

DILLON
CONSULTING

TOWN OF TECUMSEH

Tecumseh Road CIP Streetscape Improvements

Traffic Analysis Report

Table of Contents

1.0	Introduction	1
1.1	Purpose	1
1.2	Scope	1
2.0	Traffic Volumes	2
2.1	Existing Traffic Volumes	2
2.2	Traffic Growth	3
2.2.1	General Background Traffic Growth	3
2.2.2	CIP Development Traffic	4
2.2.3	Lesperance Road / CR 22 Grade Separation	6
2.3	Total Future Traffic Volumes.....	8
3.0	Proposed Roadway Modifications	9
4.0	Tecumseh Road and Lesperance Road	11
4.1	Proposed Intersection Configuration.....	11
4.2	Assumptions and Methodology	12
4.3	Intersection Operations — AM Peak Hour	13
4.4	Intersection Operations — PM Peak Hour.....	15
4.4.1	Capacity.....	16
4.4.2	Queues	17
4.4.3	Level of Service / Delays	17
4.5	Results for Alternative 4.....	18
4.6	Mitigation.....	20
4.6.1	Road Geometry Changes.....	20
4.6.2	Traffic Signal Changes	20
4.6.3	Traffic Pattern Changes.....	21
5.0	Tecumseh Road at Shawnee Road	24
5.1	Proposed Intersection Configuration.....	24
5.2	Assumptions and Methodology	24
5.3	Intersection Operations	24
6.0	Tecumseh Road at Southfield Drive	26

6.1	Proposed Intersection Configuration.....	26
6.2	Assumptions and Methodology	26
6.3	Intersection Operations	27

7.0 Summary 29

7.1	Background	29
7.2	Corridor Capacity and Tecumseh Road / Lesperance Road Intersection.....	29
7.3	Mitigation.....	30
7.4	Recommendations	31

Figures

Figure 1:	Existing Traffic Volumes	2
Figure 2:	CIP Demonstration Plan Traffic Levels	5
Figure 3:	Effect of Grade Separation at CR 22 and Lesperance Road	7
Figure 4:	Total Future Traffic Volumes with CIP Development.....	8
Figure 5:	Total Future Traffic Volumes with CIP Development and CR 22 Grade Separation	8
Figure 6:	Potential Alternate Travel Patterns	23

Tables

Table 1:	Comparison of Historical Traffic Data Along Tecumseh Road	4
Table 2:	Alternative Intersection Configurations at Tecumseh Road and Lesperance Road	11
Table 3:	Intersection Operations at Tecumseh Road and Lesperance Road (AM Peak Hour)	13
Table 4:	Intersection Operations at Tecumseh Road and Lesperance Road (PM Peak Hour).....	15
Table 5:	Level of Service and Critical Movements under Alternative 4.....	18
Table 6:	Critical Movement Details under Alternative 4 (PM Peak Hour).....	19
Table 7:	Intersection Operations at Tecumseh Road and Shawnee Road.....	24
Table 8:	Intersection Operations at Tecumseh Road and Southfield Drive	27

Appendices

A	Level of Service Definitions
B	Intersection Functional Designs
C	Intersection Analysis Results Tables
D	Synchro Analysis Worksheets

1.0 Introduction

1.1 Purpose

This report documents the analyses undertaken to assess the traffic impact of reconfiguring Tecumseh Road through the Tecumseh Community Improvement Plan (CIP) area. The roadway reconfiguration is currently under design, with construction currently anticipated to occur over the next few years. As part of the reconfiguration, it is proposed to reduce the number of lanes on Tecumseh Road from four to two lanes, with the curb lanes dedicated to a mixture of on-street parking and landscaping.

Dillon previously undertook a high-level review of traffic demands and capacity in the Tecumseh Road corridor in 2012, as part of the initial planning for the Tecumseh CIP. This report builds upon that prior work, with the following updates:

- Up-to-date traffic volume data have been collected;
- Traffic projections have been updated to reflect anticipated mid- to long-term build-out levels in the CIP area; and
- Intersection analyses have been refined to reflect a variety of roadway configuration alternatives, including different turn lane storage lengths.

This analysis included the following components:

- Collection of up-to-date traffic volumes in the study area;
- A review of historical growth patterns;
- Estimation of future traffic growth due to development and road network changes; and
- Capacity analysis of different roadway alternatives under existing and projected future volumes.

1.2 Scope

The road reconstruction is planned to extend along Tecumseh Road from the City of Windsor boundary to the VIA Rail level crossing east of Bedell Avenue, as well as along Lesperance Road from McNorton Street to Arbour Street. The most substantial modifications will be on Tecumseh Road, where the four-lane cross-section is proposed to be reduced to two lanes. The capacity of both corridors is governed by the traffic signals where the two roadways intersect, and therefore the analyses have focused on that intersection, with some additional analyses of other key locations along Tecumseh Road to test the impact of the proposed cross-section reduction.

Traffic operations were assessed during the weekday AM and PM peak hours at three horizons:

- Existing traffic volumes (representing short-term conditions);
- Future traffic volumes with development in the CIP area; and
- Future traffic volumes with CIP development plus a planned grade separation at County Road 22 (CR 22) and Lesperance Road.

2.0 Traffic Volumes

2.1 Existing Traffic Volumes

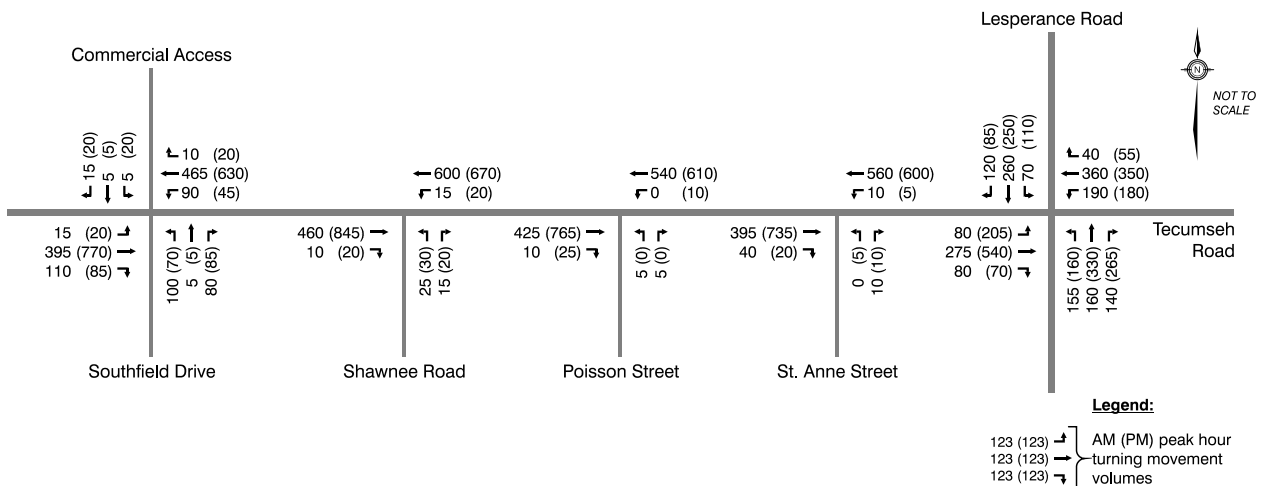
Traffic volumes were surveyed during the AM and PM peak periods (7:00–9:00 AM; 4:00–6:00 PM) at four intersections along Tecumseh Road:

- Southfield Drive;
- Shawnee Road;
- Poisson Street;
- St. Anne Street; and
- Lesperance Road.

The traffic volume data were surveyed by Dillon in March 2016, except for the AM peak period volumes at Lesperance Road, which were surveyed separately in May 2014 as part of work undertaken for the 2014 Tecumseh Road Needs Study, and the volumes at Shawnee Road, which were collected by F.R. Berry and Associates in May 2015 as part of a traffic study for a proposed development at Tecumseh Road and Shawnee Road.

The existing traffic volumes are illustrated in **Figure 1**.

Figure 1: Existing Traffic Volumes



The approximate mid-block traffic volumes on Tecumseh Road, west of Lesperance Road, are as follows:

- AM peak hour: 635 vph westbound, 435 vph eastbound
- PM peak hour: 595 vph westbound, 815 vph eastbound

2.2 Traffic Growth

The following potential sources of traffic growth were considered:

- General background increases in traffic volumes;
- Potential development in the CIP area; and
- Traffic redistribution associated with planned changes at CR22 and Lesperance Road.

2.2.1 General Background Traffic Growth

In prior analyses undertaken by Dillon in the CIP area, a general background growth rate of 1.5% per year has been applied. For the current analyses, a review of current and historical traffic volumes was undertaken to determine the magnitude of traffic growth that has actually occurred in recent years. The following historical sources of traffic data were considered:

- Tecumseh Road East Improvements Class EA, Jefferson Boulevard to Banwell Road (LaFontaine, Cowie, Buratto & Associates Limited, October 1996)
- Manning Road EA — Distribution of Traffic due to Preferred Alternative at County Road 22 and Lesperance Road (Dillon Consulting Limited, December 2008)
- Banwell Road Class EA Transportation Study (Paradigm Transportation Solutions Ltd., March 2009)
- Operational Review, Tecumseh Road East at Southfield Lane Intersection (Dillon Consulting Limited, September 2010)

Table 1 outlines the existing and historical traffic data available at various locations along the Tecumseh Road corridor. The review of current and historical data indicated that, for the most part, peak hour traffic volumes have not substantially increased along Tecumseh Road over the past ten to twenty years, particularly during the PM peak period. In the afternoon peak, traffic volumes near Banwell Road were virtually unchanged between 1996 and 2007, and traffic volumes near Lesperance Road remained stable or decreased from 2007 to 2016. Some growth was observed near Lesperance Road during the morning peak period, but a decrease was observed near Southfield Drive.

Given the relatively stable volumes during the critical PM peak period, and the fact that the roadway reconfiguration will make Tecumseh Road less attractive for non-local trips that would normally be the source of background traffic growth, a background growth rate of 0% was applied. This means that traffic volumes will continue to remain relatively stable, other than growth related to local land use changes in the study area and changes to the surrounding road network (as discussed in the following sections).

Because an annual growth rate has not been applied, the analysis horizon refers not to a specific year, but a specific development and land use condition. The specific year to which the traffic projections apply will depend on the pace of development in the CIP and the timing of the CR 22 / Lesperance Road grade separation.

Table 1: Comparison of Historical Traffic Data Along Tecumseh Road

Source	Year of data	AM peak hour		PM peak hour	
		Westbound	Eastbound	Westbound	Eastbound
West of Banwell:					
Tecumseh–Jefferson EA	1996			720	1,030
Banwell Road EA	2006	705	570	695	1,040
CR22 / Lesperance Study	2007	565	425	575	1,010
East of Banwell:					
Tecumseh–Jefferson EA	1996			640	870
Banwell Road EA	2006	585	605	690	855
CR22 / Lesperance Study	2007	540	455	645	870
West of Southfield:					
Tecumseh / Southfield review	2010	780	490	665	795
Tecumseh CIP study	2016	580	520	720	875
East of Southfield:					
Tecumseh / Southfield review	2010	685	485	645	790
Tecumseh CIP study	2016	565	480	695	875
West of Lesperance:					
CR22 / Lesperance Study	2007	520	325	630	800
Tecumseh CIP study	2016	635	435	595	815
East of Lesperance:					
CR22 / Lesperance Study	2007	410	350	720	1,005
Tecumseh CIP study	2016	590	485	585	915

2.2.2 CIP Development Traffic

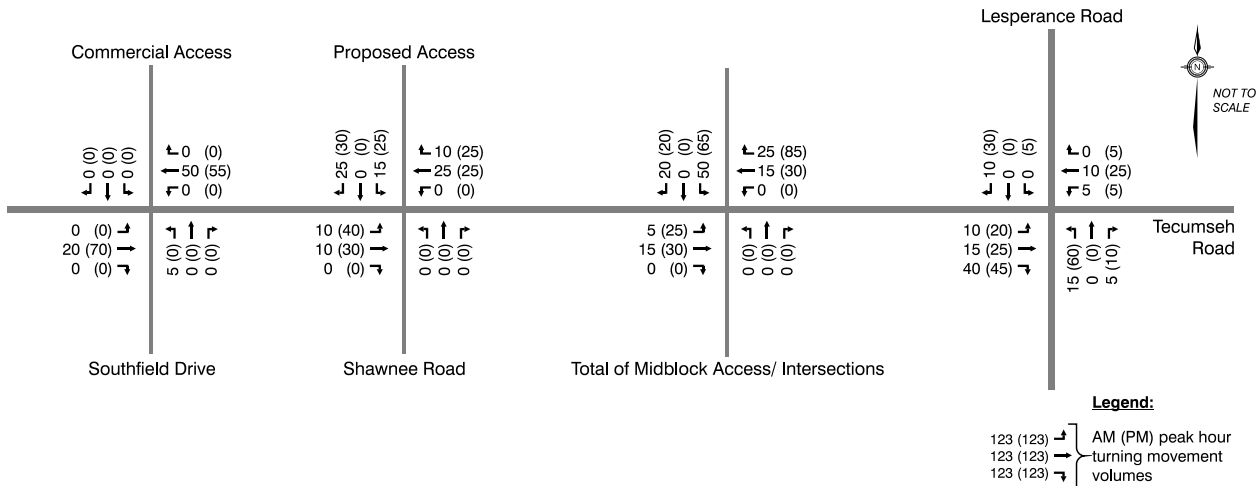
The Town has engaged Dialog to review opportunities for intensification within the CIP area. The CIP area is largely built out, and redevelopment will therefore predominantly consist of infill and intensification rather than greenfield development. Dialog has prepared a demonstration plan that envisions the potential for the following:

- Redevelopment or infill on several lower-density commercial properties along Tecumseh Road, to consist of higher-coverage ground floor commercial uses with residential units on upper storeys;
- Infill residential development (townhouses and low-rise apartments) on the east side of Southfield Drive;
- Redevelopment of the former St. Anne’s school site (reuse of the building for community use; construction of townhouses on the athletic field at the south end of the property); and
- In the longer term, infill residential development (townhouses) at the rear of the deeper lots that extend between Tecumseh Road and the VIA Rail corridor.

In the prior 2012 analyses, traffic projections were prepared for development in the CIP area. These projections were based on full build-out of the Dialog demonstration plan, which was estimated to yield growth of approximately 705 residential units and 163,000 sq. ft. of commercial GFA. Redevelopment in the CIP area will be driven by the market and as such there is no set timeline for full build-out (or a defined ultimate development yield). To date, applications have been brought forward for redevelopment on two sites: a townhouse development on the former St. Anne’s school lands (currently built out and occupied), and a mixed commercial/residential site north of Shawnee Road. In consultation with the Town and Dialog, it has been assumed that in the medium term the majority of further development interest is likely to be in the eastern part of the CIP area (east of Shawnee Road). An approximate mid-term forecast of 270 residential units and 91,000 sq. ft. of commercial GFA has been identified for this area and carried forward for analysis purposes.

Figure 2 illustrates the volume of traffic projected to be generated in the medium term by infill development in the CIP area.

Figure 2: CIP Demonstration Plan Traffic Levels



2.2.3 Lesperance Road / CR 22 Grade Separation

The Manning Road EA identified significant future capacity deficiencies on CR 22 at the intersections with Banwell Road, Lesperance Road, and Manning Road. These deficiencies were proposed to be addressed through the following modifications:

- Banwell Road: construct a partial cloverleaf type interchange (as per Banwell Road EA)
- Lesperance Road: construct a grade separation, with partial access as follows:
 - Westbound on-ramp from northbound and southbound Lesperance Road, in northwest quadrant of the intersection
 - Eastbound off-ramp to northbound and southbound Lesperance Road via a modified version of the existing turn-off to Sylvestre Drive (and extension of Westlake Boulevard)
 - Manning Road: construct a “point diamond” or “SPUI” type interchange

The interchanges have the potential to affect traffic volumes in the CIP area:

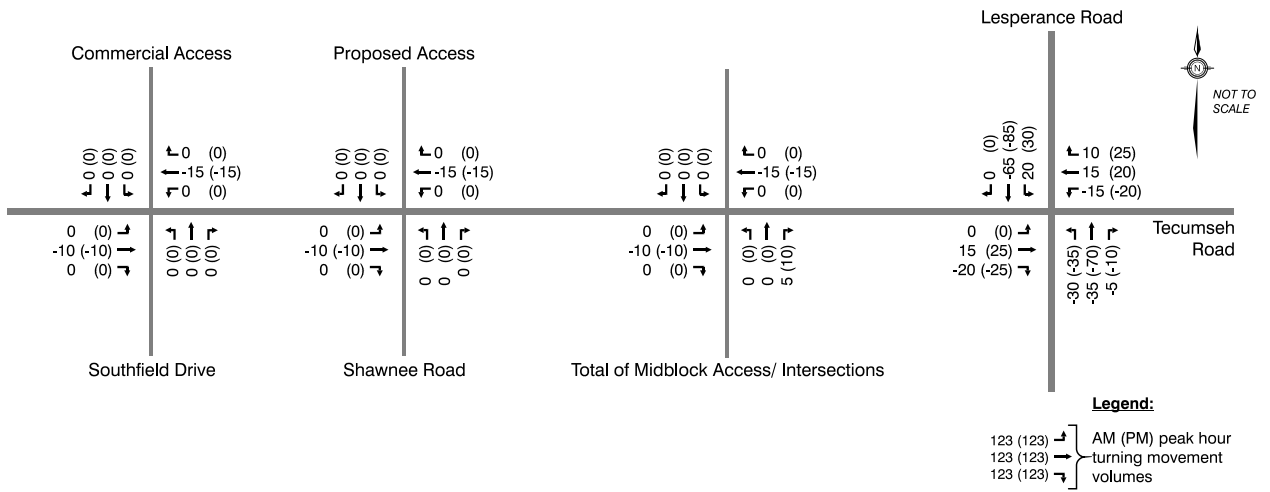
- Additional through capacity on CR 22 may be able to accommodate diversion of through trips currently using Tecumseh Road;
- Removal of the eastbound left turn capacity constraint from CR 22 during the PM peak hour may enable (and/or encourage) more Windsor–Tecumseh trips to use CR 22 rather than Tecumseh Road, and may also result in a shift in northbound demand (e.g., some motorists bound for east Windsor / west Tecumseh may be choosing to bypass excessive queues at CR 22 and Banwell Road, and turn left instead at Lesperance Road).
- Removal of the east-oriented movements at Lesperance Road and CR 22 will require that traffic currently using those movements be reassigned to alternate routes.

The impact of the Lesperance Road / CR 22 grade separation was previously reviewed as part of the Manning Road EA. The estimated effects have been updated to reflect more recent traffic volume data at CR 22 and Lesperance Road, and to reflect AM peak hour conditions.

The effect of additional through capacity and/or left turn capacity on CR 22 has not been specifically included in future traffic projections, but has been considered at a high level in reviewing the analysis results.

Figure 3 illustrates the effect of the proposed CR 22 / Lesperance Road grade separation on traffic volumes in the Tecumseh Road corridor.

Figure 3: Effect of Grade Separation at CR 22 and Lesperance Road



2.3 Total Future Traffic Volumes

Recognizing that there is some level of uncertainty about the magnitude and timelines for development in the CIP, and about the schedule for the planned CR 22 / Lesperance Road grade separation, analyses have been undertaken for three traffic scenarios:

- Existing traffic volumes (as illustrated in **Figure 1**), to reflect short-term conditions;
- Total future traffic volumes accounting for infill development in the east CIP area (as illustrated in **Figure 4**); and
- Total future traffic volumes accounting for infill development in the east CIP area, plus construction of the planned grade separation and partial interchange at Lesperance Road and CR 22 (as illustrated in **Figure 5**).

Figure 4: Total Future Traffic Volumes with CIP Development

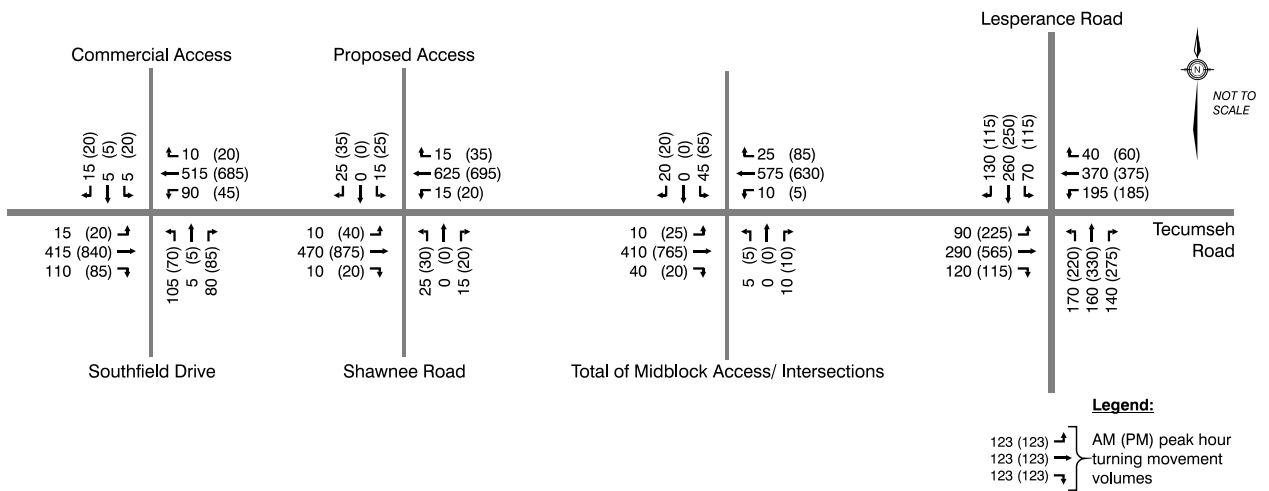
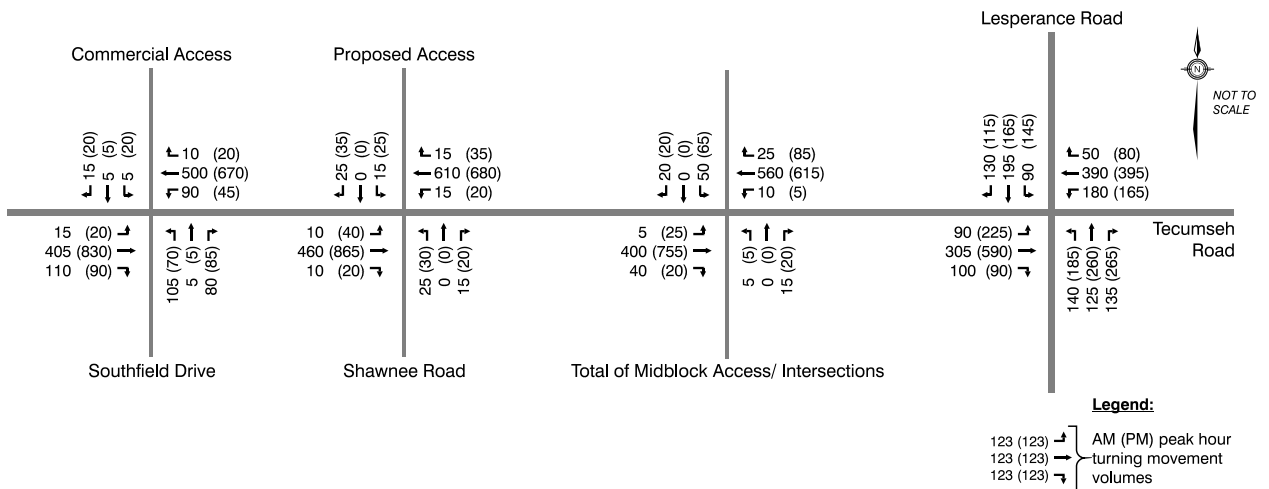


Figure 5: Total Future Traffic Volumes with CIP Development and CR 22 Grade Separation



3.0 Proposed Roadway Modifications

The project consists of the reconfiguration of Tecumseh Road, from the City of Windsor / Town of Tecumseh boundary west of Southfield Drive to the VIA Rail level crossing east of Tecumseh Road, as well as other modifications along Lesperance Road in the vicinity of Tecumseh Road and farther to the north. This phase of the project builds upon other prior and/or concurrent initiatives:

- The Tecumseh CIP, prepared by Dialog, recommends roadway modifications to the Tecumseh Road corridor to better reflect the historic “main street” context, to create an environment more conducive to pedestrian activity and more supportive of local businesses, and to encourage revitalization and infill development along the corridor.
- The Tecumseh Transportation Master Plan (TMP) proposed that Tecumseh Road be reclassified from an arterial road to a new “Commercial Main Street” roadway classification. Whereas an arterial road has a primary function of moving traffic, the new roadway classification that combines elements of a minor arterial and a collector roadway — for example, it is still a strategically important connection between Tecumseh and Windsor, but also is locally important in providing access to the CIP and surrounding community, and should have a scale that is compatible with pedestrian activity and the surrounding urban context. The redesignation means that design measures and policies applied to the corridor will recognize the road’s diverse functions rather than emphasizing traffic movement.
- The existing aerial utilities have been proposed to be relocated underground as a measure to allow for continuous and sustainable planting of street trees; to provide additional landscaping opportunities including street furniture; to widen the sidewalks to increase the walkability of the corridor; and to create a less cluttered environment.

The exact configuration of the proposed roadway modifications is still under development, with the traffic analyses in this report serving as background information to the overall design and evaluation process. However, the main principles of the reconfiguration are the reallocation of the existing roadway cross-section to provide a more “complete street” environment, and the rebalancing of the role and function away from traffic throughput and toward local access and pedestrian activity.

Preliminary intersection configurations are presented in **Appendix B** for reference. They have been prepared to a functional design level and illustrate four potential alternative configurations that were assessed at Tecumseh Road and Lesperance Road, and the proposed configuration for the Tecumseh Road intersections at Southfield Drive and Shawnee Road.

In general, the four-lane cross-section on Tecumseh Road is proposed to be reduced to two lanes. The remaining pavement width would be reallocated to on-street parking, landscaping, and/or turn lanes.

The analyses focused on the three signalized intersections along the Tecumseh Road corridor, to review the following aspects and design elements:

- The configuration of the Tecumseh Road and Lesperance Road intersection and the capacity effect of varying the roadway geometry;
- The capacity of signalized intersections west of Lesperance Road, to confirm whether the major or minor intersections are governing the capacity of the corridor; and
- The transition from four to two lanes at the west end of the study area.

4.0 Tecumseh Road and Lesperance Road

4.1 Proposed Intersection Configuration

At the time of the analyses, a specific intersection design had not been determined at Tecumseh Road and Lesperance Road. A range of alternatives was developed to illustrate the variation in traffic impact depending on the relative balance between maintaining the street's traffic function and maximizing opportunities for landscaping and placemaking.

Four alternatives were developed (in addition to the “do nothing” alternative) that progress incrementally from minimizing traffic impacts (largest intersection footprint) to maximizing landscaping and streetscaping opportunities (smallest intersection footprint). All four alternatives include a dedicated left turn lane and single through lane on each approach. The four alternatives vary in terms of the length of the eastbound left turn lane, and the number of approaches with dedicated right turn lanes.

Table 2 documents the differences between the assessed alternatives. Alternative 0 (“do nothing”) and Alternative 1 place the most emphasis on traffic movement; Alternative 4 places the most emphasis on urban design and landscaping, with the lowest emphasis on traffic movement. Functional designs were subsequently developed for each potential configuration; these are presented in **Appendix B**.

Table 2: Alternative Intersection Configurations at Tecumseh Road and Lesperance Road

Alternative	Eastbound left turn storage length	Dedicated right turn lanes
0 (do nothing)	Indefinite*	All approaches
1	90 m	All but westbound
2	45 m	All but westbound
3	45 m	Northbound and southbound
4	30 m	Northbound only

*Second (inside) eastbound lane becomes dedicated left turn lane at Lesperance Road

These design alternatives are intended to be illustrative of a range of lane configurations and storage lengths. In practice, as the design is carried out, other variations may emerge within this range as being feasible and/or preferable when considering driveway locations, specific streetscaping and/or parking opportunities, or other site-specific opportunities or constraints.

In addition to the signalized intersection alternatives outlined above, consideration was also given to constructing a roundabout at the intersection. In preliminary testing, a roundabout was estimated to result in better traffic operations than a signalized intersection, assuming two entry lanes on the

northbound and eastbound approaches, and two circulating lanes (developed in a spiral configuration) between the west leg entry lanes and the east leg exit lane. However, a roundabout would have substantial property impacts in the southwest and/or northeast quadrants of the intersection. As a result, the analyses focused on the signalized intersection alternatives.

4.2 Assumptions and Methodology

Traffic operations at the signalized intersections in the study area were analyzed based on the methodology outlined in the *Highway Capacity Manual* (HCM), 2000 edition, using the Synchro (version 6) software package.

Signal timings were estimated for current conditions, and were optimized for future conditions. The cycle length applied to the analyses was 80 to 90 seconds during the AM peak hour, and 90 seconds during the PM peak hour. The maximum desirable cycle length was assumed to be 90 seconds to avoid the impact of longer cycle lengths on pedestrian delays and vehicle queues.

