **Kewaunee St and Warren Ave** is an unsignalized four-leg intersection with two-way stop control on the east and west approaches. The easterly leg is anticipated to serve the undefined development east of Harvest Crossing. All approaches have a single left/thru/right lane.
- **Harvest Rd and Wesley Pl** is an unsignalized four-leg intersection with two-way stop control on the east and west approaches. All approaches have a single left/thru/right lane.
- **Kewaunee St and Wesley Pl** is an unsignalized three-leg intersection with two-way stop control on the west approach. All approaches have a single left/thru/right lane.
- **Harvest Rd and E. Yale Ave** is a three-leg single-lane roundabout. West of Harvest Rd, E. Yale Ave is anticipated to connect to Gun Club Rd, increasing volumes along E. Yale Ave and driving the need for the roundabout.
- **Jackson Gap St and E. Yale Ave** is an unsignalized three-leg intersection with side street stop control on the Jackson Gap St approach. All approaches have one lane for all movements.
- **Kewaunee St and E. Yale Ave** is an unsignalized three-leg intersection with side street stop control on the Kewaunee St approach. All approaches have one lane for all movements.
- **E. Jewell Ave and Kewaunee St** is a signalized four-leg intersection with the following geometry. The eastbound approach has one left turn lane, two thru lanes, and a shared thru/right turn lane. The westbound approach has one left turn lane, two thru lanes, and a shared thru/right turn lane. The northbound approach has a left turn lane, two thru lanes, and a shared thru/right turn lane. The southbound approach has a left turn lane and a shared thru/right lane.

## KEY MAP



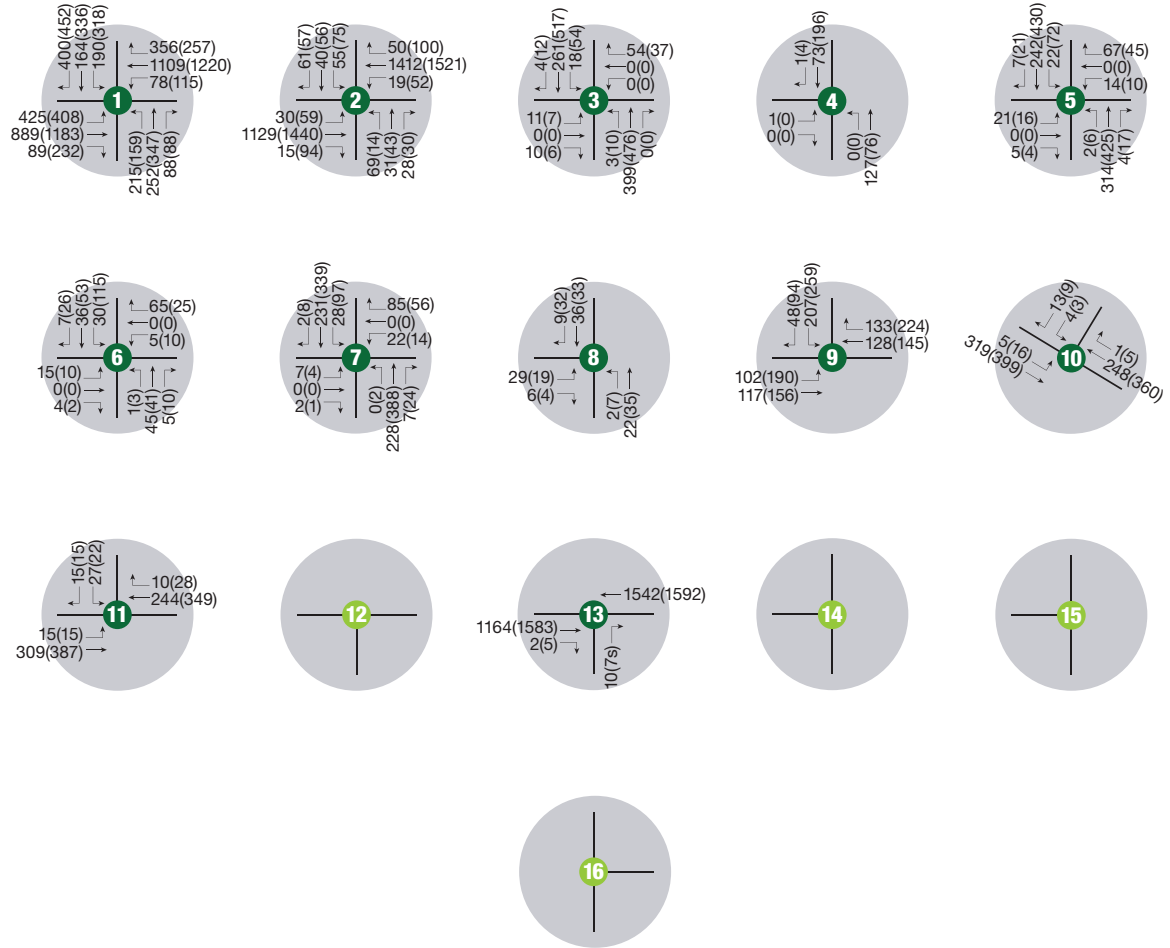
### LEGEND

xxx(yyy) = AM(PM) Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes

X = Future Intersection

NOTE: Drawing Not to Scale



**Figure 7** presents the intersection operational results for the long-term background traffic projections. Note: The intersections of Jewell Ave with Harvest Rd and Kewaunee St are assumed to be signalized by the long-term scenario. Further detail of the signal warrant analyses is contained in the following section. All of the intersections, both signalized and unsignalized, evaluated in this study operate at or above City LOS standards in the long-term background scenario. **Appendix E** summarizes the short-term and long-term background LOS results.

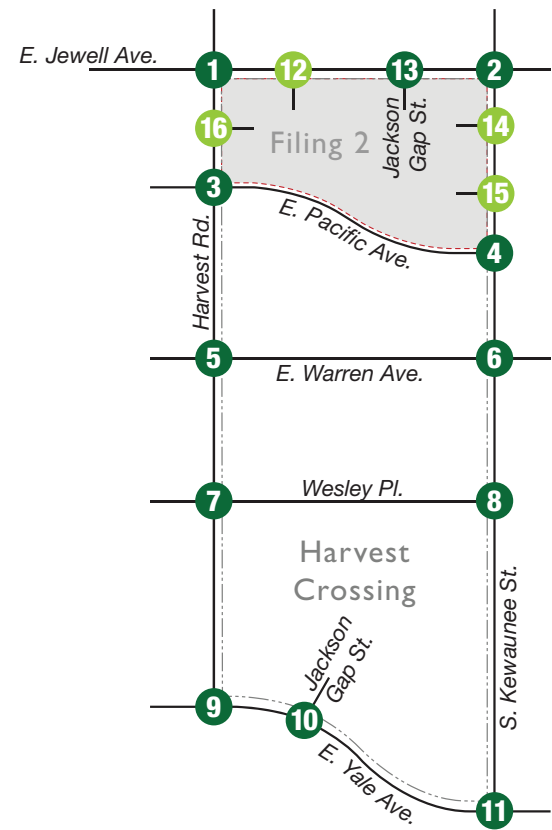
### ***Traffic Signalization Warrant Analyses – Long-Term***

The *Manual on Uniform Traffic Control Devices* (MUTCD) identifies eight warrants that provide guidance to determine whether installation of a traffic signal is justified. Some of these warrants are based on traffic volume levels, while others are based on the accident history of an intersection or whether the intersection is a designated school crossing. The master traffic impact analysis conducted a long-term scenario warrant analysis and recommends monitoring this location for signalization between the short-term and long-term scenarios.

Based on the volumes calculated herein, the intersections of Jewell Ave with Kewaunee St and Harvest Rd would meet the eight-hour volume, four-hour volume, and peak hour volume warrants by the long-term background scenario. **Appendix E** contains signal warrant analysis results.



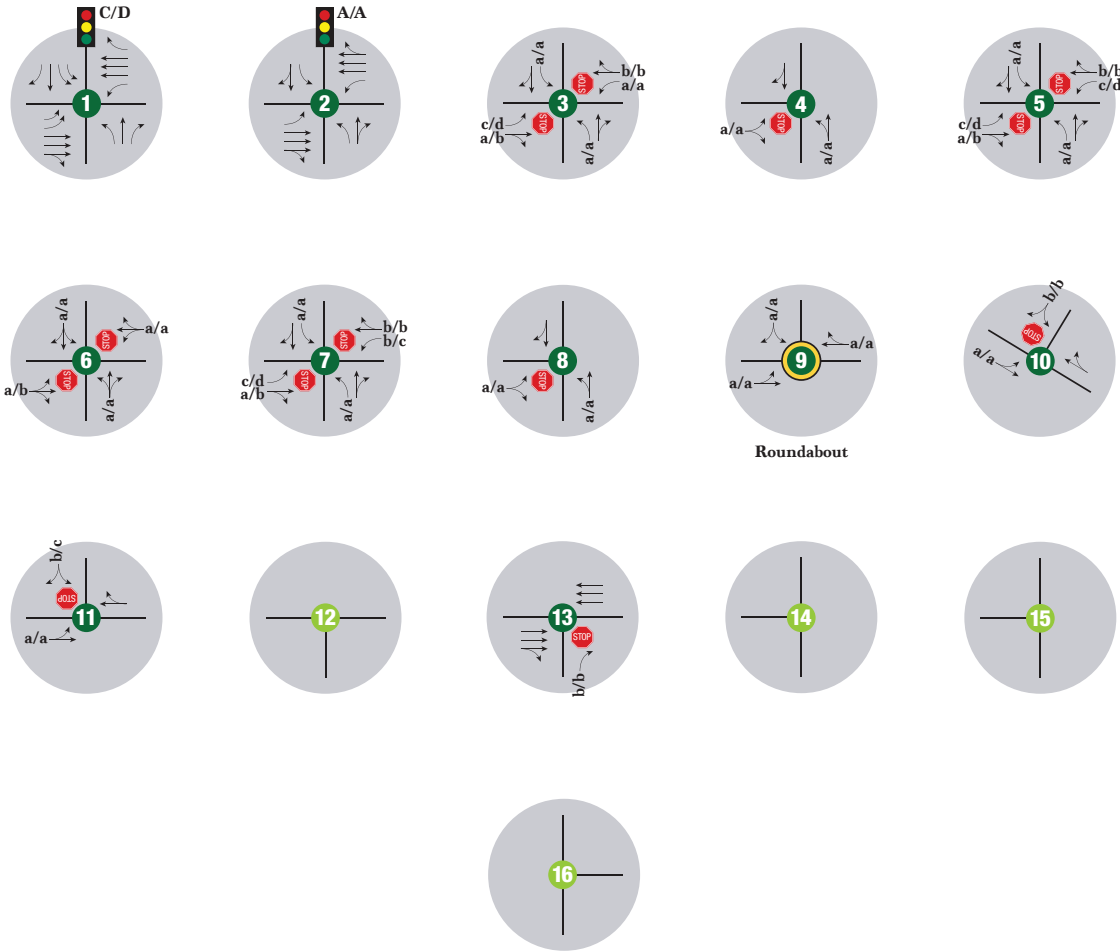
KEY MAP



LEGEND

- X/X = AM/PM Peak Hour Signalized Intersection Level of Service
- x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service
- STOP = Stop Sign
- Traffic Signal = Traffic Signal
- X = Future Intersection

NOTE: Drawing Not to Scale



## V. PROJECTED CONDITIONS

The proposed Harvest Crossing development will consist of residential and commercial land uses. The following subsections describe the proposed development and how it is anticipated to interact with the adjacent street network.

### V.A. Site Trip Generation

The number of vehicle-trips that will be generated by the proposed development was forecast based on trip rates and procedures documented in *Trip Generation* (Institute of Transportation Engineers, 11<sup>th</sup> Edition, 2021). The categories used in this analysis include Single Family Detached Housing (ITE land use code 210), Single Family Attached Housing (ITE Land Use Code 215), and two shopping center categories (ITE land use codes 821 and 822). Land use code 821 is used for small shopping plazas of 40k sf to 150k sf; whereas land use code 822 is used for small strip plazas of less than 40k sf.

**Table 1** summarizes the trip generation rates, and **Table 2** includes trip generation estimates by phases developed for purposes of traffic assignment.

**Table 1. Trip Generation Rates**

Land Use	LUC Code	Daily	AM	Distribution	PM	Distribution
Single Family Detached	210	$T = X * 9.43$	$T = X * 0.7$	In: 25%	$T = X * 0.94$	In: 63%
				Out: 75%		Out: 37%
Single Family Attached	215	$T = X * 7.2$	$T = X * 0.48$	In: 25%	$T = X * 0.57$	In: 59%
				Out: 75%		Out: 41%
Shopping Plaza	821	$T = X * 67.52$	$T = X * 1.73$	In: 62%	$T = X * 5.19$	In: 49%
				Out: 38%		Out: 51%
Strip Retail Plaza	822	$T = X * 54.45$	$T = X * 2.36$	In: 60%	$T = X * 6.59$	In: 50%
				Out: 40%		Out: 50%

Filing 2 is anticipated to include 138 single family detached DUs, 89 single family attached DUs, and 76,500 square feet of commercial space, with 54,500 square feet in Tract A and 22,000 square feet in Tract B. It should be noted that for a conservative estimate within this study, 140 single family detached and 90 single family attached dwelling units were used for analyses. The total buildout scenario includes 824 single family detached DUs and 76,500 square feet of commercial land use. Although limited internal capture may occur between some commercial land uses and residential units, this study did not adjust trips for internal capture as the nature of the commercial land use is unknown. Similarly, no pass-by trip credits were taken for the commercial area due to the unknown nature of the commercial land use.

In total, the entire Harvest Crossing development is estimated to generate approximately 703 trips during the AM peak hour, 1,168 trips during the PM peak hour, and 12,446 trips per day. This represents a reduction of overall trips from the master traffic impact analysis. The reduction is due to the changes in land uses (and particularly a reduction in commercial space) and minor changes in ITE trip generation rates between the 10<sup>th</sup> Edition and the 11<sup>th</sup> Edition. Of these trips, the Filing 2 development is anticipated to contribute 288 trips in the AM, 610 trips in the PM, and 6,846 trips per day. Filing 2 contributes approximately 41 to 55 percent of the overall Harvest Crossing trips generated.

**Table 2. Trip Generation Estimates**

	Land Use	LUC Code	Quantity	Units	Daily Trips	AM Peak Hour Trips*			PM Peak Hour Trips*		
						In	Out	Total	In	Out	Total
Filing 1	Single Family Detached	210	145	DU	1,367	25	76	101	86	51	137
Background Trips					1,367	25	76	101	86	51	137
Filing 2	Single Family Detached (north of Pacific)	210	140	DU	1,320	25	74	99	83	49	132
	Single Family Attached	215	90	DU	648	11	32	43	30	21	51
	Commercial (north of Pacific)	821	54.5	KSF	3,680	58	36	94	139	144	283
		822	22	KSF	1,198	31	21	52	72	72	144
Filing 2 Trips					6,846	125	163	288	324	286	610
Total Trips (Short-Term)					8,213	150	239	389	410	337	747
Filing 3	Single Family Detached (south of Warren)	210	449	DU	4,233	79	235	314	266	155	421
Trips from Future Phases					4,233	79	235	314	266	155	421
Total Trips (Long-Term)					12,446	229	474	703	676	492	1,168
*Peak hour trips were calculated using the 11 <sup>th</sup> edition of the ITE <i>Trip Generation Manual</i> and are based on peak hour of adjacent street.											

## **V.B. Trip Distribution and Traffic Assignment**

The external trips generated by the site were assigned to the study area roadway network using percentages of trips expected to travel in different directions to/from the site. Trip distribution percentages were carried forward from the master traffic impact analysis. The distributions differed for short-term and long-term given the development of the roadway network timelines associated with each phase of development. Directional distributions for site-generated trips are illustrated on **Figure 8** and **Figure 9** and are described as follows:

### **Short-Term**

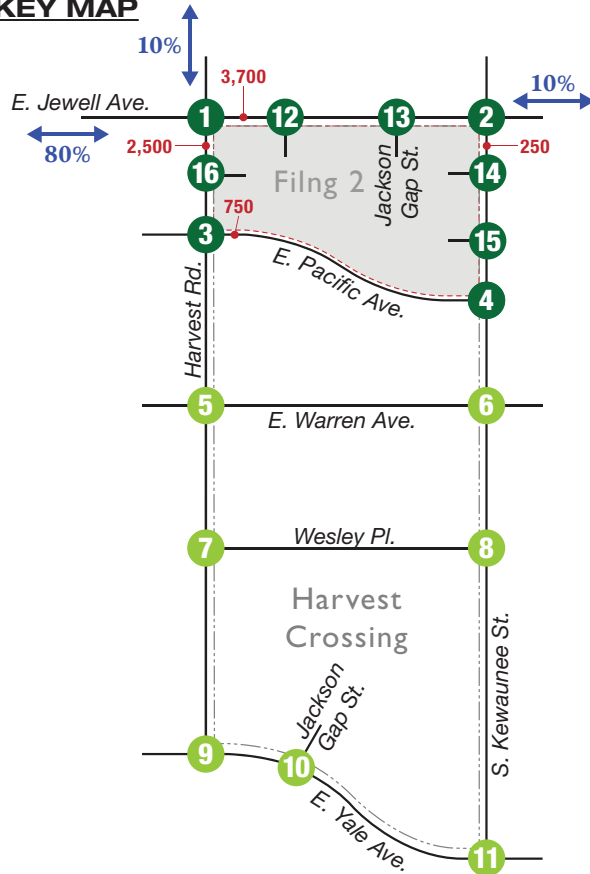
- 80 percent to/from the west on E. Jewell Ave (west of Harvest Rd)
- 10 percent to/from the east on E. Jewell Ave (east of Kewaunee St)
- 10 percent to/from the north on Harvest Rd (north of E. Jewell Ave)

### **Long-Term**

- 40 percent to/from the west on E. Jewell Ave (west of Harvest Rd)
- 15 percent to/from the north on Harvest Rd (north of E. Jewell Ave)
- 15 percent to/from the west on Yale Ave (west of Harvest Rd)
- 10 percent to/from the east on E. Jewell Ave (east of Kewaunee St)
- 5 percent to/from the north on Kewaunee St (north of E. Jewell Ave)
- 5 percent to/from the east on Yale Ave (east of Kewaunee St)

The peak hour site generated traffic volumes were assigned to the roadway network and site access points based on these trip distribution percentages. **Figure 8** and **Figure 9** show the trip distribution and the estimated site generated traffic for the proposed development for both planning horizons.

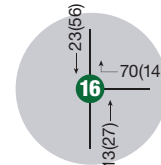
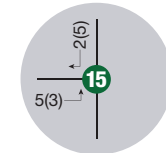
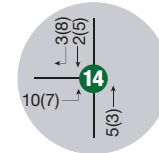
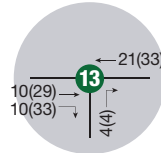
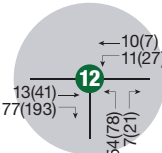
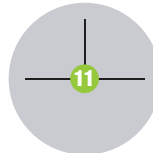
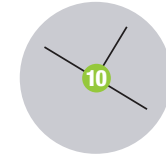
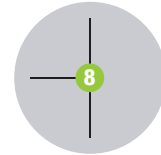
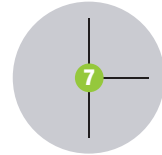
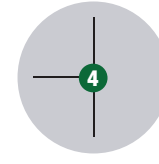
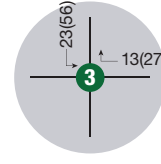
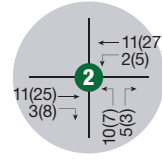
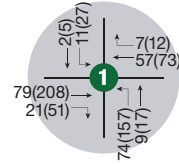
## KEY MAP



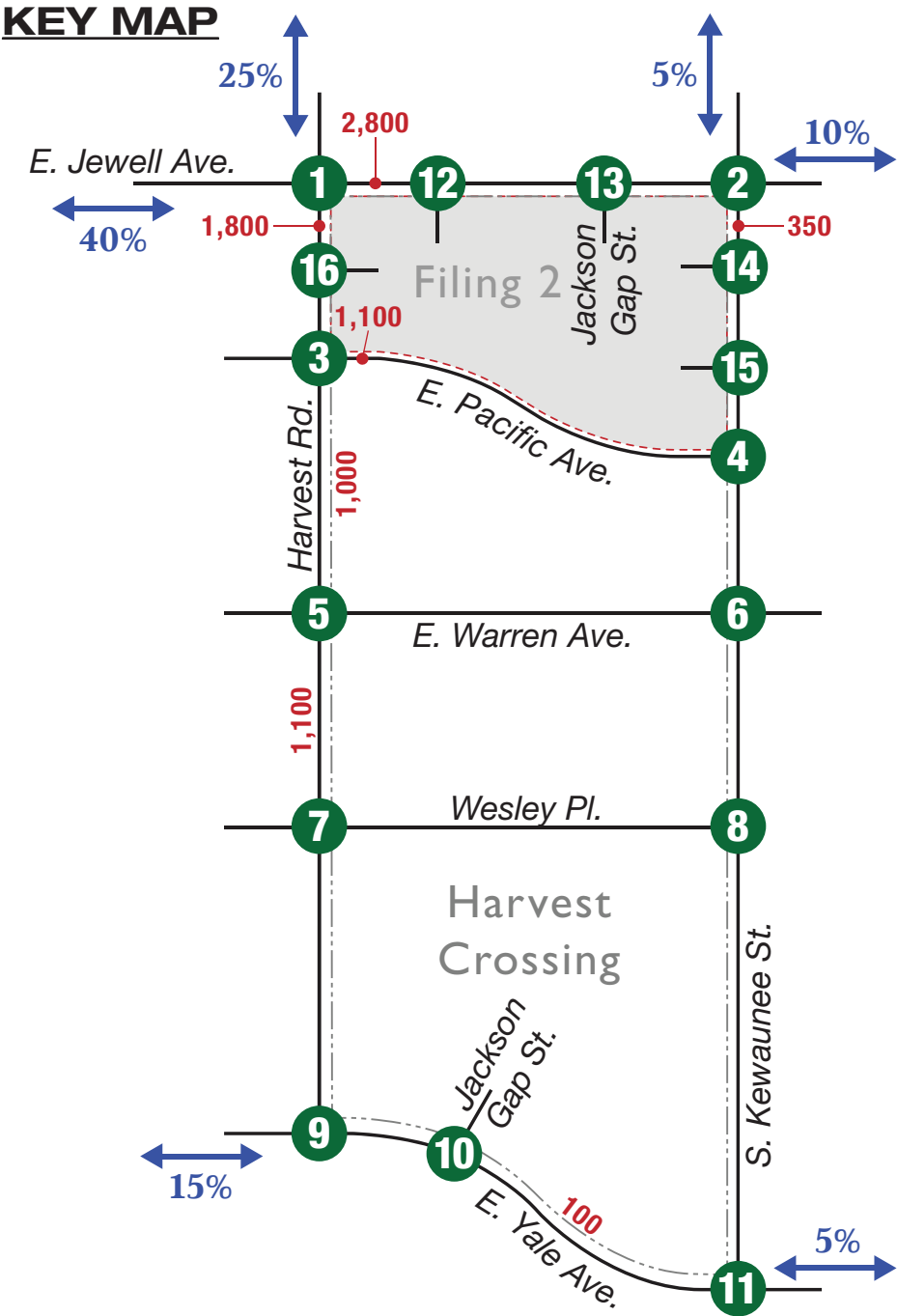
### LEGEND

- xxx(xxx) = AM(PM) Peak Hour Traffic Volumes
- XXXX = Daily Traffic Volumes
- XX% = Site Trip Distribution
- X = Future Intersection

NOTE: Drawing Not to Scale

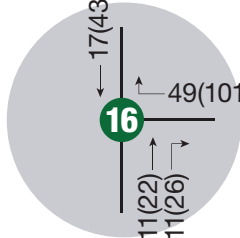
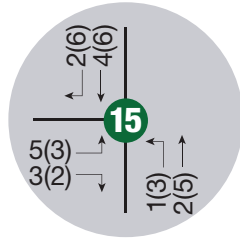
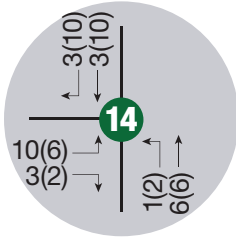
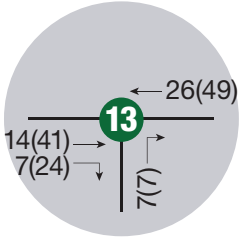
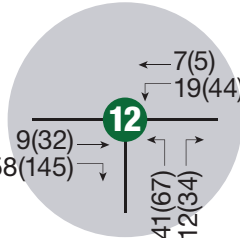
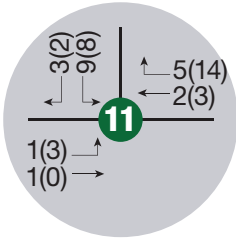
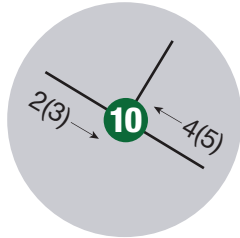
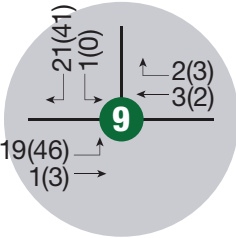
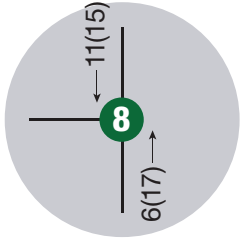
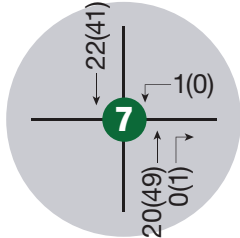
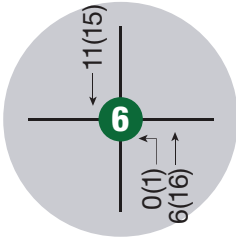
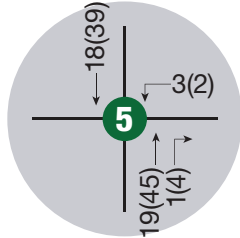
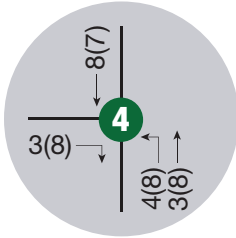
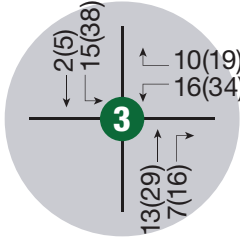
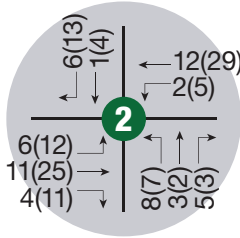
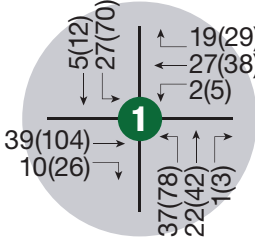


KEY MAP



- LEGEND**
- xxx(xxx) = AM(PM) Peak Hour Traffic Volumes
  - XXXX = Daily Traffic Volumes
  - XX% = Site Trip Distribution

NOTE: Drawing Not to Scale



## VI. TOTAL TRAFFIC CONDITIONS

The external site generated traffic was added to the short-term (2026) and long-term background (2040) volumes to develop total traffic volumes. These total traffic scenarios were then evaluated to determine LOS and project-related operational affects. LOS worksheets are shown in **Appendix D**.

### VI.A. Short-Term Total Projections and Operations

The short-term total traffic reflects traffic estimates for the short-term timeframe (year 2026), including short-term background traffic and trips generated from the Harvest Crossing Filing 2 development. These volumes are shown on **Figure 10**.

