

# AMLIN CROSSING

*Traffic Impact Study*

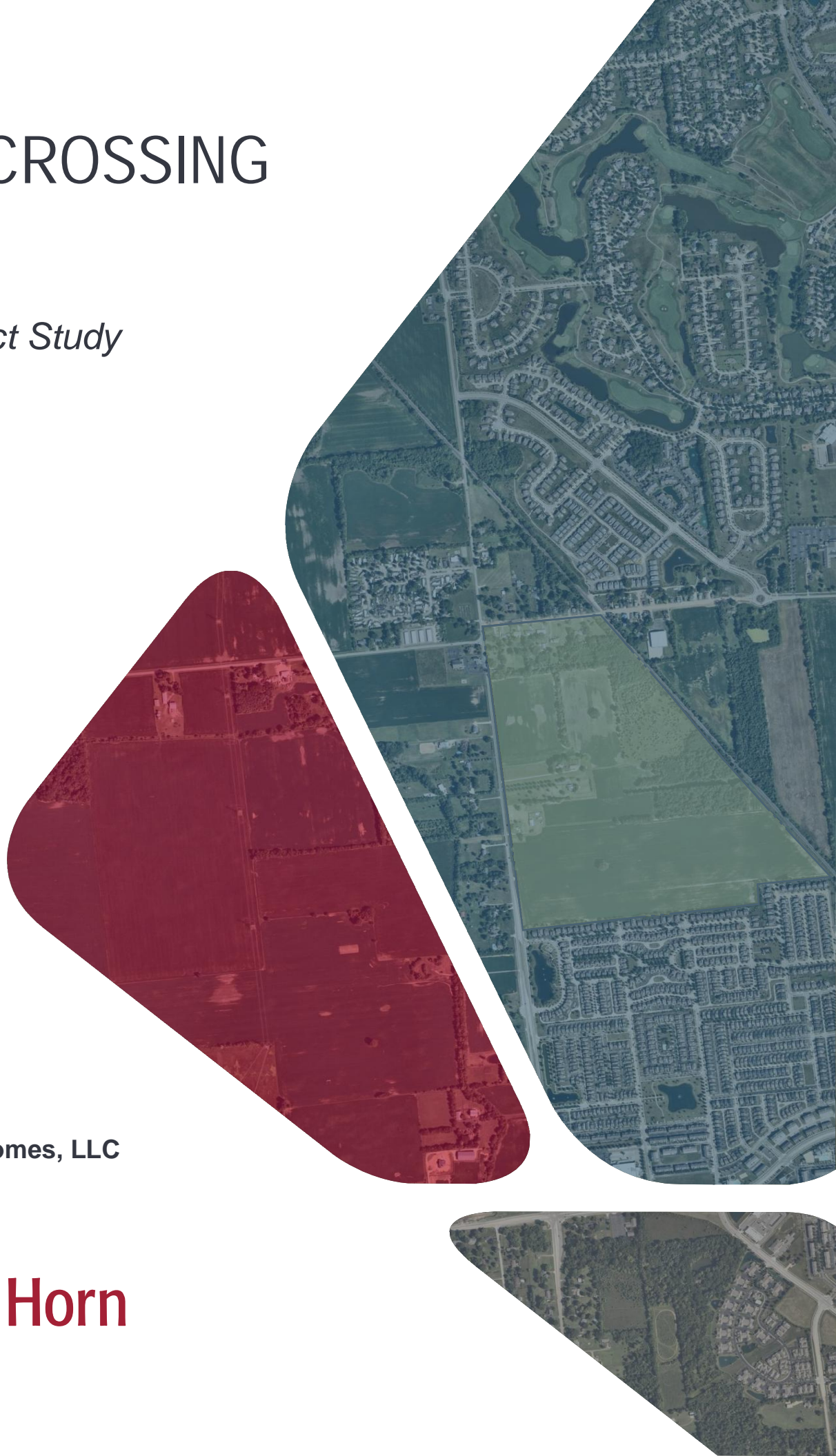
**Dublin, Ohio**

**June 2023**

Prepared for:

**Schottenstein Homes, LLC**

**Kimley»»Horn**



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## INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) was retained by Schottenstein Homes, LLC to perform a traffic study for a proposed residential development located south of Rings Road and east of Cosgray Road in Dublin, Ohio. The proposed development will replace three undeveloped agricultural parcels.

An aerial view of the study location and the surrounding roadway network is presented in **Exhibit 1**, and the conceptual site plan is provided in the **Appendix**.

A Memorandum of Understanding (MOU) meeting was conducted on April 3, 2023, with the City of Dublin. After several follow-up communications, the study parameters were agreed upon between the City of Dublin, Franklin County, and City of Columbus. A copy of the updated MOU is provided in the **Appendix**. The study includes derivation of trip generation characteristics for the proposed residential uses. Site generated traffic volumes were added to background traffic volumes and offsite traffic volumes to assess the site's impact on the area roadway network. This study includes an evaluation of the future no build and build traffic operations with and without the extension of Tuttle Crossing Boulevard.

Figure 1: Site Location Map



## NO BUILD CONDITIONS

Kimley-Horn collected relevant information pertaining to existing land uses in the surrounding area, the adjacent street system, current traffic volumes and operating conditions, lane configurations and traffic controls at nearby intersections, and other key roadway characteristics. This section of the report details information on these existing conditions.

### AREA LAND USES AND EXISTING ROADWAY CHARACTERISTICS

The proposed development is located south of Rings Road and east of Cosgray Road, in Dublin, Ohio. This project would replace approximately 43 acres of undeveloped agricultural land and single-family residential lots. The proposed development will be surrounded by single-family residences and undeveloped agricultural land. A lane designation exhibit for the Cosgray Road corridor and study intersections is provided in the [Appendix](#). The study area for this analysis includes the following intersections:

- Cosgray Road and Rings Road (East Leg)
- Cosgray Road and Rings Road (West Leg)
- Cosgray Road and Site Access A
- Cosgray Road and Tuttle Crossing Boulevard
- Cosgray Road and Boucher Road
- Cosgray Road and Hayden Farms Road
- Cosgray Road and Hayden Run Road
- Tuttle Crossing Boulevard and Site Access B
- Tuttle Crossing Boulevard and Site Access C

**Cosgray Road** is a north-south oriented minor arterial roadway with a posted speed limit of 45 mph. Adjacent to the site, Cosgray Road is a 2-lane roadway, providing one travel lane in each direction. South of the site, Cosgray Road is a 4-lane divided roadway. At the unsignalized intersection with Boucher Road, Cosgray Road provides southbound left-turn and northbound right-turn lanes. At the signalized intersection with Hayden Run Road, Cosgray Road includes northbound and southbound left-turn and right-turn lanes. At the unsignalized intersection with Hayden Farms Road, Cosgray Road provides southbound right-turn, southbound left-turn, and northbound right-turn lanes. The northbound left-turn and southbound right-turn lanes at the Hayden Farms intersection, do not currently carry traffic volumes and are designed for the future construction west of Cosgray Road. A divided median is present along Cosgray Road, within the site vicinity. There is a sidewalk present on the east side of Cosgray Road and a shared-use path present on the west side.

**Rings Road** is a 2-lane major collector, providing one travel lane in each direction within the site vicinity. Rings Road is an east-west oriented roadway with a posted speed limit of 35 mph. No designated sidewalks are present on either side of Rings Road.

**Hayden Run Road** is a 4-lane major collector, providing two travel lanes in each direction, within the site vicinity. Hayden Run Road is an east-west oriented roadway with an unposted speed limit of 45 mph. At the signalized intersection with Cosgray Road, Hayden Run Road includes a westbound left-turn, eastbound right-turn, and eastbound left-turn lanes. There is a sidewalk on the south side of Hayden Run Road and a shared-use path on the north side.

**Boucher Road** is a 2-lane local road, providing one travel lane in each direction within the site vicinity. Boucher Road is an east-west oriented roadway with an unposted speed limit of 25 mph. The westbound left-turn movement from Boucher Road, onto Cosgray Road is a prohibited movement. There are sidewalks present on both sides of Boucher Road.

**Hayden Farms Road** is a 2-lane local road, providing one travel lane in each direction within the site vicinity. Hayden Farms Road is a east-west oriented roadway with an unposted speed limit of 25 mph. There are sidewalks present on both sides of Hayden Farms Road.

**Tuttle Crossing Boulevard** is a future minor arterial. A conceptual layout of the proposed Tuttle Crossing Boulevard Extension was referenced from the *City of Dublin Tuttle Crossing Boulevard Extension, Feasibility Study, 2020*, and is provided in the [Appendix](#).

## TRAFFIC COUNT DATA COLLECTION

24-hour weekday traffic count data was collected on April 19<sup>th</sup>, at the following intersections.

- Cosgray Road and Boucher Road
- Cosgray Road and Hayden Run Road

An additional 24-hour weekday traffic count data was collected on April 26<sup>th</sup>, at the following intersection.

- Cosgray Road and Hayden Farms Road

Traffic count data was referenced from the Mid-Ohio Regional Planning Commission (MORPC) Transportation Data Management System at the Cosgray Road and Rings Road intersections. Referenced traffic counts are provided in the [Appendix](#).

The existing raw traffic counts were balanced following the Ohio Traffic Forecasting Manual, Module 2: Traffic Forecasting Methodologies. The counts along Cosgray Road were balanced using the higher volume distributed method, which increases lower volume movements through an equal distribution of existing counts. Per the guidance of the Ohio Forecasting Manual, the existing volumes along Cosgray Road between the Cosgray Road and Hayden Farms Road and Cosgray Road and Hayden Run Road intersections were not balanced/smoothed, as there are commercial (supermarket, fuel station, drive-thru bank, restaurant, etc.) and residential developments between the two intersections. The 2023 raw traffic counts, and the 2023 raw balanced traffic counts are shown in [Exhibit 2](#) and [Exhibit 3](#). The raw traffic counts are provided in the [Appendix](#).

## EXPECTED GROWTH TRAFFIC ASSIGNMENT

Area background traffic was developed with consideration for regional traffic growth over time. To estimate the growth in the ambient levels of traffic in the study area, annual growth rates were applied to existing traffic volumes in the study area.

The growth rates were obtained from the Mid-Ohio Regional Planning Commission (MORPC) via their regional travel demand model and is provided in [Table 1](#). Copies of the communications with MORPC are included in the [Appendix](#).

**Table 1: MORPC Growth Rates**

Roadway	Location	Linear Annual Growth Rate
Rings Road East	East of Cosgray Road	2.70%
Cosgray Road	North of Rings Road East	1.90%
Cosgray Road	South of Rings Road East	1.80%
Cosgray Road	North of Rings Road West	1.80%
Rings Road West	West of Cosgray Road	2.60%
Cosgray Road	South of Rings Road West	1.60%
Cosgray Road	North of Boucher Road	1.60%
Cosgray Road	South of Boucher Road	1.60%
Cosgray Road	North of Hayden Farms Road	1.60%
Cosgray Road	South of Hayden Farms Road	1.50%
Hayden Run Road	East of Cosgray Road	2.30%
Cosgray Road	North of Hayden Run Road	1.60%
Hayden Run Road	West of Cosgray Road	3.40%
Cosgray Road	South of Hayden Run Road	0.90%

**NO BUILD TRAFFIC VOLUMES**

The opening year for the Amlin Crossing development is estimated to be 2025. The 2025 No Build traffic volumes are illustrated in **Exhibit 4**. The 10-year horizon (2035) No Build volumes were derived by adding 12 years of growth to the existing 2023 balanced traffic counts, then adding the trip projections representing the potential off-site development of “Area X” and “Area Y”. It is anticipated that these off-site developments will be fully constructed prior to the horizon year (2035) of the study. The number of single-family residential units was estimated based on an assumption of 5 units per-acre.

To approximate the anticipated offsite traffic volumes, data was referenced from the Institute of Transportation Engineers (ITE) Manual titled Trip Generation, 11th Edition. Trip generation rates for the ITE Land Use Code (LUC) corresponding to the existing offsite use are shown in **Table 2**. Copies of the ITE data are included in the **Appendix**. The anticipated offsite generated traffic projections are presented in **Table 3**.

