Renaissance Infrastructure Consulting

100% EMPLOYEE OWNED

TRAFFIC IMPACT STUDY

Heartland Market

Lee's Summit, MO

Prepared For:

Great American Dream LLC

Prepared By:

Renaissance Infrastructure Consulting

November 2022

November 23, 2022

Great American Dream LLC
Jack Hopkins
PO BOX 200
Raymore, MO 64083

RE: NE Colbern Road & NE Rice Road C-Store - Traffic Impact Study
Lee's Summit, MO

Dear Jack Hopkins,

In response to your request, RIC has completed a traffic impact study for a proposed Convenience Store to be located northeast of NE Colbern Road & Rice Road in Lee's Summit, MO. The purpose of this study was to assess the impact of the proposed development on the surrounding transportation system. The following report documents our analysis and recommendations.

Please do not hesitate to contact us should you have any questions.

Sincerely,

Renaissance Infrastructure Consulting

Grant Niehus, PE, PTOE
Traffic Engineer

Contents

1 Introduction

In response to your request, Renaissance Infrastructure Consulting (RIC) has completed the following Traffic Impact Study (TIS) for a proposed development in Lee's Summit, MO. The purpose of this study was to assess the impact of the proposed development on the existing roadway network. To evaluate the increase of traffic on adjacent streets, the number of trips in the AM and PM peak periods were estimated. Existing traffic counts were collected to conduct a capacity analysis at the study intersections. The study also includes analysis on access management and provides recommendations for proposed geometric and traffic control improvements that may be necessary for the proposed development.

Figure 1 – Project Location

2 Study Scope

Guidance provided by the City of Lee's Summit Access Management Code and MoDOT's Engineering Policy Guide were used in the development of this study and its associated scope.

2.1 Study Area

Based on discussions with the city and MoDOT, the study area for this TIS includes the following intersections:

- *Missouri Route 291 Northbound Ramp & NE Colbern Road*
- *NE Colbern Road & NE Rice Road*
- *NE Colbern Road & NE Todd George Parkway*
- *NE Colbern Road & Lucky Road*
- *NE Rice Road & Ikerd Road*
- *Lucky Road & Proposed East Driveway*

2.2 Analysis Scenarios

For this traffic study, analysis was completed for the following scenarios:

- *Existing Conditions*
- *Existing Plus Proposed Conditions*

2.3 Analysis Methodology

For all study intersections, trip generation estimates were developed for both the AM and PM peak hours using ITE's Trip Generation Manual, 11th Edition. Intersection Capacity Analysis was performed using PTV VISTRO 2022 which uses Highway Capacity Manual (HCM) methodology for the analysis.

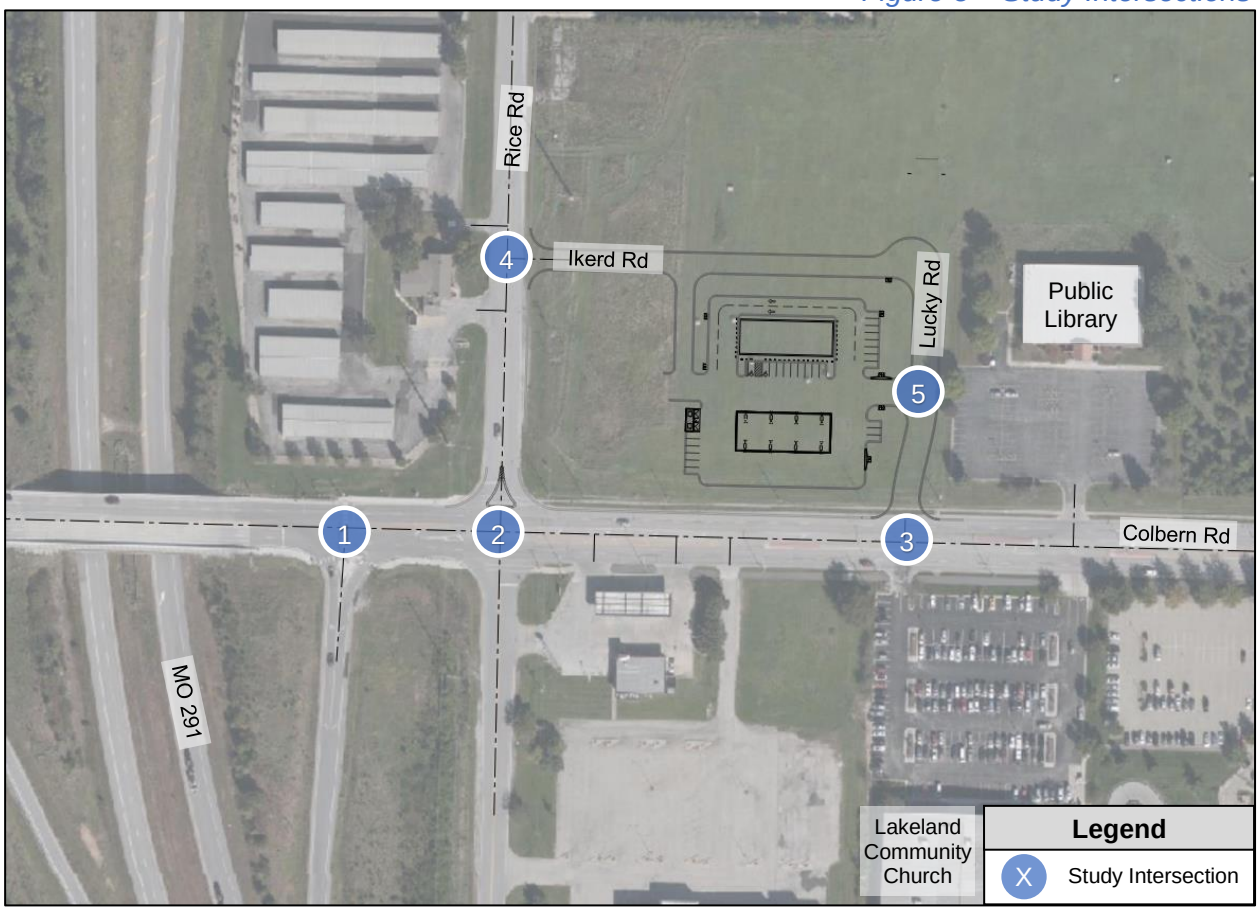
3 Project Description

The proposed development is located northeast of Colbern Road and Rice Road in Lee's Summit, MO. It will include a gas station with 16 fueling stations and an associated convenience store on an approximately 1.70 acre lot. The site plan for the proposed development is included in **Appendix A**.

The proposed development will be accessed through two driveways, one on a yet to be built public road that extends east from Rice Road, north of Colbern Road. The other driveway is located on another yet to be built public road that extends north from Colbern Road. Both public roads are

proposed to be constructed by the master developer of the larger property. Lucky Road will intersect Colbern Road approximately 511 feet east of Rice Road measured center-to-center, aligning with the existing driveway of Lakeland Community Church, located south of Colbern Road. The other proposed public road, Ikerd Road is located approximately 352 feet north of Colbern Road, measured center-to-center.

Figure 3 – Study Intersections



Note: NE Colbern Road & NE Todd George Parkway is located further east beyond the limits of the figure

3.1 Existing Street Network and Land Uses

Missouri Route 291 runs north/south and is located to the west of the proposed development. It is 4-lane divided roadway with a posted speed limit of 55 mph. It is classified as 'Other Principal Arterial' by MoDOT's Functional Classification Map and merges with Interstate 470 north of Colbern Road.

Northeast Colbern Road is located to the south of the proposed development. It is a 4-lane divided roadway supporting eastbound and westbound traffic with median openings and exclusive left turn lanes at each intersection. It is classified as 'Major Arterial' in Lee's Summit's Roadway Classification Map and has a posted speed limit of 40 mph.

Northeast Rice Road is located to the west of the proposed development. It is a 2-lane roadway supporting northbound and southbound traffic. It is classified as 'Commercial/ Industrial Collector' in Lee's Summit's Roadway Classification Map and has a posted speed limit of 45 mph to the north and 25 mph to the south of Colbern Road.

Table 3.1 – Roadway Characteristics

Roadway	Functional Classification	Posted Speed	Travel Lanes	Sidewalks
MO Route 291	Other Principal Arterial	55	4	No
NE Colbern Road	Major Arterial	40	4	Both Sides
NE Rice Road	Commercial/ Industrial Collector	45(1)	2	No

(1) 25 mph south of Colbern Road

The lot for the proposed development is currently vacant and is zoned as 'Planned Community Commercial (CP-2)' according to Lee's Summit's zoning map.

3.2 Existing Traffic Volumes

Traffic Counts were collected on August 9th, 2022, between 7:00 - 9:00 AM and 4:00 - 6:00 PM. The collected traffic data revealed that all the intersections had a peak hour window of 7:15 – 8:15 AM and 4:30 – 5:30 PM. A summary of existing traffic counts is included in **Appendix B.**

Traffic counts were also collected at the Public Library driveway on Colbern Road on October 4th and 6th between 7:00 – 9:00 AM and 4:00 – 6:00 PM.

3.3 Planned Colbern Road Improvements

Improvements to Colbern Road have been proposed by the master developer of the property that the Convenience Store/Gas Station is proposed to be located on. Those improvements include constructing a raised median on Colbern Road that restricts north and south Rice Road to right only movements. The median is planned to extend from Rice Road to Paradise Park Drive, with a break at the planned intersection of Lucky Road to provide a full-access intersection with eastbound and westbound left turn lanes. Note that the recommendations included in this study only include the projected traffic for the proposed gas station parcel, it does not account for future development in the larger site or surrounding area.

4 Proposed Conditions

4.1 Trip Generation

Trip generation estimates developed for this study are based on the 11th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). The Manual is the most widely used industry resource for this type of data. The trip generation data are organized by land use types, with more than 170 different categories of land uses. For each category, the manual provides a data set for use in estimating the number of vehicle and person trips generated by a site based on its characteristics such as physical size or intensity. Trips may be estimated by direction (entering or exiting the site) and for time periods typically pertaining to a full day (weekday or weekend), peak hours of the adjacent roadway, and peak hours of the particular land use. Used properly, the Trip Generation Manual provides an objective basis for estimating trips generated by a proposed development.

The ITE category Convenience Store/Gas Station was used to project traffic volumes for the proposed development using the listed intensity for the development. Both the AM and PM Peak hour trips were estimated based on projections from various studies included in ITE's Trip Generation Manual for the hours of 7-9 am & 4-6 pm, respectively. An average of 6,930 vehicles per day are expected to access the development for the Existing plus Proposed scenario.

Table 4a – Trip Generation

Land Use	Intensity	ITE Code	Weekday Trips	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
C-Store/Gas Station	5,400 S.F. 16 Fueling Positions	945	6,930	246	247	493	213	213	426

Convenience Store/Gas Station's typically generate significant pass-by vehicle trips, which represent trips which have other final destinations that are interrupted to visit the proposed development. Hence, pass-by trips do not add new traffic to the adjoining street system. The ITE Trip Generation Manual recommends an average pass-by rate of 76% for the AM Peak Hours and 75% for the PM Peak Hours for ITE Land Use 945, Convenience Store/Gas Station. For simplicity, an average pass-by rate of 75% for both the AM and PM peak periods was applied in this study.

As a general guideline, the number of pass-by trips assumed for a site should not exceed 10% of the adjacent street traffic. To check this, the calculated number of pass-by trips were compared to two-way volume on Colbern Road adjacent to the project site for each analysis hour. No more than 136 pass-by trips should be assumed for the AM peak hour analysis (10% of 1359), and 174 for the PM peak hour analysis (10% of 1733). The results of the pass-by reduction are included in **Table 3**.

Table 4b – Trip Generation w/ Pass-By Trip Reduction								
Land Use	Intensity	ITE Code	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
C-Store/Gas Station	5,400 S.F.	945	246	247	493	213	213	426
Pass-by Trips (1)			-68	-68	-136	-87	-87	-174
Total New Development Trips			**178**	**179**	**357**	**126**	**126**	**252**

(1) Pass-by Trips are reported as 10% of the adjacent, two-way, traffic on Colbern Road.

4.2 Trip Distribution

The traffic generated by the proposed development was distributed to the adjacent roadway system based on engineering judgement. It is anticipated that a significant portion of the primary trips (trips navigating to a destination and returning back to their original departure location) will be arriving on Colbern Road from the east and west directions. Remaining traffic will arrive from the north and south directions using Rice Road as shown in **Figure 4.2a**. PM trip distribution is higher to the west due to increased peak hour volume on nearby I-470.

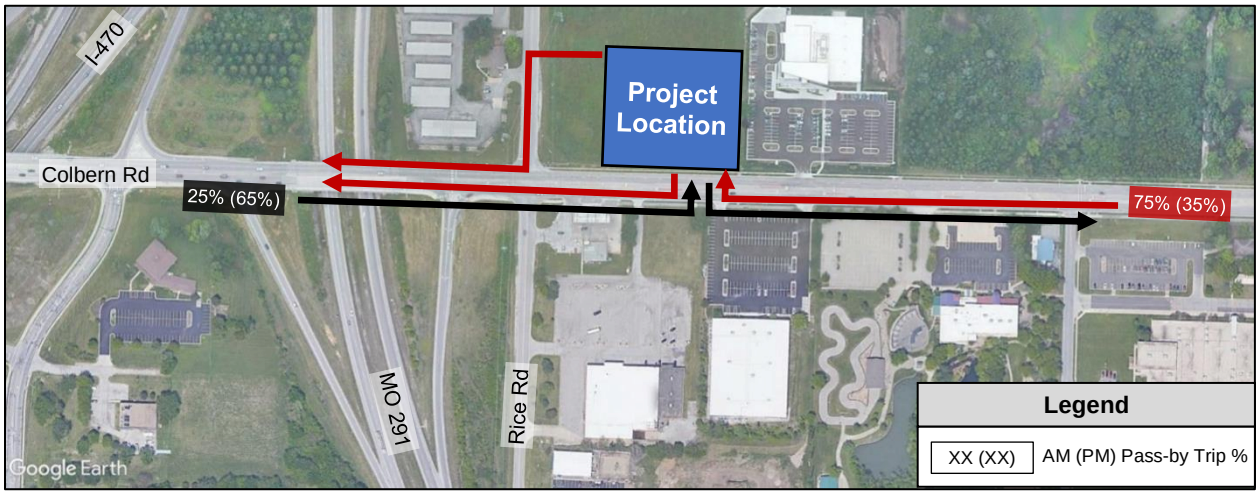
The trips arriving from the west and south directions will be required to use Lucky Road to access the development due to the right-in/right-out restriction at Rice Road. The trips from the north will access the development via Ikerd Road.

Figure 4.2a – Trip Distribution – Primary Trips

The pass-by trip percentage distribution for both AM and PM peak hours was based on adjacent street traffic volume on Colbern Road as shown in **Figure 4.2b**. All pass-by trips are expected to enter via Lucky Road. Traffic exiting and going east will be required to use Lucky Road and traffic

exiting to go west is expected to have a 50/50 split between Lucky Road and Rice Road.

Figure 4.2b – Trip Distribution - Pass-by Trips



4.3 Access Management

The curb radius requirements for the two proposed private driveways, one on Lucky Road and the other on Ikerd Road were analyzed against the Lee's Summit's design criteria. A minimum curb radius of 35 feet measured at the back of the curb is required for a driveway on a Commercial Collector. Both driveways are proposed with a 35-foot curb radius and meet city requirements.

The curb return of Lucky Road intersecting Colbern Road is currently proposed with a 25-foot radius. In order to meet city requirements for a Commercial Collector, the radius should be increased to 35 feet.

Lee's Summit requires a 28 ft. driveway width for a Low Volume approach and 42 ft. for a Medium Volume approach based on their Access Management Code. The driveway on Ikerd is expected to fall under the Low Volume approach classification and the driveway on Lucky Road is expected to fall under the Medium Volume driveway classification. Both driveways meet city requirements for driveway width.

The access spacing criteria for both proposed driveways were analyzed based on guidelines in Lee's Summit Access Management Code. The proposed driveway on Ikerd Road should be located at least 125 feet from Rice Road to meet city requirements for spacing on Commercial Local roads. The driveway on Ikerd Road, measured at approximately 225 feet from Rice Road, measured center-to-center, exceeds the minimum required spacing.

The proposed driveway on Lucky Road is located approximately 180 feet north of Colbern Road and does not meet the city spacing requirement of 300 feet, measured center-to-center, for a

Commercial Collector. It is recommended that a raised median be constructed on Lucky Road to prevent northbound left-turn vehicles into the development. The current spacing of approximately 180 feet would provide enough stacking distance for vehicles on the southbound approach of Colbern Road & Lucky Road. The raised median should be at least 4 feet in width. Through and turn lanes should be 12 feet in width for a total cross section of 44 feet, measured at back of curb.

Minimum throat length for each driveway was analyzed against Lee's Summit Access Management Code. The driveway on Ikerd Road should have a minimum throat length of 75 feet and the driveway on Lucky Road should have a minimum throat length of 100 feet based on the projected peak hour trips accessing each driveway and using an adjacent Roadway Classification of Collector. The throat length of the driveway on Ikerd Road, measured at 120 feet, exceeds the minimum requirement. However, the proposed driveway on Lucky Road, measured at 50 feet, does not meet the minimum requirement of 100 feet. However, with a restricted median proposed on Lucky Road, the queueing for exiting vehicles will be limited to traffic taking a right-turn from the development. Our analysis shows a 95th percentile queue length of 25 feet which is lower than the proposed throat length.

4.3.1 Turn Lane Requirements

All intersections within the study area were analyzed for turn lane requirements.

4.3.1.1 Colbern Road & Lucky Road

Lee's Summit's Access Management Code requires a minimum of 200 feet plus taper for left turn lanes on Arterial streets intersecting Collectors. The westbound left turn lane is currently proposed with a storage length of 122.5 feet. The storage length should be increased to 200 feet to meet city requirements. The taper should be designed with two 150-foot reverse curves.

The westbound left turn lane is currently proposed with a storage length of 81.61 feet. The storage length should be increased to 200 feet to meet city requirements. The taper should be designed with two 150-foot reverse curves. Due to the proposed limited access intersection at Colbern Road & Rice Road, it is expected that a significant amount of traffic will attempt a U-Turn maneuver at Lucky Road. It is recommended that the intersection be designed to support U-Turn movements by conducting a swept path analysis.

The projected volume for right turns onto Lucky Road from Colbern Road exceeds the threshold for constructing a right turn lane on Major Arterial Streets. The peak hour right-turn volume of 78 vehicles in the AM Peak hour and 56 vehicles in the PM Peak hour are greater than the 30 vehicles per hour threshold as documented in the city's Access Management Code. It is recommended that a right turn lane be constructed with a storage length of 150 feet and taper length of 150 feet. The taper should start prior to the existing library driveway and extend through it.

4.3.1.2 Colbern Road & Rice Road

The westbound left turn lane at Colbern Road & Rice Road will not have enough room to construct a full 200-foot left turn lane if a full 200-foot eastbound left turn is constructed at Lucky Road. The results of the capacity analysis showed a larger expected queue length for the left turn lane at Lucky Road so it is recommended that the full 200-foot length be provided there and a storage length of 135 feet be provided for the westbound left turn lane at Rice Road.

4.3.1.3 Colbern Road & MO-291 NB Ramp

There are no turning movements on Colbern Road at this intersection, so no changes are recommended.

4.3.1.4 Lucky Road & Ikerd Road

The projected volume for northbound left turns at Lucky Road & Ikerd Road is above 30 vehicles per hour which is above the city's threshold for providing an auxiliary left turn lane on a collector. The proposed available storage space of 170 feet between Colbern Road and Ikerd Road will not allow the full storage length of 150 feet to be provided to the northbound left turn lane and southbound turn lane at Colbern Road. Based on the operational analysis, it is recommended that a storage length of 60 feet be provided for the northbound left turn lane and 125 feet for the southbound left turn lane at Colbern Road.

No other turn lane modifications or additions are recommended.

5 Intersection Capacity Analysis

To analyze the existing traffic, operating conditions were analyzed using PTV Vistro, a macroscopic analysis and optimization software. PTV Vistro is based on study procedures outlined in the Highway Capacity Manual, 7th edition. The analysis determines the "Level of Service" of the intersections and is based on factors such as the number and types of lanes, signal timing, traffic volumes, pedestrian activity, etc. This manual, which is used universally by traffic engineers to measure roadway capacity, establishes six levels of traffic service: Level A ("Free Flow") to Level F ("Fully Saturated").

Table 5 – Level of Service Criteria		
Level of Service	**Signalized Intersection (sec/veh)**	**Unsignalized Intersection (sec/veh)**
A	< 10 seconds	< 10 seconds
B	< 20 seconds	< 15 seconds
C	< 35 seconds	< 25 seconds
D	< 55 seconds	< 35 seconds
E	< 80 seconds	< 50 seconds
F	≥ 80 seconds	≥ 50 seconds

Level of Service "D" is typically considered the minimum acceptable LOS, however in some cases Level of Service "E" is acceptable in peak times. The above table shows the thresholds for Levels of Service A through F for unsignalized intersections.

Intersection capacity analysis was performed for Existing Conditions and Existing + Proposed Conditions scenarios. Detailed capacity analysis can be found in **Appendix C**.

5.1 MO-291 Northbound Ramp & NE Colbern Road

Table 5.1 summarizes the LOS, control delay, and 95th percentile queue lengths at the existing ramp off MO-291.

Table 5.1 – MO-291 Northbound Ramp & NE Colbern Road

Condition	Measure	NB		EB	WB	Intersection
		NBL	NBR	EBT	WBT	LOS (Delay)
AM Peak Hour						
Existing Conditions	LOS (Delay)	D (46.6)		A (3.1)	A (4.7)	A (8.3)
	95% Queue	173'	173'	28'	124'	
Existing plus Proposed Conditions	LOS (Delay)	D (46.6)		A (3.3)	A (5.2)	A (8.1)
	95% Queue	172'	172'	38'	156'	
PM Peak Hour						
Existing Conditions	LOS (Delay)	B (16.7)		A (6.3)	A (5.7)	A (6.8)
	95% Queue	42'	42'	43'	30'	
Existing plus Proposed Conditions	LOS (Delay)	B (16.7)		A (6.3)	A (5.8)	A (6.8)
	95% Queue	41'	41'	43'	30'	

As shown in **Table 5.1**, the intersection is expected to operate with acceptable conditions in both the Existing conditions and Existing and Proposed conditions scenarios.

5.2 NE Colbern Road & NE Rice Road

Table 5.2 summarizes the LOS, control delay, and 95th percentile queue lengths at the intersection of Colbern Road and Rice Road.

Table 5.2 – NE Colbern Road & NE Rice Road

Condition	Measure	NB	SB	EB			WB		
		NBLTR	SBLTR	EBL	EBT	EBTR	WBL	WBT	WBTR
AM Peak Hour									
Existing Conditions	LOS (Delay)	D (31.4)	C (17.1)	A (0.8)			A (0.1)		
	95% Queue	25'	25'	25'	25'	25'	25'	25'	25'
Existing plus Proposed Conditions	LOS (Delay)	B (10.3)*	C (16.9)*	-	A (0.0)		A (0.3)		
	95% Queue	25'*	33*	-	25'	25'	25'	25'	25'
PM Peak Hour									
Existing Conditions	LOS (Delay)	F (108.7)	D (33.7)	A (0.5)			A (0.2)		
	95% Queue	70'	53'	25'	25'	25'	25'	25'	25'
Existing plus Proposed Conditions	LOS (Delay)	C (15.6)*	B (12.1)*	-	A (0.0)		A (0.7)		
	95% Queue	25'*	25'*	-	25'	25'	25'	25'	25'

* Restricted to right-in/right-out access.

As shown in **Table 5.2**, the northbound approach operatses with a LOS D and F in the Existing Condition scenario for the AM and PM peak period, respectively.

In the Existing plus Proposed Conditions, the southbound and northbound approach is planned to operate as a right-in/right-out approach due to the proposed raised median and is expected to operate with an acceptable LOS.

5.3 NE Colbern Road & NE Lucky Road

Table 5.3 summarizes the LOS, control delay, and 95th percentile queue lengths at the intersection of Colbern Road and Lucky Road.

Table 5.3 – NE Colbern Road & Lucky Road

Condition	Measure	NB	SB		EB			WB			Intersection
		NBLTR	SBLT	SBR	EBL	EBT	EBTR	WBL	WBT	WBR	LOS (Delay)
AM Peak Hour											
Existing plus Proposed Conditions (Stop Controlled)	LOS (Delay)	F (81.1)	F (288.7)		B (11.4)			A (0.0)			
	95% Queue	25'	168'	25'	98'	25'	25'	25'	25'	25'	
Existing plus Proposed Conditions (Signalized)	LOS (Delay)	A (0.0)	C (20.3)		A (8.2)			B (16.0)			B (13.8)
	95% Queue	25'	26'	28'	37'	35'	35'	25'	210'	25'	

Condition	Measure	NB	SB		EB			WB			Intersection
		NBLTR	SBLT	SBR	EBL	EBT	EBTR	WBL	WBT	WBR	LOS (Delay)
PM Peak Hour											
Existing plus Proposed Conditions (Stop Controlled)	LOS (Delay)	F (551.0)	F (1232.8)		A (2.7)			A (0.0)			
	95% Queue	61'	409'	25'	50'	25'	25'	25'	25'	25'	
Existing plus Proposed Conditions (Signalized)	LOS (Delay)	C (23.1)	B (13.4)		B (11.7)			B (16.2)			B (13.2)
	95% Queue	25'	44'	25'	48'	168'	168'	25'	110'	25'	

As shown in **Table 5.4**, both northbound and southbound approaches are expected to have a LOS F, with the southbound approach having an average delay per vehicle of over 15 minutes.

A second scenario was developed that modeled the intersection as a signal. (See Section 6 for Signal Warrant Analysis) The intersection is expected to operate with an acceptable LOS in this scenario.

5.4 NE Rice Road & NE Ikerd Road

Table 5.4 summarizes the LOS, control delay, and 95th percentile queue lengths at the intersection of Rice Road and Ikerd Road.

Table 5.4 – NE Rice Road & Ikerd Road

Condition	Measure	NB	SB	WB
		NBLTR	SBLTR	WBLTR
AM Peak Hour				
Existing plus Proposed Conditions	LOS (Delay)	A (0.0)	A (2.1)	A (9.5)
	95% Queue	25'	25'	25'
PM Peak Hour				
Existing plus Proposed Conditions	LOS (Delay)	A (0.0)	A (2.5)	A (9.7)
	95% Queue	25'	25'	25'

As shown in **Table 5.4**, the intersection is expected to operate with acceptable conditions for the Existing Conditions and Existing Conditions plus Proposed scenario.

5.5 NE Colbern Road & NE Todd George Parkway

Table 5.5 summarizes the LOS, control delay, and 95th percentile queue lengths at the intersection of Colbern Road and Todd George Parkway.