**Figure 11** presents the intersection operational results for the short-term total traffic projections. All signalized intersections and unsignalized movements are projected to operate at LOS D or better. It should be noted that the intersection of Jewell Ave with Harvest Rd is anticipated to meet signal warrants by this timeframe and should be monitored for signalization. The following section details the signal warrant analysis.

#### *Traffic Signalization Warrant Analyses – Short-Term*

The master traffic impact analysis assumed a signal would be warranted by 2026 at the intersection of E. Jewell Ave and Harvest Rd. Based on the volumes calculated herein, this intersection would meet the eight-hour volume, four-hour volume, and peak hour volume warrants by the short-term total scenario. However, the intersection does not warrant a signal under 2026 background conditions. A signal is anticipated to be warranted shortly before the completion of Filing 2. Further, it is anticipated that intersection 12, Jewell Avenue with Irvington Street, would warrant signalization with development to the north; however, volume associated with this development are not anticipated to warrant signalization at this intersection. **Appendix E** contains signal warrant analysis results.

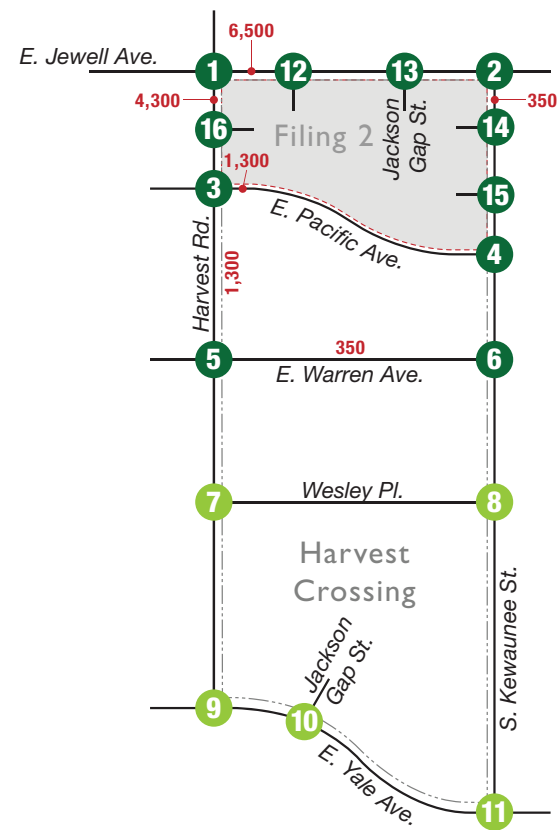
#### *Internal Intersection Controls – Short-Term*

The local street network internal to the Filing 2 site was not analyzed for operations. The peak hour volumes are very low (typically less than 100 vehicles per hour), which is normal for local residential streets within subdivisions. The following intersection controls are assumed based on internal connectivity and geometric layouts:

- Stop control for S Irvington St approaching Pacific Ave and Jewell Ave
- Stop control for Jackson Gap St approaching E. Pacific Ave and Jewell Ave
- Stop control for northern site access approaching Irvington St, Jackson Gap St, and Kewaunee St
- Stop control for southern site access approaching Irvington St, Jackson Gap St, and Kewaunee St
- Stop control for southern site access right in/right out approaching Harvest Rd

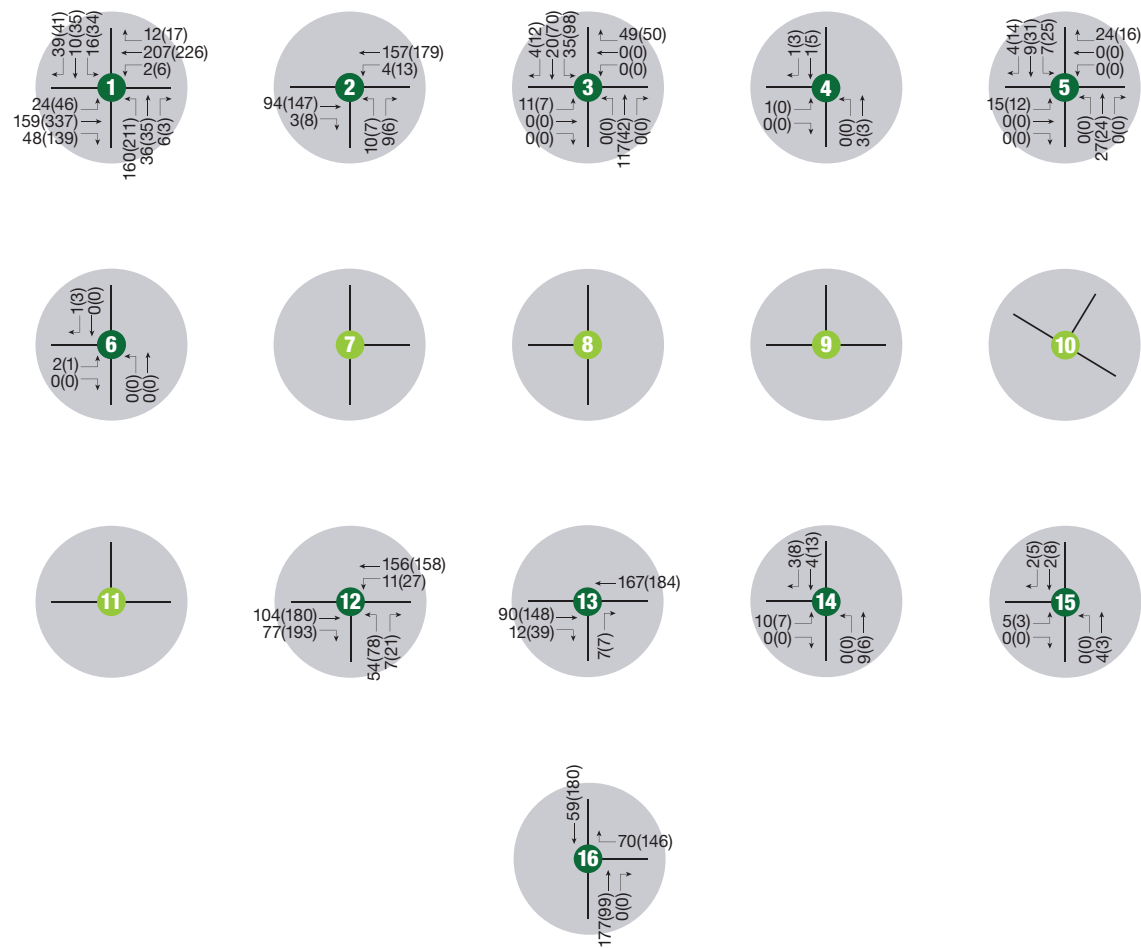
No turn lanes are assumed at these internal intersections.

KEY MAP



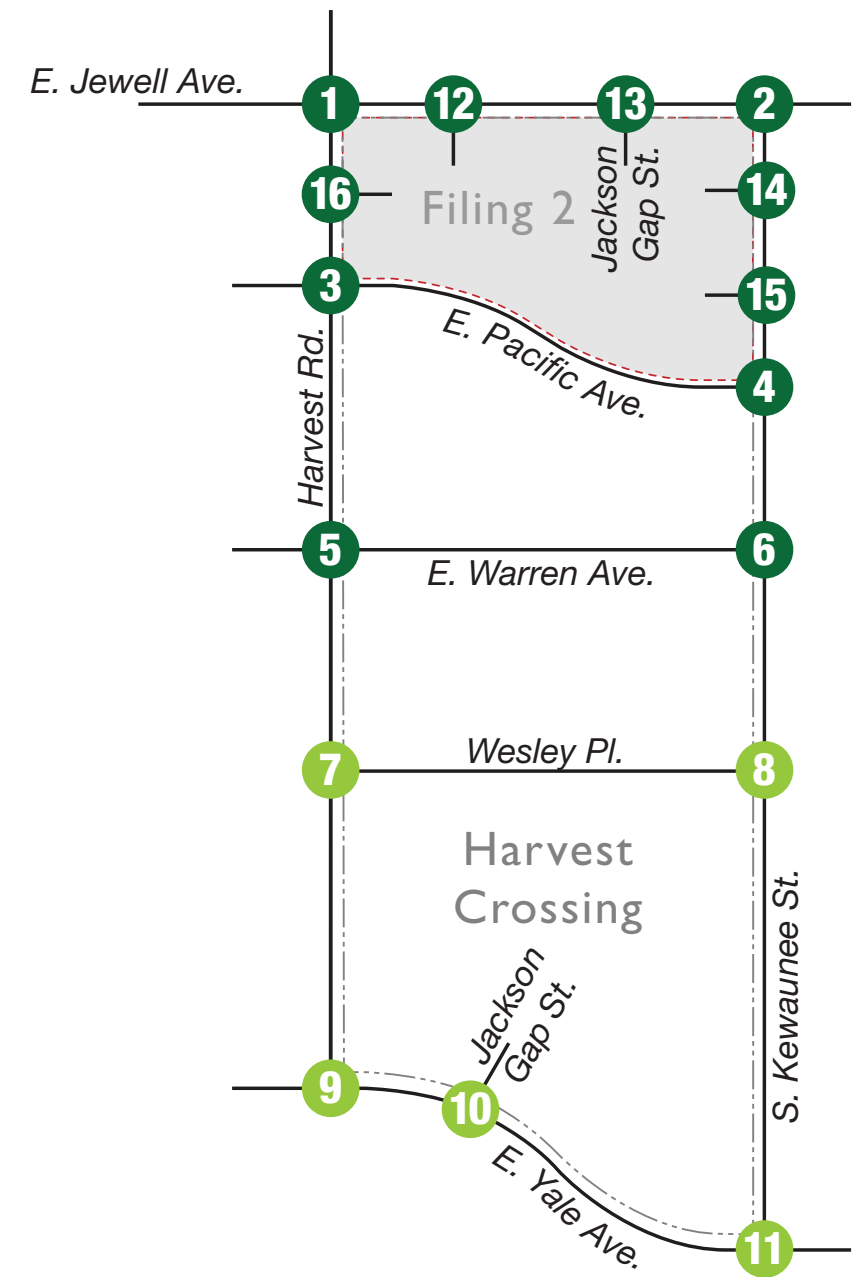
- LEGEND**
- xxx(yyy) = AM(PM) Peak Hour Traffic Volumes
  - XXXX = Daily Traffic Volumes
  - X = Future Intersection

NOTE: Drawing Not to Scale



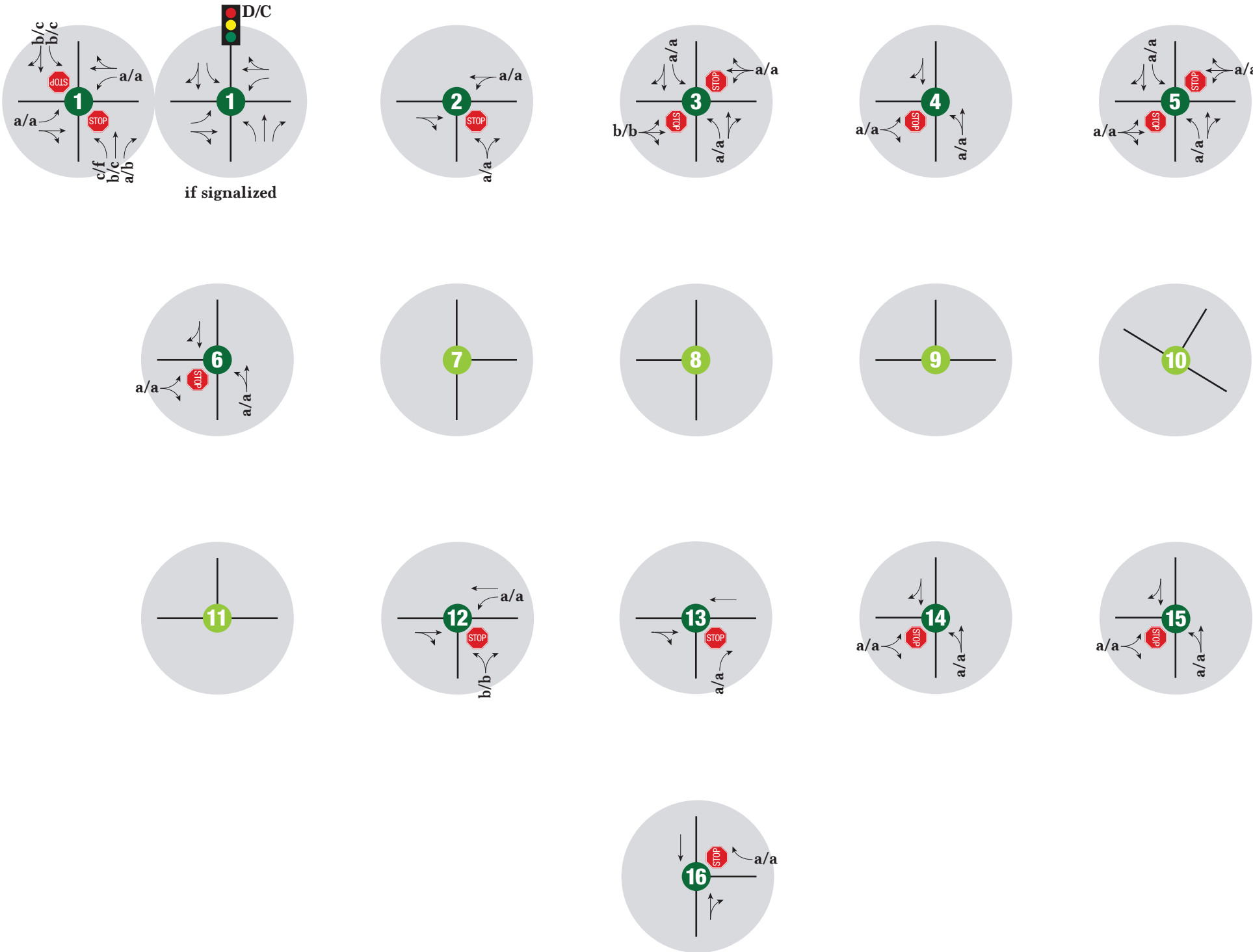


KEY MAP



- LEGEND**
- X/X = AM/PM Peak Hour Signalized Intersection Level of Service
  - x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service
  - STOP = Stop Sign
  - Traffic Signal = Traffic Signal
  - X = Future Intersection

NOTE: Drawing Not to Scale



## **VI.B. Long-Term Total Projections and Operations**

The long-term total traffic reflects traffic estimates for the long-term timeframe (year 2040), including long-term background traffic and trips generated from the Harvest Crossing Filing 2 development. These volumes are shown on **Figure 12**. It should be noted that a large reduction in the commercial square footage of this development has led to reduced trips and laneage at the northbound approach at the intersection of Harvest Road with Jewell Avenue.

**Figure 13** presents the intersection operational results for the long-term total traffic projections. The individual movements and overall intersection operations are projected to operate with acceptable LOS (LOS D and better) with the exception of the following:

### **Harvest Road & Pacific Avenue**

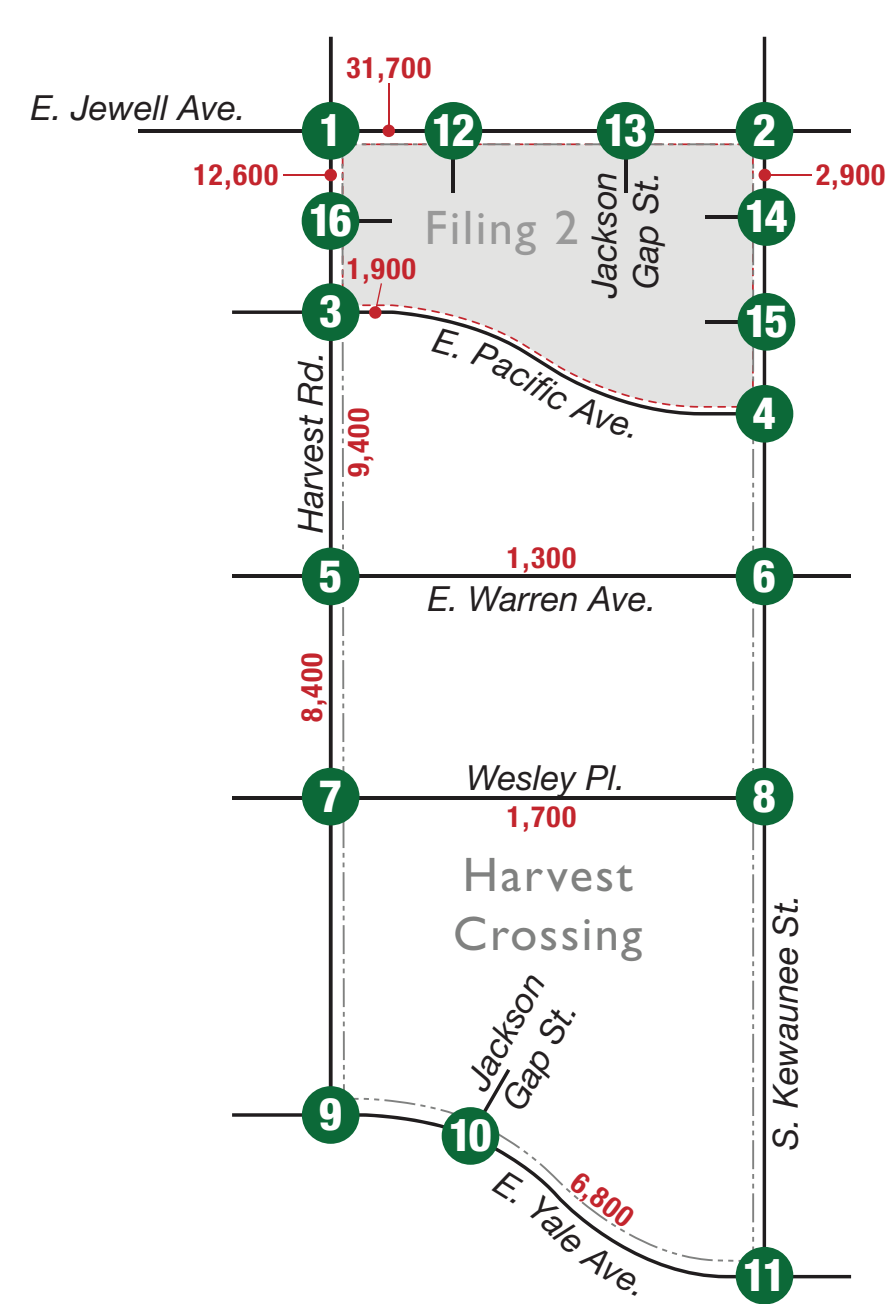
- The eastbound left turn operates at LOS E in the PM peak hour.
- The westbound left turn operates at LOS F in the PM peak hour.

### **Harvest Road / Warren Avenue**

- The eastbound left turn operates at LOS E in the PM peak hour.

Note: These operational analyses assumed signalization of the intersection of Jewell Ave with Kewaunee St and Harvest Rd as outlined in the long-term background condition. **Appendix F** summarizes all study intersections and the anticipated LOS results for both the short- and long-term scenarios. **Appendix D** contains LOS worksheets for both the short- and long-term scenarios.

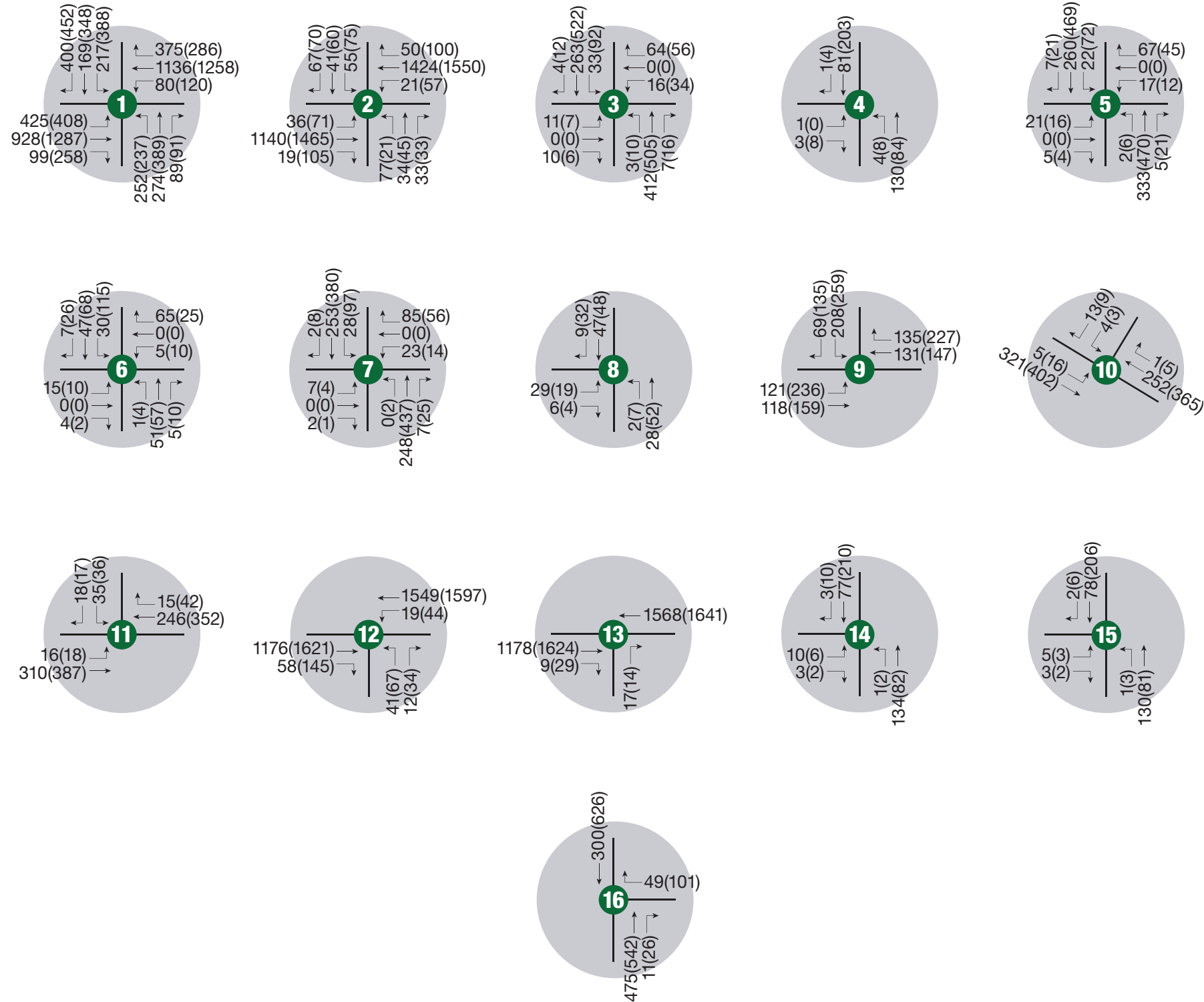
KEY MAP



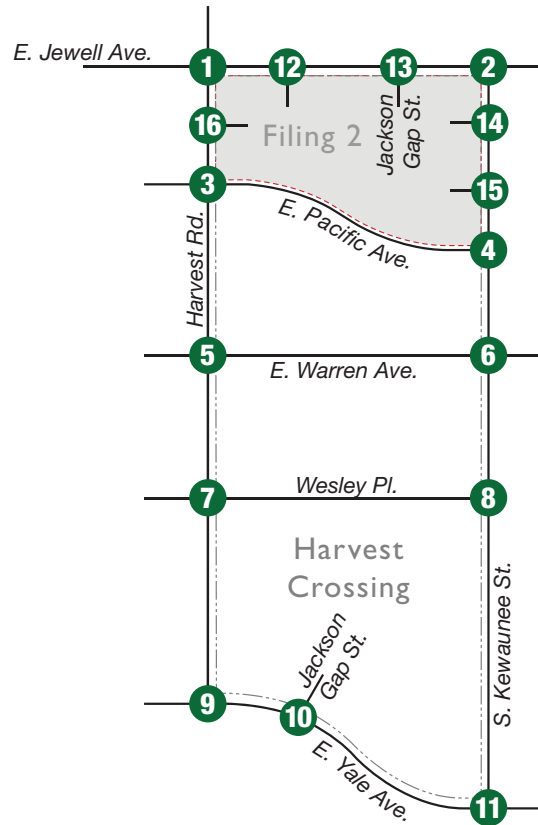
**LEGEND**

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

XXXX = Daily Traffic Volumes




## KEY MAP




### LEGEND

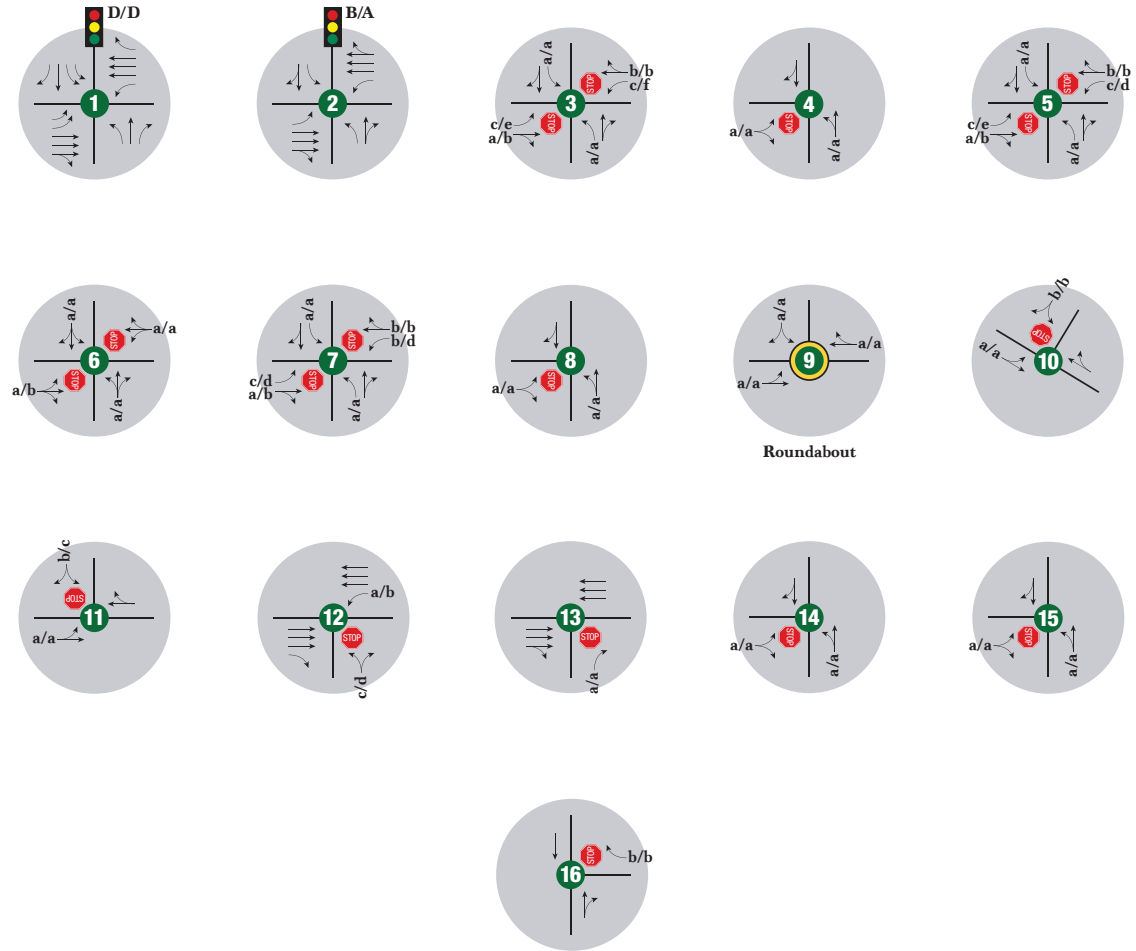
X/X = AM/PM Peak Hour Signalized Intersection Level of Service

x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service

 = Stop Sign

 = Traffic Signal

NOTE: Drawing Not to Scale



***Other Mitigations***

Signalization of the E. Jewell Ave / Harvest Rd intersection will address identified operational issues at that location. The signal is reasonably anticipated in Aurora's long-range planning efforts and is shown to be warranted in the master traffic impact analysis. The remaining operational issues are addressed as follows:

- The eastbound and westbound left-turn movements at the Pacific Ave / Harvest Rd intersection are expected to operate at LOS E and LOS F during the PM peak hour, respectively. The left turn volumes are low (less than 40 vehicles per hour in both peak periods), and the left turns operate from exclusive lanes. The recommended storage length for both the eastbound and westbound approach is 50 feet. This is not anticipated to interfere with nearby internal intersections. The poorly operating left-turn condition is common for left-turn movements from side streets onto collector roadways. Hence, no mitigations have been proposed.
- The eastbound left-turn movement at the Warren Ave / Harvest Rd intersection is expected to operate at LOS E during the PM peak hour. The left turn volumes are low at 16 vehicles per hour, and the left turn operates from an exclusive lane. The recommended storage length for this movement is 50 feet. This is not anticipated to interfere with nearby internal intersections. The poorly operating left-turn condition is common for left-turn movements from side streets onto collector roadways. Hence, no mitigations have been proposed.
- The E. Jewell Ave / Road C (Irvington St) intersection does not meet signal warrants solely with Harvest Crossing traffic. It is anticipated that future development north of E. Jewell Ave will eventually result in a signal being warranted at this location. Hence, it should be monitored for signalization.
- The E. Jewell Ave / Kewaunee St intersection does not meet signal warrants solely with Harvest Crossing traffic. It is anticipated that future development north of E. Jewell Ave and east of Kewaunee St will eventually result in a signal being warranted at this location. Hence, it should also be monitored for signalization.