**Table 2: ITE Trip Generation Data - Residential Units**

ITE Land Use	Units	Weekday		
		Daily	AM Peak Hour	PM Peak Hour
Single-Family Detached Housing (210)	170	$\ln(T) = 0.92 \ln(X) + 2.68$ 50% in/50% out	$\ln(T) = 0.91 \ln(X) + 0.12$ 26% in/74% out	$\ln(T) = 0.94 \ln(X) + 0.27$ 63% in/37% out

T – Site-generated trips      X – Housing Units

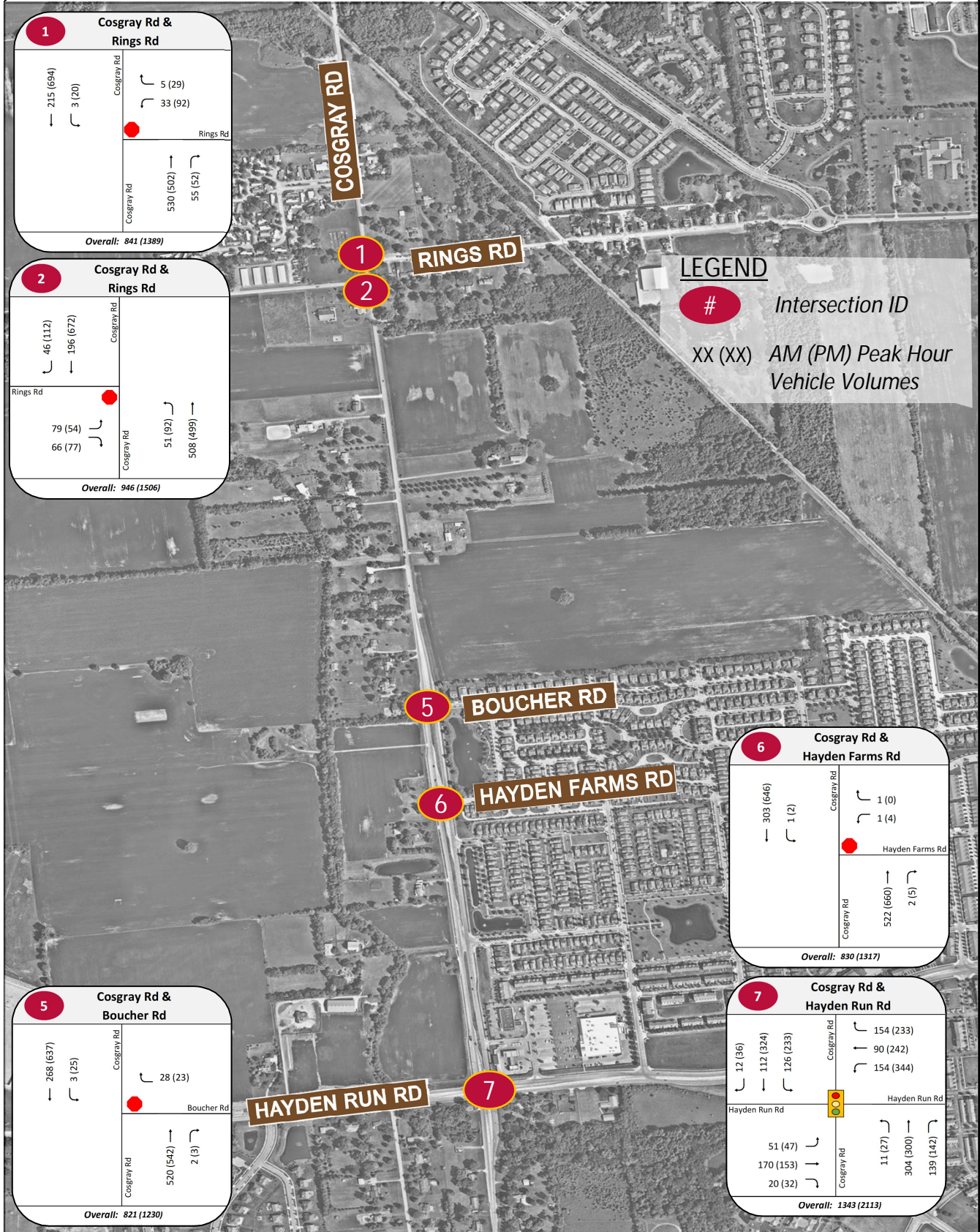


**Table 3: Proposed Site Generated Traffic Projections**

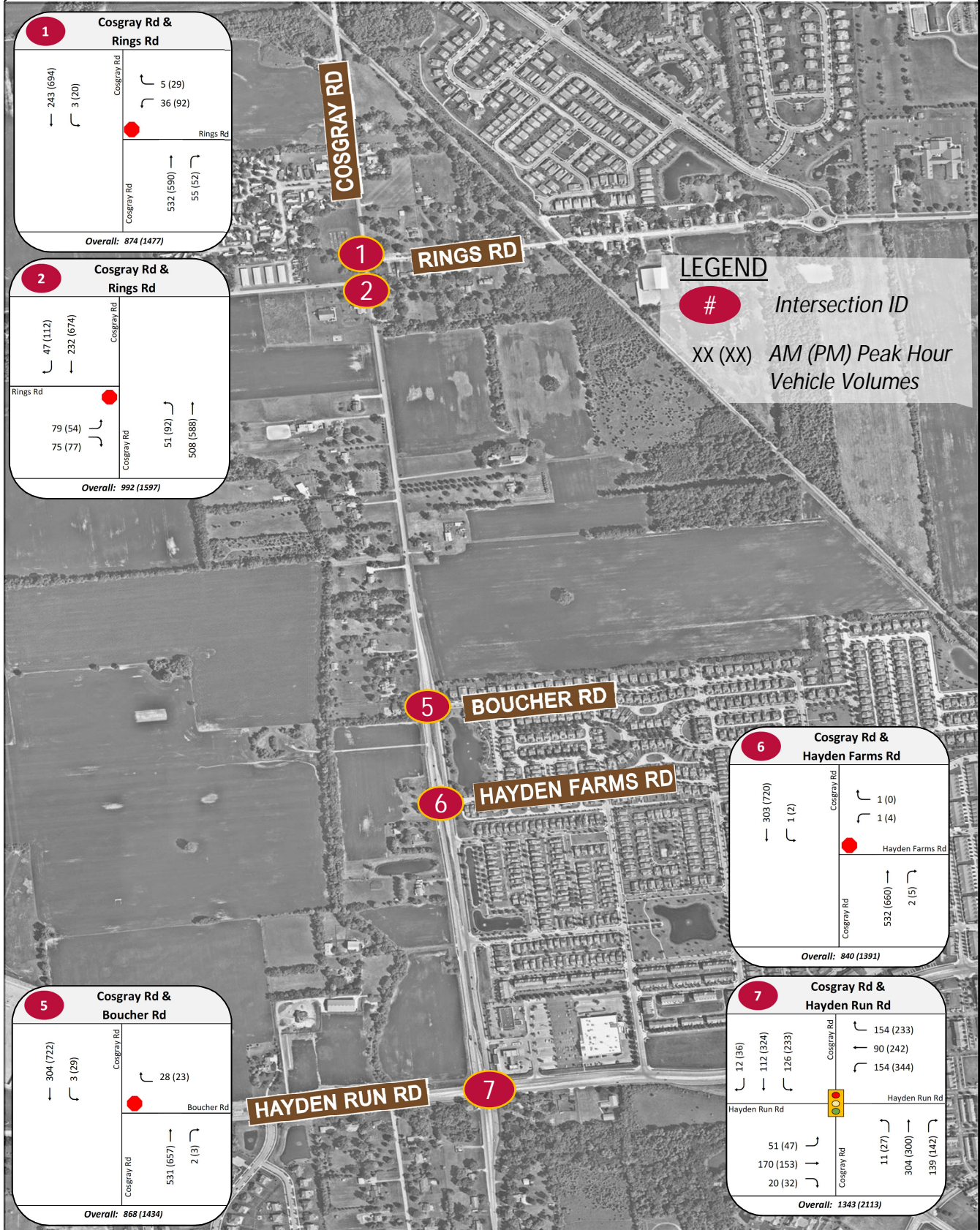
ITE Land Use	Area	Units	Vehicle Type	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Single-Family Detached Housing (210)	Area X	70	All	727	14	40	54	45	26	71
Single-Family Detached Housing (210)	Area Y	100	All	1,009	19	56	75	63	37	100
<i>Total Trips</i>					<i>33</i>	<i>96</i>	<i>129</i>	<i>108</i>	<i>63</i>	<i>171</i>

The distribution of trips entering/exiting the anticipated offsite developments is assumed to be the same as the distribution pattern for the proposed site generated trips. The anticipated directional distributions estimated for the anticipated offsite generated trips are provided in **Table 6** and are provided on **Exhibit 5**. The 2035 No Build traffic volumes were calculated by adding the 2023 raw balanced traffic volumes (**Exhibit 5**) plus 12-years of linear annual growth, to the anticipated offsite generated trips (**Exhibit 5**). The 2035 No Build traffic volumes are illustrated in **Exhibit 6**. The 2035 No Build Traffic Volumes without the offsite trips, and offsite trips along the anticipated offsite access drives are included in the **Appendix**.

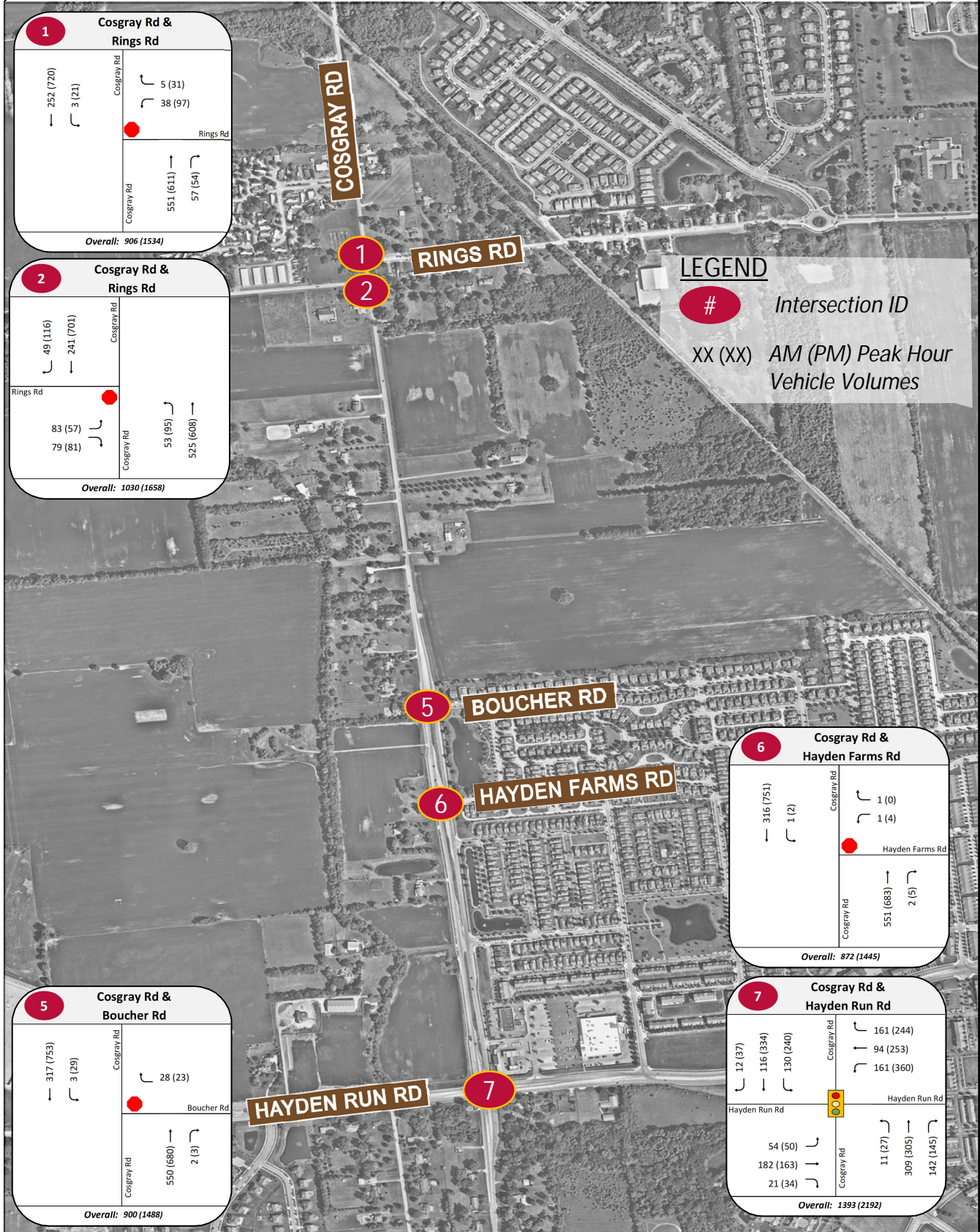
# Exhibit 2: 2023 Raw Counts AM & PM Peak Hour Vehicle Volumes