A key differentiator between the geometric alternatives is the length of the left turn storage provided in the eastbound left turn lane. Because the HCM methodology calculations do not explicitly consider the impact of storage length, saturation flow rate adjustment factors were estimated and applied to the through movements to reflect the effect of auxiliary turning lane storage length on the capacity of the adjacent through lane. These adjustments were also applied to the other three intersection approaches as necessary.

AM and PM peak hour traffic volumes were assessed under three volume conditions:

- Short-term conditions (existing volumes);
- With CIP development traffic; and
- With CIP development traffic, plus traffic redistribution associated with the CR 22 / Lesperance Road grade separation.

For each volume scenario, the overall intersection level of service (LOS)¹ and average vehicular delay were noted. In addition, the LOS, delay, and volume-to-capacity (v/c) ratio were identified for any critical movements.² More detailed tables are provided in **Appendix B**, showing how the v/c ratios, queues,

¹ Level of Service (LOS), applied to an intersection, is a measure qualifying the amount of delay experienced by motorists, expressed either for specific turning movements or for the intersection as a whole. A more detailed explanation of LOS is provided in **Appendix A**.

² Typically, it is preferable for through movements to operate within 85% of capacity, and for dedicated turn lanes to operate within 100% of capacity. Movements operating above these thresholds are identified as “critical movements” with potential operational constraints, and considered as potential candidates for mitigation. Left or right turn movements may also be identified as critical when the projected 95th percentile queue length exceeds the available turn lane storage, leading to increased potential for queues of turning vehicles to block through traffic.

level of service and delay changes for each individual movement from one alternative to the next. Analysis worksheets are provided in **Appendix D**.

4.3 Intersection Operations — AM Peak Hour

Table 3 summarizes the intersection operations at Tecumseh Road and Lesperance Road during the AM peak hour.

Table 3: Intersection Operations at Tecumseh Road and Lesperance Road (AM Peak Hour)

Alternative	Overall intersection		Critical movements				
	Delay (s/veh)	LOS	Movement	v/c	Delay (s/veh)	LOS	95 th %ile Queue (m)
Existing volumes							
Existing geometry	19.4	B	SB Through	0.64	33.8	C	62
Alternative 1	20.3	C	SB Through	0.70	38.8	D	70
Alternative 2	20.3	C	SB Through	0.70	38.8	D	70
Alternative 3	21.3	C	SB Through	0.70	38.8	D	70
Alternative 4	27.3	C	SB Through	0.84	42.9	D	101
With CIP development							
Existing geometry	19.5	B	SB Through	0.64	33.9	C	62
Alternative 1	20.5	C	SB Through	0.70	39.0	D	70
Alternative 2	20.5	C	SB Through	0.70	39.0	D	70
Alternative 3	22.4	C	SB Through	0.70	39.0	D	70
Alternative 4	30.2	C	SB Through	0.81	41.0	D	109
With CIP development and CR 22 grade separation							
Existing geometry	18.1	B	N/A	—	—	—	—
Alternative 1	19.0	B	N/A	—	—	—	—
Alternative 2	19.1	B	N/A	—	—	—	—
Alternative 3	20.6	C	N/A	—	—	—	—
Alternative 4	26.0	C	SB Through	0.79	41.7	D	92

Any of the geometric alternatives at Tecumseh Road and Lesperance Road would have sufficient capacity to accommodate the existing volumes and the projected future volumes. The delay for the intersection increases incrementally in each successive alternative; however, the intersection is projected to operate

at LOS C or better in all scenarios, and all movements are projected to operate at LOS D or better in all scenarios.

The southbound through movement is identified as a critical movement in some cases — not because of a capacity deficiency, but because of queues:

- There is a level railway crossing north of the intersection, with a storage length of 52 metres (approximately 9 car lengths) between the crossing and the intersection.
- The existing queues are calculated at 62 metres and therefore extend beyond the tracks. (In practice, the actual queue is longer than 62 metres, since the calculated queue does not include left- and right-turning vehicles that have not yet been able to enter the left and right turn lanes.)
- Under existing volumes, the only configuration that affects southbound queues substantially is Alternative 4, where the calculated queue increases to approximately 100 metres.
- The scenario with CIP development traffic has similar results, except that the queue in Alternative 4 is calculated to be 10 metres longer than under existing volumes.
- With a grade separation constructed at CR 22, the southbound queue is calculated to decrease to 50 metres in all but Alternative 4; this queue would just fit within the storage between Tecumseh Road and the level crossing, although again in practice the queue would likely be somewhat longer after accounting for left and right turns at the back of the through lane queue. In Alternative 4, the queue is calculated at 92 metres and would extend beyond the tracks.

Overall, any alternative is likely to have queues reach or cross the tracks for at least part of the peak hour. However, in Alternative 4 the queues will extend farther, and will reach the tracks for a greater portion of the day. VIA Rail staff have identified concern over existing queues and the potential for queues to increase in length and/or duration with proposed roadway modifications, and have raised the potential need to mitigate queues. Further discussion is required to identify potential mitigation, particularly if Alternative 4 is selected for implementation.

4.4 Intersection Operations — PM Peak Hour

Table 4 summarizes the intersection operations at Tecumseh Road and Lesperance Road during the PM peak hour.

Table 4: Intersection Operations at Tecumseh Road and Lesperance Road (PM Peak Hour)

Alternative	Overall intersection		Critical movements				
	Delay (s/veh)	LOS	Movement	v/c	Delay (s/veh)	LOS	95 th %ile Queue (m)
Existing volumes							
Existing geometry	31.8	C	EB Through	0.89	38.4	D	150
			NB Through	0.93	63.0	E	110
			SB Through	0.54	31.3	C	63
Alternative 1	35.4	D	EB Through	0.94	44.2	D	157
			NB Through	0.98	75.9	E	113
			SB Through	0.56	32.6	C	64
Alternative 2	47.7	D	EB Through	1.12	98.2	F	176
			NB Through	1.03	91.1	F	117
			SB Through	0.59	34.1	C	65
Alternative 3	56.9	E	EB Through	1.16	109	F	196
			NB Through	1.09	111	F	121
			SB Through	0.61	35.7	D	66
Alternative 4	65.5	E	EB Through	1.21	133	F	201
			NB Through	1.09	111	F	121
			SB Through	0.83	48.0	D	101
With CIP development							
Existing geometry	36.1	D	EB Through	0.93	45.9	D	164
			NB Through	0.99	79.1	E	114
			SB Through	0.55	31.6	C	63
Alternative 1	44.3	D	EB Through	1.02	65.5	E	174
			NB Through	1.05	95.1	F	118
			SB Through	0.57	32.9	C	64
Alternative 2	64.3	E	EB Through	1.24	147	F	193
			NB Through	1.19	145	F	125
			SB Through	0.62	36.0	D	66
Alternative 3	80.8	F	EB Through	1.30	169	F	227
			NB Through	1.27	179	F	129
			SB Through	0.64	37.9	D	67
Alternative 4	97.9	F	EB Through	1.36	194	F	231
			NB Left	1.10	115	F	75
			NB Through	1.27	179	F	129
			SB Through	0.97	69.8	E	119

Table 4: Intersection Operations at Tecumseh Road and Lesperance Road (PM Peak Hour) (continued)

Alternative	Overall intersection		Critical movements				
	Delay (s/veh)	LOS	Movement	v/c	Delay (s/veh)	LOS	95 th %ile Queue (m)
With CIP development and CR 22 grade separation							
Existing geometry	24.4	C	EB Through	0.82	26.7	C	150
Alternative 1	28.3	C	EB Through	0.90	32.7	C	162
			NB Through	0.87	60.7	E	89
Alternative 2	36.5	D	EB Through	1.02	59.4	E	179
			NB Through	0.99	88.1	F	96
Alternative 3	46.2	D	EB Through	1.11	85.5	F	208
			NB Through	0.99	88.1	F	96
Alternative 4	57.2	E	EB Through	1.15	103	F	213
			NB Through	0.99	88.1	F	96
			SB Through	0.91	63.6	E	92

4.4.1 Capacity

During the PM peak hour, the eastbound and northbound through movements are currently identified as critical under the existing volumes and existing intersection geometry, although both are currently operating within capacity. Any of the design alternatives would reduce capacity on these two movements; Alternatives 2 through 4 would result in both movements exceeding capacity by varying degrees.

Growth in traffic related to CIP development will place additional traffic pressure on the intersection and will increase the capacity deficiency on the northbound and eastbound through movements. It is also projected to result in the northbound left turn exceeding capacity under Alternative 4.

If the planned grade separation is constructed at CR 22 and Lesperance Road, the resulting traffic pattern changes would be expected to draw traffic away from the Tecumseh Road and Lesperance Road intersection, reducing the traffic pressure on the critical movements and helping to offset the impacts of development-related traffic growth.

For the most part, the difference between alternatives is incremental — i.e., a gradual reduction in the eastbound left turn storage length results in a gradual reduction in capacity. Even though the storage length change only directly impacts the eastbound through movement, there are also impacts to other movements because the traffic signal timings have been adjusted to rebalance the green time between the north-south and east-west phases (i.e., provide less green time to Lesperance Road and use the reallocated green time to help mitigate the reduced capacity on Tecumseh Road).

The more substantial and immediate (as opposed to incremental) impact is the elimination of the southbound right turn lane. This change affects the southbound through movement since it would consolidate two movements into a single lane; it also reduces the number of gaps in southbound traffic, which affects capacity on the opposing northbound left turn movement. Eliminating the eastbound right turn lane also has an impact; however, the impact is more modest because the eastbound right turn comprises a lower proportion of the eastbound approach demand and because the relatively short length of the eastbound right turn lane (11 metres) already limits its effectiveness.

4.4.2 Queues

During the PM peak hour, the primary queuing issue is on the eastbound approach. In all cases the queue extends beyond St. Anne Street. In Alternatives 3 and 4, the queue is projected to extend to Poisson Street, and in practice would extend beyond there (since the eastbound approach is over capacity, the queue will gradually build over the peak period until volumes decrease to a level that allows the queue to dissipate).

To accommodate the 95th percentile queues, the following turn lane lengths would be required (at minimum) to reduce the risk of a left turn queue blocking the single through lane:

- Westbound left turn: 60 metres
- Northbound left turn: 75 metres
- Southbound left turn: 30 to 40 metres

The eastbound left turn storage was considered separately, given that different storage lengths are under consideration. Strictly from the perspective of accommodating the calculated 95th percentile left turn queues, a 30-metre storage length would be sufficient. However, there are further differences between the different storage lengths because the length of the queue in the through lane will block access to the left turn lane and reduce the effectiveness of the left turn phase, and because reduced storage increases the likelihood of the saturation flow rate being reduced during the main phase as left turning vehicles depart the eastbound stream. The effect of storage length on eastbound capacity is documented in **Section 4.4.1**.

4.4.3 Level of Service / Delays

During the PM peak hour, delays progressively increase and levels of service progressively worsen with the alternatives with smaller footprints. The level of service is primarily governed by the over-capacity eastbound and northbound through movements, which are calculated to decrease to LOS F in Alternatives 2 through 4. The level of service on the other movements are generally expected to be reasonable, although the level of service on the northbound and eastbound left and right turns would be higher than indicated after accounting for additional delay incurred in the through lane while waiting to enter the turn lane.

4.5 Results for Alternative 4

In preliminary discussions with the Town and the project team, there was particular interest in Alternative 4 — specifically, whether the traffic impacts of the smallest-footprint alternative would be considered to be acceptable.

Strictly from a traffic operations and capacity perspective, Alternative 1 (or, the “do nothing” alternative) would be identified as being preferred, with the least effect on corridor capacity, delays and queues. However, in this case, the intent of the project is to rebalance the function of the street away from focusing on the movement of through traffic, and placing greater emphasis on the street’s role in serving the immediate area and creating an environment more conducive to pedestrian activity.

Alternative 4 has the smallest roadway footprint and reflects the greatest potential to achieve the urban design and streetscaping goals of the project. Conversely, it has the greatest impact on traffic capacity. The main constraints are expected to occur during the PM peak period, on the eastbound and northbound through movements. **Table 5** outlines the overall peak hour level of service at the intersection at various traffic horizons, and lists any critical movements (whether identified as critical due to capacity constraints, queue lengths or both). **Table 6** provides additional detail on the capacity-related critical movements during the PM peak hour and the magnitude of any identified capacity constraints.

Table 5: Level of Service and Critical Movements under Alternative 4

Traffic scenario	AM peak hour		PM peak hour	
	LOS	Critical movements	LOS	Critical movements
Existing volumes; existing intersection	B	SB through	C	EB through NB through SB through
Existing volumes; reconfigured intersection	C	SB through	E	EB through NB through SB through
With CIP development; reconfigured intersection	D	SB through	F	EB through NB left NB through SB through
With CIP development and CR 22 grade separation; reconfigured intersection	C	SB through	E	EB through NB through SB through

There are no substantial traffic capacity issues identified during the AM peak hour under any of the traffic volume scenarios (although there are queuing issues identified on Lesperance Road associated with the intersection's proximity to the VIA Rail crossing). However, there are several capacity constraints identified during the PM peak hour.

Table 6: Critical Movement Details under Alternative 4 (PM Peak Hour)

Traffic scenario	Critical movements	v/c	Over capacity
Existing volumes; existing intersection	EB through	0.89	—
	NB through	0.93	—
Existing volumes; reconfigured intersection	EB through	1.21	105 vph
	NB through	1.09	25 vph
With CIP development; reconfigured intersection	EB through	1.36	180 vph
	NB left	1.10	20 vph
	NB through	1.27	70 vph
	SB through	0.97	—
With CIP development and CR 22 grade separation; reconfigured intersection	EB through	1.15	90 vph
	NB through	0.99	—
	SB through	0.91	—

The eastbound and northbound through movements are identified as critical under all traffic scenarios, although the magnitude of any capacity deficiency varies by scenario. The constraints are greatest on Tecumseh Road (both in terms of the v/c ratio and the volume of traffic exceeding capacity), although this depends to some extent on the ultimate traffic signal timings.

Under existing conditions, the eastbound and northbound through movements are critical but are still operating within capacity. In the short-term “future build” scenario (with the intersection reconfigured but no change in traffic volumes), the eastbound through / right turn lane is projected to be 21% over capacity. With increased development in the CIP and no diversion of traffic away from the corridor, the eastbound through / right turn lane is projected to be 36% over capacity. This is equivalent to 105 vehicles per hour (2 to 3 vehicles per traffic signal cycle) in the short term, and 180 vehicles per hour (4 to 5 vehicles per cycle) in the longer term. The capacity deficiency would be observed as a gradually growing queue that would reach 800 metres (short term) to 1.4 kilometres (longer term) by the end of the peak hour. The impacts of CIP traffic growth would be offset once the planned CR 22 / Lesperance Road grade separation is in place (or if a comparable level of traffic redistribution is realized).

Notwithstanding the eastbound capacity constraint and potential for queuing under Alternative 4, any of the alternatives (other than Alternative 1) would result in over-capacity conditions and queuing. For example, under Alternative 2, the eastbound approach would exceed capacity by approximately 130 vehicles per hour in the longer term, with a corresponding queue of 1 kilometre.

In practice, while queues would be expected to grow under the revised geometry compared to existing conditions, the queues that actually materialize would likely be less than indicated above, because motorists would begin to divert to other routes or otherwise change their travel patterns as the corridor becomes more constrained. (In fact, this would likely begin to occur during the construction period when the magnitude of the constraint would be greater.) The potential for traffic to shift as a form of mitigation is discussed further in **Section 4.6.3**.

4.6 Mitigation

The results presented in the preceding sections assume no mitigation, other than optimized traffic signal timings. Some opportunity exists to mitigate these conditions, at least in part. Three forms of mitigation were considered:

- Road geometry changes;
- Traffic signal changes; and
- Traffic pattern changes.

4.6.1 Road Geometry Changes

Typically, one means of addressing a roadway capacity constraint would be to change the roadway geometry — widening the roadway (or reallocating the existing cross-section) to provide additional lanes, to provide dedicated turn lanes where they do not currently exist, or to lengthen auxiliary lanes. In this case, mitigation through roadway geometry changes is generally less applicable because the intent of the project is not to mitigate an existing or anticipated traffic constraint, but to select from a set of alternatives each of which gives different weights to traffic and urban design objectives. Mitigating through road geometry would involve selecting a different alternative with a larger footprint (or adding elements from a larger-footprint alternative). In considering whether to mitigate capacity constraints through road geometry changes (i.e., selecting a different alternative), the Town would be evaluating the relative priority placed on traffic service vs. urban design and streetscaping opportunities, and balancing the risk of traffic impacts against the opportunity afforded by the additional sidewalk and landscaping area.

4.6.2 Traffic Signal Changes

There are some possible traffic signal changes that may have a minor impact on operations.

- The left turn lane detectors are currently located at the stop bars, but should be relocated so that they are set back three car lengths from the stop bar. In their current locations, the loops will call a left turn phase even if only one vehicle is waiting. If relocated, the loops would only call a left turn phase if three or more vehicles are waiting, and otherwise the left turn phase time would be allocated to the main (through) phases. This change would potentially increase delays for some left-turning vehicles, but would reduce delays for most intersection traffic and would increase intersection efficiency by only calling the left turn phases when they are needed and when they can be used to their maximum efficiency. The left turn phases would continue to be protected/permissive (as opposed to fully protected) as they are today. Changing the detector loop location may have the

potential to slightly increase capacity for the critical through movements, delay the onset of congestion, and/or reduce the duration of congestion.

- Signal progression can be set such that eastbound traffic arrives at Lesperance Road sufficiently in advance of the green signal to allow the left turn storage to be filled and to allow the eastbound phase to operate at a greater level of efficiency. (This has already been accounted for in the analyses.)
- Further changes to cycle and/or phase lengths may result in modest improvements to some movements (possibly at the expense of other movements). This could include disabling some left turn phases at some times of the day. These changes should be reviewed once the road reconstruction has been completed and motorists have had an opportunity to adjust.

4.6.3 Traffic Pattern Changes

Traffic pattern changes may mitigate congested conditions. The analyses are based on unconstrained volumes and assume that motorists will continue to use the road network as they do today. In practice, if the Tecumseh Road corridor is perceived as being more constrained and less attractive than it is today, motorists may make other travel choices — for example:

- Selecting alternate travel routes;
- Adjusting departure times; or
- Reducing the amount of discretionary travel during times of peak congestion.

There are a number of alternate routes that motorists may select, depending on the specific start and end points of their trip (including whether they have an origin or destination within the study area, or whether they are traveling through the study area between two external points). Some of these alternate routes are illustrated in **Figure 6** and are discussed below.

Some eastbound traffic on Tecumseh Road may shift to parallel corridors. The level of diversion required for Tecumseh Road to operate at or below capacity would be approximately 105 vehicles per hour in the short term, and 180 vehicles per hour in the longer term. The main corridors serving both local and longer-distance trips are CR 22 and, to a lesser extent, Riverside Drive. Other corridors that may also serve locally destined trips include the McHugh Street / McNorton Street corridor and the Wyandotte Street / Little River Boulevard corridor. Eastbound diverted trips may be observed as eastbound vehicles turning left or right from Tecumseh Road at Banwell Road and traveling north or south to access one of these parallel corridors. Other motorists may elect to use other north-south streets to access the parallel corridors without traveling on Tecumseh Road at all.

Some northbound traffic on Lesperance Road may shift to Banwell Road or Manning Road. The level of diversion required for Lesperance Road to operate at or below capacity would be approximately 25 vehicles per hour in the short term, and 90 vehicles per hour in the longer term. Northbound volumes on Banwell Road, Lesperance Road and Manning Road during the PM peak period are currently governed to some extent by capacity limitations on the left turn movements from the E.C. Row

Expressway / CR 22. Intersection modifications planned by the County of Essex at CR 22 and Manning Road may allow for some redistribution of the eastbound left turn movement away from Lesperance Road. The City of Windsor's longer-term proposed interchange at the E.C. Row Expressway and Banwell Road would provide a similar and potentially more attractive opportunity.

There is also potential for undesirable redistribution of traffic to local streets in the study area — in particular, St. Anne Street, Poisson Street, Shawnee Road and Arbour Street. For example, if there is an eastbound queue that extends to Poisson Street, a motorist destined to southbound Lesperance Road may see Poisson Street and Arbour Street as being an attractive bypass corridor. This risk may be partially mitigated by metering eastbound traffic at the Shawnee Road and/or Southfield Drive signals, so that eastbound queues are relocated upstream to an area that is less susceptible to cut-through traffic.

There would typically be a potential for some trips to shift to alternate modes (walking; cycling; transit). In this case, the potential for a shift is likely low (especially for a shift to transit, given the limited transit service in the area). There may be the potential for a modest shift to walking or cycling, given the pedestrian-oriented changes to the corridor and Town policies encouraging a shift to active travel modes.

Although the magnitude of the required level of diversion is presented as a change from existing conditions, in practice it should be noted that the roadway would not immediately transition from the existing configuration and capacity to the modified configuration and capacity. There will be an intermediate condition during the construction season when capacity is even further constrained and some level of traffic diversion would be expected. The construction period will establish a new baseline in terms of traffic volumes and motorist travel and routing choices. Not all motorists that divert away from the study area during the construction season may necessarily return post-construction, particularly if there is a recognition (or perception) that Tecumseh Road is more constrained.

Figure 6: Potential Alternate Travel Patterns

Potential eastbound diversion routes from Tecumseh Road



Potential diversion routes from Lesperance Road



Potential diversion routes around Tecumseh / Lesperance intersection



5.0 Tecumseh Road at Shawnee Road

5.1 Proposed Intersection Configuration

At the Shawnee Road intersection, Tecumseh Road currently has two lanes in each direction with no dedicated turn lanes. With the proposed cross-section reduction to the west and east, the Tecumseh Road approaches will be reconfigured to have a single through lane in each direction. A short left turn lane is recommended on the eastbound and westbound approach to allow through traffic to bypass left turn queues.

5.2 Assumptions and Methodology

The assumptions and methodology applied at Tecumseh Road and Shawnee Road were similar to those discussed in **Section 4.2**. A cycle length of 80 to 90 seconds was applied, matching the cycle length applied at Lesperance Road.

5.3 Intersection Operations

The overall intersection delay and level of service are summarized in **Table 7**. No critical movements were identified during either the AM or PM peak hours, under any of the volume or intersection geometry scenarios.

Table 7: Intersection Operations at Tecumseh Road and Shawnee Road

Alternative	AM peak hour		PM peak hour	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Existing volumes				
Existing geometry	2.8	A	3.3	A
Modified geometry	4.4	A	5.3	A
With CIP development				
Existing geometry	3.4	A	4.4	A
Modified geometry	5.1	A	5.8	A
With CIP development and CR 22 grade separation				
Existing geometry	3.3	A	4.6	A
Modified geometry	5.4	A	6.3	A

The intersection is projected to operate at a good level of service and within capacity under all traffic volume scenarios, in either the existing or proposed future configuration. There is no change in the level of service for the intersection as a whole or for individual movements. The v/c ratios and queues will

increase on the eastbound and westbound approaches compared to existing conditions, but are expected to remain at reasonable levels.

The operations outlined above assume that the traffic signal operates in a conventional manner for a lower-volume side street intersection, with timings that favour Tecumseh Road. As noted in **Section 0**, a potential mitigation strategy at Tecumseh Road and Lesperance Road could be to time the traffic signals at Shawnee Road to meter flow during the weekday PM peak period, so that the queue of eastbound traffic is relocated so that it primarily extends west from Shawnee Road instead of west from Tecumseh Road. This would not increase capacity in the corridor but could help reduce the risk of cut-through traffic through the adjacent neighbourhood. In this case, the eastbound queues approaching the intersection during the PM peak hour would be longer than shown in the tables in **Appendix B**.

6.0 Tecumseh Road at Southfield Drive

6.1 Proposed Intersection Configuration

At the Southfield Drive intersection, Tecumseh Road currently has two lanes in each direction with no dedicated turn lanes.

The change in cross-section from four to two lanes is proposed to be implemented in the vicinity of Southfield Drive. A high-level assessment was made of three possible treatments for dropping the second eastbound lane:

- Lane drop occurs east of Southfield (downstream)
- Lane drop occurs at Southfield (curb lane becomes “must exit” right turn lane)
- Lane drop occurs west of Southfield (upstream)

The upstream lane drop is not recommended, due to the level of variance from typical driver expectations:

- It would be unusual for a lane to end immediately upstream from a signalized intersection, rather than to be carried through to the intersection or terminated downstream.
- There already exists an additional lane drop (reducing the cross-section from three to two eastbound lanes) approximately 150 metres west of Southfield Drive. If the second lane was reduced west of Southfield, there would be two lane drops almost in immediate succession.

The base analyses were undertaken with a single through lane and a dedicated right turn lane (i.e., the lane drop occurs at the intersection) to determine whether this configuration would have sufficient capacity, or whether it would be necessary to terminate the second through lane downstream from the intersection to maximize capacity for through traffic. For analysis purposes, Tecumseh Road was assumed to be reconfigured as follows:

- A single through lane in both directions;
- A dedicated left turn lane in both directions; and
- A dedicated eastbound right turn lane (formed from the second existing eastbound through lane).

No changes to the existing cross-section were assumed on the northbound and southbound approaches.

6.2 Assumptions and Methodology

The assumptions and methodology applied at Tecumseh Road and Southfield Drive were similar to those discussed in **Section 4.2**. A cycle length of 80 to 90 seconds was applied, matching the cycle length applied at Lesperance Road.

The future projections assume that CIP development interest will be focused in the eastern part of the CIP area through the medium term. However, the CIP demonstration plan identified some infill development potential in the vicinity of Southfield Drive — residential development southeast of the intersection (closer to Arbour Street) and mixed-use development north of Tecumseh Road. The analyses assumed that development in this area would occur beyond the study horizon, but considered the need to leave residual capacity on the side street approaches to accommodate development once it occurs.

6.3 Intersection Operations

The overall intersection delay and level of service are summarized in **Table 8**. No critical movements were identified during either the AM or PM peak hours, under any of the volume or intersection geometry scenarios.

Table 8: Intersection Operations at Tecumseh Road and Southfield Drive

Alternative	AM peak hour		PM peak hour	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Existing volumes				
Existing geometry	6.1	A	7.1	A
Modified geometry	6.7	A	8.4	A
With CIP development				
Existing geometry	6.4	A	6.8	A
Modified geometry	7.2	A	8.9	A
With CIP development and CR 22 grade separation				
Existing geometry	6.4	A	6.9	A
Modified geometry	7.1	A	8.7	A

This configuration was found to have sufficient capacity; it is not necessary to carry the second eastbound lane through the intersection from a capacity perspective. Further, it is less critical to maximize eastbound through capacity at this location, since eastbound capacity is governed by other locations farther downstream. In fact, as noted below, one of the potential mitigation measures may be to use the traffic signals at Southfield and/or Shawnee to meter the rate of traffic that enters the lower-capacity section to the east. This can best be achieved by dropping the second lane at Southfield rather than downstream. This configuration can also allow the right turn lane to be used as a queue jump lane for buses should transit service levels be increased in the Tecumseh Road corridor in the future.

The level of service is largely unaffected by the proposed reconfiguration. The northbound left turn level of service may increase slightly from LOS C to LOS D during the AM peak hour as a result of signal timing

adjustments (i.e., increasing the cycle length from 80 to 90 seconds to match the proposed change at Tecumseh Road and Lesperance Road).

Queues on Tecumseh Road are expected to increase with the reduction in the number of through lanes, but are expected to remain at reasonable levels. During the PM peak hour, westbound queues are projected to increase from 45 metres per lane (existing) to 90 metres (future), and eastbound queues are projected to increase from 40 metres per lane (existing) to 115 metres (future). The eastbound queue would extend to approximately the east (unsignalized) driveway serving the Metro grocery store east of Banwell Road. Eastbound queues would therefore have minimal impact on the Metro store, but would potentially affect operations of two full-movement driveways serving the shopping plaza and Tim Hortons restaurant southwest of the intersection. These driveways would need to be monitored following the reconfiguration.

There is sufficient northbound and southbound capacity at the intersection to accommodate additional development traffic. The v/c ratios on the northbound and southbound approaches are not expected to exceed 0.50 at the study horizon, leaving residual capacity available to accommodate growth beyond the study horizon.

7.0 Summary

7.1 Background

The Town of Tecumseh is planning roadway and streetscape modifications along Tecumseh Road and Lesperance Road in the Tecumseh CIP area. The roadway modifications are proposed to include a reconfiguration of Tecumseh Road such that the existing four-lane cross-section is reduced to two lanes (not including any auxiliary turn lanes). This change would allow a greater portion of the right-of-way to be allocated to other uses, including landscaping, street furniture, and on-street parking. The intention of the modification is to rebalance the function of the street, so that there is less of a priority on the movement of traffic, and greater emphasis on the street's role in serving the immediate area and creating an environment more conducive to pedestrian activity.

Analyses were undertaken to allow the Town to understand how the proposed changes may affect traffic capacity along Tecumseh Road, and to assess the means of implementing the transition from four to two lanes at the west end of the study area.

7.2 Corridor Capacity and Tecumseh Road / Lesperance Road Intersection

The analyses confirmed that the capacity of the Tecumseh Road corridor is governed by the intersection at Lesperance Road. A range of alternatives were analyzed that vary the balance between maximizing traffic service (largest roadway footprint) and maximizing the ability to achieve other non-traffic design objectives (smallest roadway footprint). The main differentiators between the alternatives were the length of the eastbound left turn lane (ranging from 30 to 90 metres) and whether or not right turn lanes are provided on the eastbound and/or southbound approaches.