Table 5.5 – NE Colbern Rd & NE Todd George Parkway

Condition	Measure	NB			SB			EB			WB			Intersection
		NBL	NBT	NBR	SBL	SBT	SBTR	EBL	EBT	EBR	WBL	WBT	WBTR	LOS (Delay)
AM Peak Hour														
Existing Conditions	LOS (Delay)	B (13.8)			B (13.0)			B (13.5)			B (15.4)			B (14.5)
	95% Queue	87'	129'	25'	25'	25'	25'	25'	35'	25'	25'	183'	175'	
Existing plus Proposed Conditions	LOS (Delay)	B (14.0)			B (13.2)			B (13.5)			B (15.5)			B (14.6)
	95% Queue	88'	131'	25'	25'	25'	25'	25'	40'	25'	25'	191'	182'	
PM Peak Hour														
Existing Conditions	LOS (Delay)	B (15.0)			B (14.1)			B (16.6)			B (14.6)			B (15.3)
	95% Queue	41'	118'	25'	79'	79'	78'	25'	170'	46'	25'	96'	92'	
Existing plus Proposed Conditions	LOS (Delay)	B (15.3)			B (14.4)			B (16.7)			B (14.7)			B (15.4)
	95% Queue	42'	120'	25'	81'	80'	79'	25'	178'	46'	25'	103'	98'	

As shown in **Table 5.3**, the intersection is expected to operate with acceptable conditions in both the Existing Conditions and Existing plus Proposed Conditions scenarios.

5.6 NE Lucky Road & Proposed East Driveway

Table 5.6 summarizes the LOS, control delay, and 95th percentile queue lengths at the intersection of NE Lucky Road & Proposed East Driveway.

Table 5.6 – NE Lucky Road & Proposed East Driveway

Condition	Measure	NB	SB	EB
		NBT	SBTR	EBR
AM Peak Hour				
Existing plus Proposed Conditions	LOS (Delay)	A (0.0)	A (0.0)	A (9.2)
	95% Queue	25'	25'	25'
PM Peak Hour				
Existing plus Proposed Conditions	LOS (Delay)	A (0.0)	A (0.0)	A (9.2)
	95% Queue	25'	25'	25'

As shown in **Table 5.6**, the intersection is expected to operate with acceptable conditions in the Existing plus Proposed Conditions scenario.

6 Signal Warrant Analysis

Traffic signal warrants were evaluated for the intersection of Colbern Road & Lucky Road for the Existing + Proposed scenario. To warrant traffic signalization, an intersection must satisfy one or more of the nine warrants presented in the MUTCD. However, the satisfaction of a signal warrant shall not in itself require the installation of a traffic signal.

The nine warrants outlined in the MUTCD are as follows:

- *Warrant 1, Eight-Hour Vehicular Volume*
- *Warrant 2, Four-Hour Vehicular Volume*
- *Warrant 3, Peak Hour*
- *Warrant 4, Pedestrian Volume*
- *Warrant 5, School Crossing*
- *Warrant 6, Coordinated Signal System*
- *Warrant 7, Crash Experience*
- *Warrant 8, Roadway Network*
- *Warrant 9, Intersection Near a Grade Crossing*

For the purpose of this study process, the traffic signal warrant evaluation was limited to Signal Warrant 3 for the existing plus proposed condition. Warrant 1 and 2 were not evaluated since the intersections were analyzed for a future proposed scenario. A brief description of the warrant, based on traffic volumes, as presented in the MUTCD is provided as follows:

6.1 Signal Warrant 3 - Peak-hour volume

The Peak Hour Signal Warrant is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. This warrant is intended to apply for unusual cases where a facility generates or attracts an unusual amount of traffic over a short time.

Colbern Road & Lucky Road was analyzed against this warrant, and it was observed that a signal was warranted for the Existing + Proposed scenario. The signal warrant analysis was conducted in accordance with the methodology presented in Chapter 4C of the MUTCD. A detailed summary of the Signal Warrant Analysis is included in **Appendix D**.

Figure 6.1 – Peak Hour Warrant

Warrant 3: Peak Hour Volume **100%**

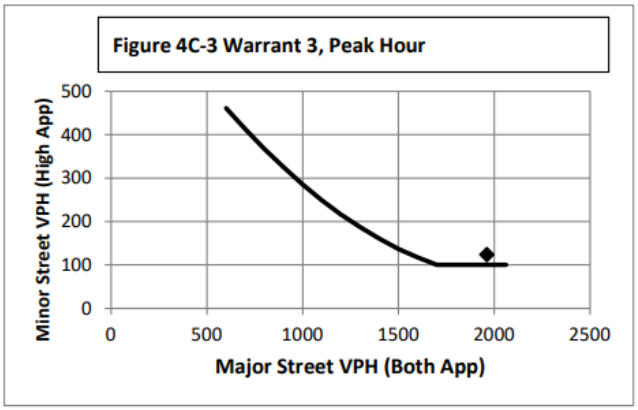
Warrant Evaluated? Yes **Warrant Satisfied? Yes** **Manually Set To:**

Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	4	
Volume on Minor Approach	100	Yes
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
16:00	1961	124



7 Summary

RIC completed the preceding analysis to study the traffic impacts associated with a proposed development located northeast of NE Colbern Road & Rice Road in Lee's Summit, MO.

Based on the traffic analysis completed for the Existing Conditions scenario, the following summary is provided:

- All study intersections currently operate with an acceptable LOS except for the northbound approach at Colbern Road and Rice Road, with a LOS F for the PM Peak Hour.

Based on the traffic analysis completed for the Existing plus Proposed Conditions scenario, the following summary is provided.

- The curb return of Lucky Road intersecting Colbern Road is currently proposed with a 25-foot radius. To meet city requirements for a Commercial Collector, the radius should be increased to 35 feet, measured at the back of curb.

- The proposed location of the gas station driveway on Lucky Road does not meet the city requirement of 300 feet spacing for driveways on Commercial Collectors. It is recommended that a raised median be constructed on Lucky Road to restrict left turns from the development and northbound left-turn vehicles into the development. The current spacing of approximately 180 feet would provide enough stacking distance for vehicles on the southbound approach of Colbern Road & Lucky Road. The raised median should be at least 4 feet in width. Through and turn lanes should be 12 feet in width for a total cross

section of 44 feet, measured at back of curb.

- The throat length of the proposed driveway on Lucky Road does not meet the minimum requirement of 100 feet. However, the 95th percentile queue length for exiting vehicles from the development was determined to be 25 feet, lower than the proposed throat length of 50 feet.

- The westbound left-turn lane at Colbern Road and Rice Road should be constructed with a storge length of 135 feet and a taper with two 150-foot reverse curves.

- A northbound left turn lane should be constructed on Lucky Road & Ikerd Road with a storage length of 60 feet.

- The southbound left turn lane on Lucky Road & Colbern Road should have a storage length of 125 feet.

- The westbound and eastbound left-turn lanes at Colbern Road & Lucky Road should be constructed with a storage length of 200 feet and a taper with two 150-foot reverse curves.

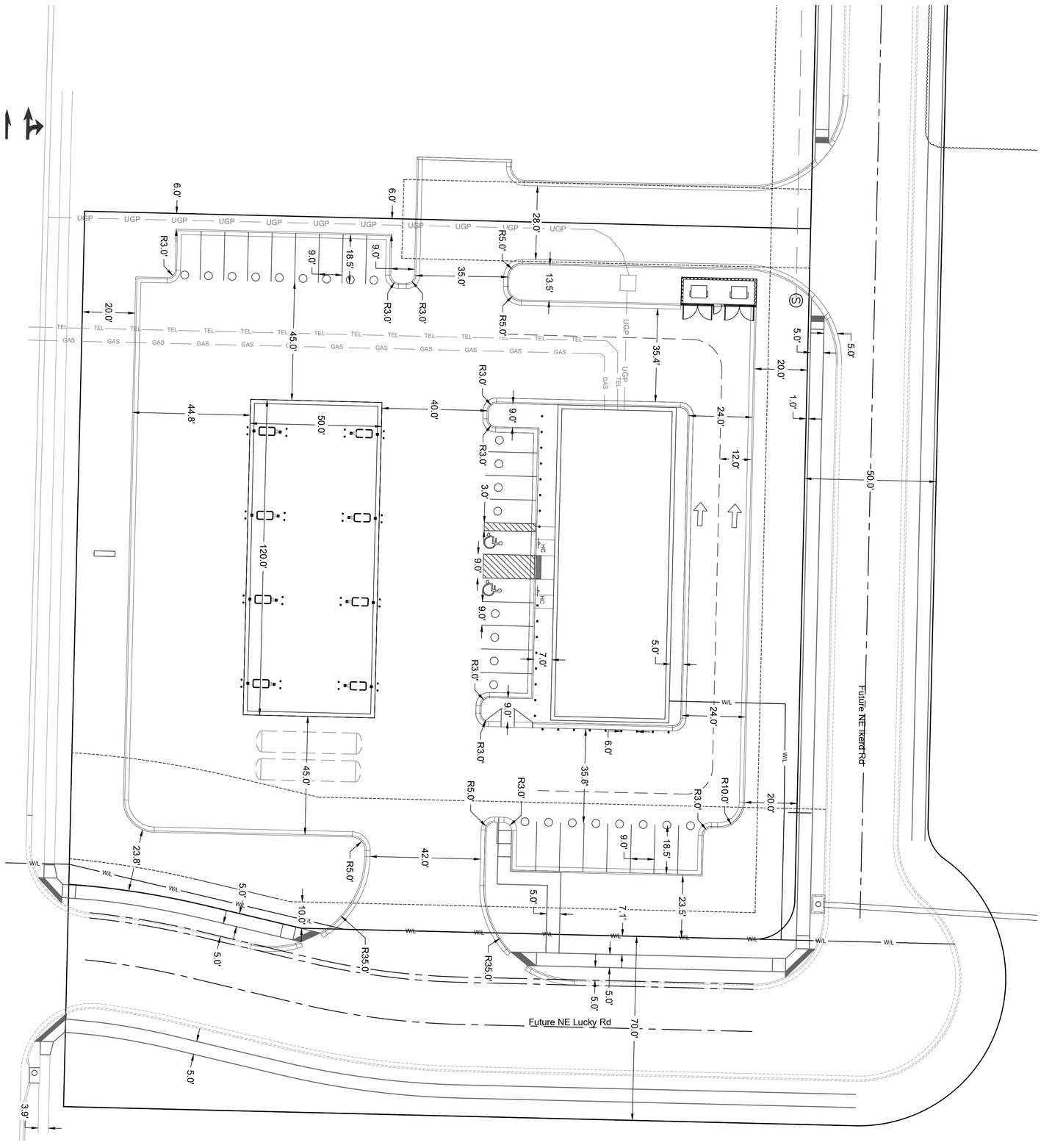
- It is recommended that the intersection of Colbern Road & Lucky Road be designed to support eastbound left U-Turn movements.

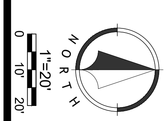
- A right-turn lane is required to be constructed at Colbern Road & Lucky Road to meet city requirements. A storage length of 150 feet plus 150-foot straight lane taper should be provided. The taper should start prior to the existing library driveway and extend through it.

- The proposed intersection of Colbern Road & Lucky Road meets peak hour signal warrants and is recommended to be designed as a signalized intersection.

- All study intersections are expected to operate with acceptable conditions for the Existing plus Proposed conditions with recommended improvements.

Appendix A - Site Plan





Sheet
C03

Renaissance Infrastructure Consulting
400 E 17th Street
Kansas City, Missouri 64108
816.800.0950
www.ric-consult.com

DRAWN BY: ZM
CHECKED BY: DB

NO.	DATE	REVISION
1	09/20/2022	PDP Submittal
2	10/17/2022	Revised Per City Comments

Dimension Plan

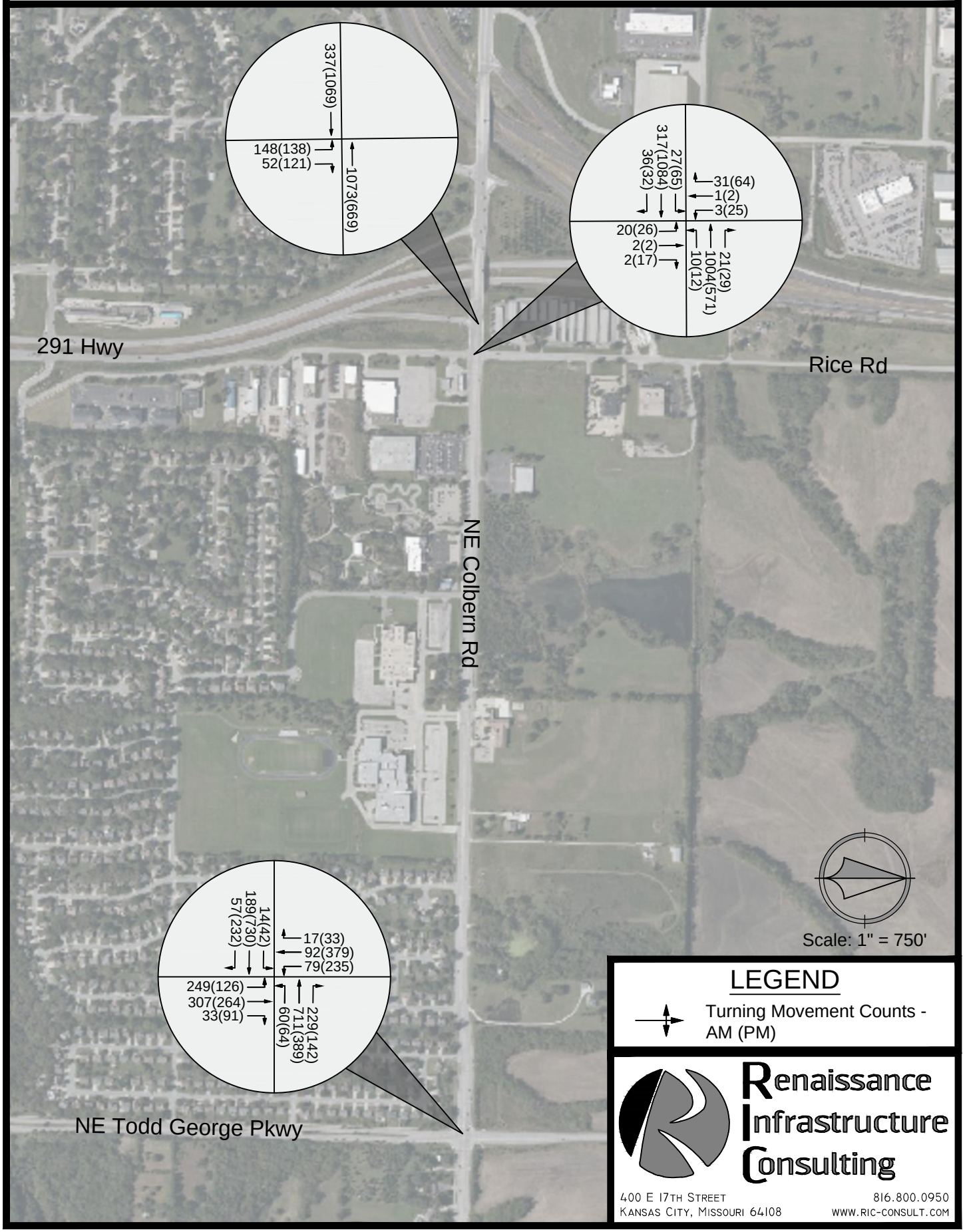
Preliminary Development Plans

22-0133
Heartland Market - Lee's Summit
Lee's Summit, Jackson County, Missouri

MO Certificate of Authority: E-2010033630

Appendix B - Traffic Volumes

Volume - Existing Conditions



LEGEND

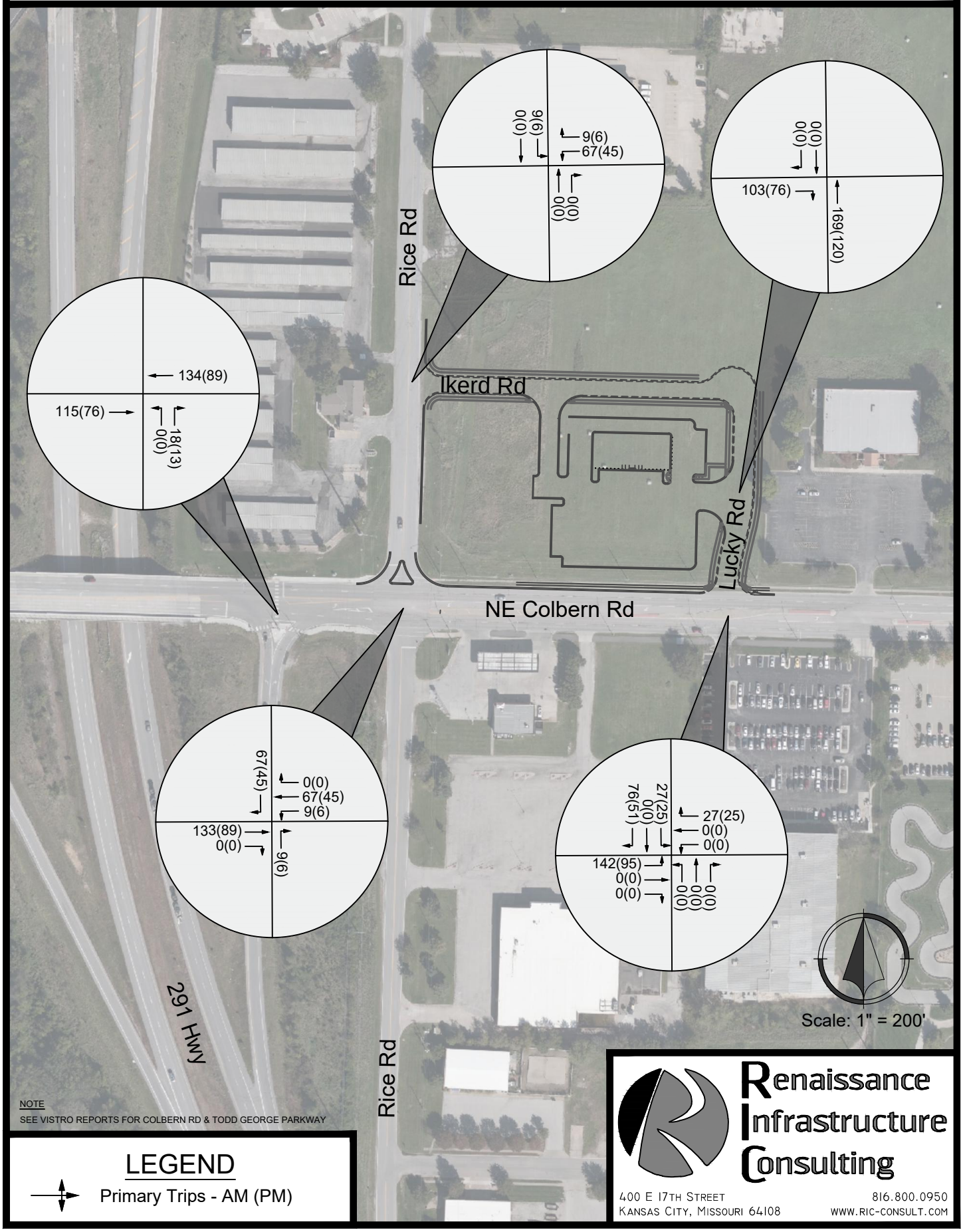
Turning Movement Counts - AM (PM)

Renaissance Infrastructure Consulting

400 E 17th Street
Kansas City, Missouri 64108

816.800.0950
www.ric-consult.com

Primary Trips - Existing Plus Proposed Conditions



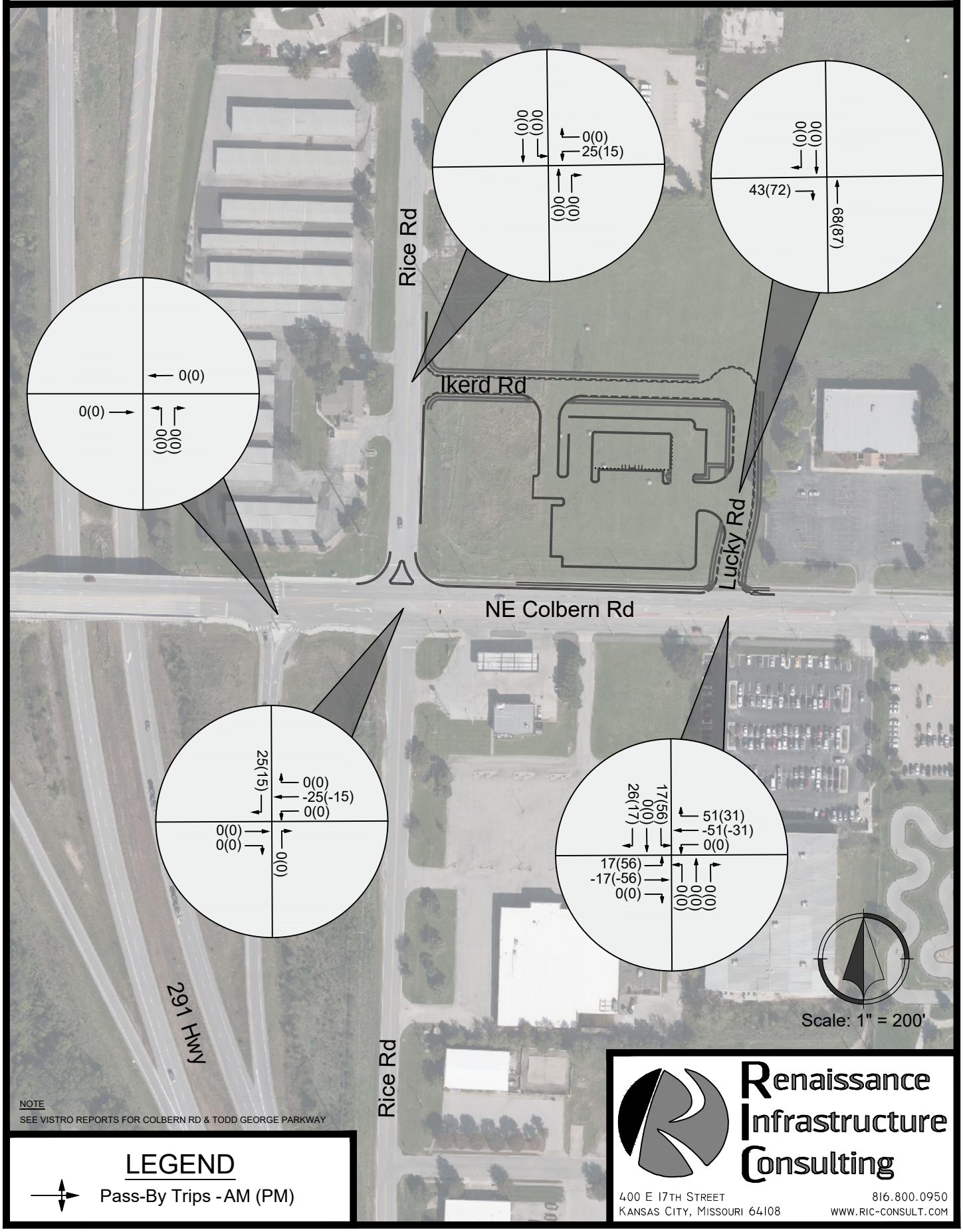
NOTE
SEE VISTRO REPORTS FOR COLBERN RD & TODD GEORGE PARKWAY

LEGEND

Primary Trips - AM (PM)

Renaissance Infrastructure Consulting
400 E 17th Street
Kansas City, Missouri 64108
816.800.0950
www.ric-consult.com

Pass-By Trips - Existing Plus Proposed Conditions



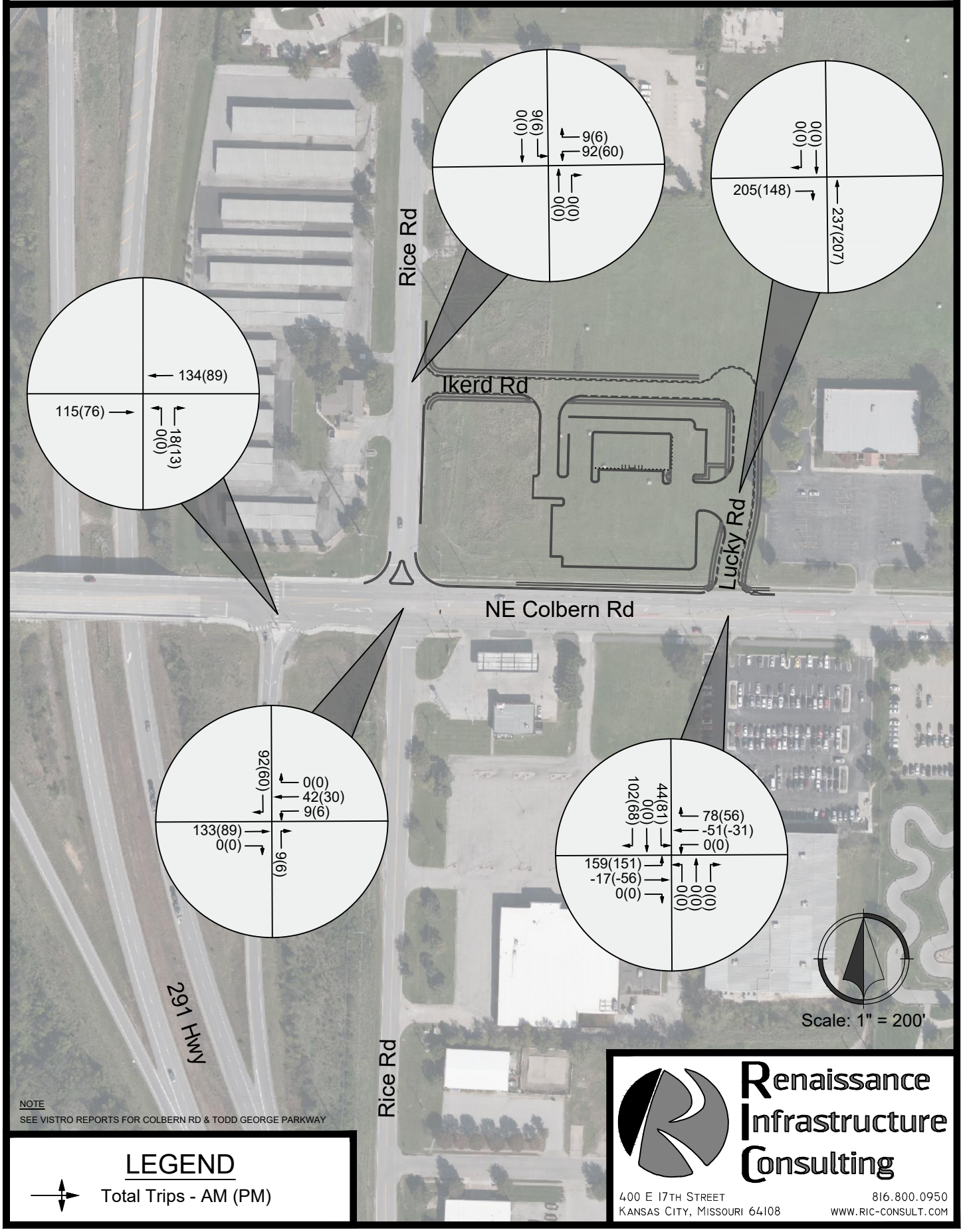
NOTE
SEE VISTRO REPORTS FOR COLBERN RD & TODD GEORGE PARKWAY

LEGEND

Pass-By Trips - AM (PM)