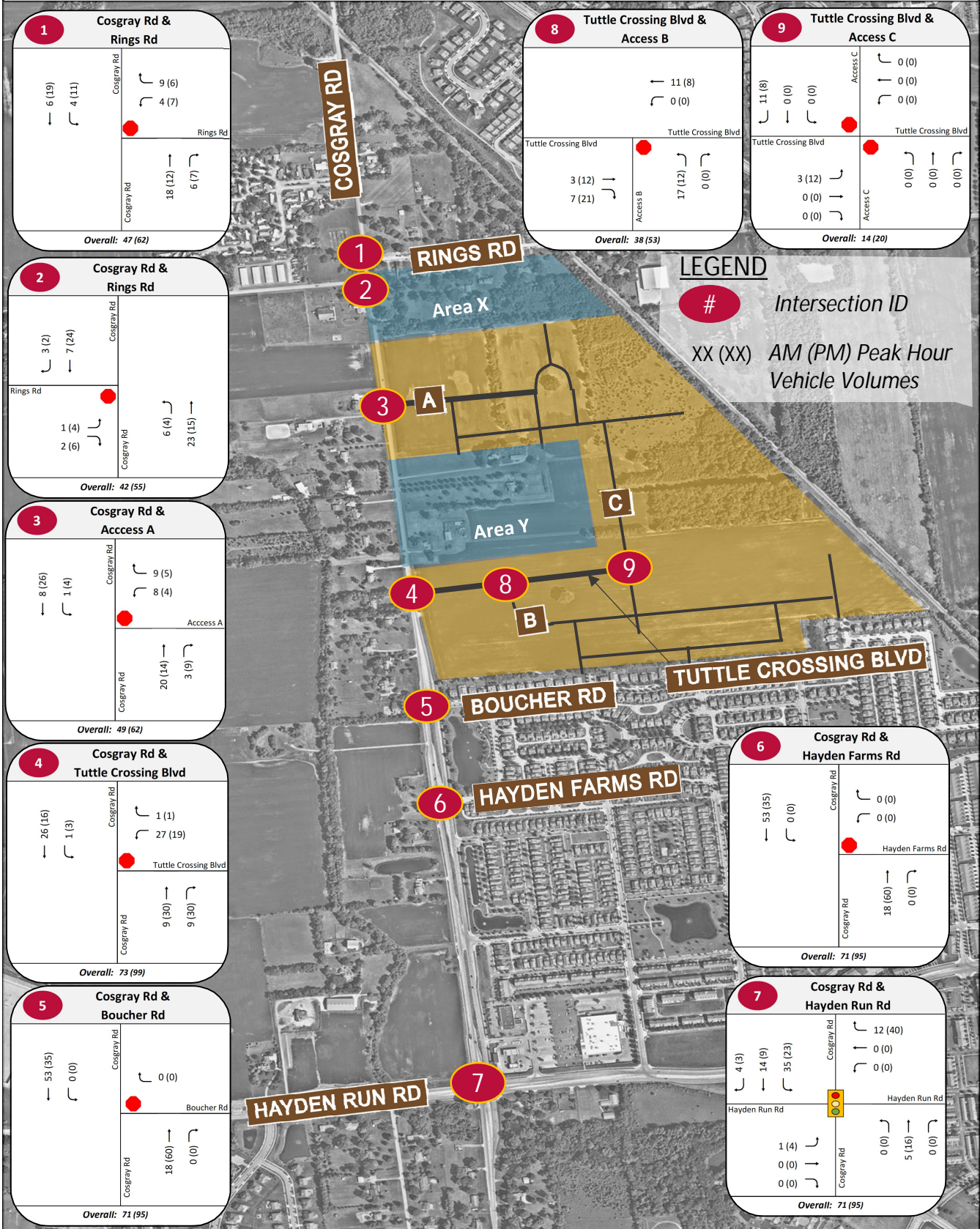
# Exhibit 3: 2023 Raw Counts Balanced AM & PM Peak Hour Vehicle Volumes



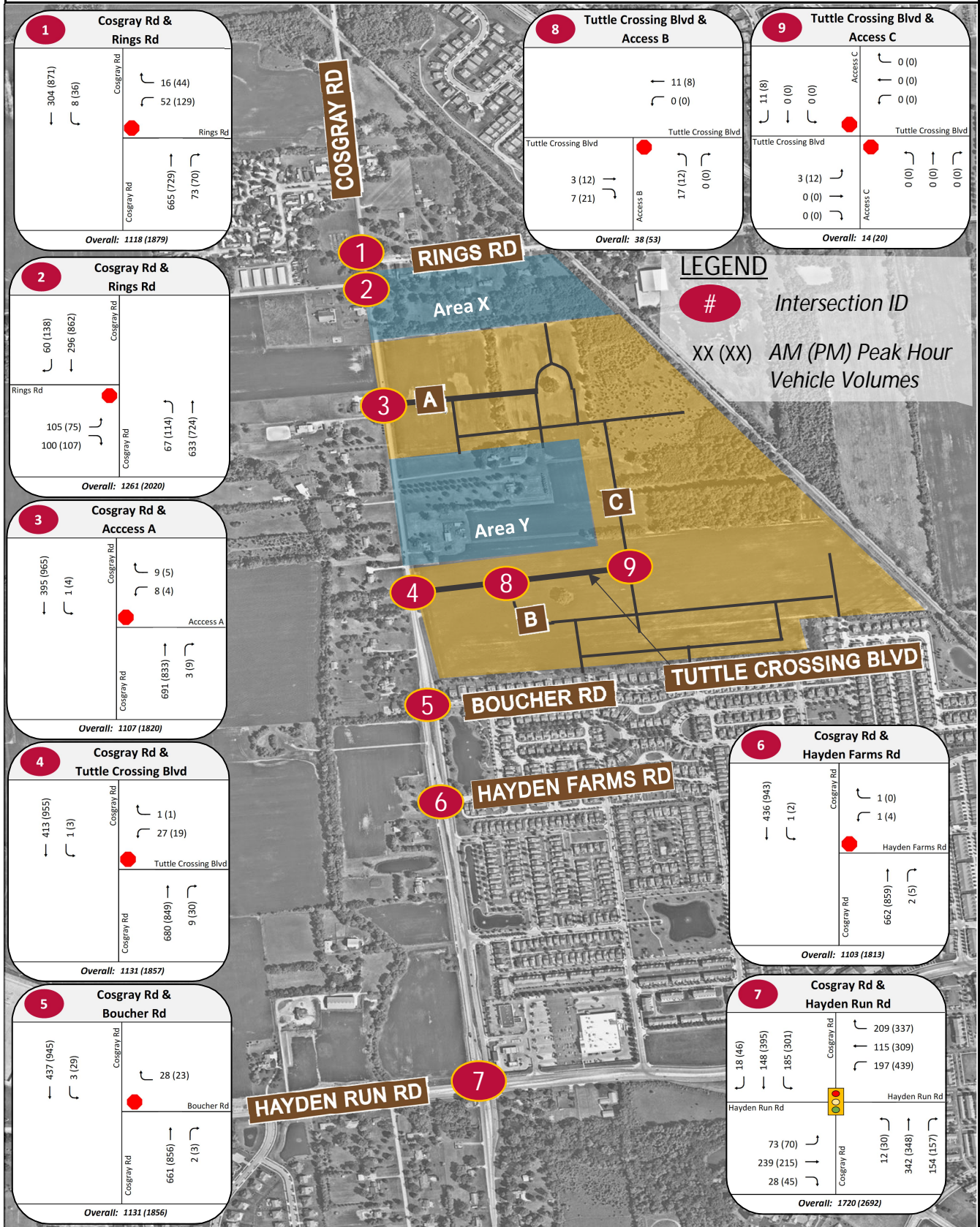
# Exhibit 4: 2025 No Build Balanced AM & PM Peak Hour Vehicle Volumes



# Exhibit 5: Offsite Trip Assignment AM & PM Peak Hour Vehicle Volumes



# Exhibit 6: 2035 No Build + Offsites Balanced AM & PM Peak Hour Vehicle Volumes



## BUILD CONDITIONS

This section of the report outlines the proposed site plan and summarizes site-specific traffic characteristics.

### DEVELOPMENT CHARACTERISTICS

The proposed 43-acre residential development includes 200 detached single-family housing units and 240 attached single-family housing units. The proposed development is comprised of three sub-areas that include 150 detached single-family homes, 50 detached single-family homes, and 240 attached single-family homes. Access to the proposed developments is provided via a full-access drive (Access A) and Tuttle Crossing Boulevard (Access B and C) which will intersect with Cosgray Road. Additionally, cross-site access is provided to the existing residential development, south of the proposed site. Upon the construction of the anticipated offsite developments, additional cross-site access may be included. The site access configuration is illustrated on the conceptual site plan included in the [Appendix](#).

### TRIP GENERATION

To calculate trips generated by the proposed residential development, data was referenced from the Institute of Transportation Engineers' (ITE) [Trip Generation Manual](#), 11th Edition. The provided site plan includes 150 single-family housing units (Single-Family Detached Housing, LUC-210), 50 single-family housing units (Single-Family Detached Housing, LUC-210), and 240 attached single-family housing units (Single-Family Attached Housing, LUC-215). Trip generation rates can be seen in [Table 4](#). Copies of the ITE data are provided in the [Appendix](#).

**Table 4: ITE Trip Generation Data - Residential Units**

ITE Land Use	Units	Weekday		
		Daily	AM Peak Hour	PM Peak Hour
Single-Family Detached Housing (210)	150	$\ln(T) = 0.92 \ln(X) + 2.68$ 50% in/50% out	$\ln(T) = 0.91 \ln(X) + 0.12$ 26% in/74% out	$\ln(T) = 0.94 \ln(X) + 0.27$ 63% in/37% out
Single-Family Detached Housing (210)	50	$\ln(T) = 0.92 \ln(X) + 2.68$ 50% in/50% out	$\ln(T) = 0.91 \ln(X) + 0.12$ 26% in/74% out	$\ln(T) = 0.94 \ln(X) + 0.27$ 63% in/37% out
Single-Family Attached Housing (215)	240	$T = 7.62(X) - 50.48$ 50% in/50% out	$T = 0.52(X) - 5.70$ 25% in/75% out	$T = 0.60(X) - 3.93$ 59% in/41% out

T – Site-generated trips      X – Housing Units

The proposed site generated traffic projections are illustrated in [Table 5](#).

**Table 5: Proposed Site Generated Traffic Projections**

ITE Land Use	Units	Vehicle Type	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Single-Family Detached Housing (210)	150	All	1,465	27	81	108	92	54	146
Single-Family Detached Housing (210)	50	All	533	10	30	40	33	19	52
Single-Family Attached Housing (215)	240	All	1,778	30	89	119	83	57	140
<i>Total Trips</i>				<i>67</i>	<i>200</i>	<i>267</i>	<i>208</i>	<i>130</i>	<i>338</i>

## DIRECTIONAL DISTRIBUTION

The estimated distribution of site-generated traffic on the surrounding roadway network as it approaches and departs the site is a function of several variables, such as the nature of surrounding land uses, prevailing traffic volumes/patterns, characteristics of the street system, and the ease with which motorists can travel over various sections of that system. To determine the percentage of traffic traveling to/from the proposed site, traffic counts to/from each direction were compared. The distribution of trips entering/exiting the proposed site was determined based on internal roadway geometry, location of access driveways, and Google Maps “fastest route” determinations. The cordon counts along the Cosgray Road corridor were compared to determine the percent volume from each direction. These percentages were then adjusted to remove thru trips along Cosgray (assumed 50%). Finally, percent volumes east of Hayden Run Road were adjusted to account for the additional neighborhood accesses along Hayden Run Boulevard.

The anticipated directional distributions estimated for proposed site related trips are provided for the roadway network with and without the Tuttle Crossing Boulevard extension. The directional distributions are outlined in **Table 7**. The site generated trip assignment, without the Tuttle Crossing Boulevard extension is shown in **Exhibit 6**.

**Table 6: Estimated Trip Distribution**

<i>Traveling to/from:</i>	<i>Trip Distribution – WITHOUT Tuttle Crossing Boulevard Extension</i>	<i>Trip Distribution – WITH Tuttle Crossing Boulevard Extension</i>
<i>North on Cosgray Road</i>	28%	28%
<i>South on Cosgray Road</i>	15%	15%
<i>West on Rings Road</i>	9%	9%
<i>East on Rings Road</i>	7%	3%
<i>West on Hayden Run Road</i>	4%	4%
<i>East on Hayden Run Road</i>	37%	25%
<i>East on Tuttle Crossing Boulevard</i>	-	16%

## BUILD TRAFFIC ASSIGNMENT

The 2025 and 2035 Build traffic assignment represents traffic volumes at the study intersections upon construction of the proposed development. When the proposed development is built and connected to the neighborhood streets to the south of the site, a portion of the trips from that neighborhood are expected to re-route, using the portion of Tuttle Crossing Boulevard that will be constructed within the proposed development. The 2025 Build condition traffic volumes incorporate the relocated trips, and a relocated background traffic volume calculations are provided in the **Appendix**. The 2025 and 2035 Build condition traffic volumes (without Tuttle Crossing Extension) are shown in **Exhibit 8** and **Exhibit 9**.