### **Auxiliary Lane Requirements**

Auxiliary lanes were evaluated using two methodologies. First, 95<sup>th</sup> percentile queues were extracted directly from the project's Synchro software analyses. These queue lengths are based on projected operating conditions (including heavy vehicles, opposing traffic flows, and signal timings). Second, City of Aurora *Traffic Impact Study Guidelines* indicate that the Colorado Department of Transportation's *State Highway Access Code* (SHAC) should be used to determine storage and taper lengths. However, the SHAC procedures do not account for other conditions in the intersection such as low opposing through movements if a left-turn movement is in question. The project team evaluated these two sets of results to develop ultimate recommendations for auxiliary lanes. These recommendations for vehicle storage lengths (in feet) are presented in **Table 3** for use in identifying construction needs for Harvest Crossing.

Output from the traffic analysis effort was used to recommend these storage lengths, using the following methodology:

- **Left turn lane storage lengths.** At signalized intersections, the greater of the HCM 6<sup>th</sup> Edition or Synchro methodology queue calculations were reported. For unsignalized intersections, the HCM 6<sup>th</sup> Edition calculation was reported.
- **Through movements.** For signalized intersections, Synchro calculation results were reported. No through movement queues are reported for unsignalized intersections as the through movements are free flowing.
- **Right turn movements.** The Synchro queue length was used. HCM 6<sup>th</sup> Edition information was not used because HCM's signalized intersection methodology does not account for right turns on red.

The first column of queue lengths presented in **Table 3** is the long-term 95<sup>th</sup> percentile queue length results from Synchro/HCM, rounded up to the nearest 25 feet. These are shown for both AM and PM peak hours to account for directionality of traffic flows. These values are presented for all turn lanes included in the study except two-way left turn lanes. Generally, the higher of these two values is used for the storage length.

The second column of queue lengths presented in **Table 3** is the storage length recommendations from the SHAC. As noted previously, SHAC requirements are based on assumed arterial conditions. Hence, they have been applied to only the collector and arterial roadways, not local roadways. It was assumed E. Jewell Ave is classified as a NR-B Regional Highway operating at 40 mph adjacent to the project site, where a 12:1 transition taper ratio + storage length would be required. SHAC requirements for NR-C Arterials were applied to Harvest Rd, Yale Ave, and Warren Ave, and the operating speed was assumed to be 30 mph, where an 8:1 transition taper ratio + storage length would be required. The results of this evaluation are summarized in **Table 3**.

The final column in **Table 3** provides recommended auxiliary lane lengths along study area roadways based on results from both the 95<sup>th</sup> percentile and SHAC evaluations.

**Table 3. Year 2040 Intersection Auxiliary Lane Results**

Intersection	Movement	Existing Storage (ft)	95th Percentile Queue (ft)	SHAC Recommended Storage (ft)	Overall Recommended Storage (ft)
1. Harvest Rd & E Jewell Ave	EB Left	100	300	220	300
	EB Through	Continuous	Continuous	Continuous	Continuous
	EB Right	Continuous	Continuous	Continuous	Continuous
	WB Left	–	225	120	225
	WB Through	Continuous	Continuous	Continuous	Continuous
	WB Right	Continuous	Continuous	Continuous	Continuous
	NB Left	–	300	260	300
	NB Through	Continuous	Continuous	Continuous	Continuous
	NB Right	–	50	100	100
	SB Left	–	300	200	300
	SB Through	Continuous	Continuous	Continuous	Continuous
	SB Right	–	360	460	460
2. Kewaunee St & Jewell Avenue	EB Left	–	50	80	80
	EB Through	Continuous	Continuous	Continuous	Continuous
	EB Right	Continuous	Continuous	Continuous	Continuous
	WB Left	–	50	60	60
	WB Through	Continuous	Continuous	Continuous	Continuous
	WB Right	Continuous	Continuous	Continuous	Continuous
	NB Left	–	125	80	125
	NB Through/Right	Continuous	Continuous	Continuous	Continuous
	SB Left	–	125	80	125
	SB Through/Right	Continuous	Continuous	Continuous	Continuous
3. Harvest Rd & Pacific Ave	EB Left	–	50	40	50
	EB Through/Right	Continuous	Continuous	Continuous	Continuous
	WB Left	–	50	40	50
	WB Through/Right	Continuous	Continuous	Continuous	Continuous
	NB Left	–	50	40	50
	SB Left	–	50	100	100
4. Kewaunee St & Pacific Ave	EB Left/Right	Continuous	Continuous	Continuous	Continuous
	NB Left	Continuous	Continuous	Continuous	Continuous
5. Harvest Rd & Warren Ave	EB Left	–	50	40	50
	EB Through/Right	Continuous	Continuous	Continuous	Continuous
	WB Left	–	50	40	50
	WB Through/Right	Continuous	Continuous	Continuous	Continuous
	NB Left	–	50	40	50
	SB Left	–	50	80	80

Intersection	Movement	Existing Storage (ft)	95th Percentile Queue (ft)	SHAC Recommended Storage (ft)	Overall Recommended Storage (ft)
6. Kewaunee St & Warren Ave	EB Left/Through/Right	Continuous	Continuous	Continuous	Continuous
	WB Left/Through/Right	Continuous	Continuous	Continuous	Continuous
	NB Left/Through/Right	Continuous	Continuous	Continuous	Continuous
	SB Left/Through/Right	Continuous	Continuous	Continuous	Continuous
7. Harvest Rd & Wesley Pl	EB Left	–	50	40	50
	EB Through/Right	Continuous	Continuous	Continuous	Continuous
	WB Left	–	50	40	50
	WB Through/Right	Continuous	Continuous	Continuous	Continuous
	NB Left	–	50	40	50
	SB Left	–	50	100	100
8. Kewaunee ST & Wesley Pl	EB Left/Right	Continuous	Continuous	Continuous	Continuous
	NB Left/Through	Continuous	Continuous	Continuous	Continuous
9. Harvest Rd & Yale Ave	EB Left/Through	Continuous	Continuous	Continuous	Continuous
	WB Through/Right	Continuous	Continuous	Continuous	Continuous
	SB Left/Right	Continuous	Continuous	Continuous	Continuous
10. Yale Ave & Jackson Gap St	EB Left/Through	Continuous	Continuous	Continuous	Continuous
	SB Left/Right	Continuous	Continuous	Continuous	Continuous
11. Yale Ave & Kewaunee St	EB Left/Through	Continuous	Continuous	Continuous	Continuous
	SB Left/Right	Continuous	Continuous	Continuous	Continuous
12. Jewell Ave & Access	WB Left	-	50	50	50
	NB Left/Right	Continuous	Continuous	Continuous	Continuous
13. Jewell Ave & Jackson Gap St	NB Right	Continuous	Continuous	Continuous	Continuous
14. Kewaunee St & North Site Access	EB Left/Right	Continuous	Continuous	Continuous	Continuous
	NB Left/Through	Continuous	Continuous	Continuous	Continuous
15. Kewaunee St & South Site Access	EB Left/Right	Continuous	Continuous	Continuous	Continuous
	NB Left/Through	Continuous	Continuous	Continuous	Continuous
16. Harvest Rd & Access	WB Right	Continuous	Continuous	Continuous	Continuous



## VII. SUMMARY AND RECOMMENDATIONS

Harvest Crossing is a planned development encompassing approximately 200 acres in Aurora, Colorado. The site is located in the southeast quadrant of the Harvest Rd / E. Jewell Ave intersection and is directly east of the Murphy Creek East development. The proposed land uses include 145 single family dwelling units in Filing 1 and 260 single family dwelling units in Filing 2 (year 2026). The total buildout of 824 single family dwelling units and 76,500 square feet of commercial space is expected by 2040. The total buildout of the development is estimated to generate approximately 12,930 daily vehicle-trips per day.

Roadway classifications were based on the approved Harvest Crossing master traffic impact analysis. Traffic signals are anticipated to be installed at the major intersections, including:

- **E. Jewell Ave & Harvest Rd**, which is anticipated to meet warrants near the completion of Filing 2 in 2026. The developer should anticipate a 25 percent contribution to the signal construction at this location. It should be noted that, due to a significant reduction in commercial square footage from the master study, the northbound approach at this intersection has been reduced from a double to a single left turn lane.
- **E. Jewell Ave & Road C (Irvington St)**, was analyzed as a side-street stop-controlled intersection for the purposes of the analysis contained in this report and was found to operate acceptably. However, it is anticipated to meet warrants when development north of Harvest Crossing begins to occur. This development is currently unknown and therefore was not analyzed in this study. When development to the north occurs, the developer should anticipate a 50 percent contribution to the eventual signal construction at this location if the adjacent property develops in a way that meets those warrants.
- **E. Jewell Ave & Kewaunee St**, which is anticipated to meet warrants when development north and east of Harvest Crossing begins to occur. The developer should anticipate a 25 percent contribution to the eventual signal construction at this location.

Most of the studied intersections operate at LOS D or better in the short-term and long-term total traffic scenarios. The individual movements at the unsignalized intersection operate with acceptable LOS (LOS D and better) except for the following:

- Harvest Rd / Pacific Ave
  - The eastbound left-turn operates at LOS E in the PM peak hour.
  - The westbound left-turn operates at LOS F in the PM peak hour.
- Harvest Rd / Warren Ave
  - The eastbound left-turn operates at LOS E in the PM peak hour.

The study has also demonstrated that two means of egress can be provided during both Filing 2 and full buildout scenarios.

## APPENDIX A. EXISTING TRAFFIC COUNTS

**All Traffic Data Services**  
Wheat Ridge, CO 80033

Page 1

Site Code: 2  
Station ID: 2  
JEWELL AVE E.O. HARVEST RD

Start Time	13-Feb-20 Thu	EB	WB							Total
12:00 AM		5	17							22
01:00		3	8							11
02:00		7	3							10
03:00		6	4							10
04:00		21	1							22
05:00		74	21							95
06:00		86	69							155
07:00		59	120							179
08:00		65	63							128
09:00		45	56							101
10:00		38	52							90
11:00		34	52							86
12:00 PM		52	59							111
01:00		64	53							117
02:00		53	97							150
03:00		62	114							176
04:00		90	114							204
05:00		80	110							190
06:00		61	61							122
07:00		44	41							85
08:00		29	19							48
09:00		37	18							55
10:00		13	10							23
11:00		8	25							33
Total		1036	1187							2223
Percent		46.6%	53.4%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	86	120	-	-	-	-	-	-	179
PM Peak	-	16:00	15:00	-	-	-	-	-	-	16:00
Vol.	-	90	114	-	-	-	-	-	-	204
Grand Total		1036	1187							2223
Percent		46.6%	53.4%							
ADT		ADT 2,223	AADT 2,223							



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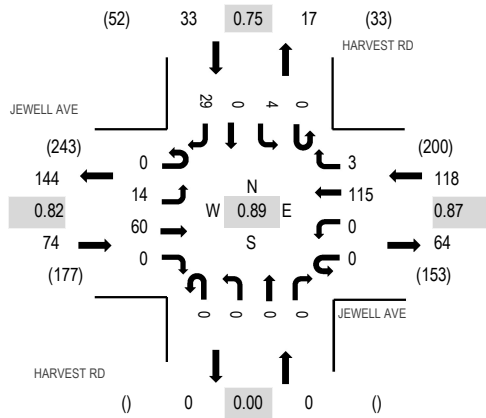
Location: 1 HARVEST RD & JEWELL AVE AM

Date: Thursday, February 13, 2020

Peak Hour: 06:45 AM - 07:45 AM

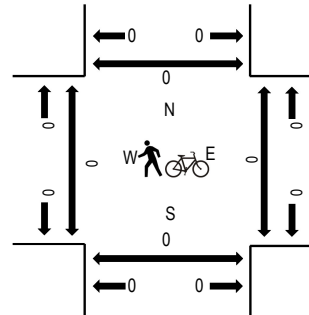
Peak 15-Minutes: 07:30 AM - 07:45 AM

### Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

### Peak Hour - Pedestrians/Bicycles on Crosswalk



### Traffic Counts

Interval Start Time	JEWELL AVE Eastbound				JEWELL AVE Westbound				HARVEST RD Northbound				HARVEST RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:30 AM	0	2	30	0	0	0	0	19	1	0	0	0	0	0	0	5	57	219	0	0	0	0
6:45 AM	0	4	22	0	0	0	0	29	0	0	0	0	0	1	0	4	60	225	0	0	0	0
7:00 AM	0	4	13	0	0	0	0	27	1	0	0	0	0	0	0	11	56	218	0	0	0	0
7:15 AM	0	4	9	0	0	0	0	25	2	0	0	0	0	0	0	6	46	210	0	0	0	0
7:30 AM	0	2	16	0	0	0	0	34	0	0	0	0	0	3	0	8	63	210	0	0	0	0
7:45 AM	0	1	18	0	0	0	0	29	0	0	0	0	0	0	0	5	53		0	0	0	0
8:00 AM	1	6	20	0	0	0	0	17	0	0	0	0	0	0	0	4	48		0	0	0	0
8:15 AM	0	5	20	0	0	0	0	15	1	0	0	0	0	1	0	4	46		0	0	0	0
Count Total	1	28	148	0	0	0	0	195	5	0	0	0	0	5	0	47	429		0	0	0	0
Peak Hour	0	14	60	0	0	0	0	115	3	0	0	0	0	4	0	29	225		0	0	0	0



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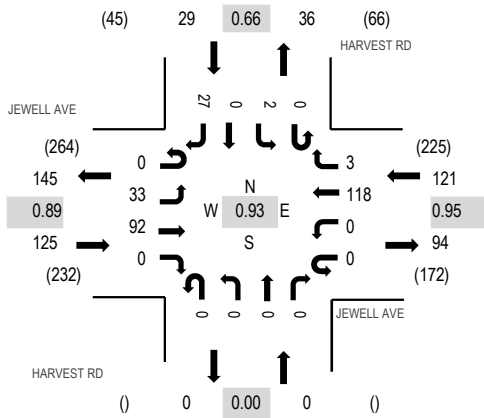
Location: 1 HARVEST RD & JEWELL AVE PM

Date: Thursday, February 13, 2020

Peak Hour: 04:30 PM - 05:30 PM

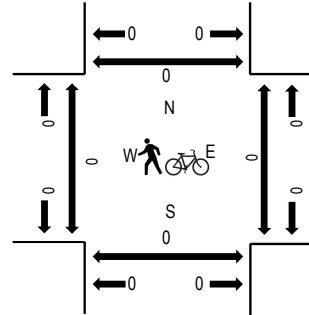
Peak 15-Minutes: 05:15 PM - 05:30 PM

### Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

### Peak Hour - Pedestrians/Bicycles on Crosswalk






### Traffic Counts

Interval Start Time	JEWELL AVE Eastbound				JEWELL AVE Westbound				HARVEST RD Northbound				HARVEST RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	4	19	0	0	0	0	27	0	0	0	0	0	0	0	4	54	251	0	0	0	0
4:15 PM	0	8	19	0	0	0	0	27	1	0	0	0	0	1	0	4	60	261	0	0	0	0
4:30 PM	0	5	30	0	0	0	0	32	0	0	0	0	0	1	0	5	73	275	0	0	0	0
4:45 PM	0	10	20	0	0	0	0	27	1	0	0	0	0	1	0	5	64	269	0	0	0	0
5:00 PM	0	9	19	0	0	0	0	29	1	0	0	0	0	0	0	6	64	251	0	0	0	0
5:15 PM	0	9	23	0	0	0	0	30	1	0	0	0	0	0	0	11	74		0	0	0	0
5:30 PM	0	11	23	0	0	0	0	30	0	0	0	0	0	0	0	3	67		0	0	0	0
5:45 PM	1	6	16	0	0	0	0	19	0	0	0	0	0	0	0	4	46		0	0	0	0
Count Total	1	62	169	0	0	0	0	221	4	0	0	0	0	3	0	42	502		0	0	0	0
Peak Hour	0	33	92	0	0	0	0	118	3	0	0	0	0	2	0	27	275		0	0	0	0

## APPENDIX B. EXISTING LEVEL OF SERVICE

HCM 6th TWSC  
1: Jewell Avenue & Harvest Road

Existing Conditions  
AM Peak

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	60	115	3	4	29
Future Vol, veh/h	14	60	115	3	4	29
Conflicting Peds, #/hr	0	0	0	0	4	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	87	87	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	73	132	3	5	39




Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	135	0	0 245 134
Stage 1	-	-	- 134 -
Stage 2	-	-	- 111 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1449	-	- 743 915
Stage 1	-	-	- 892 -
Stage 2	-	-	- 914 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1449	-	- 734 915
Mov Cap-2 Maneuver	-	-	- 734 -
Stage 1	-	-	- 881 -
Stage 2	-	-	- 914 -

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1449	-	-	-	888
HCM Lane V/C Ratio	0.012	-	-	-	0.05
HCM Control Delay (s)	7.5	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

HCM 6th TWSC  
1: Jewell Avenue & Harvest Road

Existing Conditions  
PM Peak

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	33	92	118	3	4	27
Future Vol, veh/h	33	92	118	3	4	27
Conflicting Peds, #/hr	0	0	0	0	4	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	95	95	66	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	103	124	3	6	41

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	127	0	0	307	126
Stage 1	-	-	-	126	-
Stage 2	-	-	-	181	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1459	-	-	685	924
Stage 1	-	-	-	900	-
Stage 2	-	-	-	850	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1459	-	-	667	924
Mov Cap-2 Maneuver	-	-	-	667	-
Stage 1	-	-	-	876	-
Stage 2	-	-	-	850	-

Approach	EB	WB	SB
HCM Control Delay, s	2	0	9.3
HCM LOS			A








Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1459	-	-	-	880
HCM Lane V/C Ratio	0.025	-	-	-	0.053
HCM Control Delay (s)	7.5	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2



## APPENDIX C. BACKGROUND TRAFFIC LEVEL OF SERVICE WORKSHEETS




HCM 6th TWSC  
1: Harvest Road & Jewell Avenue

Short Term Background Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	80	27	2	150	5	86	27	6	5	8	39
Future Vol, veh/h	24	80	27	2	150	5	86	27	6	5	8	39
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	250	-	-	-	-	-	250	-	250	-	-	-
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	26	87	29	2	163	5	93	29	7	5	9	42
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	168	0	0	116	0	0	349	326	102	342	338	166
Stage 1	-	-	-	-	-	-	154	154	-	170	170	-
Stage 2	-	-	-	-	-	-	195	172	-	172	168	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1410	-	-	1473	-	-	606	592	953	612	583	878
Stage 1	-	-	-	-	-	-	848	770	-	832	758	-
Stage 2	-	-	-	-	-	-	807	756	-	830	759	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1410	-	-	1473	-	-	562	581	953	576	572	878
Mov Cap-2 Maneuver	-	-	-	-	-	-	562	581	-	576	572	-
Stage 1	-	-	-	-	-	-	833	756	-	817	757	-
Stage 2	-	-	-	-	-	-	758	755	-	778	745	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.4			0.1			12.2			10		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1		
Capacity (veh/h)	562	581	953	1410	-	-	1473	-	-	775		
HCM Lane V/C Ratio	0.166	0.051	0.007	0.019	-	-	0.001	-	-	0.073		
HCM Control Delay (s)	12.7	11.5	8.8	7.6	-	-	7.4	0	-	10		
HCM Lane LOS	B	B	A	A	-	-	A	A	-	B		
HCM 95th %tile Q(veh)	0.6	0.2	0	0.1	-	-	0	-	-	0.2		

HCM 6th TWSC  
2: Kewaunee Street & Jewell Avenue

Short Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	83	0	2	146	0	4
Future Vol, veh/h	83	0	2	146	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	90	0	2	159	0	4

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	90	0	253	90
Stage 1	-	-	-	-	90	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1505	-	736	968
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1505	-	735	968
Mov Cap-2 Maneuver	-	-	-	-	735	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	865	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	968	-	-	1505	-
HCM Lane V/C Ratio	0.004	-	-	0.001	-
HCM Control Delay (s)	8.7	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-




HCM 6th TWSC  
3: Harvest Road & Pacific Avenue

Short Term Background Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↗		↙	↗	
Traffic Vol, veh/h	11	0	0	0	0	36	0	117	0	12	20	4
Future Vol, veh/h	11	0	0	0	0	36	0	117	0	12	20	4
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	-	-	-	-	-	-	150	-	-	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	12	0	0	0	0	39	0	127	0	13	22	4
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	197	177	24	177	179	127	26	0	0	127	0	0
Stage 1	50	50	-	127	127	-	-	-	-	-	-	-
Stage 2	147	127	-	50	52	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	762	717	1052	785	715	923	1588	-	-	1459	-	-
Stage 1	963	853	-	877	791	-	-	-	-	-	-	-
Stage 2	856	791	-	963	852	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	725	711	1052	780	709	923	1588	-	-	1459	-	-
Mov Cap-2 Maneuver	725	711	-	780	709	-	-	-	-	-	-	-
Stage 1	963	845	-	877	791	-	-	-	-	-	-	-
Stage 2	820	791	-	954	844	-	-	-	-	-	-	-
Approach	EB		WB		NB			SB				
HCM Control Delay, s	10		9.1		0			2.5				
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1588	-	-	725	923	1459	-	-				
HCM Lane V/C Ratio	-	-	-	0.016	0.042	0.009	-	-				
HCM Control Delay (s)	0	-	-	10	9.1	7.5	-	-				
HCM Lane LOS	A	-	-	B	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th TWSC  
4: Kewaunee Street & Pacific Avenue

Short Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	3	1	1
Future Vol, veh/h	1	0	0	3	1	1
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	-	-	-	-	-
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	1	0	0	3	1	1

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	5	2	2	0	-	0
Stage 1	2	-	-	-	-	-
Stage 2	3	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1017	1082	1620	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1017	1082	1620	-	-	-
Mov Cap-2 Maneuver	1017	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1020	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1620	-	1017	-	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	0	-	8.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-




HCM 6th TWSC  
5: Harvest Road & Warren Avenue

Short Term Background Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	15	0	0	0	0	24	0	27	0	7	9	4
Future Vol, veh/h	15	0	0	0	0	24	0	27	0	7	9	4
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	-	-	-	-	-	-	150	-	-	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	16	0	0	0	0	26	0	29	0	8	10	4
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	70	57	12	57	59	29	14	0	0	29	0	0
Stage 1	28	28	-	29	29	-	-	-	-	-	-	-
Stage 2	42	29	-	28	30	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	922	834	1069	940	832	1046	1604	-	-	1584	-	-
Stage 1	989	872	-	988	871	-	-	-	-	-	-	-
Stage 2	972	871	-	989	870	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	895	830	1069	936	828	1046	1604	-	-	1584	-	-
Mov Cap-2 Maneuver	895	830	-	936	828	-	-	-	-	-	-	-
Stage 1	989	868	-	988	871	-	-	-	-	-	-	-
Stage 2	948	871	-	984	866	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.1		8.5			0			2.5			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1604	-	-	895	1046	1584	-	-				
HCM Lane V/C Ratio	-	-	-	0.018	0.025	0.005	-	-				
HCM Control Delay (s)	0	-	-	9.1	8.5	7.3	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th TWSC  
6: Kewaunee Street & Warren Avenue

Short Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	5.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	0	0	1
Future Vol, veh/h	2	0	0	0	0	1
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	-	-	-	-	-
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	2	0	0	0	0	1




Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1	1	1
Stage 1	1	-	-
Stage 2	0	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	1022	1084	1622
Stage 1	1022	-	-
Stage 2	-	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	1022	1084	1622
Mov Cap-2 Maneuver	1022	-	-
Stage 1	1022	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1022	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	8.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC  
7: Harvest Road & Wesley Place




Short Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	27	0	0	9
Future Vol, veh/h	0	0	27	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	29	0	0	10
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	39	29	0	0	29	0
Stage 1	29	-	-	-	-	-
Stage 2	10	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	973	1046	-	-	1584	-
Stage 1	994	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	973	1046	-	-	1584	-
Mov Cap-2 Maneuver	973	-	-	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	-	1584	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	-	-	0	0	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	-	0	-	



HCM 6th TWSC  
8: Kewaunee Street & Wesley Place

Short Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	6	3	0
Future Vol, veh/h	0	0	0	6	3	0
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	-	-	-	-	-
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	0	0	0	7	3	0




Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	10	3	3	0	-	0
Stage 1	3	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1010	1081	1619	-	-	-
Stage 1	1020	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1081	1619	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1020	-	-	-	-	-
Stage 2	1016	-	-	-	-	-




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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1619	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

HCM 6th TWSC  
10: Yale Avenue & Jackson Gap Street (South)

Short Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	0	0	0	0	0	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	1	0	-	0	1	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1022	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1022	1084
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	6	3	0
Future Vol, veh/h	0	0	0	6	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	0	0	0	7	3	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	7	0	0 4 4
Stage 1	-	-	- 4 -
Stage 2	-	-	- 0 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1614	-	- 1018 1080
Stage 1	-	-	- 1019 -
Stage 2	-	-	- - -
Platoon blocked, %		-	- -
Mov Cap-1 Maneuver	1614	-	- 1018 1080
Mov Cap-2 Maneuver	-	-	- 1018 -
Stage 1	-	-	- 1019 -
Stage 2	-	-	- - -








Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1614	-	-	-	1018
HCM Lane V/C Ratio	-	-	-	-	0.003
HCM Control Delay (s)	0	-	-	-	8.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱		↱
Traffic Vol, veh/h	80	2	0	146	0	3
Future Vol, veh/h	80	2	0	146	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	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	87	2	0	159	0	3
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	88
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	970
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	970
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		8.7	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	970	-	-	-		
HCM Lane V/C Ratio	0.003	-	-	-		
HCM Control Delay (s)	8.7	-	-	-		
HCM Lane LOS	A	-	-	-		
HCM 95th %tile Q(veh)	0	-	-	-		