In the morning peak hour, any of the alternatives can operate within capacity; the level of traffic service would be poorer than existing conditions but would still be acceptable.

In the afternoon peak hour, there are capacity constraints projected on the eastbound and northbound through movements. The constraints increase as the footprint decreases (i.e., more emphasis on place making and less emphasis on traffic movement). The northbound constraint is comparatively minor, whereas the eastbound constraint is more substantial. Under Alternative 4 (the alternative with the smallest footprint), the eastbound through / right turn lane is projected to be 21% over capacity in the short term, and 36% over capacity with increased development in the CIP. This is equivalent to 105 vehicles per hour (2 to 3 vehicles per traffic signal cycle) in the short term, and 180 vehicles per hour (4 to 5 vehicles per cycle) in the longer term. The capacity deficiency would be observed as a gradually growing queue that would reach 800 metres (short term) to 1.4 kilometres (longer term) by the end of the peak hour, assuming existing traffic patterns are maintained with no diversion of traffic to alternate routes or travel times.

7.3 Mitigation

A capacity deficiency in this area may be viewed as being less of a concern than it might be in a different context. The Town would need to recognize that the roadway will operate over capacity for a portion of the afternoon, acknowledging that the street serves multiple roles and that the project is placing more of a priority on factors other than just traffic service. Notwithstanding, opportunities were reviewed for mitigation, either through design / operational measures or by identifying traffic pattern changes that would need to be achieved to allow the roadway to operate within capacity.

Some minor adjustments could be applied to the signal timings and signal design to improve the efficiency of the intersection. In particular, the left turn lane detector loops could be relocated to be set back from the stop bar rather than located at the stop bar, so that they call the left turn phase only when three or more vehicles are queued. This change would improve the signal efficiency slightly by only calling the left turn phases when they are most needed and when they can operate at maximum efficiency. Other minor changes could include slight adjustments to phase or cycle lengths, or implementing time-of-day timing plans where the left turn phases are disabled during portions of the day.

Consideration could also be given to using the Shawnee Road and/or Southfield Drive signals to meter eastbound volumes during the PM peak period. The signal timings would be set to provide more green time to the side street than necessary, so that the signals only release as many eastbound vehicles as can be served at Lesperance Road. This would not increase the capacity of the road, but would help to reduce the potential for cut-through traffic in the southwest quadrant of the Tecumseh Road and Lesperance Road intersection.

The other mitigation potential is for a change in traffic patterns that reduces the demand on Tecumseh Road and/or Lesperance Road. As motorists become aware of the more constrained conditions, some may adjust their travel patterns accordingly (e.g., selecting different routes). The analyses do not assume any redistribution, in part to reflect worst-case conditions in the event that this does not occur, and in part to identify the magnitude of the shift that would address the constraint.

In the short term, the following diversion would need to occur to allow all movements to operate at or below capacity:

- 105 vehicles per hour would need to shift from Tecumseh Road to other parallel corridors. Depending on whether the diverting motorist has a local destination or is only traveling through the study area en route between two external points, the 105 vehicles could be dispersed between CR 22; Riverside Drive; Wyandotte Street / Little River Boulevard; and McNorton Street.
- 25 vehicles per hour would need to shift from Lesperance Road to other parallel corridors. The County is planning modifications at CR 22 and Manning Road that may make that route more attractive for some trips currently traveling through the Lesperance Road and Tecumseh Road intersection.

With development in the CIP, the shift would be greater — approximately 180 vehicles per hour on Tecumseh Road, and 90 vehicles per hour on Lesperance Road. However, the overall pattern would be similar.

There would typically be a potential for some trips to shift to alternate modes (walking; cycling; transit). In this case, the potential for a shift is likely low (especially for a shift to transit, given the limited transit service in the area). There may be the potential for a modest shift to walking or cycling, given the pedestrian-oriented changes to the corridor and Town policies encouraging a shift to active travel modes.

Although the magnitude of this diversion is presented as a change from existing conditions, in practice it should be noted that the roadway would not immediately transition from the existing configuration and capacity to the modified configuration and capacity. There will be an intermediate condition during the construction season when capacity is even further constrained and some level of traffic diversion would be expected. The construction period will establish a new baseline in terms of traffic volumes and motorist travel and routing choices. Not all motorists that divert away from the study area during the construction season may necessarily return post-construction, particularly if there is a recognition (or perception) that Tecumseh Road is more constrained.

7.4 Recommendations

Strictly from a traffic capacity and operations perspective, Alternative 1 (or even the “do nothing” condition) would be recommended; those alternatives result in the lowest level of change and offer the greatest amount of traffic capacity. However, they also have the largest roadway footprints and do not achieve the other project objectives. Conversely, from the perspective of other project objectives and priorities, Alternative 4 might be viewed as preferable given that it features the smallest roadway footprint.

The selection of an overall preferred alternative involves an evaluation of the relative priority placed on traffic service vs. urban design and streetscaping opportunities, and requires balancing the risk of traffic impacts against the opportunity afforded by the additional sidewalk and landscaping area. Upon review of the analysis results, Alternative 3 is recommended to help mitigate the risk of traffic impacts associated with the reduced roadway footprint while still providing opportunity for urban design and placemaking. Alternative 3 differs from Alternative 4 (the alternative with the smallest footprint) as follows:

- In Alternative 3, the existing southbound right turn lane is maintained, whereas it would be removed under Alternative 4.
- In Alternative 3, the eastbound left turn storage length is approximately 45 metres, whereas it would be reduced to 30 metres in Alternative 4.

Restoring the southbound right turn lane would help mitigate the occurrence of southbound queues extending over the VIA Rail crossing. It also would increase capacity on Lesperance Road, including on the northbound approach.

Restoring some of the left turn lane storage has a more modest benefit, but also has modest impacts from a streetscape perspective (it would eliminate two parking spaces on the north side of the street, but these would be offset by new spaces on the south side). The additional 15 metres of storage would slightly increase eastbound capacity, but would also provide additional flexibility to accommodate variation in demand during the peak hour and would help to mitigate the risk of left turn queues blocking the eastbound lane.

It should be noted that the alternatives identified for the traffic analyses were developed prior to the preparation of designs and were intended to be illustrative of a potential range of lane configurations and storage lengths. In practice, as the design is carried out, other variations may emerge within this range as being feasible and/or preferable when considering driveway locations, specific streetscaping and/or parking opportunities, or other site-specific opportunities or constraints.

Other recommendations are as follows:

- The transition from four to two lanes at the west end of the study area should be achieved by terminating the curb lane at Southfield Drive as a dedicated right turn lane. An upstream lane drop is not recommended. A downstream lane drop would be feasible, but is not necessary for capacity reasons.
- Dedicated left turn lanes should be provided on Tecumseh Road at all signalized intersections in the corridor.
- The left turn lane detector loops at Tecumseh Road and Lesperance Road (on all approaches) should be changed to setback loops that only call left turn phases when three or more vehicles are queued in the left turn lane.
- Consideration should be given to using the traffic signals at Shawnee Road (and/or Southfield Drive) to meter the flow of eastbound traffic during the PM peak period, to reduce the risk of infiltration through the surrounding neighbourhood.
- The traffic signal cycle length along the corridor should be maintained at 90 seconds or less, if possible, to minimize queue lengths, maximize the frequency of gaps at unsignalized intersections and driveways, and to reduce delays for pedestrian crossings.

Appendix A

Level of Service Definitions

LEVEL OF SERVICE¹

Level of Service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. This concept was introduced in the 1965 *Highway Capacity Manual* as a criteria for interrupted flow conditions. The 2000 *Highway Capacity Manual* changed the basis for measuring Level of Service at intersections to control delay².

Six Levels of Service are defined with LOS A representing the best operating conditions, and LOS F the worst (briefly described below). It should be noted that there is often significant variability in the amount of delay experienced by individual drivers.

- LOS A:** This Level of Service describes the highest quality of traffic flow and is referred to as free flow. The approach appears open, turning movements are easily made and drivers have freedom of operation. Control delay is less than 10 seconds/vehicle.
- LOS B:** This Level of Service is referred to as a stable flow. Drivers feel somewhat restricted and occasionally may have to wait to complete the minor movement. Control delay is 10-15 seconds/vehicle for unsignalized intersections and 10-20 seconds/vehicle for signalized intersections.
- LOS C:** At this level, the operation is stable. Drivers feel more restricted and may have to wait, with queues developing for short periods. Control delay is 15-25 seconds/vehicle at unsignalized intersections and 20-35 seconds/vehicle at signalized intersections.
- LOS D:** At this level, traffic is approaching unstable flow. The motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough gaps to lower demand to permit occasional clearance of developing queues and prevent excessive back-ups. Control delay is 25-35 seconds/vehicle at unsignalized intersections and 35-55 seconds/vehicle at signalized intersections.
- LOS E:** At this level capacity occurs. Long queues of vehicles exist and delays to vehicles may extend. Control delay is 35-50 seconds/vehicle at unsignalized intersections and 55-80 seconds/vehicle at signalized intersections.
- LOS F:** At this Level of Service, the intersection has failed. Capacity of the intersection has been exceeded. Control delay exceeds 50 seconds/vehicle at unsignalized intersections and exceeds 80 seconds/vehicle at signalized intersections.

¹

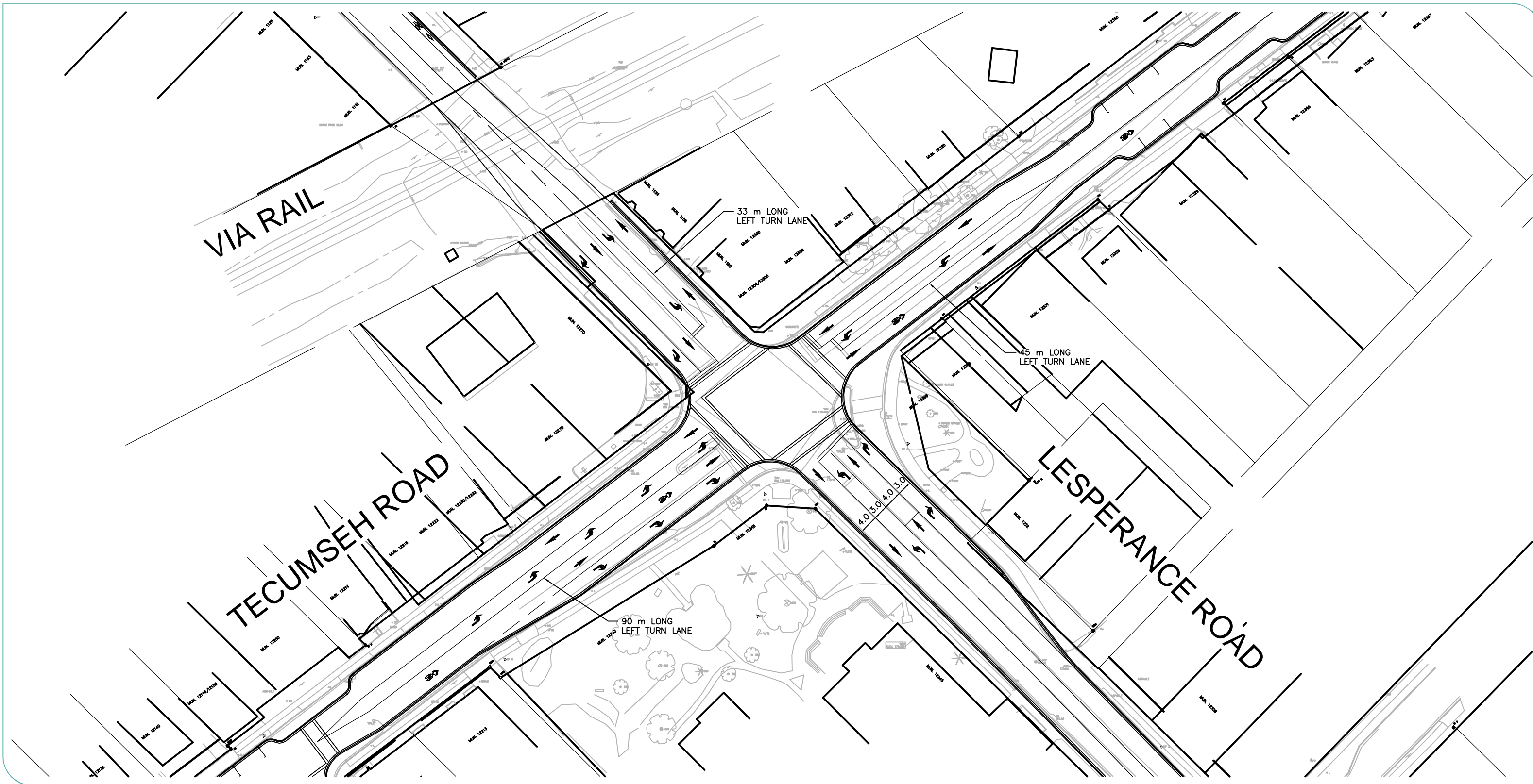
Transportation Research Board: Highway Capacity Manual 1965, 2000

²

Control delay is defined as the component of delay that results when a control signal causes a lane group to reduce speed or to stop; it is measured by comparison with the uncontrolled condition.

Appendix B

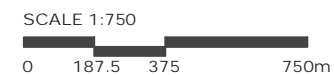
Intersection Functional Designs



TOWN OF TECUMSEH
 TECUMSEH ROAD CIP STREETScape
 IMPROVEMENTS
 TRAFFIC ANALYSIS REPORT
 FUNCTIONAL DESIGN OF
 TECUMSEH ROAD AND
 LESPERANCE ROAD
 ALTERNATIVE 1
 FIGURE B-1



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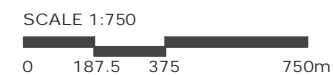
PROJECT: 163254
 STATUS: FINAL
 DATE: AUGUST 2016



TOWN OF TECUMSEH
 TECUMSEH ROAD CIP STREETScape
 IMPROVEMENTS
 TRAFFIC ANALYSIS REPORT
 FUNCTIONAL DESIGN OF
 TECUMSEH ROAD AND
 LESPERANCE ROAD
 ALTERNATIVE 2
 FIGURE B-2



File Location:
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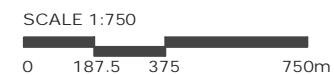
PROJECT: 163254
 STATUS: FINAL
 DATE: AUGUST 2016



TOWN OF TECUMSEH
 TECUMSEH ROAD CIP STREETScape
 IMPROVEMENTS
 TRAFFIC ANALYSIS REPORT
 FUNCTIONAL DESIGN OF
 TECUMSEH ROAD AND
 LESPERANCE ROAD
 ALTERNATIVE 3
 FIGURE B-3



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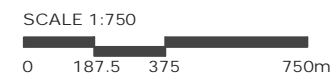
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 DATE: AUGUST 2016



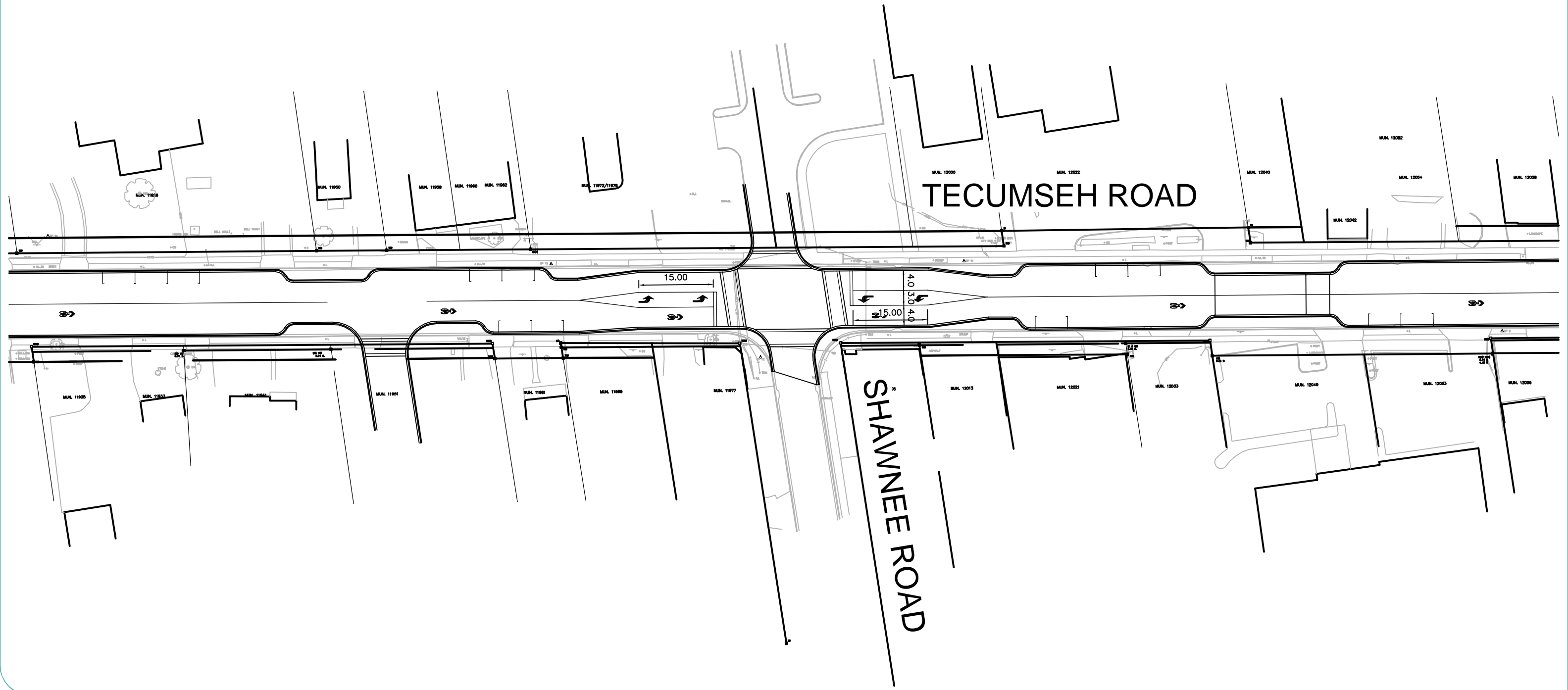
TOWN OF TECUMSEH
 TECUMSEH ROAD CIP STREETScape
 IMPROVEMENTS
 TRAFFIC ANALYSIS REPORT
 FUNCTIONAL DESIGN OF
 TECUMSEH ROAD AND
 LESPERANCE ROAD
 ALTERNATIVE 4
 FIGURE B-4



File Location:
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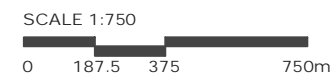
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 STATUS: FINAL
 DATE: AUGUST 2016



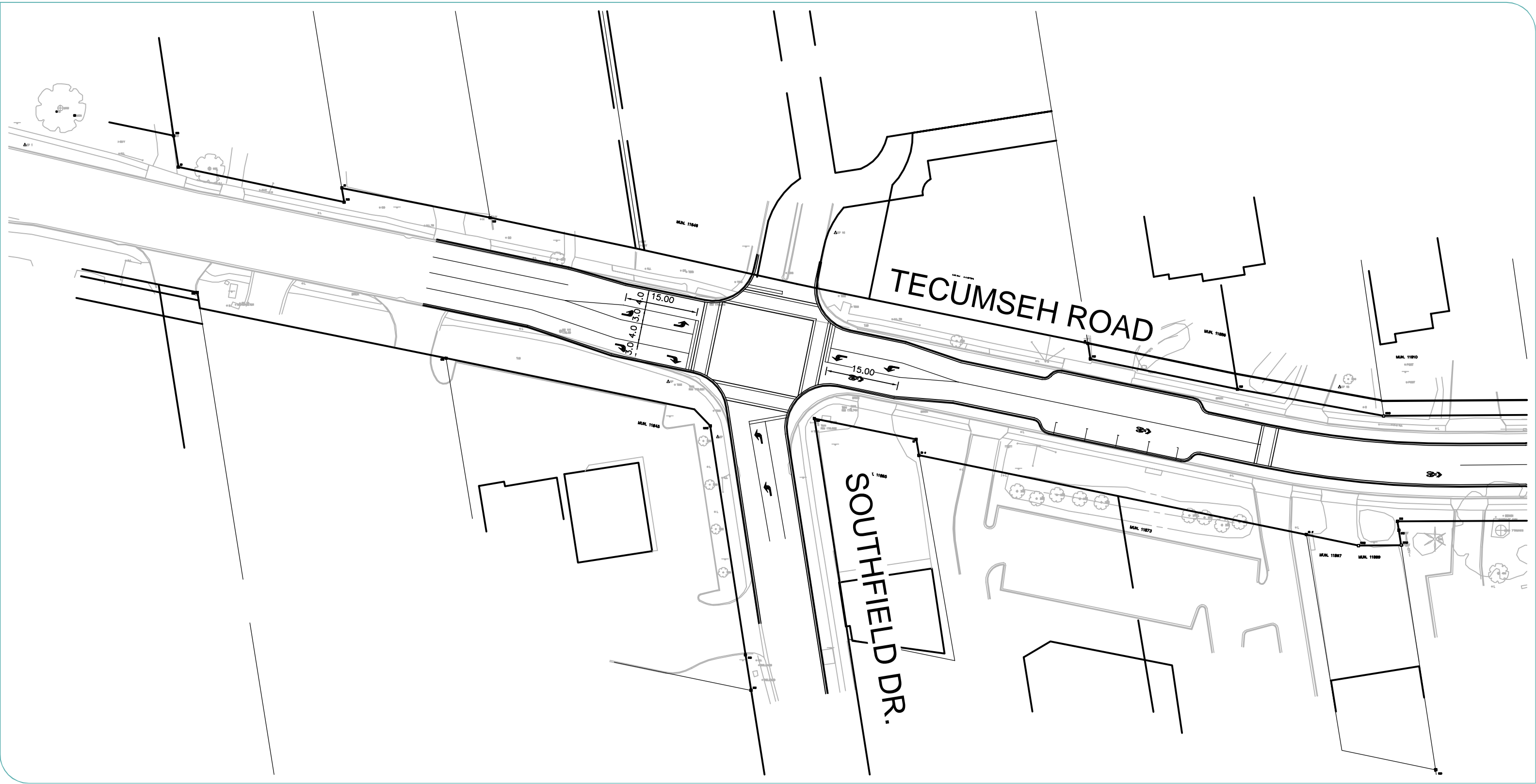
TOWN OF TECUMSEH
 TECUMSEH ROAD CIP STREETScape
 IMPROVEMENTS
 TRAFFIC ANALYSIS REPORT
 FUNCTIONAL DESIGN OF
 TECUMSEH ROAD AND
 SHAWNEE ROAD
 FIGURE B-5



File Location:
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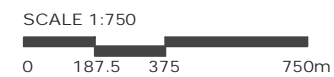
PROJECT: 163254
 STATUS: FINAL
 DATE: AUGUST 2016



TOWN OF TECUMSEH
 TECUMSEH ROAD CIP STREETScape
 IMPROVEMENTS
 TRAFFIC ANALYSIS REPORT
 FUNCTIONAL DESIGN OF
 TECUMSEH ROAD AND
 SOUTHFIELD DRIVE
 FIGURE B-6



File Location:
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PROJECT: 163254
 STATUS: FINAL
 DATE: AUGUST 2016

Appendix C

Intersection Analysis Results Tables

Table C-1: v/c Ratios at Tecumseh Road / Lesperance Road

Alt.	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
AM peak hour — existing volumes												
Exist.	0.23	0.46	0.15	0.45	0.61	0.07	0.49	0.38	0.28	0.18	0.64	0.26
1	0.23	0.43	0.14	0.43	0.66	—	0.55	0.42	0.29	0.19	0.70	0.28
2	0.23	0.44	0.14	0.43	0.66	—	0.55	0.42	0.29	0.19	0.70	0.28
3	0.23	0.58	—	0.50	0.66	—	0.55	0.42	0.29	0.19	0.70	0.28
4	0.28	0.69	—	0.58	0.76	—	0.62	0.35	0.26	0.17	0.84	—
AM peak hour — with CIP development												
Exist.	0.27	0.48	0.21	0.48	0.63	0.07	0.54	0.38	0.28	0.18	0.64	0.28
1	0.27	0.45	0.20	0.45	0.68	—	0.60	0.42	0.29	0.19	0.70	0.30
2	0.27	0.47	0.20	0.45	0.68	—	0.60	0.42	0.29	0.19	0.70	0.30
3	0.27	0.69	—	0.57	0.68	—	0.60	0.42	0.29	0.19	0.70	0.30
4	0.32	0.78	—	0.69	0.77	—	0.69	0.34	0.25	0.16	0.81	—
AM peak hour — with CIP development and CR 22 grade separation												
Exist.	0.26	0.48	0.17	0.43	0.62	0.08	0.41	0.33	0.29	0.23	0.54	0.30
1	0.28	0.46	0.17	0.41	0.71	—	0.43	0.34	0.30	0.24	0.57	0.31
2	0.28	0.49	0.17	0.41	0.71	—	0.43	0.34	0.30	0.24	0.57	0.31
3	0.28	0.66	—	0.50	0.71	—	0.43	0.34	0.30	0.24	0.57	0.31
4	0.30	0.68	—	0.53	0.73	—	0.57	0.30	0.27	0.22	0.79	—
Alt.	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
PM peak hour — existing volumes												
Exist.	0.61	0.89	0.13	0.91	0.63	0.10	0.48	0.93	0.44	0.40	0.54	0.18
1	0.67	0.94	0.13	0.85	0.75	—	0.49	0.98	0.45	0.42	0.56	0.18
2	0.64	1.12	0.12	0.81	0.73	—	0.51	1.03	0.45	0.44	0.59	0.19
3	0.62	1.16	—	0.92	0.70	—	0.54	1.09	0.46	0.46	0.61	0.19
4	0.62	1.21	—	0.92	0.70	—	0.68	1.09	0.46	0.46	0.83	—
PM peak hour — with CIP development												
Exist.	0.71	0.93	0.21	0.94	0.68	0.11	0.65	0.99	0.45	0.42	0.55	0.23
1	0.79	1.02	0.21	0.94	0.82	—	0.68	1.05	0.46	0.44	0.57	0.24
2	0.73	1.24	0.20	0.84	0.77	—	0.74	1.19	0.48	0.48	0.62	0.25
3	0.70	1.30	—	0.94	0.74	—	0.77	1.27	0.49	0.51	0.64	0.26
4	0.70	1.36	—	0.94	0.74	—	1.10	1.27	0.49	0.51	0.97	—
PM peak hour — with CIP development and CR 22 grade separation												
Exist.	0.60	0.82	0.14	0.69	0.61	0.13	0.57	0.82	0.50	0.57	0.48	0.28
1	0.69	0.90	0.14	0.66	0.75	—	0.59	0.87	0.51	0.60	0.50	0.29
2	0.64	1.02	0.13	0.60	0.71	—	0.64	0.99	0.54	0.68	0.55	0.31
3	0.64	1.11	—	0.78	0.71	—	0.64	0.99	0.54	0.68	0.55	0.31
4	0.64	1.15	—	0.78	0.71	—	0.93	0.99	0.54	0.68	0.91	—

Table C-2: 95th Percentile Queues at Tecumseh Road / Lesperance Road

Alt.	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
AM peak hour — existing volumes												
Exist.	8	22	1	29	77	6	29	39	13	15	62	12
1	7	19	1	27	85	—	31	40	13	16	70	12
2	7	19	1	27	85	—	31	40	13	16	70	12
3	7	22	—	27	85	—	31	40	13	16	70	12
4	8	26	—	31	106	—	30	38	12	14	101	—
AM peak hour — with CIP development												
Exist.	9	27	5	30	80	6	32	39	13	15	62	12
1	8	24	1	28	88	—	34*	41	13	16	70*	13
2	8	24	1	28	88	—	34*	41	13	16	70*	13
3	8	37	—	28	88	—	34*	41	13	16	70*	13
4	12	110*	—	39*	117*	—	33*	40	13	15	109*	—
AM peak hour — with CIP development and CR 22 grade separation												
Exist.	9	27	4	26	82	6	28	32	13	19	48	13
1	8	25	1	25	99*	—	29	33	13	20	49	13
2	8	25	1	25	99*	—	29	33	13	20	49	13
3	8	36	—	25	99*	—	29	33	13	20	49	13
4	11	43	—	29	116*	—	30	34	13	21	92*	—
Alt.	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
PM peak hour — existing volumes												
Exist.	25	150	9	57	82	8	32	110	17	23	63	10
1	23	157	7	52	100	—	33	113	17	24	64	10
2	20	176	7	47	96	—	34	117	18	24	65	11
3	18	196	—	58	94	—	34	121	18	25	66	11
4	18	201	—	58	94	—	39	121	18	25	101	—
PM peak hour — with CIP development												
Exist.	33*	164*	15	60*	90	8	44	114*	17	24	63	12
1	41*	174*	14	60*	122*	—	46*	118*	18	24	64	12
2	31*	193*	12	51*	110*	—	54*	125*	18	25	66	12
3	27*	227*	—	60*	103	—	58*	129*	18	26	67	12
4	25*	231*	—	60*	103	—	75*	129*	18	26	119*	—
PM peak hour — with CIP development and CR 22 grade separation												
Exist.	24	150*	7	33*	85	8	42	86*	19	33	46	13
1	19*	162*	7	27*	109	—	43	89*	19	34	46	13
2	13	179*	6	22	104*	—	45*	96*	20	40*	48	14
3	13	208*	—	44*	104	—	45*	96*	20	40*	48	14
4	13	213*	—	44*	104	—	58*	96*	20	40*	92*	—

Queues are expressed in metres.