## NO BUILD TRAFFIC ASSIGNMENT WITH TUTTLE CROSSING EXTENSION

Per the *City of Dublin Tuttle Crossing Boulevard Extension, Feasibility Study, American Structurepoint, 2020*, and *City of Dublin Thoroughfare Plan*, Tuttle Crossing Boulevard is anticipated to be extended east to connect to Avery Road. This study assumed that the Tuttle Crossing Boulevard extension would be constructed prior to the Horizon Year (2035). Upon the construction of the Tuttle Crossing Boulevard Extension, background and anticipated offsite traffic volumes are anticipated to adhere to a different trip

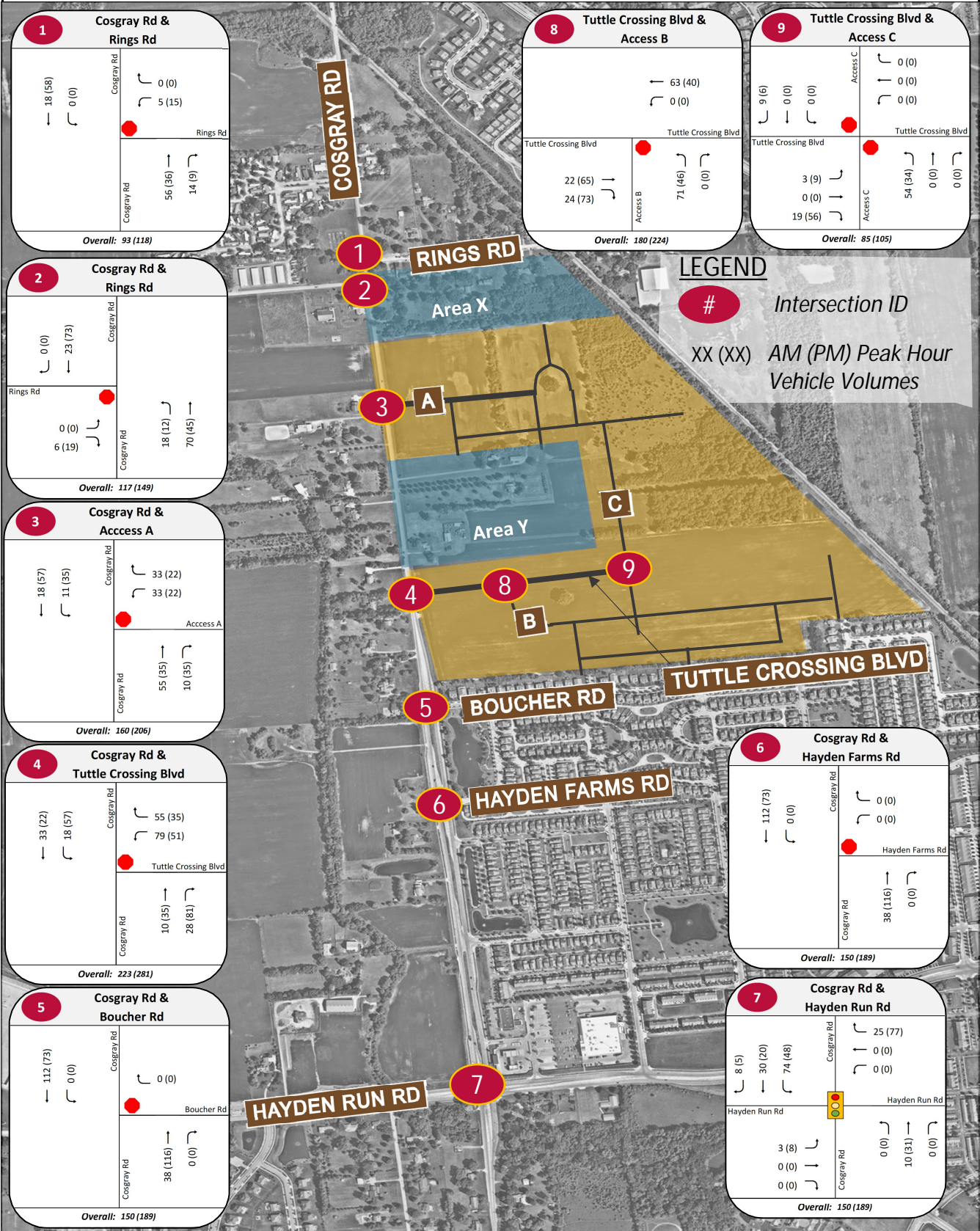


distribution pattern. A percentage of vehicles which are entering and exiting the site location from the east on Rings Road, and the East on Hayden Run Road are anticipated to be relocated onto the proposed Tuttle Crossing Boulevard extension. The relocated background traffic volumes were estimated based on the 2035 No Build Balanced traffic volumes at the Cosgray Road and Rings Road, and Cosgray Road and Hayden Run Road intersections. It was assumed that 50-percent of the vehicular volumes represented “thru-vehicles” along Cosgray Road and Hayden Run Road. The number of relocated background traffic volumes, after the construction of the Tuttle Crossing Boulevard extension, are provided in **Exhibit 10**. The estimated trip distribution of offsite generated traffic volumes are provided in **Table 7**, and are shown on **Exhibit 11**. The 2035 No Build traffic volumes with Tuttle Crossing Boulevard Extension were determined by summing the 2035 No Build (**Exhibit 6**), Relocated 2035 Background Tips with Tuttle Crossing Boulevard Extension (**Exhibit 10**), and offsite generated trips with Tuttle Crossing Extension (**Exhibit 11**) traffic volumes. The offsite generated traffic volumes at the anticipated offsite access drives is provided in the **Appendix**. The 2035 No Build traffic volumes with Tuttle Crossing Boulevard extension are provided in **Exhibit 12**.

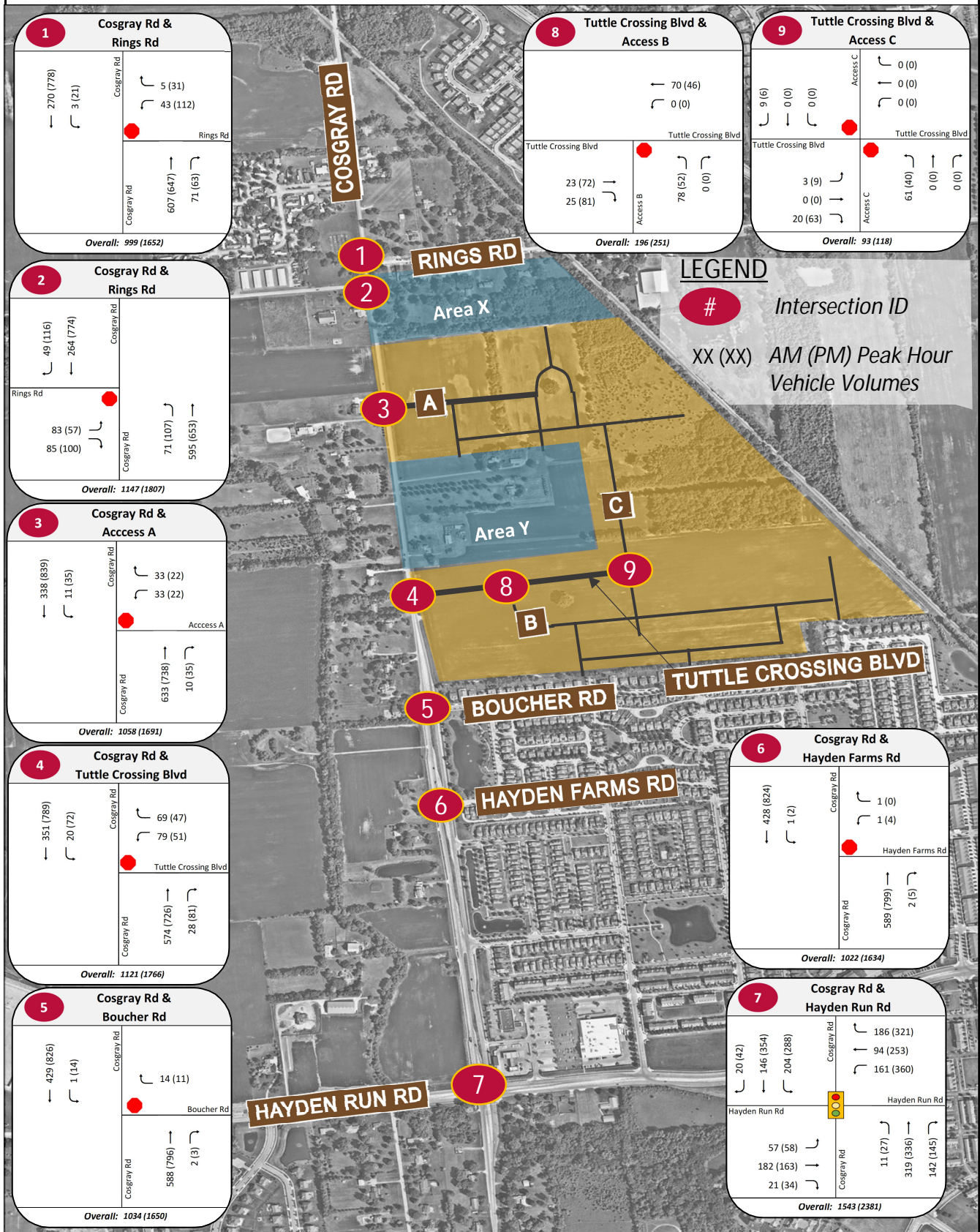
## BUILD TRAFFIC ASSIGNMENT WITH TUTTLE CROSSING EXTENSION

Upon the construction of the Tuttle Crossing Boulevard Extension, site generated traffic volumes are anticipated to adhere to a different trip distribution pattern. The anticipated directional distributions estimated for proposed site related trips for the roadway network with the Tuttle Crossing Boulevard extension, are provided in **Table 7**. The site generated trip assignment, with the Tuttle Crossing Boulevard extension is shown in **Exhibit 13**. The 2035 Build traffic volumes with Tuttle Crossing Boulevard extension were calculated by adding the 2035 No Build traffic volumes with Tuttle Crossing Boulevard extension (**Exhibit 12**) and site generated trips with Tuttle Crossing extension (**Exhibit 13**). The 2035 Build traffic volumes with Tuttle Crossing extension are provided in **Exhibit 14**.

# Exhibit 7: Site Generated Trip Assignment AM & PM Peak Hour Vehicle Volumes



# Exhibit 8: 2025 Build AM & PM Peak Hour Vehicle Volumes



# Exhibit 9: 2035 Build AM & PM Peak Hour Vehicle Volumes

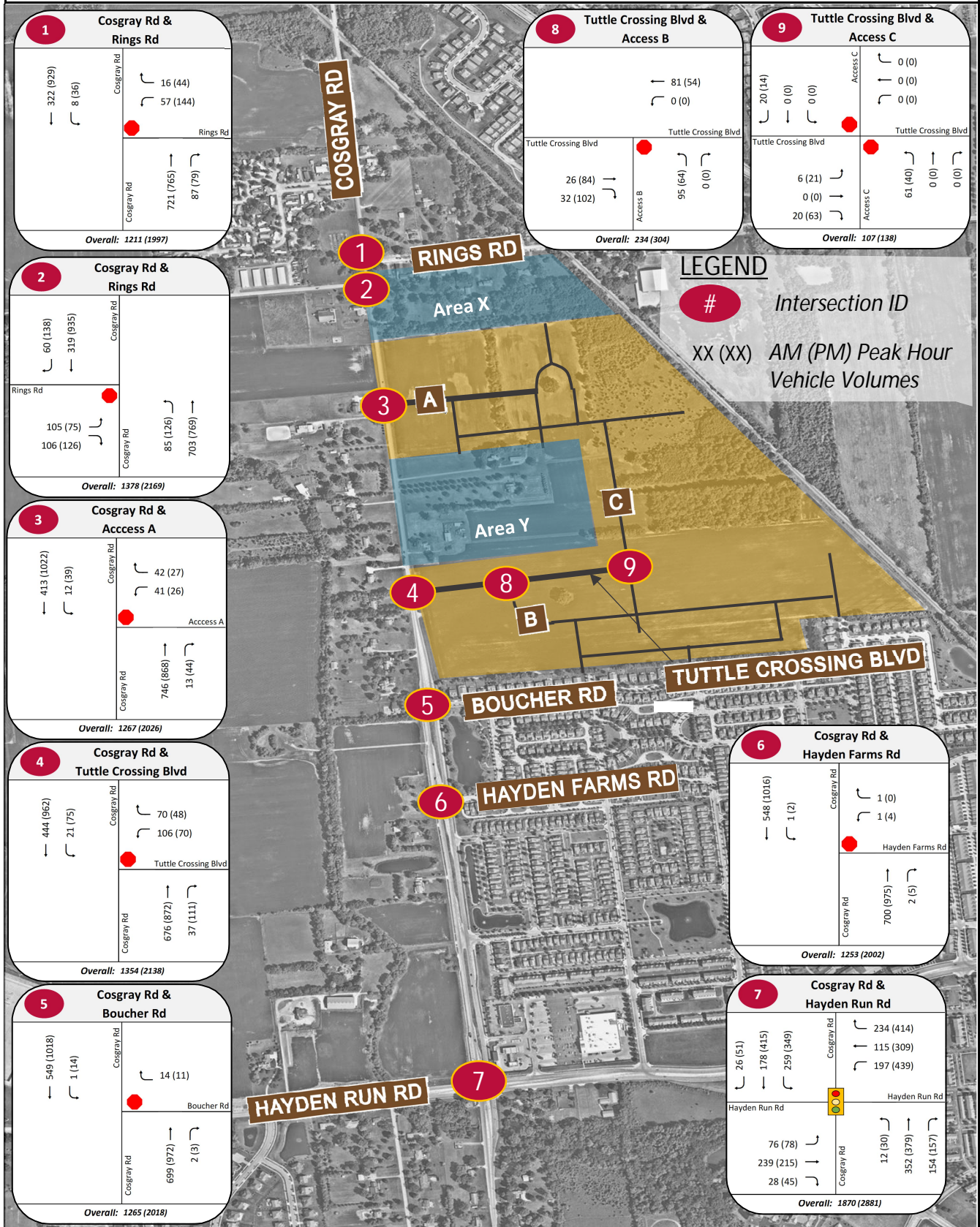


Exhibit 10: Relocated 2035 Background Trips W/ Tuttle Crossing Ext. AM & PM Peak Hour Vehicle Volumes