HCM 6th TWSC  
1: Harvest Road & Jewell Avenue

Short Term Background Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	129	88	6	153	5	54	18	3	7	30	41
Future Vol, veh/h	46	129	88	6	153	5	54	18	3	7	30	41
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	250	-	-	-	-	-	250	-	250	-	-	-
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	50	140	96	7	166	5	59	20	3	8	33	45

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	171	0	0	236	0	0	510	473	188	483	519	169
Stage 1	-	-	-	-	-	-	288	288	-	183	183	-
Stage 2	-	-	-	-	-	-	222	185	-	300	336	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1406	-	-	1331	-	-	474	490	854	494	461	875
Stage 1	-	-	-	-	-	-	720	674	-	819	748	-
Stage 2	-	-	-	-	-	-	780	747	-	709	642	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1406	-	-	1331	-	-	411	469	854	461	442	875
Mov Cap-2 Maneuver	-	-	-	-	-	-	411	469	-	461	442	-
Stage 1	-	-	-	-	-	-	694	650	-	790	744	-
Stage 2	-	-	-	-	-	-	704	743	-	661	619	-




Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.3			0.3			14.4			12		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	NBLn3	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	411	469	854	1406	-	-	1331	-	-	600
HCM Lane V/C Ratio	0.143	0.042	0.004	0.036	-	-	0.005	-	-	0.141
HCM Control Delay (s)	15.2	13	9.2	7.7	-	-	7.7	0	-	12
HCM Lane LOS	C	B	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0.1	0	0.1	-	-	0	-	-	0.5

HCM 6th TWSC  
2: Kewaunee Street & Jewell Avenue

Short Term Background Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	0	8	152	0	3
Future Vol, veh/h	122	0	8	152	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	0	9	165	0	3







Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	133	0	316	133
Stage 1	-	-	-	-	133	-
Stage 2	-	-	-	-	183	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1452	-	677	916
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1452	-	672	916
Mov Cap-2 Maneuver	-	-	-	-	672	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	842	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	916	-	-	1452	-
HCM Lane V/C Ratio	0.004	-	-	0.006	-
HCM Control Delay (s)	8.9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-




HCM 6th TWSC  
3: Harvest Road & Pacific Avenue

Short Term Background Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	0	0	0	23	0	42	0	42	70	12
Future Vol, veh/h	7	0	0	0	0	23	0	42	0	42	70	12
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	-	-	-	-	-	-	150	-	-	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	8	0	0	0	0	25	0	46	0	46	76	13
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	234	221	83	221	227	46	89	0	0	46	0	0
Stage 1	175	175	-	46	46	-	-	-	-	-	-	-
Stage 2	59	46	-	175	181	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	721	678	976	735	672	1023	1506	-	-	1562	-	-
Stage 1	827	754	-	968	857	-	-	-	-	-	-	-
Stage 2	953	857	-	827	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	688	658	976	719	653	1023	1506	-	-	1562	-	-
Mov Cap-2 Maneuver	688	658	-	719	653	-	-	-	-	-	-	-
Stage 1	827	732	-	968	857	-	-	-	-	-	-	-
Stage 2	930	857	-	803	728	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	10.3		8.6			0			2.5			
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1506	-	-	688	1023	1562	-	-				
HCM Lane V/C Ratio	-	-	-	0.011	0.024	0.029	-	-				
HCM Control Delay (s)	0	-	-	10.3	8.6	7.4	-	-				
HCM Lane LOS	A	-	-	B	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-				

HCM 6th TWSC  
4: Kewaunee Street & Pacific Avenue

Short Term Background Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	3	5	3
Future Vol, veh/h	0	0	0	3	5	3
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	-	-	-	-	-
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	0	0	0	3	5	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	10	7	8	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	3	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1010	1075	1612	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1075	1612	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1612	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	



HCM 6th TWSC  
5: Harvest Road & Warren Avenue

Short Term Background Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	12	0	0	0	0	16	0	24	0	25	31	14
Future Vol, veh/h	12	0	0	0	0	16	0	24	0	25	31	14
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	-	-	-	-	-	-	150	-	-	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	13	0	0	0	0	17	0	26	0	27	34	15




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	131	122	42	122	129	26	49	0	0	26	0	0
Stage 1	96	96	-	26	26	-	-	-	-	-	-	-
Stage 2	35	26	-	96	103	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	841	768	1029	853	762	1050	1558	-	-	1588	-	-
Stage 1	911	815	-	992	874	-	-	-	-	-	-	-
Stage 2	981	874	-	911	810	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	817	755	1029	842	749	1050	1558	-	-	1588	-	-
Mov Cap-2 Maneuver	817	755	-	842	749	-	-	-	-	-	-	-
Stage 1	911	801	-	992	874	-	-	-	-	-	-	-
Stage 2	965	874	-	896	796	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.5		8.5		0		2.6	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1558	-	-	817 1050	1588	-	-
HCM Lane V/C Ratio	-	-	-	0.016 0.017 0.017	-	-	-
HCM Control Delay (s)	0	-	-	9.5 8.5 7.3	-	-	-
HCM Lane LOS	A	-	-	A A A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.1 0.1	-	-	-

HCM 6th TWSC  
6: Kewaunee Street & Warren Avenue




Short Term Background Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	0	0	3
Future Vol, veh/h	1	0	0	0	0	3
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	-	-	-	-	-
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	1	0	0	0	0	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2	2	3	0	-	0
Stage 1	2	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1021	1082	1619	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1021	1082	1619	-	-	-
Mov Cap-2 Maneuver	1021	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1619	-	1021	-	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	0	-	8.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	24	0	0	31
Future Vol, veh/h	0	0	24	0	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	26	0	0	34




Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	60	26	0
Stage 1	26	-	-
Stage 2	34	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	947	1050	-
Stage 1	997	-	-
Stage 2	988	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	947	1050	-
Mov Cap-2 Maneuver	947	-	-
Stage 1	997	-	-
Stage 2	988	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1588
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

HCM 6th TWSC  
8: Kewaunee Street & Wesley Place

Short Term Background Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
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	-	-	-	-	-
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	0	0	0	0	0	0




Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1022	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1022	1084	1622	-	-	-
Mov Cap-2 Maneuver	1022	-	-	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	-	-	-	-	-	-




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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

HCM 6th TWSC  
10: Yale Avenue & Jackson Gap Street (South)

Short Term Background Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	0	0	0	0	0	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	1	0	-	0	1	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1022	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1022	1084
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	0	0	0	0	0	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	1	0	-	0	1	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1022	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1022	1084
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	





























Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱		↱
Traffic Vol, veh/h	119	6	0	151	0	3
Future Vol, veh/h	119	6	0	151	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	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	129	7	0	164	0	3
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	133
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	916
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	916
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		8.9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	916	-	-	-		
HCM Lane V/C Ratio	0.004	-	-	-		
HCM Control Delay (s)	8.9	-	-	-		
HCM Lane LOS	A	-	-	-		
HCM 95th %tile Q(veh)	0	-	-	-		

# Timings

## 1: Harvest Road & Jewell Avenue

Long Term Background Conditions

AM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		  					 		
Traffic Volume (vph)	425	889	78	1109	356	215	252	88	190	164	400
Future Volume (vph)	425	889	78	1109	356	215	252	88	190	164	400
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2	1	6		3	8		7	4	5
Permitted Phases					6			8			4
Detector Phase	5	2	1	6	6	3	8	8	7	4	5
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	21.0	9.0	21.0	21.0	9.0	21.0	9.0
Total Split (s)	28.0	55.0	17.0	44.0	44.0	26.0	32.0	32.0	16.0	22.0	28.0
Total Split (%)	23.3%	45.8%	14.2%	36.7%	36.7%	21.7%	26.7%	26.7%	13.3%	18.3%	23.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	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	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	21.0	57.7	10.2	44.6	44.6	19.2	23.8	23.8	10.6	15.2	41.2
Actuated g/C Ratio	0.18	0.48	0.08	0.37	0.37	0.16	0.20	0.20	0.09	0.13	0.34
v/c Ratio	0.77	0.44	0.56	0.64	0.48	0.83	0.74	0.22	0.68	0.75	0.71
Control Delay	56.2	22.6	66.6	28.1	4.4	72.4	57.5	1.9	65.0	70.5	31.5
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	56.2	22.6	66.6	28.1	4.4	72.4	57.5	1.9	65.0	70.5	31.5
LOS	E	C	E	C	A	E	E	A	E	E	C
Approach Delay		32.8		24.6			54.4			48.4	
Approach LOS		C		C			D			D	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 35.4

Intersection LOS: D

Intersection Capacity Utilization 70.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Harvest Road & Jewell Avenue


































# HCM 6th Signalized Intersection Summary

## 1: Harvest Road & Jewell Avenue

# Long Term Background Conditions























AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  					 		
Traffic Volume (veh/h)	425	889	89	78	1109	356	215	252	88	190	164	400
Future Volume (veh/h)	425	889	89	78	1109	356	215	252	88	190	164	400
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	462	966	97	85	1205	387	234	274	96	207	178	435
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	537	2282	229	107	1982	615	263	398	337	265	265	471
Arrive On Green	0.16	0.48	0.49	0.12	0.78	0.78	0.15	0.21	0.21	0.08	0.14	0.14
Sat Flow, veh/h	3456	4717	472	1781	5106	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	462	696	367	85	1205	387	234	274	96	207	178	435
Grp Sat Flow(s),veh/h/ln	1728	1702	1785	1781	1702	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	15.6	15.9	16.0	5.6	12.0	12.8	15.5	16.2	6.1	7.1	10.8	17.0
Cycle Q Clear(g_c), s	15.6	15.9	16.0	5.6	12.0	12.8	15.5	16.2	6.1	7.1	10.8	17.0
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	537	1647	864	107	1982	615	263	398	337	265	265	471
V/C Ratio(X)	0.86	0.42	0.42	0.80	0.61	0.63	0.89	0.69	0.28	0.78	0.67	0.92
Avail Cap(c_a), veh/h	662	1647	864	178	1982	615	312	421	357	317	265	471
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.4	20.1	20.0	52.1	9.5	9.6	50.2	43.6	39.6	54.4	48.9	40.8
Incr Delay (d2), s/veh	9.4	0.8	1.5	12.5	1.4	4.8	22.8	4.4	0.5	10.0	6.5	23.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.8	10.3	11.0	4.9	5.4	6.4	13.3	12.6	4.4	6.2	9.4	21.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.8	20.9	21.5	64.6	10.9	14.4	72.9	47.9	40.0	64.4	55.3	64.8
LnGrp LOS	E	C	C	E	B	B	E	D	D	E	E	E
Approach Vol, veh/h		1525			1677			604			820	
Approach Delay, s/veh		32.5			14.5			56.4			62.6	
Approach LOS		C			B			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	63.1	22.7	22.0	23.7	51.6	14.2	30.5				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	12.0	50.0	21.0	17.0	23.0	39.0	11.0	27.0				
Max Q Clear Time (g_c+I1), s	7.6	18.0	17.5	19.0	17.6	14.8	9.1	18.2				
Green Ext Time (p_c), s	0.1	5.2	0.3	0.0	1.0	8.7	0.2	1.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			34.4									
HCM 6th LOS			C									

# Timings 2: Kewaunee Street & Jewell Avenue

Long Term Background Conditions

AM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		  		  		 		 
Traffic Volume (vph)	30	1129	19	1412	69	31	55	40
Future Volume (vph)	30	1129	19	1412	69	31	55	40
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	13.0	74.0	12.0	73.0	34.0	34.0	34.0	34.0
Total Split (%)	10.8%	61.7%	10.0%	60.8%	28.3%	28.3%	28.3%	28.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
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)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	95.5	93.0	94.2	90.6	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.80	0.78	0.78	0.76	0.10	0.10	0.10	0.10
v/c Ratio	0.12	0.32	0.06	0.42	0.66	0.31	0.43	0.47
Control Delay	4.0	4.4	3.3	6.6	77.1	32.0	58.3	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	4.4	3.3	6.6	77.1	32.0	58.3	29.9
LOS	A	A	A	A	E	C	E	C
Approach Delay		4.4		6.6		56.3		40.0
Approach LOS		A		A		E		D

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

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: 2: Kewaunee Street & Jewell Avenue























# HCM 6th Signalized Intersection Summary

## 2: Kewaunee Street & Jewell Avenue









Long Term Background Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1129	15	19	1412	50	69	31	28	55	40	61
Future Volume (veh/h)	30	1129	15	19	1412	50	69	31	28	55	40	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	1227	16	21	1535	54	75	34	30	60	43	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	290	3745	49	410	3623	127	160	126	111	199	91	140
Arrive On Green	0.04	1.00	1.00	0.02	0.72	0.72	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1781	5194	68	1781	5064	178	1284	916	809	1338	665	1021
Grp Volume(v), veh/h	33	804	439	21	1032	557	75	0	64	60	0	109
Grp Sat Flow(s),veh/h/ln	1781	1702	1858	1781	1702	1838	1284	0	1725	1338	0	1687
Q Serve(g_s), s	0.6	0.0	0.0	0.4	14.8	14.9	6.9	0.0	4.0	5.0	0.0	7.2
Cycle Q Clear(g_c), s	0.6	0.0	0.0	0.4	14.8	14.9	14.0	0.0	4.0	9.0	0.0	7.2
Prop In Lane	1.00		0.04	1.00		0.10	1.00		0.47	1.00		0.61
Lane Grp Cap(c), veh/h	290	2454	1340	410	2436	1315	160	0	237	199	0	231
V/C Ratio(X)	0.11	0.33	0.33	0.05	0.42	0.42	0.47	0.00	0.27	0.30	0.00	0.47
Avail Cap(c_a), veh/h	369	2454	1340	484	2436	1315	294	0	417	339	0	408
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.1	0.0	0.0	4.4	7.0	7.0	54.2	0.0	46.4	50.4	0.0	47.7
Incr Delay (d2), s/veh	0.2	0.4	0.7	0.1	0.5	1.0	2.1	0.0	0.6	0.8	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.2	0.4	0.2	8.3	9.1	4.2	0.0	3.2	3.1	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.3	0.4	0.7	4.4	7.5	8.0	56.3	0.0	47.0	51.3	0.0	49.2
LnGrp LOS	A	A	A	A	A	A	E	A	D	D	A	D
Approach Vol, veh/h	1276			1610			139			169		
Approach Delay, s/veh	0.6			7.6			52.0			50.0		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	91.5		21.5	7.7	90.9		21.5				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	7.0	69.0		29.0	8.0	68.0		29.0				
Max Q Clear Time (g_c+I1), s	2.4	2.0		11.0	2.6	16.9		16.0				
Green Ext Time (p_c), s	0.0	6.5		0.7	0.0	9.6		0.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	9.0											
HCM 6th LOS	A											

HCM 6th TWSC  
3: Harvest Road & Pacific Avenue

Long Term Background Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	10	0	0	54	3	399	0	18	261	4
Future Vol, veh/h	11	0	10	0	0	54	3	399	0	18	261	4
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	150	-	-	150	-	-	150	-	-	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	12	0	11	0	0	59	3	434	0	20	284	4




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	796	766	286	772	768	434	288	0	0	434	0	0
Stage 1	326	326	-	440	440	-	-	-	-	-	-	-
Stage 2	470	440	-	332	328	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	305	333	753	317	332	622	1274	-	-	1126	-	-
Stage 1	687	648	-	596	578	-	-	-	-	-	-	-
Stage 2	574	578	-	681	647	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	272	326	753	307	325	622	1274	-	-	1126	-	-
Mov Cap-2 Maneuver	272	326	-	307	325	-	-	-	-	-	-	-
Stage 1	686	636	-	595	577	-	-	-	-	-	-	-
Stage 2	519	577	-	659	635	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.6		11.4		0.1		0.5	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1274	-	-	272	753	-	622	1126	-	-
HCM Lane V/C Ratio	0.003	-	-	0.044	0.014	-	0.094	0.017	-	-
HCM Control Delay (s)	7.8	-	-	18.8	9.9	0	11.4	8.3	-	-
HCM Lane LOS	A	-	-	C	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-	0.3	0.1	-	-

HCM 6th TWSC  
4: Kewaunee Street & Pacific Avenue

Long Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	127	73	1
Future Vol, veh/h	1	0	0	127	73	1
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	-	-	-	-	-
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	1	0	0	138	79	1









Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	218	80	80	0	-	0
Stage 1	80	-	-	-	-	-
Stage 2	138	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	788	1006	1528	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	788	1006	1528	-	-	-
Mov Cap-2 Maneuver	788	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	889	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1528	-	788	-	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC  
5: Harvest Road & Warren Avenue

Long Term Background Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	0	5	14	0	67	2	314	4	22	242	7
Future Vol, veh/h	21	0	5	14	0	67	2	314	4	22	242	7
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	150	-	-	150	-	-	150	-	-	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	23	0	5	15	0	73	2	341	4	24	263	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	699	664	267	665	666	343	271	0	0	345	0	0
Stage 1	315	315	-	347	347	-	-	-	-	-	-	-
Stage 2	384	349	-	318	319	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	354	381	772	374	380	700	1292	-	-	1214	-	-
Stage 1	696	656	-	669	635	-	-	-	-	-	-	-
Stage 2	639	633	-	693	653	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	312	373	772	365	372	700	1292	-	-	1214	-	-
Mov Cap-2 Maneuver	312	373	-	365	372	-	-	-	-	-	-	-
Stage 1	695	643	-	668	634	-	-	-	-	-	-	-
Stage 2	572	632	-	675	640	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.9		11.5		0		0.7	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1292	-	-	312	772	365	700	1214	-	-
HCM Lane V/C Ratio	0.002	-	-	0.073	0.007	0.042	0.104	0.02	-	-
HCM Control Delay (s)	7.8	-	-	17.4	9.7	15.3	10.7	8	-	-
HCM Lane LOS	A	-	-	C	A	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0.1	0.3	0.1	-	-

HCM 6th TWSC  
6: Kewaunee Street & Warren Avenue

Long Term Background Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	0	4	5	0	65	1	45	5	30	36	7
Future Vol, veh/h	15	0	4	5	0	65	1	45	5	30	36	7
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	-	-	-	-	-	-	-	-	-	-	-	-
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	16	0	4	5	0	71	1	49	5	33	39	8









Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	198	165	43	165	167	52	47	0	0	54	0	0
Stage 1	109	109	-	54	54	-	-	-	-	-	-	-
Stage 2	89	56	-	111	113	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	766	731	1034	805	729	1016	1563	-	-	1551	-	-
Stage 1	901	807	-	958	850	-	-	-	-	-	-	-
Stage 2	918	848	-	899	804	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	700	714	1034	788	712	1016	1563	-	-	1551	-	-
Mov Cap-2 Maneuver	700	714	-	788	712	-	-	-	-	-	-	-
Stage 1	900	790	-	957	849	-	-	-	-	-	-	-
Stage 2	853	847	-	875	787	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.9		8.9		0.1		3	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1563	-	-	751 995	1551	-	-
HCM Lane V/C Ratio	0.001	-	-	0.027 0.076	0.021	-	-
HCM Control Delay (s)	7.3	0	-	9.9 8.9	7.4	0	-
HCM Lane LOS	A	A	-	A A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0.2	0.1	-	-

HCM 6th TWSC  
7: Harvest Road & Wesley Place

Long Term Background Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	2	22	0	85	0	228	7	28	231	2
Future Vol, veh/h	7	0	2	22	0	85	0	228	7	28	231	2
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	150	-	-	150	-	-	150	-	-	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	8	0	2	24	0	92	0	248	8	30	251	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	610	568	252	565	565	252	253	0	0	256	0	0
Stage 1	312	312	-	252	252	-	-	-	-	-	-	-
Stage 2	298	256	-	313	313	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	407	432	787	436	434	787	1312	-	-	1309	-	-
Stage 1	699	658	-	752	698	-	-	-	-	-	-	-
Stage 2	711	696	-	698	657	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	353	422	787	427	424	787	1312	-	-	1309	-	-
Mov Cap-2 Maneuver	353	422	-	427	424	-	-	-	-	-	-	-
Stage 1	699	643	-	752	698	-	-	-	-	-	-	-
Stage 2	628	696	-	680	642	-	-	-	-	-	-	-




Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.1		11		0		0.8	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1312	-	-	353	787	427	787	1309	-	-
HCM Lane V/C Ratio	-	-	-	0.022	0.003	0.056	0.117	0.023	-	-
HCM Control Delay (s)	0	-	-	15.4	9.6	13.9	10.2	7.8	-	-
HCM Lane LOS	A	-	-	C	A	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.2	0.4	0.1	-	-






HCM 6th TWSC  
8: Kewaunee Street & Wesley Place




Long Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	3.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	6	2	22	36	9
Future Vol, veh/h	29	6	2	22	36	9
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	-	-	-	-	-
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	32	7	2	24	39	10
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	72	44	49	0	-	0
Stage 1	44	-	-	-	-	-
Stage 2	28	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	932	1026	1558	-	-	-
Stage 1	978	-	-	-	-	-
Stage 2	995	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	931	1026	1558	-	-	-
Mov Cap-2 Maneuver	931	-	-	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	995	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1558	-	946	-	-	
HCM Lane V/C Ratio	0.001	-	0.04	-	-	
HCM Control Delay (s)	7.3	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC  
10: Yale Avenue & Jackson Gap Street (South)

Long Term Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	319	248	1	4	13
Future Vol, veh/h	5	319	248	1	4	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	5	347	270	1	4	14
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	271	0	-	0	628	271
Stage 1	-	-	-	-	271	-
Stage 2	-	-	-	-	357	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1292	-	-	-	447	768
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	708	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1292	-	-	-	445	768
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	708	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		10.6		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1292	-	-	-	656	
HCM Lane V/C Ratio	0.004	-	-	-	0.028	
HCM Control Delay (s)	7.8	0	-	-	10.6	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	309	244	10	27	15
Future Vol, veh/h	30	309	244	10	27	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	33	336	265	11	29	16
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	276	0	-	0	673	271
Stage 1	-	-	-	-	271	-
Stage 2	-	-	-	-	402	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1287	-	-	-	421	768
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	676	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1287	-	-	-	408	768
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	676	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.7	0		13.1		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1287	-	-	-	490	
HCM Lane V/C Ratio	0.025	-	-	-	0.093	
HCM Control Delay (s)	7.9	0	-	-	13.1	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↗
Traffic Vol, veh/h	1164	2	0	1542	0	10
Future Vol, veh/h	1164	2	0	1542	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	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	1265	2	0	1676	0	11
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	634
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	*653
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*653
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		10.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	653	-	-	-		
HCM Lane V/C Ratio	0.017	-	-	-		
HCM Control Delay (s)	10.6	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.1	-	-	-		
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# MOVEMENT SUMMARY

 **Site: 9 [AM\_Harvest & Yale (Site Folder: General)]**

AM\_9  
Site Category: (None)  
Roundabout





























Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
East: Yale Ave														
6	T1	128	3.0	139	3.0	0.238	5.1	LOS A	1.2	30.7	0.30	0.16	0.30	35.1
16	R2	133	3.0	145	3.0	0.238	5.1	LOS A	1.2	30.7	0.30	0.16	0.30	34.1
Approach		261	3.0	284	3.0	0.238	5.1	LOS A	1.2	30.7	0.30	0.16	0.30	34.6
North: Harvest Rd														
7	L2	207	3.0	225	3.0	0.239	5.3	LOS A	1.2	30.6	0.34	0.20	0.34	32.8
14	R2	48	3.0	52	3.0	0.239	5.3	LOS A	1.2	30.6	0.34	0.20	0.34	31.9
Approach		255	3.0	277	3.0	0.239	5.3	LOS A	1.2	30.6	0.34	0.20	0.34	32.6
West: Yale Ave														
5	L2	102	3.0	111	3.0	0.225	5.5	LOS A	1.1	27.4	0.42	0.29	0.42	33.7
2	T1	117	3.0	127	3.0	0.225	5.5	LOS A	1.1	27.4	0.42	0.29	0.42	33.6
Approach		219	3.0	238	3.0	0.225	5.5	LOS A	1.1	27.4	0.42	0.29	0.42	33.6
All Vehicles		735	3.0	799	3.0	0.239	5.3	LOS A	1.2	30.7	0.35	0.21	0.35	33.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Roundabout LOS Method: Same as Sign Control.  
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
Roundabout Capacity Model: US HCM 6.  
Delay Model: HCM Delay Formula (Geometric Delay is not included).  
Queue Model: HCM Queue Formula.  
Gap-Acceptance Capacity: Traditional M1.  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# Timings

## 1: Harvest Road & Jewell Avenue

Long Term Background Conditions  
PM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		  					 		
Traffic Volume (vph)	408	1183	115	1220	257	159	347	88	318	336	452
Future Volume (vph)	408	1183	115	1220	257	159	347	88	318	336	452
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2	1	6		3	8		7	4	5
Permitted Phases					6			8			4
Detector Phase	5	2	1	6	6	3	8	8	7	4	5
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	21.0	9.0	21.0	21.0	9.0	21.0	9.0
Total Split (s)	24.0	49.0	18.0	43.0	43.0	20.0	33.0	33.0	20.0	33.0	24.0
Total Split (%)	20.0%	40.8%	15.0%	35.8%	35.8%	16.7%	27.5%	27.5%	16.7%	27.5%	20.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	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	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	18.7	46.7	11.9	39.9	39.9	14.3	26.7	26.7	14.6	27.1	50.8
Actuated g/C Ratio	0.16	0.39	0.10	0.33	0.33	0.12	0.22	0.22	0.12	0.23	0.42
v/c Ratio	0.83	0.79	0.71	0.78	0.39	0.82	0.91	0.20	0.83	0.87	0.69
Control Delay	63.1	35.6	70.9	38.8	8.4	80.6	72.2	1.7	68.5	66.3	30.2
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	63.1	35.6	70.9	38.8	8.4	80.6	72.2	1.7	68.5	66.3	30.2
LOS	E	D	E	D	A	F	E	A	E	E	C
Approach Delay		41.8		36.2			64.0			52.2	
Approach LOS		D		D			E			D	

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 44.9

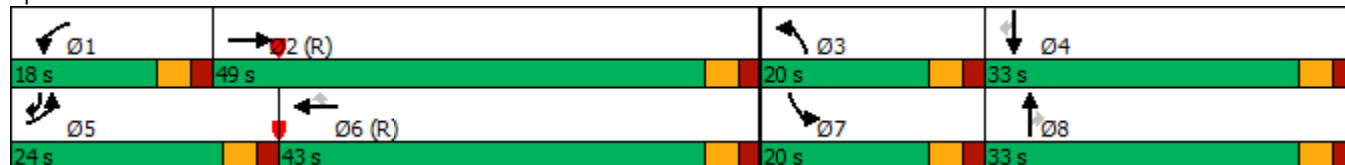
Intersection LOS: D

Intersection Capacity Utilization 79.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Harvest Road & Jewell Avenue
