Renaissance Infrastructure Consulting
400 E 17th Street
Kansas City, Missouri 64108
816.800.0950
www.ric-consult.com

Total Trips - Existing Plus Proposed Conditions



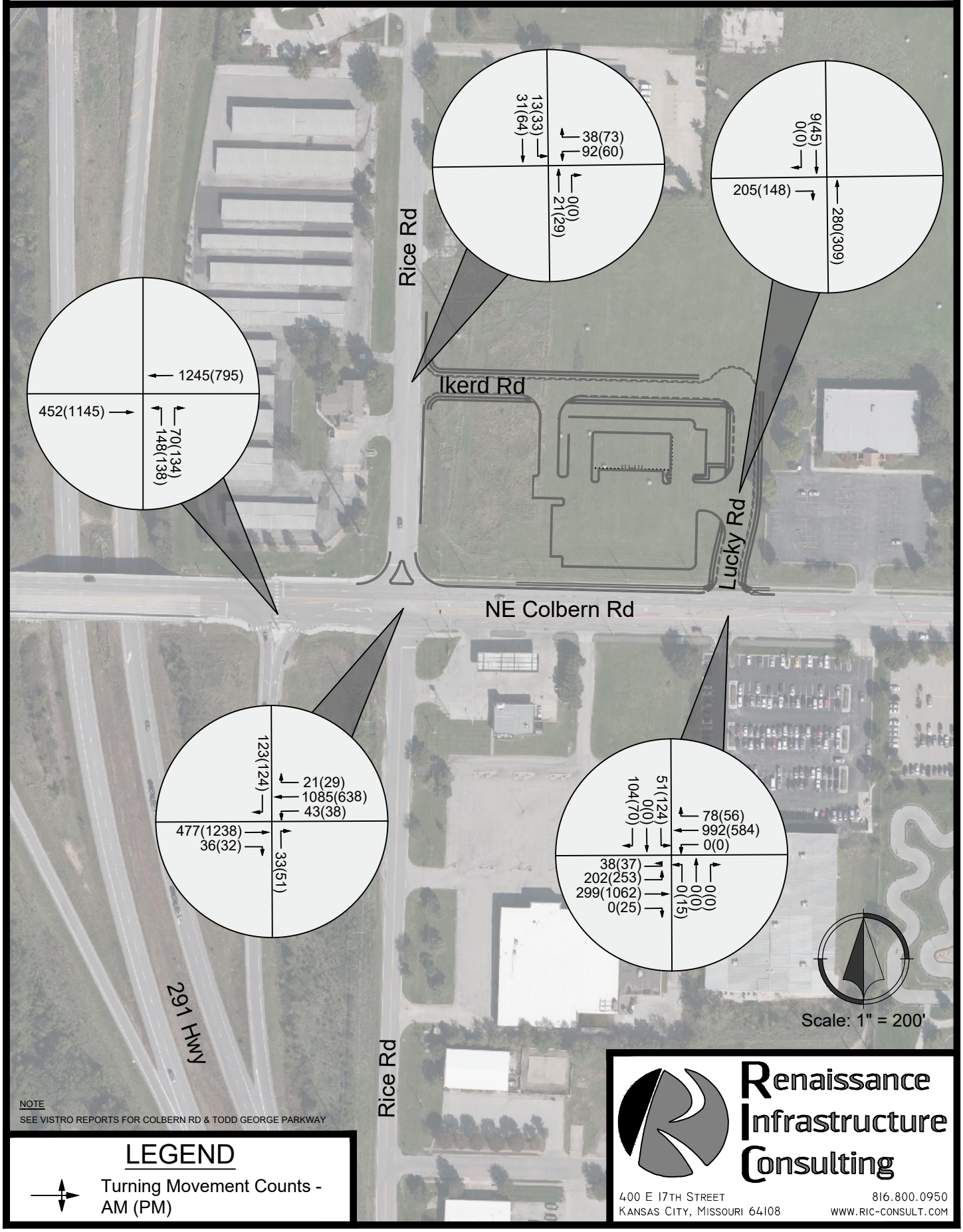
NOTE
SEE VISTRO REPORTS FOR COLBERN RD & TODD GEORGE PARKWAY

LEGEND

Total Trips - AM (PM)

Renaissance Infrastructure Consulting
400 E 17th Street
Kansas City, Missouri 64108
816.800.0950
www.ric-consult.com

Turning Movement Counts - Existing Plus Proposed Conditions w/ Improvements



NOTE

SEE VISTRO REPORTS FOR COLBERN RD & TODD GEORGE PARKWAY

LEGEND

Turning Movement Counts - AM (PM)

Renaissance Infrastructure Consulting

400 E 17th Street
Kansas City, Missouri 64108

816.800.0950
www.ric-consult.com

Trip Generation Data for Adjacent Properties

Peak Hour

Date: 10/04/2022

	Colbern Road & Library Driveway							
	NB		SB		EB		WB	
	L	R	L	R	L	R	L	R
4:00 PM	0	0	3	9	8	0	0	7
4:15 PM	0	0	4	14	3	0	0	2
4:30 PM	0	1	2	8	10	0	0	2
4:45 PM	0	1	4	10	15	0	2	10
5:00 PM	7	1	6	14	6	0	2	3
5:15 PM	8	3	6	12	4	3	8	5
5:30 PM	6	5	4	6	13	2	6	1
5:45 PM	0	2	4	5	10	2	0	2

	Colbern Road & Lakeland Church West Driveway							
	NB		SB		EB		WB	
	L	R	L	R	L	R	L	R
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	10	0	0
5:15 PM	0	0	0	0	0	15	0	0
5:30 PM	0	0	0	0	0	2	0	0
5:45 PM	0	0	0	0	0	1	0	0

Date: 10/06/2022

	Colbern Road & Library Driveway							
	NB		SB		EB		WB	
	L	R	L	R	L	R	L	R
7:00 AM	0	0	0	2	2	0	0	0
7:15 AM	0	0	1	0	1	0	0	0
7:30 AM	0	0	0	0	3	0	0	1
7:45 AM	0	0	2	2	4	0	0	3
8:00 AM	0	0	2	3	6	0	0	1
8:15 AM	0	0	0	3	3	0	0	1
8:30 AM	0	0	0	6	5	0	1	3
8:45 AM	0	0	0	3	8	0	0	2

	Colbern Road & Lakeland Church West Driveway							
	NB		SB		EB		WB	
	L	R	L	R	L	R	L	R
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0

Colbern Rd & Rice Rd - TMC

Tue Aug 9, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976528, Location: 38.946176, -94.359562

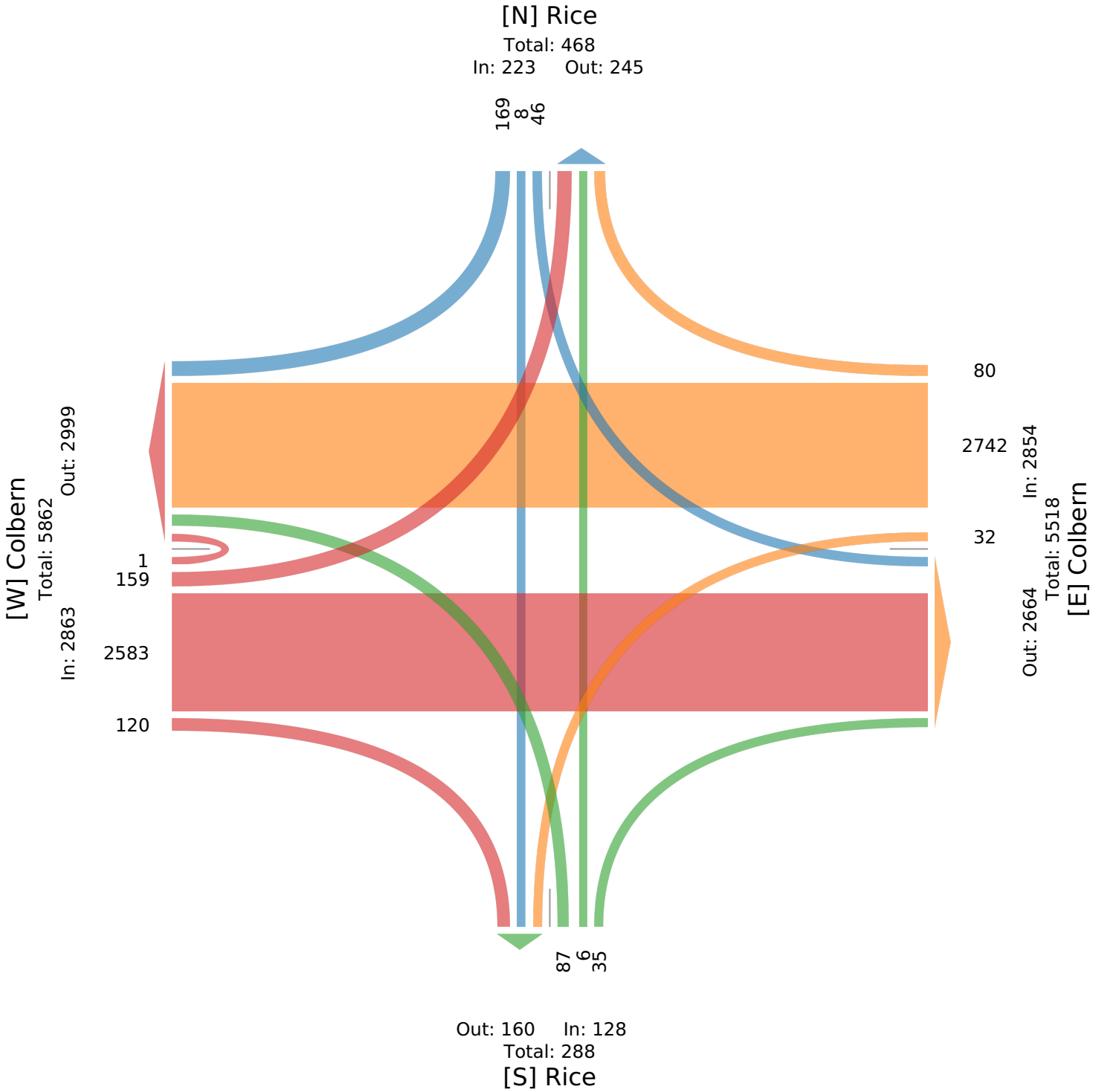
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Rice					Rice					Colbern					Colbern					
Direction	Northbound					Southbound					Eastbound					Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2022-08-09 7:00AM	1	1	1	0	**3**	2	0	4	0	**6**	2	41	1	0	**44**	1	211	6	0	**218**	**271**
7:15AM	8	0	0	0	**8**	1	0	8	0	**9**	10	70	5	0	**85**	2	257	7	0	**266**	**368**
7:30AM	6	0	2	0	**8**	0	0	8	0	**8**	10	86	11	0	**107**	5	269	8	0	**282**	**405**
7:45AM	4	1	0	0	**5**	2	0	9	0	**11**	6	77	15	1	**99**	2	280	5	0	**287**	**402**
Hourly Total	19	2	3	0	**24**	5	0	29	0	**34**	28	274	32	1	**335**	10	1017	26	0	**1053**	**1446**
8:00AM	2	1	0	0	**3**	0	1	6	0	**7**	1	84	5	0	**90**	1	198	1	0	**200**	**300**
8:15AM	10	1	3	0	**14**	1	2	6	0	**9**	6	82	5	0	**93**	1	171	2	0	**174**	**290**
8:30AM	1	0	0	0	**1**	3	1	8	0	**12**	9	82	7	0	**98**	0	135	2	0	**137**	**248**
8:45AM	4	0	1	0	**5**	3	0	15	0	**18**	11	82	9	0	**102**	1	150	6	0	**157**	**282**
Hourly Total	17	2	4	0	**23**	7	4	35	0	**46**	27	330	26	0	**383**	3	654	11	0	**668**	**1120**
4:00PM	7	0	3	0	**10**	3	1	15	0	**19**	19	210	9	0	**238**	2	128	7	0	**137**	**404**
4:15PM	5	0	1	0	**6**	2	1	15	0	**18**	9	198	5	0	**212**	2	124	5	0	**131**	**367**
4:30PM	7	0	5	0	**12**	10	1	20	0	**31**	23	250	5	0	**278**	1	132	7	0	**140**	**461**
4:45PM	6	1	3	0	**10**	6	0	12	0	**18**	18	266	11	0	**295**	3	147	8	0	**158**	**481**
Hourly Total	25	1	12	0	**38**	21	3	62	0	**86**	69	924	30	0	**1023**	8	531	27	0	**566**	**1713**
5:00PM	8	1	4	0	**13**	5	1	19	0	**25**	14	268	6	0	**288**	3	130	9	0	**142**	**468**
5:15PM	5	0	5	0	**10**	4	0	13	0	**17**	10	300	10	0	**320**	5	162	5	0	**172**	**519**
5:30PM	8	0	6	0	**14**	2	0	6	0	**8**	4	257	10	0	**271**	3	116	2	0	**121**	**414**
5:45PM	5	0	1	0	**6**	2	0	5	0	**7**	7	230	6	0	**243**	0	132	0	0	**132**	**388**
Hourly Total	26	1	16	0	**43**	13	1	43	0	**57**	35	1055	32	0	**1122**	11	540	16	0	**567**	**1789**
Total	87	6	35	0	**128**	46	8	169	0	**223**	159	2583	120	1	**2863**	32	2742	80	0	**2854**	**6068**
% Approach	68.0%	4.7%	27.3%	0%	**-**	20.6%	3.6%	75.8%	0%	**-**	5.6%	90.2%	4.2%	0%	**-**	1.1%	96.1%	2.8%	0%	**-**	-
% Total	1.4%	0.1%	0.6%	0%	**2.1%**	0.8%	0.1%	2.8%	0%	**3.7%**	2.6%	42.6%	2.0%	0%	**47.2%**	0.5%	45.2%	1.3%	0%	**47.0%**	-
Lights	87	3	34	0	**124**	46	8	164	0	**218**	157	2542	108	1	**2808**	30	2698	80	0	**2808**	5958
% Lights	100%	50.0%	97.1%	0%	**96.9%**	100%	100%	97.0%	0%	**97.8%**	98.7%	98.4%	90.0%	100%	**98.1%**	93.8%	98.4%	100%	0%	**98.4%**	98.2%
Articulated Trucks	0	0	0	0	**0**	0	0	1	0	**1**	0	6	0	0	**6**	0	9	0	0	**9**	16
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0.6%	0%	**0.4%**	0%	0.2%	0%	0%	**0.2%**	0%	0.3%	0%	0%	**0.3%**	0.3%
Buses and Single-Unit Trucks	0	3	1	0	**4**	0	0	4	0	**4**	2	35	12	0	**49**	2	35	0	0	**37**	94
% Buses and Single-Unit Trucks	0%	50.0%	2.9%	0%	**3.1%**	0%	0%	2.4%	0%	**1.8%**	1.3%	1.4%	10.0%	0%	**1.7%**	6.3%	1.3%	0%	0%	**1.3%**	1.5%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Rd & Rice Rd - TMC
Tue Aug 9, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976528, Location: 38.946176, -94.359562

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Rd & Rice Rd - TMC

Tue Aug 9, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976528, Location: 38.946176, -94.359562

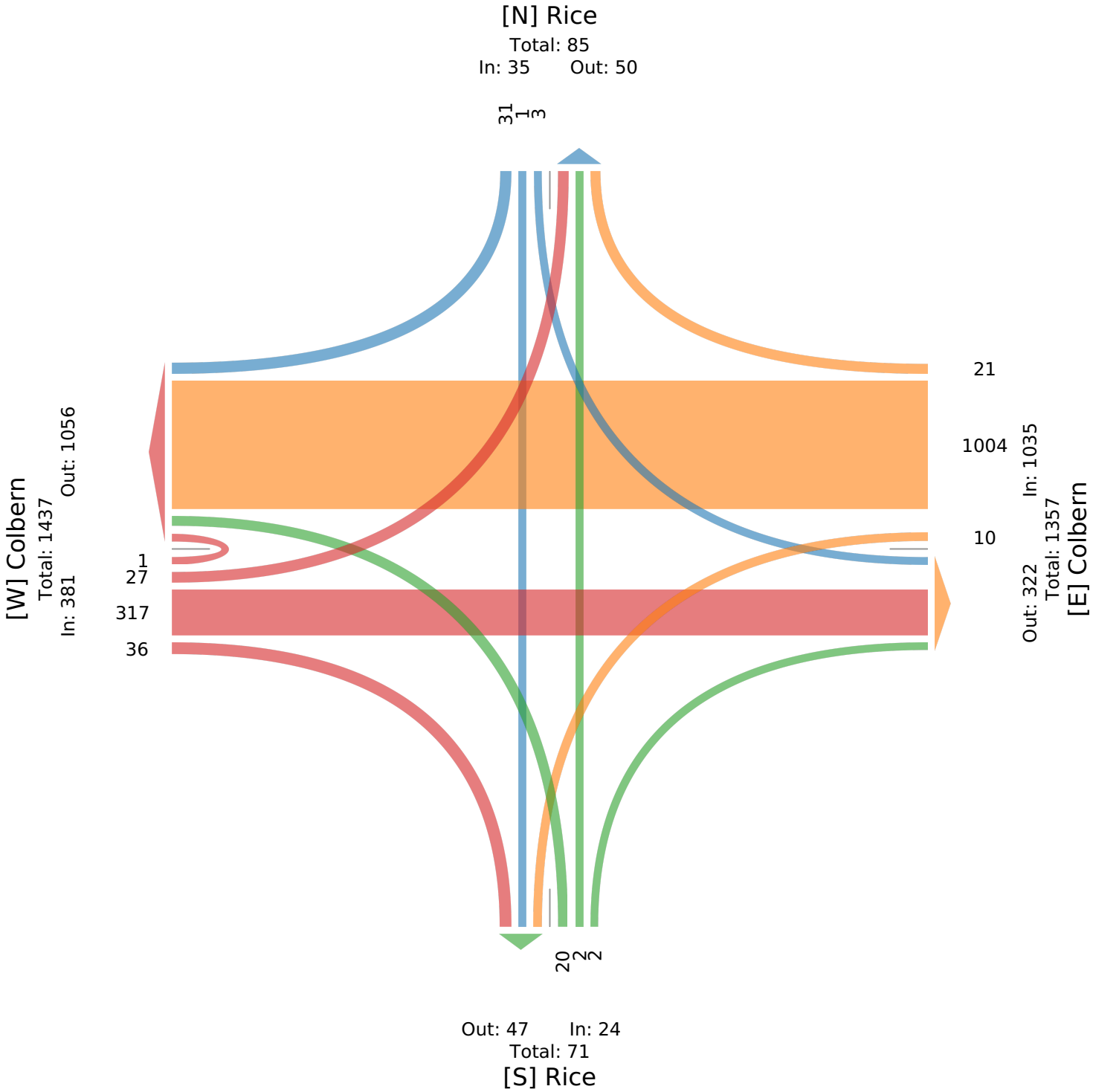
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Rice					Rice					Colbern					Colbern					
Direction	Northbound					Southbound					Eastbound					Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2022-08-09 7:15AM	8	0	0	0	**8**	1	0	8	0	**9**	10	70	5	0	**85**	2	257	7	0	**266**	**368**
7:30AM	6	0	2	0	**8**	0	0	8	0	**8**	10	86	11	0	**107**	5	269	8	0	**282**	**405**
7:45AM	4	1	0	0	**5**	2	0	9	0	**11**	6	77	15	1	**99**	2	280	5	0	**287**	**402**
8:00AM	2	1	0	0	**3**	0	1	6	0	**7**	1	84	5	0	**90**	1	198	1	0	**200**	**300**
Total	20	2	2	0	**24**	3	1	31	0	**35**	27	317	36	1	**381**	10	1004	21	0	**1035**	**1475**
% Approach	83.3%	8.3%	8.3%	0%	**-**	8.6%	2.9%	88.6%	0%	**-**	7.1%	83.2%	9.4%	0.3%	**-**	1.0%	97.0%	2.0%	0%	**-**	-
% Total	1.4%	0.1%	0.1%	0%	**1.6%**	0.2%	0.1%	2.1%	0%	**2.4%**	1.8%	21.5%	2.4%	0.1%	**25.8%**	0.7%	68.1%	1.4%	0%	**70.2%**	-
PHF	0.625	0.500	0.250	-	**0.750**	0.375	0.250	0.861	-	**0.795**	0.675	0.922	0.600	0.250	**0.890**	0.500	0.896	0.656	-	**0.902**	0.910
Lights	20	1	2	0	**23**	3	1	30	0	**34**	27	299	33	1	**360**	9	993	21	0	**1023**	1440
% Lights	100%	50.0%	100%	0%	**95.8%**	100%	100%	96.8%	0%	**97.1%**	100%	94.3%	91.7%	100%	**94.5%**	90.0%	98.9%	100%	0%	**98.8%**	97.6%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	0	1	0	0	**1**	2
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0.3%	0%	0%	**0.3%**	0%	0.1%	0%	0%	**0.1%**	0.1%
Buses and Single-Unit Trucks	0	1	0	0	**1**	0	0	1	0	**1**	0	17	3	0	**20**	1	10	0	0	**11**	33
% Buses and Single-Unit Trucks	0%	50.0%	0%	0%	**4.2%**	0%	0%	3.2%	0%	**2.9%**	0%	5.4%	8.3%	0%	**5.2%**	10.0%	1.0%	0%	0%	**1.1%**	2.2%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Rd & Rice Rd - TMC
Tue Aug 9, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976528, Location: 38.946176, -94.359562

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Rd & Rice Rd - TMC

Tue Aug 9, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976528, Location: 38.946176, -94.359562

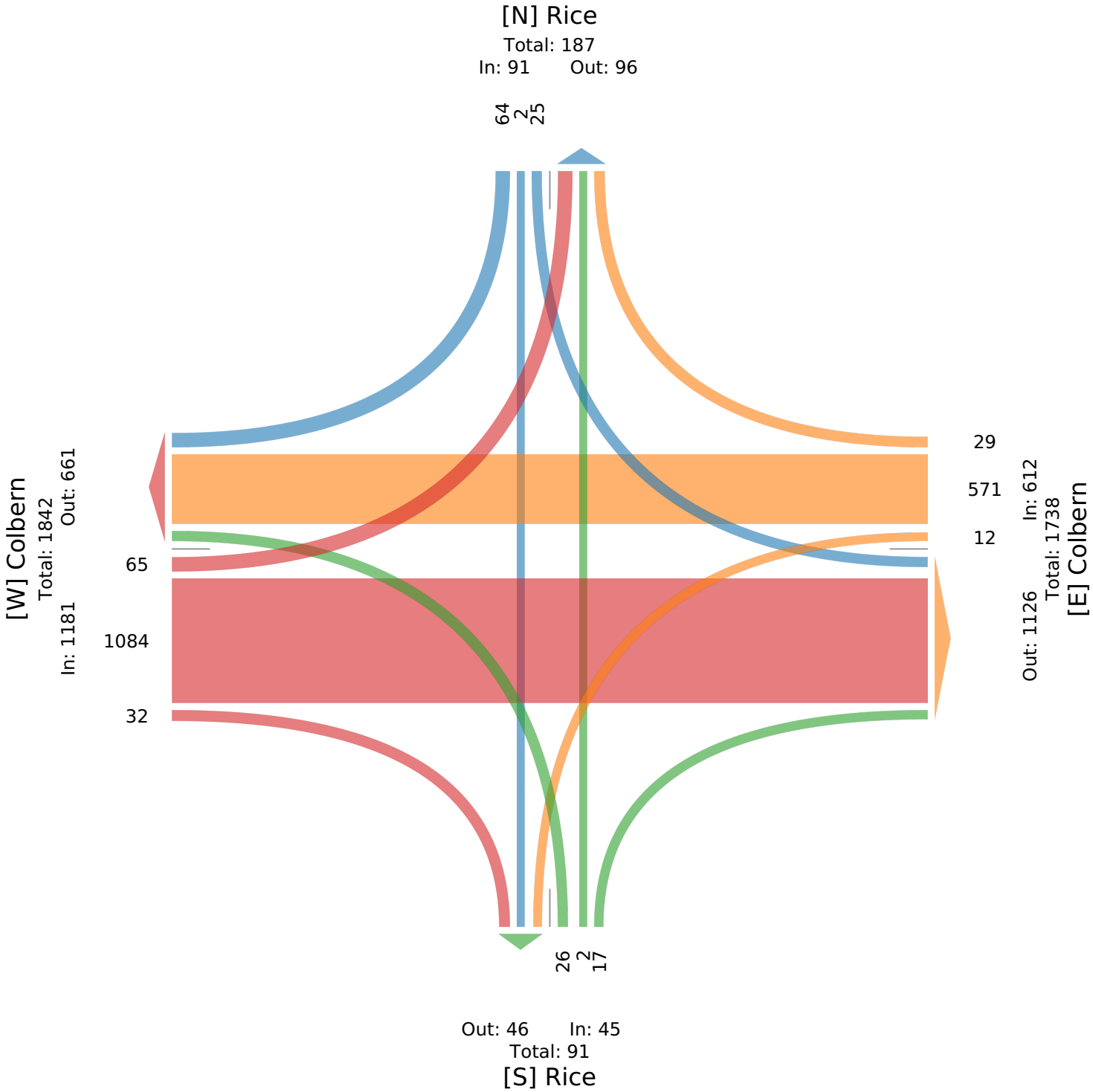
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Rice					Rice					Colbern					Colbern					
Direction	Northbound					Southbound					Eastbound					Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2022-08-09 4:30PM	7	0	5	0	**12**	10	1	20	0	**31**	23	250	5	0	**278**	1	132	7	0	**140**	**461**
4:45PM	6	1	3	0	**10**	6	0	12	0	**18**	18	266	11	0	**295**	3	147	8	0	**158**	**481**
5:00PM	8	1	4	0	**13**	5	1	19	0	**25**	14	268	6	0	**288**	3	130	9	0	**142**	**468**
5:15PM	5	0	5	0	**10**	4	0	13	0	**17**	10	300	10	0	**320**	5	162	5	0	**172**	**519**
Total	26	2	17	0	**45**	25	2	64	0	**91**	65	1084	32	0	**1181**	12	571	29	0	**612**	**1929**
% Approach	57.8%	4.4%	37.8%	0%	-	27.5%	2.2%	70.3%	0%	-	5.5%	91.8%	2.7%	0%	-	2.0%	93.3%	4.7%	0%	-	-
% Total	1.3%	0.1%	0.9%	0%	**2.3%**	1.3%	0.1%	3.3%	0%	**4.7%**	3.4%	56.2%	1.7%	0%	**61.2%**	0.6%	29.6%	1.5%	0%	**31.7%**	-
PHF	0.813	0.500	0.850	-	**0.865**	0.625	0.500	0.800	-	**0.734**	0.707	0.903	0.727	-	**0.923**	0.600	0.881	0.806	-	**0.890**	0.929
Lights	26	2	17	0	**45**	25	2	63	0	**90**	64	1076	31	0	**1171**	12	561	29	0	**602**	1908
% Lights	100%	100%	100%	0%	**100%**	100%	100%	98.4%	0%	**98.9%**	98.5%	99.3%	96.9%	0%	**99.2%**	100%	98.2%	100%	0%	**98.4%**	98.9%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	0	1	0	0	**1**	2
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0.1%	0%	0%	**0.1%**	0%	0.2%	0%	0%	**0.2%**	0.1%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	0	1	0	**1**	1	7	1	0	**9**	0	9	0	0	**9**	19
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	0%	1.6%	0%	**1.1%**	1.5%	0.6%	3.1%	0%	**0.8%**	0%	1.6%	0%	0%	**1.5%**	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