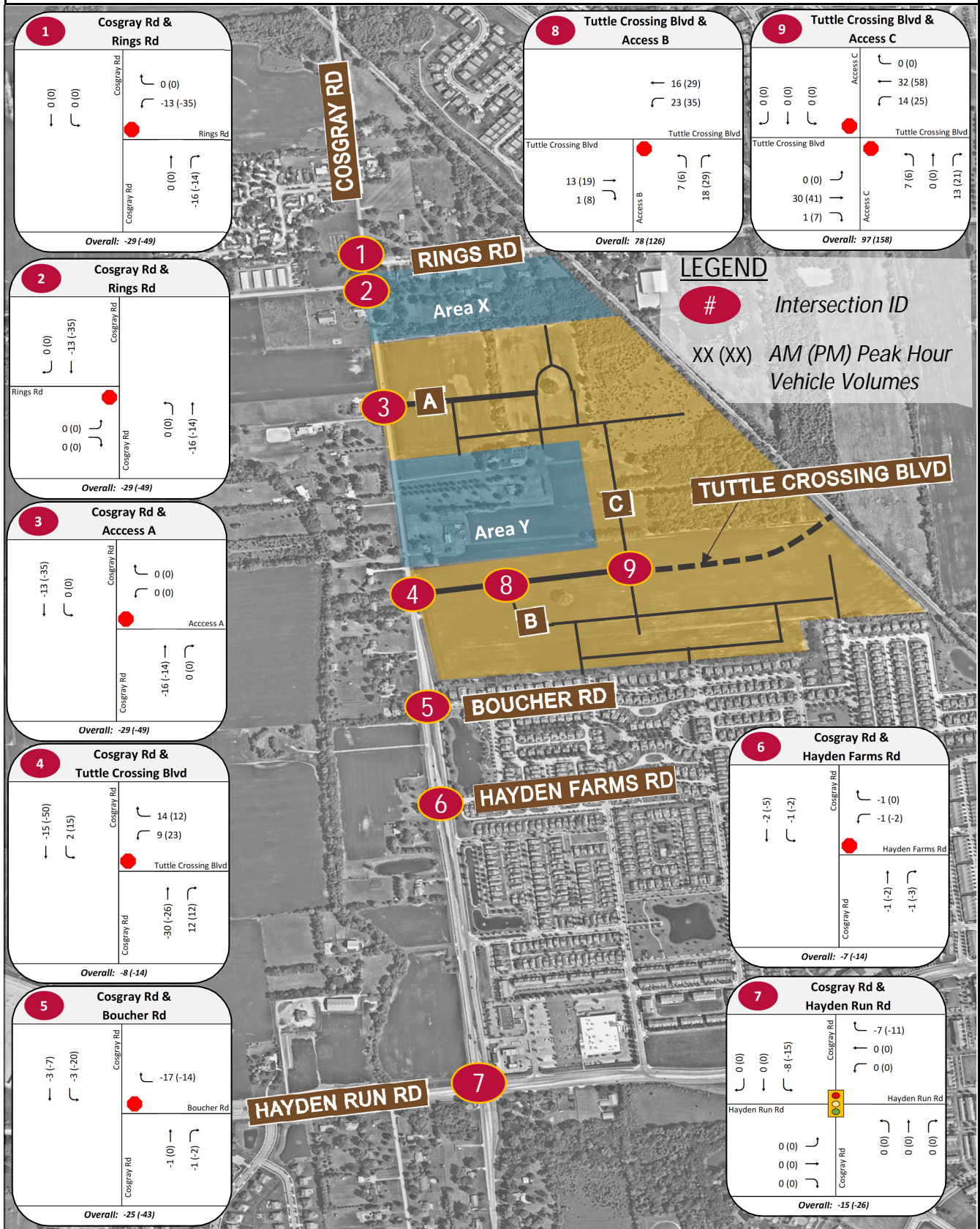
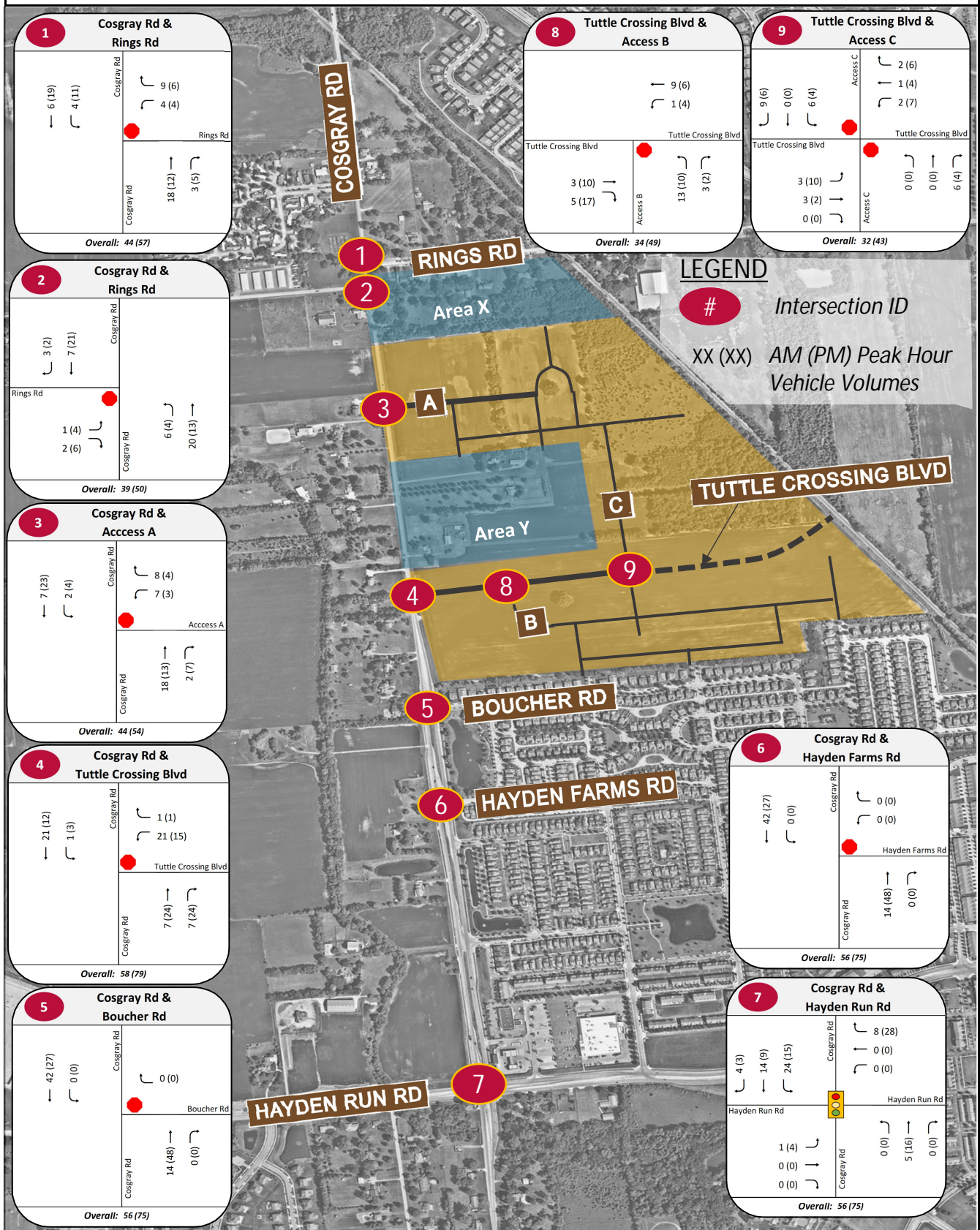


Exhibit 11: Offsite Generated Trips W/ Tuttle Crossing Ext. AM & PM Peak Hour Vehicle Volumes



# Exhibit 12: 2035 No Build W/ Tuttle Crossing Ext. AM & PM Peak Hour Vehicle Volumes

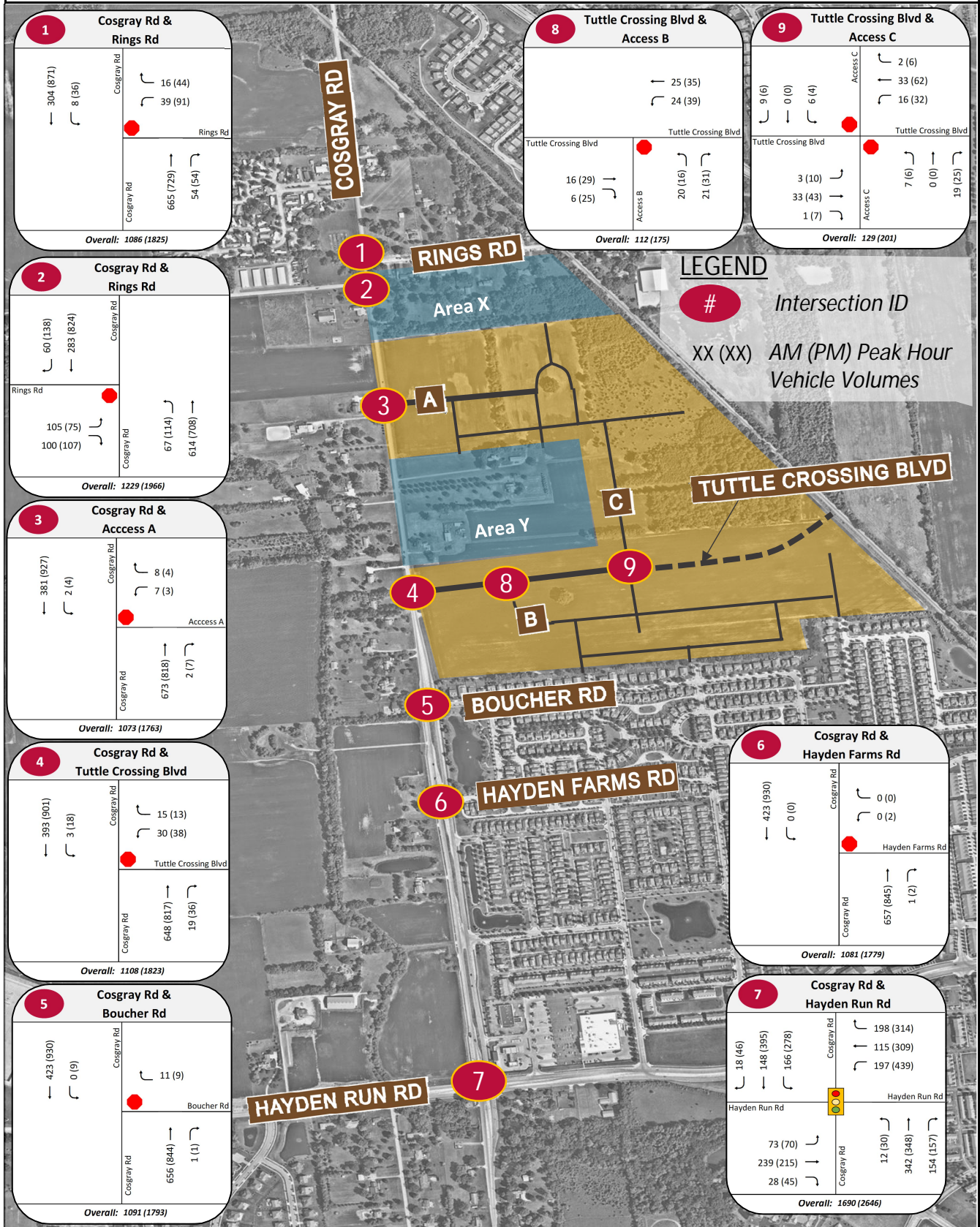
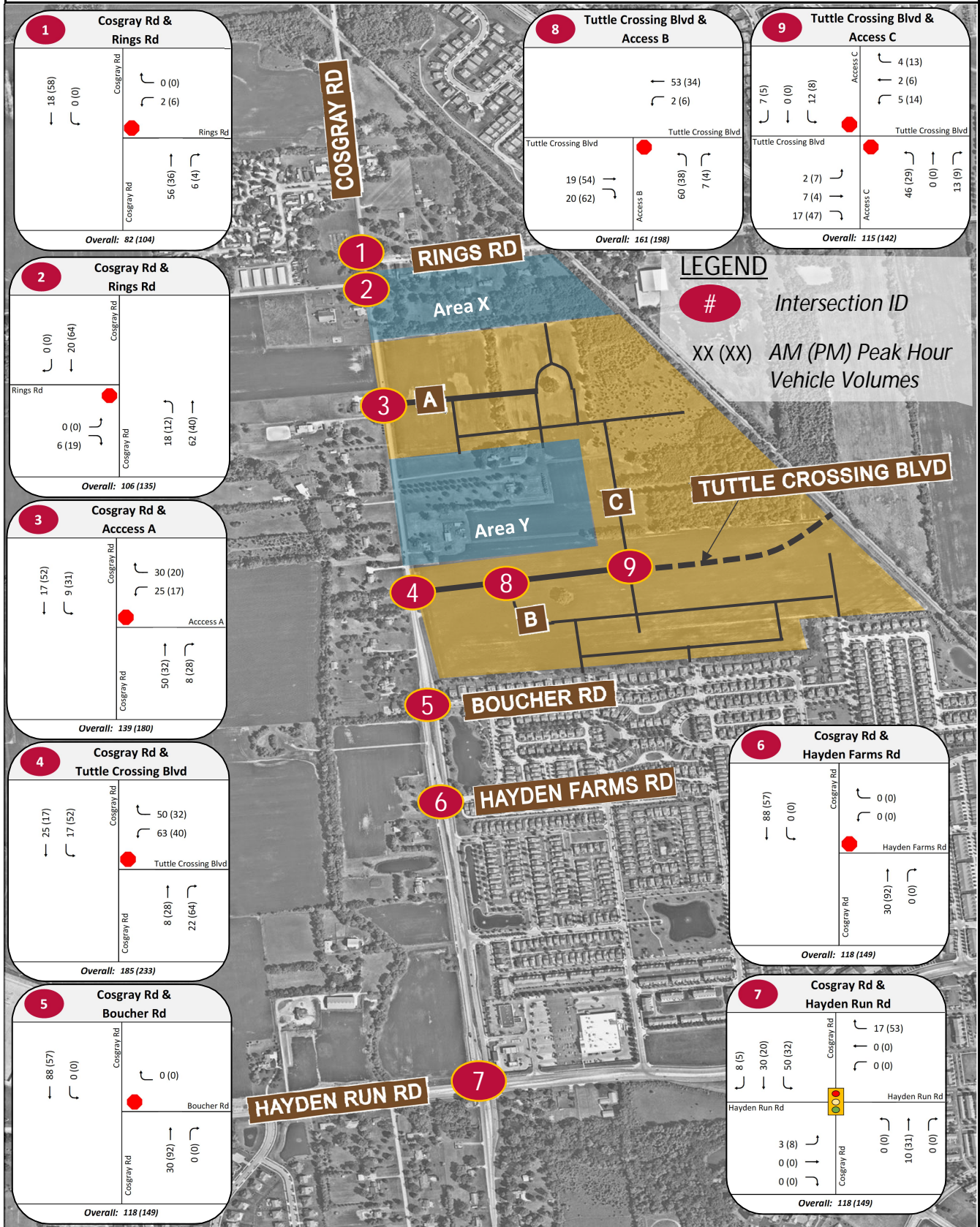
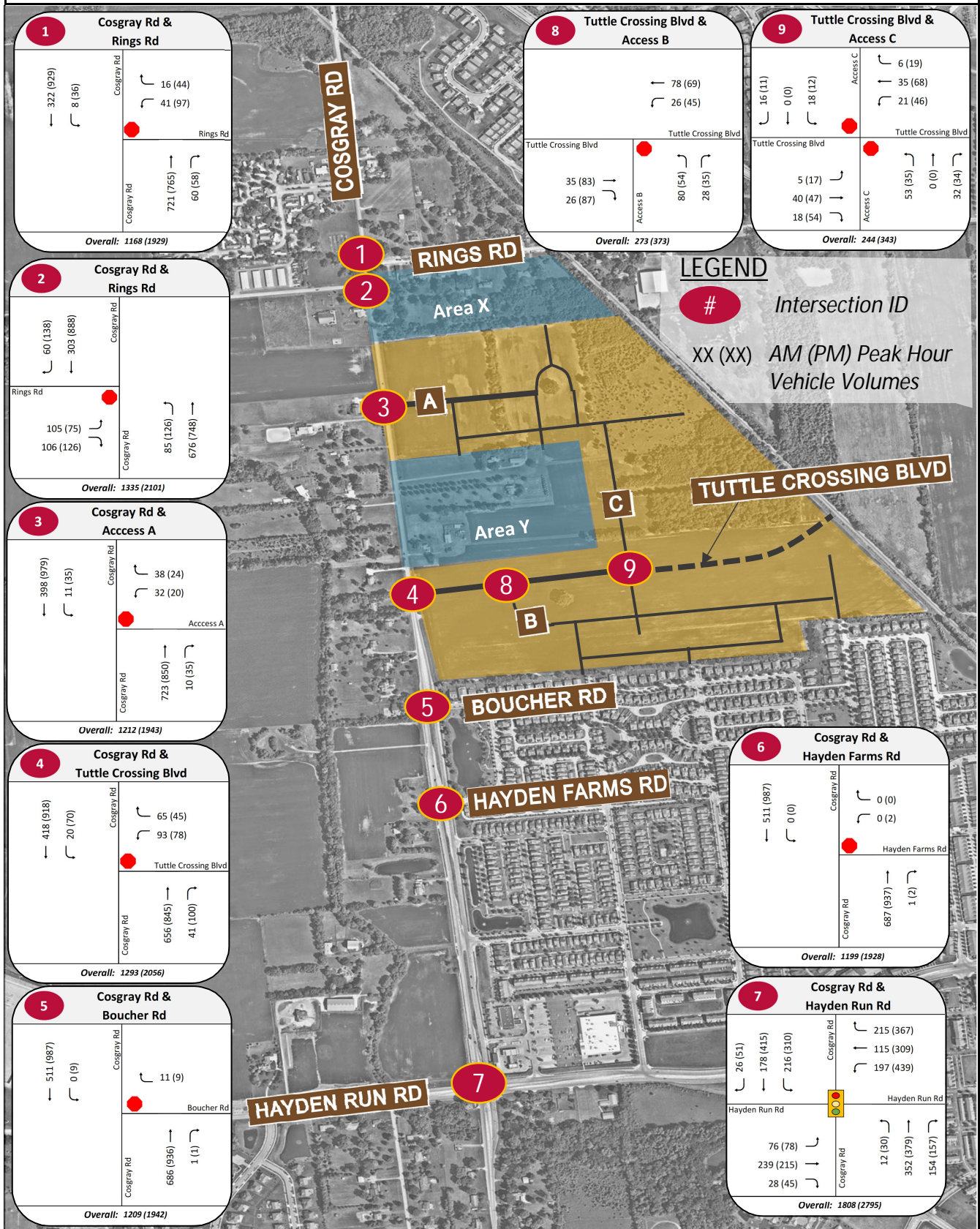