# HCM 6th Signalized Intersection Summary

## 1: Harvest Road & Jewell Avenue

Long Term Background Conditions

PM Peak Hour

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  					 		
Traffic Volume (veh/h)	408	1183	232	115	1220	257	159	347	88	318	336	452
Future Volume (veh/h)	408	1183	232	115	1220	257	159	347	88	318	336	452
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	443	1286	252	125	1326	279	173	377	96	346	365	491
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	504	1725	338	151	1745	542	200	429	363	403	436	601
Arrive On Green	0.15	0.40	0.41	0.11	0.45	0.45	0.11	0.23	0.23	0.12	0.23	0.23
Sat Flow, veh/h	3456	4284	839	1781	5106	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	443	1022	516	125	1326	279	173	377	96	346	365	491
Grp Sat Flow(s),veh/h/ln	1728	1702	1719	1781	1702	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	15.1	30.7	30.7	8.2	26.0	15.0	11.5	23.4	6.0	11.8	22.3	28.0
Cycle Q Clear(g_c), s	15.1	30.7	30.7	8.2	26.0	15.0	11.5	23.4	6.0	11.8	22.3	28.0
Prop In Lane	1.00		0.49	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	504	1371	692	151	1745	542	200	429	363	403	436	601
V/C Ratio(X)	0.88	0.75	0.75	0.83	0.76	0.52	0.86	0.88	0.26	0.86	0.84	0.82
Avail Cap(c_a), veh/h	547	1371	692	193	1745	542	223	436	370	432	436	601
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	30.6	30.4	52.4	28.6	25.7	52.3	44.7	37.9	52.0	43.8	33.5
Incr Delay (d2), s/veh	14.4	3.7	7.2	20.4	3.2	3.5	25.9	18.1	0.4	15.0	13.3	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.9	18.7	19.5	7.8	14.9	9.7	10.8	18.8	0.1	9.9	17.5	20.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.7	34.3	37.5	72.7	31.8	29.1	78.3	62.7	38.3	67.1	57.1	42.2
LnGrp LOS	E	C	D	E	C	C	E	E	D	E	E	D
Approach Vol, veh/h	1981		1730				646			1202		
Approach Delay, s/veh	41.9		34.3				63.3			53.9		
Approach LOS	D		C				E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.2	53.3	18.5	33.0	22.5	46.0	19.0	32.5				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	13.0	44.0	15.0	28.0	19.0	38.0	15.0	28.0				
Max Q Clear Time (g_c+I1), s	10.2	32.7	13.5	30.0	17.1	28.0	13.8	25.4				
Green Ext Time (p_c), s	0.1	5.6	0.1	0.0	0.4	5.5	0.2	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	44.6											
HCM 6th LOS	D											

# Timings

## 2: Kewaunee Street & Jewell Avenue

Long Term Background Conditions

PM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	59	1440	52	1521	14	43	75	56
Future Volume (vph)	59	1440	52	1521	14	43	75	56
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	16.0	80.0	13.0	77.0	27.0	27.0	27.0	27.0
Total Split (%)	13.3%	66.7%	10.8%	64.2%	22.5%	22.5%	22.5%	22.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
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)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	93.3	88.0	93.1	87.9	12.8	12.8	12.8	12.8
Actuated g/C Ratio	0.78	0.73	0.78	0.73	0.11	0.11	0.11	0.11
v/c Ratio	0.27	0.45	0.23	0.48	0.14	0.38	0.59	0.57
Control Delay	8.5	5.9	5.1	8.0	49.3	38.6	66.9	44.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	5.9	5.1	8.0	49.3	38.6	66.9	44.9
LOS	A	A	A	A	D	D	E	D
Approach Delay		6.0		7.9		40.2		53.7
Approach LOS		A		A		D		D

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 10.3

Intersection LOS: B

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Kewaunee Street & Jewell Avenue





























# HCM 6th Signalized Intersection Summary









## 2: Kewaunee Street & Jewell Avenue

Long Term Background Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Traffic Volume (veh/h)	59	1440	94	52	1521	100	14	43	30	75	56	57
Future Volume (veh/h)	59	1440	94	52	1521	100	14	43	30	75	56	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	1565	102	57	1653	109	15	47	33	82	61	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	3539	231	325	3532	233	131	127	89	168	105	107
Arrive On Green	0.06	1.00	1.00	0.03	0.72	0.72	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1781	4898	319	1781	4894	322	1268	1023	718	1319	850	864
Grp Volume(v), veh/h	64	1087	580	57	1149	613	15	0	80	82	0	123
Grp Sat Flow(s),veh/h/ln	1781	1702	1813	1781	1702	1812	1268	0	1741	1319	0	1715
Q Serve(g_s), s	1.1	0.0	0.0	1.0	17.0	17.1	1.4	0.0	5.1	7.3	0.0	8.1
Cycle Q Clear(g_c), s	1.1	0.0	0.0	1.0	17.0	17.1	9.5	0.0	5.1	12.4	0.0	8.1
Prop In Lane	1.00		0.18	1.00		0.18	1.00		0.41	1.00		0.50
Lane Grp Cap(c), veh/h	270	2460	1310	325	2456	1308	131	0	216	168	0	213
V/C Ratio(X)	0.24	0.44	0.44	0.18	0.47	0.47	0.11	0.00	0.37	0.49	0.00	0.58
Avail Cap(c_a), veh/h	381	2460	1310	394	2456	1308	207	0	319	246	0	314
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.3	0.0	0.0	3.9	7.0	7.0	54.1	0.0	48.3	53.9	0.0	49.6
Incr Delay (d2), s/veh	0.4	0.6	1.1	0.3	0.6	1.2	0.4	0.0	1.1	2.2	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.4	0.7	0.6	9.2	9.9	0.8	0.0	4.1	4.5	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.7	0.6	1.1	4.1	7.7	8.2	54.5	0.0	49.3	56.1	0.0	52.1
LnGrp LOS	A	A	A	A	A	A	D	A	D	E	A	D
Approach Vol, veh/h	1731				1819				95		205	
Approach Delay, s/veh	0.9				7.7				50.1		53.7	
Approach LOS	A				A				D		D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	91.7		19.9	8.5	91.6		19.9				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	8.0	75.0		22.0	11.0	72.0		22.0				
Max Q Clear Time (g_c+I1), s	3.0	2.0		14.4	3.1	19.1		11.5				
Green Ext Time (p_c), s	0.0	10.7		0.5	0.1	11.6		0.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	8.2											
HCM 6th LOS	A											

HCM 6th TWSC  
3: Harvest Road & Pacific Avenue

Long Term Background Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	6	0	0	37	10	476	0	54	517	12
Future Vol, veh/h	7	0	6	0	0	37	10	476	0	54	517	12
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	150	-	-	150	-	-	150	-	-	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	8	0	7	0	0	40	11	517	0	59	562	13




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1246	1226	569	1229	1232	517	575	0	0	517	0	0
Stage 1	687	687	-	539	539	-	-	-	-	-	-	-
Stage 2	559	539	-	690	693	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	151	179	522	155	177	558	998	-	-	1049	-	-
Stage 1	437	447	-	527	522	-	-	-	-	-	-	-
Stage 2	513	522	-	435	445	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	133	167	522	145	165	558	998	-	-	1049	-	-
Mov Cap-2 Maneuver	133	167	-	145	165	-	-	-	-	-	-	-
Stage 1	432	422	-	521	516	-	-	-	-	-	-	-
Stage 2	471	516	-	405	420	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.7		12		0.2		0.8	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	998	-	-	133	522	-	558	1049	-	-
HCM Lane V/C Ratio	0.011	-	-	0.057	0.012	-	0.072	0.056	-	-
HCM Control Delay (s)	8.6	-	-	33.7	12	0	12	8.6	-	-
HCM Lane LOS	A	-	-	D	B	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	-	0.2	0.2	-	-









HCM 6th TWSC  
4: Kewaunee Street & Pacific Avenue

Long Term Background Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	76	196	4
Future Vol, veh/h	0	0	0	76	196	4
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	-	-	-	-	-
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	0	0	0	83	213	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	298	215	217	0	-	0
Stage 1	215	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	*779	*920	*1377	-	-	-
Stage 1	*867	-	-	-	-	-
Stage 2	*940	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*779	*920	*1377	-	-	-
Mov Cap-2 Maneuver	*779	-	-	-	-	-
Stage 1	*867	-	-	-	-	-
Stage 2	*940	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	* 1377	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

HCM 6th TWSC  
5: Harvest Road & Warren Avenue

Long Term Background Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	0	4	10	0	45	6	425	17	72	430	21
Future Vol, veh/h	16	0	4	10	0	45	6	425	17	72	430	21
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	150	-	-	150	-	-	150	-	-	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	17	0	4	11	0	49	7	462	18	78	467	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1145	1129	479	1122	1131	471	490	0	0	480	0	0
Stage 1	635	635	-	485	485	-	-	-	-	-	-	-
Stage 2	510	494	-	637	646	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	177	204	587	183	203	593	1073	-	-	1082	-	-
Stage 1	467	472	-	563	552	-	-	-	-	-	-	-
Stage 2	546	546	-	465	467	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	153	188	587	171	187	593	1073	-	-	1082	-	-
Mov Cap-2 Maneuver	153	188	-	171	187	-	-	-	-	-	-	-
Stage 1	464	438	-	559	548	-	-	-	-	-	-	-
Stage 2	498	542	-	428	433	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	27.4		14.5		0.1		1.2	
HCM LOS	D		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1073	-	-	153	587	171	593	1082	-	-
HCM Lane V/C Ratio	0.006	-	-	0.114	0.007	0.064	0.082	0.072	-	-
HCM Control Delay (s)	8.4	-	-	31.5	11.2	27.5	11.6	8.6	-	-
HCM Lane LOS	A	-	-	D	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0.2	0.3	0.2	-	-

HCM 6th TWSC  
6: Kewaunee Street & Warren Avenue

Long Term Background Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	0	2	10	0	25	3	41	10	115	53	26
Future Vol, veh/h	10	0	2	10	0	25	3	41	10	115	53	26
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	-	-	-	-	-	-	-	-	-	-	-	-
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	11	0	2	11	0	27	3	45	11	125	58	28









Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	392	384	72	380	393	51	86	0	0	56	0	0
Stage 1	322	322	-	57	57	-	-	-	-	-	-	-
Stage 2	70	62	-	323	336	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	580	557	1016	591	551	1017	1520	-	-	1549	-	-
Stage 1	701	655	-	955	847	-	-	-	-	-	-	-
Stage 2	940	843	-	700	645	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	-	-	-
Mov Cap-1 Maneuver	528	509	1016	551	503	1017	1520	-	-	1549	-	-
Mov Cap-2 Maneuver	528	509	-	551	503	-	-	-	-	-	-	-
Stage 1	699	599	-	953	845	-	-	-	-	-	-	-
Stage 2	913	841	-	639	590	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.4		9.6		0.4		4.5	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1520	-	-	574	819	1549	-
HCM Lane V/C Ratio	0.002	-	-	0.023	0.046	0.081	-
HCM Control Delay (s)	7.4	0	-	11.4	9.6	7.5	0
HCM Lane LOS	A	A	-	B	A	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.3	-

HCM 6th TWSC  
7: Harvest Road & Wesley Place

Long Term Background Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	1	14	0	56	2	388	24	97	339	8
Future Vol, veh/h	4	0	1	14	0	56	2	388	24	97	339	8
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	150	-	-	150	-	-	150	-	-	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	4	0	1	15	0	61	2	422	26	105	368	9




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1053	1035	373	1022	1026	435	377	0	0	448	0	0
Stage 1	583	583	-	439	439	-	-	-	-	-	-	-
Stage 2	470	452	-	583	587	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	204	232	673	214	235	621	1181	-	-	1112	-	-
Stage 1	498	499	-	597	578	-	-	-	-	-	-	-
Stage 2	574	570	-	498	497	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	171	210	673	198	212	621	1181	-	-	1112	-	-
Mov Cap-2 Maneuver	171	210	-	198	212	-	-	-	-	-	-	-
Stage 1	497	452	-	596	577	-	-	-	-	-	-	-
Stage 2	517	569	-	450	450	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.4		14.1		0		1.9	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1181	-	-	171	673	198	621	1112	-	-
HCM Lane V/C Ratio	0.002	-	-	0.025	0.002	0.077	0.098	0.095	-	-
HCM Control Delay (s)	8.1	-	-	26.6	10.4	24.7	11.4	8.6	-	-
HCM Lane LOS	A	-	-	D	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.2	0.3	0.3	-	-

HCM 6th TWSC  
8: Kewaunee Street & Wesley Place

Long Term Background Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	4	7	35	33	32
Future Vol, veh/h	19	4	7	35	33	32
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	-	-	-	-	-
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	21	4	8	38	36	35




Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	108	54	71
Stage 1	54	-	-
Stage 2	54	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	889	1013	1529
Stage 1	969	-	-
Stage 2	969	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	885	1013	1529
Mov Cap-2 Maneuver	885	-	-
Stage 1	964	-	-
Stage 2	969	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1529	-	905	-	-
HCM Lane V/C Ratio	0.005	-	0.028	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC  
10: Yale Avenue & Jackson Gap Street (South)

Long Term Background Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	399	360	5	3	9
Future Vol, veh/h	16	399	360	5	3	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	17	434	391	5	3	10

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	396	0	0 862 394
Stage 1	-	-	- - 394 -
Stage 2	-	-	- - 468 -
Critical Hdwy	4.12	-	- - 6.42 6.22
Critical Hdwy Stg 1	-	-	- - 5.42 -
Critical Hdwy Stg 2	-	-	- - 5.42 -
Follow-up Hdwy	2.218	-	- - 3.518 3.318
Pot Cap-1 Maneuver	1163	-	- - 325 655
Stage 1	-	-	- - 681 -
Stage 2	-	-	- - 630 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1163	-	- - 319 655
Mov Cap-2 Maneuver	-	-	- - 319 -
Stage 1	-	-	- - 668 -
Stage 2	-	-	- - 630 -




Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1163	-	-	-	518
HCM Lane V/C Ratio	0.015	-	-	-	0.025
HCM Control Delay (s)	8.1	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	387	349	28	22	15
Future Vol, veh/h	30	387	349	28	22	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	33	421	379	30	24	16

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	409	0	881
Stage 1	-	-	394
Stage 2	-	-	487
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1150	-	317
Stage 1	-	-	681
Stage 2	-	-	618
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1150	-	305
Mov Cap-2 Maneuver	-	-	305
Stage 1	-	-	656
Stage 2	-	-	618

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1150	-	-	-	389
HCM Lane V/C Ratio	0.028	-	-	-	0.103
HCM Control Delay (s)	8.2	0	-	-	15.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↓			↑↑↑↑		↗
Traffic Vol, veh/h	1583	5	0	1592	0	7
Future Vol, veh/h	1583	5	0	1592	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	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	1721	5	0	1730	0	8
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	-	-	-	863
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	*536
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*536
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		11.8		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	536	-	-	-		
HCM Lane V/C Ratio	0.014	-	-	-		
HCM Control Delay (s)	11.8	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0	-	-	-		
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

# MOVEMENT SUMMARY

 **Site: 9 [PM\_Harvest & Yale (Site Folder: General)]**

PM\_9  
Site Category: (None)  
Roundabout



















Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
East: Yale Ave														
6	T1	145	3.0	158	3.0	0.372	7.2	LOS A	2.1	53.0	0.47	0.33	0.47	34.0
16	R2	224	3.0	243	3.0	0.372	7.2	LOS A	2.1	53.0	0.47	0.33	0.47	33.0
Approach		369	3.0	401	3.0	0.372	7.2	LOS A	2.1	53.0	0.47	0.33	0.47	33.4
North: Harvest Rd														
7	L2	259	3.0	282	3.0	0.338	6.5	LOS A	1.9	47.7	0.40	0.25	0.40	32.5
14	R2	94	3.0	102	3.0	0.338	6.5	LOS A	1.9	47.7	0.40	0.25	0.40	31.5
Approach		353	3.0	384	3.0	0.338	6.5	LOS A	1.9	47.7	0.40	0.25	0.40	32.2
West: Yale Ave														
5	L2	190	3.0	207	3.0	0.377	7.7	LOS A	2.0	51.8	0.53	0.43	0.53	32.4
2	T1	156	3.0	170	3.0	0.377	7.7	LOS A	2.0	51.8	0.53	0.43	0.53	32.4
Approach		346	3.0	376	3.0	0.377	7.7	LOS A	2.0	51.8	0.53	0.43	0.53	32.4
All Vehicles		1068	3.0	1161	3.0	0.377	7.1	LOS A	2.1	53.0	0.47	0.34	0.47	32.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Roundabout LOS Method: Same as Sign Control.  
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
Roundabout Capacity Model: US HCM 6.  
Delay Model: HCM Delay Formula (Geometric Delay is not included).  
Queue Model: HCM Queue Formula.  
Gap-Acceptance Capacity: Traditional M1.  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## APPENDIX D. TOTAL TRAFFIC LEVEL OF SERVICE WORKSHEETS

# Timings 1: Harvest Road & Jewell Avenue

Short Term Total Conditions  
AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	159	2	207	160	36	6	16	10
Future Volume (vph)	24	159	2	207	160	36	6	16	10
Lane Group Flow (vph)	26	225	2	238	174	39	7	17	53
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases	4		8		2		2	6	
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	9.0	21.0	21.0	9.0	21.0
Total Split (s)	12.0	50.0	15.0	53.0	29.0	43.0	43.0	12.0	26.0
Total Split (%)	10.0%	41.7%	12.5%	44.2%	24.2%	35.8%	35.8%	10.0%	21.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	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	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
v/c Ratio	0.13	0.56	0.01	0.73	0.19	0.03	0.01	0.02	0.06
Control Delay	31.8	43.7	28.0	59.0	9.2	12.9	0.0	9.9	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	43.7	28.0	59.0	9.2	12.9	0.0	9.9	7.6
Queue Length 50th (ft)	15	135	1	174	50	10	0	4	4
Queue Length 95th (ft)	35	222	7	245	96	35	0	16	30
Internal Link Dist (ft)		1006		535		342			776
Turn Bay Length (ft)	250		250		250		250	250	
Base Capacity (vph)	201	683	271	741	954	1198	1057	861	930
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.33	0.01	0.32	0.18	0.03	0.01	0.02	0.06

## Intersection Summary

Cycle Length: 120

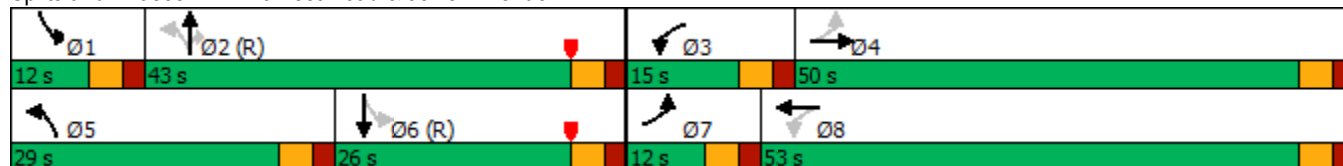
Actuated Cycle Length: 120

Offset: 28 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated























Splits and Phases: 1: Harvest Road & Jewell Avenue



# HCM 6th Signalized Intersection Summary




## 1: Harvest Road & Jewell Avenue

Short Term Total Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	159	48	2	207	12	160	36	6	16	10	39
Future Volume (veh/h)	24	159	48	2	207	12	160	36	6	16	10	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	173	52	2	225	13	174	39	7	17	11	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	127	236	71	124	269	16	958	1208	1024	909	206	785
Arrive On Green	0.02	0.17	0.17	0.00	0.15	0.15	0.06	0.65	0.65	0.01	0.61	0.61
Sat Flow, veh/h	1781	1381	415	1781	1751	101	1781	1870	1585	1781	340	1297
Grp Volume(v), veh/h	26	0	225	2	0	238	174	39	7	17	0	53
Grp Sat Flow(s),veh/h/ln	1781	0	1796	1781	0	1852	1781	1870	1585	1781	0	1637
Q Serve(g_s), s	1.5	0.0	14.3	0.1	0.0	15.0	4.2	0.9	0.2	0.4	0.0	1.6
Cycle Q Clear(g_c), s	1.5	0.0	14.3	0.1	0.0	15.0	4.2	0.9	0.2	0.4	0.0	1.6
Prop In Lane	1.00		0.23	1.00		0.05	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	127	0	307	124	0	284	958	1208	1024	909	0	991
V/C Ratio(X)	0.20	0.00	0.73	0.02	0.00	0.84	0.18	0.03	0.01	0.02	0.00	0.05
Avail Cap(c_a), veh/h	197	0	673	268	0	741	1216	1208	1024	987	0	991
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.6	0.0	47.2	43.4	0.0	49.3	7.0	7.7	7.5	8.8	0.0	9.7
Incr Delay (d2), s/veh	0.8	0.0	3.4	0.1	0.0	6.5	0.1	0.0	0.0	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	6.7	0.1	0.0	7.4	1.5	0.4	0.1	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	0.0	50.6	43.5	0.0	55.8	7.1	7.7	7.6	8.8	0.0	9.8
LnGrp LOS	D	A	D	D	A	E	A	A	A	A	A	A
Approach Vol, veh/h		251			240			220			70	
Approach Delay, s/veh		49.8			55.7			7.2			9.5	
Approach LOS		D			E			A			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	82.5	5.3	25.5	11.6	77.6	7.3	23.4				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	38.0	10.0	45.0	24.0	21.0	7.0	48.0				
Max Q Clear Time (g_c+I1), s	2.4	2.9	2.1	16.3	6.2	3.6	3.5	17.0				
Green Ext Time (p_c), s	0.0	0.2	0.0	1.4	0.4	0.2	0.0	1.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			36.0									
HCM 6th LOS			D									

HCM 6th TWSC  
2: Kewaunee Street & Jewell Avenue

Short Term Total Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	3	4	157	10	9
Future Vol, veh/h	94	3	4	157	10	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	3	4	171	11	10
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	105	0	283	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	179	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1503	-	733	996
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1503	-	731	996
Mov Cap-2 Maneuver	-	-	-	-	731	-
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	849	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		9.4	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	836	-	-	1503	-	
HCM Lane V/C Ratio	0.025	-	-	0.003	-	
HCM Control Delay (s)	9.4	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

HCM 6th TWSC  
3: Harvest Road & Pacific Avenue




Short Term Total Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↖		↙	↖	
Traffic Vol, veh/h	11	0	0	0	0	49	0	117	0	35	20	4
Future Vol, veh/h	11	0	0	0	0	49	0	117	0	35	20	4
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	-	-	-	-	-	-	150	-	-	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	12	0	0	0	0	53	0	127	0	38	22	4
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	254	227	24	227	229	127	26	0	0	127	0	0
Stage 1	100	100	-	127	127	-	-	-	-	-	-	-
Stage 2	154	127	-	100	102	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	699	672	1052	728	671	923	1588	-	-	1459	-	-
Stage 1	906	812	-	877	791	-	-	-	-	-	-	-
Stage 2	848	791	-	906	811	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	646	655	1052	713	654	923	1588	-	-	1459	-	-
Mov Cap-2 Maneuver	646	655	-	713	654	-	-	-	-	-	-	-
Stage 1	906	791	-	877	791	-	-	-	-	-	-	-
Stage 2	799	791	-	882	790	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.7		9.1		0		4.5					
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1588	-	-	646	923	1459	-	-				
HCM Lane V/C Ratio	-	-	-	0.019	0.058	0.026	-	-				
HCM Control Delay (s)	0	-	-	10.7	9.1	7.5	-	-				
HCM Lane LOS	A	-	-	B	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.1	-	-				



HCM 6th TWSC  
4: Kewaunee Street & Pacific Avenue

Short Term Total Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	3	1	1
Future Vol, veh/h	1	0	0	3	1	1
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	-	-	-	-	-
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	1	0	0	3	1	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	5	2	2	0	-	0
Stage 1	2	-	-	-	-	-
Stage 2	3	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1017	1082	1620	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1017	1082	1620	-	-	-
Mov Cap-2 Maneuver	1017	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.5	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1620	-	1017	-	-	
HCM Lane V/C Ratio	-	-	0.001	-	-	
HCM Control Delay (s)	0	-	8.5	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC  
5: Harvest Road & Warren Avenue

Short Term Total Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	15	0	0	0	0	24	0	27	0	7	9	4
Future Vol, veh/h	15	0	0	0	0	24	0	27	0	7	9	4
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	-	-	-	-	-	-	150	-	-	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	16	0	0	0	0	26	0	29	0	8	10	4
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	70	57	12	57	59	29	14	0	0	29	0	0
Stage 1	28	28	-	29	29	-	-	-	-	-	-	-
Stage 2	42	29	-	28	30	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	922	834	1069	940	832	1046	1604	-	-	1584	-	-
Stage 1	989	872	-	988	871	-	-	-	-	-	-	-
Stage 2	972	871	-	989	870	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	895	830	1069	936	828	1046	1604	-	-	1584	-	-
Mov Cap-2 Maneuver	895	830	-	936	828	-	-	-	-	-	-	-
Stage 1	989	868	-	988	871	-	-	-	-	-	-	-
Stage 2	948	871	-	984	866	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.1		8.5			0			2.5			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1604	-	-	895	1046	1584	-	-				
HCM Lane V/C Ratio	-	-	-	0.018	0.025	0.005	-	-				
HCM Control Delay (s)	0	-	-	9.1	8.5	7.3	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th TWSC  
6: Kewaunee Street & Warren Avenue

Short Term Total Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	5.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	0	0	1
Future Vol, veh/h	2	0	0	0	0	1
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	-	-	-	-	-
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	2	0	0	0	0	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1	1	1
Stage 1	1	-	-
Stage 2	0	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	1022	1084	1622
Stage 1	1022	-	-
Stage 2	-	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	1022	1084	1622
Mov Cap-2 Maneuver	1022	-	-
Stage 1	1022	-	-
Stage 2	-	-	-



















Approach	EB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1022	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	0	-	8.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

# Timings

## 1: Harvest Road & Jewell Avenue

Short Term Total Conditions  
PM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	46	337	6	226	211	35	3	34	35
Future Volume (vph)	46	337	6	226	211	35	3	34	35
Lane Group Flow (vph)	50	517	7	264	229	38	3	37	83
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2	1	6	3	8		7	4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	3	8	8	7	4
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	9.0	21.0	21.0	9.0	21.0
Total Split (s)	12.0	63.0	12.0	63.0	23.0	33.0	33.0	12.0	22.0
Total Split (%)	10.0%	52.5%	10.0%	52.5%	19.2%	27.5%	27.5%	10.0%	18.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	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
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
v/c Ratio	0.07	0.43	0.01	0.23	0.68	0.11	0.01	0.18	0.47
Control Delay	8.0	12.1	8.2	13.5	48.5	40.7	0.0	34.4	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	12.1	8.2	13.5	48.5	40.7	0.0	34.4	36.9
Queue Length 50th (ft)	12	164	2	97	149	25	0	21	31
Queue Length 95th (ft)	29	340	8	164	217	55	0	47	80
Internal Link Dist (ft)		1006		535		342			776
Turn Bay Length (ft)	250		250		250		250	250	
Base Capacity (vph)	727	1202	568	1124	354	450	465	213	292
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.43	0.01	0.23	0.65	0.08	0.01	0.17	0.28

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated























Splits and Phases: 1: Harvest Road & Jewell Avenue



# HCM 6th Signalized Intersection Summary




## 1: Harvest Road & Jewell Avenue

Short Term Total Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	337	139	6	226	17	211	35	3	34	35	41
Future Volume (veh/h)	46	337	139	6	226	17	211	35	3	34	35	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	366	151	7	246	18	229	38	3	37	38	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	741	802	331	520	1063	78	344	337	285	221	58	68
Arrive On Green	0.04	0.64	0.64	0.02	0.62	0.62	0.14	0.18	0.18	0.03	0.07	0.07
Sat Flow, veh/h	1781	1258	519	1781	1722	126	1781	1870	1585	1781	780	924
Grp Volume(v), veh/h	50	0	517	7	0	264	229	38	3	37	0	83
Grp Sat Flow(s),veh/h/ln	1781	0	1777	1781	0	1848	1781	1870	1585	1781	0	1704
Q Serve(g_s), s	1.2	0.0	17.8	0.2	0.0	7.6	13.6	2.0	0.2	2.3	0.0	5.7
Cycle Q Clear(g_c), s	1.2	0.0	17.8	0.2	0.0	7.6	13.6	2.0	0.2	2.3	0.0	5.7
Prop In Lane	1.00		0.29	1.00		0.07	1.00		1.00	1.00		0.54
Lane Grp Cap(c), veh/h	741	0	1133	520	0	1141	344	337	285	221	0	126
V/C Ratio(X)	0.07	0.00	0.46	0.01	0.00	0.23	0.67	0.11	0.01	0.17	0.00	0.66
Avail Cap(c_a), veh/h	797	0	1133	611	0	1141	377	452	383	280	0	256
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.6	0.0	11.1	9.1	0.0	10.2	41.1	41.2	40.4	48.8	0.0	54.1
Incr Delay (d2), s/veh	0.0	0.0	1.3	0.0	0.0	0.5	3.9	0.1	0.0	0.4	0.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.8	0.1	0.0	3.0	6.3	1.0	0.1	1.0	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.6	0.0	12.4	9.1	0.0	10.7	45.0	41.3	40.4	49.2	0.0	59.9
LnGrp LOS	A	A	B	A	A	B	D	D	D	D	A	E
Approach Vol, veh/h	567			271			270			120		
Approach Delay, s/veh	12.0			10.7			44.4			56.6		
Approach LOS	B			B			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	80.5	20.8	12.9	8.2	78.1	8.0	25.6				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	58.0	18.0	17.0	7.0	58.0	7.0	28.0				
Max Q Clear Time (g_c+I1), s	2.2	19.8	15.6	7.7	3.2	9.6	4.3	4.0				
Green Ext Time (p_c), s	0.0	3.6	0.2	0.2	0.0	1.6	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	23.2											
HCM 6th LOS	C											