Queues in through lanes do not include left and right turning vehicles that have not reached a dedicated turn lane, and actual queue length may be longer.

*The 95th percentile volumes exceed capacity. The stated queue reflects two cycles of oversaturated conditions; the actual queue may be longer.

Table C-3: Levels of Service at Tecumseh Road / Lesperance Road

Alt.	Overall	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
AM peak hour — existing volumes													
Exist.	B	A	B	A	B	C	A	C	C	A	B	C	A
1	C	A	B	A	B	C	—	C	C	A	B	D	A
2	C	A	B	A	B	C	—	C	C	A	B	D	A
3	C	A	B	—	B	C	—	C	C	A	B	D	A
4	C	B	C	—	C	C	—	C	C	A	B	D	—
AM peak hour — with CIP development													
Exist.	B	B	B	A	B	C	A	C	C	A	B	C	A
1	C	A	B	A	B	C	—	C	C	A	B	D	A
2	C	A	B	A	B	C	—	C	C	A	B	D	A
3	C	A	B	—	B	C	—	C	C	A	B	D	A
4	C	B	C	—	C	D	—	C	C	A	B	D	—
AM peak hour — with CIP development and CR 22 grade separation													
Exist.	B	A	B	A	B	C	A	C	C	A	B	C	A
1	B	A	B	A	B	C	—	C	C	A	B	C	A
2	B	A	B	A	B	C	—	C	C	A	B	C	A
3	C	A	B	—	B	C	—	C	C	A	B	C	A
4	C	B	C	—	B	C	—	C	C	A	B	D	—
Alt.	Overall	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
PM peak hour — existing volumes													
Exist.	C	B	D	A	E	C	A	C	E	A	C	C	A
1	D	B	D	A	D	C	—	C	E	A	C	C	A
2	D	B	F	A	D	C	—	C	F	A	C	C	A
3	E	B	F	—	E	C	—	C	F	A	C	D	A
4	E	B	F	—	E	C	—	D	F	A	C	D	—
PM peak hour — with CIP development													
Exist.	D	C	D	A	E	C	A	C	E	A	C	C	A
1	D	C	E	A	E	D	—	C	F	A	C	C	A
2	E	C	F	A	D	C	—	D	F	A	C	D	A
3	F	B	F	—	E	C	—	D	F	A	C	D	A
4	F	B	F	—	E	C	—	F	F	A	C	E	—
PM peak hour — with CIP development and CR 22 grade separation													
Exist.	C	B	C	A	C	C	A	C	D	A	C	C	A
1	C	B	C	A	C	C	—	C	E	A	C	D	A
2	D	B	E	A	B	C	—	D	F	A	D	D	A
3	D	B	F	—	D	C	—	D	F	A	D	D	A
4	E	B	F	—	D	C	—	E	F	A	D	E	—

Note: Delays for turning movements do not include delays incurred in through lane before being able to enter a dedicated turn lane.

Table C-4: Average Delays at Tecumseh Road / Lesperance Road

Alt.	Overall	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
AM peak hour — existing volumes													
Exist.	19.4	9.5	17.5	3.9	15.5	25.5	6.0	22.0	27.0	5.8	16.4	33.8	6.2
1	20.3	7.9	14.1	2.6	13.7	25.4	—	25.3	29.3	6.3	17.9	38.8	6.8
2	20.3	7.9	14.3	2.6	13.7	25.4	—	25.3	29.3	6.3	17.9	38.8	6.8
3	21.3	7.9	16.1	—	15.3	25.4	—	25.3	29.3	6.3	17.9	38.8	6.8
4	27.3	10.7	22.7	—	20.8	34.1	—	26.6	25.0	5.3	15.0	42.9	—
AM peak hour — with CIP development													
Exist.	19.5	10.1	18.4	4.4	16.0	26.0	6.0	23.5	27.1	5.8	16.4	33.9	6.1
1	20.5	8.6	15.2	3.0	14.1	26.3	—	27.5	29.4	6.3	17.9	39.0	6.7
2	20.5	8.6	15.7	3.0	14.1	26.3	—	27.5	29.4	6.3	17.9	39.0	6.7
3	22.4	8.6	19.8	—	17.6	26.3	—	27.5	29.4	6.3	17.9	39.0	6.7
4	30.2	12.5	30.1	—	28.5	36.2	—	32.5	25.9	5.2	16.3	41.0	—
AM peak hour — with CIP development and CR 22 grade separation													
Exist.	18.1	9.1	17.2	4.0	13.7	24.4	5.2	21.4	27.8	6.4	18.3	32.7	6.7
1	19.0	8.4	14.9	3.0	12.9	26.8	—	22.6	28.8	6.6	19.1	34.4	7.0
2	19.1	8.4	15.5	3.0	12.9	26.8	—	22.6	28.8	6.6	19.1	34.4	7.0
3	20.6	8.4	18.5	—	14.9	26.8	—	22.6	28.8	6.6	19.1	34.4	7.0
4	26.0	10.5	22.	—	18.1	30.3	—	28.2	28.3	6.0	19.5	41.7	—
Alt.	Overall	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
PM peak hour — existing volumes													
Exist.	31.8	17.0	38.4	8.1	61.4	29.2	5.8	22.2	63.0	5.4	20.6	31.3	6.2
1	35.4	18.9	44.2	8.2	48.5	33.4	—	23.5	75.9	5.6	21.8	32.6	6.5
2	47.7	16.6	98.2	7.6	40.3	31.2	—	24.9	91.1	5.8	23.1	34.1	6.7
3	56.9	14.8	109	—	64.7	29.3	—	26.4	111	6.1	24.5	35.7	7.0
4	65.5	14.8	133	—	64.7	29.3	—	35.2	111	6.1	24.5	48.0	—
PM peak hour — with CIP development													
Exist.	36.1	24.3	45.9	9.5	70.0	30.9	5.7	28.9	79.1	5.4	20.9	31.6	5.7
1	44.3	29.2	65.5	9.2	68.8	38.6	—	31.2	95.1	5.6	22.2	32.9	6.0
2	64.3	22.0	147	7.39	45.6	33.0	—	37.2	145	6.1	25.1	36.0	6.4
3	80.8	19.4	169	—	69.9	30.7	—	41.1	179	6.4	27.0	37.9	6.7
4	97.9	18.4	194	—	69.9	30.7	—	115	179	6.4	27.0	69.8	—
PM peak hour — with CIP development and CR 22 grade separation													
Exist.	24.4	12.7	26.7	6.1	26.5	24.4	4.0	29.5	53.0	7.0	30.6	34.7	7.2
1	28.3	16.3	32.7	5.1	23.1	28.5	—	31.3	60.7	7.3	32.9	36.2	7.5
2	36.5	12.2	59.4	4.3	17.9	25.1	—	35.6	88.1	8.1	39.9	39.5	8.2
3	46.2	12.2	85.5	—	37.7	25.1	—	35.6	88.1	8.1	39.9	39.5	8.2
4	57.2	12.2	103	—	37.7	25.1	—	73.7	88.1	8.1	39.9	63.6	—

Note: Delays for turning movements do not include delays incurred in through lane before being able to enter a dedicated turn lane.

Table C-5: v/c Ratios at Tecumseh Road / Shawnee Road

Alt.	EBL	EBT	WBL	WBT	NB	SB
AM peak hour — existing volumes						
Exist.	—	0.18	—	0.25	0.20	—
4	—	0.34	0.03	0.43	0.20	—
AM peak hour — with CIP development						
Exist.	—	0.20	—	0.26	0.20	0.19
4	0.03	0.35	0.03	0.46	0.20	0.19
AM peak hour — with CIP development and CR 22 grade separation						
Exist.	—	0.19	—	0.26	0.20	0.19
4	0.03	0.34	0.03	0.45	0.20	0.18
Alt.	EBL	EBT	WBL	WBT	NB	SB
PM peak hour — existing volumes						
Exist.	—	0.33	—	0.29	0.24	—
4	—	0.62	0.19	0.49	0.24	—
PM peak hour — with CIP development						
Exist.	—	0.40	—	0.31	0.25	0.27
4	0.15	0.64	0.19	0.52	0.25	0.27
PM peak hour — with CIP development and CR 22 grade separation						
Exist.	—	0.40	—	0.31	0.25	0.27
4	0.15	0.64	0.19	0.52	0.25	0.27

Table C-6: 95th Percentile Queues at Tecumseh Road / Shawnee Road

Alt.	EBL	EBT	WBL	WBT	NB	SB
AM peak hour — existing volumes						
Exist.	—	28	—	7	11	—
4	—	69	1	23	11	—
AM peak hour — with CIP development						
Exist.	—	30	—	11	11	10
4	2	70	1	59	12	11
AM peak hour — with CIP development and CR 22 grade separation						
Exist.	—	29	—	8	11	10
4	2	67	1	68	12	11
Alt.	EBL	EBT	WBL	WBT	NB	SB
PM peak hour — existing volumes						
Exist.	—	28	—	21	14	—
4	—	64	2	49	14	—
PM peak hour — with CIP development						
Exist.	—	38	—	30	14	14
4	3	69	1	46	14	14
PM peak hour — with CIP development and CR 22 grade separation						
Exist.	—	37	—	32	14	14
4	3	69	2	58	14	14

Table C-7: Levels of Service at Tecumseh Road / Shawnee Road

Alt.	Overall	EBL	EBT	WBL	WBT	NB	SB
AM peak hour — existing volumes							
Exist.	A	—	A	—	A	C	—
4	A	—	A	A	A	C	—
AM peak hour — with CIP development							
Exist.	A	—	A	—	A	C	B
4	A	A	A	A	A	C	B
AM peak hour — with CIP development and CR 22 grade separation							
Exist.	A	—	A	—	A	C	B
4	A	A	A	A	A	C	B
Alt.	Overall	EBL	EBT	WBL	WBT	NB	SB
PM peak hour — existing volumes							
Exist.	A	—	A	—	A	C	—
4	A	—	A	A	A	C	—
PM peak hour — with CIP development							
Exist.	A	—	A	—	A	C	B
4	A	A	A	A	A	C	B
PM peak hour — with CIP development and CR 22 grade separation							
Exist.	A	—	A	—	A	C	B
4	A	A	A	A	A	C	B

Table C-8: Average Delays at Tecumseh Road / Shawnee Road

Alt.	Overall	EBL	EBT	WBL	WBT	NB	SB
AM peak hour — existing volumes							
Exist.	2.8	—	3.3	—	1.1	22.6	—
4	4.4	—	5.0	2.5	2.8	22.6	—
AM peak hour — with CIP development							
Exist.	3.4	—	3.4	—	1.4	22.7	17.4
4	5.1	5.5	5.4	1.3	3.0	24.6	18.6
AM peak hour — with CIP development and CR 22 grade separation							
Exist.	3.3	—	3.4	—	1.1	22.7	17.4
4	5.4	5.5	5.3	1.7	3.6	24.6	18.6
Alt.	Overall	EBL	EBT	WBL	WBT	NB	SB
PM peak hour — existing volumes							
Exist.	3.3	—	2.9	—	2.2	24.4	—
4	5.3	—	5.2	7.0	4.0	24.4	—
PM peak hour — with CIP development							
Exist.	4.4	—	3.4	—	3.1	24.6	19.5
4	5.8	4.6	5.3	6.0	4.0	24.6	19.5
PM peak hour — with CIP development and CR 22 grade separation							
Exist.	4.6	—	3.3	—	3.6	24.6	19.5
4	6.3	4.6	5.3	7.5	5.2	24.6	19.5

Table C-9: v/c Ratios at Tecumseh Road / Southfield Drive

Alt.	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
AM peak hour — existing volumes									
Exist.	—	0.24	—	—	0.31	0.45	0.26	0.02	0.07
4	0.03	0.31	0.10	0.16	0.38	0.45	0.26	0.02	0.07
AM peak hour — with CIP development									
Exist.	—	0.25	—	—	0.33	0.47	0.26	0.02	0.07
4	0.04	0.34	0.10	0.18	0.43	0.50	0.28	0.02	0.07
AM peak hour — with CIP development and CR 22 grade separation									
Exist.	—	0.25	—	—	0.33	0.47	0.26	0.02	0.07
4	0.04	0.33	0.10	0.17	0.42	0.50	0.28	0.02	0.07
Alt.	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
PM peak hour — existing volumes									
Exist.	—	0.38	—	—	0.34	0.38	0.31	0.12	0.10
4	0.07	0.59	0.07	0.24	0.50	0.38	0.31	0.12	0.10
PM peak hour — with CIP development									
Exist.	—	0.41	—	—	0.37	0.38	0.31	0.12	0.10
4	0.08	0.63	0.07	0.34	0.53	0.38	0.31	0.12	0.10
PM peak hour — with CIP development and CR 22 grade separation									
Exist.	—	0.41	—	—	0.36	0.38	0.31	0.12	0.10
4	0.08	0.63	0.07	0.34	0.53	0.38	0.31	0.12	0.10

Table C-10: 95th Percentile Queues at Tecumseh Road / Southfield Drive

Alt.	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
AM peak hour — existing volumes									
Exist.	—	20	—	—	20	27	11	3	6
4	2	40	5	5	42	27	11	3	6
AM peak hour — with CIP development									
Exist.	—	22	—	—	28	28	11	3	6
4	3	44	5	3	12	31	12	3	6
AM peak hour — with CIP development and CR 22 grade separation									
Exist.	—	21	—	—	23	28	11	3	6
4	3	43	5	2	9	31	12	3	6
Alt.	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
PM peak hour — existing volumes									
Exist.	—	38	—	—	45	24	13	9	7
4	3	97	4	8	73	24	13	9	7
PM peak hour — with CIP development									
Exist.	—	42	—	—	39	24	13	9	7
4	3	114	3	9	88	24	13	9	7
PM peak hour — with CIP development and CR 22 grade separation									
Exist.	—	42	—	—	37	24	12	9	7
4	3	114	4	7	70	24	13	9	7

Table C-11: Levels of Service at Tecumseh Road / Southfield Drive

Alt.	Overall	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
AM peak hour — existing volumes										
Exist.	A	—	A	—	—	A	C	A	C	B
4	A	A	A	A	A	A	C	A	C	B
AM peak hour — with CIP development										
Exist.	A	—	A	—	—	A	C	A	C	B
4	A	A	A	A	A	A	D	A	C	B
AM peak hour — with CIP development and CR 22 grade separation										
Exist.	A	—	A	—	—	A	C	A	C	B
4	A	A	A	A	A	A	D	A	C	B
Alt.	Overall	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
PM peak hour — existing volumes										
Exist.	A	—	A	—	—	A	D	B	C	B
4	A	A	A	A	A	A	D	B	C	B
PM peak hour — with CIP development										
Exist.	A	—	A	—	—	A	D	B	C	B
4	A	A	A	A	B	A	D	B	C	B
PM peak hour — with CIP development and CR 22 grade separation										
Exist.	A	—	A	—	—	A	D	B	C	B
4	A	A	A	A	B	A	D	B	C	B

Table C-12: Average Delays at Tecumseh Road / Southfield Drive

Alt.	Overall	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
AM peak hour — existing volumes										
Exist.	6.1	—	3.8	—	—	2.4	34.4	8.9	24.6	14.3
4	6.7	4.5	5.2	1.2	2.4	3.4	34.4	8.9	24.6	14.3
AM peak hour — with CIP development										
Exist.	6.4	—	4.0	—	—	3.1	34.4	8.8	24.2	14.1
4	7.2	4.5	5.5	1.1	2.2	3.1	40.6	9.8	28.4	16.1
AM peak hour — with CIP development and CR 22 grade separation										
Exist.	6.4	—	3.9	—	—	2.9	34.4	8.8	24.2	14.1
4	7.1	4.4	5.4	1.1	1.9	3.0	40.6	9.8	28.4	16.1
Alt.	Overall	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
PM peak hour — existing volumes										
Exist.	7.1	—	4.2	—	—	6.0	38.8	10.8	32.6	15.8
4	8.4	4.1	7.2	1.0	8.2	6.3	38.8	10.8	32.6	15.8
PM peak hour — with CIP development										
Exist.	6.8	—	4.4	—	—	5.3	38.8	10.8	32.6	15.8
4	8.9	4.2	8.1	1.0	12.0	6.5	38.8	0.8	32.6	15.8
PM peak hour — with CIP development and CR 22 grade separation										
Exist.	6.9	—	4.4	—	—	5.6	38.8	10.8	32.6	15.8
4	8.7	4.2	8.1	1.0	11.5	6.1	38.8	10.8	32.6	15.8

Appendix D

Synchro Analysis Worksheets

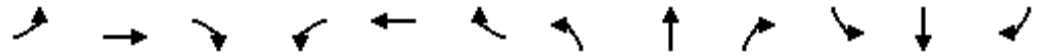
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Existing volumes; existing configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		1	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850			0.850			0.850			0.850
Fl _t Protected	0.950			0.950	*0.914		0.950	*0.870		0.950	*0.936	
Satd. Flow (prot)	1712	1802	1532	1712	1647	1532	1712	1568	1532	1712	1687	1532
Fl _t Permitted	0.345			0.455			0.391			0.576		
Satd. Flow (perm)	614	1802	1532	820	1802	1532	701	1802	1532	1038	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			62			43			152			130
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	80	275	80	190	360	40	155	160	140	70	260	120
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	299	87	207	391	43	168	174	152	76	283	130
Lane Group Flow (vph)	87	299	87	207	391	43	168	174	152	76	283	130
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phases	5	2	2	1	6	6	3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0	22.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	33.0	33.0	11.0	33.0	33.0	11.0	25.0	25.0	11.0	25.0	25.0
Total Split (%)	13.8%	41.3%	41.3%	13.8%	41.3%	41.3%	13.8%	31.3%	31.3%	13.8%	31.3%	31.3%
Maximum Green (s)	7.0	28.0	28.0	7.0	28.0	28.0	7.0	20.0	20.0	7.0	20.0	20.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	36.0	29.0	29.0	36.8	31.2	31.2	28.8	23.2	23.2	28.0	21.0	21.0
Actuated g/C Ratio	0.45	0.36	0.36	0.46	0.39	0.39	0.36	0.29	0.29	0.35	0.26	0.26
v/c Ratio	0.23	0.46	0.15	0.45	0.61	0.07	0.49	0.38	0.28	0.18	0.64	0.26
Control Delay	9.5	17.5	3.9	15.5	25.5	6.0	22.0	27.0	5.8	16.4	33.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.5	17.5	3.9	15.5	25.5	6.0	22.0	27.0	5.8	16.4	33.8	6.2

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Existing volumes; existing configuration

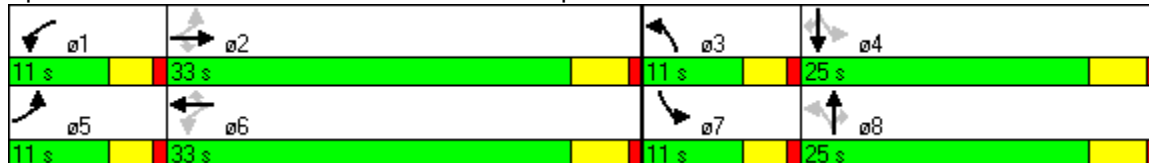


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B	A	B	C	A	C	C	A	B	C	A
Approach Delay		13.5			21.0			18.8			23.8	
Approach LOS		B			C			B			C	
Queue Length 50th (m)	3.6	34.2	1.5	16.7	48.1	0.0	16.3	21.6	0.0	7.0	37.5	0.0
Queue Length 95th (m)	7.9	21.9	1.1	28.9	77.1	6.0	29.3	39.0	12.7	14.9	62.1	11.8
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)			15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	372	653	595	455	642	624	341	455	552	422	443	498
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.46	0.15	0.45	0.61	0.07	0.49	0.38	0.28	0.18	0.64	0.26

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	19.4
Intersection LOS:	B
Intersection Capacity Utilization	63.2%
ICU Level of Service	B
Analysis Period (min)	15
* User Entered Value	

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Existing volumes; Alternative 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.985				0.850			0.850
Fl _t Protected	0.950			0.950	*0.888		0.950	*0.877		0.950	*0.943	
Satd. Flow (prot)	1712	1802	1532	1712	1576	0	1712	1580	1532	1712	1699	1532
Fl _t Permitted	0.320			0.470			0.358			0.561		
Satd. Flow (perm)	570	1802	1532	847	1775	0	639	1802	1532	1011	1802	1532
Right Turn on Red			Yes				Yes		Yes			Yes
Satd. Flow (RTOR)			64		8				152			130
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	80	275	80	190	360	40	155	160	140	70	260	120
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	299	87	207	391	43	168	174	152	76	283	130
Lane Group Flow (vph)	87	299	87	207	434	0	168	174	152	76	283	130
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	35.0	35.0	11.0	35.0	0.0	11.0	23.0	23.0	11.0	23.0	23.0
Total Split (%)	13.8%	43.8%	43.8%	13.8%	43.8%	0.0%	13.8%	28.8%	28.8%	13.8%	28.8%	28.8%
Maximum Green (s)	7.0	30.0	30.0	7.0	30.0		7.0	18.0	18.0	7.0	18.0	18.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	38.0	31.0	31.0	38.8	33.2		26.8	21.2	21.2	26.0	19.0	19.0
Actuated g/C Ratio	0.48	0.39	0.39	0.48	0.42		0.34	0.26	0.26	0.32	0.24	0.24
v/c Ratio	0.23	0.43	0.14	0.43	0.66		0.55	0.42	0.29	0.19	0.70	0.28
Control Delay	7.9	14.1	2.6	13.7	25.4		25.3	29.3	6.3	17.9	38.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	14.1	2.6	13.7	25.4		25.3	29.3	6.3	17.9	38.8	6.8

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Existing volumes; Alternative 1

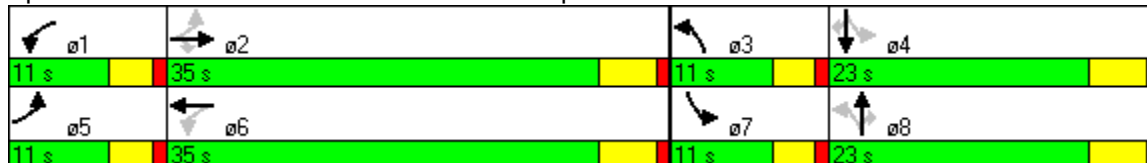


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B	A	B	C		C	C	A	B	D	A
Approach Delay		10.8			21.6			20.9			27.0	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	2.9	27.1	0.6	15.7	52.6		17.1	22.4	0.0	7.3	38.9	0.0
Queue Length 95th (m)	6.8	19.2	0.6	27.2	85.1		30.7	40.4	13.2	15.6	#69.8	12.3
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	90.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	371	698	633	486	659		308	419	518	390	404	463
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	0.23	0.43	0.14	0.43	0.66		0.55	0.42	0.29	0.19	0.70	0.28

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	20.3
Intersection LOS:	C
Intersection Capacity Utilization:	65.2%
ICU Level of Service:	C
Analysis Period (min):	15
* User Entered Value	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Existing volumes; Alternative 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.985				0.850			0.850
Fl _t Protected	0.950	*0.976		0.950	*0.888		0.950	*0.877		0.950	*0.943	
Satd. Flow (prot)	1712	1759	1532	1712	1576	0	1712	1580	1532	1712	1699	1532
Fl _t Permitted	0.320			0.470			0.358			0.561		
Satd. Flow (perm)	570	1802	1532	847	1775	0	639	1802	1532	1011	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			64		8				152			130
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	80	275	80	190	360	40	155	160	140	70	260	120
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	299	87	207	391	43	168	174	152	76	283	130
Lane Group Flow (vph)	87	299	87	207	434	0	168	174	152	76	283	130
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	35.0	35.0	11.0	35.0	0.0	11.0	23.0	23.0	11.0	23.0	23.0
Total Split (%)	13.8%	43.8%	43.8%	13.8%	43.8%	0.0%	13.8%	28.8%	28.8%	13.8%	28.8%	28.8%
Maximum Green (s)	7.0	30.0	30.0	7.0	30.0		7.0	18.0	18.0	7.0	18.0	18.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	38.0	31.0	31.0	38.8	33.2		26.8	21.2	21.2	26.0	19.0	19.0
Actuated g/C Ratio	0.48	0.39	0.39	0.48	0.42		0.34	0.26	0.26	0.32	0.24	0.24
v/c Ratio	0.23	0.44	0.14	0.43	0.66		0.55	0.42	0.29	0.19	0.70	0.28
Control Delay	7.9	14.3	2.6	13.7	25.4		25.3	29.3	6.3	17.9	38.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	14.3	2.6	13.7	25.4		25.3	29.3	6.3	17.9	38.8	6.8

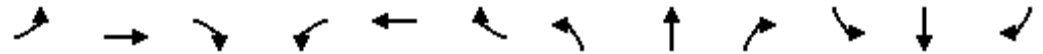
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Existing volumes; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		0.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.966			0.985				0.850			0.850
Fl _t Protected	0.950	*0.963		0.950	*0.888		0.950	*0.877		0.950	*0.943	
Satd. Flow (prot)	1712	1676	0	1712	1576	0	1712	1580	1532	1712	1699	1532
Fl _t Permitted	0.320			0.372			0.358			0.561		
Satd. Flow (perm)	570	1741	0	670	1775	0	639	1802	1532	1011	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			8				152			130
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	80	275	80	190	360	40	155	160	140	70	260	120
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	299	87	207	391	43	168	174	152	76	283	130
Lane Group Flow (vph)	87	386	0	207	434	0	168	174	152	76	283	130
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Detector Phases	5	2		1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	35.0	0.0	11.0	35.0	0.0	11.0	23.0	23.0	11.0	23.0	23.0
Total Split (%)	13.8%	43.8%	0.0%	13.8%	43.8%	0.0%	13.8%	28.8%	28.8%	13.8%	28.8%	28.8%
Maximum Green (s)	7.0	30.0		7.0	30.0		7.0	18.0	18.0	7.0	18.0	18.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	38.0	31.0		38.8	33.2		26.8	21.2	21.2	26.0	19.0	19.0
Actuated g/C Ratio	0.48	0.39		0.48	0.42		0.34	0.26	0.26	0.32	0.24	0.24
v/c Ratio	0.23	0.58		0.50	0.66		0.55	0.42	0.29	0.19	0.70	0.28
Control Delay	7.9	16.1		15.3	25.4		25.3	29.3	6.3	17.9	38.8	6.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	16.1		15.3	25.4		25.3	29.3	6.3	17.9	38.8	6.8

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Existing volumes; Alternative 3

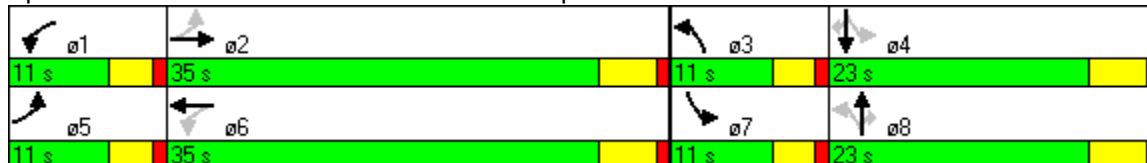


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		B	C		C	C	A	B	D	A
Approach Delay		14.6			22.1			20.9			27.0	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	2.9	43.0		15.7	52.6		17.1	22.4	0.0	7.3	38.9	0.0
Queue Length 95th (m)	6.8	21.5		27.2	85.1		30.7	40.4	13.2	15.6	#69.8	12.3
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0			60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	371	662		416	659		308	419	518	390	404	463
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.58		0.50	0.66		0.55	0.42	0.29	0.19	0.70	0.28

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 21.3 Intersection LOS: C
 Intersection Capacity Utilization 68.4% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



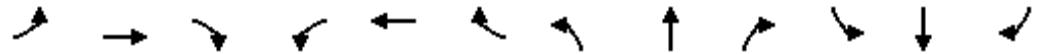
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Existing volumes; Alternative 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.966			0.985				0.850		0.953	
Fl _t Protected	0.950	*0.924		0.950	*0.871		0.950	*0.865		0.950	*0.949	
Satd. Flow (prot)	1712	1608	0	1712	1546	0	1712	1559	1532	1712	1630	0
Fl _t Permitted	0.268			0.327			0.227			0.588		
Satd. Flow (perm)	478	1741	0	589	1775	0	407	1802	1532	1060	1717	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			7				152		29	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	80	275	80	190	360	40	155	160	140	70	260	120
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	299	87	207	391	43	168	174	152	76	283	130
Lane Group Flow (vph)	87	386	0	207	434	0	168	174	152	76	413	0
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phases	5	2		1	6		3	8	8	7	4	
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	
Total Split (s)	11.0	31.0	0.0	11.0	31.0	0.0	11.0	27.0	27.0	11.0	27.0	0.0
Total Split (%)	13.8%	38.8%	0.0%	13.8%	38.8%	0.0%	13.8%	33.8%	33.8%	13.8%	33.8%	0.0%
Maximum Green (s)	7.0	26.0		7.0	26.0		7.0	22.0	22.0	7.0	22.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	
Pedestrian Calls (#/hr)		0			0			0	0		0	
Act Effct Green (s)	34.0	27.0		34.8	29.2		30.8	25.2	25.2	30.0	23.0	
Actuated g/C Ratio	0.42	0.34		0.44	0.36		0.38	0.32	0.32	0.38	0.29	
v/c Ratio	0.28	0.69		0.58	0.76		0.62	0.35	0.26	0.17	0.84	
Control Delay	10.7	22.7		20.8	34.1		26.6	25.0	5.3	15.0	42.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	10.7	22.7		20.8	34.1		26.6	25.0	5.3	15.0	42.9	

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Existing volumes; Alternative 4

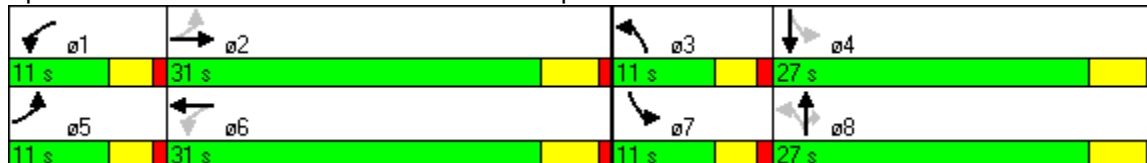


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	C		C	C		C	C	A	B	D	
Approach Delay		20.5			29.8			19.5			38.5	
Approach LOS		C			C			B			D	
Queue Length 50th (m)	3.6	47.4		17.7	58.0		15.6	20.8	0.0	6.6	54.2	
Queue Length 95th (m)	8.1	25.6		30.6	#105.9		#30.3	37.6	12.2	14.2	#101.3	
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	30.0			60.0			45.0		45.0	45.0		
Base Capacity (vph)	311	556		355	568		271	491	587	455	489	
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	0.28	0.69		0.58	0.76		0.62	0.35	0.26	0.17	0.84	

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 27.3 Intersection LOS: C
 Intersection Capacity Utilization 76.1% ICU Level of Service D
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



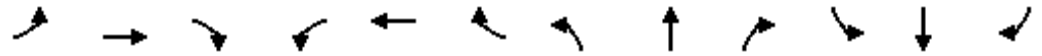
Lanes, Volumes, Timings
1: Tecumseh Rd. & Southfield Dr.