Exhibit 13: Site Generated Trips W/ Tuttle Crossing Ext. AM & PM Peak Hour Vehicle Volumes





# Exhibit 14: 2035 Build W/ Tuttle Crossing Ext. AM & PM Peak Hour Vehicle Volumes



## APPENDIX

**A - Conceptual Site Plan**

**B – Memorandum of Understanding (MOU)**

**C – MioVision Traffic Counts**

**D – MORPC Traffic Count Data**

**E – Data from ITE Trip Generation, 11<sup>th</sup> Edition**

**F – MORPC Growth Rate Data**

**G – Excerpts from Tuttle Crossing Boulevard Ext., Feasibility Study**

**H – Relocated Background Trip Calculations**

**I – 2035 No Build Balanced Traffic Volumes**

**J – Offsite Trip Calculations**

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**G – Excerpts from Tuttle Crossing Boulevard Ext., Feasibility Study**

**H – Relocated Background Trip Calculations**

**I – 2035 No Build Balanced Traffic Volumes**

**J – Offsite Trip Calculations**

APPENDIX

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**A.**

# Conceptual Site Plan

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APPENDIX

**B.**

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# Memorandum of Understanding (MOU)

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## MEMORANDUM

To: Tina Wawszkiewicz, PE – Deputy Director, City of Dublin  
Daniel Blechschmidt, PE – City of Columbus  
Bill S. Hebble, PE - Franklin County Engineers

From: Perry Morgan, PE - Kimley-Horn

Date: June 2, 2023

Subject: Amlin Crossing Traffic Impact Study - MOU

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The purpose of this memo is to formalize the requirements of the Traffic Impact Study for the Amlin Crossing Development in Dublin, Ohio. This memo includes items discussed as part of the April 3, 2023, meeting with the Dublin staff and email correspondence with the Franklin County Engineers Office.

### Study Intersections

The proposed residential subdivision is to be constructed east of Cosgray Road, south of Rings Road, and north of Boucher Road. **Figure 1** illustrates the site location, conceptual street network, and access, as well as the proposed study intersections. This 101-acre site is anticipated to include a maximum of 200 single-family (detached) units and 240 single-family (attached) units. It should be noted that this is preliminary and is subject to changes. These number of units are intended to represent maximum numbers of units so that this study evaluates the maximum impact to the adjacent roadways. Proposed access includes two full access drives along Cosgray Road. One of these accesses is the extension of Tuttle Crossing Boulevard, which will bisect the proposed neighborhood. The site is planned to include two accesses with the proposed extension of Tuttle Crossing Boulevard. The proposed site is to also connect to the existing residential development to the south, future mixed-use development to the north, and the future mixed residential development between the two access drives. "Area X" and "Area Y" represent anticipated offsite developments in **Figure 1**.

Figure 1: Site Location Map





### Study Intersections

The study intersections are outlined in the site location graphic on the previous page and will include:

1. Cosgray Road and Rings Road (West Leg)
2. Cosgray Road and Rings Road (East Leg)
3. Cosgray Road and Site Access A
4. Cosgray Road and Tuttle Crossing Boulevard
5. Cosgray Road and Boucher Road
6. Cosgray Road and Hayden Run Road
7. Cosgray Road and Hayden Run Road
8. Tuttle Crossing Boulevard and Site Access B
9. Tuttle Crossing Boulevard and Site Access C

### Data Collection

Turning movement counts will be collected at the following intersections. The traffic counts will be collected via MioVision cameras.

- Cosgray Road and Boucher Road
- Cosgray Road and Hayden Run Road

The Franklin County Engineer has contracted for a study of the Cosgray Road and Rings Road intersection. The County has agreed to share the traffic counts and volume data from that study to provide consistency with the volumes of these two studies. If this data isn't readily available, counts may be collected at the Rings Road intersections.

Area background traffic will be developed with consideration for regional traffic growth over time. To estimate the growth in the ambient levels of traffic in the study area, an annual growth rate will be applied to existing traffic volumes in the study area. The growth rate will be requested from Mid-Ohio Regional Planning Commission (MORPC) via their regional travel demand model.

For the Amlin Crossing Development, it is assumed that the opening year is 2025 and the horizon year is 2035. The offsite developments, within Area X and Area Y will be included in the horizon year analysis. The location of the anticipated offsite developments are illustrated in **Figure 1**. Analysis will be completed for the following AM & PM peak hour volume scenarios:

- 2025 – No Build
- 2035 – No Build
- 2025 – Full Build
- 2035 – Full Build without Future Tuttle Crossing Boulevard
- 2035 – Full Build with Future Tuttle Crossing Boulevard

The City of Dublin Future Land Use Map, and City of Dublin Community Plan will be used to determine the use and density of anticipated offsite developments within the study area. Traffic volumes will be balanced/soothed following the *Ohio Traffic Forecasting Manual, Module 2: Traffic Forecasting Methodologies*.

### Expected Growth Traffic Assignment

To calculate trips generated by the proposed residential development, data will be referenced from the Institute of Transportation Engineer’s (ITE) Trip Generation Manual, 11th Edition. The provided site plan shows 200 single-family (detached) lots and 240 single-family (attached) lots. Trip generation rates for the ITE Land Use Code (LUC) corresponding to the proposed residential developments are provided in **Table 2**.

**Table 2: ITE Trip Generation Data – Residential Units**

ITE Land Use	Units	Weekday		
		Daily	AM Peak Hour	PM Peak Hour
Single-Family Detached Housing (210)	200	$\ln(T) = 0.92 \ln(X) + 2.68$ 50% in/50% out	$\ln(T) = 0.91 \ln(X) + 0.12$ 25% in/75% out	$\ln(T) = 0.94 \ln(X) + 0.27$ 63% in/37% out
Single-Family Attached Housing (215)	240	$T = 7.62(X) - 50.48$ 50% in/50% out	$T = 0.52(X) - 5.70$ 25% in/75% out	$T = 0.60(X) - 3.93$ 59% in/41% out

T – Site-generated trips      X – Units

For this study, all site generated trips are expected to be “Primary Trips” when traveling to and from the subject site. Primary trips are trips to and from the proposed residential site that would not normally travel on the study roadways and are considered new trips within the study area. Per these assumptions, the proposed site generated traffic projections are illustrated in **Table 3**.

**Table 3: Proposed Site Generated Traffic Projections – Residential**

ITE Land Use	Units	Vehicle Type	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Single-Family Detached Housing (210)	150	All	1,465	27	81	108	92	54	146
Single-Family Detached Housing (210)	50	All	533	10	30	40	33	19	52
Single-Family Attached Housing (215)	240	All	1,778	30	89	119	83	57	140
<i>Total Trips</i>			3,776	67	200	267	208	130	338

### Site Trips Distribution Pattern

The estimated distribution of site-generated traffic on the surrounding roadway network as it approaches and departs the site is a function of several variables, such as the nature of surrounding land uses, prevailing traffic volumes/patterns, characteristics of the street system, and the ease with which motorists can travel over various sections of that system. To determine the percentage of traffic traveling to/from the proposed site, will include a comparison of recent traffic counts will and mapped routing for travel times.

**Analysis**

Turn lane warrants will be completed per the guidance of section 400 of the ODOT Location & Design Manual, Volume 1. Signalized intersections will be evaluated with existing signal timings as provided by the agencies. Per City of Dublin requirement, a left turn lane will be required at the site access intersections along Cosgray Road, regardless of turn lane warrant results.

The study intersections will be evaluated for level-of-service (LOS) and the need for turn lanes, for each study scenario. If a roundabout is included as a mitigated/ committed condition, the intersection will be analyzed using Sidra-9 software. Capacity analysis will be completed using Synchro-11 software at the study intersections.

**Table 4** illustrates the operational criteria for the City of Dublin, City of Columbus (COC) and Franklin County (FCEO). Mitigation measures will be performed for each analysis condition, on all study intersections which do not meet operational goals illustrated in **Table 4**.