HCM 6th TWSC  
2: Kewaunee Street & Jewell Avenue

Short Term Total Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	147	8	13	179	7	6
Future Vol, veh/h	147	8	13	179	7	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	160	9	14	195	8	7

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	169	0	388	165
Stage 1	-	-	-	-	165	-
Stage 2	-	-	-	-	223	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1435	-	652	956
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	814	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1435	-	645	956
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	805	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	759	-	-	1435	-
HCM Lane V/C Ratio	0.019	-	-	0.01	-
HCM Control Delay (s)	9.8	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 6th TWSC  
3: Harvest Road & Pacific Avenue

Short Term Total Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	7	0	0	0	0	50	0	42	0	98	70	12
Future Vol, veh/h	7	0	0	0	0	50	0	42	0	98	70	12
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	-	-	-	-	-	-	150	-	-	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	8	0	0	0	0	54	0	46	0	107	76	13




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	370	343	83	343	349	46	89	0	0	46	0	0
Stage 1	297	297	-	46	46	-	-	-	-	-	-	-
Stage 2	73	46	-	297	303	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	601	589	1002	626	584	1023	1516	-	-	1562	-	-
Stage 1	723	672	-	968	857	-	-	-	-	-	-	-
Stage 2	937	857	-	723	669	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	539	549	1002	593	544	1023	1516	-	-	1562	-	-
Mov Cap-2 Maneuver	539	549	-	593	544	-	-	-	-	-	-	-
Stage 1	723	626	-	968	857	-	-	-	-	-	-	-
Stage 2	887	857	-	673	622	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.8		8.7		0		4.1	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1516	-	-	539 1023	1562	-	-
HCM Lane V/C Ratio	-	-	-	0.014 0.053 0.068	-	-	-
HCM Control Delay (s)	0	-	-	11.8 8.7 7.5	-	-	-
HCM Lane LOS	A	-	-	B A A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.2 0.2	-	-	-

HCM 6th TWSC  
4: Kewaunee Street & Pacific Avenue

Short Term Total Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	3	5	3
Future Vol, veh/h	0	0	0	3	5	3
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	-	-	-	-	-
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	0	0	0	3	5	3

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	10	7	8	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	3	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1010	1075	1612	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1075	1612	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1020	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1612	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-



HCM 6th TWSC  
5: Harvest Road & Warren Avenue

Short Term Total Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	12	0	0	0	0	16	0	24	0	25	31	14
Future Vol, veh/h	12	0	0	0	0	16	0	24	0	25	31	14
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	-	-	-	-	-	-	150	-	-	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	13	0	0	0	0	17	0	26	0	27	34	15




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	131	122	42	122	129	26	49	0	0	26	0	0
Stage 1	96	96	-	26	26	-	-	-	-	-	-	-
Stage 2	35	26	-	96	103	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	841	768	1029	853	762	1050	1558	-	-	1588	-	-
Stage 1	911	815	-	992	874	-	-	-	-	-	-	-
Stage 2	981	874	-	911	810	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	817	755	1029	842	749	1050	1558	-	-	1588	-	-
Mov Cap-2 Maneuver	817	755	-	842	749	-	-	-	-	-	-	-
Stage 1	911	801	-	992	874	-	-	-	-	-	-	-
Stage 2	965	874	-	896	796	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.5		8.5		0		2.6	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1558	-	-	817 1050	1588	-	-
HCM Lane V/C Ratio	-	-	-	0.016 0.017 0.017	-	-	-
HCM Control Delay (s)	0	-	-	9.5 8.5 7.3	-	-	-
HCM Lane LOS	A	-	-	A A A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.1 0.1	-	-	-

HCM 6th TWSC  
6: Kewaunee Street & Warren Avenue

Short Term Total Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	0	0	3
Future Vol, veh/h	1	0	0	0	0	3
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	-	-	-	-	-
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	1	0	0	0	0	3





























Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2	2	3	0	-	0
Stage 1	2	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1021	1082	1619	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1021	1082	1619	-	-	-
Mov Cap-2 Maneuver	1021	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1619	-	1021	-	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	0	-	8.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

# Timings 1: Harvest Road & Jewell Avenue

Long Term Total Conditions  
AM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		  					 		
Traffic Volume (vph)	425	928	80	1136	375	252	274	89	217	169	400
Future Volume (vph)	425	928	80	1136	375	252	274	89	217	169	400
Lane Group Flow (vph)	462	1117	87	1235	408	274	298	97	236	184	435
Turn Type	Prot	NA	Prot	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2	1	6	7	3	8		7	4	5
Permitted Phases					6	8		8			4
Detector Phase	5	2	1	6	7	3	8	8	7	4	5
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	9.0	9.0	21.0	21.0	9.0	21.0	9.0
Total Split (s)	26.0	51.0	16.0	41.0	20.0	21.0	33.0	33.0	20.0	32.0	26.0
Total Split (%)	21.7%	42.5%	13.3%	34.2%	16.7%	17.5%	27.5%	27.5%	16.7%	26.7%	21.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	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	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None	None
v/c Ratio	0.77	0.49	0.54	0.66	0.46	0.70	0.78	0.22	0.59	0.54	0.65
Control Delay	56.4	24.8	58.4	29.1	17.5	38.7	59.3	1.9	56.2	49.2	28.2
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	56.4	24.8	58.4	29.1	17.5	38.7	59.3	1.9	56.2	49.2	28.2
Queue Length 50th (ft)	173	223	49	309	194	158	219	0	90	129	217
Queue Length 95th (ft)	234	287	103	382	315	219	309	7	131	193	308
Internal Link Dist (ft)		1006		535			342			776	
Turn Bay Length (ft)	250		250		250	250		250	250		
Base Capacity (vph)	635	2280	177	1876	917	397	450	500	457	434	682
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.49	0.49	0.66	0.44	0.69	0.66	0.19	0.52	0.42	0.64

## Intersection Summary

Cycle Length: 120

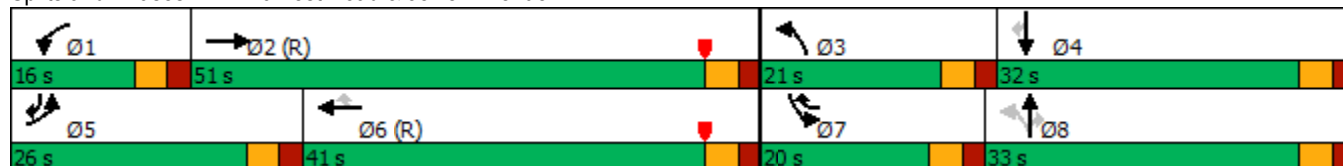
Actuated Cycle Length: 120

Offset: 43 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated






























Splits and Phases: 1: Harvest Road & Jewell Avenue



# HCM 6th Signalized Intersection Summary

















## 1: Harvest Road & Jewell Avenue

Long Term Total Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  					 		
Traffic Volume (veh/h)	425	928	99	80	1136	375	252	274	89	217	169	400
Future Volume (veh/h)	425	928	99	80	1136	375	252	274	89	217	169	400
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	462	1009	108	87	1235	408	274	298	97	236	184	435
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	552	1996	213	125	1719	683	424	516	437	326	436	623
Arrive On Green	0.16	0.43	0.43	0.02	0.11	0.11	0.14	0.28	0.28	0.09	0.23	0.23
Sat Flow, veh/h	3456	4684	500	1781	5106	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	462	733	384	87	1235	408	274	298	97	236	184	435
Grp Sat Flow(s),veh/h/ln	1728	1702	1780	1781	1702	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	15.6	18.9	19.0	5.8	28.0	25.7	13.4	16.5	5.7	8.0	10.0	27.6
Cycle Q Clear(g_c), s	15.6	18.9	19.0	5.8	28.0	25.7	13.4	16.5	5.7	8.0	10.0	27.6
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	552	1451	759	125	1719	683	424	516	437	326	436	623
V/C Ratio(X)	0.84	0.51	0.51	0.70	0.72	0.60	0.65	0.58	0.22	0.72	0.42	0.70
Avail Cap(c_a), veh/h	634	1451	759	178	1719	683	433	516	437	461	436	623
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	25.2	25.2	57.3	47.8	35.9	27.6	37.4	33.5	52.8	39.1	30.5
Incr Delay (d2), s/veh	8.6	1.3	2.4	6.8	2.6	3.8	3.2	1.6	0.3	3.3	0.6	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.7	12.2	13.0	5.2	19.1	17.2	10.1	12.3	4.0	6.5	8.3	16.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.5	26.4	27.6	64.1	50.4	39.7	30.8	39.0	33.8	56.2	39.8	33.9
LnGrp LOS	E	C	C	E	D	D	C	D	C	E	D	C
Approach Vol, veh/h	1579			1730			669			855		
Approach Delay, s/veh	35.8			48.6			34.9			41.3		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.4	55.1	20.4	32.0	23.2	44.4	15.3	37.1				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	11.0	46.0	16.0	27.0	21.0	36.0	15.0	28.0				
Max Q Clear Time (g_c+I1), s	7.8	21.0	15.4	29.6	17.6	30.0	10.0	18.5				
Green Ext Time (p_c), s	0.0	7.8	0.1	0.0	0.6	4.2	0.3	1.4				
Intersection Summary												
HCM 6th Ctrl Delay	41.2											
HCM 6th LOS	D											

# Timings 2: Kewaunee Street & Jewell Avenue

Long Term Total Conditions  
AM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	1140	21	1424	77	34	55	41
Future Volume (vph)	36	1140	21	1424	77	34	55	41
Lane Group Flow (vph)	39	1260	23	1602	84	73	60	118
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	9.0	21.0	9.0	21.0
Total Split (s)	12.0	69.0	12.0	69.0	13.0	27.0	12.0	26.0
Total Split (%)	10.0%	57.5%	10.0%	57.5%	10.8%	22.5%	10.0%	21.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
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	-1.0	-1.0	-1.0	-1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
v/c Ratio	0.16	0.36	0.07	0.45	0.41	0.39	0.30	0.61
Control Delay	3.4	5.0	5.6	10.4	45.8	34.0	43.8	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	5.0	5.6	10.4	45.8	34.0	43.8	40.6
Queue Length 50th (ft)	1	227	4	218	55	27	39	44
Queue Length 95th (ft)	m7	288	13	299	97	71	75	102
Internal Link Dist (ft)		460		1800		300		248
Turn Bay Length (ft)	250		250		250		250	
Base Capacity (vph)	251	3544	349	3528	210	345	200	344
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.36	0.07	0.45	0.40	0.21	0.30	0.34

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120


Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

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





















Splits and Phases: 2: Kewaunee Street & Jewell Avenue

			
Ø1	Ø2 (R)	Ø3	Ø4
12 s	69 s	13 s	26 s
			
Ø5	Ø6 (R)	Ø7	Ø8
12 s	69 s	12 s	27 s

# HCM 6th Signalized Intersection Summary









## 2: Kewaunee Street & Jewell Avenue

Long Term Total Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	1140	19	21	1424	50	77	34	33	55	41	67
Future Volume (veh/h)	36	1140	19	21	1424	50	77	34	33	55	41	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	1239	21	23	1548	54	84	37	36	60	45	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	3518	60	403	3414	119	208	89	87	216	57	92
Arrive On Green	0.05	1.00	1.00	0.03	0.67	0.67	0.06	0.10	0.10	0.04	0.09	0.09
Sat Flow, veh/h	1781	5171	88	1781	5066	177	1781	871	847	1781	642	1041
Grp Volume(v), veh/h	39	816	444	23	1040	562	84	0	73	60	0	118
Grp Sat Flow(s),veh/h/ln	1781	1702	1855	1781	1702	1839	1781	0	1718	1781	0	1683
Q Serve(g_s), s	0.8	0.0	0.0	0.5	17.2	17.3	5.0	0.0	4.8	3.6	0.0	8.2
Cycle Q Clear(g_c), s	0.8	0.0	0.0	0.5	17.2	17.3	5.0	0.0	4.8	3.6	0.0	8.2
Prop In Lane	1.00		0.05	1.00		0.10	1.00		0.49	1.00		0.62
Lane Grp Cap(c), veh/h	269	2316	1262	403	2294	1239	208	0	176	216	0	149
V/C Ratio(X)	0.15	0.35	0.35	0.06	0.45	0.45	0.40	0.00	0.41	0.28	0.00	0.79
Avail Cap(c_a), veh/h	329	2316	1262	476	2294	1239	230	0	315	247	0	295
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.1	0.0	0.0	5.5	9.2	9.2	44.7	0.0	50.5	47.1	0.0	53.6
Incr Delay (d2), s/veh	0.2	0.4	0.8	0.1	0.6	1.2	1.3	0.0	1.5	0.7	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	0.2	0.5	0.3	9.8	10.7	4.1	0.0	3.8	3.0	0.0	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.4	0.4	0.8	5.5	9.8	10.4	46.0	0.0	52.0	47.8	0.0	62.6
LnGrp LOS	A	A	A	A	A	B	D	A	D	D	A	E
Approach Vol, veh/h	1299			1625				157			178	
Approach Delay, s/veh	0.8			10.0				48.8			57.6	
Approach LOS	A			A				D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	85.6	11.6	15.6	7.9	84.9	9.9	17.3				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	64.0	8.0	21.0	7.0	64.0	7.0	22.0				
Max Q Clear Time (g_c+I1), s	2.5	2.0	7.0	10.2	2.8	19.3	5.6	6.8				
Green Ext Time (p_c), s	0.0	10.8	0.0	0.4	0.0	15.3	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	10.8											
HCM 6th LOS	B											

HCM 6th TWSC  
3: Harvest Road & Pacific Avenue

Long Term Total Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	10	16	0	64	3	412	7	33	263	4
Future Vol, veh/h	11	0	10	16	0	64	3	412	7	33	263	4
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	150	-	-	150	-	-	150	-	-	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	12	0	11	17	0	70	3	448	8	36	286	4




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	853	822	288	824	820	452	290	0	0	456	0	0
Stage 1	360	360	-	458	458	-	-	-	-	-	-	-
Stage 2	493	462	-	366	362	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	279	309	751	292	310	608	1272	-	-	1105	-	-
Stage 1	658	626	-	583	567	-	-	-	-	-	-	-
Stage 2	558	565	-	653	625	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	240	298	751	280	299	608	1272	-	-	1105	-	-
Mov Cap-2 Maneuver	240	298	-	280	299	-	-	-	-	-	-	-
Stage 1	657	605	-	582	566	-	-	-	-	-	-	-
Stage 2	493	564	-	623	604	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.6		13.1		0.1		0.9	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1272	-	-	240	751	280	608	1105	-	-
HCM Lane V/C Ratio	0.003	-	-	0.05	0.014	0.062	0.114	0.032	-	-
HCM Control Delay (s)	7.8	-	-	20.8	9.9	18.7	11.7	8.4	-	-
HCM Lane LOS	A	-	-	C	A	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0.2	0.4	0.1	-	-

HCM 6th TWSC  
4: Kewaunee Street & Pacific Avenue









Long Term Total Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	4	130	81	1
Future Vol, veh/h	1	3	4	130	81	1
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	-	-	-	-	-
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	1	3	4	141	88	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	238	89	89	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	149	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	781	1017	1525	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	778	1017	1525	-	-	-
Mov Cap-2 Maneuver	778	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.8	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1525	-	944	-	-	
HCM Lane V/C Ratio	0.003	-	0.005	-	-	
HCM Control Delay (s)	7.4	0	8.8	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	



HCM 6th TWSC  
5: Harvest Road & Warren Avenue

Long Term Total Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	0	5	17	0	67	2	333	5	22	260	7
Future Vol, veh/h	21	0	5	17	0	67	2	333	5	22	260	7
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	150	-	-	150	-	-	150	-	-	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	23	0	5	18	0	73	2	362	5	24	283	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	740	706	287	707	708	365	291	0	0	367	0	0
Stage 1	335	335	-	369	369	-	-	-	-	-	-	-
Stage 2	405	371	-	338	339	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	333	361	752	350	360	680	1271	-	-	1192	-	-
Stage 1	679	643	-	651	621	-	-	-	-	-	-	-
Stage 2	622	620	-	676	640	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	292	353	752	342	352	680	1271	-	-	1192	-	-
Mov Cap-2 Maneuver	292	353	-	342	352	-	-	-	-	-	-	-
Stage 1	678	630	-	650	620	-	-	-	-	-	-	-
Stage 2	555	619	-	658	627	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.7		12		0		0.6	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1271	-	-	292	752	342	680	1192	-	-
HCM Lane V/C Ratio	0.002	-	-	0.078	0.007	0.054	0.107	0.02	-	-
HCM Control Delay (s)	7.8	-	-	18.4	9.8	16.1	10.9	8.1	-	-
HCM Lane LOS	A	-	-	C	A	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0.2	0.4	0.1	-	-

HCM 6th TWSC  
6: Kewaunee Street & Warren Avenue

Long Term Total Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	0	4	5	0	65	1	51	5	30	47	7
Future Vol, veh/h	15	0	4	5	0	65	1	51	5	30	47	7
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	-	-	-	-	-	-	-	-	-	-	-	-
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	16	0	4	5	0	71	1	55	5	33	51	8









Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	216	183	55	183	185	58	59	0	0	60	0	0
Stage 1	121	121	-	60	60	-	-	-	-	-	-	-
Stage 2	95	62	-	123	125	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	764	727	1040	803	725	1008	1556	-	-	1544	-	-
Stage 1	903	805	-	951	845	-	-	-	-	-	-	-
Stage 2	912	843	-	901	802	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	-	-	-
Mov Cap-1 Maneuver	698	710	1040	786	708	1008	1556	-	-	1544	-	-
Mov Cap-2 Maneuver	698	710	-	786	708	-	-	-	-	-	-	-
Stage 1	902	788	-	950	844	-	-	-	-	-	-	-
Stage 2	847	842	-	878	785	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.9		8.9		0.1		2.6	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1556	-	-	750 988	1544	-	-
HCM Lane V/C Ratio	0.001	-	-	0.028 0.077	0.021	-	-
HCM Control Delay (s)	7.3	0	-	9.9 8.9	7.4	0	-
HCM Lane LOS	A	A	-	A A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0.2	0.1	-	-

HCM 6th TWSC  
7: Harvest Road & Wesley Place

Long Term Total Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	2	23	0	85	0	248	7	28	253	2
Future Vol, veh/h	7	0	2	23	0	85	0	248	7	28	253	2
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	150	-	-	150	-	-	150	-	-	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	8	0	2	25	0	92	0	270	8	30	275	2




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	656	614	276	611	611	274	277	0	0	278	0	0
Stage 1	336	336	-	274	274	-	-	-	-	-	-	-
Stage 2	320	278	-	337	337	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	379	407	763	406	409	765	1286	-	-	1285	-	-
Stage 1	678	642	-	732	683	-	-	-	-	-	-	-
Stage 2	692	680	-	677	641	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	327	398	763	397	400	765	1286	-	-	1285	-	-
Mov Cap-2 Maneuver	327	398	-	397	400	-	-	-	-	-	-	-
Stage 1	678	627	-	732	683	-	-	-	-	-	-	-
Stage 2	608	680	-	659	626	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.8		11.3		0		0.8	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1286	-	-	327	763	397	765	1285	-	-
HCM Lane V/C Ratio	-	-	-	0.023	0.003	0.063	0.121	0.024	-	-
HCM Control Delay (s)	0	-	-	16.3	9.7	14.7	10.4	7.9	-	-
HCM Lane LOS	A	-	-	C	A	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.2	0.4	0.1	-	-

HCM 6th TWSC  
8: Kewaunee Street & Wesley Place

Long Term Total Conditions  
AM Peak Hour




Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	6	2	28	47	9
Future Vol, veh/h	29	6	2	28	47	9
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	-	-	-	-	-
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	32	7	2	30	51	10
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	90	56	61	0	-	0
Stage 1	56	-	-	-	-	-
Stage 2	34	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	910	1011	1542	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	909	1011	1542	-	-	-
Mov Cap-2 Maneuver	909	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1542	-	925	-	-	
HCM Lane V/C Ratio	0.001	-	0.041	-	-	
HCM Control Delay (s)	7.3	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC  
10: Yale Avenue & Jackson Gap Street (South)

Long Term Total Conditions  
AM Peak Hour

Intersection




Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	321	252	1	4	13
Future Vol, veh/h	5	321	252	1	4	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	5	349	274	1	4	14

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	275	0	0 634 275
Stage 1	-	-	- 275 -
Stage 2	-	-	- 359 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1288	-	- 443 764
Stage 1	-	-	- 771 -
Stage 2	-	-	- 707 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1288	-	- 441 764
Mov Cap-2 Maneuver	-	-	- 441 -
Stage 1	-	-	- 767 -
Stage 2	-	-	- 707 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1288	-	-	-	652
HCM Lane V/C Ratio	0.004	-	-	-	0.028
HCM Control Delay (s)	7.8	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	310	246	15	35	18
Future Vol, veh/h	15	310	246	15	35	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	16	337	267	16	38	20
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	283	0	-	0	644	275
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	369	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1279	-	-	-	437	764
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1279	-	-	-	430	764
Mov Cap-2 Maneuver	-	-	-	-	430	-
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	699	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		13		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1279	-	-	-	505	
HCM Lane V/C Ratio	0.013	-	-	-	0.114	
HCM Control Delay (s)	7.9	0	-	-	13	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑	↗	↘	↑↑↑↑	↘↗	
Traffic Vol, veh/h	1176	58	19	1549	41	12
Future Vol, veh/h	1176	58	19	1549	41	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	100	-	-	-
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	1278	63	21	1684	45	13
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1341	0	1994	639
Stage 1	-	-	-	-	1278	-
Stage 2	-	-	-	-	716	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	799	-	*320	*646
Stage 1	-	-	-	-	*663	-
Stage 2	-	-	-	-	*572	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	799	-	*312	*646
Mov Cap-2 Maneuver	-	-	-	-	*312	-
Stage 1	-	-	-	-	*663	-
Stage 2	-	-	-	-	*557	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.1		17.2	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	353	-	-	799	-	
HCM Lane V/C Ratio	0.163	-	-	0.026	-	
HCM Control Delay (s)	17.2	-	-	9.6	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-	
Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						

HCM 6th TWSC  
13: Jackson Gap Street (North) & Jewell Avenue




Long Term Total Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↗
Traffic Vol, veh/h	1178	9	0	1568	0	17
Future Vol, veh/h	1178	9	0	1568	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	-	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	1280	10	0	1704	0	18
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	-	-	0	-	0	0
Stage 1	-	-	0	-	0	0
Stage 2	-	-	0	-	0	0
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Control Delay (s)	0	-	-	-		
HCM Lane LOS	A	-	-	-		
HCM 95th %tile Q(veh)	-	-	-	-		






HCM 6th TWSC  
14: Kewaunee St & Northern Site Access

Long Term Total Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	3	1	134	77	3
Future Vol, veh/h	10	3	1	134	77	3
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	-	-	-	-	-
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	11	3	1	146	84	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	234	86	87	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	785	1021	1528	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	784	1021	1528	-	-	-
Mov Cap-2 Maneuver	784	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.4	0.1		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1528	-	828	-	-	
HCM Lane V/C Ratio	0.001	-	0.017	-	-	
HCM Control Delay (s)	7.4	0	9.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC  
15: Kewaunee St & Southern Site Access




Long Term Total Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	3	1	130	78	2
Future Vol, veh/h	5	3	1	130	78	2
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	-	-	-	-	-
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	5	3	1	141	85	2

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	229	86	87	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	791	1021	1528	-	-	-
Stage 1	964	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	790	1021	1528	-	-	-
Mov Cap-2 Maneuver	790	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1528	-	863	-	-
HCM Lane V/C Ratio	0.001	-	0.01	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	49	475	11	0	300
Future Vol, veh/h	0	49	475	11	0	300
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	-	-	-	-
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	0	53	516	12	0	326
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	522	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	555	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	555	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.2	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)	-	555		-		
HCM Lane V/C Ratio	-	0.096		-		
HCM Control Delay (s)	-	12.2		-		
HCM Lane LOS	-	B		-		
HCM 95th %tile Q(veh)	-	0.3		-		

# MOVEMENT SUMMARY

 **Site: 9 [Harvest & Yale AM (Site Folder: General)]**

AM\_9\_LongTerm Total  
Site Category: (None)  
Roundabout





























Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
East: Yale Ave														
6	T1	131	3.0	142	3.0	0.248	5.3	LOS A	1.3	32.0	0.33	0.19	0.33	35.0
16	R2	135	3.0	147	3.0	0.248	5.3	LOS A	1.3	32.0	0.33	0.19	0.33	34.0
Approach		266	3.0	289	3.0	0.248	5.3	LOS A	1.3	32.0	0.33	0.19	0.33	34.5
North: Harvest Rd														
7	L2	208	3.0	226	3.0	0.261	5.5	LOS A	1.3	34.1	0.35	0.21	0.35	32.9
14	R2	69	3.0	75	3.0	0.261	5.5	LOS A	1.3	34.1	0.35	0.21	0.35	31.9
Approach		277	3.0	301	3.0	0.261	5.5	LOS A	1.3	34.1	0.35	0.21	0.35	32.6
West: Yale Ave														
5	L2	121	3.0	132	3.0	0.246	5.7	LOS A	1.2	30.5	0.43	0.30	0.43	33.5
2	T1	118	3.0	128	3.0	0.246	5.7	LOS A	1.2	30.5	0.43	0.30	0.43	33.4
Approach		239	3.0	260	3.0	0.246	5.7	LOS A	1.2	30.5	0.43	0.30	0.43	33.4
All Vehicles		782	3.0	850	3.0	0.261	5.5	LOS A	1.3	34.1	0.37	0.23	0.37	33.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Roundabout LOS Method: Same as Sign Control.  
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
Roundabout Capacity Model: US HCM 6.  
Delay Model: HCM Delay Formula (Geometric Delay is not included).  
Queue Model: HCM Queue Formula.  
Gap-Acceptance Capacity: Traditional M1.  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# Timings

## 1: Harvest Road & Jewell Avenue

Long Term Total Conditions  
PM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		  					 		
Traffic Volume (vph)	408	1287	120	1258	286	237	389	91	388	348	452
Future Volume (vph)	408	1287	120	1258	286	237	389	91	388	348	452
Lane Group Flow (vph)	443	1679	130	1367	311	258	423	99	422	378	491
Turn Type	Prot	NA	Prot	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2	1	6	7	3	8		7	4	5
Permitted Phases					6	8		8			4
Detector Phase	5	2	1	6	7	3	8	8	7	4	5
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	9.0	9.0	21.0	21.0	9.0	21.0	9.0
Total Split (s)	23.0	48.0	16.0	41.0	21.0	17.0	35.0	35.0	21.0	39.0	23.0
Total Split (%)	19.2%	40.0%	13.3%	34.2%	17.5%	14.2%	29.2%	29.2%	17.5%	32.5%	19.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	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	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None	None
v/c Ratio	0.83	0.88	0.76	0.84	0.37	0.81	0.91	0.19	0.87	0.72	0.63
Control Delay	63.8	41.1	75.8	33.2	14.3	45.7	68.2	1.8	69.6	47.2	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	41.1	75.8	33.2	14.3	45.7	68.2	1.8	69.6	47.2	24.4
Queue Length 50th (ft)	173	440	82	369	150	130	316	0	167	260	237
Queue Length 95th (ft)	#247	510	#189	432	241	#217	#494	9	#251	373	353
Internal Link Dist (ft)		1006		535			342			776	
Turn Bay Length (ft)	250		250		250	250		250	250		
Base Capacity (vph)	543	1900	177	1629	839	318	481	523	486	543	785
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.88	0.73	0.84	0.37	0.81	0.88	0.19	0.87	0.70	0.63

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 44 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

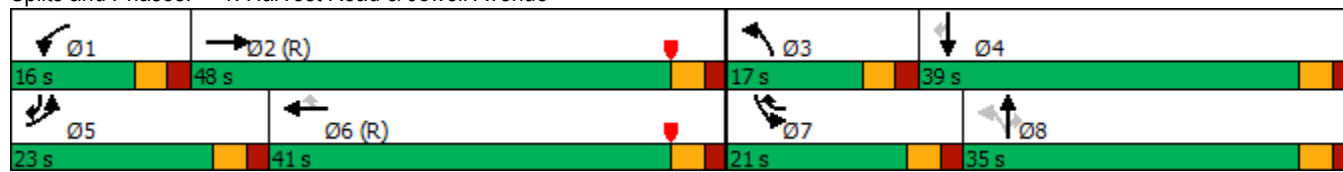
Natural Cycle: 80

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.
