Colbern Rd & Rice Rd - TMC
Tue Aug 9, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976528, Location: 38.946176, -94.359562

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



291 Hwy & Northbound Ramp - TMC

Tue Aug 9, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976529, Location: 38.946164, -94.360232

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

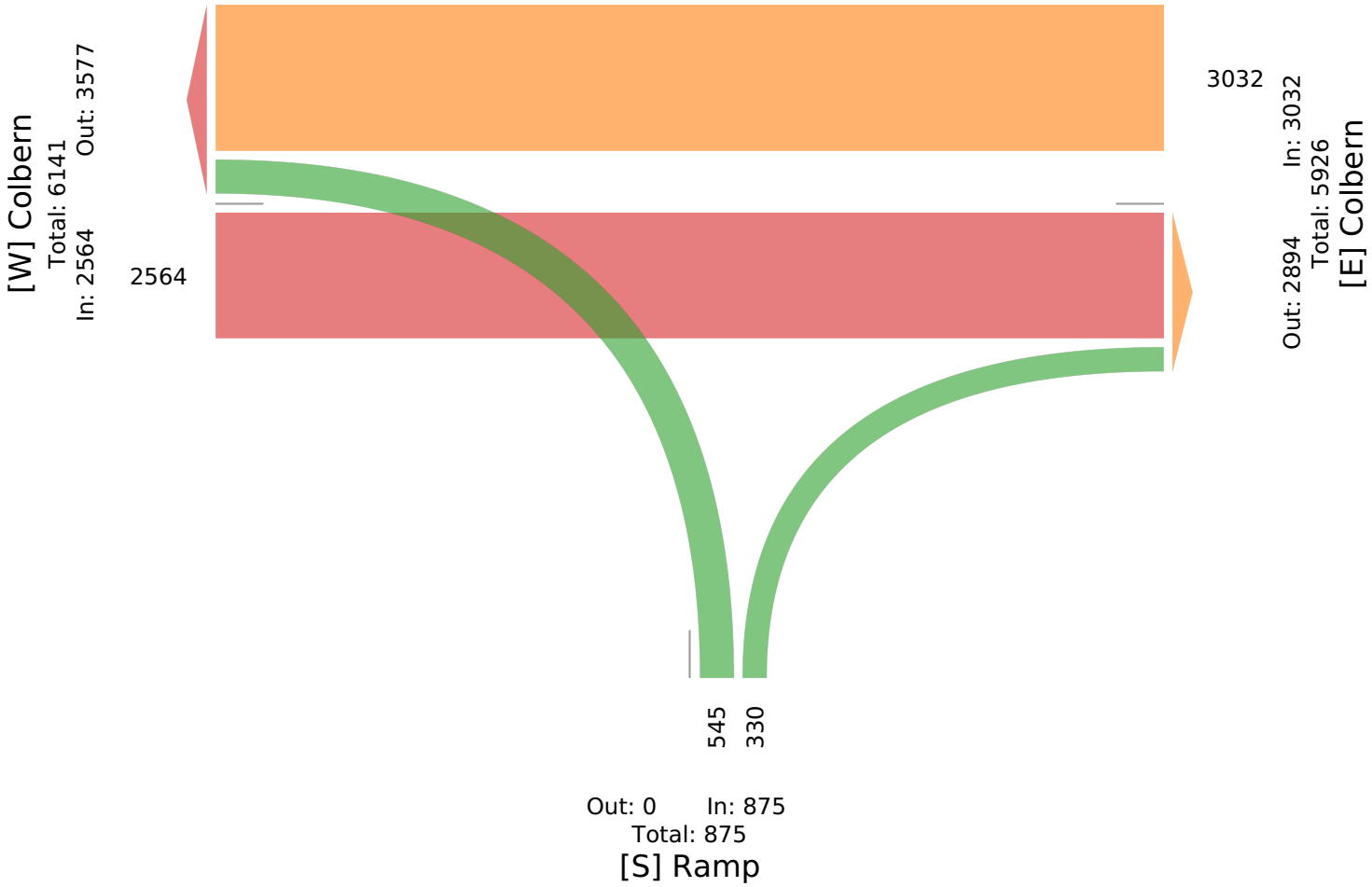
Leg	Ramp				Colbern				Colbern				
Direction	Northbound				Eastbound				Westbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2022-08-09 7:00AM	40	7	0	**47**	43	0	0	**43**	0	214	0	**214**	**304**
7:15AM	48	12	0	**60**	73	0	0	**73**	0	280	0	**280**	**413**
7:30AM	34	19	0	**53**	90	0	0	**90**	0	285	0	**285**	**428**
7:45AM	41	8	0	**49**	92	0	0	**92**	0	300	0	**300**	**441**
Hourly Total	163	46	0	**209**	298	0	0	**298**	0	1079	0	**1079**	**1586**
8:00AM	25	13	0	**38**	82	0	0	**82**	0	208	0	**208**	**328**
8:15AM	36	19	0	**55**	76	0	0	**76**	0	188	0	**188**	**319**
8:30AM	30	16	0	**46**	85	0	0	**85**	0	141	0	**141**	**272**
8:45AM	33	15	0	**48**	84	0	0	**84**	0	173	0	**173**	**305**
Hourly Total	124	63	0	**187**	327	0	0	**327**	0	710	0	**710**	**1224**
4:00PM	32	23	0	**55**	214	0	0	**214**	0	153	0	**153**	**422**
4:15PM	24	16	0	**40**	199	0	0	**199**	0	146	0	**146**	**385**
4:30PM	34	23	0	**57**	255	0	0	**255**	0	159	0	**159**	**471**
4:45PM	30	35	0	**65**	262	0	0	**262**	0	169	0	**169**	**496**
Hourly Total	120	97	0	**217**	930	0	0	**930**	0	627	0	**627**	**1774**
5:00PM	45	29	0	**74**	263	0	0	**263**	0	157	0	**157**	**494**
5:15PM	29	34	0	**63**	289	0	0	**289**	0	184	0	**184**	**536**
5:30PM	38	25	0	**63**	245	0	0	**245**	0	134	0	**134**	**442**
5:45PM	26	36	0	**62**	212	0	0	**212**	0	141	0	**141**	**415**
Hourly Total	138	124	0	**262**	1009	0	0	**1009**	0	616	0	**616**	**1887**
Total	545	330	0	**875**	2564	0	0	**2564**	0	3032	0	**3032**	**6471**
% Approach	62.3%	37.7%	0%	**-**	100%	0%	0%	**-**	0%	100%	0%	**-**	-
% Total	8.4%	5.1%	0%	**13.5%**	39.6%	0%	0%	**39.6%**	0%	46.9%	0%	**46.9%**	-
Lights	526	322	0	**848**	2503	0	0	**2503**	0	2983	0	**2983**	6334
% Lights	96.5%	97.6%	0%	**96.9%**	97.6%	0%	0%	**97.6%**	0%	98.4%	0%	**98.4%**	97.9%
Articulated Trucks	2	1	0	**3**	4	0	0	**4**	0	9	0	**9**	16
% Articulated Trucks	0.4%	0.3%	0%	**0.3%**	0.2%	0%	0%	**0.2%**	0%	0.3%	0%	**0.3%**	0.2%
Buses and Single-Unit Trucks	17	7	0	**24**	57	0	0	**57**	0	40	0	**40**	121
% Buses and Single-Unit Trucks	3.1%	2.1%	0%	**2.7%**	2.2%	0%	0%	**2.2%**	0%	1.3%	0%	**1.3%**	1.9%

*L: Left, R: Right, T: Thru, U: U-Turn

291 Hwy & Northbound Ramp - TMC

Tue Aug 9, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976529, Location: 38.946164, -94.360232

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



291 Hwy & Northbound Ramp - TMC

Tue Aug 9, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976529, Location: 38.946164, -94.360232

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

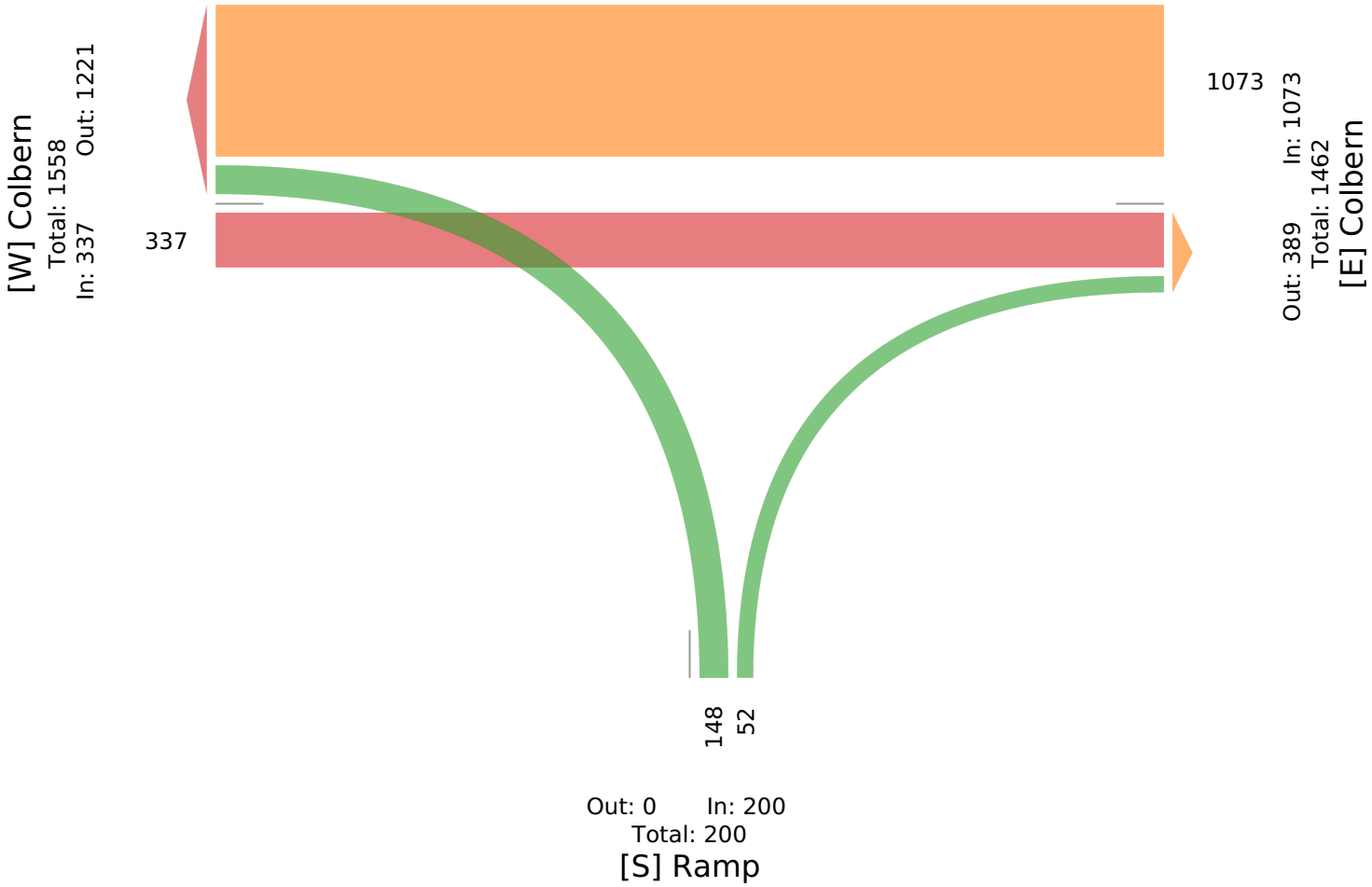
Leg Direction	Ramp Northbound				Colbern Eastbound				Colbern Westbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2022-08-09 7:15AM	48	12	0	**60**	73	0	0	**73**	0	280	0	**280**	**413**
7:30AM	34	19	0	**53**	90	0	0	**90**	0	285	0	**285**	**428**
7:45AM	41	8	0	**49**	92	0	0	**92**	0	300	0	**300**	**441**
8:00AM	25	13	0	**38**	82	0	0	**82**	0	208	0	**208**	**328**
Total	148	52	0	**200**	337	0	0	**337**	0	1073	0	**1073**	**1610**
% Approach	74.0%	26.0%	0%	**-**	100%	0%	0%	**-**	0%	100%	0%	**-**	-
% Total	9.2%	3.2%	0%	**12.4%**	20.9%	0%	0%	**20.9%**	0%	66.6%	0%	**66.6%**	-
PHF	0.771	0.684	-	**0.833**	0.916	-	-	**0.916**	-	0.894	-	**0.894**	0.913
Lights	143	51	0	**194**	313	0	0	**313**	0	1060	0	**1060**	1567
% Lights	96.6%	98.1%	0%	**97.0%**	92.9%	0%	0%	**92.9%**	0%	98.8%	0%	**98.8%**	97.3%
Articulated Trucks	0	0	0	**0**	2	0	0	**2**	0	4	0	**4**	6
% Articulated Trucks	0%	0%	0%	**0%**	0.6%	0%	0%	**0.6%**	0%	0.4%	0%	**0.4%**	0.4%
Buses and Single-Unit Trucks	5	1	0	**6**	22	0	0	**22**	0	9	0	**9**	37
% Buses and Single-Unit Trucks	3.4%	1.9%	0%	**3.0%**	6.5%	0%	0%	**6.5%**	0%	0.8%	0%	**0.8%**	2.3%

*L: Left, R: Right, T: Thru, U: U-Turn

291 Hwy & Northbound Ramp - TMC

Tue Aug 9, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976529, Location: 38.946164, -94.360232

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



291 Hwy & Northbound Ramp - TMC

Tue Aug 9, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976529, Location: 38.946164, -94.360232

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

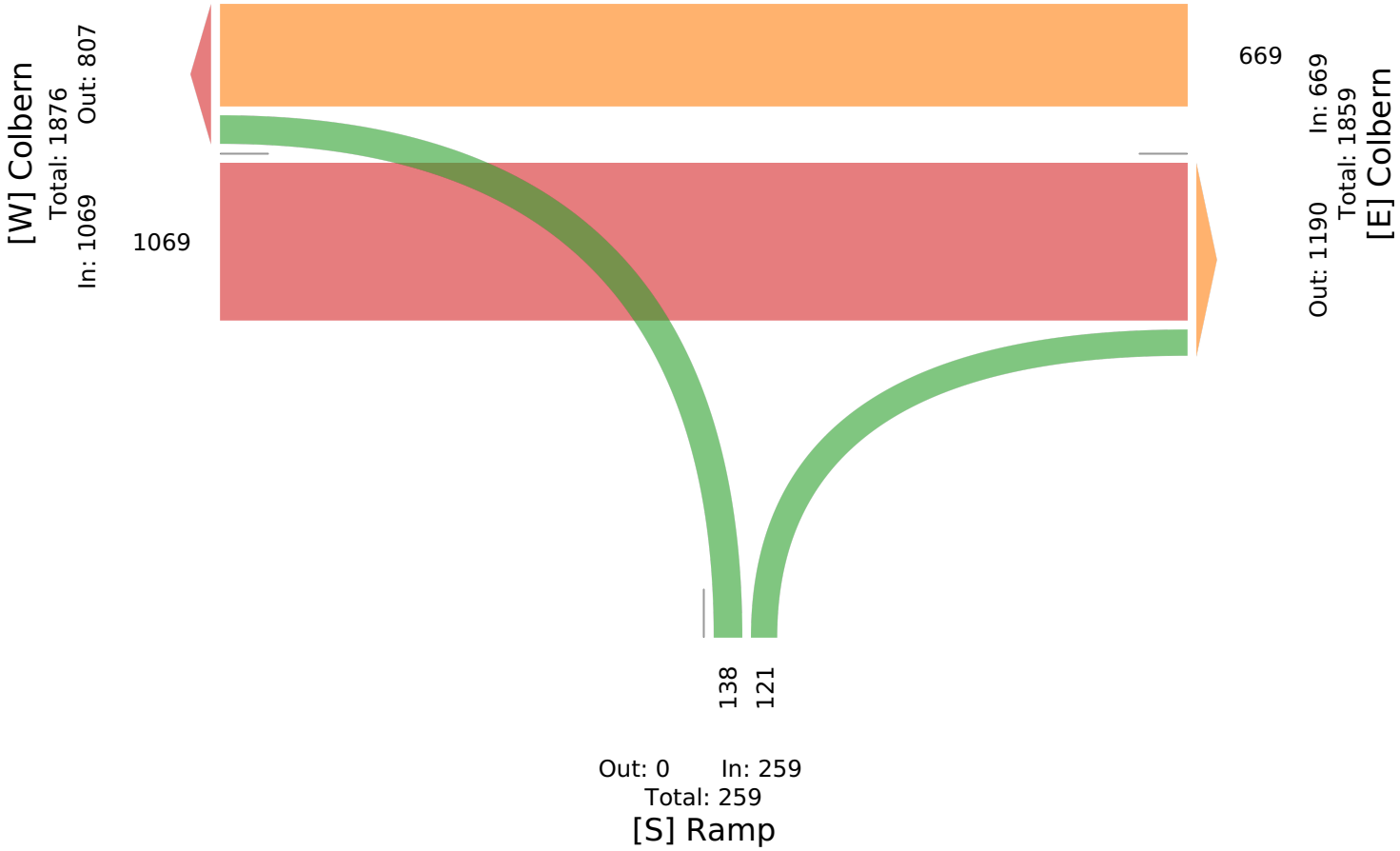
Leg	Ramp				Colbern				Colbern				
Direction	Northbound				Eastbound				Westbound				
Time	L	R	U	**App**	T	R	U	**App**	L	T	U	**App**	**Int**
2022-08-09 4:30PM	34	23	0	**57**	255	0	0	**255**	0	159	0	**159**	**471**
4:45PM	30	35	0	**65**	262	0	0	**262**	0	169	0	**169**	**496**
5:00PM	45	29	0	**74**	263	0	0	**263**	0	157	0	**157**	**494**
5:15PM	29	34	0	**63**	289	0	0	**289**	0	184	0	**184**	**536**
Total	138	121	0	**259**	1069	0	0	**1069**	0	669	0	**669**	**1997**
% Approach	53.3%	46.7%	0%	**-**	100%	0%	0%	**-**	0%	100%	0%	**-**	-
% Total	6.9%	6.1%	0%	**13.0%**	53.5%	0%	0%	**53.5%**	0%	33.5%	0%	**33.5%**	-
PHF	0.767	0.864	-	**0.875**	0.925	-	-	**0.925**	-	0.909	-	**0.909**	0.931
Lights	136	120	0	**256**	1055	0	0	**1055**	0	658	0	**658**	1969
% Lights	98.6%	99.2%	0%	**98.8%**	98.7%	0%	0%	**98.7%**	0%	98.4%	0%	**98.4%**	98.6%
Articulated Trucks	0	0	0	**0**	1	0	0	**1**	0	1	0	**1**	2
% Articulated Trucks	0%	0%	0%	**0%**	0.1%	0%	0%	**0.1%**	0%	0.1%	0%	**0.1%**	0.1%
Buses and Single-Unit Trucks	2	1	0	**3**	13	0	0	**13**	0	10	0	**10**	26
% Buses and Single-Unit Trucks	1.4%	0.8%	0%	**1.2%**	1.2%	0%	0%	**1.2%**	0%	1.5%	0%	**1.5%**	1.3%

*L: Left, R: Right, T: Thru, U: U-Turn

291 Hwy & Northbound Ramp - TMC

Tue Aug 9, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976529, Location: 38.946164, -94.360232

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Rd & Phillips 66 Driveway - TMC

Tue Aug 9, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976527, Location: 38.946122, -94.358941

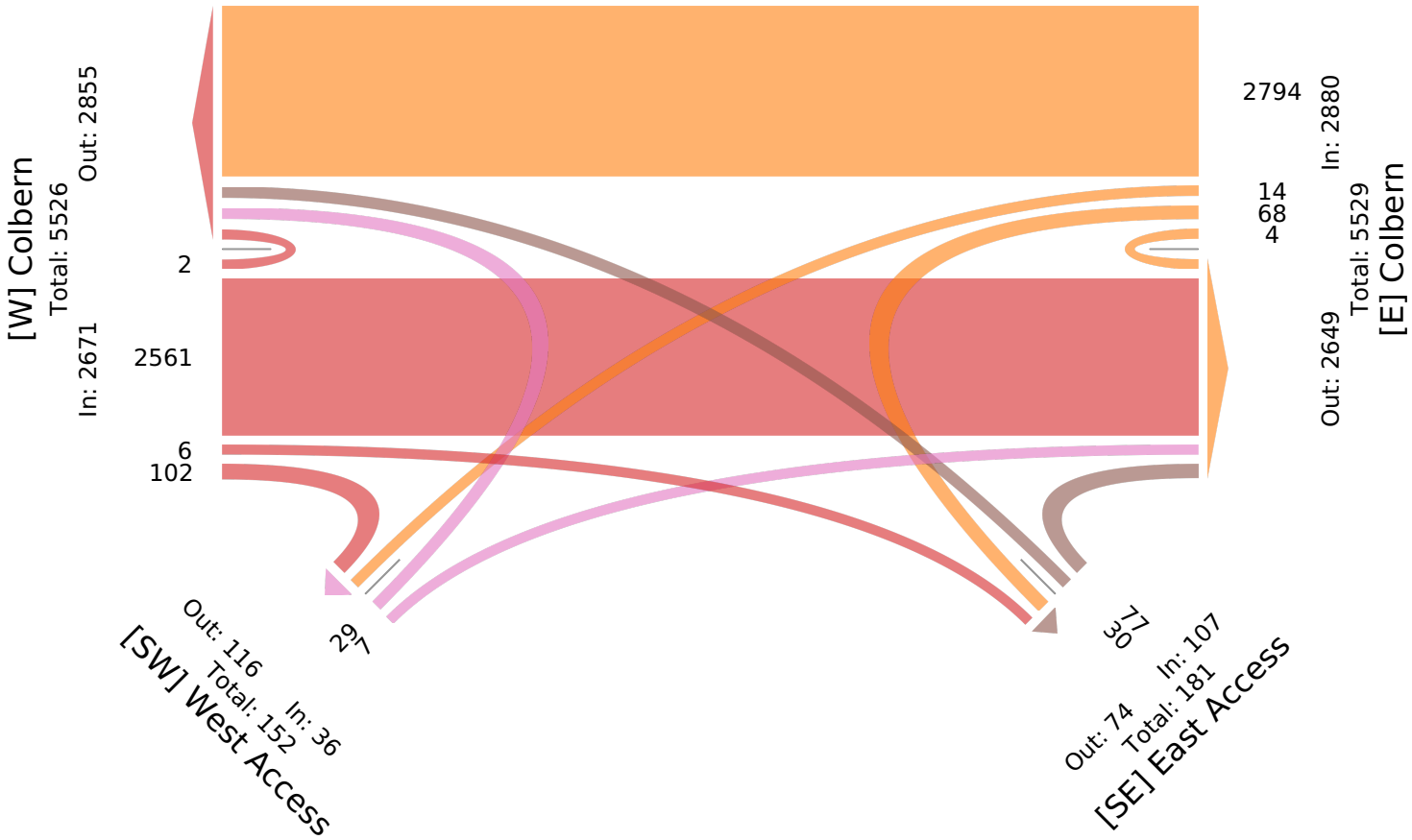
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Colbern					Colbern					West Access					East Access					
Direction	Eastbound					Westbound					Northeastbound					Northwestbound					
Time	T	BR	HR	U	App	HL	BL	T	U	App	HL	BR	R	U	App	L	BL	HR	U	App	Int
2022-08-09 7:00AM	41	0	3	0	**44**	8	2	213	0	**223**	5	0	0	0	**5**	0	2	4	0	**6**	**278**
7:15AM	68	0	4	0	**72**	5	0	266	0	**271**	2	0	0	0	**2**	0	3	0	0	**3**	**348**
7:30AM	85	0	2	0	**87**	10	1	279	0	**290**	2	2	0	0	**4**	0	2	2	0	**4**	**385**
7:45AM	75	0	5	0	**80**	5	0	277	0	**282**	0	0	0	0	**0**	0	4	3	0	**7**	**369**
Hourly Total	269	0	14	0	**283**	28	3	1035	0	**1066**	9	2	0	0	**11**	0	11	9	0	**20**	**1380**
8:00AM	81	0	5	0	**86**	2	0	198	0	**200**	2	0	0	0	**2**	0	3	0	0	**3**	**291**
8:15AM	81	2	5	0	**88**	2	0	170	0	**172**	3	0	0	0	**3**	0	2	2	0	**4**	**267**
8:30AM	83	2	2	0	**87**	5	0	140	0	**145**	0	1	0	0	**1**	0	1	4	0	**5**	**238**
8:45AM	77	0	5	0	**82**	4	4	150	0	**158**	2	0	0	0	**2**	0	2	5	0	**7**	**249**
Hourly Total	322	4	17	0	**343**	13	4	658	0	**675**	7	1	0	0	**8**	0	8	11	0	**19**	**1045**
4:00PM	207	0	9	0	**216**	4	0	131	0	**135**	1	0	0	0	**1**	0	3	5	0	**8**	**360**
4:15PM	197	0	4	0	**201**	2	0	127	0	**129**	3	0	0	0	**3**	0	1	6	0	**7**	**340**
4:30PM	258	0	9	0	**267**	3	1	142	0	**146**	0	0	0	0	**0**	0	1	7	0	**8**	**421**
4:45PM	264	0	9	0	**273**	5	3	150	0	**158**	2	0	0	0	**2**	0	2	10	0	**12**	**445**
Hourly Total	926	0	31	0	**957**	14	4	550	0	**568**	6	0	0	0	**6**	0	7	28	0	**35**	**1566**
5:00PM	268	0	7	0	**275**	3	0	138	1	**142**	2	0	0	0	**2**	0	1	8	0	**9**	**428**
5:15PM	297	1	13	1	**312**	2	1	166	0	**169**	1	1	0	0	**2**	0	2	4	0	**6**	**489**
5:30PM	250	0	9	0	**259**	3	1	119	0	**123**	1	3	0	0	**4**	0	1	10	0	**11**	**397**
5:45PM	229	1	11	1	**242**	5	1	128	3	**137**	3	0	0	0	**3**	0	0	7	0	**7**	**389**
Hourly Total	1044	2	40	2	**1088**	13	3	551	4	**571**	7	4	0	0	**11**	0	4	29	0	**33**	**1703**
Total	2561	6	102	2	**2671**	68	14	2794	4	**2880**	29	7	0	0	**36**	0	30	77	0	**107**	**5694**
% Approach	95.9%	0.2%	3.8%	0.1%	**-**	2.4%	0.5%	97.0%	0.1%	**-**	80.6%	19.4%	0%	0%	**-**	0%	28.0%	72.0%	0%	**-**	-
% Total	45.0%	0.1%	1.8%	0%	**46.9%**	1.2%	0.2%	49.1%	0.1%	**50.6%**	0.5%	0.1%	0%	0%	**0.6%**	0%	0.5%	1.4%	0%	**1.9%**	-
Lights	2522	5	100	2	**2629**	68	14	2759	4	**2845**	28	4	0	0	**32**	0	30	77	0	**107**	5613
% Lights	98.5%	83.3%	98.0%	100%	**98.4%**	100%	100%	98.7%	100%	**98.8%**	96.6%	57.1%	0%	0%	**88.9%**	0%	100%	100%	0%	**100%**	98.6%
Articulated Trucks	10	0	0	0	**10**	0	0	8	0	**8**	0	0	0	0	**0**	0	0	0	0	**0**	18
% Articulated Trucks	0.4%	0%	0%	0%	**0.4%**	0%	0%	0.3%	0%	**0.3%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.3%
Buses and Single-Unit Trucks	29	1	2	0	**32**	0	0	27	0	**27**	1	3	0	0	**4**	0	0	0	0	**0**	63
% Buses and Single-Unit Trucks	1.1%	16.7%	2.0%	0%	**1.2%**	0%	0%	1.0%	0%	**0.9%**	3.4%	42.9%	0%	0%	**11.1%**	0%	0%	0%	0%	**0%**	1.1%

*BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Colbern Rd & Phillips 66 Driveway - TMC
Tue Aug 9, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976527, Location: 38.946122, -94.358941

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Rd & Phillips 66 Driveway - TMC

Tue Aug 9, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976527, Location: 38.946122, -94.358941

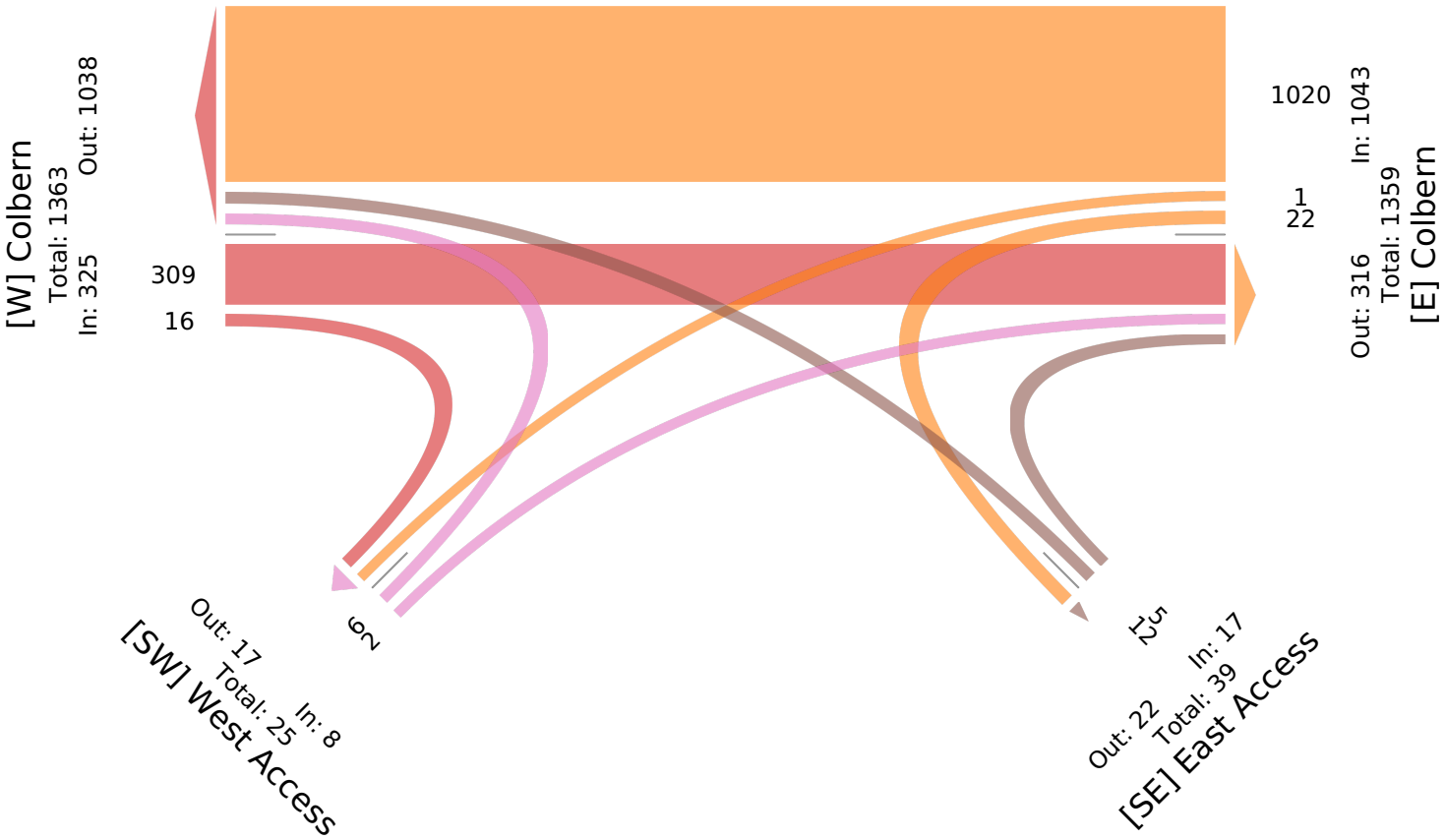
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Colbern					Colbern					West Access					East Access					
Direction	Eastbound					Westbound					Northeastbound					Northwestbound					
Time	T	BR	HR	U	**App**	HL	BL	T	U	**App**	HL	BR	R	U	**App**	L	BL	HR	U	**App**	**Int**
2022-08-09 7:15AM	68	0	4	0	**72**	5	0	266	0	**271**	2	0	0	0	**2**	0	3	0	0	**3**	**348**
7:30AM	85	0	2	0	**87**	10	1	279	0	**290**	2	2	0	0	**4**	0	2	2	0	**4**	**385**
7:45AM	75	0	5	0	**80**	5	0	277	0	**282**	0	0	0	0	**0**	0	4	3	0	**7**	**369**
8:00AM	81	0	5	0	**86**	2	0	198	0	**200**	2	0	0	0	**2**	0	3	0	0	**3**	**291**
Total	309	0	16	0	**325**	22	1	1020	0	**1043**	6	2	0	0	**8**	0	12	5	0	**17**	**1393**
% Approach	95.1%	0%	4.9%	0%	**-**	2.1%	0.1%	97.8%	0%	**-**	75.0%	25.0%	0%	0%	**-**	0%	70.6%	29.4%	0%	**-**	**-**
% Total	22.2%	0%	1.1%	0%	**23.3%**	1.6%	0.1%	73.2%	0%	**74.9%**	0.4%	0.1%	0%	0%	**0.6%**	0%	0.9%	0.4%	0%	**1.2%**	**-**
PHF	0.909	-	0.800	-	**0.934**	0.550	0.250	0.914	-	**0.899**	0.750	0.250	-	-	**0.500**	-	0.750	0.417	-	**0.607**	0.905
Lights	291	0	15	0	**306**	22	1	1010	0	**1033**	6	0	0	0	**6**	0	12	5	0	**17**	1362
% Lights	94.2%	0%	93.8%	0%	**94.2%**	100%	100%	99.0%	0%	**99.0%**	100%	0%	0%	0%	**75.0%**	0%	100%	100%	0%	**100%**	97.8%
Articulated Trucks	6	0	0	0	**6**	0	0	2	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	8
% Articulated Trucks	1.9%	0%	0%	0%	**1.8%**	0%	0%	0.2%	0%	**0.2%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.6%
Buses and Single-Unit Trucks	12	0	1	0	**13**	0	0	8	0	**8**	0	2	0	0	**2**	0	0	0	0	**0**	23
% Buses and Single-Unit Trucks	3.9%	0%	6.3%	0%	**4.0%**	0%	0%	0.8%	0%	**0.8%**	0%	100%	0%	0%	**25.0%**	0%	0%	0%	0%	**0%**	1.7%

*BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Colbern Rd & Phillips 66 Driveway - TMC
Tue Aug 9, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976527, Location: 38.946122, -94.358941

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Colbern Rd & Phillips 66 Driveway - TMC

Tue Aug 9, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976527, Location: 38.946122, -94.358941

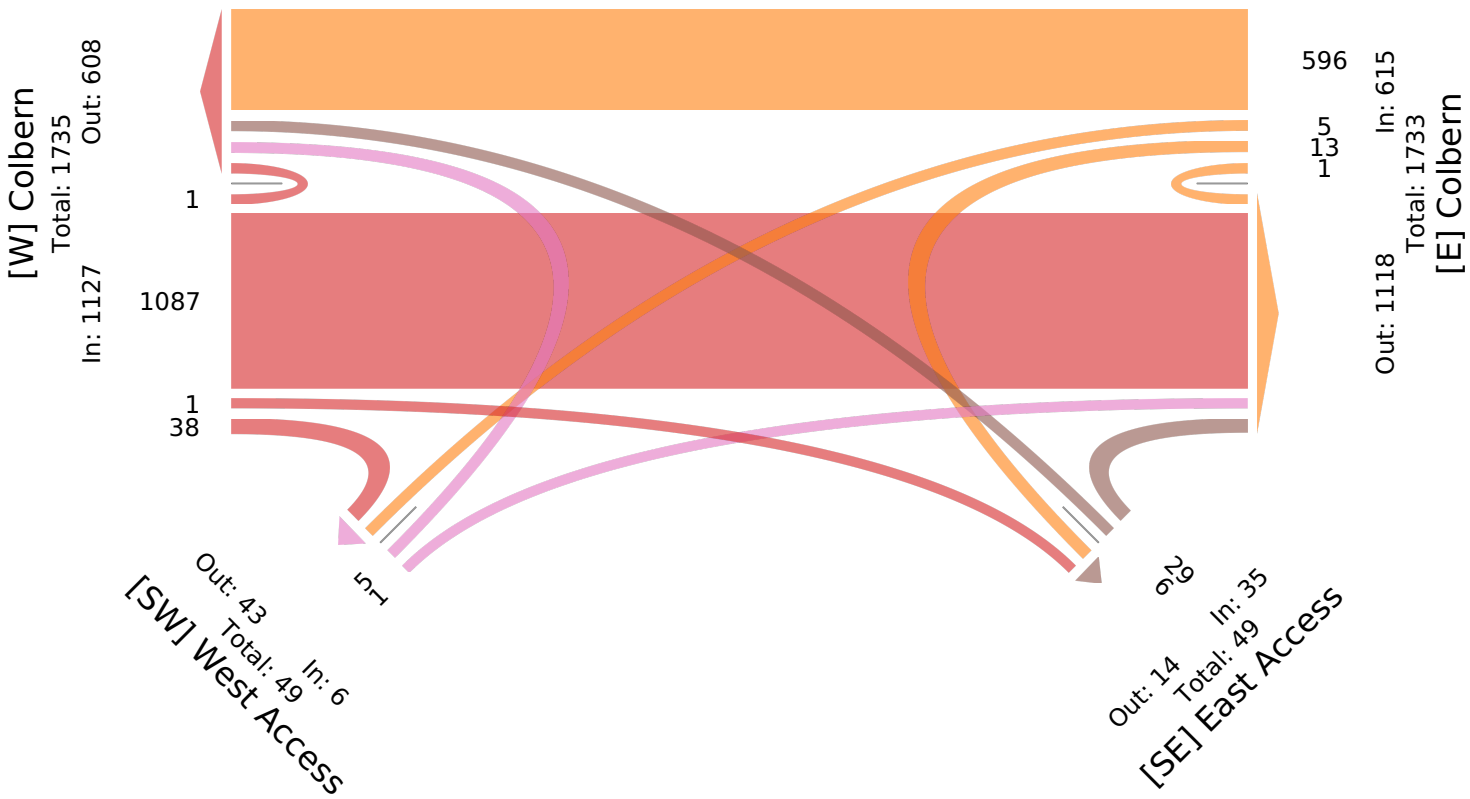
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Colbern					Colbern					West Access					East Access					
Direction	Eastbound					Westbound					Northeastbound					Northwestbound					
Time	T	BR	HR	U	**App**	HL	BL	T	U	**App**	HL	BR	R	U	**App**	L	BL	HR	U	**App**	**Int**
2022-08-09 4:30PM	258	0	9	0	**267**	3	1	142	0	**146**	0	0	0	0	**0**	0	1	7	0	**8**	**421**
4:45PM	264	0	9	0	**273**	5	3	150	0	**158**	2	0	0	0	**2**	0	2	10	0	**12**	**445**
5:00PM	268	0	7	0	**275**	3	0	138	1	**142**	2	0	0	0	**2**	0	1	8	0	**9**	**428**
5:15PM	297	1	13	1	**312**	2	1	166	0	**169**	1	1	0	0	**2**	0	2	4	0	**6**	**489**
Total	1087	1	38	1	**1127**	13	5	596	1	**615**	5	1	0	0	**6**	0	6	29	0	**35**	**1783**
% Approach	96.5%	0.1%	3.4%	0.1%	**-**	2.1%	0.8%	96.9%	0.2%	**-**	83.3%	16.7%	0%	0%	**-**	0%	17.1%	82.9%	0%	**-**	-
% Total	61.0%	0.1%	2.1%	0.1%	**63.2%**	0.7%	0.3%	33.4%	0.1%	**34.5%**	0.3%	0.1%	0%	0%	**0.3%**	0%	0.3%	1.6%	0%	**2.0%**	-
PHF	0.915	0.250	0.731	0.250	**0.903**	0.650	0.417	0.898	0.250	**0.910**	0.625	0.250	-	-	**0.750**	-	0.750	0.725	-	**0.729**	0.912
Lights	1080	1	38	1	**1120**	13	5	588	1	**607**	5	1	0	0	**6**	0	6	29	0	**35**	1768
% Lights	99.4%	100%	100%	100%	**99.4%**	100%	100%	98.7%	100%	**98.7%**	100%	100%	0%	0%	**100%**	0%	100%	100%	0%	**100%**	99.2%
Articulated Trucks	1	0	0	0	**1**	0	0	1	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	2
% Articulated Trucks	0.1%	0%	0%	0%	**0.1%**	0%	0%	0.2%	0%	**0.2%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.1%
Buses and Single-Unit Trucks	6	0	0	0	**6**	0	0	7	0	**7**	0	0	0	0	**0**	0	0	0	0	**0**	13
% Buses and Single-Unit Trucks	0.6%	0%	0%	0%	**0.5%**	0%	0%	1.2%	0%	**1.1%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.7%

*BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

Colbern Rd & Phillips 66 Driveway - TMC
Tue Aug 9, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976527, Location: 38.946122, -94.358941

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Northeast Colbern Road & Northeast Todd Geor... - TMC

Tue Aug 9, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976526, Location: 38.945912, -94.343388

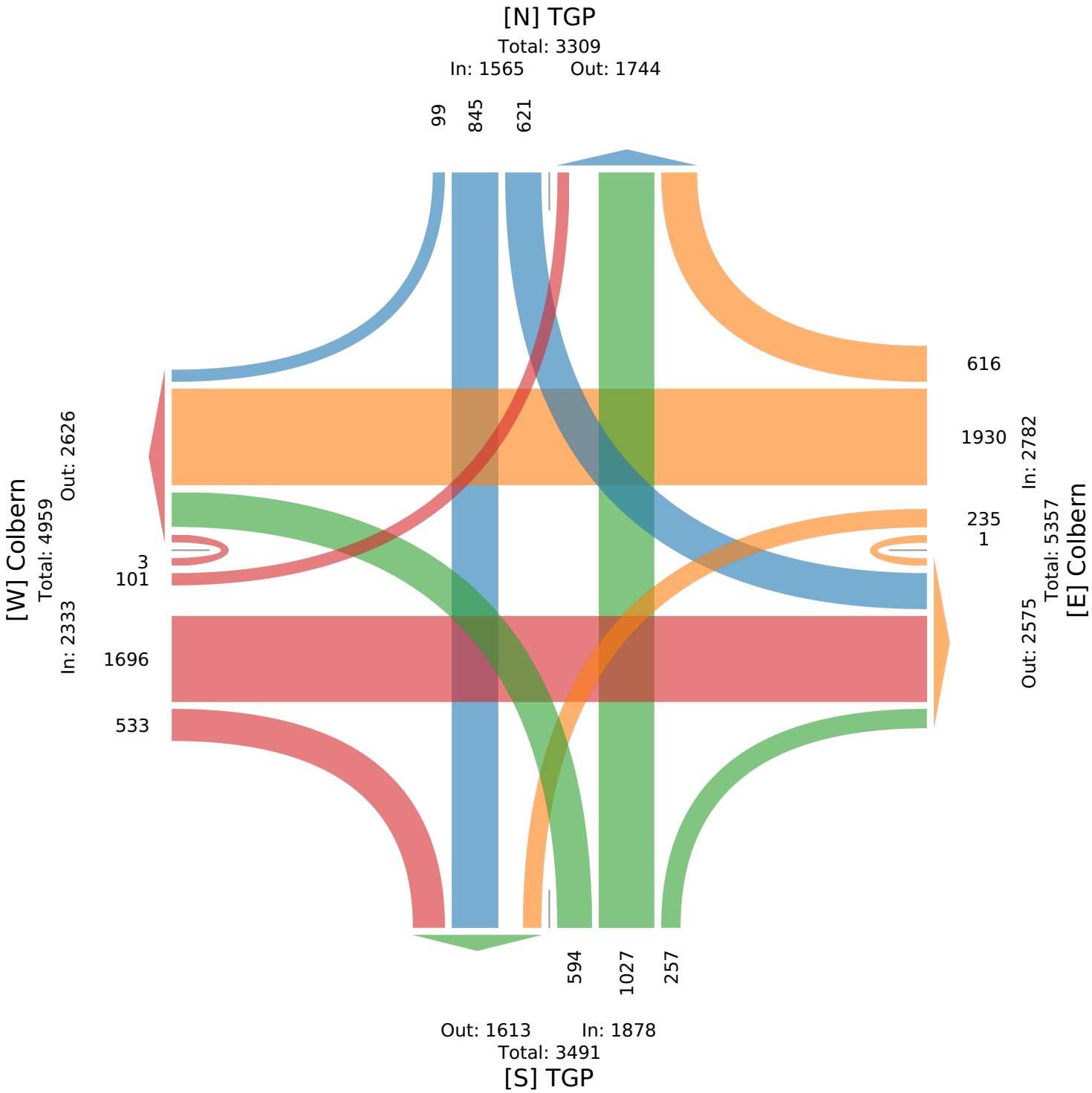
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	TGP					TGP					Colbern					Colbern					
Direction	Northbound					Southbound					Eastbound					Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2022-08-09 7:00AM	48	64	4	0	**116**	12	16	8	0	**36**	2	27	7	0	**36**	10	140	40	0	**190**	**378**
7:15AM	66	79	6	0	**151**	12	19	6	0	**37**	3	45	12	0	**60**	20	184	57	0	**261**	**509**
7:30AM	68	89	11	0	**168**	21	26	6	0	**53**	4	49	12	1	**66**	11	192	45	0	**248**	**535**
7:45AM	65	76	7	0	**148**	18	25	3	0	**46**	4	41	16	1	**62**	19	218	76	0	**313**	**569**
Hourly Total	247	308	28	0	**583**	63	86	23	0	**172**	13	162	47	2	**224**	60	734	218	0	**1012**	**1991**
8:00AM	50	63	9	0	**122**	28	22	2	0	**52**	3	54	17	0	**74**	10	117	51	0	**178**	**426**
8:15AM	30	62	10	0	**102**	24	28	3	0	**55**	2	53	16	0	**71**	14	128	29	0	**171**	**399**
8:30AM	29	61	19	0	**109**	33	25	4	0	**62**	5	51	12	0	**68**	13	101	42	0	**156**	**395**
8:45AM	31	57	12	0	**100**	30	32	7	0	**69**	1	64	18	0	**83**	14	113	36	0	**163**	**415**
Hourly Total	140	243	50	0	**433**	115	107	16	0	**238**	11	222	63	0	**296**	51	459	158	0	**668**	**1635**
4:00PM	22	50	26	0	**98**	44	64	6	0	**114**	9	144	43	0	**196**	13	95	28	1	**137**	**545**
4:15PM	9	55	29	0	**93**	58	77	6	0	**141**	10	126	45	1	**182**	18	81	17	0	**116**	**532**
4:30PM	33	58	25	0	**116**	52	107	8	0	**167**	5	175	46	0	**226**	15	91	26	0	**132**	**641**
4:45PM	34	70	21	0	**125**	60	93	5	0	**158**	8	170	63	0	**241**	17	93	37	0	**147**	**671**
Hourly Total	98	233	101	0	**432**	214	341	25	0	**580**	32	615	197	1	**845**	63	360	108	1	**532**	**2389**
5:00PM	33	74	20	0	**127**	55	90	5	0	**150**	10	183	54	0	**247**	15	97	39	0	**151**	**675**
5:15PM	26	62	25	0	**113**	68	89	15	0	**172**	19	202	69	0	**290**	17	108	40	0	**165**	**740**
5:30PM	19	53	16	0	**88**	54	75	9	0	**138**	11	165	50	0	**226**	16	81	26	0	**123**	**575**
5:45PM	31	54	17	0	**102**	52	57	6	0	**115**	5	147	53	0	**205**	13	91	27	0	**131**	**553**
Hourly Total	109	243	78	0	**430**	229	311	35	0	**575**	45	697	226	0	**968**	61	377	132	0	**570**	**2543**
Total	594	1027	257	0	**1878**	621	845	99	0	**1565**	101	1696	533	3	**2333**	235	1930	616	1	**2782**	**8558**
% Approach	31.6%	54.7%	13.7%	0%	**-**	39.7%	54.0%	6.3%	0%	**-**	4.3%	72.7%	22.8%	0.1%	**-**	8.4%	69.4%	22.1%	0%	**-**	-
% Total	6.9%	12.0%	3.0%	0%	**21.9%**	7.3%	9.9%	1.2%	0%	**18.3%**	1.2%	19.8%	6.2%	0%	**27.3%**	2.7%	22.6%	7.2%	0%	**32.5%**	-
Lights	590	1015	252	0	**1857**	603	838	98	0	**1539**	100	1666	523	3	**2292**	233	1891	593	1	**2718**	8406
% Lights	99.3%	98.8%	98.1%	0%	**98.9%**	97.1%	99.2%	99.0%	0%	**98.3%**	99.0%	98.2%	98.1%	100%	**98.2%**	99.1%	98.0%	96.3%	100%	**97.7%**	98.2%
Articulated Trucks	0	3	1	0	**4**	8	0	1	0	**9**	0	5	2	0	**7**	1	8	7	0	**16**	36
% Articulated Trucks	0%	0.3%	0.4%	0%	**0.2%**	1.3%	0%	1.0%	0%	**0.6%**	0%	0.3%	0.4%	0%	**0.3%**	0.4%	0.4%	1.1%	0%	**0.6%**	0.4%
Buses and Single-Unit Trucks	4	9	4	0	**17**	10	7	0	0	**17**	1	25	8	0	**34**	1	31	16	0	**48**	116
% Buses and Single-Unit Trucks	0.7%	0.9%	1.6%	0%	**0.9%**	1.6%	0.8%	0%	0%	**1.1%**	1.0%	1.5%	1.5%	0%	**1.5%**	0.4%	1.6%	2.6%	0%	**1.7%**	1.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Northeast Colbern Road & Northeast Todd Geor... - TMC
Tue Aug 9, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976526, Location: 38.945912, -94.343388

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Northeast Colbern Road & Northeast Todd Geor... - TMC

Tue Aug 9, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976526, Location: 38.945912, -94.343388