AM peak hour
Existing volumes; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	30.0		0.0
Storage Lanes	1		1	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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850		0.997			0.858			0.886	
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1784	1517	1695	1779	0	1695	1531	0	1695	1581	0
Fl _t Permitted	0.374			0.439			0.744			0.697		
Satd. Flow (perm)	667	1784	1517	783	1779	0	1328	1531	0	1244	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			120		2			87			16	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		398.9			131.2			334.0			154.3	
Travel Time (s)		28.7			9.4			24.0			11.1	
Volume (vph)	15	395	110	90	465	10	100	5	80	5	5	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	16	429	120	98	505	11	109	5	87	5	5	16
Lane Group Flow (vph)	16	429	120	98	516	0	109	92	0	5	21	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phases	2	2	2	6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		21.0	21.0		21.0	21.0	
Total Split (s)	50.0	50.0	50.0	50.0	50.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	62.5%	62.5%	62.5%	62.5%	62.5%	0.0%	37.5%	37.5%	0.0%	37.5%	37.5%	0.0%
Maximum Green (s)	43.0	43.0	43.0	43.0	43.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0	10.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		20	20		20	20	
Act Effct Green (s)	61.1	61.1	61.1	61.1	61.1		14.5	14.5		14.5	14.5	
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76		0.18	0.18		0.18	0.18	
v/c Ratio	0.03	0.31	0.10	0.16	0.38		0.45	0.26		0.02	0.07	
Control Delay	4.5	5.2	1.2	2.4	3.4		34.4	8.9		24.6	14.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.5	5.2	1.2	2.4	3.4		34.4	8.9		24.6	14.3	

Lanes, Volumes, Timings
 1: Tecumseh Rd. & Southfield Dr.

AM peak hour
 Existing volumes; modified configuration

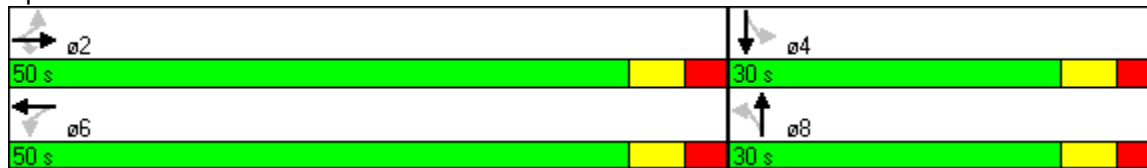


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A	A	A	A		C	A		C	B	
Approach Delay		4.3				3.3		22.7			16.3	
Approach LOS		A				A		C			B	
Queue Length 50th (m)	0.6	19.2	0.0	2.1	11.3		14.8	0.6		0.6	0.6	
Queue Length 95th (m)	2.7	40.0	4.7	5.1	42.0		27.0	11.0		3.1	5.7	
Internal Link Dist (m)		374.9				107.2		310.0			130.3	
Turn Bay Length (m)	30.0			30.0			30.0			30.0		
Base Capacity (vph)	509	1362	1187	598	1359		432	556		404	525	
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	0.03	0.31	0.10	0.16	0.38		0.25	0.17		0.01	0.04	

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	8 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.45
Intersection Signal Delay:	6.7
Intersection LOS:	A
Intersection Capacity Utilization	54.8%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 1: Tecumseh Rd. & Southfield Dr.



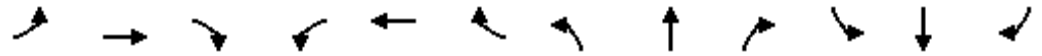
Lanes, Volumes, Timings
4: Tecumseh Rd. & Shawnee Rd.

AM peak hour
Existing volumes; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.997			0.999			0.950				
Fl _t Protected				0.950				0.970				
Satd. Flow (prot)	1784	1779	0	1695	1783	0	0	1644	0	0	1784	0
Fl _t Permitted				0.377				0.874				
Satd. Flow (perm)	1784	1779	0	673	1783	0	0	1482	0	0	1784	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			1			16				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			40			50				50
Link Distance (m)		209.7			228.4			321.5				166.2
Travel Time (s)		18.9			20.6			23.1				12.0
Volume (vph)	0	460	10	15	600	5	25	0	15	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	500	11	16	652	5	27	0	16	0	0	0
Lane Group Flow (vph)	0	511	0	16	657	0	0	43	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Detector Phases	2	2		6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		22.0	22.0		22.0	22.0	
Total Split (s)	50.0	50.0	0.0	50.0	50.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	62.5%	62.5%	0.0%	62.5%	62.5%	0.0%	37.5%	37.5%	0.0%	37.5%	37.5%	0.0%
Maximum Green (s)	44.0	44.0		44.0	44.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)	0	0		0	0		20	20		20	20	
Act Effct Green (s)		67.8		67.8	67.8			11.0				
Actuated g/C Ratio		0.85		0.85	0.85			0.14				
v/c Ratio		0.34		0.03	0.43			0.20				
Control Delay		5.0		2.5	2.8			22.6				
Queue Delay		0.0		0.0	0.0			0.0				
Total Delay		5.0		2.5	2.8			22.6				

Lanes, Volumes, Timings
 4: Tecumseh Rd. & Shawnee Rd.

AM peak hour
 Existing volumes; modified configuration

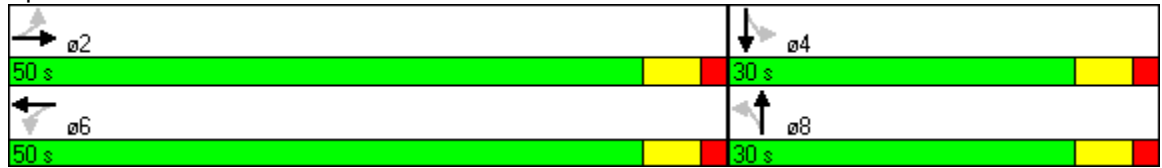


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		A		A	A			C				
Approach Delay		5.0			2.8			22.6				
Approach LOS		A			A			C				
Queue Length 50th (m)		35.1		0.3	13.9			3.7				
Queue Length 95th (m)		69.4		m0.6	m23.2			10.9				
Internal Link Dist (m)		185.7			204.4			297.5			142.2	
Turn Bay Length (m)				30.0								
Base Capacity (vph)		1509		571	1512			492				
Starvation Cap Reductn		0		0	0			0				
Spillback Cap Reductn		0		0	0			0				
Storage Cap Reductn		0		0	0			0				
Reduced v/c Ratio		0.34		0.03	0.43			0.09				

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 52 (65%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 4.4 Intersection LOS: A
 Intersection Capacity Utilization 46.2% ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Tecumseh Rd. & Shawnee Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Existing volumes; existing configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	0		1	1		1	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950	*0.910		0.950	*0.717		0.950	*0.924	
Satd. Flow (prot)	1712	1802	1532	1712	1640	1532	1712	1292	1532	1712	1665	1532
Flt Permitted	0.353			0.126			0.434			0.310		
Satd. Flow (perm)	627	1802	1532	227	1802	1532	774	1802	1532	559	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25			60			288			92
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	205	540	70	180	350	55	160	330	265	110	250	85
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	587	76	196	380	60	174	359	288	120	272	92
Lane Group Flow (vph)	223	587	76	196	380	60	174	359	288	120	272	92
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phases	5	2	2	1	6	6	3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0	25.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	37.0	37.0	11.0	37.0	37.0	11.0	31.0	31.0	11.0	31.0	31.0
Total Split (%)	12.2%	41.1%	41.1%	12.2%	41.1%	41.1%	12.2%	34.4%	34.4%	12.2%	34.4%	34.4%
Maximum Green (s)	7.0	32.0	32.0	7.0	32.0	32.0	7.0	26.0	26.0	7.0	26.0	26.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	40.0	33.0	33.0	40.0	33.0	33.0	34.0	27.0	27.0	34.0	27.0	27.0
Actuated g/C Ratio	0.44	0.37	0.37	0.44	0.37	0.37	0.38	0.30	0.30	0.38	0.30	0.30
v/c Ratio	0.61	0.89	0.13	0.91	0.63	0.10	0.48	0.93	0.44	0.40	0.54	0.18
Control Delay	17.9	39.5	8.2	61.4	29.2	5.8	22.2	63.0	5.4	20.6	31.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	39.5	8.2	61.4	29.2	5.8	22.2	63.0	5.4	20.6	31.3	6.2

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Existing volumes; existing configuration

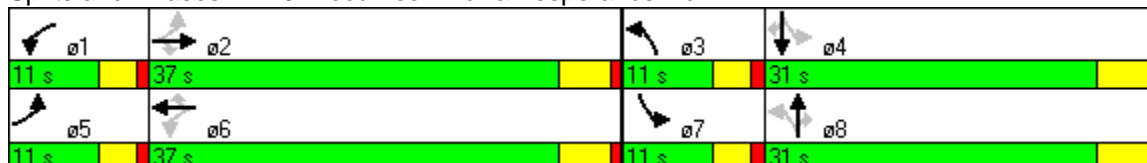


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	D	A	E	C	A	C	E	A	C	C	A
Approach Delay		31.3			36.9			34.1			23.8	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	15.3	93.3	1.9	18.4	52.5	0.0	18.6	59.0	0.0	12.4	38.6	0.0
Queue Length 95th (m)	24.9	#153.4	8.5	#56.8	82.1	7.5	32.1	#109.8	17.0	23.1	62.5	10.2
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)			15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	363	661	578	216	601	600	365	388	661	301	500	524
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.89	0.13	0.91	0.63	0.10	0.48	0.93	0.44	0.40	0.54	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 9 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 32.1 Intersection LOS: C
 Intersection Capacity Utilization 78.6% ICU Level of Service D
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



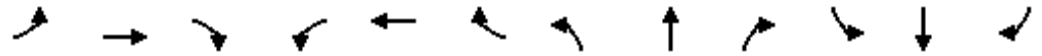
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Existing volumes; Alternative 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.980				0.850			0.850
Fl _t Protected	0.950	*0.920		0.950	*0.869		0.950	*0.706		0.950	*0.926	
Satd. Flow (prot)	1712	1658	1532	1712	1535	0	1712	1272	1532	1712	1669	1532
Fl _t Permitted	0.297			0.142			0.424			0.296		
Satd. Flow (perm)	529	1802	1532	256	1766	0	756	1802	1532	533	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25		10				288			92
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	205	540	70	180	350	55	160	330	265	110	250	85
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	587	76	196	380	60	174	359	288	120	272	92
Lane Group Flow (vph)	223	587	76	196	440	0	174	359	288	120	272	92
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	38.0	38.0	11.0	38.0	0.0	11.0	30.0	30.0	11.0	30.0	30.0
Total Split (%)	12.2%	42.2%	42.2%	12.2%	42.2%	0.0%	12.2%	33.3%	33.3%	12.2%	33.3%	33.3%
Maximum Green (s)	7.0	33.0	33.0	7.0	33.0		7.0	25.0	25.0	7.0	25.0	25.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	41.0	34.0	34.0	41.0	34.0		33.0	26.0	26.0	33.0	26.0	26.0
Actuated g/C Ratio	0.46	0.38	0.38	0.46	0.38		0.37	0.29	0.29	0.37	0.29	0.29
v/c Ratio	0.67	0.94	0.13	0.85	0.75		0.49	0.98	0.45	0.42	0.56	0.18
Control Delay	18.9	44.2	8.2	48.5	33.4		23.5	75.9	5.6	21.8	32.6	6.5
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	18.9	44.2	8.2	48.5	33.4		23.5	75.9	5.6	21.8	32.6	6.5

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Existing volumes; Alternative 1

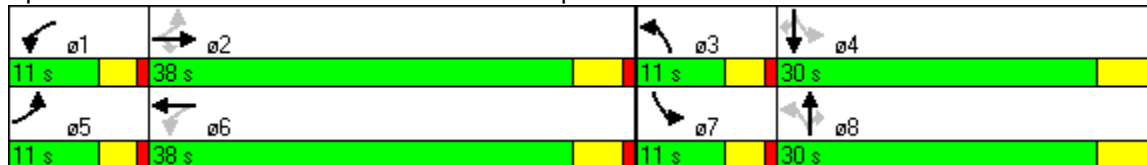


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	D	A	D	C		C	E	A	C	C	A
Approach Delay		34.7			38.1			40.1			24.9	
Approach LOS		C			D			D			C	
Queue Length 50th (m)	16.8	95.4	2.1	18.0	62.6		19.0	60.5	0.0	12.6	39.3	0.0
Queue Length 95th (m)	#22.9	#156.7	m6.8	#51.7	#100.4		32.8	#113.4	17.3	23.6	63.5	10.4
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	90.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	333	626	594	230	586		352	367	647	287	482	508
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	0.67	0.94	0.13	0.85	0.75		0.49	0.98	0.45	0.42	0.56	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 35.4 Intersection LOS: D
 Intersection Capacity Utilization 78.6% ICU Level of Service D
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Existing volumes; Alternative 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.980				0.850			0.850
Fl _t Protected	0.950	*0.748		0.950	*0.873		0.950	*0.694		0.950	*0.928	
Satd. Flow (prot)	1712	1348	1532	1712	1542	0	1712	1251	1532	1712	1672	1532
Fl _t Permitted	0.307			0.157			0.413			0.280		
Satd. Flow (perm)	547	1802	1532	283	1766	0	737	1802	1532	505	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25		10				288			92
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	205	540	70	180	350	55	160	330	265	110	250	85
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	587	76	196	380	60	174	359	288	120	272	92
Lane Group Flow (vph)	223	587	76	196	440	0	174	359	288	120	272	92
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	39.0	39.0	11.0	39.0	0.0	11.0	29.0	29.0	11.0	29.0	29.0
Total Split (%)	12.2%	43.3%	43.3%	12.2%	43.3%	0.0%	12.2%	32.2%	32.2%	12.2%	32.2%	32.2%
Maximum Green (s)	7.0	34.0	34.0	7.0	34.0		7.0	24.0	24.0	7.0	24.0	24.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	42.0	35.0	35.0	42.0	35.0		32.0	25.0	25.0	32.0	25.0	25.0
Actuated g/C Ratio	0.47	0.39	0.39	0.47	0.39		0.36	0.28	0.28	0.36	0.28	0.28
v/c Ratio	0.64	1.12	0.12	0.81	0.73		0.51	1.03	0.45	0.44	0.59	0.19
Control Delay	16.6	98.2	7.6	40.3	31.2		24.9	91.1	5.8	23.1	34.1	6.7
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	16.6	98.2	7.6	40.3	31.2		24.9	91.1	5.8	23.1	34.1	6.7

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
 Existing volumes; Alternative 2

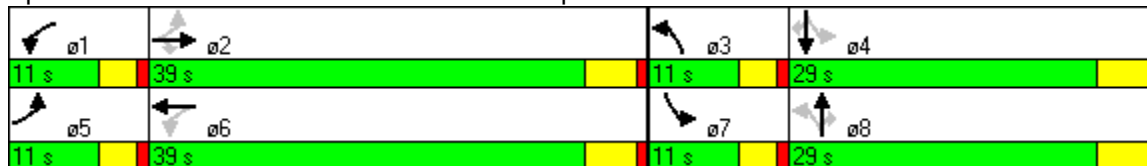


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	F	A	D	C		C	F	A	C	C	A
Approach Delay		69.9			34.0			47.1			26.2	
Approach LOS		E			C			D			C	
Queue Length 50th (m)	16.4	~117.1	2.0	17.5	61.2		19.4	~66.4	0.0	12.9	40.0	0.0
Queue Length 95th (m)	19.8	#175.9	m6.5	#46.7	96.2		33.5	#117.0	17.6	24.1	64.6	10.5
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	346	524	611	243	606		338	348	634	273	464	492
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	0.64	1.12	0.12	0.81	0.73		0.51	1.03	0.45	0.44	0.59	0.19

Intersection Summary

- Area Type: Other
- Cycle Length: 90
- Actuated Cycle Length: 90
- Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
- Natural Cycle: 100
- Control Type: Actuated-Coordinated
- Maximum v/c Ratio: 1.12
- Intersection Signal Delay: 47.7
- Intersection LOS: D
- Intersection Capacity Utilization 78.6%
- ICU Level of Service D
- Analysis Period (min) 15
- * User Entered Value
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Existing volumes; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.983			0.980				0.850			0.850
Fl _t Protected	0.950	*0.803		0.950	*0.876		0.950	*0.682		0.950	*0.931	
Satd. Flow (prot)	1712	1422	0	1712	1547	0	1712	1229	1532	1712	1678	1532
Fl _t Permitted	0.318			0.111			0.401			0.263		
Satd. Flow (perm)	567	1771	0	200	1766	0	716	1802	1532	474	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			11				288			92
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	205	540	70	180	350	55	160	330	265	110	250	85
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	587	76	196	380	60	174	359	288	120	272	92
Lane Group Flow (vph)	223	663	0	196	440	0	174	359	288	120	272	92
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Detector Phases	5	2		1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	40.0	0.0	11.0	40.0	0.0	11.0	28.0	28.0	11.0	28.0	28.0
Total Split (%)	12.2%	44.4%	0.0%	12.2%	44.4%	0.0%	12.2%	31.1%	31.1%	12.2%	31.1%	31.1%
Maximum Green (s)	7.0	35.0		7.0	35.0		7.0	23.0	23.0	7.0	23.0	23.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.0	3.5	3.5
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	43.0	36.0		43.0	36.0		31.0	24.0	24.0	31.0	24.0	24.0
Actuated g/C Ratio	0.48	0.40		0.48	0.40		0.34	0.27	0.27	0.34	0.27	0.27
v/c Ratio	0.62	1.16		0.92	0.70		0.54	1.09	0.46	0.46	0.61	0.19
Control Delay	14.8	109.3		64.7	29.3		26.4	111.3	6.1	24.5	35.7	7.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	109.3		64.7	29.3		26.4	111.3	6.1	24.5	35.7	7.0

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

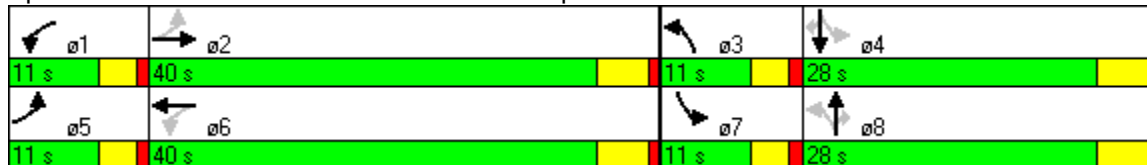
PM peak hour
 Existing volumes; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	F		E	C		C	F	A	C	D	A
Approach Delay		85.5			40.2			56.4			27.5	
Approach LOS		F			D			E			C	
Queue Length 50th (m)	15.9	~134.9		18.4	59.8		19.8	~70.0	0.0	13.2	40.6	0.0
Queue Length 95th (m)	18.4	#196.0		#58.0	93.9		34.2	#120.5	17.9	24.6	65.7	10.7
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0			60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	360	574		213	625		324	328	620	260	447	476
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.62	1.16		0.92	0.70		0.54	1.09	0.46	0.46	0.61	0.19

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 56.9 Intersection LOS: E
 Intersection Capacity Utilization 83.1% ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Existing volumes; Alternative 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.983			0.980				0.850		0.962	
Fl _t Protected	0.950	*0.765		0.950	*0.876		0.950	*0.682		0.950	*0.915	
Satd. Flow (prot)	1712	1355	0	1712	1547	0	1712	1229	1532	1712	1586	0
Fl _t Permitted	0.318			0.111			0.256			0.263		
Satd. Flow (perm)	567	1771	0	200	1766	0	458	1802	1532	474	1734	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			11				288		18	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	205	540	70	180	350	55	160	330	265	110	250	85
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	587	76	196	380	60	174	359	288	120	272	92
Lane Group Flow (vph)	223	663	0	196	440	0	174	359	288	120	364	0
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phases	5	2		1	6		3	8	8	7	4	
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	
Total Split (s)	11.0	40.0	0.0	11.0	40.0	0.0	11.0	28.0	28.0	11.0	28.0	0.0
Total Split (%)	12.2%	44.4%	0.0%	12.2%	44.4%	0.0%	12.2%	31.1%	31.1%	12.2%	31.1%	0.0%
Maximum Green (s)	7.0	35.0		7.0	35.0		7.0	23.0	23.0	7.0	23.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.0	3.5	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	
Pedestrian Calls (#/hr)		0			0			0	0		0	
Act Effct Green (s)	43.0	36.0		43.0	36.0		31.0	24.0	24.0	31.0	24.0	
Actuated g/C Ratio	0.48	0.40		0.48	0.40		0.34	0.27	0.27	0.34	0.27	
v/c Ratio	0.62	1.21		0.92	0.70		0.68	1.09	0.46	0.46	0.83	
Control Delay	14.8	132.8		64.7	29.3		35.2	111.3	6.1	24.5	48.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	14.8	132.8		64.7	29.3		35.2	111.3	6.1	24.5	48.0	

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Existing volumes; Alternative 4

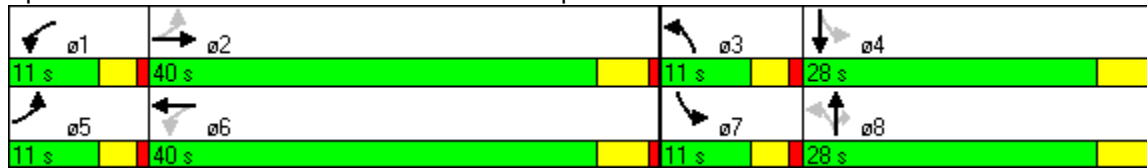


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	F		E	C		D	F	A	C	D	
Approach Delay		103.1			40.2			58.3			42.2	
Approach LOS		F			D			E			D	
Queue Length 50th (m)	15.9	~139.9		18.4	59.8		19.8	~70.0	0.0	13.2	55.8	
Queue Length 95th (m)	18.4	#201.0		#58.0	93.9		#39.2	#120.5	17.9	24.6	#101.4	
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	30.0			60.0			45.0		45.0	45.0		
Base Capacity (vph)	360	547		213	625		255	328	620	260	436	
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	0.62	1.21		0.92	0.70		0.68	1.09	0.46	0.46	0.83	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.21
 Intersection Signal Delay: 65.5 Intersection LOS: E
 Intersection Capacity Utilization 87.0% ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



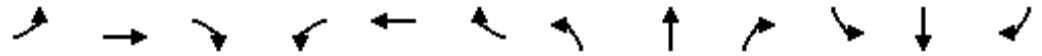
Lanes, Volumes, Timings
1: Tecumseh Rd. & Southfield Dr.

PM peak hour
Existing volumes; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	30.0		0.0
Storage Lanes	1		1	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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850		0.995			0.858			0.878	
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1784	1517	1695	1775	0	1695	1531	0	1695	1567	0
Fl _t Permitted	0.231			0.145			0.740			0.694		
Satd. Flow (perm)	412	1784	1517	259	1775	0	1320	1531	0	1238	1567	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			92		3			92			22	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		398.9			131.2			334.0			154.3	
Travel Time (s)		28.7			9.4			24.0			11.1	
Volume (vph)	20	770	85	45	630	20	70	5	85	20	5	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	22	837	92	49	685	22	76	5	92	22	5	22
Lane Group Flow (vph)	22	837	92	49	707	0	76	97	0	22	27	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phases	2	2	2	6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		21.0	21.0		21.0	21.0	
Total Split (s)	55.0	55.0	55.0	55.0	55.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	61.1%	61.1%	61.1%	61.1%	61.1%	0.0%	38.9%	38.9%	0.0%	38.9%	38.9%	0.0%
Maximum Green (s)	48.0	48.0	48.0	48.0	48.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0	10.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		20	20		20	20	
Act Effct Green (s)	71.9	71.9	71.9	71.9	71.9		13.7	13.7		13.7	13.7	
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80		0.15	0.15		0.15	0.15	
v/c Ratio	0.07	0.59	0.07	0.24	0.50		0.38	0.31		0.12	0.10	
Control Delay	4.1	7.2	1.0	8.2	6.3		38.8	10.8		32.6	15.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.1	7.2	1.0	8.2	6.3		38.8	10.8		32.6	15.8	

Lanes, Volumes, Timings
 1: Tecumseh Rd. & Southfield Dr.

PM peak hour
 Existing volumes; modified configuration

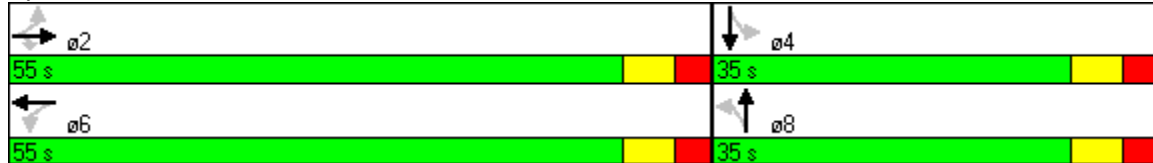


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A	A	A	A		D	B		C	B	
Approach Delay		6.6				6.4		23.1			23.3	
Approach LOS		A				A		C			C	
Queue Length 50th (m)	0.7	49.3	0.0	1.9	28.9		11.9	0.8		3.3	0.8	
Queue Length 95th (m)	3.1	97.4	3.5	m8.3	72.9		23.5	12.8		9.4	7.3	
Internal Link Dist (m)		374.9				107.2		310.0			130.3	
Turn Bay Length (m)	30.0			30.0			30.0			30.0		
Base Capacity (vph)	329	1425	1230	207	1418		455	588		426	554	
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	0.59	0.07	0.24	0.50		0.17	0.16		0.05	0.05	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 39 (43%), 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: 8.4 Intersection LOS: A
 Intersection Capacity Utilization 60.2% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Tecumseh Rd. & Southfield Dr.



Lanes, Volumes, Timings
4: Tecumseh Rd. & Shawnee Rd.

PM peak hour
Existing volumes; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.996			0.998			0.946			0.865	
Fl _t Protected				0.950				0.971				
Satd. Flow (prot)	1784	1777	0	1695	1781	0	0	1639	0	0	1543	0
Fl _t Permitted				0.078				0.871				
Satd. Flow (perm)	1784	1777	0	139	1781	0	0	1470	0	0	1543	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			1			22			203	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		209.7			228.4			321.5			166.2	
Travel Time (s)		18.9			20.6			23.1			12.0	
Volume (vph)	0	845	20	20	670	10	30	0	20	0	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	918	22	22	728	11	33	0	22	0	0	5
Lane Group Flow (vph)	0	940	0	22	739	0	0	55	0	0	5	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phases	2	2		6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		22.0	22.0		22.0	22.0	
Total Split (s)	55.0	55.0	0.0	55.0	55.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	61.1%	61.1%	0.0%	61.1%	61.1%	0.0%	38.9%	38.9%	0.0%	38.9%	38.9%	0.0%
Maximum Green (s)	49.0	49.0		49.0	49.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)	0	0		0	0		20	20		20	20	
Act Effct Green (s)		76.2		76.2	76.2			12.6			12.6	
Actuated g/C Ratio		0.85		0.85	0.85			0.14			0.14	
v/c Ratio		0.62		0.19	0.49			0.24			0.01	
Control Delay		5.2		7.0	4.0			24.4			0.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		5.2		7.0	4.0			24.4			0.0	

Lanes, Volumes, Timings
 4: Tecumseh Rd. & Shawnee Rd.