Splits and Phases: 1: Harvest Road & Jewell Avenue



# HCM 6th Signalized Intersection Summary

















## 1: Harvest Road & Jewell Avenue

Long Term Total Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	408	1287	258	120	1258	286	237	389	91	388	348	452
Future Volume (veh/h)	408	1287	258	120	1258	286	237	389	91	388	348	452
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	443	1399	280	130	1367	311	258	423	99	422	378	491
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	523	1611	322	172	1646	736	319	470	398	490	532	691
Arrive On Green	0.15	0.38	0.38	0.03	0.11	0.11	0.11	0.25	0.25	0.14	0.28	0.28
Sat Flow, veh/h	3456	4268	853	1781	5106	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	443	1115	564	130	1367	311	258	423	99	422	378	491
Grp Sat Flow(s),veh/h/ln	1728	1702	1717	1781	1702	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	15.0	36.4	36.5	8.7	31.5	17.8	13.0	26.3	6.0	14.3	21.7	30.4
Cycle Q Clear(g_c), s	15.0	36.4	36.5	8.7	31.5	17.8	13.0	26.3	6.0	14.3	21.7	30.4
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	523	1285	648	172	1646	736	319	470	398	490	532	691
V/C Ratio(X)	0.85	0.87	0.87	0.76	0.83	0.42	0.81	0.90	0.25	0.86	0.71	0.71
Avail Cap(c_a), veh/h	547	1285	648	178	1646	736	319	483	409	490	546	702
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	34.6	34.6	56.7	50.4	29.0	31.0	43.5	35.9	50.4	38.5	27.7
Incr Delay (d2), s/veh	11.4	8.1	14.8	16.4	5.0	1.8	14.4	19.4	0.3	14.6	4.2	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.6	22.4	24.1	8.4	21.5	12.5	11.1	20.9	0.1	11.6	15.9	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	42.7	49.4	73.1	55.4	30.8	45.4	62.9	36.2	64.9	42.7	31.0
LnGrp LOS	E	D	D	E	E	C	D	E	D	E	D	C
Approach Vol, veh/h	2122			1808			780			1291		
Approach Delay, s/veh	48.3			52.5			53.7			45.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.6	49.3	17.0	38.1	22.2	42.7	21.0	34.1				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	11.0	43.0	12.0	34.0	18.0	36.0	16.0	30.0				
Max Q Clear Time (g_c+I1), s	10.7	38.5	15.0	32.4	17.0	33.5	16.3	28.3				
Green Ext Time (p_c), s	0.0	3.5	0.0	0.8	0.2	2.0	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	49.7											
HCM 6th LOS	D											

# Timings 2: Kewaunee Street & Jewell Avenue

Long Term Total Conditions  
PM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	71	1465	57	1550	21	45	75	60
Future Volume (vph)	71	1465	57	1550	21	45	75	60
Lane Group Flow (vph)	77	1706	62	1794	23	85	82	141
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	9.0	21.0	9.0	21.0
Total Split (s)	16.0	72.0	12.0	68.0	12.0	23.0	13.0	24.0
Total Split (%)	13.3%	60.0%	10.0%	56.7%	10.0%	19.2%	10.8%	20.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
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	-1.0	-1.0	-1.0	-1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
v/c Ratio	0.37	0.51	0.27	0.54	0.11	0.45	0.38	0.58
Control Delay	16.5	1.4	8.6	13.6	37.0	42.8	44.4	44.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	1.4	8.6	13.6	37.0	42.8	44.4	44.0
Queue Length 50th (ft)	2	15	12	274	14	44	54	74
Queue Length 95th (ft)	m9	35	30	391	35	91	94	136
Internal Link Dist (ft)		460		1800		300		248
Turn Bay Length (ft)	250		250		250		250	
Base Capacity (vph)	261	3351	240	3324	215	283	221	310
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.51	0.26	0.54	0.11	0.30	0.37	0.45

## Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 m Volume for 95th percentile queue is metered by upstream signal.





















## Splits and Phases: 2: Kewaunee Street & Jewell Avenue

 Ø1	 Ø2 (R)		 Ø3	 Ø4
12 s	72 s		12 s	24 s
 Ø5	 Ø6 (R)		 Ø7	 Ø8
16 s	68 s		13 s	23 s

# HCM 6th Signalized Intersection Summary

## 2: Kewaunee Street & Jewell Avenue









Long Term Total Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	1465	105	57	1550	100	21	45	33	75	60	70
Future Volume (veh/h)	71	1465	105	57	1550	100	21	45	33	75	60	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	1592	114	62	1685	109	23	49	36	82	65	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	251	3362	241	324	3379	218	145	67	49	182	81	95
Arrive On Green	0.06	1.00	1.00	0.04	0.69	0.68	0.03	0.07	0.07	0.05	0.10	0.10
Sat Flow, veh/h	1781	4864	348	1781	4901	317	1781	1002	736	1781	786	919
Grp Volume(v), veh/h	77	1114	592	62	1170	624	23	0	85	82	0	141
Grp Sat Flow(s),veh/h/ln	1781	1702	1808	1781	1702	1813	1781	0	1738	1781	0	1705
Q Serve(g_s), s	1.6	0.0	0.0	1.2	19.5	19.6	1.4	0.0	5.8	5.0	0.0	9.7
Cycle Q Clear(g_c), s	1.6	0.0	0.0	1.2	19.5	19.6	1.4	0.0	5.8	5.0	0.0	9.7
Prop In Lane	1.00		0.19	1.00		0.17	1.00		0.42	1.00		0.54
Lane Grp Cap(c), veh/h	251	2353	1249	324	2347	1250	145	0	116	182	0	176
V/C Ratio(X)	0.31	0.47	0.47	0.19	0.50	0.50	0.16	0.00	0.73	0.45	0.00	0.80
Avail Cap(c_a), veh/h	360	2353	1249	376	2347	1250	217	0	261	203	0	270
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.2	0.0	0.0	4.6	8.8	8.9	49.2	0.0	55.0	47.5	0.0	52.6
Incr Delay (d2), s/veh	0.7	0.7	1.3	0.3	0.8	1.4	0.5	0.0	8.7	1.7	0.0	9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	0.4	0.8	0.7	10.7	11.6	1.2	0.0	5.0	4.2	0.0	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.7	1.3	4.9	9.6	10.3	49.7	0.0	63.6	49.2	0.0	61.8
LnGrp LOS	A	A	A	A	A	B	D	A	E	D	A	E
Approach Vol, veh/h	1783		1856				108		223			
Approach Delay, s/veh	1.2		9.7				60.7		57.2			
Approach LOS	A		A				E		E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	86.9	7.1	17.4	8.7	86.7	11.6	13.0				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	7.0	67.0	7.0	19.0	11.0	63.0	8.0	18.0				
Max Q Clear Time (g_c+I1), s	3.2	2.0	3.4	11.7	3.6	21.6	7.0	7.8				
Green Ext Time (p_c), s	0.0	18.6	0.0	0.4	0.1	17.9	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									



HCM 6th TWSC  
3: Harvest Road & Pacific Avenue

Long Term Total Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	6	34	0	56	10	505	16	92	522	12
Future Vol, veh/h	7	0	6	34	0	56	10	505	16	92	522	12
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	150	-	-	150	-	-	150	-	-	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	8	0	7	37	0	61	11	549	17	100	567	13




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1384	1362	574	1357	1360	558	580	0	0	566	0	0
Stage 1	774	774	-	580	580	-	-	-	-	-	-	-
Stage 2	610	588	-	777	780	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	121	148	518	126	148	529	994	-	-	1006	-	-
Stage 1	391	408	-	500	500	-	-	-	-	-	-	-
Stage 2	482	496	-	390	406	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	98	132	518	114	132	529	994	-	-	1006	-	-
Mov Cap-2 Maneuver	98	132	-	114	132	-	-	-	-	-	-	-
Stage 1	387	368	-	495	495	-	-	-	-	-	-	-
Stage 2	422	491	-	347	366	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	29.7		27.2		0.2		1.3	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	994	-	-	98	518	114	529	1006	-	-
HCM Lane V/C Ratio	0.011	-	-	0.078	0.013	0.324	0.115	0.099	-	-
HCM Control Delay (s)	8.7	-	-	44.8	12	51	12.7	9	-	-
HCM Lane LOS	A	-	-	E	B	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	1.3	0.4	0.3	-	-









HCM 6th TWSC  
4: Kewaunee Street & Pacific Avenue

Long Term Total Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	8	8	84	203	4
Future Vol, veh/h	0	8	8	84	203	4
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	-	-	-	-	-
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	0	9	9	91	221	4
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	332	223	225	0	-	0
Stage 1	223	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	*739	*920	*1377	-	-	-
Stage 1	*867	-	-	-	-	-
Stage 2	*916	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	*734	*920	*1377	-	-	-
Mov Cap-2 Maneuver	*734	-	-	-	-	-
Stage 1	*861	-	-	-	-	-
Stage 2	*916	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	9		0.7		0	
HCM LOS	A					
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 1377		-	920	-	-
HCM Lane V/C Ratio	0.006		-	0.009	-	-
HCM Control Delay (s)	7.6		0	9	-	-
HCM Lane LOS	A		A	A	-	-
HCM 95th %tile Q(veh)	0		-	0	-	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

HCM 6th TWSC  
5: Harvest Road & Warren Avenue

Long Term Total Conditions  
PM Peak Hour

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	16	0	4	12	0	45	6	470	21	72	469	21
Future Vol, veh/h	16	0	4	12	0	45	6	470	21	72	469	21
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	150	-	-	150	-	-	150	-	-	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	17	0	4	13	0	49	7	511	23	78	510	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1239	1226	522	1217	1226	523	533	0	0	534	0	0
Stage 1	678	678	-	537	537	-	-	-	-	-	-	-
Stage 2	561	548	-	680	689	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	152	179	555	158	179	554	1035	-	-	1034	-	-
Stage 1	442	452	-	528	523	-	-	-	-	-	-	-
Stage 2	512	517	-	441	446	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	130	165	555	147	165	554	1035	-	-	1034	-	-
Mov Cap-2 Maneuver	130	165	-	147	165	-	-	-	-	-	-	-
Stage 1	439	418	-	524	519	-	-	-	-	-	-	-
Stage 2	464	513	-	405	413	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	31.8		16.3		0.1		1.1	
HCM LOS	D		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1035	-	-	130	555	147	554	1034	-	-
HCM Lane V/C Ratio	0.006	-	-	0.134	0.008	0.089	0.088	0.076	-	-
HCM Control Delay (s)	8.5	-	-	36.9	11.5	31.9	12.1	8.8	-	-
HCM Lane LOS	A	-	-	E	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0.3	0.3	0.2	-	-

HCM 6th TWSC  
6: Kewaunee Street & Warren Avenue

Long Term Total Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	0	2	10	0	25	4	57	10	115	68	26
Future Vol, veh/h	10	0	2	10	0	25	4	57	10	115	68	26
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	-	-	-	-	-	-	-	-	-	-	-	-
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	11	0	2	11	0	27	4	62	11	125	74	28









Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	427	419	88	415	428	68	102	0	0	73	0	0
Stage 1	338	338	-	76	76	-	-	-	-	-	-	-
Stage 2	89	81	-	339	352	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	549	532	996	560	526	995	1499	-	-	1527	-	-
Stage 1	686	644	-	933	832	-	-	-	-	-	-	-
Stage 2	918	828	-	685	635	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	498	484	996	520	479	995	1499	-	-	1527	-	-
Mov Cap-2 Maneuver	498	484	-	520	479	-	-	-	-	-	-	-
Stage 1	684	588	-	930	830	-	-	-	-	-	-	-
Stage 2	890	826	-	624	579	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.8		9.8		0.4		4.2	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1499	-	-	543	789	1527	-
HCM Lane V/C Ratio	0.003	-	-	0.024	0.048	0.082	-
HCM Control Delay (s)	7.4	0	-	11.8	9.8	7.6	0
HCM Lane LOS	A	A	-	B	A	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.3	-

HCM 6th TWSC  
7: Harvest Road & Wesley Place

Long Term Total Conditions  
PM Peak Hour

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	4	0	1	14	0	56	2	437	25	97	380	8
Future Vol, veh/h	4	0	1	14	0	56	2	437	25	97	380	8
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	150	-	-	150	-	-	150	-	-	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	4	0	1	15	0	61	2	475	27	105	413	9




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1151	1134	418	1121	1125	489	422	0	0	502	0	0
Stage 1	628	628	-	493	493	-	-	-	-	-	-	-
Stage 2	523	506	-	628	632	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	175	203	635	183	205	579	1137	-	-	1062	-	-
Stage 1	471	476	-	558	547	-	-	-	-	-	-	-
Stage 2	537	540	-	471	474	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	145	182	635	169	184	579	1137	-	-	1062	-	-
Mov Cap-2 Maneuver	145	182	-	169	184	-	-	-	-	-	-	-
Stage 1	470	429	-	557	546	-	-	-	-	-	-	-
Stage 2	480	539	-	424	427	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	26.6		15.2		0		1.8	
HCM LOS	D		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1137	-	-	145	635	169	579	1062	-	-
HCM Lane V/C Ratio	0.002	-	-	0.03	0.002	0.09	0.105	0.099	-	-
HCM Control Delay (s)	8.2	-	-	30.6	10.7	28.4	11.9	8.8	-	-
HCM Lane LOS	A	-	-	D	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.3	0.4	0.3	-	-




HCM 6th TWSC  
8: Kewaunee Street & Wesley Place

Long Term Total Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	4	7	52	48	32
Future Vol, veh/h	19	4	7	52	48	32
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	-	-	-	-	-
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	21	4	8	57	52	35
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	143	70	87	0	-	0
Stage 1	70	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	850	993	1509	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	846	993	1509	-	-	-
Mov Cap-2 Maneuver	846	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.3	0.9		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1509	-	868	-	-	
HCM Lane V/C Ratio	0.005	-	0.029	-	-	
HCM Control Delay (s)	7.4	0	9.3	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC  
10: Yale Avenue & Jackson Gap Street (South)




Long Term Total Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	402	365	5	3	9
Future Vol, veh/h	16	402	365	5	3	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	17	437	397	5	3	10

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	402	0	0 871 400
Stage 1	-	-	- 400 -
Stage 2	-	-	- 471 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1157	-	- 322 650
Stage 1	-	-	- 677 -
Stage 2	-	-	- 628 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1157	-	- 316 650
Mov Cap-2 Maneuver	-	-	- 316 -
Stage 1	-	-	- 664 -
Stage 2	-	-	- 628 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1157	-	-	-	514
HCM Lane V/C Ratio	0.015	-	-	-	0.025
HCM Control Delay (s)	8.2	0	-	-	12.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	387	352	42	36	17
Future Vol, veh/h	18	387	352	42	36	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	20	421	383	46	39	18
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	429	0	-	0	867	406
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	461	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1130	-	-	-	323	645
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	635	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1130	-	-	-	316	645
Mov Cap-2 Maneuver	-	-	-	-	316	-
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	635	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		16.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1130	-	-	-	378	
HCM Lane V/C Ratio	0.017	-	-	-	0.152	
HCM Control Delay (s)	8.2	0	-	-	16.2	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	



Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑	↗	↘	↑↑↑↑	↘↗	
Traffic Vol, veh/h	1621	145	44	1597	67	34
Future Vol, veh/h	1621	145	44	1597	67	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	100	-	-	-
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	1762	158	48	1736	73	37
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1920	0	2552	881
Stage 1	-	-	-	-	1762	-
Stage 2	-	-	-	-	790	-
Critical Hdwy	-	-	5.34	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	3.12	-	3.82	3.92
Pot Cap-1 Maneuver	-	-	617	-	*227	*536
Stage 1	-	-	-	-	*550	-
Stage 2	-	-	-	-	*550	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	617	-	*209	*536
Mov Cap-2 Maneuver	-	-	-	-	*209	-
Stage 1	-	-	-	-	*550	-
Stage 2	-	-	-	-	*507	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		28.2	
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	263	-	-	617	-	
HCM Lane V/C Ratio	0.417	-	-	0.078	-	
HCM Control Delay (s)	28.2	-	-	11.3	-	
HCM Lane LOS	D	-	-	B	-	
HCM 95th %tile Q(veh)	2	-	-	0.3	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

HCM 6th TWSC  
13: Jackson Gap Street (North) & Jewell Avenue

Long Term Total Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↑
Traffic Vol, veh/h	1624	29	0	1641	0	14
Future Vol, veh/h	1624	29	0	1641	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	-	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	1765	32	0	1784	0	15




Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-
Pot Cap-1 Maneuver	-	-	0	-	0	0
Stage 1	-	-	0	-	0	0
Stage 2	-	-	0	-	0	0
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

HCM 6th TWSC  
14: Kewaunee St & Northern Site Access

Long Term Total Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	2	2	82	210	10
Future Vol, veh/h	6	2	2	82	210	10
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	-	-	-	-	-
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	2	2	89	228	11

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	327	234	239	0	-	0
Stage 1	234	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	745	912	1361	-	-	-
Stage 1	861	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	744	912	1361	-	-	-
Mov Cap-2 Maneuver	744	-	-	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	931	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.2	0
HCM LOS	A		




Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1361	-	780	-	-
HCM Lane V/C Ratio	0.002	-	0.011	-	-
HCM Control Delay (s)	7.6	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC  
15: Kewaunee St & Southern Site Access

Long Term Total Conditions  
PM Peak Hour

Intersection




Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	2	3	81	206	6
Future Vol, veh/h	3	2	3	81	206	6
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	-	-	-	-	-
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	3	2	3	88	224	7

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	322	228	231	0	-	0
Stage 1	228	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	751	919	1372	-	-	-
Stage 1	867	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	750	919	1372	-	-	-
Mov Cap-2 Maneuver	750	-	-	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	930	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1372	-	810	-	-
HCM Lane V/C Ratio	0.002	-	0.007	-	-
HCM Control Delay (s)	7.6	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	101	542	26	0	626
Future Vol, veh/h	0	101	542	26	0	626
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	-	-	-	-
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	0	110	589	28	0	680
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	603	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	499	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	499	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.2	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBT		
Capacity (veh/h)	-	- 499		-		
HCM Lane V/C Ratio	-	- 0.22		-		
HCM Control Delay (s)	-	- 14.2		-		
HCM Lane LOS	-	- B		-		
HCM 95th %tile Q(veh)	-	- 0.8		-		

# MOVEMENT SUMMARY

 **Site: 9 [Harvest & Yale PM (Site Folder: General)]**

PM\_9\_Long Term Total  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
East: Yale Ave														
6	T1	147	3.0	160	3.0	0.397	7.8	LOS A	2.2	56.4	0.52	0.41	0.52	33.7
16	R2	227	3.0	247	3.0	0.397	7.8	LOS A	2.2	56.4	0.52	0.41	0.52	32.7
Approach		374	3.0	407	3.0	0.397	7.8	LOS A	2.2	56.4	0.52	0.41	0.52	33.1
North: Harvest Rd														
7	L2	259	3.0	282	3.0	0.378	7.0	LOS A	2.2	55.8	0.42	0.27	0.42	32.4
14	R2	135	3.0	147	3.0	0.378	7.0	LOS A	2.2	55.8	0.42	0.27	0.42	31.5
Approach		394	3.0	428	3.0	0.378	7.0	LOS A	2.2	55.8	0.42	0.27	0.42	32.1
West: Yale Ave														
5	L2	236	3.0	257	3.0	0.431	8.5	LOS A	2.4	62.4	0.56	0.46	0.56	32.0
2	T1	159	3.0	173	3.0	0.431	8.5	LOS A	2.4	62.4	0.56	0.46	0.56	31.9
Approach		395	3.0	429	3.0	0.431	8.5	LOS A	2.4	62.4	0.56	0.46	0.56	31.9
All Vehicles		1163	3.0	1264	3.0	0.431	7.8	LOS A	2.4	62.4	0.50	0.38	0.50	32.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Roundabout LOS Method: Same as Sign Control.  
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
Roundabout Capacity Model: US HCM 6.  
Delay Model: HCM Delay Formula (Geometric Delay is not included).  
Queue Model: HCM Queue Formula.  
Gap-Acceptance Capacity: Traditional M1.  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## APPENDIX E. SIGNAL WARRANT ANALYSES

**MUTCD Volume-based Warrant Evaluation**  
**Harvest Road & Jewell Avenue**  
**2040\_LT Background**



Major Street: Jewell Avenue  
 Lanes Moving Traffic: 2 or more  
 Approach Speed: 40 MPH  
 Option: Rural Community

Minor Street: Harvest Road  
 Lanes Moving Traffic: 2 or more  
 Right Turn Volume Included: 100% SB, 100% NB  
 per NCHRP 457 Methodology

**WARRANT 1, Condition A - Minimum Vehicular Volume**

70% Satisfied Yes

	Vehicles per hour 70% (56%)	Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
Both Apprchs. Major Street	420 (336)	3415	3206	2996	2787	2578	2369	2159	1950
Highest Apprch. Minor Street	140 (112)	949	891	833	775	716	658	600	542

**WARRANT 1, Condition B - Interruption of Continuous Traffic**

70% Satisfied Yes

	Vehicles per hour 70% (56%)	Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
Both Apprchs. Major Street	630 (504)	3415	3206	2996	2787	2578	2369	2159	1950
Highest Apprch. Minor Street	70 (56)	949	891	833	775	716	658	600	542

**WARRANT 1, Condition A and Condition B**

56% Satisfied Yes

**WARRANT 2, Four Hour Volume**

70% Satisfied Yes

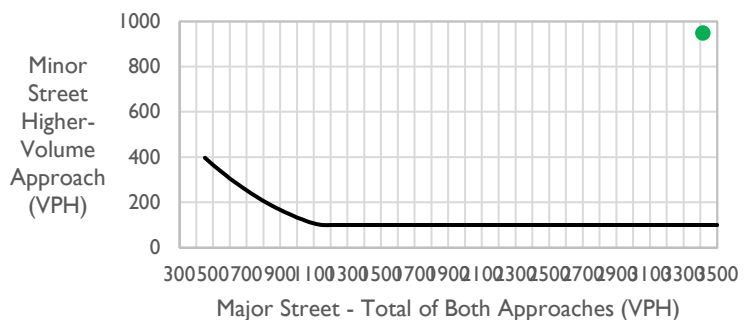
	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
Peak Hour	3415	949
2nd Highest	3206	891
3rd Highest	2996	833
4th Highest	2787	775



**WARRANT 3, Peak Hour Volume**

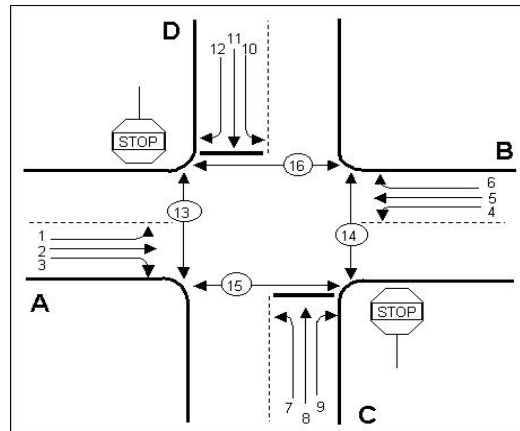
70% Satisfied Yes

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
Peak Hour	3415	949





**Figure 2 - 11. Minor-road right-turn volume reduction for warrant check.**  
**Harvest Road & Jewell Avenue**  
**2040\_LT Background**



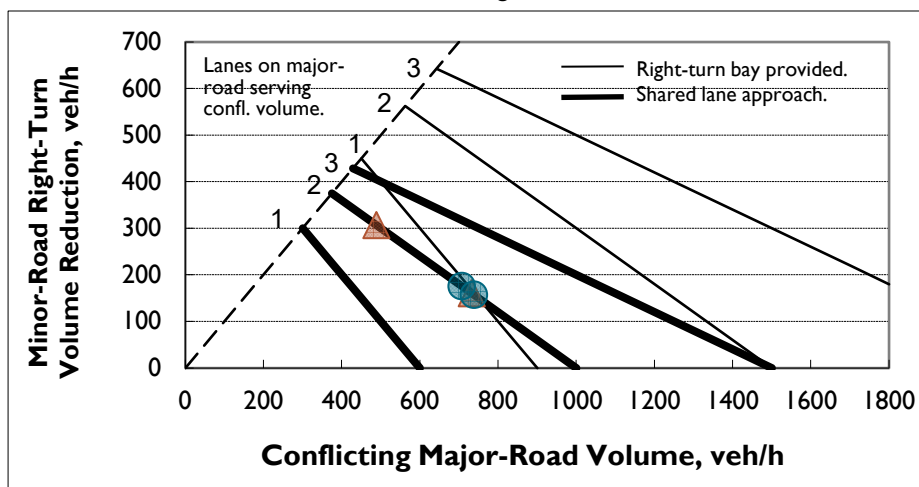
**INPUT**

Number of lanes on major-road approach:			2	
Right-turn geometry on minor-road:			Shared-lane approach	
Approach	Number	Movement	Volume (veh/hr)	
Major A	2	Through	AM 889	PM 1183
	3	Right	89	232
Major B	5	Through	1109	1220
	6	Right	356	257
Minor C	7	Left	215	159
	8	Through	252	347
	9	Right	88	88
Minor D	10	Left	190	318
	11	Through	164	336
	12	Right	400	452

**OUTPUT**

Variable	Volume (veh/hr)	
	AM	PM
Conflicting major-road volume (Vc9):	489	708
Conflicting major-road volume (Vc12):	733	739
Right-turn volume reduction (Vr9):	307	176
Right-turn volume reduction (Vr12):	161	157
Adjusted right-turn volume reduction (Vr9):	88	88
Adjusted right-turn volume reduction (Vr12):	161	157
Adjusted minor-road volume:	594	949