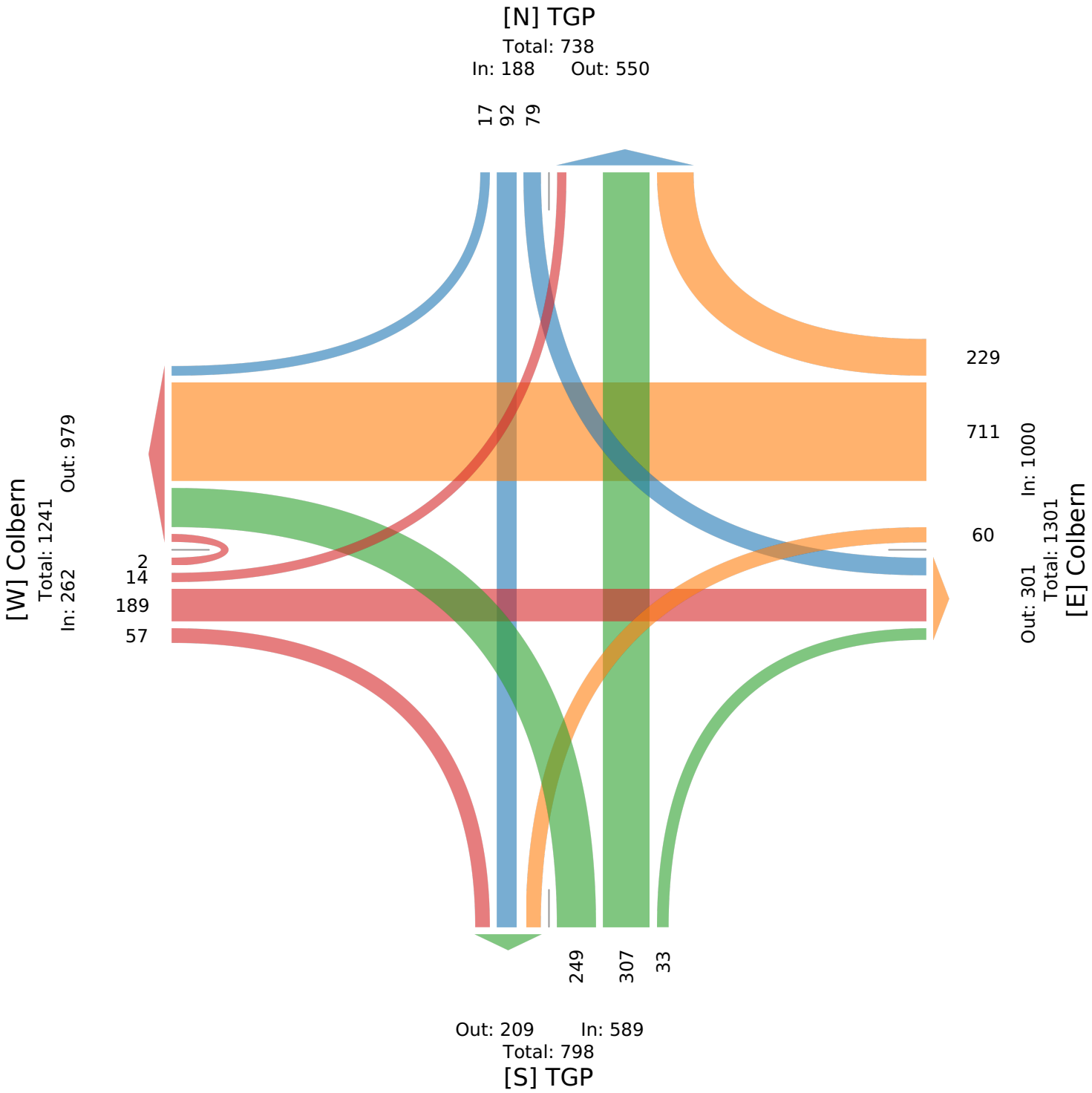
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	TGP					TGP					Colbern					Colbern					
Direction	Northbound					Southbound					Eastbound					Westbound					
Time	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	L	T	R	U	**App**	**Int**
2022-08-09 7:15AM	66	79	6	0	**151**	12	19	6	0	**37**	3	45	12	0	**60**	20	184	57	0	**261**	**509**
7:30AM	68	89	11	0	**168**	21	26	6	0	**53**	4	49	12	1	**66**	11	192	45	0	**248**	**535**
7:45AM	65	76	7	0	**148**	18	25	3	0	**46**	4	41	16	1	**62**	19	218	76	0	**313**	**569**
8:00AM	50	63	9	0	**122**	28	22	2	0	**52**	3	54	17	0	**74**	10	117	51	0	**178**	**426**
Total	249	307	33	0	**589**	79	92	17	0	**188**	14	189	57	2	**262**	60	711	229	0	**1000**	**2039**
% Approach	42.3%	52.1%	5.6%	0%	**-**	42.0%	48.9%	9.0%	0%	**-**	5.3%	72.1%	21.8%	0.8%	**-**	6.0%	71.1%	22.9%	0%	**-**	-
% Total	12.2%	15.1%	1.6%	0%	**28.9%**	3.9%	4.5%	0.8%	0%	**9.2%**	0.7%	9.3%	2.8%	0.1%	**12.8%**	2.9%	34.9%	11.2%	0%	**49.0%**	-
PHF	0.915	0.862	0.750	-	**0.876**	0.705	0.885	0.708	-	**0.887**	0.875	0.875	0.838	0.500	**0.885**	0.750	0.815	0.753	-	**0.799**	0.896
Lights	248	303	32	0	**583**	73	90	16	0	**179**	14	179	52	2	**247**	59	701	221	0	**981**	1990
% Lights	99.6%	98.7%	97.0%	0%	**99.0%**	92.4%	97.8%	94.1%	0%	**95.2%**	100%	94.7%	91.2%	100%	**94.3%**	98.3%	98.6%	96.5%	0%	**98.1%**	97.6%
Articulated Trucks	0	2	0	0	**2**	3	0	1	0	**4**	0	2	2	0	**4**	1	2	3	0	**6**	16
% Articulated Trucks	0%	0.7%	0%	0%	**0.3%**	3.8%	0%	5.9%	0%	**2.1%**	0%	1.1%	3.5%	0%	**1.5%**	1.7%	0.3%	1.3%	0%	**0.6%**	0.8%
Buses and Single-Unit Trucks	1	2	1	0	**4**	3	2	0	0	**5**	0	8	3	0	**11**	0	8	5	0	**13**	33
% Buses and Single-Unit Trucks	0.4%	0.7%	3.0%	0%	**0.7%**	3.8%	2.2%	0%	0%	**2.7%**	0%	4.2%	5.3%	0%	**4.2%**	0%	1.1%	2.2%	0%	**1.3%**	1.6%

*L: Left, R: Right, T: Thru, U: U-Turn

Northeast Colbern Road & Northeast Todd Geor... - TMC
Tue Aug 9, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976526, Location: 38.945912, -94.343388

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Northeast Colbern Road & Northeast Todd Geor... - TMC

Tue Aug 9, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976526, Location: 38.945912, -94.343388

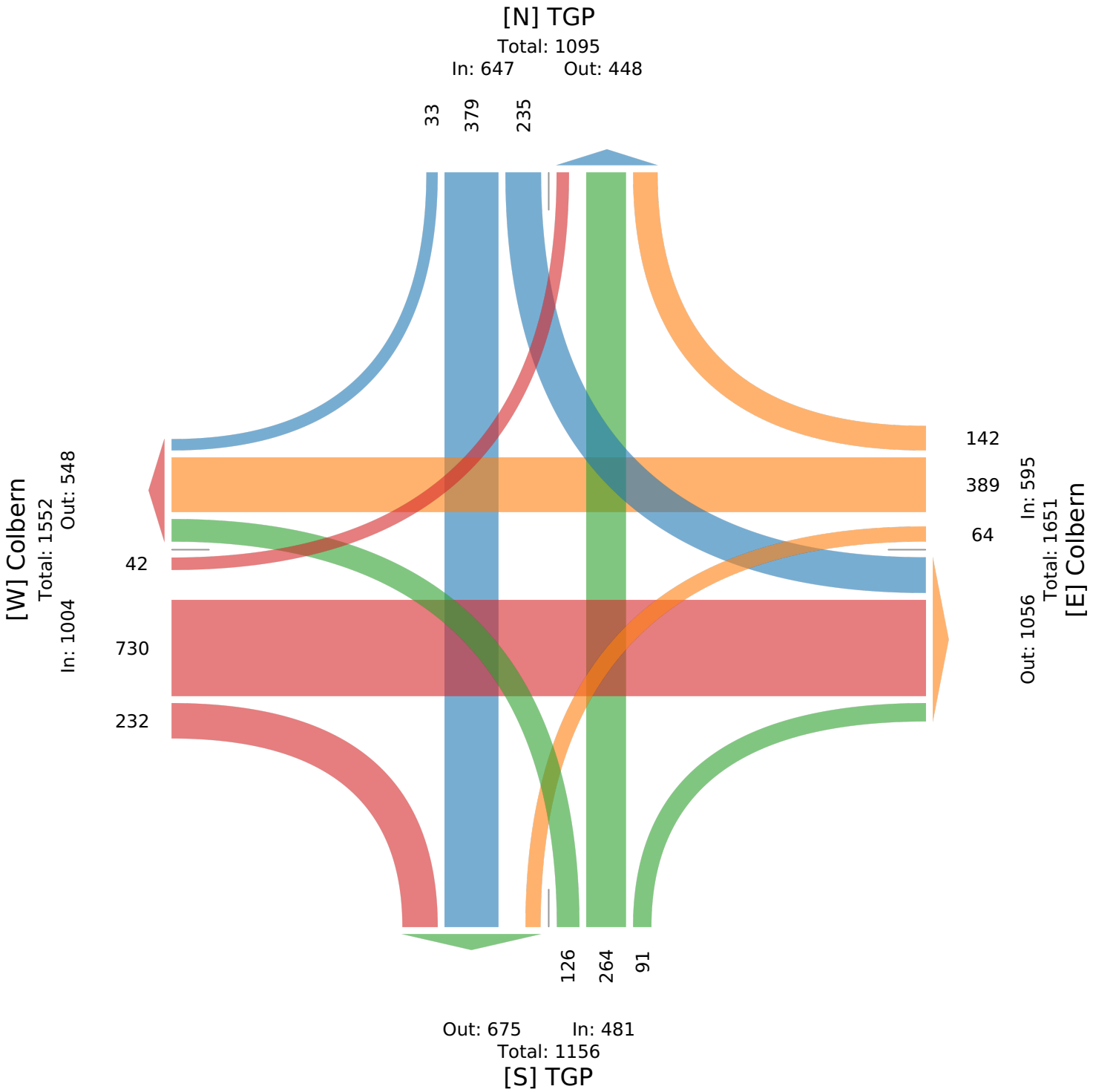
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	TGP					TGP					Colbern					Colbern					
Direction	Northbound					Southbound					Eastbound					Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2022-08-09 4:30PM	33	58	25	0	**116**	52	107	8	0	**167**	5	175	46	0	**226**	15	91	26	0	**132**	**641**
4:45PM	34	70	21	0	**125**	60	93	5	0	**158**	8	170	63	0	**241**	17	93	37	0	**147**	**671**
5:00PM	33	74	20	0	**127**	55	90	5	0	**150**	10	183	54	0	**247**	15	97	39	0	**151**	**675**
5:15PM	26	62	25	0	**113**	68	89	15	0	**172**	19	202	69	0	**290**	17	108	40	0	**165**	**740**
Total	126	264	91	0	**481**	235	379	33	0	**647**	42	730	232	0	**1004**	64	389	142	0	**595**	**2727**
% Approach	26.2%	54.9%	18.9%	0%	-	36.3%	58.6%	5.1%	0%	-	4.2%	72.7%	23.1%	0%	-	10.8%	65.4%	23.9%	0%	-	-
% Total	4.6%	9.7%	3.3%	0%	**17.6%**	8.6%	13.9%	1.2%	0%	**23.7%**	1.5%	26.8%	8.5%	0%	**36.8%**	2.3%	14.3%	5.2%	0%	**21.8%**	-
PHF	0.926	0.892	0.910	-	**0.947**	0.864	0.886	0.550	-	**0.940**	0.553	0.903	0.841	-	**0.866**	0.941	0.900	0.888	-	**0.902**	0.921
Lights	126	262	89	0	**477**	232	379	33	0	**644**	42	723	231	0	**996**	64	381	139	0	**584**	2701
% Lights	100%	99.2%	97.8%	0%	**99.2%**	98.7%	100%	100%	0%	**99.5%**	100%	99.0%	99.6%	0%	**99.2%**	100%	97.9%	97.9%	0%	**98.2%**	99.0%
Articulated Trucks	0	0	0	0	**0**	1	0	0	0	**1**	0	1	0	0	**1**	0	1	1	0	**2**	4
% Articulated Trucks	0%	0%	0%	0%	**0%**	0.4%	0%	0%	0%	**0.2%**	0%	0.1%	0%	0%	**0.1%**	0%	0.3%	0.7%	0%	**0.3%**	0.1%
Buses and Single-Unit Trucks	0	2	2	0	**4**	2	0	0	0	**2**	0	6	1	0	**7**	0	7	2	0	**9**	22
% Buses and Single-Unit Trucks	0%	0.8%	2.2%	0%	**0.8%**	0.9%	0%	0%	0%	**0.3%**	0%	0.8%	0.4%	0%	**0.7%**	0%	1.8%	1.4%	0%	**1.5%**	0.8%

*L: Left, R: Right, T: Thru, U: U-Turn

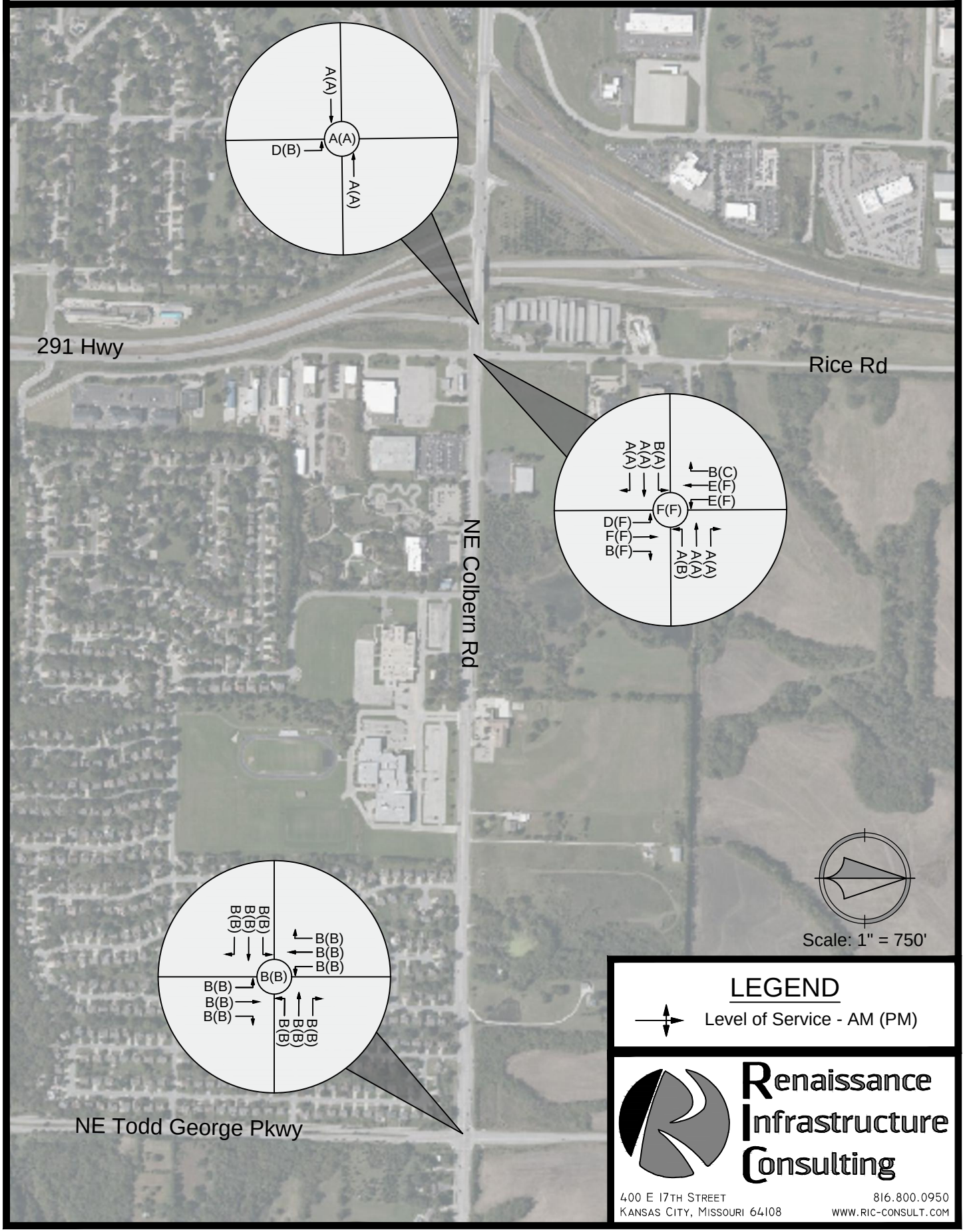
Northeast Colbern Road & Northeast Todd Geor... - TMC
Tue Aug 9, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 976526, Location: 38.945912, -94.343388

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Appendix C - Operational Analysis

Level of Service - Existing Conditions



LEGEND

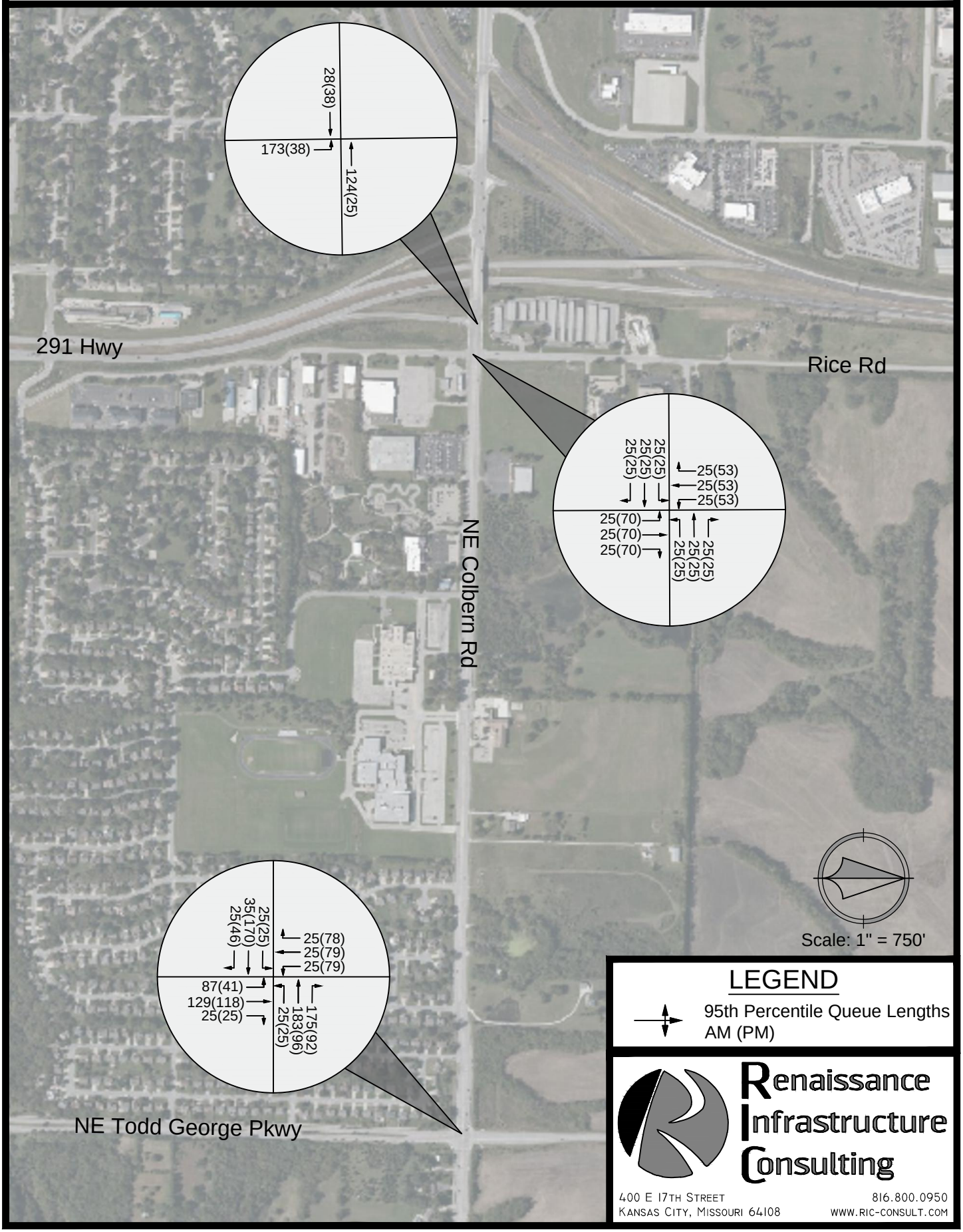
Level of Service - AM (PM)

Renaissance Infrastructure Consulting

400 E 17th Street
Kansas City, Missouri 64108

816.800.0950
www.ric-consult.com

Queue Lengths - Existing Conditions

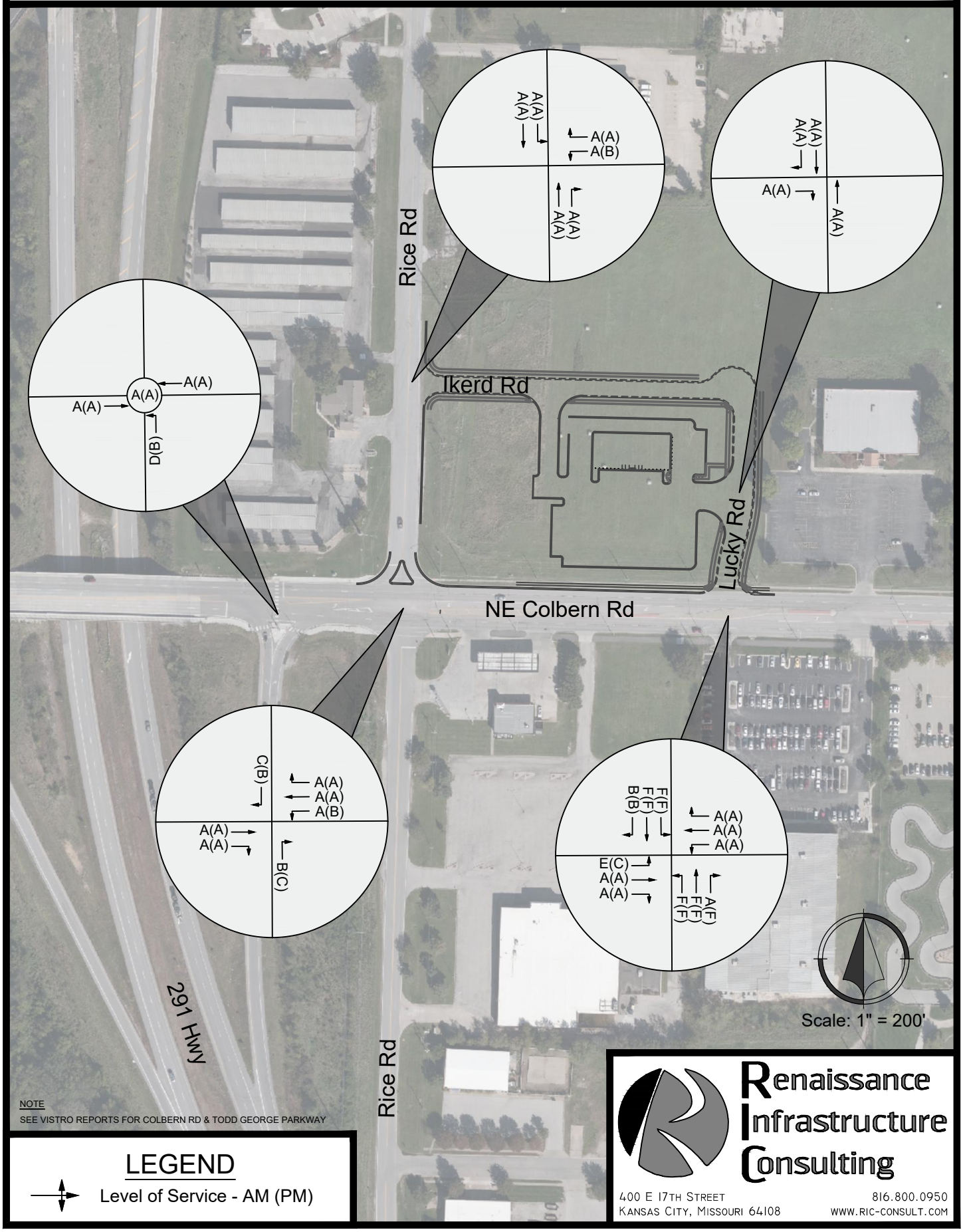


LEGEND

95th Percentile Queue Lengths
AM (PM)

Renaissance Infrastructure Consulting
400 E 17th Street
Kansas City, Missouri 64108
816.800.0950
www.ric-consult.com

Level of Service - Existing Plus Proposed Conditions



NOTE

SEE VISTRO REPORTS FOR COLBERN RD & TODD GEORGE PARKWAY

LEGEND

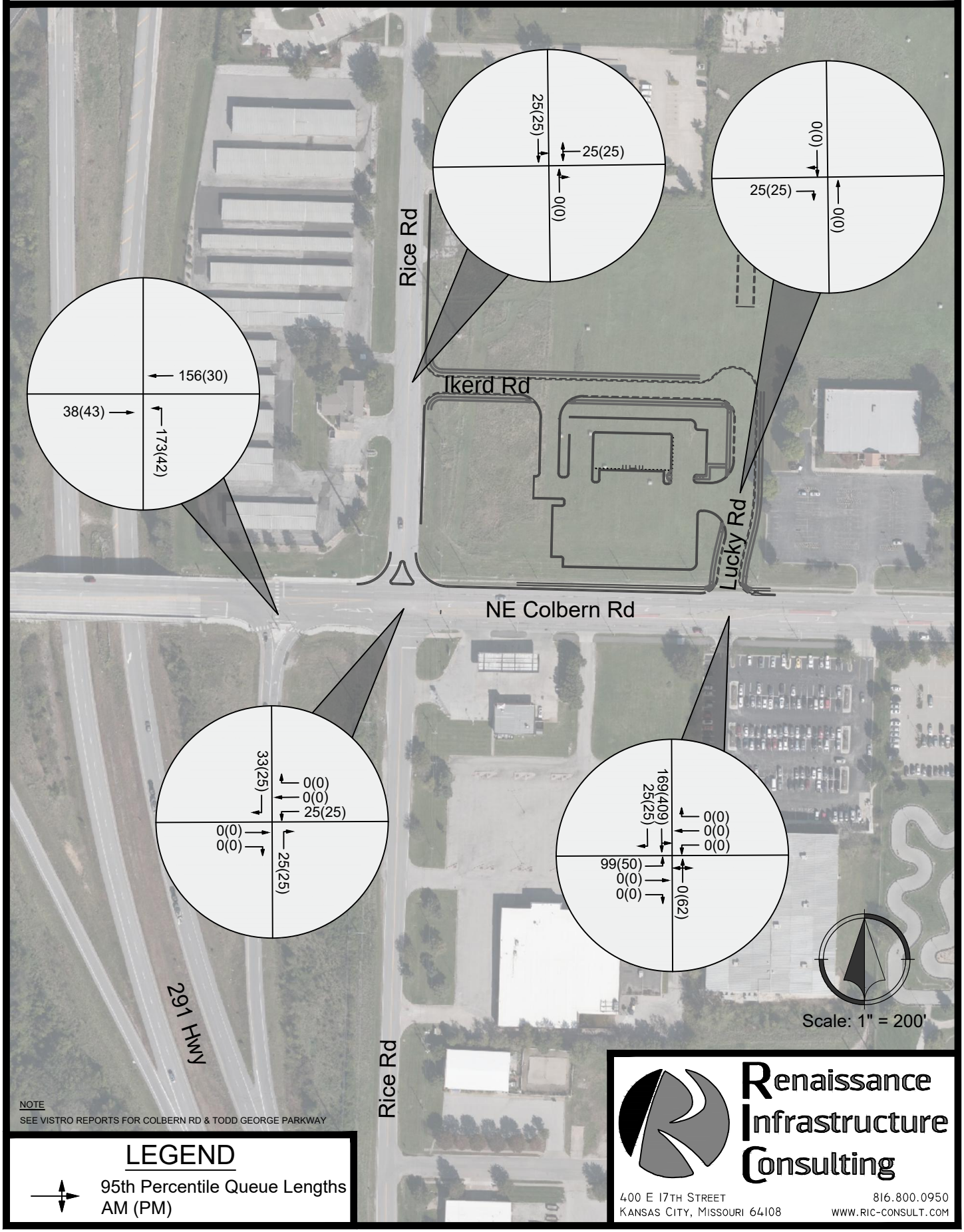
Level of Service - AM (PM)

Renaissance Infrastructure Consulting

400 E 17th Street
Kansas City, Missouri 64108

816.800.0950
www.ric-consult.com

Queue Lengths - Existing Plus Proposed Conditions



NOTE
SEE VISTRO REPORTS FOR COLBERN RD & TODD GEORGE PARKWAY

LEGEND

95th Percentile Queue Lengths
AM (PM)