PM peak hour
 Existing volumes; modified configuration

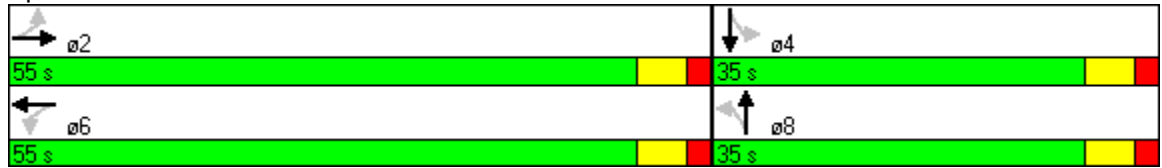


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		A		A	A			C			A	
Approach Delay		5.2			4.1			24.4			0.0	
Approach LOS		A			A			C			A	
Queue Length 50th (m)		42.5		0.6	26.4			5.3			0.0	
Queue Length 95th (m)		64.3		m1.8	m49.4			14.3			0.0	
Internal Link Dist (m)		185.7			204.4			297.5			142.2	
Turn Bay Length (m)				30.0								
Base Capacity (vph)		1504		118	1507			521			665	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.63		0.19	0.49			0.11			0.01	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 45 (50%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 5.3 Intersection LOS: A
 Intersection Capacity Utilization 64.6% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Tecumseh Rd. & Shawnee Rd.



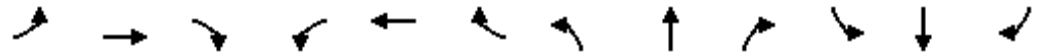
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CIP; existing configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		1	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850			0.850			0.850			0.850
Fl _t Protected	0.950			0.950	*0.914		0.950	*0.864		0.950	*0.933	
Satd. Flow (prot)	1712	1802	1532	1712	1647	1532	1712	1557	1532	1712	1681	1532
Fl _t Permitted	0.332			0.435			0.391			0.576		
Satd. Flow (perm)	591	1802	1532	784	1802	1532	701	1802	1532	1038	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87			43			152			141
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	290	120	195	370	40	170	160	140	70	260	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	315	130	212	402	43	185	174	152	76	283	141
Lane Group Flow (vph)	98	315	130	212	402	43	185	174	152	76	283	141
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phases	5	2	2	1	6	6	3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0	22.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	33.0	33.0	11.0	33.0	33.0	11.0	25.0	25.0	11.0	25.0	25.0
Total Split (%)	13.8%	41.3%	41.3%	13.8%	41.3%	41.3%	13.8%	31.3%	31.3%	13.8%	31.3%	31.3%
Maximum Green (s)	7.0	28.0	28.0	7.0	28.0	28.0	7.0	20.0	20.0	7.0	20.0	20.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	36.0	29.0	29.0	36.8	31.2	31.2	28.8	23.2	23.2	28.0	21.0	21.0
Actuated g/C Ratio	0.45	0.36	0.36	0.46	0.39	0.39	0.36	0.29	0.29	0.35	0.26	0.26
v/c Ratio	0.27	0.48	0.21	0.48	0.63	0.07	0.54	0.38	0.28	0.18	0.64	0.28
Control Delay	10.1	18.4	4.4	16.0	26.0	6.0	23.5	27.1	5.8	16.4	33.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	18.4	4.4	16.0	26.0	6.0	23.5	27.1	5.8	16.4	33.9	6.1

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Future volumes with CIP; existing configuration

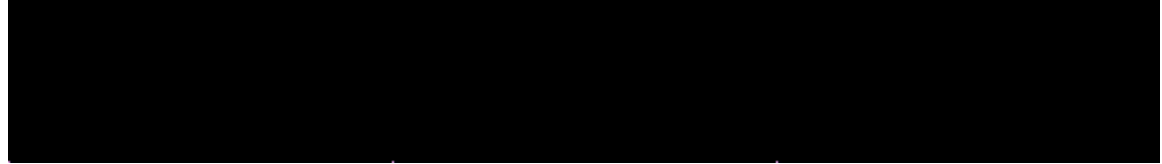


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B	A	B	C	A	C	C	A	B	C	A
Approach Delay		13.6			21.5			19.5			23.4	
Approach LOS		B			C			B			C	
Queue Length 50th (m)	4.5	36.5	2.0	17.2	49.9	0.0	18.2	21.7	0.0	7.0	37.6	0.0
Queue Length 95th (m)	9.4	26.5	4.7	29.7	79.8	6.0	32.1	39.0	12.7	14.9	62.2	12.3
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)			15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	364	653	611	442	642	624	341	452	552	422	441	506
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.48	0.21	0.48	0.63	0.07	0.54	0.38	0.28	0.18	0.64	0.28

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 19.5 Intersection LOS: B
 Intersection Capacity Utilization 65.2% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



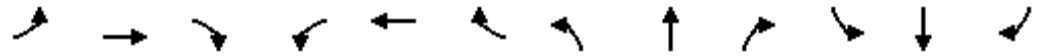
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CIP; Alternative 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.986				0.850			0.850
Fl _t Protected	0.950			0.950	*0.880		0.950	*0.871		0.950	*0.940	
Satd. Flow (prot)	1712	1802	1532	1712	1564	0	1712	1570	1532	1712	1694	1532
Fl _t Permitted	0.308			0.452			0.358			0.561		
Satd. Flow (perm)	549	1802	1532	814	1777	0	639	1802	1532	1011	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91		8				152			141
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	290	120	195	370	40	170	160	140	70	260	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	315	130	212	402	43	185	174	152	76	283	141
Lane Group Flow (vph)	98	315	130	212	445	0	185	174	152	76	283	141
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	35.0	35.0	11.0	35.0	0.0	11.0	23.0	23.0	11.0	23.0	23.0
Total Split (%)	13.8%	43.8%	43.8%	13.8%	43.8%	0.0%	13.8%	28.8%	28.8%	13.8%	28.8%	28.8%
Maximum Green (s)	7.0	30.0	30.0	7.0	30.0		7.0	18.0	18.0	7.0	18.0	18.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	38.0	31.0	31.0	38.8	33.2		26.8	21.2	21.2	26.0	19.0	19.0
Actuated g/C Ratio	0.48	0.39	0.39	0.48	0.42		0.34	0.26	0.26	0.32	0.24	0.24
v/c Ratio	0.27	0.45	0.20	0.45	0.68		0.60	0.42	0.29	0.19	0.70	0.30
Control Delay	8.6	15.2	3.0	14.1	26.3		27.5	29.4	6.3	17.9	39.0	6.7
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	8.6	15.2	3.0	14.1	26.3		27.5	29.4	6.3	17.9	39.0	6.7

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Future volumes with CIP; Alternative 1

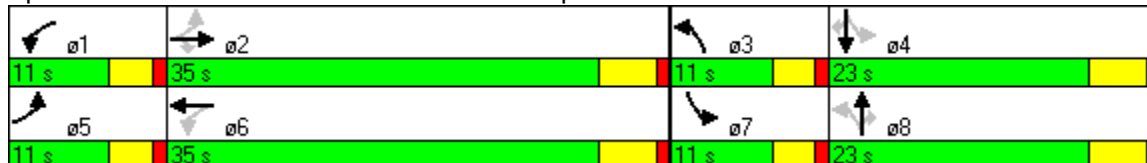


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B	A	B	C		C	C	A	B	D	A
Approach Delay		11.1			22.4			21.9			26.7	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	3.8	30.7	0.8	16.1	54.6		19.0	22.5	0.0	7.3	38.9	0.0
Queue Length 95th (m)	8.3	23.7	0.9	27.9	88.3		#33.7	40.5	13.2	15.6	#70.0	12.8
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	90.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	363	698	649	473	654		308	416	518	390	402	471
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	0.27	0.45	0.20	0.45	0.68		0.60	0.42	0.29	0.19	0.70	0.30

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 20.5 Intersection LOS: C
 Intersection Capacity Utilization 66.7% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CIP; Alternative 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.986				0.850			0.850
Fl _t Protected	0.950	*0.953		0.950	*0.880		0.950	*0.871		0.950	*0.940	
Satd. Flow (prot)	1712	1717	1532	1712	1564	0	1712	1570	1532	1712	1694	1532
Fl _t Permitted	0.308			0.452			0.358			0.561		
Satd. Flow (perm)	549	1802	1532	814	1777	0	639	1802	1532	1011	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91		8				152			141
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	290	120	195	370	40	170	160	140	70	260	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	315	130	212	402	43	185	174	152	76	283	141
Lane Group Flow (vph)	98	315	130	212	445	0	185	174	152	76	283	141
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	35.0	35.0	11.0	35.0	0.0	11.0	23.0	23.0	11.0	23.0	23.0
Total Split (%)	13.8%	43.8%	43.8%	13.8%	43.8%	0.0%	13.8%	28.8%	28.8%	13.8%	28.8%	28.8%
Maximum Green (s)	7.0	30.0	30.0	7.0	30.0		7.0	18.0	18.0	7.0	18.0	18.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	38.0	31.0	31.0	38.8	33.2		26.8	21.2	21.2	26.0	19.0	19.0
Actuated g/C Ratio	0.48	0.39	0.39	0.48	0.42		0.34	0.26	0.26	0.32	0.24	0.24
v/c Ratio	0.27	0.47	0.20	0.45	0.68		0.60	0.42	0.29	0.19	0.70	0.30
Control Delay	8.6	15.7	3.0	14.1	26.3		27.5	29.4	6.3	17.9	39.0	6.7
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	8.6	15.7	3.0	14.1	26.3		27.5	29.4	6.3	17.9	39.0	6.7

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Future volumes with CIP; Alternative 2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B	A	B	C		C	C	A	B	D	A
Approach Delay		11.4			22.4			21.9			26.7	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	3.8	32.2	0.8	16.1	54.6		19.0	22.5	0.0	7.3	38.9	0.0
Queue Length 95th (m)	8.3	23.8	0.9	27.9	88.3		#33.7	40.5	13.2	15.6	#70.0	12.8
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	363	665	649	473	654		308	416	518	390	402	471
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	0.27	0.47	0.20	0.45	0.68		0.60	0.42	0.29	0.19	0.70	0.30

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 20.5 Intersection LOS: C
 Intersection Capacity Utilization 66.7% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



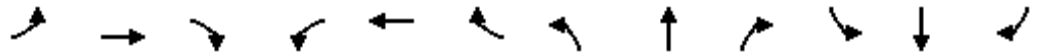
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CIP; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		0.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.956			0.986				0.850			0.850
Fl _t Protected	0.950	*0.945		0.950	*0.880		0.950	*0.871		0.950	*0.940	
Satd. Flow (prot)	1712	1628	0	1712	1564	0	1712	1570	1532	1712	1694	1532
Fl _t Permitted	0.308			0.308			0.358			0.561		
Satd. Flow (perm)	549	1723	0	555	1777	0	639	1802	1532	1011	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			8				152			141
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40				50
Link Distance (m)		120.2			329.7			291.7				1148.3
Travel Time (s)		10.8			23.7			26.3				82.7
Volume (vph)	90	290	120	195	370	40	170	160	140	70	260	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	315	130	212	402	43	185	174	152	76	283	141
Lane Group Flow (vph)	98	445	0	212	445	0	185	174	152	76	283	141
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Detector Phases	5	2		1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	35.0	0.0	11.0	35.0	0.0	11.0	23.0	23.0	11.0	23.0	23.0
Total Split (%)	13.8%	43.8%	0.0%	13.8%	43.8%	0.0%	13.8%	28.8%	28.8%	13.8%	28.8%	28.8%
Maximum Green (s)	7.0	30.0		7.0	30.0		7.0	18.0	18.0	7.0	18.0	18.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	38.0	31.0		38.8	33.2		26.8	21.2	21.2	26.0	19.0	19.0
Actuated g/C Ratio	0.48	0.39		0.48	0.42		0.34	0.26	0.26	0.32	0.24	0.24
v/c Ratio	0.27	0.69		0.57	0.68		0.60	0.42	0.29	0.19	0.70	0.30
Control Delay	8.6	19.8		17.6	26.3		27.5	29.4	6.3	17.9	39.0	6.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	19.8		17.6	26.3		27.5	29.4	6.3	17.9	39.0	6.7

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Future volumes with CIP; Alternative 3

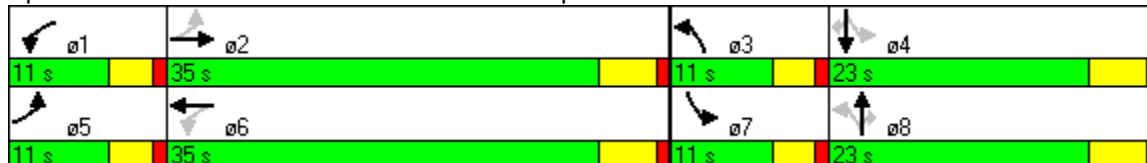


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		B	C		C	C	A	B	D	A
Approach Delay		17.8			23.5			21.9			26.7	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	3.8	51.6		16.1	54.6		19.0	22.5	0.0	7.3	38.9	0.0
Queue Length 95th (m)	8.3	37.2		27.9	88.3		#33.7	40.5	13.2	15.6	#70.0	12.8
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0			60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	363	649		371	654		308	416	518	390	402	471
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.69		0.57	0.68		0.60	0.42	0.29	0.19	0.70	0.30

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 22.4 Intersection LOS: C
 Intersection Capacity Utilization 72.9% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CIP; Alternative 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Frt		0.956			0.986				0.850		0.950	
Flt Protected	0.950	*0.902		0.950	*0.847		0.950	*0.853		0.950	*0.941	
Satd. Flow (prot)	1712	1554	0	1712	1505	0	1712	1537	1532	1712	1611	0
Flt Permitted	0.268			0.268			0.237			0.586		
Satd. Flow (perm)	478	1723	0	483	1777	0	425	1802	1532	1056	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			7				152		29	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	290	120	195	370	40	170	160	140	70	260	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	315	130	212	402	43	185	174	152	76	283	141
Lane Group Flow (vph)	98	445	0	212	445	0	185	174	152	76	424	0
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phases	5	2		1	6		3	8	8	7	4	
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	
Total Split (s)	11.0	36.0	0.0	11.0	36.0	0.0	11.0	32.0	32.0	11.0	32.0	0.0
Total Split (%)	12.2%	40.0%	0.0%	12.2%	40.0%	0.0%	12.2%	35.6%	35.6%	12.2%	35.6%	0.0%
Maximum Green (s)	7.0	31.0		7.0	31.0		7.0	27.0	27.0	7.0	27.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	
Pedestrian Calls (#/hr)		0			0			0	0		0	
Act Effct Green (s)	39.0	32.0		39.8	34.2		35.8	30.2	30.2	35.0	28.0	
Actuated g/C Ratio	0.43	0.36		0.44	0.38		0.40	0.34	0.34	0.39	0.31	
v/c Ratio	0.32	0.78		0.69	0.77		0.69	0.34	0.25	0.16	0.81	
Control Delay	12.5	30.1		28.5	36.2		32.5	25.9	5.2	16.3	41.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	12.5	30.1		28.5	36.2		32.5	25.9	5.2	16.3	41.0	

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Future volumes with CIP; Alternative 4

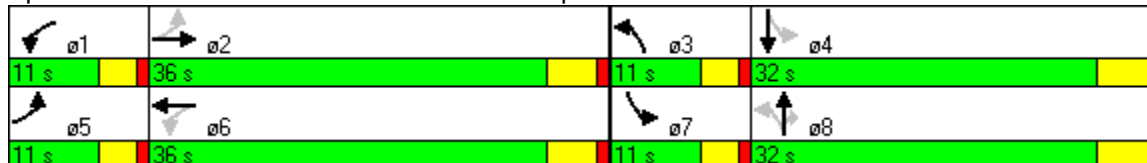


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	C		C	D		C	C	A	B	D	
Approach Delay		26.9			33.7			22.1			37.2	
Approach LOS		C			C			C			D	
Queue Length 50th (m)	8.1	64.0		20.7	67.2		19.4	22.9	0.0	7.5	62.1	
Queue Length 95th (m)	12.0	#109.5		#39.0	#117.3		#33.3	40.0	12.5	15.4	#109.1	
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	30.0			60.0			45.0		45.0	45.0		
Base Capacity (vph)	303	569		309	577		269	516	615	462	521	
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	0.32	0.78		0.69	0.77		0.69	0.34	0.25	0.16	0.81	

Intersection Summary

























Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 6 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 30.2 Intersection LOS: C
 Intersection Capacity Utilization 81.3% ICU Level of Service D
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



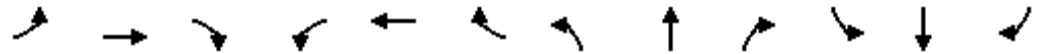
Lanes, Volumes, Timings
1: Tecumseh Rd. & Southfield Dr.

AM peak hour
Future volumes with CIP; modified configuration

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	30.0		0.0
Storage Lanes	1		1	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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850			0.997			0.858			0.886
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1784	1517	1695	1779	0	1695	1531	0	1695	1581	0
Fl _t Permitted	0.332			0.418			0.744			0.697		
Satd. Flow (perm)	592	1784	1517	746	1779	0	1328	1531	0	1244	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			120			2			87			16
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		398.9			131.2			334.0			154.3	
Travel Time (s)		28.7			9.4			24.0			11.1	
Volume (vph)	15	415	110	90	515	10	105	5	80	5	5	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	16	451	120	98	560	11	114	5	87	5	5	16
Lane Group Flow (vph)	16	451	120	98	571	0	114	92	0	5	21	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8				4
Permitted Phases	2		2	6			8			4		
Detector Phases	2	2	2	6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		21.0	21.0		21.0	21.0	
Total Split (s)	56.0	56.0	56.0	56.0	56.0	0.0	34.0	34.0	0.0	34.0	34.0	0.0
Total Split (%)	62.2%	62.2%	62.2%	62.2%	62.2%	0.0%	37.8%	37.8%	0.0%	37.8%	37.8%	0.0%
Maximum Green (s)	49.0	49.0	49.0	49.0	49.0		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0	10.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		20	20		20	20	
Act Effct Green (s)	66.6	66.6	66.6	66.6	66.6		15.4	15.4		15.4	15.4	
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74		0.17	0.17		0.17	0.17	
v/c Ratio	0.04	0.34	0.10	0.18	0.43		0.50	0.28		0.02	0.07	
Control Delay	4.5	5.5	1.1	2.2	3.1		40.6	9.8		28.4	16.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.5	5.5	1.1	2.2	3.1		40.6	9.8		28.4	16.1	

Lanes, Volumes, Timings
 1: Tecumseh Rd. & Southfield Dr.

AM peak hour
 Future volumes with CIP; modified configuration

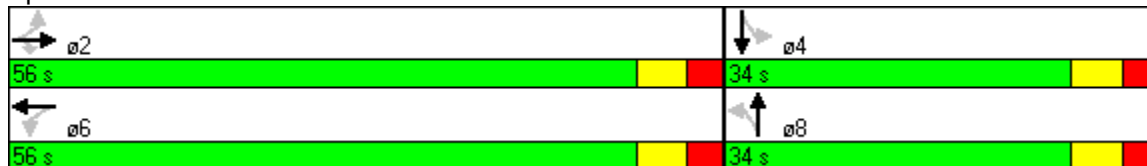


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A	A	A	A		D	A		C	B	
Approach Delay		4.6				3.0		26.9			18.5	
Approach LOS		A				A		C			B	
Queue Length 50th (m)	0.6	21.8	0.0	1.0	6.0		17.9	0.7		0.7	0.7	
Queue Length 95th (m)	2.7	43.9	4.7	3.0	11.9		31.4	12.0		3.4	6.2	
Internal Link Dist (m)		374.9				107.2		310.0			130.3	
Turn Bay Length (m)	30.0			30.0			30.0			30.0		
Base Capacity (vph)	438	1320	1154	552	1317		443	568		415	538	
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	0.04	0.34	0.10	0.18	0.43		0.26	0.16		0.01	0.04	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	6 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	7.2
Intersection LOS:	A
Intersection Capacity Utilization	57.9%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 1: Tecumseh Rd. & Southfield Dr.



Lanes, Volumes, Timings
4: Tecumseh Rd. & Shawnee Rd.

AM peak hour
Future volumes with CIP; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.997			0.950			0.915	
Flt Protected	0.950			0.950				0.970			0.982	
Satd. Flow (prot)	1695	1779	0	1695	1779	0	0	1644	0	0	1603	0
Flt Permitted	0.276			0.387				0.852			0.918	
Satd. Flow (perm)	492	1779	0	691	1779	0	0	1444	0	0	1499	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			16			27	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		209.7			228.4			321.5			166.2	
Travel Time (s)		18.9			20.6			23.1			12.0	
Volume (vph)	10	470	10	15	625	15	25	0	15	15	0	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	511	11	16	679	16	27	0	16	16	0	27
Lane Group Flow (vph)	11	522	0	16	695	0	0	43	0	0	43	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phases	2	2		6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		22.0	22.0		22.0	22.0	
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	66.7%	66.7%	0.0%	66.7%	66.7%	0.0%	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	54.0	54.0		54.0	54.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)	0	0		0	0		20	20		20	20	
Act Effct Green (s)	76.2	76.2		76.2	76.2		12.6	12.6		12.6	12.6	
Actuated g/C Ratio	0.85	0.85		0.85	0.85		0.14	0.14		0.14	0.14	
v/c Ratio	0.03	0.35		0.03	0.46		0.20	0.20		0.18	0.18	
Control Delay	5.5	5.4		1.3	3.0		24.6	24.6		18.6	18.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	5.5	5.4		1.3	3.0		24.6	24.6		18.6	18.6	

Lanes, Volumes, Timings
 4: Tecumseh Rd. & Shawnee Rd.

AM peak hour
 Future volumes with CIP; modified configuration



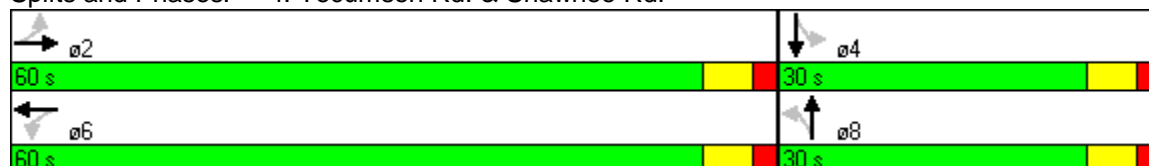
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A			C			B	
Approach Delay		5.4			2.9			24.7			18.6	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	0.3	16.5		0.1	2.9			4.3			2.5	
Queue Length 95th (m)	m2.3	70.1		m0.5	m58.6			12.3			10.6	
Internal Link Dist (m)		185.7			204.4			297.5			142.2	
Turn Bay Length (m)	30.0			30.0								
Base Capacity (vph)	417	1507		585	1507			429			452	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.35		0.03	0.46			0.10			0.10	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 66 (73%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 5.1 Intersection LOS: A
 Intersection Capacity Utilization 48.2% ICU Level of Service A
 Analysis Period (min) 15

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

Splits and Phases: 4: Tecumseh Rd. & Shawnee Rd.


























Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CIP; existing configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	0		1	1		1	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850			0.850			0.850			0.850
Fl _t Protected	0.950			0.950	*0.910		0.950	*0.670		0.950	*0.910	
Satd. Flow (prot)	1712	1802	1532	1712	1640	1532	1712	1207	1532	1712	1640	1532
Fl _t Permitted	0.321			0.121			0.434			0.310		
Satd. Flow (perm)	571	1802	1532	218	1802	1532	774	1802	1532	559	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			39			65			299			125
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	565	115	185	375	60	220	330	275	115	250	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	614	125	201	408	65	239	359	299	125	272	125
Lane Group Flow (vph)	245	614	125	201	408	65	239	359	299	125	272	125
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phases	5	2	2	1	6	6	3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0	25.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	37.0	37.0	11.0	37.0	37.0	11.0	31.0	31.0	11.0	31.0	31.0
Total Split (%)	12.2%	41.1%	41.1%	12.2%	41.1%	41.1%	12.2%	34.4%	34.4%	12.2%	34.4%	34.4%
Maximum Green (s)	7.0	32.0	32.0	7.0	32.0	32.0	7.0	26.0	26.0	7.0	26.0	26.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	40.0	33.0	33.0	40.0	33.0	33.0	34.0	27.0	27.0	34.0	27.0	27.0
Actuated g/C Ratio	0.44	0.37	0.37	0.44	0.37	0.37	0.38	0.30	0.30	0.38	0.30	0.30
v/c Ratio	0.71	0.93	0.21	0.94	0.68	0.11	0.65	0.99	0.45	0.42	0.55	0.23
Control Delay	24.3	45.9	9.5	70.0	30.9	5.7	28.9	79.1	5.4	20.9	31.6	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	45.9	9.5	70.0	30.9	5.7	28.9	79.1	5.4	20.9	31.6	5.7

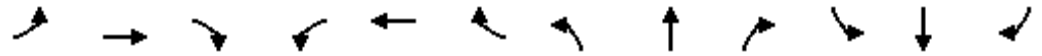
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CIP; Alternative 1

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.979				0.850			0.850
Fl _t Protected	0.950	*0.881		0.950	*0.854		0.950	*0.658		0.950	*0.913	
Satd. Flow (prot)	1712	1588	1532	1712	1507	0	1712	1186	1532	1712	1645	1532
Fl _t Permitted	0.261			0.118			0.424			0.296		
Satd. Flow (perm)	466	1802	1532	213	1764	0	756	1802	1532	533	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			39		10				299			125
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	565	115	185	375	60	220	330	275	115	250	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	614	125	201	408	65	239	359	299	125	272	125
Lane Group Flow (vph)	245	614	125	201	473	0	239	359	299	125	272	125
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	38.0	38.0	11.0	38.0	0.0	11.0	30.0	30.0	11.0	30.0	30.0
Total Split (%)	12.2%	42.2%	42.2%	12.2%	42.2%	0.0%	12.2%	33.3%	33.3%	12.2%	33.3%	33.3%
Maximum Green (s)	7.0	33.0	33.0	7.0	33.0		7.0	25.0	25.0	7.0	25.0	25.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	41.0	34.0	34.0	41.0	34.0		33.0	26.0	26.0	33.0	26.0	26.0
Actuated g/C Ratio	0.46	0.38	0.38	0.46	0.38		0.37	0.29	0.29	0.37	0.29	0.29
v/c Ratio	0.79	1.02	0.21	0.94	0.82		0.68	1.05	0.46	0.44	0.57	0.24
Control Delay	29.2	65.5	9.2	68.8	38.6		31.2	95.1	5.6	22.2	32.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	65.5	9.2	68.8	38.6		31.2	95.1	5.6	22.2	32.9	6.0

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CIP; Alternative 1

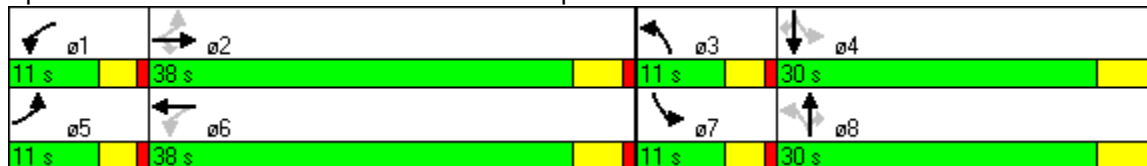


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C	E	A	E	D		C	F	A	C	C	A
Approach Delay		49.3			47.6			48.2			23.9	
Approach LOS		D			D			D			C	
Queue Length 50th (m)	19.1	~113.0	4.0	19.3	70.1		27.2	~67.3	0.0	13.2	39.4	0.0
Queue Length 95th (m)	#41.0	#173.5	m13.7	#60.0	#121.6		#46.4	#117.9	17.5	24.4	63.9	11.8
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	309	600	603	214	576		352	343	655	287	475	531
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	0.79	1.02	0.21	0.94	0.82		0.68	1.05	0.46	0.44	0.57	0.24

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.05
 Intersection Signal Delay: 44.3 Intersection LOS: D
 Intersection Capacity Utilization 82.3% ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



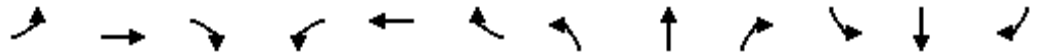
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CIP; Alternative 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.979				0.850			0.850
Fl _t Protected	0.950	*0.687		0.950	*0.862		0.950	*0.629		0.950	*0.919	
Satd. Flow (prot)	1712	1238	1532	1712	1521	0	1712	1133	1532	1712	1656	1532
Fl _t Permitted	0.284			0.145			0.401			0.263		
Satd. Flow (perm)	507	1802	1532	261	1764	0	716	1802	1532	474	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			41		11				299			125
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	565	115	185	375	60	220	330	275	115	250	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	614	125	201	408	65	239	359	299	125	272	125
Lane Group Flow (vph)	245	614	125	201	473	0	239	359	299	125	272	125
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	40.0	40.0	11.0	40.0	0.0	11.0	28.0	28.0	11.0	28.0	28.0
Total Split (%)	12.2%	44.4%	44.4%	12.2%	44.4%	0.0%	12.2%	31.1%	31.1%	12.2%	31.1%	31.1%
Maximum Green (s)	7.0	35.0	35.0	7.0	35.0		7.0	23.0	23.0	7.0	23.0	23.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	43.0	36.0	36.0	43.0	36.0		31.0	24.0	24.0	31.0	24.0	24.0
Actuated g/C Ratio	0.48	0.40	0.40	0.48	0.40		0.34	0.27	0.27	0.34	0.27	0.27
v/c Ratio	0.73	1.24	0.20	0.84	0.77		0.74	1.19	0.48	0.48	0.62	0.25
Control Delay	22.0	146.7	7.9	45.6	33.0		37.2	145.4	6.1	25.1	36.0	6.4
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	22.0	146.7	7.9	45.6	33.0		37.2	145.4	6.1	25.1	36.0	6.4