Chart Legend:



**MUTCD Volume-based Warrant Evaluation**  
**Kewaunee Street & Jewell Avenue**  
**2040\_LT Background**



Major Street: Jewell Avenue  
 Lanes Moving Traffic: 2 or more  
 Approach Speed: 40 MPH  
 Option: Rural Community

Minor Street: Kewaunee Street  
 Lanes Moving Traffic: 2 or more  
 Right Turn Volume Included: 0% SB, 0% NB  
 per NCHRP 457 Methodology

**WARRANT 1, Condition A - Minimum Vehicular Volume**

**70% Satisfied** **No**

	Vehicles per hour 70% (56%)	Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
Both Apprchs. Major Street	420 (336)	3266	3066	2866	2666	2465	2265	2065	1865
Highest Apprch. Minor Street	140 (112)	131	123	115	107	99	91	83	75

**WARRANT 1, Condition B - Interruption of Continuous Traffic**

**70% Satisfied** **Yes**

	Vehicles per hour 70% (56%)	Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
Both Apprchs. Major Street	630 (504)	3266	3066	2866	2666	2465	2265	2065	1865
Highest Apprch. Minor Street	70 (56)	131	123	115	107	99	91	83	75

**WARRANT 1, Condition A and Condition B**

**56% Satisfied** **No**

**WARRANT 2, Four Hour Volume**

**70% Satisfied** **Yes**

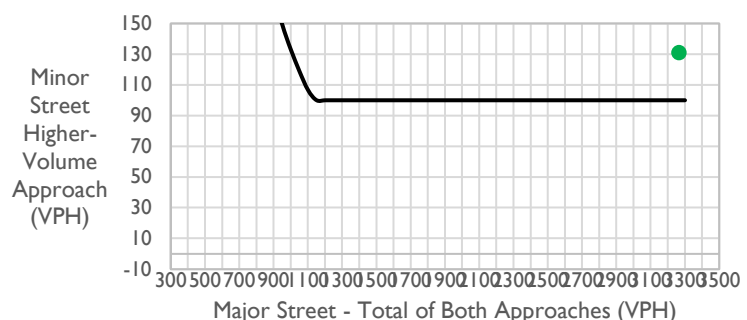
	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
Peak Hour	3266	131
2nd Highest	3066	123
3rd Highest	2866	115
4th Highest	2666	107



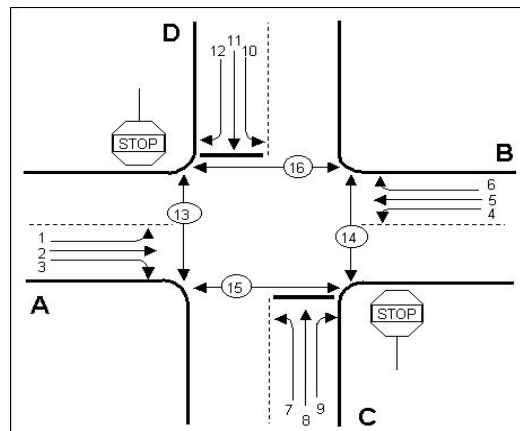
**WARRANT 3, Peak Hour Volume**

**70% Satisfied** **Yes**

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
Peak Hour	3266	131



**Figure 2 - 11. Minor-road right-turn volume reduction for warrant check.**  
**Kewaunee Street & Jewell Avenue**  
**2040\_LT Background**



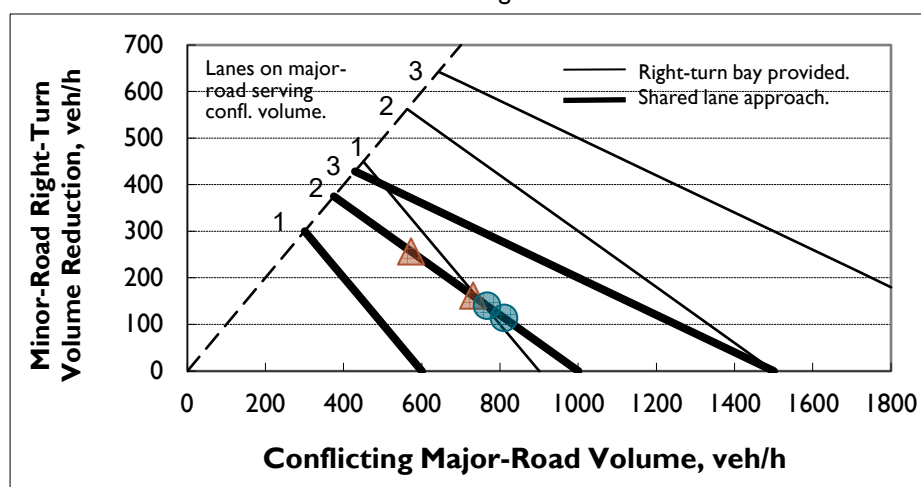
**INPUT**

Number of lanes on major-road approach:			2	
Right-turn geometry on minor-road:			Shared-lane approach	
Approach	Number	Movement	Volume (veh/hr)	
Major A	2	Through	AM 1129	PM 1440
	3	Right	15	94
Major B	5	Through	1412	1521
	6	Right	50	100
Minor C	7	Left	69	14
	8	Through	31	43
	9	Right	28	30
Minor D	10	Left	55	75
	11	Through	40	56
	12	Right	61	57

**OUTPUT**

Variable	Volume (veh/hr)	
	AM	PM
Conflicting major-road volume (Vc9):	572	767
Conflicting major-road volume (Vc12):	731	811
Right-turn volume reduction (Vr9):	257	140
Right-turn volume reduction (Vr12):	161	114
Adjusted right-turn volume reduction (Vr9):	28	30
Adjusted right-turn volume reduction (Vr12):	61	57
Adjusted minor-road volume:	100	131

Chart Legend:



**MUTCD Volume-based Warrant Evaluation**  
**Harvest Road & Jewell Avenue**  
**2026\_ST Total**



Major Street: Jewell Avenue  
 Lanes Moving Traffic: 2 or more  
 Approach Speed: 30 MPH  
 Option: Rural Community

Minor Street: Harvest Road  
 Lanes Moving Traffic: 2 or more  
 Right Turn Volume Included: 0% SB, 0% NB  
 per NCHRP 457 Methodology

**WARRANT 1, Condition A - Minimum Vehicular Volume**

**70% Satisfied** **Yes**

	Vehicles per hour 70% (56%)	Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
Both Apprchs. Major Street	420 (336)	771	724	676	629	582	535	487	440
Highest Apprch. Minor Street	140 (112)	246	231	216	201	186	171	156	140

**WARRANT 1, Condition B - Interruption of Continuous Traffic**

**70% Satisfied** **No**

	Vehicles per hour 70% (56%)	Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
Both Apprchs. Major Street	630 (504)	771	724	676	629	582	535	487	440
Highest Apprch. Minor Street	70 (56)	246	231	216	201	186	171	156	140

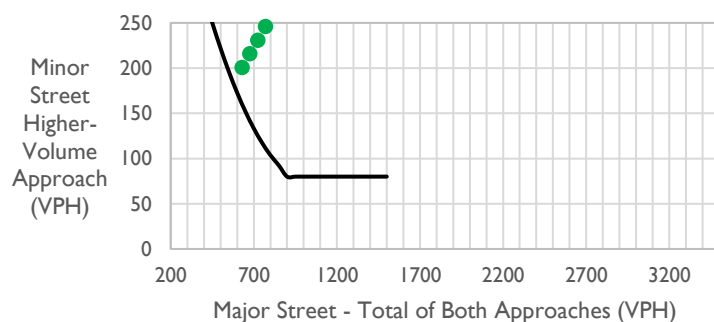
**WARRANT 1, Condition A and Condition B**

**56% Satisfied** **No**

**WARRANT 2, Four Hour Volume**

**70% Satisfied** **Yes**

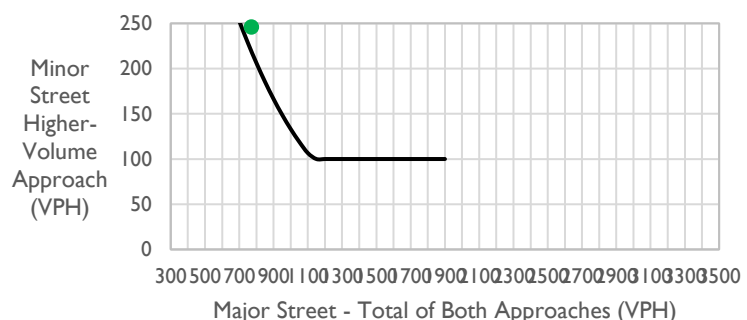
	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
Peak Hour	771	246
2nd Highest	724	231
3rd Highest	676	216
4th Highest	629	201



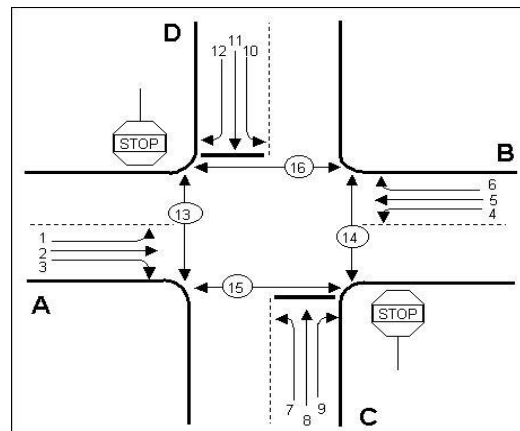
**WARRANT 3, Peak Hour Volume**

**70% Satisfied** **Yes**

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
Peak Hour	771	246



**Figure 2 - 11. Minor-road right-turn volume reduction for warrant check.**  
**Harvest Road & Jewell Avenue**  
**2026\_ST Total**



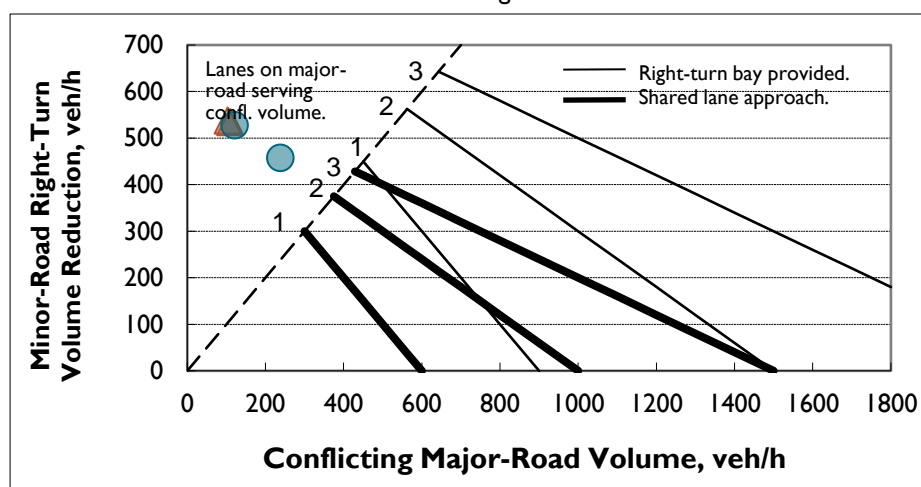
**INPUT**

Number of lanes on major-road approach:			2	
Right-turn geometry on minor-road:			Shared-lane approach	
Approach	Number	Movement	Volume (veh/hr)	
Major A	2	Through	159	337
	3	Right	48	139
Major B	5	Through	207	226
	6	Right	12	17
Minor C	7	Left	160	211
	8	Through	36	35
	9	Right	6	3
Minor D	10	Left	16	34
	11	Through	10	35
	12	Right	39	41

**OUTPUT**

Variable	Volume (veh/hr)	
	AM	PM
Conflicting major-road volume (Vc9):	104	238
Conflicting major-road volume (Vc12):	110	122
Right-turn volume reduction (Vr9):	538	457
Right-turn volume reduction (Vr12):	534	527
Adjusted right-turn volume reduction (Vr9):	6	3
Adjusted right-turn volume reduction (Vr12):	39	41
Adjusted minor-road volume:	196	246

Chart Legend:



**MUTCD Volume-based Warrant Evaluation**  
**Harvest Road & Jewell Avenue**  
**2026\_ST Background**



Major Street: Jewell Avenue  
 Lanes Moving Traffic: 2 or more  
 Approach Speed: 40 MPH  
 Option: Rural Community

Minor Street: Harvest Road  
 Lanes Moving Traffic: 2 or more  
 Right Turn Volume Included: 0% SB, 0% NB  
 per NCHRP 457 Methodology

**WARRANT 1, Condition A - Minimum Vehicular Volume**

**70% Satisfied** No

	Vehicles per hour 70% (56%)	Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
Both Apprchs. Major Street	420 (336)	427	401	375	348	322	296	270	244
Highest Apprch. Minor Street	140 (112)	113	106	99	92	85	78	71	65

**WARRANT 1, Condition B - Interruption of Continuous Traffic**

**70% Satisfied** No

	Vehicles per hour 70% (56%)	Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
Both Apprchs. Major Street	630 (504)	427	401	375	348	322	296	270	244
Highest Apprch. Minor Street	70 (56)	113	106	99	92	85	78	71	65

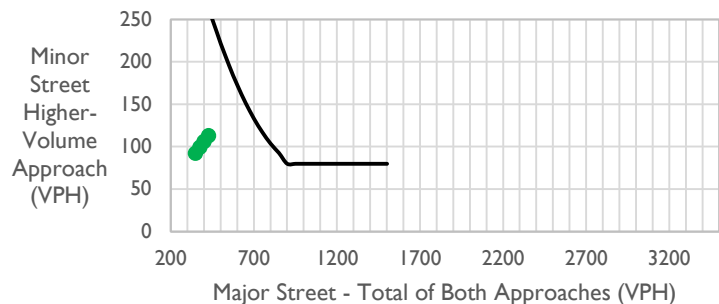
**WARRANT 1, Condition A and Condition B**

**56% Satisfied** No

**WARRANT 2, Four Hour Volume**

**70% Satisfied** No

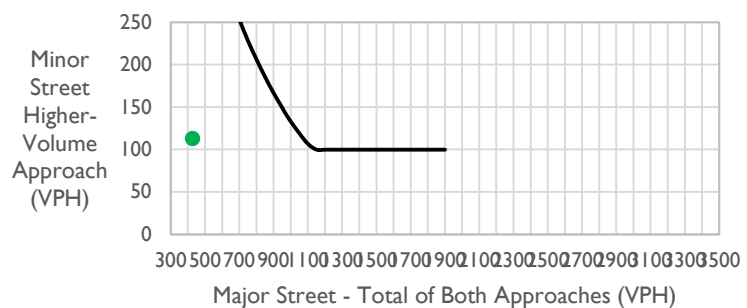
	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
Peak Hour	427	113
2nd Highest	401	106
3rd Highest	375	99
4th Highest	348	92



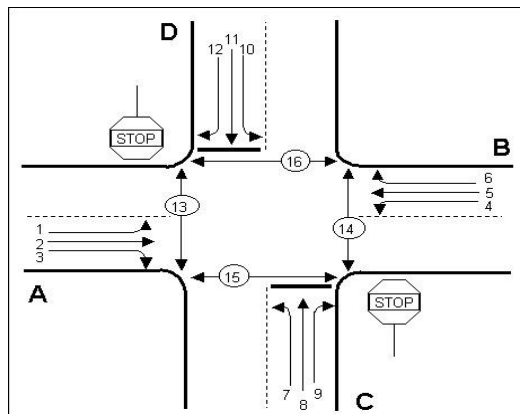
**WARRANT 3, Peak Hour Volume**

**70% Satisfied** No

	Both Apprchs. Major Street	Higher Vol. Apprch. Minor Street
Peak Hour	427	113



**Figure 2 - 11. Minor-road right-turn volume reduction for warrant check.**  
**Harvest Road & Jewell Avenue**  
**2026\_ST Background**



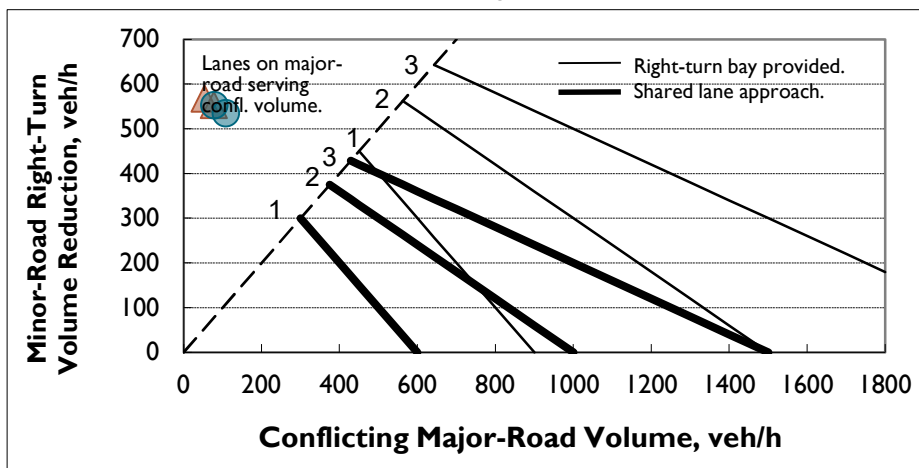
**INPUT**

Number of lanes on major-road approach:			2	
Right-turn geometry on minor-road:			Shared-lane approach	
Approach	Number	Movement	Volume (veh/hr)	
Major A	2	Through	80	129
	3	Right	27	88
Major B	5	Through	150	153
	6	Right	5	5
Minor C	7	Left	86	54
	8	Through	27	18
	9	Right	6	3
Minor D	10	Left	5	7
	11	Through	8	30
	12	Right	39	41

**OUTPUT**

Variable	Volume (veh/hr)	
	AM	PM
Conflicting major-road volume (Vc9):	54	109
Conflicting major-road volume (Vc12):	78	79
Right-turn volume reduction (Vr9):	568	535
Right-turn volume reduction (Vr12):	554	553
Adjusted right-turn volume reduction (Vr9):	6	3
Adjusted right-turn volume reduction (Vr12):	39	41
Adjusted minor-road volume:	113	72

Chart Legend:



Source: NCHRP Report 457

## APPENDIX F.      LEVEL OF SERVICE AND DELAY SUMMARY TABLE



Intersection	Movement	AM LOS (Delay) / PM LOS (delay)				
		Existing	Short Term Background	Long Term Background	Short Term Total	Long Term Total
1. Harvest Rd & E Jewell Ave	EB Left	N/A	a (7.6) / a (7.7)	e (58.8) / e (64.7)	d (43.4) / a (7.6)	e (57.5) / e (61)
	EB Through	a (7.6) / a (7.6)	N/A	c (20.9) / c (34.3)	d (50.6) / b (12.4)	c (26.4) / d (42.7)
	EB Right	N/A	N/A	c (21.5) / d (37.5)	N/A	c (27.6) / d (49.4)
	WB Left	N/A	a (7.5) / a (7.7)	e (64.6) / e (72.7)	d (43.5) / a (9.1)	e (64.1) / e (73.1)
	WB Through	N/A	N/A	b (10.9) / c (31.8)	e (55.8) / b (10.7)	d (50.4) / e (55.4)
	WB Right	N/A	N/A	b (14.4) / c (29.1)	N/A	d (39.7) / c (30.8)
	NB Left	N/A	b (12.7) / c (15.2)	e (72.9) / e (78.3)	a (7.1) / d (45)	c (30.8) / d (45.4)
	NB Through	N/A	b (11.5) / b (13)	d (47.9) / e (62.7)	a (7.7) / d (41.3)	d (39) / e (62.9)
	NB Right	N/A	a (8.8) / a (9.2)	d (40) / d (38.3)	a (7.6) / d (40.4)	c (33.8) / d (36.2)
	SB Left	a (9.4) / a (9.4)	b (10) / b (12)	e (64.4) / e (67.1)	a (8.8) / d (49.2)	e (56.2) / e (64.9)
	SB Through	N/A	N/A	e (55.3) / e (57.1)	a (9.8) / e (59.9)	d (39.8) / d (42.7)
	SB Right	N/A	N/A	e (64.8) / d (42.2)	N/A	c (33.9) / c (31)
	Overall	N/A	N/A	C (34.4) / D (44.6)	D (36) / C (23.2)	D (41.2) / D (49.7)
2. Kewaunee St & Jewell Avenue	EB Left	N/A	N/A	a (5.3) / a (5.7)	N/A	a (7.4) / a (7.9)
	EB Through	N/A	N/A	a (0.4) / a (0.6)	N/A	a (0.4) / a (0.7)
	EB Right	N/A	N/A	a (0.7) / a (1.1)	N/A	a (0.8) / a (1.3)
	WB Left	N/A	a (7.4) / a (7.5)	a (4.4) / a (4.1)	N/A	a (5.5) / a (4.9)
	WB Through	N/A	N/A	a (7.5) / a (7.7)	a (7.4) / a (7.5)	a (9.8) / a (9.6)
	WB Right	N/A	N/A	a (8) / a (8.2)	N/A	b (10.4) / b (10.3)
	NB Left	N/A	a (8.7) / a (8.9)	e (56.3) / d (54.5)	a (9.4) / a (9.8)	d (46) / d (49.7)
	NB Through	N/A	N/A	d (47) / d (49.3)	N/A	a (0) / a (0)
	NB Right	N/A	N/A	N/A	N/A	d (52) / e (63.6)
	SB Left	N/A	N/A	d (51.3) / e (56.1)	N/A	d (47.8) / d (49.2)
	SB Through/Right	N/A	N/A	d (49.2) / d (51.2)	N/A	e (62.6) / e (61.8)
	Overall	N/A	N/A	A (9) / A (8.2)	N/A	B (10.8) / A (9.9)
3. Harvest Rd & Pacific Ave	EB Left	N/A	N/A	c (18.8) / d (33.7)	N/A	c (20.8) / e (44.8)
	EB Through/Right	N/A	b (10) / b (10.3)	a (9.9) / b (12)	b (10.7) / b (11.8)	a (9.9) / b (12)
	WB Left	N/A	N/A	a (0) / a (0)	N/A	c (18.7) / f (51)
	WB Through/Right	N/A	a (9.1) / a (8.6)	b (11.4) / b (12)	a (9.1) / a (8.7)	b (11.7) / b (12.7)
	NB Left	N/A	a (0) / a (0)	a (7.8) / a (8.6)	a (0) / a (0)	a (7.8) / a (8.7)
	SB Left	N/A	a (7.5) / a (7.4)	a (8.3) / a (8.6)	a (7.5) / a (7.5)	a (8.4) / a (9)
4. Kewaunee St & Pacific Ave	EB Left/Right	N/A	a (8.5) / a (0)	a (9.6) / a (0)	a (8.5) / a (0)	a (8.8) / a (9)
	NB Left	N/A	a (0) / a (0)	a (0) / a (0)	a (0) / a (0)	a (7.4) / a (7.6)
5. Harvest Rd & Warren Ave	EB Left	N/A	N/A	c (17.4) / d (31.5)	N/A	c (18.4) / e (36.9)
	EB Through/Right	N/A	a (9.1) / a (9.5)	a (9.7) / b (11.2)	a (9.1) / a (9.5)	a (9.8) / b (11.5)
	WB Left	N/A	N/A	c (15.3) / d (27.5)	N/A	c (16.1) / d (31.9)
	WB Through/Right	N/A	a (8.5) / a (8.5)	b (10.7) / b (11.6)	a (8.5) / a (8.5)	b (10.9) / b (12.1)
	NB Left	N/A	a (0) / a (0)	a (7.8) / a (8.4)	a (0) / a (0)	a (7.8) / a (8.5)
	SB Left	N/A	a (7.3) / a (7.3)	a (8) / a (8.6)	a (7.3) / a (7.3)	a (8.1) / a (8.8)
6. Kewaunee St & Warren Ave	EB Left/Through/Right	N/A	a (8.5) / a (8.5)	a (9.9) / b (11.4)	a (8.5) / a (8.5)	a (9.9) / b (11.8)
	WB Left/Through/Right	N/A	N/A	a (8.9) / a (9.6)	N/A	a (8.9) / a (9.8)
	NB Left	N/A	a (0) / a (0)	a (7.3) / a (7.4)	a (0) / a (0)	a (7.3) / a (7.4)
	SB Left	N/A	N/A	a (7.4) / a (7.5)	N/A	a (7.4) / a (7.6)
7. Harvest Rd & Wesley Pl	EB Left	N/A	N/A	c (15.4) / d (26.6)	N/A	c (16.3) / d (30.6)
	EB Through/Right	N/A	N/A	a (9.6) / b (10.4)	N/A	a (9.7) / b (10.7)
	WB Left	N/A	N/A	b (13.9) / c (24.7)	N/A	b (14.7) / d (28.4)
	WB Through/Right	N/A	N/A	b (10.2) / b (11.4)	N/A	b (10.4) / b (11.9)
	NB Left	N/A	N/A	a (0) / a (8.1)	N/A	a (0) / a (8.2)
	SB Left	N/A	N/A	a (7.8) / a (8.6)	N/A	a (7.9) / a (8.8)

Intersection	Movement	AM LOS (Delay) / PM LOS (delay)				
		Existing	Short Term Background	Long Term Background	Short Term Total	Long Term Total
8. Kewaunee ST & Wesley Pl	EB Left/Right	N/A	N/A	a (9) / a (9.1)	N/A	a (9.1) / a (9.3)
	NB Left	N/A	N/A	a (7.3) / a (7.4)	N/A	a (7.3) / a (7.4)
9. Harvest Rd & Yale Ave	EB Left/Through	N/A	N/A	a (7.7) / a (5.5)	N/A	a (5.7) / a (8.5)
	WB Through/Right	N/A	N/A	a (7.2) / a (5.1)	N/A	a (5.3) / a (7.8)
	SB Left/Right	N/A	N/A	a (6.5) / a (5.3)	N/A	a (5.5) / a (7)
	Overall	N/A	N/A	A (7.1) / A (5.3)	N/A	A (5.5) / A (7.8)
10. Yale Ave & Jackson Gap St	EB Left/Through	N/A	N/A	a (7.8) / a (8.1)	N/A	a (7.8) / a (8.2)
	SB Left/Right	N/A	N/A	b (10.6) / b (12.1)	N/A	b (10.7) / b (12.2)
11. Yale Ave & Kewaunee St	EB Left/Through	N/A	N/A	a (7.9) / a (8.2)	N/A	a (7.9) / a (8.2)
	SB Left/Right	N/A	N/A	b (13.1) / c (15.3)	N/A	b (13) / c (16.2)
12. Jewell Ave & Access	WB Left	N/A	N/A	N/A	a (7.6) / a (8.2)	a (9.6) / b (11.3)
	NB Left/Right	N/A	N/A	N/A	b (10.8) / b (12.9)	c (17.2) / d (28.2)
13. Jewell Ave & Jackson Gap St	NB Right	N/A	a (8.7) / a (8.9)	b (10.6) / b (11.8)	a (8.6) / a (8.9)	a (0) / a (0)
14. Kewaunee St & North Site Access	EB Left/Right	N/A	N/A	N/A	a (8.6) / a (8.7)	a (9.4) / a (9.7)
	NB Left	N/A	N/A	N/A	a (0) / a (0)	a (7.4) / a (7.6)
15. Kewaunee St & South Site Access	EB Left/Right	N/A	N/A	N/A	a (8.6) / a (8.6)	a (9.2) / a (9.5)
	NB Left	N/A	N/A	N/A	a (0) / a (0)	a (7.4) / a (7.6)
16. Harvest Rd & Access	WB Right	N/A	N/A	N/A	a (9.7) / a (9.6)	b (12.2) / b (14.2)

\*Overall results are presented for signalized intersections. Some signalized locations have movements below City LOS standards as outlined in the text.