Renaissance Infrastructure Consulting
400 E 17th Street
Kansas City, Missouri 64108
816.800.0950
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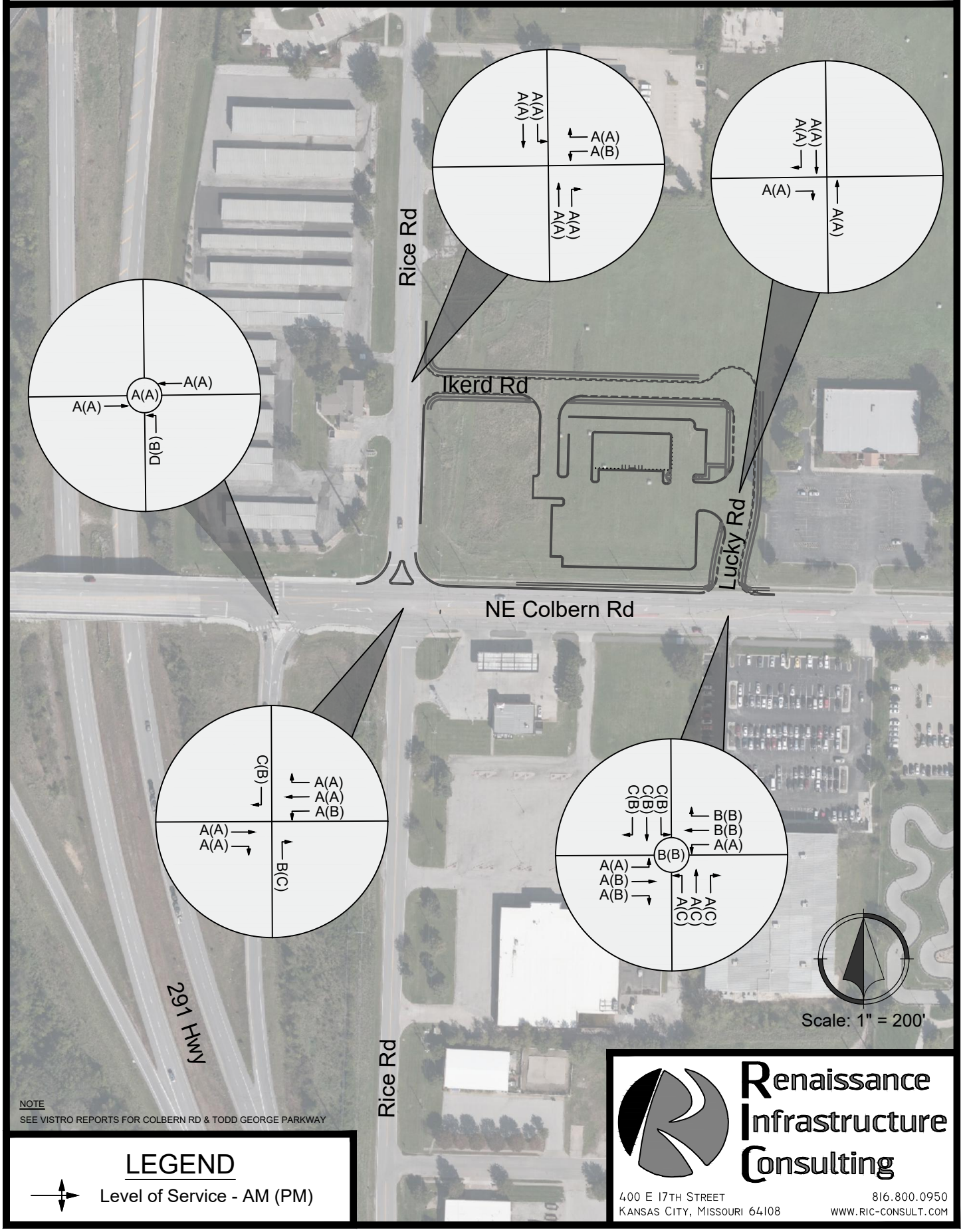
Level of Service - Existing Plus Proposed Conditions w/ Improvements



NOTE
SEE VISTRO REPORTS FOR COLBERN RD & TODD GEORGE PARKWAY

LEGEND

Level of Service - AM (PM)

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816.800.0950
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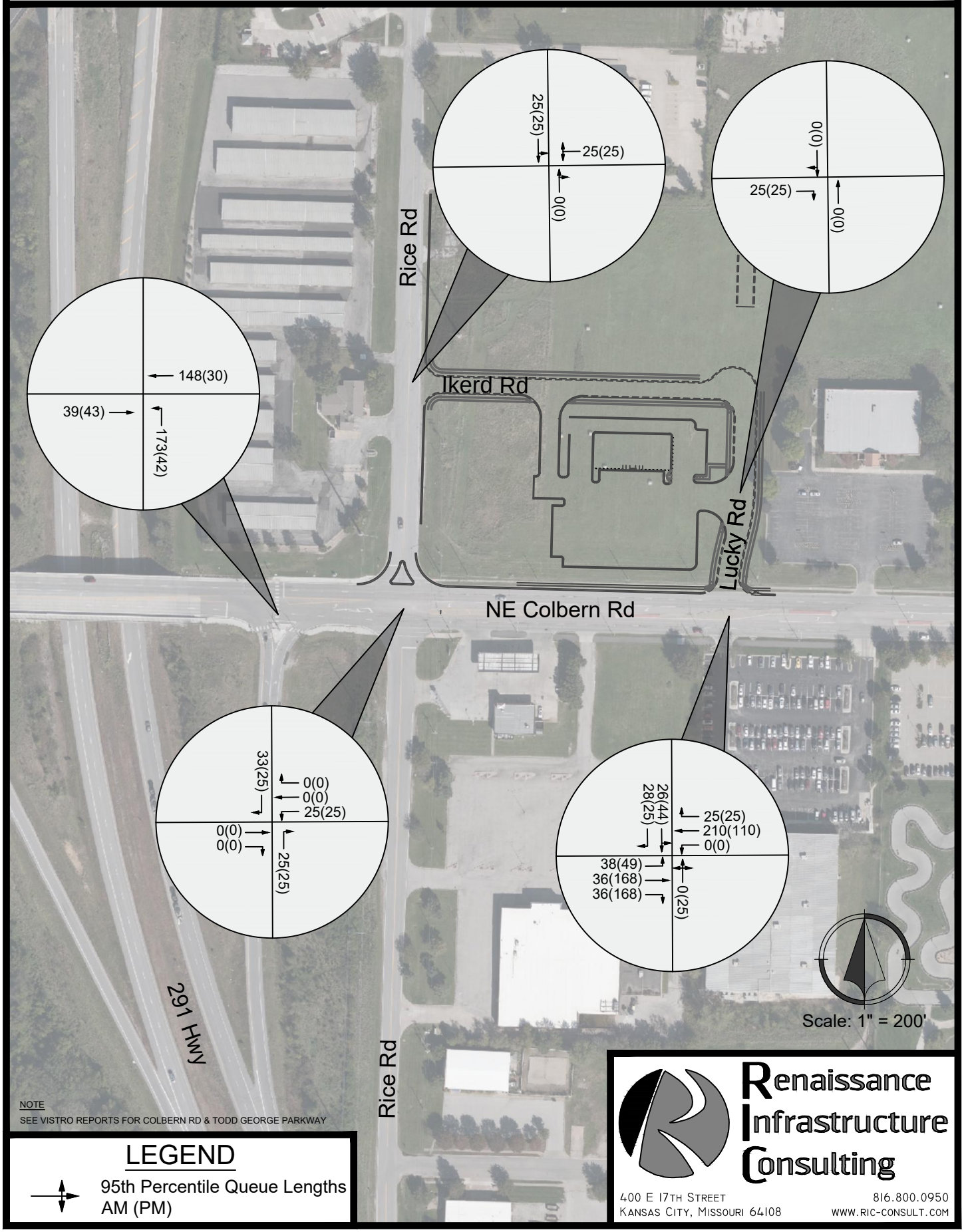
Queue Lengths - Existing Plus Proposed Conditions w/ Improvements



NOTE
SEE VISTRO REPORTS FOR COLBERN RD & TODD GEORGE PARKWAY

LEGEND

95th Percentile Queue Lengths
AM (PM)

Renaissance Infrastructure Consulting
400 E 17th Street
Kansas City, Missouri 64108
816.800.0950
www.ric-consult.com

Intersection Level Of Service Report
Intersection 1: MO 291 & Colbern Rd

Control Type:	Signalized	Delay (sec / veh):	8.3
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.420

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	210.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		40.00		40.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	148	52	337	0	0	1073
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.40	1.90	7.10	2.00	2.00	1.20
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	26	0	0	0	0
Total Hourly Volume [veh/h]	148	52	337	0	0	1073
Peak Hour Factor	0.9130	0.9130	0.9130	1.0000	1.0000	0.9130
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	14	92	0	0	294
Total Analysis Volume [veh/h]	162	57	369	0	0	1175
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	79.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Unsignalized	Permissive	Permissive	Permissive	Permissive
Signal Group	3	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	0	6	0	0	6
Maximum Green [s]	25	0	40	0	0	40
Amber [s]	3.0	0.0	4.4	0.0	0.0	3.5
All red [s]	2.9	0.0	1.3	0.0	0.0	2.9
Split [s]	30	0	36	0	0	40
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	18	0	28	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.7	0.0	0.0	4.4
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C
C, Cycle Length [s]	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.70	6.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.90	3.70	4.40
g_i, Effective Green Time [s]	10	68	67
g / C, Green / Cycle	0.11	0.76	0.75
(v / s)_i Volume / Saturation Flow Rate	0.09	0.11	0.33
s, saturation flow rate [veh/h]	1761	3415	3583
c, Capacity [veh/h]	200	2587	2687
d1, Uniform Delay [s]	38.92	2.96	4.18
k, delay calibration	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	7.71	0.12	0.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.14	0.44
d, Delay for Lane Group [s/veh]	46.63	3.08	4.70
Lane Group LOS	D	A	A
Critical Lane Group	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	3.83	0.60	2.73
50th-Percentile Queue Length [ft/ln]	95.65	15.06	68.35
95th-Percentile Queue Length [veh/ln]	6.89	1.08	4.92
95th-Percentile Queue Length [ft/ln]	172.17	27.11	123.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.63	0.00	3.08	0.00	0.00	4.70
Movement LOS	D		A			A
d_A, Approach Delay [s/veh]	46.63		3.08		4.70	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	8.33					
Intersection LOS	A					
Intersection V/C	0.420					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	0.00	34.65
l_p,int, Pedestrian LOS Score for Intersection	1.806	0.000	2.632
Crosswalk LOS	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	536	674	747
d_b, Bicycle Delay [s]	24.10	19.78	17.65
l_b,int, Bicycle LOS Score for Intersection	1.560	1.864	2.529
Bicycle LOS	A	A	B

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Rice Rd & Colbern Rd

Control Type:	Two-way stop	Delay (sec / veh):	64.8
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.031

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	60.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			45.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name												
Base Volume Input [veh/h]	20	2	2	3	1	31	27	317	36	10	1004	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	50.00	0.00	0.00	0.00	3.20	0.00	5.70	8.30	10.00	1.10	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	2	2	3	1	31	27	317	36	10	1004	21
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	1	1	0	9	7	87	10	3	276	6
Total Analysis Volume [veh/h]	22	2	2	3	1	34	30	348	40	11	1103	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.03	0.00	0.03	0.01	0.07	0.05	0.00	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	30.03	64.80	13.59	43.23	41.24	14.08	11.02	0.00	0.00	8.27	0.00	0.00
Movement LOS	D	F	B	E	E	B	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.56	0.56	0.56	0.38	0.38	0.38	0.15	0.00	0.00	0.03	0.00	0.00
95th-Percentile Queue Length [ft/ln]	13.89	13.89	13.89	9.49	9.49	9.49	3.76	0.00	0.00	0.75	0.00	0.00
d_A, Approach Delay [s/veh]	31.44			17.10			0.79			0.08		
Approach LOS	D			C			A			A		
d_I, Intersection Delay [s/veh]	1.17											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: NE Colbern Rd & Todd George Pkwy

Control Type:	Signalized	Delay (sec / veh):	14.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.482

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	215.00	100.00	100.00	265.00	100.00	100.00	130.00	100.00	185.00	160.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00			45.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	249	307	33	79	92	17	14	189	57	60	711	229
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.40	1.40	3.00	7.60	2.20	5.90	0.00	5.30	8.80	1.70	1.40	3.50
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	17	0	0	9	0	0	29	0	0	115
Total Hourly Volume [veh/h]	249	307	16	79	92	8	14	189	28	60	711	114
Peak Hour Factor	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	86	4	22	26	2	4	53	8	17	198	32
Total Analysis Volume [veh/h]	278	343	18	88	103	9	16	211	31	67	794	127
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Beginning of First Red
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	15	40	0	15	40	0	20	40	0	20	40	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.5	2.5	0.0	2.5	2.5	0.0	2.5	2.5	0.0	2.5	2.5	0.0
Split [s]	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	30	0	0	29	0	0	28	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	53	53	53	53	53	53	53	53	53	53	53	53
L, Total Lost Time per Cycle [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	27	17	17	27	15	15	26	16	16	26	18	18
g / C, Green / Cycle	0.51	0.32	0.32	0.51	0.28	0.28	0.49	0.31	0.31	0.49	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.18	0.18	0.01	0.07	0.03	0.03	0.02	0.06	0.02	0.05	0.25	0.25
s, saturation flow rate [veh/h]	1530	1879	1577	1247	1867	1815	964	3466	1503	1380	1879	1790
c, Capacity [veh/h]	888	599	503	625	515	501	473	1066	462	765	652	621
d1, Uniform Delay [s]	11.78	15.09	12.48	11.16	14.38	14.39	12.03	13.58	13.02	11.10	15.14	15.14
k, delay calibration	0.10	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.19	0.32	0.01	0.04	0.03	0.04	0.01	0.03	0.02	0.02	0.57	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.31	0.57	0.04	0.14	0.11	0.11	0.03	0.20	0.07	0.09	0.72	0.72
d, Delay for Lane Group [s/veh]	11.97	15.41	12.49	11.20	14.41	14.42	12.04	13.62	13.05	11.12	15.71	15.74
Lane Group LOS	B	B	B	B	B	B	B	B	B	B	B	B
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.91	2.86	0.12	0.51	0.42	0.41	0.10	0.78	0.22	0.42	4.05	3.87
50th-Percentile Queue Length [ft/ln]	47.81	71.55	3.08	12.81	10.41	10.31	2.45	19.38	5.50	10.50	101.37	96.68
95th-Percentile Queue Length [veh/ln]	3.44	5.15	0.22	0.92	0.75	0.74	0.18	1.40	0.40	0.76	7.30	6.96
95th-Percentile Queue Length [ft/ln]	86.06	128.78	5.55	23.05	18.74	18.56	4.40	34.88	9.90	18.90	182.47	174.02

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.97	15.41	12.49	11.20	14.42	14.42	12.04	13.62	13.05	11.12	15.72	15.74
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	13.83			13.00			13.45			15.41		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.45											
Intersection LOS	B											
Intersection V/C	0.482											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	-6.5	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	18.26	33.39	18.26	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.557	2.446	2.875	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1510	1510	1510	1510
d_b, Bicycle Delay [s]	1.59	1.59	1.59	1.59
l_b,int, Bicycle LOS Score for Intersection	2.642	1.732	1.796	2.470
Bicycle LOS	B	A	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: MO 291 & Colbern Rd

Control Type:	Signalized	Delay (sec / veh):	6.8
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.403

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	210.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		40.00		40.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	138	121	1069	0	0	669
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.40	0.80	1.30	2.00	2.00	1.60
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	61	0	0	0	0
Total Hourly Volume [veh/h]	138	121	1069	0	0	669
Peak Hour Factor	0.9310	0.9310	0.9310	1.0000	1.0000	0.9310
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	32	287	0	0	180
Total Analysis Volume [veh/h]	148	130	1148	0	0	719
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	92.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Unsignalized	Permissive	Permissive	Permissive	Permissive
Signal Group	3	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	0	6	0	0	6
Maximum Green [s]	25	0	40	0	0	40
Amber [s]	3.0	0.0	4.4	0.0	0.0	3.5
All red [s]	2.9	0.0	1.3	0.0	0.0	2.9
Split [s]	20	0	80	0	0	80
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	18	0	28	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.7	0.0	0.0	4.4
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C
C, Cycle Length [s]	28	28	28
L, Total Lost Time per Cycle [s]	5.90	5.70	6.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.90	3.70	4.40
g_i, Effective Green Time [s]	3	13	13
g / C, Green / Cycle	0.12	0.47	0.44
(v / s)_i Volume / Saturation Flow Rate	0.08	0.32	0.20
s, saturation flow rate [veh/h]	1790	3580	3572
c, Capacity [veh/h]	220	1682	1591
d1, Uniform Delay [s]	11.95	5.89	5.49
k, delay calibration	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	3.53	0.49	0.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.67	0.68	0.45
d, Delay for Lane Group [s/veh]	15.47	6.39	5.69
Lane Group LOS	B	A	A
Critical Lane Group	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.83	0.83	0.52
50th-Percentile Queue Length [ft/ln]	20.78	20.87	12.88
95th-Percentile Queue Length [veh/ln]	1.50	1.50	0.93
95th-Percentile Queue Length [ft/ln]	37.41	37.56	23.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.47	0.00	6.39	0.00	0.00	5.69
Movement LOS	B		A			A
d_A, Approach Delay [s/veh]	15.47		6.39		5.69	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	6.81					
Intersection LOS	A					
Intersection V/C	0.403					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	5.33	0.00	5.33
l_p,int, Pedestrian LOS Score for Intersection	1.723	0.000	2.662
Crosswalk LOS	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	993	5231	5182
d_b, Bicycle Delay [s]	3.60	37.07	35.95
l_b,int, Bicycle LOS Score for Intersection	1.560	2.507	2.153
Bicycle LOS	A	B	B

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Rice Rd & Colbern Rd

Control Type:	Two-way stop	Delay (sec / veh):	132.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.544

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	60.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			45.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name												
Base Volume Input [veh/h]	26	2	17	25	2	64	65	1084	32	12	571	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.70	3.10	0.00	1.80	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	2	17	25	2	64	65	1084	32	12	571	29
Peak Hour Factor	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	1	5	7	1	17	17	292	9	3	154	8
Total Analysis Volume [veh/h]	28	2	18	27	2	69	70	1167	34	13	615	31
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.54	0.04	0.04	0.31	0.04	0.10	0.07	0.01	0.00	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	132.11	127.36	70.13	58.09	82.76	22.67	9.14	0.00	0.00	11.26	0.00	0.00
Movement LOS	F	F	F	F	F	C	A	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	2.79	2.79	2.79	2.10	2.10	2.10	0.24	0.00	0.00	0.07	0.00	0.00
95th-Percentile Queue Length [ft/ln]	69.72	69.72	69.72	52.57	52.57	52.57	6.03	0.00	0.00	1.69	0.00	0.00
d_A, Approach Delay [s/veh]	108.67			33.66			0.50			0.22		
Approach LOS	F			D			A			A		
d_I, Intersection Delay [s/veh]	4.48											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: NE Colbern Rd & Todd George Pkwy

Control Type:	Signalized	Delay (sec / veh):	15.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	215.00	100.00	100.00	265.00	100.00	100.00	130.00	100.00	185.00	160.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00			45.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	126	264	91	235	379	33	42	730	232	64	389	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.80	2.20	1.30	0.00	0.00	0.00	0.90	0.40	0.00	2.10	2.10
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	46	0	0	17	0	0	116	0	0	71
Total Hourly Volume [veh/h]	126	264	45	235	379	16	42	730	116	64	389	71
Peak Hour Factor	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	72	12	64	103	4	11	198	31	17	106	19
Total Analysis Volume [veh/h]	137	287	49	255	412	17	46	793	126	69	422	77
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Beginning of First Red
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	15	40	0	15	40	0	20	40	0	20	40	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.5	2.5	0.0	2.5	2.5	0.0	2.5	2.5	0.0	2.5	2.5	0.0
Split [s]	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	30	0	0	29	0	0	28	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	56	56	56	56	56	56	56	56	56	56	56	56
L, Total Lost Time per Cycle [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	29	16	16	29	18	18	27	17	17	27	18	18
g / C, Green / Cycle	0.51	0.29	0.29	0.51	0.32	0.32	0.49	0.31	0.31	0.49	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.11	0.15	0.03	0.19	0.11	0.11	0.04	0.22	0.08	0.07	0.14	0.14
s, saturation flow rate [veh/h]	1293	1888	1587	1364	1900	1874	1211	3592	1610	1045	1868	1770
c, Capacity [veh/h]	705	555	467	691	600	591	626	1127	505	521	611	578
d1, Uniform Delay [s]	11.34	16.46	14.40	12.57	14.80	14.80	11.61	16.93	14.31	12.61	14.70	14.72
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.05	0.28	0.04	0.12	0.14	0.14	0.02	0.30	0.09	0.04	0.17	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.19	0.52	0.11	0.37	0.36	0.36	0.07	0.70	0.25	0.13	0.42	0.42
d, Delay for Lane Group [s/veh]	11.39	16.74	14.44	12.69	14.93	14.94	11.63	17.23	14.41	12.65	14.87	14.90
Lane Group LOS	B	B	B	B	B	B	B	B	B	B	B	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.91	2.61	0.39	1.75	1.74	1.72	0.31	3.77	1.01	0.46	2.13	2.04
50th-Percentile Queue Length [ft/ln]	22.65	65.37	9.72	43.86	43.48	42.94	7.63	94.24	25.33	11.62	53.24	51.01
95th-Percentile Queue Length [veh/ln]	1.63	4.71	0.70	3.16	3.13	3.09	0.55	6.79	1.82	0.84	3.83	3.67
95th-Percentile Queue Length [ft/ln]	40.78	117.67	17.50	78.94	78.26	77.30	13.73	169.63	45.59	20.92	95.83	91.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.39	16.74	14.44	12.69	14.94	14.94	11.63	17.23	14.41	12.65	14.88	14.90
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	14.95			14.10			16.59			14.61		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	15.25											
Intersection LOS	B											
Intersection V/C	0.520											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	-6.5	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	19.64	34.79	19.64	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.696	2.608	3.019	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1433	1433	1433	1433
d_b, Bicycle Delay [s]	2.24	2.24	2.24	2.24
l_b,int, Bicycle LOS Score for Intersection	2.416	2.138	2.451	2.087
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: MO 291 & Colbern Rd

Control Type:	Signalized	Delay (sec / veh):	8.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.473

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	210.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		40.00		40.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	148	52	337	0	0	1073
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.40	1.90	7.10	2.00	2.00	1.20
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	18	115	0	0	134
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	38
Right Turn on Red Volume [veh/h]	0	35	0	0	0	0
Total Hourly Volume [veh/h]	148	70	452	0	0	1245
Peak Hour Factor	0.9130	0.9130	0.9130	1.0000	1.0000	0.9130
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	19	124	0	0	341
Total Analysis Volume [veh/h]	162	77	495	0	0	1364
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Unsignalized	Permissive	Permissive	Permissive	Permissive
Signal Group	3	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	0	6	0	0	6
Maximum Green [s]	25	0	40	0	0	40
Amber [s]	3.0	0.0	4.4	0.0	0.0	3.5
All red [s]	2.9	0.0	1.3	0.0	0.0	2.9
Split [s]	30	0	36	0	0	40
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	18	0	28	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.7	0.0	0.0	4.4
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C
C, Cycle Length [s]	90	90	90
L, Total Lost Time per Cycle [s]	5.90	5.70	6.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.90	3.70	4.40
g_i, Effective Green Time [s]	10	68	67
g / C, Green / Cycle	0.11	0.76	0.75
(v / s)_i Volume / Saturation Flow Rate	0.09	0.14	0.38
s, saturation flow rate [veh/h]	1761	3415	3583
c, Capacity [veh/h]	200	2587	2687
d1, Uniform Delay [s]	38.92	3.09	4.54
k, delay calibration	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	7.71	0.16	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.19	0.51
d, Delay for Lane Group [s/veh]	46.63	3.25	5.23
Lane Group LOS	D	A	A
Critical Lane Group	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	3.83	0.84	3.46
50th-Percentile Queue Length [ft/ln]	95.65	21.10	86.42
95th-Percentile Queue Length [veh/ln]	6.89	1.52	6.22
95th-Percentile Queue Length [ft/ln]	172.17	37.98	155.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.63	0.00	3.25	0.00	0.00	5.23
Movement LOS	D		A			A
d_A, Approach Delay [s/veh]	46.63		3.25		5.23	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	8.06					
Intersection LOS	A					
Intersection V/C	0.473					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.65	0.00	34.65
l_p,int, Pedestrian LOS Score for Intersection	1.806	0.000	2.735
Crosswalk LOS	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	536	674	747
d_b, Bicycle Delay [s]	24.10	19.78	17.65
l_b,int, Bicycle LOS Score for Intersection	1.560	1.968	2.685
Bicycle LOS	A	A	B

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Rice Rd & Colbern Rd

Control Type:	Two-way stop	Delay (sec / veh):	16.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.310

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			45.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name												
Base Volume Input [veh/h]	20	2	2	3	1	31	27	317	36	10	1004	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	50.00	0.00	0.00	0.00	3.20	0.00	5.70	8.30	10.00	1.10	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	9	0	0	67	0	133	0	9	67	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	25	0	0	0	0	-25	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	22	0	0	0	0	27	0	24	39	0
Total Hourly Volume [veh/h]	20	2	33	3	1	123	27	477	36	43	1085	21
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	9	1	0	34	7	131	10	12	298	6
Total Analysis Volume [veh/h]	22	2	36	3	1	135	30	524	40	47	1192	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.05	0.00	0.00	0.31	0.00	0.01	0.00	0.05	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	10.25	0.00	0.00	16.91	0.00	0.00	0.00	8.98	0.00	0.00
Movement LOS			B			C		A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.16	0.00	0.00	1.30	0.00	0.00	0.00	0.16	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.93	0.00	0.00	32.50	0.00	0.00	0.00	3.90	0.00	0.00
d_A, Approach Delay [s/veh]	10.25			16.91			0.00			0.33		
Approach LOS	B			C			A			A		
d_I, Intersection Delay [s/veh]	1.54											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: NE Colbern Rd & Todd George Pkwy

Control Type:	Signalized	Delay (sec / veh):	14.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.490