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
 Future volumes with CIP; Alternative 2

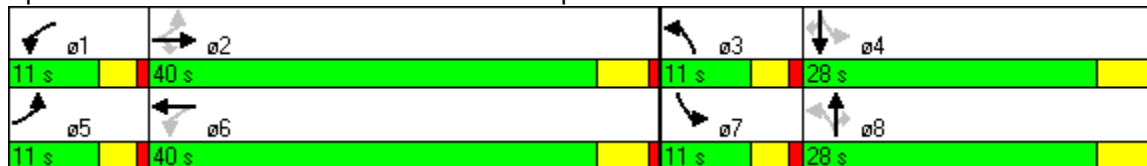


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C	F	A	D	C		D	F	A	C	D	A
Approach Delay		98.0			36.7			70.1			26.3	
Approach LOS		F			D			E			C	
Queue Length 50th (m)	18.1	~132.6	3.6	17.6	66.9		28.4	~74.6	0.0	13.8	40.7	0.0
Queue Length 95th (m)	#31.3	#193.1	m12.3	#51.0	#109.7		#54.2	#125.1	18.1	25.4	66.0	12.2
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	336	495	637	238	615		324	302	628	260	442	500
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	1.24	0.20	0.84	0.77		0.74	1.19	0.48	0.48	0.62	0.25

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.24
 Intersection Signal Delay: 64.3
 Intersection LOS: E
 Intersection Capacity Utilization 82.3%
 ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



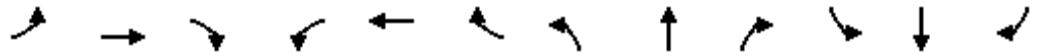
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CIP; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.975			0.979				0.850			0.850
Fl _t Protected	0.950	*0.777		0.950	*0.866		0.950	*0.613		0.950	*0.922	
Satd. Flow (prot)	1712	1365	0	1712	1528	0	1712	1105	1532	1712	1661	1532
Fl _t Permitted	0.294			0.108			0.388			0.245		
Satd. Flow (perm)	524	1757	0	195	1764	0	692	1802	1532	441	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			11				299			125
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	565	115	185	375	60	220	330	275	115	250	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	614	125	201	408	65	239	359	299	125	272	125
Lane Group Flow (vph)	245	739	0	201	473	0	239	359	299	125	272	125
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Detector Phases	5	2		1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	41.0	0.0	11.0	41.0	0.0	11.0	27.0	27.0	11.0	27.0	27.0
Total Split (%)	12.2%	45.6%	0.0%	12.2%	45.6%	0.0%	12.2%	30.0%	30.0%	12.2%	30.0%	30.0%
Maximum Green (s)	7.0	36.0		7.0	36.0		7.0	22.0	22.0	7.0	22.0	22.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	44.0	37.0		44.0	37.0		30.0	23.0	23.0	30.0	23.0	23.0
Actuated g/C Ratio	0.49	0.41		0.49	0.41		0.33	0.26	0.26	0.33	0.26	0.26
v/c Ratio	0.70	1.30		0.94	0.74		0.77	1.27	0.49	0.51	0.64	0.26
Control Delay	19.4	168.7		69.9	30.7		41.1	179.0	6.4	27.0	37.9	6.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	168.7		69.9	30.7		41.1	179.0	6.4	27.0	37.9	6.7

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CIP; Alternative 3

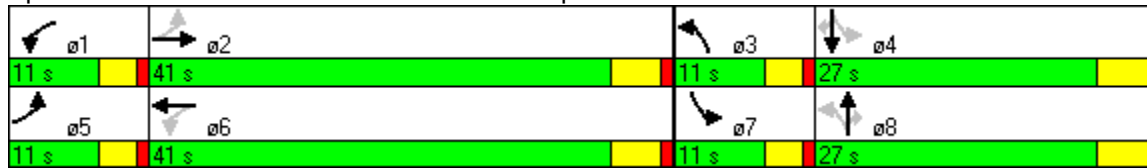


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	F		E	C		D	F	A	C	D	A
Approach Delay		131.5			42.4			84.7			27.8	
Approach LOS		F			D			F			C	
Queue Length 50th (m)	17.6	~163.1		19.5	65.5		29.0	~78.1	0.0	14.1	41.3	0.0
Queue Length 95th (m)	#26.5	#226.7		#60.1	102.6		#58.2	#128.7	18.4	25.9	67.0	12.4
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0			60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	349	569		213	635		310	282	614	246	424	485
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.70	1.30		0.94	0.74		0.77	1.27	0.49	0.51	0.64	0.26

Intersection Summary

- Area Type: Other
- Cycle Length: 90
- Actuated Cycle Length: 90
- Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
- Natural Cycle: 150
- Control Type: Actuated-Coordinated
- Maximum v/c Ratio: 1.30
- Intersection Signal Delay: 80.8
- Intersection LOS: F
- Intersection Capacity Utilization 89.7%
- ICU Level of Service E
- Analysis Period (min) 15
- * User Entered Value
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



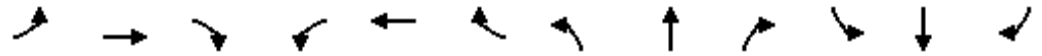
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CIP; Alternative 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.975			0.979				0.850		0.953	
Fl _t Protected	0.950	*0.741		0.950	*0.866		0.950	*0.613		0.950	*0.893	
Satd. Flow (prot)	1712	1302	0	1712	1528	0	1712	1105	1532	1712	1534	0
Fl _t Permitted	0.294			0.108			0.185			0.245		
Satd. Flow (perm)	524	1757	0	195	1764	0	331	1802	1532	441	1717	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			11				299		25	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	565	115	185	375	60	220	330	275	115	250	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	614	125	201	408	65	239	359	299	125	272	125
Lane Group Flow (vph)	245	739	0	201	473	0	239	359	299	125	397	0
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phases	5	2		1	6		3	8	8	7	4	
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	
Total Split (s)	11.0	41.0	0.0	11.0	41.0	0.0	11.0	27.0	27.0	11.0	27.0	0.0
Total Split (%)	12.2%	45.6%	0.0%	12.2%	45.6%	0.0%	12.2%	30.0%	30.0%	12.2%	30.0%	0.0%
Maximum Green (s)	7.0	36.0		7.0	36.0		7.0	22.0	22.0	7.0	22.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.0	3.5	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	
Pedestrian Calls (#/hr)		0			0			0	0		0	
Act Effct Green (s)	44.0	37.0		44.0	37.0		30.0	23.0	23.0	30.0	23.0	
Actuated g/C Ratio	0.49	0.41		0.49	0.41		0.33	0.26	0.26	0.33	0.26	
v/c Ratio	0.70	1.36		0.94	0.74		1.10	1.27	0.49	0.51	0.97	
Control Delay	18.4	193.7		69.9	30.7		115.4	179.0	6.4	27.0	69.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	18.4	193.7		69.9	30.7		115.4	179.0	6.4	27.0	69.8	

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CIP; Alternative 4

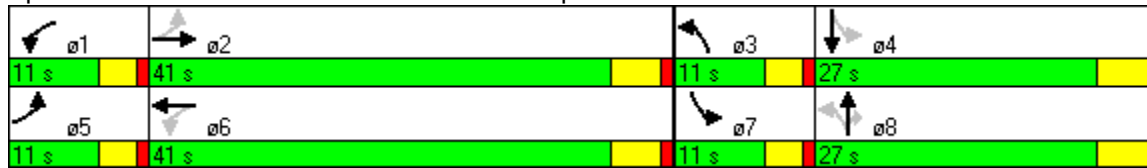


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	F		E	C		F	F	A	C	E	
Approach Delay		150.1			42.4			104.5			59.5	
Approach LOS		F			D			F			E	
Queue Length 50th (m)	17.2	~167.8		19.5	65.5		~30.9	~78.1	0.0	14.1	63.4	
Queue Length 95th (m)	#25.3	#231.2		#60.1	102.6		#75.4	#128.7	18.4	25.9	#119.1	
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	30.0			60.0			45.0		45.0	45.0		
Base Capacity (vph)	349	544		213	635		218	282	614	246	411	
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	0.70	1.36		0.94	0.74		1.10	1.27	0.49	0.51	0.97	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.36
 Intersection Signal Delay: 97.9 Intersection LOS: F
 Intersection Capacity Utilization 97.1% ICU Level of Service F
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
1: Tecumseh Rd. & Southfield Dr.

PM peak hour
Future volumes with CIP; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	30.0		0.0
Storage Lanes	1		1	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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850		0.996			0.858			0.878	
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1784	1517	1695	1777	0	1695	1531	0	1695	1567	0
Fl _t Permitted	0.203			0.102			0.740			0.694		
Satd. Flow (perm)	362	1784	1517	182	1777	0	1320	1531	0	1238	1567	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			92		3			92			22	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		398.9			131.2			334.0			154.3	
Travel Time (s)		28.7			9.4			24.0			11.1	
Volume (vph)	20	830	85	45	670	20	70	5	85	20	5	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	22	902	92	49	728	22	76	5	92	22	5	22
Lane Group Flow (vph)	22	902	92	49	750	0	76	97	0	22	27	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phases	2	2	2	6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		21.0	21.0		21.0	21.0	
Total Split (s)	55.0	55.0	55.0	55.0	55.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	61.1%	61.1%	61.1%	61.1%	61.1%	0.0%	38.9%	38.9%	0.0%	38.9%	38.9%	0.0%
Maximum Green (s)	48.0	48.0	48.0	48.0	48.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0	10.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		20	20		20	20	
Act Effct Green (s)	71.9	71.9	71.9	71.9	71.9		13.7	13.7		13.7	13.7	
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80		0.15	0.15		0.15	0.15	
v/c Ratio	0.08	0.63	0.07	0.34	0.53		0.38	0.31		0.12	0.10	
Control Delay	4.2	8.1	1.0	12.0	6.5		38.8	10.8		32.6	15.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.2	8.1	1.0	12.0	6.5		38.8	10.8		32.6	15.8	

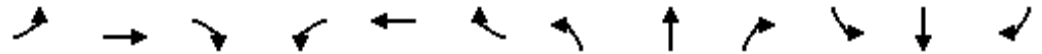
Lanes, Volumes, Timings
4: Tecumseh Rd. & Shawnee Rd.

PM peak hour
Future volumes with CIP; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.993			0.946			0.921	
Flt Protected	0.950			0.950				0.971			0.980	
Satd. Flow (prot)	1695	1779	0	1695	1772	0	0	1639	0	0	1610	0
Flt Permitted	0.185			0.078				0.847			0.896	
Satd. Flow (perm)	330	1779	0	139	1772	0	0	1430	0	0	1472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			5			22			38	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		209.7			228.4			321.5			166.2	
Travel Time (s)		18.9			20.6			23.1			12.0	
Volume (vph)	40	865	20	20	680	35	30	0	20	25	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	43	940	22	22	739	38	33	0	22	27	0	38
Lane Group Flow (vph)	43	962	0	22	777	0	0	55	0	0	65	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phases	2	2		6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		22.0	22.0		22.0	22.0	
Total Split (s)	55.0	55.0	0.0	55.0	55.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	61.1%	61.1%	0.0%	61.1%	61.1%	0.0%	38.9%	38.9%	0.0%	38.9%	38.9%	0.0%
Maximum Green (s)	49.0	49.0		49.0	49.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)	0	0		0	0		20	20		20	20	
Act Effct Green (s)	76.2	76.2		76.2	76.2			12.6			12.6	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.14			0.14	
v/c Ratio	0.15	0.64		0.19	0.52			0.25			0.27	
Control Delay	4.6	5.3		6.0	4.0			24.6			19.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.6	5.3		6.0	4.0			24.6			19.5	

Lanes, Volumes, Timings
4: Tecumseh Rd. & Shawnee Rd.

PM peak hour
Future volumes with CIP; modified configuration



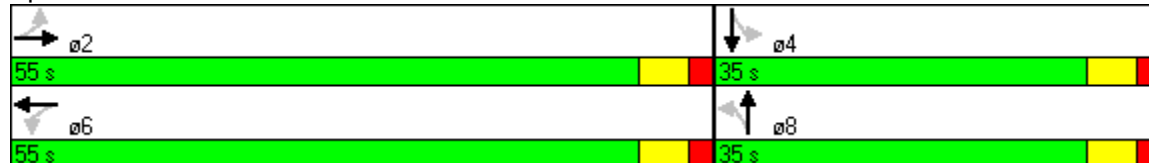
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A			C			B	
Approach Delay		5.2			4.1			24.6			19.5	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	1.1	43.7		0.6	32.3			5.3			4.3	
Queue Length 95th (m)	m3.3	69.2		m1.4	m45.8			14.3			14.1	
Internal Link Dist (m)		185.7			204.4			297.5			142.2	
Turn Bay Length (m)	30.0			30.0								
Base Capacity (vph)	279	1506		118	1500			507			532	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.15	0.64		0.19	0.52			0.11			0.12	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	45 (50%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	5.8
Intersection LOS:	A
Intersection Capacity Utilization	61.8%
ICU Level of Service	B
Analysis Period (min)	15

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

Splits and Phases: 4: Tecumseh Rd. & Shawnee Rd.



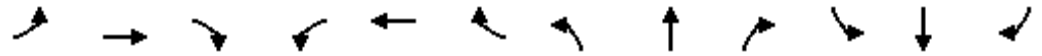
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CR22 overpass; existing configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		1	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850			0.850			0.850			0.850
Fl _t Protected	0.950			0.950	*0.912		0.950	*0.874		0.950	*0.917	
Satd. Flow (prot)	1712	1802	1532	1712	1643	1532	1712	1575	1532	1712	1652	1532
Fl _t Permitted	0.331			0.432			0.489			0.635		
Satd. Flow (perm)	590	1802	1532	778	1802	1532	875	1802	1532	1144	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			72			54			147			141
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	305	100	180	390	50	140	125	135	90	195	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	332	109	196	424	54	152	136	147	98	212	141
Lane Group Flow (vph)	98	332	109	196	424	54	152	136	147	98	212	141
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phases	5	2	2	1	6	6	3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0	22.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	35.0	35.0	11.0	35.0	35.0	11.0	23.0	23.0	11.0	23.0	23.0
Total Split (%)	13.8%	43.8%	43.8%	13.8%	43.8%	43.8%	13.8%	28.8%	28.8%	13.8%	28.8%	28.8%
Maximum Green (s)	7.0	30.0	30.0	7.0	30.0	30.0	7.0	18.0	18.0	7.0	18.0	18.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	38.0	31.0	31.0	38.8	33.2	33.2	26.8	21.2	21.2	26.0	19.0	19.0
Actuated g/C Ratio	0.48	0.39	0.39	0.48	0.42	0.42	0.34	0.26	0.26	0.32	0.24	0.24
v/c Ratio	0.26	0.48	0.17	0.43	0.62	0.08	0.41	0.33	0.29	0.23	0.54	0.30
Control Delay	9.1	17.2	4.0	13.7	24.4	5.2	21.4	27.8	6.4	18.3	32.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	17.2	4.0	13.7	24.4	5.2	21.4	27.8	6.4	18.3	32.7	6.7

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Future volumes with CR22 overpass; existing configuration

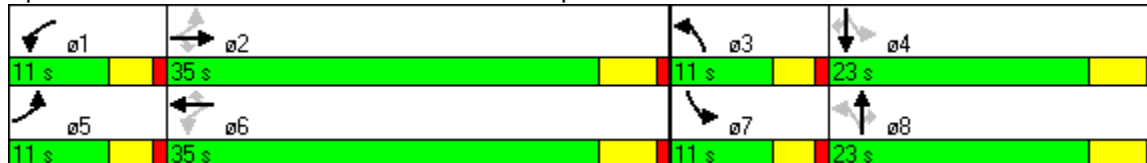


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B	A	B	C	A	C	C	A	B	C	A
Approach Delay		13.0			19.8			18.3			21.4	
Approach LOS		B			B			B			C	
Queue Length 50th (m)	4.1	37.1	1.5	14.8	51.2	0.0	15.3	17.0	0.0	9.5	27.8	0.0
Queue Length 95th (m)	8.9	26.6	3.9	25.8	81.6	6.4	28.0	32.3	13.0	19.1	48.3	12.8
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)			15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	378	698	638	459	682	668	367	417	514	422	392	471
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.48	0.17	0.43	0.62	0.08	0.41	0.33	0.29	0.23	0.54	0.30

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	18.1
Intersection LOS:	B
Intersection Capacity Utilization	59.9%
ICU Level of Service	B
Analysis Period (min)	15
* User Entered Value	

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



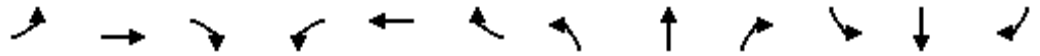
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CR22 overpass; Alternative 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	90.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.983				0.850			0.850
Fl _t Protected	0.950			0.950	*0.883		0.950	*0.877		0.950	*0.921	
Satd. Flow (prot)	1712	1802	1532	1712	1564	0	1712	1580	1532	1712	1660	1532
Fl _t Permitted	0.286			0.440			0.477			0.630		
Satd. Flow (perm)	510	1802	1532	793	1771	0	850	1802	1532	1135	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74		10				147			141
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	305	100	180	390	50	140	125	135	90	195	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	332	109	196	424	54	152	136	147	98	212	141
Lane Group Flow (vph)	98	332	109	196	478	0	152	136	147	98	212	141
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	36.0	36.0	11.0	36.0	0.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (%)	13.8%	45.0%	45.0%	13.8%	45.0%	0.0%	13.8%	27.5%	27.5%	13.8%	27.5%	27.5%
Maximum Green (s)	7.0	31.0	31.0	7.0	31.0		7.0	17.0	17.0	7.0	17.0	17.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	39.0	32.0	32.0	39.8	34.2		25.8	20.2	20.2	25.0	18.0	18.0
Actuated g/C Ratio	0.49	0.40	0.40	0.50	0.43		0.32	0.25	0.25	0.31	0.22	0.22
v/c Ratio	0.28	0.46	0.17	0.41	0.71		0.43	0.34	0.30	0.24	0.57	0.31
Control Delay	8.4	14.9	3.0	12.9	26.8		22.6	28.8	6.6	19.1	34.4	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	14.9	3.0	12.9	26.8		22.6	28.8	6.6	19.1	34.4	7.0

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Future volumes with CR22 overpass; Alternative 1

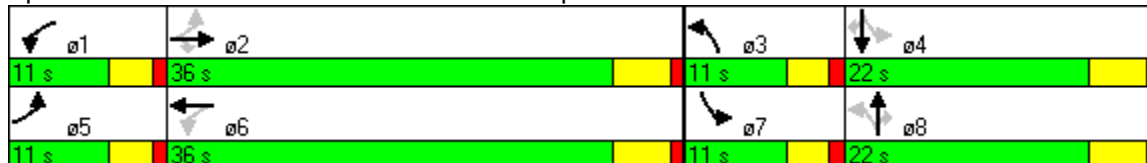


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B	A	B	C		C	C	A	B	C	A
Approach Delay		11.3			22.7			19.2			22.5	
Approach LOS		B			C			B			C	
Queue Length 50th (m)	3.6	33.5	0.7	14.3	58.8		15.6	17.4	0.0	9.7	28.3	0.0
Queue Length 95th (m)	8.1	24.6	0.5	25.0	#99.4		28.6	32.8	13.3	19.6	49.2	13.0
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	90.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	354	721	657	475	675		350	399	497	405	374	454
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	0.28	0.46	0.17	0.41	0.71		0.43	0.34	0.30	0.24	0.57	0.31

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 19.0 Intersection LOS: B
 Intersection Capacity Utilization 63.1% ICU Level of Service B
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



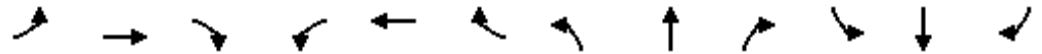
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CR22 overpass; Alternative 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.983				0.850			0.850
Fl _t Protected	0.950	*0.947		0.950	*0.883		0.950	*0.877		0.950	*0.921	
Satd. Flow (prot)	1712	1706	1532	1712	1564	0	1712	1580	1532	1712	1660	1532
Fl _t Permitted	0.286			0.440			0.477			0.630		
Satd. Flow (perm)	510	1802	1532	793	1771	0	850	1802	1532	1135	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74		10				147			141
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	305	100	180	390	50	140	125	135	90	195	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	332	109	196	424	54	152	136	147	98	212	141
Lane Group Flow (vph)	98	332	109	196	478	0	152	136	147	98	212	141
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	36.0	36.0	11.0	36.0	0.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (%)	13.8%	45.0%	45.0%	13.8%	45.0%	0.0%	13.8%	27.5%	27.5%	13.8%	27.5%	27.5%
Maximum Green (s)	7.0	31.0	31.0	7.0	31.0		7.0	17.0	17.0	7.0	17.0	17.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	39.0	32.0	32.0	39.8	34.2		25.8	20.2	20.2	25.0	18.0	18.0
Actuated g/C Ratio	0.49	0.40	0.40	0.50	0.43		0.32	0.25	0.25	0.31	0.22	0.22
v/c Ratio	0.28	0.49	0.17	0.41	0.71		0.43	0.34	0.30	0.24	0.57	0.31
Control Delay	8.4	15.5	3.0	12.9	26.8		22.6	28.8	6.6	19.1	34.4	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	15.5	3.0	12.9	26.8		22.6	28.8	6.6	19.1	34.4	7.0

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
 Future volumes with CR22 overpass; Alternative 2

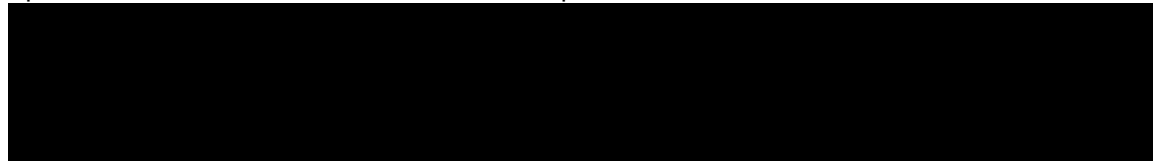


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B	A	B	C		C	C	A	B	C	A
Approach Delay		11.7			22.7			19.2			22.5	
Approach LOS		B			C			B			C	
Queue Length 50th (m)	3.6	35.9	0.7	14.3	58.8		15.6	17.4	0.0	9.7	28.3	0.0
Queue Length 95th (m)	8.1	24.7	0.5	25.0	#99.4		28.6	32.8	13.3	19.6	49.2	13.0
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	354	682	657	475	675		350	399	497	405	374	454
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	0.28	0.49	0.17	0.41	0.71		0.43	0.34	0.30	0.24	0.57	0.31

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 19.1 Intersection LOS: B
 Intersection Capacity Utilization 63.1% ICU Level of Service B
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CR22 overpass; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		0.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.963			0.983				0.850			0.850
Fl _t Protected	0.950	*0.947		0.950	*0.883		0.950	*0.877		0.950	*0.921	
Satd. Flow (prot)	1712	1643	0	1712	1564	0	1712	1580	1532	1712	1660	1532
Fl _t Permitted	0.286			0.324			0.477			0.630		
Satd. Flow (perm)	510	1735	0	584	1771	0	850	1802	1532	1135	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			10				147			141
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	305	100	180	390	50	140	125	135	90	195	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	332	109	196	424	54	152	136	147	98	212	141
Lane Group Flow (vph)	98	441	0	196	478	0	152	136	147	98	212	141
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Detector Phases	5	2		1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	36.0	0.0	11.0	36.0	0.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (%)	13.8%	45.0%	0.0%	13.8%	45.0%	0.0%	13.8%	27.5%	27.5%	13.8%	27.5%	27.5%
Maximum Green (s)	7.0	31.0		7.0	31.0		7.0	17.0	17.0	7.0	17.0	17.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	39.0	32.0		39.8	34.2		25.8	20.2	20.2	25.0	18.0	18.0
Actuated g/C Ratio	0.49	0.40		0.50	0.43		0.32	0.25	0.25	0.31	0.22	0.22
v/c Ratio	0.28	0.66		0.50	0.71		0.43	0.34	0.30	0.24	0.57	0.31
Control Delay	8.4	18.5		14.9	26.8		22.6	28.8	6.6	19.1	34.4	7.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	18.5		14.9	26.8		22.6	28.8	6.6	19.1	34.4	7.0

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

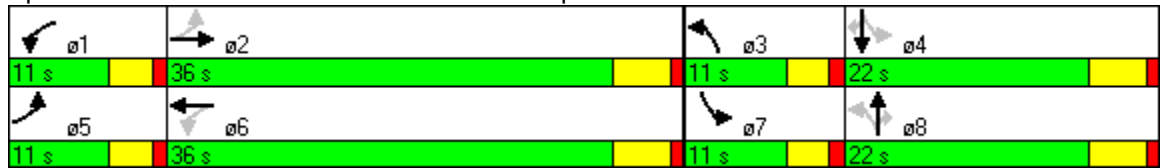
AM peak hour
 Future volumes with CR22 overpass; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		B	C		C	C	A	B	C	A
Approach Delay		16.7			23.3			19.2			22.5	
Approach LOS		B			C			B			C	
Queue Length 50th (m)	3.6	50.2		14.3	58.8		15.6	17.4	0.0	9.7	28.3	0.0
Queue Length 95th (m)	8.1	35.9		25.0	#99.4		28.6	32.8	13.3	19.6	49.2	13.0
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0			60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	354	672		389	675		350	399	497	405	374	454
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.66		0.50	0.71		0.43	0.34	0.30	0.24	0.57	0.31

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 20.6 Intersection LOS: C
 Intersection Capacity Utilization 66.2% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



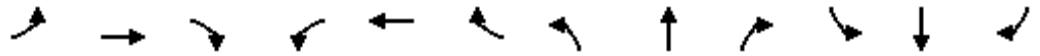
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CR22 overpass; Alternative 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t		0.963			0.983				0.850		0.940	
Fl _t Protected	0.950	*0.914		0.950	*0.866		0.950	*0.868		0.950	*0.935	
Satd. Flow (prot)	1712	1586	0	1712	1534	0	1712	1564	1532	1712	1584	0
Fl _t Permitted	0.279			0.317			0.273			0.631		
Satd. Flow (perm)	498	1735	0	571	1771	0	488	1802	1532	1137	1694	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			8				147		36	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	90	305	100	180	390	50	140	125	135	90	195	130
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	332	109	196	424	54	152	136	147	98	212	141
Lane Group Flow (vph)	98	441	0	196	478	0	152	136	147	98	353	0
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phases	5	2		1	6		3	8	8	7	4	
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	
Total Split (s)	11.0	40.0	0.0	11.0	40.0	0.0	11.0	28.0	28.0	11.0	28.0	0.0
Total Split (%)	12.2%	44.4%	0.0%	12.2%	44.4%	0.0%	12.2%	31.1%	31.1%	12.2%	31.1%	0.0%
Maximum Green (s)	7.0	35.0		7.0	35.0		7.0	23.0	23.0	7.0	23.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	
Pedestrian Calls (#/hr)		0			0			0	0		0	
Act Effct Green (s)	43.0	36.0		43.8	38.2		31.8	26.2	26.2	31.0	24.0	
Actuated g/C Ratio	0.48	0.40		0.49	0.42		0.35	0.29	0.29	0.34	0.27	
v/c Ratio	0.30	0.68		0.53	0.73		0.57	0.30	0.27	0.22	0.79	
Control Delay	10.5	22.5		18.1	30.3		28.2	28.3	6.0	19.5	41.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	10.5	22.5		18.1	30.3		28.2	28.3	6.0	19.5	41.7	

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

AM peak hour
Future volumes with CR22 overpass; Alternative 4

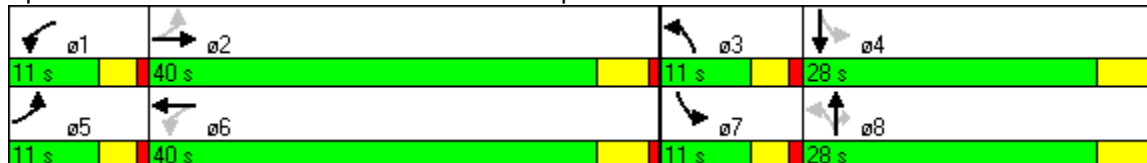


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	C		B	C		C	C	A	B	D	
Approach Delay		20.3			26.8			20.8			36.8	
Approach LOS		C			C			C			D	
Queue Length 50th (m)	7.5	59.3		17.1	68.2		17.0	18.6	0.0	10.6	50.4	
Queue Length 95th (m)	11.2	42.6		29.0	#116.1		30.2	33.9	13.2	20.7	#91.7	
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	30.0			60.0			45.0		45.0	45.0		
Base Capacity (vph)	332	648		367	655		267	455	550	436	449	
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	0.30	0.68		0.53	0.73		0.57	0.30	0.27	0.22	0.79	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 26.0 Intersection LOS: C
 Intersection Capacity Utilization 74.6% ICU Level of Service D
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
1: Tecumseh Rd. & Southfield Dr.