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	215.00	100.00	100.00	265.00	100.00	100.00	130.00	100.00	185.00	160.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	40.00			45.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	249	307	33	79	92	17	14	189	57	60	711	229
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.40	1.40	3.00	7.60	2.20	5.90	0.00	5.30	8.80	1.70	1.40	3.50
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	27	0	0	27	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	17	0	0	9	0	0	29	0	0	115
Total Hourly Volume [veh/h]	249	307	16	79	92	8	14	216	28	60	738	114
Peak Hour Factor	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	86	4	22	26	2	4	60	8	17	206	32
Total Analysis Volume [veh/h]	278	343	18	88	103	9	16	241	31	67	824	127
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Beginning of First Red
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	15	40	0	15	40	0	20	40	0	20	40	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.5	2.5	0.0	2.5	2.5	0.0	2.5	2.5	0.0	2.5	2.5	0.0
Split [s]	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	30	0	0	29	0	0	28	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	53	53	53	53	53	53	53	53	53	53	53	53
L, Total Lost Time per Cycle [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	27	17	17	27	15	15	26	17	17	26	19	19
g / C, Green / Cycle	0.51	0.32	0.32	0.51	0.27	0.27	0.49	0.31	0.31	0.49	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.18	0.18	0.01	0.07	0.03	0.03	0.02	0.07	0.02	0.05	0.26	0.26
s, saturation flow rate [veh/h]	1530	1879	1577	1247	1867	1815	947	3466	1503	1358	1879	1792
c, Capacity [veh/h]	882	596	500	619	511	497	466	1082	469	750	660	630
d1, Uniform Delay [s]	11.96	15.28	12.64	11.34	14.57	14.58	12.08	13.63	12.95	11.06	15.21	15.21
k, delay calibration	0.11	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.20	0.33	0.01	0.04	0.03	0.04	0.01	0.04	0.02	0.02	0.61	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.32	0.58	0.04	0.14	0.11	0.11	0.03	0.22	0.07	0.09	0.74	0.74
d, Delay for Lane Group [s/veh]	12.16	15.61	12.65	11.38	14.61	14.62	12.09	13.67	12.97	11.08	15.82	15.85
Lane Group LOS	B	B	B	B	B	B	B	B	B	B	B	B
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.95	2.91	0.13	0.52	0.42	0.42	0.10	0.90	0.22	0.42	4.24	4.05
50th-Percentile Queue Length [ft/ln]	48.69	72.63	3.13	13.04	10.58	10.48	2.45	22.41	5.51	10.53	106.10	101.35
95th-Percentile Queue Length [veh/ln]	3.51	5.23	0.23	0.94	0.76	0.75	0.18	1.61	0.40	0.76	7.62	7.30
95th-Percentile Queue Length [ft/ln]	87.64	130.74	5.63	23.47	19.04	18.86	4.42	40.33	9.92	18.95	190.56	182.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.16	15.61	12.65	11.38	14.61	14.62	12.09	13.67	12.97	11.08	15.83	15.85
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	14.03			13.19			13.51			15.52		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.59											
Intersection LOS	B											
Intersection V/C	0.490											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	-6.5	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	18.46	33.60	18.46	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.558	2.446	2.985	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1498	1498	1498	1498
d_b, Bicycle Delay [s]	1.68	1.68	1.68	1.68
l_b,int, Bicycle LOS Score for Intersection	2.642	1.732	1.821	2.494
Bicycle LOS	B	A	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 13: NE Rice Rd & NE Ikerd Rd

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.110

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	21	0	0	31	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.04	2.00	2.00	3.20	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	9	0	67	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	25	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	4	0	0	29
Total Hourly Volume [veh/h]	21	0	13	31	92	38
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	4	8	25	10
Total Analysis Volume [veh/h]	23	0	14	34	100	41
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.11	0.04
d_M, Delay for Movement [s/veh]	0.00	0.00	7.28	0.00	9.63	9.08
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.02	0.02	0.52	0.52
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.59	0.59	13.07	13.07
d_A, Approach Delay [s/veh]	0.00		2.12		9.47	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.78					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 14: NE Colbern Rd & NE Lucky Rd

Control Type:	Two-way stop	Delay (sec / veh):	851.8
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.144

Intersection Setup

Name													
Approach	Northbound			Southbound			Eastbound				Westbound		
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	200.0	100.0	100.0	100.0	60.00	100.00	150.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			25.00			40.00				40.00		
Grade [%]	0.00			0.00			0.00				0.00		
Crosswalk	Yes			Yes			No				No		

Volumes

Name													
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	316	0	0	1043	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	5.80	2.00	2.00	1.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	27	0	76	0	142	0	0	0	0	27
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	17	0	26	0	17	-17	0	0	-51	51
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	7	0	2	38	43	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	51	0	104	38	202	299	0	0	992	78
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.920	0.920	0.920	0.920	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	14	0	28	10	55	81	0	0	270	21
Total Analysis Volume [veh/h]	0	0	0	55	0	113	41	220	325	0	0	1078	85
Pedestrian Volume [ped/h]	0			0			0				0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	2.14	0.00	0.23	0.24	0.37	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	100.42	133.67	9.22	851.83	825.26	14.62	38.34	23.28	0.00	0.00	7.92	0.00	0.00
Movement LOS	F	F	A	F	F	B	E	C	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	6.73	6.73	0.89	3.94	3.94	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	168.30	168.30	22.25	98.38	98.38	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	81.10			288.70			11.42				0.00		
Approach LOS	F			F			B				A		
d_I, Intersection Delay [s/veh]	28.79												
Intersection LOS	F												

Intersection Level Of Service Report
Intersection 20: NE Lucky Rd & Prop East Dr.

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.208

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	169	0	0	0	103
Diverted Trips [veh/h]	0	0	0	0	0	59
Pass-by Trips [veh/h]	0	68	0	0	0	43
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	43	9	0	0	0
Total Hourly Volume [veh/h]	0	280	9	0	0	205
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	76	2	0	0	56
Total Analysis Volume [veh/h]	0	304	10	0	0	223
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.21
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.24
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.78
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	19.57
d_A, Approach Delay [s/veh]	0.00		0.00		9.24	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.84					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 1: MO 291 & Colbern Rd

Control Type:	Signalized	Delay (sec / veh):	6.8
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.426

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	210.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00		40.00		40.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	138	121	1069	0	0	669
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.40	0.80	1.30	2.00	2.00	1.60
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	76	0	0	89
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	37
Right Turn on Red Volume [veh/h]	0	67	0	0	0	0
Total Hourly Volume [veh/h]	138	134	1145	0	0	795
Peak Hour Factor	0.9310	0.9310	0.9310	1.0000	1.0000	0.9310
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	36	307	0	0	213
Total Analysis Volume [veh/h]	148	144	1230	0	0	854
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	92.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Unsignalized	Permissive	Permissive	Permissive	Permissive
Signal Group	3	0	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	0	6	0	0	6
Maximum Green [s]	25	0	40	0	0	40
Amber [s]	3.0	0.0	4.4	0.0	0.0	3.5
All red [s]	2.9	0.0	1.3	0.0	0.0	2.9
Split [s]	20	0	80	0	0	80
Vehicle Extension [s]	3.0	0.0	3.0	0.0	0.0	3.0
Walk [s]	7	0	7	0	0	0
Pedestrian Clearance [s]	18	0	28	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	3.9	0.0	3.7	0.0	0.0	4.4
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C
C, Cycle Length [s]	30	30	30
L, Total Lost Time per Cycle [s]	5.90	5.70	6.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.90	3.70	4.40
g_i, Effective Green Time [s]	4	15	14
g / C, Green / Cycle	0.12	0.50	0.47
(v / s)_i Volume / Saturation Flow Rate	0.08	0.34	0.24
s, saturation flow rate [veh/h]	1790	3580	3572
c, Capacity [veh/h]	214	1776	1689
d1, Uniform Delay [s]	12.75	5.84	5.51
k, delay calibration	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	3.94	0.49	0.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	0.69	0.51
d, Delay for Lane Group [s/veh]	16.69	6.33	5.75
Lane Group LOS	B	A	A
Critical Lane Group	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.92	0.95	0.66
50th-Percentile Queue Length [ft/ln]	23.01	23.64	16.45
95th-Percentile Queue Length [veh/ln]	1.66	1.70	1.18
95th-Percentile Queue Length [ft/ln]	41.42	42.56	29.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.69	0.00	6.33	0.00	0.00	5.75
Movement LOS	B		A			A
d_A, Approach Delay [s/veh]	16.69		6.33		5.75	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	6.80					
Intersection LOS	A					
Intersection V/C	0.426					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	6.05	0.00	6.05
l_p,int, Pedestrian LOS Score for Intersection	1.729	0.000	2.738
Crosswalk LOS	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	937	4940	4893
d_b, Bicycle Delay [s]	4.25	32.50	31.48
l_b,int, Bicycle LOS Score for Intersection	1.560	2.574	2.264
Bicycle LOS	A	B	B

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Rice Rd & Colbern Rd

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.139

Intersection Setup

Name											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			45.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name												
Base Volume Input [veh/h]	26	2	17	25	2	64	65	1084	32	12	571	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	1.50	2.00	3.10	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	0	0	45	0	89	0	6	45	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	15	0	0	0	0	-15	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	28	0	0	0	0	65	0	20	37	0
Total Hourly Volume [veh/h]	26	2	51	25	2	124	65	1238	32	38	638	29
Peak Hour Factor	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290	0.9290
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	1	14	7	1	33	17	333	9	10	172	8
Total Analysis Volume [veh/h]	28	2	55	27	2	133	70	1333	34	41	687	31
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.14	0.00	0.00	0.21	0.00	0.01	0.00	0.08	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	15.55	0.00	0.00	12.05	0.00	0.00	0.00	12.69	0.00	0.00
Movement LOS			C			B		A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.48	0.00	0.00	0.77	0.00	0.00	0.00	0.26	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	11.96	0.00	0.00	19.31	0.00	0.00	0.00	6.54	0.00	0.00
d_A, Approach Delay [s/veh]	15.55			12.05			0.00			0.69		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	1.29											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: NE Colbern Rd & Todd George Pkwy

Control Type:	Signalized	Delay (sec / veh):	15.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.528

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	215.00	100.00	100.00	265.00	100.00	100.00	130.00	100.00	185.00	160.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.21	0.00	0.00	0.00
Speed [mph]	40.00			45.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name												
Base Volume Input [veh/h]	126	264	91	235	379	33	42	730	232	64	389	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.80	2.20	1.30	0.00	0.00	0.00	0.90	0.40	0.00	2.10	2.10
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	25	0	0	25	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	46	0	0	17	0	0	116	0	0	71
Total Hourly Volume [veh/h]	126	264	45	235	379	16	42	755	116	64	414	71
Peak Hour Factor	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	72	12	64	103	4	11	205	31	17	112	19
Total Analysis Volume [veh/h]	137	287	49	255	412	17	46	820	126	69	450	77
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Beginning of First Red
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	15	40	0	15	40	0	20	40	0	20	40	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.5	2.5	0.0	2.5	2.5	0.0	2.5	2.5	0.0	2.5	2.5	0.0
Split [s]	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	0	0
Pedestrian Clearance [s]	0	30	0	0	29	0	0	28	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	56	56	56	56	56	56	56	56	56	56	56	56
L, Total Lost Time per Cycle [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	29	16	16	29	18	18	28	18	18	28	19	19
g / C, Green / Cycle	0.51	0.29	0.29	0.51	0.31	0.31	0.49	0.32	0.32	0.49	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.11	0.15	0.03	0.19	0.11	0.11	0.04	0.23	0.08	0.07	0.14	0.15
s, saturation flow rate [veh/h]	1293	1888	1587	1366	1900	1874	1190	3592	1610	1028	1868	1775
c, Capacity [veh/h]	698	549	461	684	596	587	616	1147	514	514	621	590
d1, Uniform Delay [s]	11.58	16.81	14.71	12.83	15.06	15.07	11.59	17.01	14.24	12.65	14.75	14.77
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.05	0.29	0.04	0.13	0.14	0.14	0.02	0.31	0.09	0.04	0.18	0.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression 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

Lane Group Results

X, volume / capacity	0.20	0.52	0.11	0.37	0.36	0.36	0.07	0.71	0.25	0.13	0.43	0.44
d, Delay for Lane Group [s/veh]	11.63	17.10	14.75	12.96	15.20	15.20	11.61	17.32	14.33	12.69	14.93	14.96
Lane Group LOS	B	B	B	B	B	B	B	B	B	B	B	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.93	2.68	0.40	1.80	1.78	1.76	0.31	3.95	1.02	0.47	2.28	2.18
50th-Percentile Queue Length [ft/ln]	23.22	66.90	9.95	44.99	44.43	43.88	7.66	98.85	25.44	11.67	56.95	54.62
95th-Percentile Queue Length [veh/ln]	1.67	4.82	0.72	3.24	3.20	3.16	0.55	7.12	1.83	0.84	4.10	3.93
95th-Percentile Queue Length [ft/ln]	41.79	120.42	17.91	80.98	79.97	78.99	13.79	177.94	45.79	21.01	102.52	98.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.63	17.10	14.75	12.96	15.20	15.20	11.61	17.32	14.33	12.69	14.94	14.96
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	15.27			14.37			16.67			14.68		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	15.42											
Intersection LOS	B											
Intersection V/C	0.528											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	-6.5	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	19.95	35.11	19.95	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.697	2.609	3.118	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1417	1417	1417	1417
d_b, Bicycle Delay [s]	2.40	2.40	2.40	2.40
l_b,int, Bicycle LOS Score for Intersection	2.416	2.138	2.474	2.110
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 13: NE Rice Rd & NE Ikerd Rd

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.082

Intersection Setup

Name						
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	29	0	0	64	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.50	2.00	2.00	0.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	0	45	6
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	15	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	27	0	0	67
Total Hourly Volume [veh/h]	29	0	33	64	60	73
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	9	17	16	20
Total Analysis Volume [veh/h]	32	0	36	70	65	79
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane					No	
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.08	0.08
d_M, Delay for Movement [s/veh]	0.00	0.00	7.32	0.00	10.25	9.19
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.06	0.06	0.56	0.56
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.53	1.53	13.93	13.93
d_A, Approach Delay [s/veh]	0.00		2.49		9.67	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	5.87					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 14: NE Colbern Rd & NE Lucky Rd

Control Type:	Two-way stop	Delay (sec / veh):	1,920.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	4.658

Intersection Setup

Name													
Approach	Northbound			Southbound			Eastbound				Westbound		
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	200.0	100.0	100.0	100.0	60.00	100.00	150.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			25.00			40.00				40.00		
Grade [%]	0.00			0.00			0.00				0.00		
Crosswalk	Yes			Yes			No				No		

Volumes

Name													
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	1118	0	0	615	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	25	0	51	0	95	0	0	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	56	0	17	0	56	-56	0	0	-31	31
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	15	0	0	43	0	2	37	102	0	25	0	0	0
Total Hourly Volume [veh/h]	15	0	0	124	0	70	37	253	1062	25	0	584	56
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.920	0.920	0.920	0.920	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	0	0	34	0	19	10	69	289	7	0	159	15
Total Analysis Volume [veh/h]	16	0	0	135	0	76	40	275	1154	27	0	635	61
Pedestrian Volume [ped/h]	0			0			0				0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.00	0.00	0.00	4.66	0.00	0.11	0.10	0.31	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	550.99	527.08	333.17	1920.67	1984.59	10.98	17.39	12.22	0.00	0.00	11.13	0.00	0.00
Movement LOS	F	F	F	F	F	B	C	B	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	2.45	2.45	2.45	16.35	16.35	0.38	2.01	2.01	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	61.33	61.33	61.33	408.72	408.72	9.42	50.16	50.16	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	550.99			1232.82			2.71				0.00		
Approach LOS	F			F			A				A		
d_I, Intersection Delay [s/veh]	112.85												
Intersection LOS	F												

Intersection Level Of Service Report
Intersection 18: NE Lucky Rd & Prop East Dr.

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.158

Intersection Setup

Name						
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	120	0	0	0	76
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	87	0	0	0	72
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	102	45	0	0	0
Total Hourly Volume [veh/h]	0	309	45	0	0	148
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	84	12	0	0	40
Total Analysis Volume [veh/h]	0	336	49	0	0	161
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.16
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.19
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.56
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	13.99
d_A, Approach Delay [s/veh]	0.00		0.00		9.19	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.71					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 14: NE Colbern Rd & NE Lucky Rd

Control Type:	Signalized	Delay (sec / veh):	13.8
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.423

Intersection Setup

Name													
Approach	Northbound			Southbound			Eastbound				Westbound		
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	200.0	100.0	100.0	100.0	60.00	100.00	150.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			25.00			40.00				40.00		
Grade [%]	0.00			0.00			0.00				0.00		
Curb Present	No			No			No				No		
Crosswalk	Yes			Yes			Yes				Yes		

Volumes

Name													
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	316	0	0	1043	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	5.80	2.00	2.00	1.00	2.00
Proportion of CAVs [%]	0.00												
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	27	0	76	0	143	0	0	0	0	27
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	17	0	26	0	17	-17	0	0	-51	51
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	7	0	2	38	43	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	52	0	0	0	0	0	0	39
Total Hourly Volume [veh/h]	0	0	0	51	0	52	38	203	299	0	0	992	39
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.920	0.920	0.920	0.920	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	14	0	14	10	55	81	0	0	270	11
Total Analysis Volume [veh/h]	0	0	0	55	0	57	41	221	325	0	0	1078	42
Presence of On-Street Parking	No		No	No		No	No			No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0			
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0			
v_co, Outbound Pedestrian Volume crossing	0			0			0			0			
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0			
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permi	ProtP	Permi	Permi	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	0	3	8	0	7	4	0
Auxiliary Signal Groups													
Lead / Lag	Lead	-	-	Lead	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	0	5	10	0	5	10	0
Maximum Green [s]	10	30	0	10	30	0	0	30	30	0	30	30	0
Amber [s]	3.0	4.0	0.0	3.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.0	2.5	0.0	2.0	2.5	0.0	0.0	2.5	2.5	0.0	2.5	2.5	0.0
Split [s]	15	34	0	18	52	0	0	13	36	0	12	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	0	20	0	0	20	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	4.5	0.0	3.0	4.5	0.0	0.0	4.5	4.5	0.0	4.5	4.5	0.0
Minimum Recall		No		Yes	No			No	No		No	No	
Maximum Recall		No		No	No			No	No		No	No	
Pedestrian Recall		No		No	No			No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	53	53	53	53	53	53	53	53	53
L, Total Lost Time per Cycle [s]	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.50	0.00	4.50	0.00	4.50	4.50	0.00	4.50	4.50
g_i, Effective Green Time [s]	0	8	8	32	26	26	32	20	20
g / C, Green / Cycle	0.00	0.15	0.15	0.61	0.48	0.48	0.61	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.00	0.03	0.04	0.28	0.09	0.09	0.00	0.30	0.03
s, saturation flow rate [veh/h]	1870	1687	1589	922	1813	1813	1156	3589	1589
c, Capacity [veh/h]	68	451	234	628	880	880	857	1330	589
d1, Uniform Delay [s]	0.00	19.91	20.01	8.22	7.73	7.73	0.00	15.02	10.79
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.00	0.12	0.53	0.44	0.10	0.10	0.00	1.23	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.00	0.12	0.24	0.42	0.18	0.18	0.00	0.81	0.07
d, Delay for Lane Group [s/veh]	0.00	20.03	20.55	8.66	7.83	7.83	0.00	16.25	10.84
Lane Group LOS	A	C	C	A	A	A	A	B	B
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.00	0.58	0.62	0.83	0.78	0.78	0.00	4.79	0.26
50th-Percentile Queue Length [ft/ln]	0.00	14.40	15.48	20.66	19.56	19.56	0.00	119.84	6.60
95th-Percentile Queue Length [veh/ln]	0.00	1.04	1.11	1.49	1.41	1.41	0.00	8.38	0.48
95th-Percentile Queue Length [ft/ln]	0.00	25.92	27.86	37.18	35.20	35.20	0.00	209.60	11.88

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	20.03	20.55	20.55	8.66	8.66	7.83	7.83	0.00	16.25	10.84
Movement LOS	A	A	A	C	C	C	A	A	A	A	A	B	B
d_A, Approach Delay [s/veh]	0.00			20.29			8.20				16.04		
Approach LOS	A			C			A				B		
d_I, Intersection Delay [s/veh]	13.77												
Intersection LOS	B												
Intersection V/C	0.423												

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	16.62	16.62	16.62	16.62
l_p,int, Pedestrian LOS Score for Intersection	1.685	2.262	2.883	2.815
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1039	1718	1114	1076
d_b, Bicycle Delay [s]	6.12	0.52	5.19	5.65
l_b,int, Bicycle LOS Score for Intersection	1.560	1.830	1.862	2.516
Bicycle LOS	A	A	A	B

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 14: NE Colbern Rd & NE Lucky Rd

Control Type:	Signalized	Delay (sec / veh):	13.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.272

Intersection Setup

Name													
Approach	Northbound			Southbound			Eastbound				Westbound		
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	200.0	100.0	100.0	100.0	60.00	100.00	150.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00			25.00			40.00				40.00		
Grade [%]	0.00			0.00			0.00				0.00		
Curb Present	No			No			No				No		
Crosswalk	Yes			Yes			Yes				Yes		

Volumes

Name													
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	1118	0	0	615	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00												
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	25	0	51	0	95	0	0	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	56	0	16	0	56	-56	0	0	-31	31
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	15	0	0	43	0	2	37	102	0	25	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	35	0	0	0	13	0	0	28
Total Hourly Volume [veh/h]	15	0	0	124	0	34	37	253	1062	12	0	584	28
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.920	0.920	0.920	0.920	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	0	0	34	0	9	10	69	289	3	0	159	8
Total Analysis Volume [veh/h]	16	0	0	135	0	37	40	275	1154	13	0	635	30
Presence of On-Street Parking	No		No	No		No	No			No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0				0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0				0		
v_co, Outbound Pedestrian Volume crossing	0			0			0				0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0				0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0				0		
Bicycle Volume [bicycles/h]	0			0			0				0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permi	ProtP	Permi	Permi	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	3	8	0	7	4	0
Auxiliary Signal Groups													
Lead / Lag	Lead	-	-	Lead	-	-	Lead	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	5	10	0	5	10	0
Maximum Green [s]	10	30	0	10	30	0	30	30	30	0	10	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	13	32	0	11	43	0	22	22	47	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	0	20	0	0	20	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No		Yes	No			No	No		Yes	No	
Maximum Recall		No		No	No			No	No		No	No	
Pedestrian Recall		No		No	No			No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering 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	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
C, Cycle Length [s]	44	44	44	44	44	44	44	44	44
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	0.00	3.00	0.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	2	11	11	23	18	18	23	11	11
g / C, Green / Cycle	0.05	0.26	0.26	0.52	0.40	0.40	0.52	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.89	0.08	0.02	0.26	0.31	0.31	0.00	0.18	0.02
s, saturation flow rate [veh/h]	18	1638	1589	1217	1870	1863	651	3560	1589
c, Capacity [veh/h]	165	588	397	754	765	762	455	877	391
d1, Uniform Delay [s]	21.96	13.38	12.66	7.09	11.16	11.16	0.00	15.19	12.72
k, delay calibration	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	0.20	0.10	0.37	1.62	1.64	0.00	1.15	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.10	0.23	0.09	0.42	0.76	0.76	0.00	0.72	0.08
d, Delay for Lane Group [s/veh]	23.13	13.58	12.76	7.46	12.78	12.80	0.00	16.34	12.80
Lane Group LOS	C	B	B	A	B	B	A	B	B
Critical Lane Group	Yes	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.21	0.98	0.26	1.07	3.73	3.72	0.00	2.44	0.19
50th-Percentile Queue Length [ft/ln]	5.19	24.44	6.41	26.75	93.23	93.07	0.00	61.05	4.78
95th-Percentile Queue Length [veh/ln]	0.37	1.76	0.46	1.93	6.71	6.70	0.00	4.40	0.34
95th-Percentile Queue Length [ft/ln]	9.34	43.99	11.53	48.15	167.82	167.53	0.00	109.89	8.60

Movement, Approach, & Intersection Results

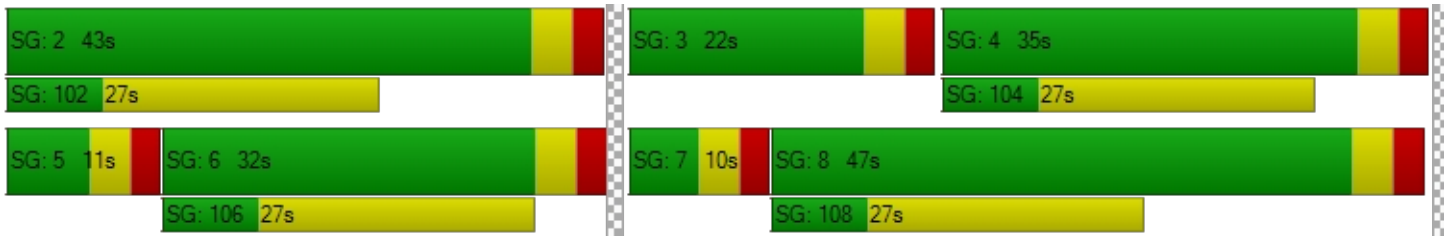
d_M, Delay for Movement [s/veh]	23.13	23.13	23.13	13.58	12.76	12.76	7.46	7.46	12.79	12.80	0.00	16.34	12.80
Movement LOS	C	C	C	B	B	B	A	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	23.13			13.41			11.66				16.18		
Approach LOS	C			B			B				B		
d_I, Intersection Delay [s/veh]	13.15												
Intersection LOS	B												
Intersection V/C	1.272												

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	12.48	12.48	12.48	12.48
l_p,int, Pedestrian LOS Score for Intersection	1.690	2.224	3.006	2.899
Crosswalk LOS	A	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1221	1719	1899	1357
d_b, Bicycle Delay [s]	3.35	0.44	0.06	2.29
l_b,int, Bicycle LOS Score for Intersection	1.586	1.901	2.566	2.131
Bicycle LOS	A	A	B	B

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix D - Signal Warrant Analysis

Traffic Signal Warrant Summary Worksheet 100%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: Colbern Road & Prop. Lucky Road
County: Jackson County
City: Lee's Summit

Major Street: Colbern Road
Critical Approach Speed: 40 mph
Lanes: 2 or more lanes

Minor Street: Prop. Lucky Road
Critical Approach Speed: 25 mph
Lanes: 1 lane

% Right Turns Included
From North (SB) 0%
From East (WB) 0%
From South (NB) 100%
From West (EB) 100%

In built-up area of isolated community of < 10,000 population? No
Total number of approaches at intersection? 4 or more
If it is a "T" intersection, inflate minor threshold to 150%? No
Manually set volume level? No

Analysis based on PROJECTED volume data.

Forecast Year	Within 5 Years of Construction?	Time (HH:MM)			
		From	AM / PM	To	AM / PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	**N/A**
Condition A: Minimum Vehicular Volume	
Condition B: Interruption of Continuous Traffic	
Condition C: Combination: 80% of A and B	
Warrant 2: Four-Hour Volume	**N/A**
Warrant 3: Peak Hour Volume	**Yes**
Warrant 4: Pedestrian Volume	**N/A**
Criterion A: Four-Hour	
Criterion B: Peak-Hour	
Warrant 5: School Crossing	**N/A**
Warrant 6: Coordinated Signal System	**N/A**
Warrant 7: Crash Experience	**N/A**
Warrant 8: Roadway Network	**N/A**
Warrant 9: Intersection Near a Grade Crossing	**N/A**

Warrant Analysis Conducted By:

Name: Akshay Patel
Agency: Renaissance Infrastructure Consulting
Date: 11/22/2022

Warrant 3: Peak Hour Volume 100%

Warrant Evaluated? Yes **Warrant Satisfied? Yes** **Manually Set To:**

Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	4	
Volume on Minor Approach	100	Yes
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
16:00	1961	124