AM peak hour
Future volumes with CR22 overpass; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	30.0		0.0
Storage Lanes	1		1	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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850			0.997			0.858			0.886
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1784	1517	1695	1779	0	1695	1531	0	1695	1581	0
Fl _t Permitted	0.344			0.427			0.744			0.697		
Satd. Flow (perm)	614	1784	1517	762	1779	0	1328	1531	0	1244	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			120			2			87			16
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		398.9			131.2			334.0			154.3	
Travel Time (s)		28.7			9.4			24.0			11.1	
Volume (vph)	15	405	110	90	500	10	105	5	80	5	5	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	16	440	120	98	543	11	114	5	87	5	5	16
Lane Group Flow (vph)	16	440	120	98	554	0	114	92	0	5	21	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phases	2	2	2	6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		21.0	21.0		21.0	21.0	
Total Split (s)	56.0	56.0	56.0	56.0	56.0	0.0	34.0	34.0	0.0	34.0	34.0	0.0
Total Split (%)	62.2%	62.2%	62.2%	62.2%	62.2%	0.0%	37.8%	37.8%	0.0%	37.8%	37.8%	0.0%
Maximum Green (s)	49.0	49.0	49.0	49.0	49.0		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0	10.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		20	20		20	20	
Act Effct Green (s)	66.6	66.6	66.6	66.6	66.6		15.4	15.4		15.4	15.4	
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74		0.17	0.17		0.17	0.17	
v/c Ratio	0.04	0.33	0.10	0.17	0.42		0.50	0.28		0.02	0.07	
Control Delay	4.4	5.4	1.1	1.9	3.0		40.6	9.8		28.4	16.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.4	5.4	1.1	1.9	3.0		40.6	9.8		28.4	16.1	

Lanes, Volumes, Timings
 1: Tecumseh Rd. & Southfield Dr.

AM peak hour
 Future volumes with CR22 overpass; modified configuration

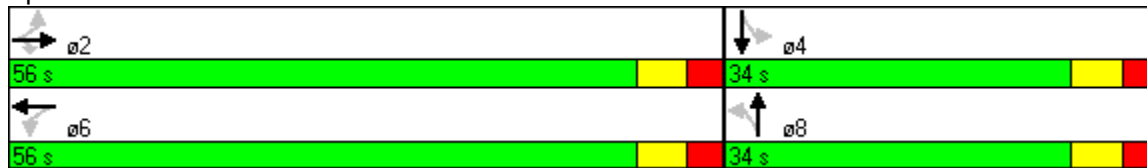


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A	A	A	A		D	A		C	B	
Approach Delay		4.5			2.8			26.9			18.5	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	0.6	21.1	0.0	0.9	5.0		17.9	0.7		0.7	0.7	
Queue Length 95th (m)	2.7	42.6	4.7	2.4	9.2		31.4	12.0		3.4	6.2	
Internal Link Dist (m)		374.9			107.2			310.0			130.3	
Turn Bay Length (m)	30.0			30.0			30.0			30.0		
Base Capacity (vph)	454	1320	1154	564	1317		443	568		415	538	
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	0.04	0.33	0.10	0.17	0.42		0.26	0.16		0.01	0.04	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	3 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	7.1
Intersection LOS:	A
Intersection Capacity Utilization	57.1%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 1: Tecumseh Rd. & Southfield Dr.



Lanes, Volumes, Timings
4: Tecumseh Rd. & Shawnee Rd.

AM peak hour
Future volumes with CR22 overpass; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.996			0.950			0.915	
Flt Protected	0.950			0.950				0.970			0.982	
Satd. Flow (prot)	1695	1779	0	1695	1777	0	0	1644	0	0	1603	0
Flt Permitted	0.286			0.395				0.852			0.918	
Satd. Flow (perm)	510	1779	0	705	1777	0	0	1444	0	0	1499	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			3			16			27	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		209.7			228.4			321.5			166.2	
Travel Time (s)		18.9			20.6			23.1			12.0	
Volume (vph)	10	460	10	15	610	15	25	0	15	15	0	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	500	11	16	663	16	27	0	16	16	0	27
Lane Group Flow (vph)	11	511	0	16	679	0	0	43	0	0	43	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phases	2	2		6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		22.0	22.0		22.0	22.0	
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	66.7%	66.7%	0.0%	66.7%	66.7%	0.0%	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	54.0	54.0		54.0	54.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)	0	0		0	0		20	20		20	20	
Act Effct Green (s)	76.2	76.2		76.2	76.2			12.6			12.6	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.14			0.14	
v/c Ratio	0.03	0.34		0.03	0.45			0.20			0.18	
Control Delay	5.5	5.3		1.7	3.6			24.6			18.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.5	5.3		1.7	3.6			24.6			18.6	

Lanes, Volumes, Timings
 4: Tecumseh Rd. & Shawnee Rd.

AM peak hour
 Future volumes with CR22 overpass; modified configuration



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A			C			B	
Approach Delay		5.3			3.5			24.7			18.6	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	0.3	16.0		0.1	2.4			4.3			2.5	
Queue Length 95th (m)	m2.4	67.1		m0.7	68.1			12.3			10.6	
Internal Link Dist (m)		185.7			204.4			297.5			142.2	
Turn Bay Length (m)	30.0			30.0								
Base Capacity (vph)	432	1507		597	1505			429			452	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.34		0.03	0.45			0.10			0.10	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 63 (70%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 47.3% ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Tecumseh Rd. & Shawnee Rd.



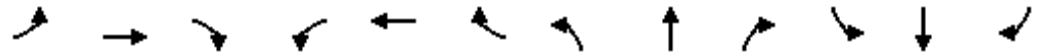
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CR22 overpass; existing configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	0		1	1		1	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850			0.850			0.850			0.850
Fl _t Protected	0.950			0.950	*0.896		0.950	*0.824		0.950	*0.894	
Satd. Flow (prot)	1712	1802	1532	1712	1615	1532	1712	1485	1532	1712	1611	1532
Fl _t Permitted	0.355			0.160			0.533			0.338		
Satd. Flow (perm)	631	1802	1532	288	1802	1532	948	1802	1532	609	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			32			92			288			125
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	590	90	165	395	85	185	260	265	145	165	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	641	98	179	429	92	201	283	288	158	179	125
Lane Group Flow (vph)	245	641	98	179	429	92	201	283	288	158	179	125
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phases	5	2	2	1	6	6	3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0	15.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0	25.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	43.0	43.0	11.0	43.0	43.0	11.0	25.0	25.0	11.0	25.0	25.0
Total Split (%)	12.2%	47.8%	47.8%	12.2%	47.8%	47.8%	12.2%	27.8%	27.8%	12.2%	27.8%	27.8%
Maximum Green (s)	7.0	38.0	38.0	7.0	38.0	38.0	7.0	20.0	20.0	7.0	20.0	20.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	46.0	39.0	39.0	46.0	39.0	39.0	28.0	21.0	21.0	28.0	21.0	21.0
Actuated g/C Ratio	0.51	0.43	0.43	0.51	0.43	0.43	0.31	0.23	0.23	0.31	0.23	0.23
v/c Ratio	0.60	0.82	0.14	0.69	0.61	0.13	0.57	0.82	0.50	0.57	0.48	0.28
Control Delay	14.0	28.3	6.5	26.5	24.4	4.0	29.5	53.0	7.0	30.6	34.7	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	28.3	6.5	26.5	24.4	4.0	29.5	53.0	7.0	30.6	34.7	7.2

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
 Future volumes with CR22 overpass; existing configuration

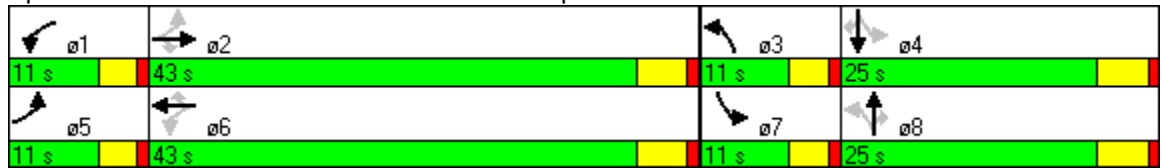


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	C	A	C	C	A	C	D	A	C	C	A
Approach Delay		22.6			22.2			29.7			25.9	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	14.2	95.4	2.3	14.2	54.8	0.0	24.7	45.9	0.0	18.9	26.5	0.0
Queue Length 95th (m)	23.4	#152.8	5.7	#32.5	84.9	8.0	41.7	#85.6	18.8	33.2	45.6	12.9
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)			15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	407	781	682	258	700	716	354	347	578	275	376	453
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.82	0.14	0.69	0.61	0.13	0.57	0.82	0.50	0.57	0.48	0.28

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 9 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 24.9 Intersection LOS: C
 Intersection Capacity Utilization 78.7% ICU Level of Service D
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



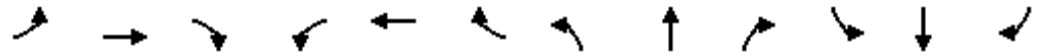
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CR22 overpass; Alternative 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.974				0.850			0.850
Fl _t Protected	0.950	*0.892		0.950	*0.879		0.950	*0.816		0.950	*0.898	
Satd. Flow (prot)	1712	1607	1532	1712	1543	0	1712	1470	1532	1712	1618	1532
Fl _t Permitted	0.278			0.172			0.524			0.321		
Satd. Flow (perm)	497	1802	1532	310	1755	0	932	1802	1532	578	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			33		15				288			125
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	590	90	165	395	85	185	260	265	145	165	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	641	98	179	429	92	201	283	288	158	179	125
Lane Group Flow (vph)	245	641	98	179	521	0	201	283	288	158	179	125
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	44.0	44.0	11.0	44.0	0.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (%)	12.2%	48.9%	48.9%	12.2%	48.9%	0.0%	12.2%	26.7%	26.7%	12.2%	26.7%	26.7%
Maximum Green (s)	7.0	39.0	39.0	7.0	39.0		7.0	19.0	19.0	7.0	19.0	19.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	47.0	40.0	40.0	47.0	40.0		27.0	20.0	20.0	27.0	20.0	20.0
Actuated g/C Ratio	0.52	0.44	0.44	0.52	0.44		0.30	0.22	0.22	0.30	0.22	0.22
v/c Ratio	0.69	0.90	0.14	0.66	0.75		0.59	0.87	0.51	0.60	0.50	0.29
Control Delay	16.3	32.7	5.1	23.1	28.5		31.3	60.7	7.3	32.9	36.2	7.5
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	16.3	32.7	5.1	23.1	28.5		31.3	60.7	7.3	32.9	36.2	7.5

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CR22 overpass; Alternative 1

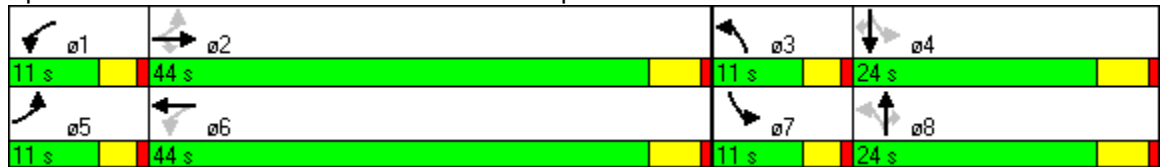


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	C	A	C	C		C	E	A	C	D	A
Approach Delay		25.9			27.1			33.1			27.3	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	15.6	99.7	2.3	13.7	69.8		25.2	46.7	0.0	19.2	26.9	0.0
Queue Length 95th (m)	#19.3	#162.1	m7.2	#26.5	109.3		42.5	#89.2	19.2	33.9	46.3	13.0
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	354	714	699	271	694		340	327	564	262	360	438
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	0.69	0.90	0.14	0.66	0.75		0.59	0.87	0.51	0.60	0.50	0.29

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 28.3 Intersection LOS: C
 Intersection Capacity Utilization 78.7% ICU Level of Service D
 Analysis Period (min) 15
 * User Entered Value
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



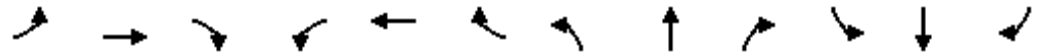
Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CR22 overpass; Alternative 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		1	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Fr _t			0.850		0.974				0.850			0.850
Fl _t Protected	0.950	*0.745		0.950	*0.885		0.950	*0.795		0.950	*0.906	
Satd. Flow (prot)	1712	1342	1532	1712	1553	0	1712	1433	1532	1712	1633	1532
Fl _t Permitted	0.297			0.195			0.503			0.279		
Satd. Flow (perm)	530	1802	1532	351	1755	0	895	1802	1532	503	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			34		16				288			125
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	590	90	165	395	85	185	260	265	145	165	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	641	98	179	429	92	201	283	288	158	179	125
Lane Group Flow (vph)	245	641	98	179	521	0	201	283	288	158	179	125
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8		8	4		4
Detector Phases	5	2	2	1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0	15.0	7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0	22.0	11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	46.0	46.0	11.0	46.0	0.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (%)	12.2%	51.1%	51.1%	12.2%	51.1%	0.0%	12.2%	24.4%	24.4%	12.2%	24.4%	24.4%
Maximum Green (s)	7.0	41.0	41.0	7.0	41.0		7.0	17.0	17.0	7.0	17.0	17.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0	10.0		10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	49.0	42.0	42.0	49.0	42.0		25.0	18.0	18.0	25.0	18.0	18.0
Actuated g/C Ratio	0.54	0.47	0.47	0.54	0.47		0.28	0.20	0.20	0.28	0.20	0.20
v/c Ratio	0.64	1.02	0.13	0.60	0.71		0.64	0.99	0.54	0.68	0.55	0.31
Control Delay	12.2	59.4	4.3	17.9	25.1		35.6	88.1	8.1	39.9	39.5	8.2
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	12.2	59.4	4.3	17.9	25.1		35.6	88.1	8.1	39.9	39.5	8.2

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
 Future volumes with CR22 overpass; Alternative 2

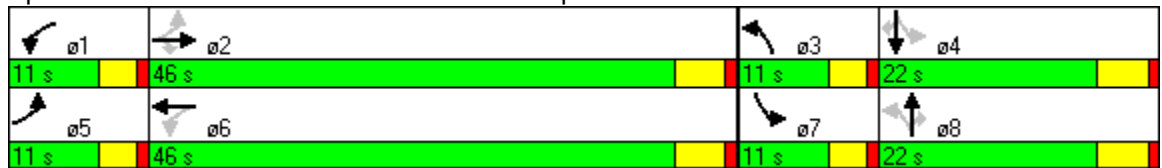


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	E	A	B	C		D	F	A	D	D	A
Approach Delay		42.2			23.3			44.6			31.2	
Approach LOS		D			C			D			C	
Queue Length 50th (m)	14.6	~118.0	2.3	12.9	66.2		26.1	48.5	0.0	20.0	27.7	0.0
Queue Length 95th (m)	12.8	#178.6	m6.4	22.2	103.8		#44.5	#96.3	19.9	#40.4	47.7	13.5
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0		15.0	60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	380	626	733	297	733		312	287	537	234	327	406
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	0.64	1.02	0.13	0.60	0.71		0.64	0.99	0.54	0.68	0.55	0.31

Intersection Summary

- Area Type: Other
- Cycle Length: 90
- Actuated Cycle Length: 90
- Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
- Natural Cycle: 90
- Control Type: Actuated-Coordinated
- Maximum v/c Ratio: 1.02
- Intersection Signal Delay: 36.5
- Intersection LOS: D
- Intersection Capacity Utilization 78.7%
- ICU Level of Service D
- Analysis Period (min) 15
- * User Entered Value
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CR22 overpass; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	45.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	1		1
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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Frt		0.980			0.974				0.850			0.850
Flt Protected	0.950	*0.803		0.950	*0.885		0.950	*0.795		0.950	*0.906	
Satd. Flow (prot)	1712	1418	0	1712	1553	0	1712	1433	1532	1712	1633	1532
Flt Permitted	0.297			0.115			0.503			0.279		
Satd. Flow (perm)	530	1766	0	207	1755	0	895	1802	1532	503	1802	1532
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			16				288			125
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40				50
Link Distance (m)		120.2			329.7			291.7				1148.3
Travel Time (s)		10.8			23.7			26.3				82.7
Volume (vph)	225	590	90	165	395	85	185	260	265	145	165	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	641	98	179	429	92	201	283	288	158	179	125
Lane Group Flow (vph)	245	739	0	179	521	0	201	283	288	158	179	125
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Detector Phases	5	2		1	6		3	8	8	7	4	4
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	11.0	46.0	0.0	11.0	46.0	0.0	11.0	22.0	22.0	11.0	22.0	22.0
Total Split (%)	12.2%	51.1%	0.0%	12.2%	51.1%	0.0%	12.2%	24.4%	24.4%	12.2%	24.4%	24.4%
Maximum Green (s)	7.0	41.0		7.0	41.0		7.0	17.0	17.0	7.0	17.0	17.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	49.0	42.0		49.0	42.0		25.0	18.0	18.0	25.0	18.0	18.0
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.28	0.20	0.20	0.28	0.20	0.20
v/c Ratio	0.64	1.11		0.78	0.71		0.64	0.99	0.54	0.68	0.55	0.31
Control Delay	12.2	85.5		37.7	25.1		35.6	88.1	8.1	39.9	39.5	8.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	85.5		37.7	25.1		35.6	88.1	8.1	39.9	39.5	8.2

Lanes, Volumes, Timings
 10: Tecumseh Rd. & Lesperance Rd.

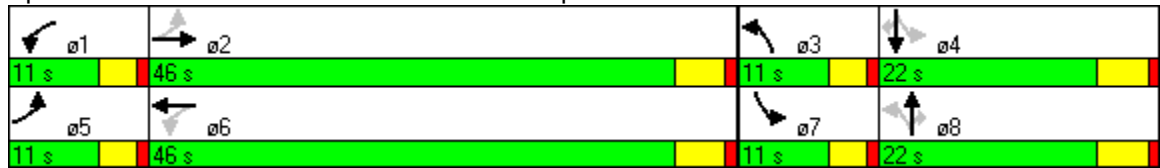
PM peak hour
 Future volumes with CR22 overpass; Alternative 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	F		D	C		D	F	A	D	D	A
Approach Delay		67.3			28.3			44.6			31.2	
Approach LOS		E			C			D			C	
Queue Length 50th (m)	14.6	~145.0		12.9	66.2		26.1	48.5	0.0	20.0	27.7	0.0
Queue Length 95th (m)	12.8	#208.4		#43.7	103.8		#44.5	#96.3	19.9	#40.4	47.7	13.5
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	45.0			60.0			45.0		45.0	45.0		45.0
Base Capacity (vph)	380	668		230	733		312	287	537	234	327	406
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.11		0.78	0.71		0.64	0.99	0.54	0.68	0.55	0.31

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 46.2 Intersection LOS: D
 Intersection Capacity Utilization 84.4% ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CR22 overpass; Alternative 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		15.0	60.0		0.0	45.0		45.0	45.0		45.0
Storage Lanes	1		0	1		0	1		1	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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0	15.0	15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99						0.99					
Frt		0.980			0.974				0.850		0.938	
Flt Protected	0.950	*0.772		0.950	*0.885		0.950	*0.795		0.950	*0.907	
Satd. Flow (prot)	1712	1363	0	1712	1553	0	1712	1433	1532	1712	1533	0
Flt Permitted	0.297			0.115			0.235			0.279		
Satd. Flow (perm)	530	1766	0	207	1755	0	420	1802	1532	503	1690	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			16				288		35	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			50			40			50	
Link Distance (m)		120.2			329.7			291.7			1148.3	
Travel Time (s)		10.8			23.7			26.3			82.7	
Volume (vph)	225	590	90	165	395	85	185	260	265	145	165	115
Confl. Peds. (#/hr)	13						7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	641	98	179	429	92	201	283	288	158	179	125
Lane Group Flow (vph)	245	739	0	179	521	0	201	283	288	158	304	0
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phases	5	2		1	6		3	8	8	7	4	
Minimum Initial (s)	7.0	15.0		7.0	15.0		7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	11.0	22.0		11.0	22.0		11.0	22.0	22.0	11.0	22.0	
Total Split (s)	11.0	46.0	0.0	11.0	46.0	0.0	11.0	22.0	22.0	11.0	22.0	0.0
Total Split (%)	12.2%	51.1%	0.0%	12.2%	51.1%	0.0%	12.2%	24.4%	24.4%	12.2%	24.4%	0.0%
Maximum Green (s)	7.0	41.0		7.0	41.0		7.0	17.0	17.0	7.0	17.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.0	3.5	
Recall Mode	None	C-Max		None	C-Max		None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	
Flash Dont Walk (s)		10.0			10.0			10.0	10.0		10.0	
Pedestrian Calls (#/hr)		0			0			0	0		0	
Act Effct Green (s)	49.0	42.0		49.0	42.0		25.0	18.0	18.0	25.0	18.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.28	0.20	0.20	0.28	0.20	
v/c Ratio	0.64	1.15		0.78	0.71		0.93	0.99	0.54	0.68	0.91	
Control Delay	12.2	103.3		37.7	25.1		73.7	88.1	8.1	39.9	63.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	12.2	103.3		37.7	25.1		73.7	88.1	8.1	39.9	63.6	

Lanes, Volumes, Timings
10: Tecumseh Rd. & Lesperance Rd.

PM peak hour
Future volumes with CR22 overpass; Alternative 4

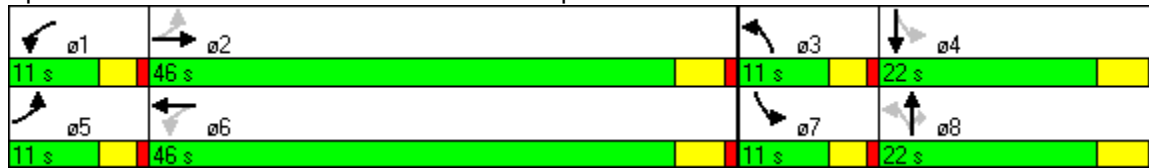


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	F		D	C		E	F	A	D	E	
Approach Delay		80.7			28.3			54.5			55.5	
Approach LOS		F			C			D			E	
Queue Length 50th (m)	14.6	~149.8		12.9	66.2		26.1	48.5	0.0	20.0	45.6	
Queue Length 95th (m)	12.8	#213.2		#43.7	103.8		#57.7	#96.3	19.9	#40.4	#92.3	
Internal Link Dist (m)		96.2			305.7			267.7			1124.3	
Turn Bay Length (m)	30.0			60.0			45.0		45.0	45.0		
Base Capacity (vph)	380	642		230	733		217	287	537	234	335	
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	0.64	1.15		0.78	0.71		0.93	0.99	0.54	0.68	0.91	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 57.2 Intersection LOS: E
 Intersection Capacity Utilization 88.9% ICU Level of Service E
 Analysis Period (min) 15
 * User Entered Value
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: Tecumseh Rd. & Lesperance Rd.



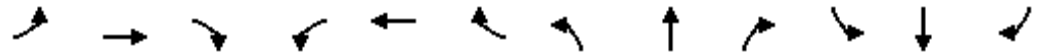
Lanes, Volumes, Timings
1: Tecumseh Rd. & Southfield Dr.

PM peak hour
Future volumes with CR22 overpass; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	30.0		0.0	30.0		0.0
Storage Lanes	1		1	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	4.0
Leading Detector (m)	15.0	15.0	15.0	15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850		0.996			0.858			0.878	
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1695	1784	1517	1695	1777	0	1695	1531	0	1695	1567	0
Fl _t Permitted	0.203			0.102			0.740			0.694		
Satd. Flow (perm)	362	1784	1517	182	1777	0	1320	1531	0	1238	1567	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			92		3			92			22	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		398.9			131.2			334.0			154.3	
Travel Time (s)		28.7			9.4			24.0			11.1	
Volume (vph)	20	830	85	45	670	20	70	5	85	20	5	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	22	902	92	49	728	22	76	5	92	22	5	22
Lane Group Flow (vph)	22	902	92	49	750	0	76	97	0	22	27	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phases	2	2	2	6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		21.0	21.0		21.0	21.0	
Total Split (s)	55.0	55.0	55.0	55.0	55.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	61.1%	61.1%	61.1%	61.1%	61.1%	0.0%	38.9%	38.9%	0.0%	38.9%	38.9%	0.0%
Maximum Green (s)	48.0	48.0	48.0	48.0	48.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0	10.0	10.0	10.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		20	20		20	20	
Act Effct Green (s)	71.9	71.9	71.9	71.9	71.9		13.7	13.7		13.7	13.7	
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80		0.15	0.15		0.15	0.15	
v/c Ratio	0.08	0.63	0.07	0.34	0.53		0.38	0.31		0.12	0.10	
Control Delay	4.2	8.1	1.0	11.5	6.1		38.8	10.8		32.6	15.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.2	8.1	1.0	11.5	6.1		38.8	10.8		32.6	15.8	

Lanes, Volumes, Timings
 1: Tecumseh Rd. & Southfield Dr.

PM peak hour
 Future volumes with CR22 overpass; modified configuration

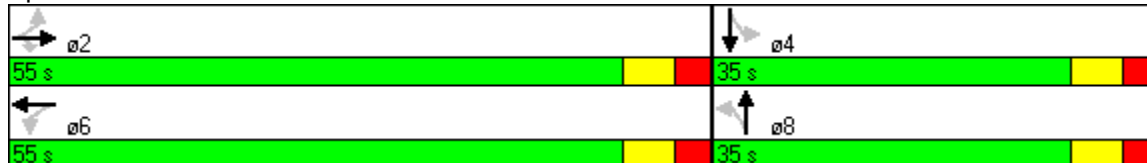


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A	A	B	A		D	B		C	B	
Approach Delay		7.4			6.4			23.1			23.3	
Approach LOS		A			A			C			C	
Queue Length 50th (m)	0.8	57.2	0.0	2.0	34.3		11.9	0.8		3.3	0.8	
Queue Length 95th (m)	3.1	114.2	3.5	m7.1	69.7		23.5	12.8		9.4	7.3	
Internal Link Dist (m)		374.9			107.2			310.0			130.3	
Turn Bay Length (m)	30.0			30.0			30.0			30.0		
Base Capacity (vph)	289	1425	1230	145	1420		455	588		426	554	
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	0.08	0.63	0.07	0.34	0.53		0.17	0.16		0.05	0.05	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 39 (43%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 8.7 Intersection LOS: A
 Intersection Capacity Utilization 63.5% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Tecumseh Rd. & Southfield Dr.



Lanes, Volumes, Timings
4: Tecumseh Rd. & Shawnee Rd.

PM peak hour
Future volumes with CR22 overpass; modified configuration

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		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	4.0
Leading Detector (m)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.993			0.946			0.921	
Flt Protected	0.950			0.950				0.971			0.980	
Satd. Flow (prot)	1695	1779	0	1695	1772	0	0	1639	0	0	1610	0
Flt Permitted	0.185			0.078				0.847			0.896	
Satd. Flow (perm)	330	1779	0	139	1772	0	0	1430	0	0	1472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			5			22			38	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		209.7			228.4			321.5			166.2	
Travel Time (s)		18.9			20.6			23.1			12.0	
Volume (vph)	40	865	20	20	680	35	30	0	20	25	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	43	940	22	22	739	38	33	0	22	27	0	38
Lane Group Flow (vph)	43	962	0	22	777	0	0	55	0	0	65	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phases	2	2		6	6		8	8		4	4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		22.0	22.0		22.0	22.0	
Total Split (s)	55.0	55.0	0.0	55.0	55.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	61.1%	61.1%	0.0%	61.1%	61.1%	0.0%	38.9%	38.9%	0.0%	38.9%	38.9%	0.0%
Maximum Green (s)	49.0	49.0		49.0	49.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		9.0	9.0		9.0	9.0	
Pedestrian Calls (#/hr)	0	0		0	0		20	20		20	20	
Act Effct Green (s)	76.2	76.2		76.2	76.2			12.6			12.6	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.14			0.14	
v/c Ratio	0.15	0.64		0.19	0.52			0.25			0.27	
Control Delay	4.6	5.3		7.5	5.2			24.6			19.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.6	5.3		7.5	5.2			24.6			19.5	

Lanes, Volumes, Timings
 4: Tecumseh Rd. & Shawnee Rd.

PM peak hour
 Future volumes with CR22 overpass; modified configuration



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A			C			B	
Approach Delay		5.2			5.3			24.6			19.5	
Approach LOS		A			A			C			B	
Queue Length 50th (m)	1.1	43.7		0.7	44.7			5.3			4.3	
Queue Length 95th (m)	m3.3	69.2		m1.8	m58.1			14.3			14.1	
Internal Link Dist (m)		185.7			204.4			297.5			142.2	
Turn Bay Length (m)	30.0			30.0								
Base Capacity (vph)	279	1506		118	1500			507			532	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.15	0.64		0.19	0.52			0.11			0.12	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 45 (50%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 6.3 Intersection LOS: A
 Intersection Capacity Utilization 61.8% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Tecumseh Rd. & Shawnee Rd.