Per City of Dublin, sight distance exhibits will be prepared in accordance with the City of Dublin guidelines for the following study intersections:

- Cosgray Road and Site Access A
- Cosgray Road and Tuttle Crossing Boulevard
- Tuttle Crossing Boulevard and Site Access B
- Tuttle Crossing Boulevard and Site Access C

**Table 4: Operational Goals of Intersections**

MOE	City of Dublin	City of Columbus	Franklin County
Intersection LOS	D or better	D or better	C or better
Approach LOS	D or better	E or better	D or better
Movement LOS	D or better	E or better	D or better
v/c	All movements < 1.0 with < 0.93 preferred.		
QSR	All movements < 1.0 from HCS/ Synchro analysis		

v/c = Volume-To-Capacity Ratio, QSR = Queue-Storage Ratio

The analysis results and recommendations will be documented in a summary report. The percent of development traffic through the Cosgray Road and Rings Road intersections will be quantified in a summary table.

If you have any questions, need additional information, or would like to modify these study requirements, please contact me ([perry.morgan@kimley-horn.com](mailto:perry.morgan@kimley-horn.com)) or ([jacob.campbell@kimley-horn.com](mailto:jacob.campbell@kimley-horn.com)). If you concur with the information provided in this memorandum of understanding, please sign and forward a copy for our records, or provide an email indicating your acceptance.



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Perry Morgan, PE  
Kimley-Horn

---

Tina Wawszkiewicz, PE  
City of Dublin

---

Bill S. Hebble, PE  
Franklin County

---

Daniel Blechschmidt, PE  
City of Columbus

Cc: Mike Reeves, PE - Kimley-Horn  
Cc: Jacob Campbell, PE – Kimley-Horn

Attachments:

ITE Trip Generation Data

Conceptual Site Plan



# Single-Family Detached Housing (210)

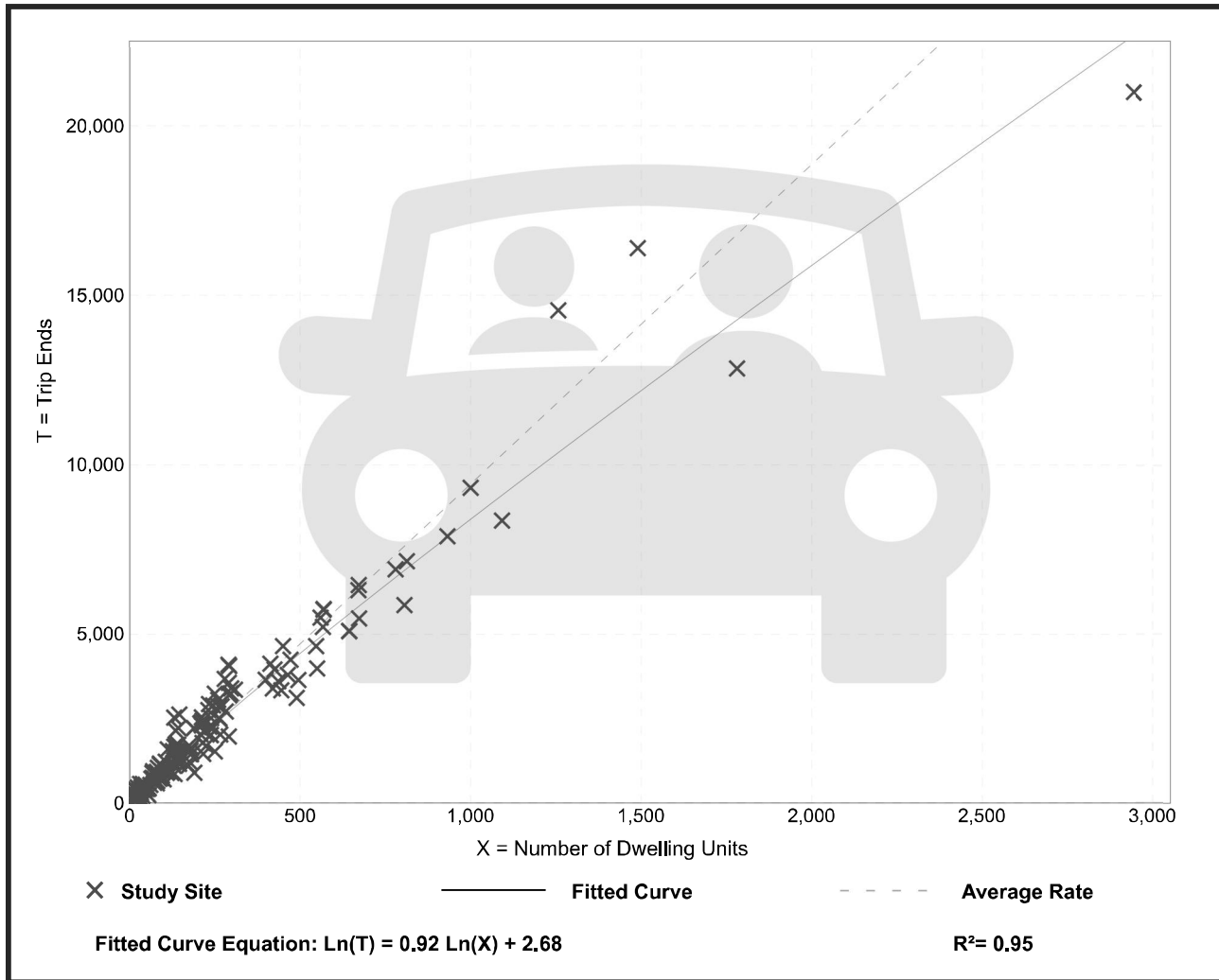
**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday**

**Setting/Location: General Urban/Suburban**  
Number of Studies: 174  
Avg. Num. of Dwelling Units: 246  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

## Data Plot and Equation



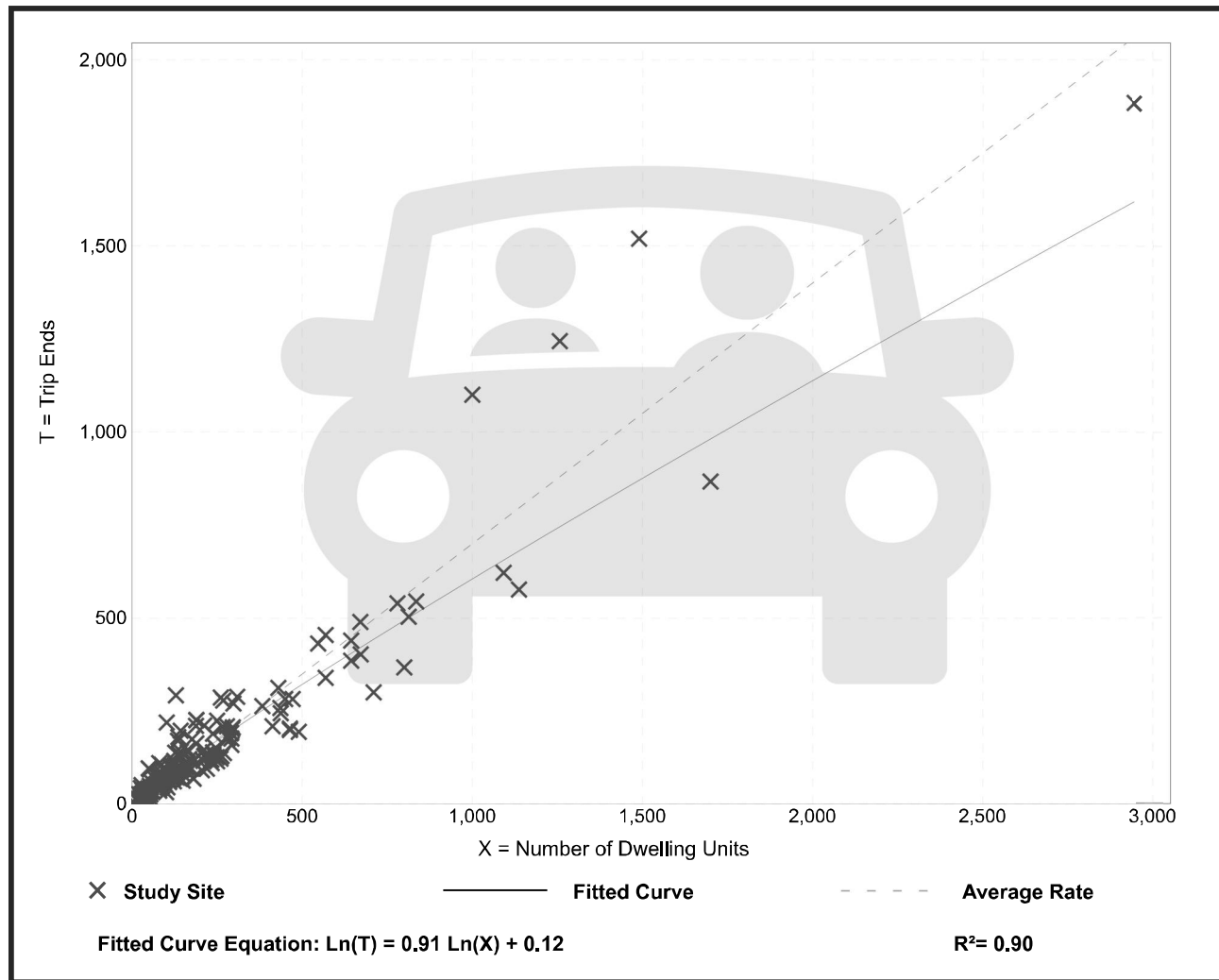
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 192  
 Avg. Num. of Dwelling Units: 226  
 Directional Distribution: 26% entering, 74% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation



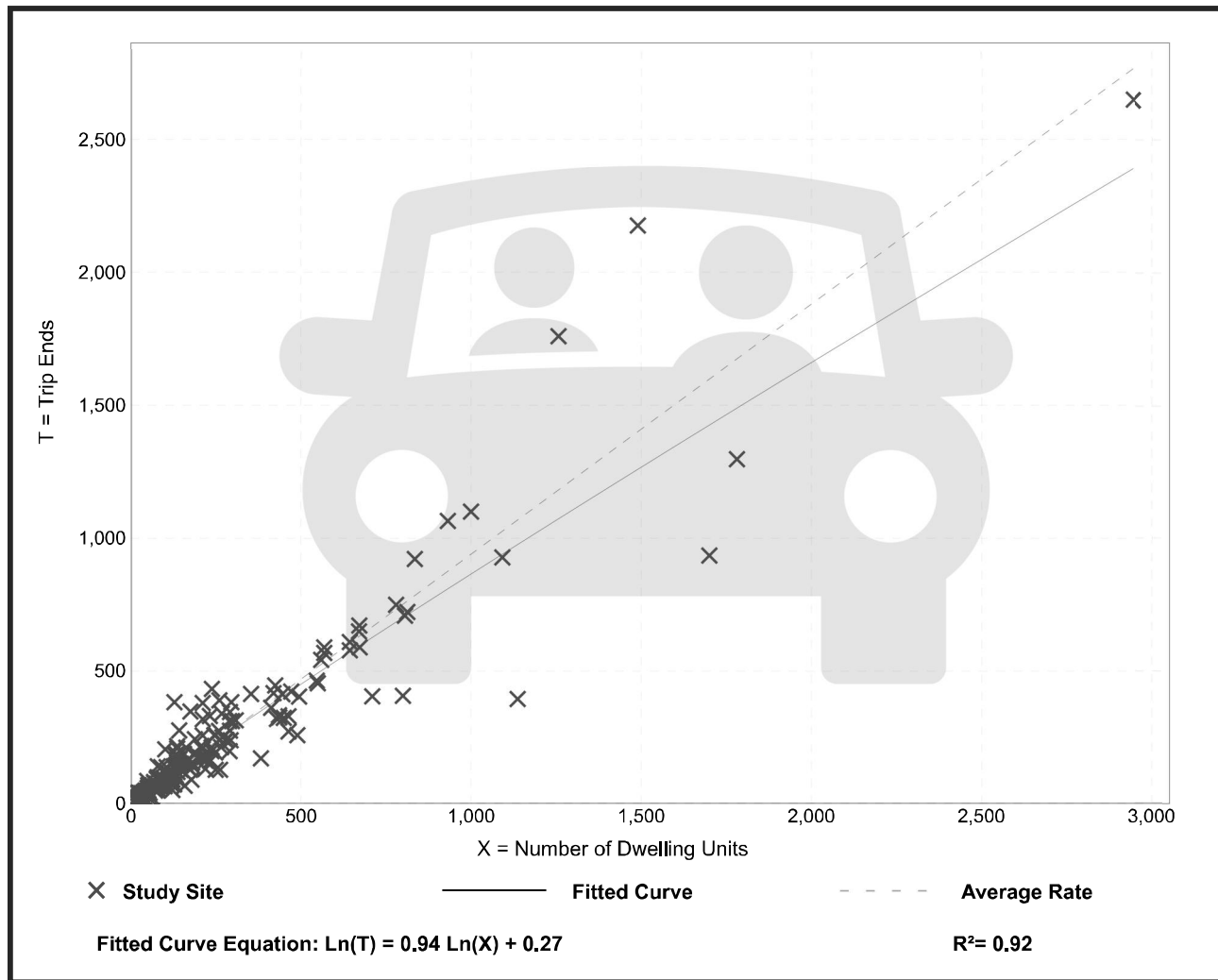
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 208  
 Avg. Num. of Dwelling Units: 248  
 Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation





# Single-Family Attached Housing (215)

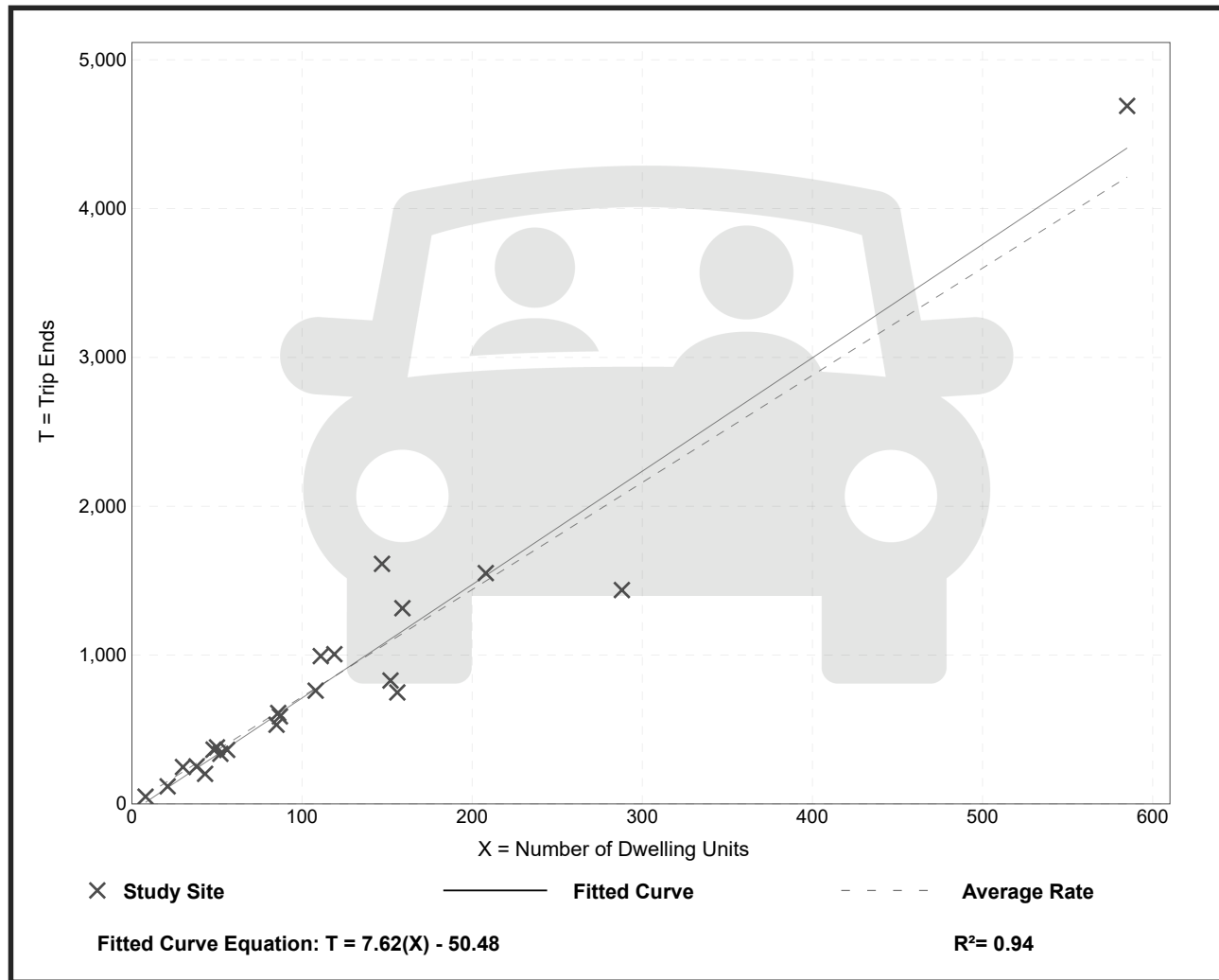
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 22  
Avg. Num. of Dwelling Units: 120  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

## Data Plot and Equation



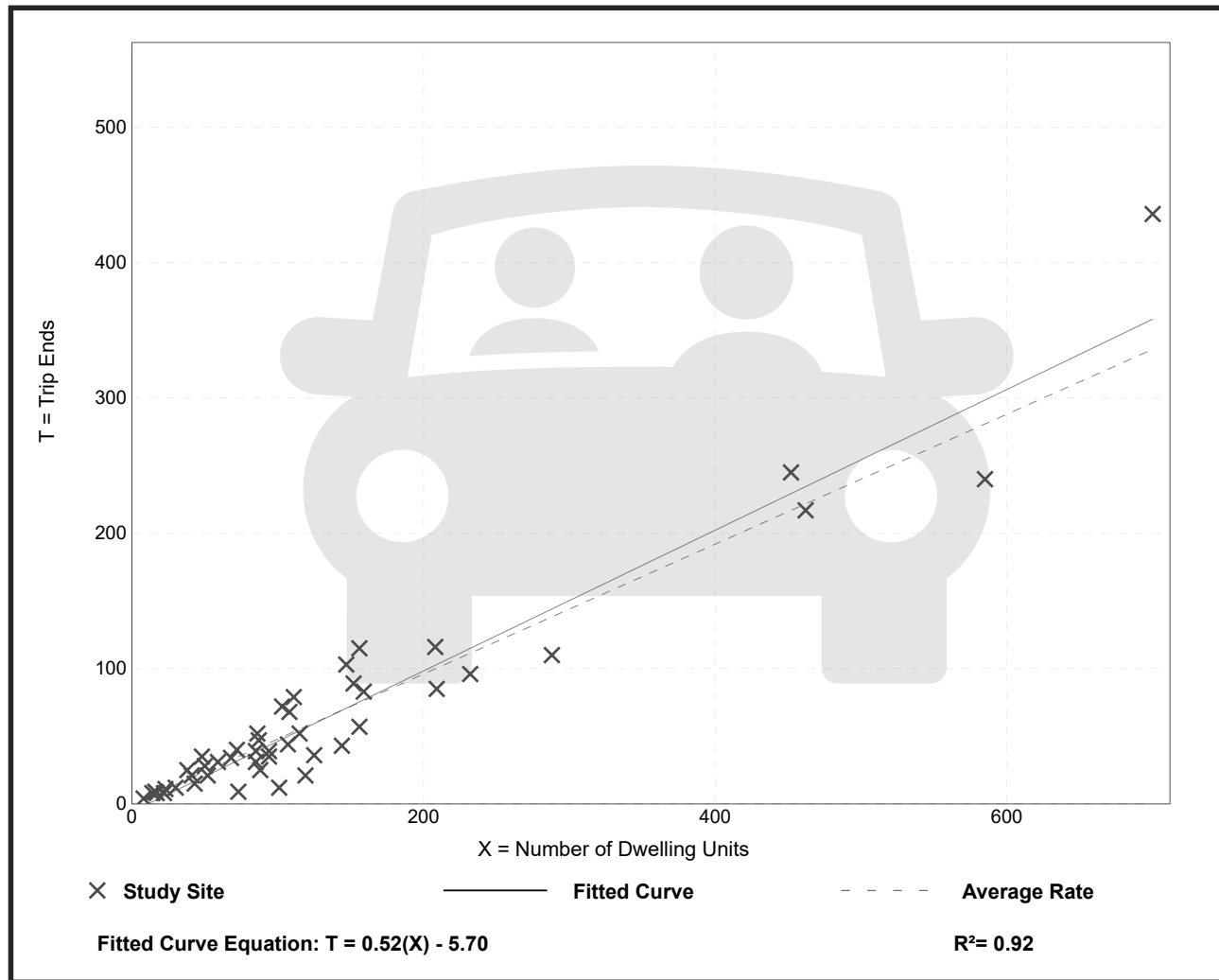
# Single-Family Attached Housing (215)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 46  
 Avg. Num. of Dwelling Units: 135  
 Directional Distribution: 25% entering, 75% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

## Data Plot and Equation



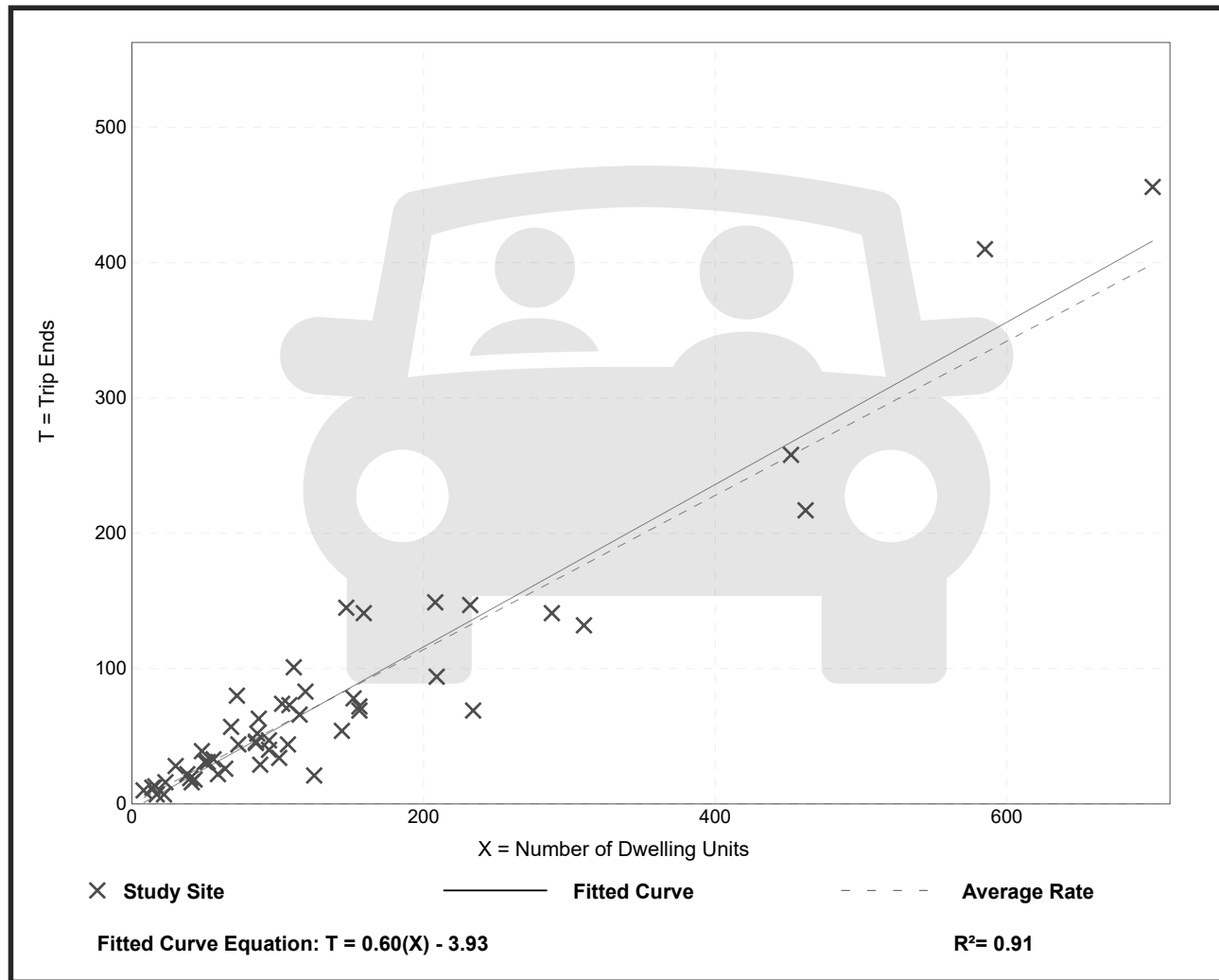
# Single-Family Attached Housing (215)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 51  
 Avg. Num. of Dwelling Units: 136  
 Directional Distribution: 59% entering, 41% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

## Data Plot and Equation



APPENDIX

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C.

## MioVision Traffic Counts

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01\_Cosgray Rd and Bocher Road - TMC

Wed Apr 19, 2023

Full Length (12 AM-12 AM (+1))

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057420, Location: 40.067732, -83.183282

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	WB Boucher Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
2023-04-19 12:00AM	0	0	0	0	2	0	0	2	0	3	0	3	5
12:15AM	0	0	0	0	2	0	0	2	0	5	0	5	7
12:30AM	0	0	0	0	2	0	0	2	0	2	0	2	4
12:45AM	0	0	0	0	1	0	0	1	0	3	0	3	4
Hourly Total	0	0	0	0	7	0	0	7	0	13	0	13	20
1:00AM	0	0	0	0	3	0	0	3	1	1	0	2	5
1:15AM	0	0	0	0	2	0	0	2	0	1	0	1	3
1:30AM	0	0	0	0	1	0	0	1	0	1	0	1	2
1:45AM	0	0	0	0	1	0	0	1	0	4	0	4	5
Hourly Total	0	0	0	0	7	0	0	7	1	7	0	8	15
2:00AM	0	0	0	0	1	0	0	1	0	1	0	1	2
2:15AM	0	0	0	0	4	0	0	4	0	0	0	0	4
2:30AM	0	0	0	0	6	0	0	6	0	3	0	3	9
2:45AM	0	0	0	0	1	0	0	1	0	1	0	1	2
Hourly Total	0	0	0	0	12	0	0	12	0	5	0	5	17
3:00AM	0	0	0	0	1	0	0	1	0	5	0	5	6
3:15AM	0	0	0	0	0	0	0	0	1	4	0	5	5
3:30AM	0	0	0	0	1	0	0	1	0	2	0	2	3
3:45AM	0	1	0	1	1	0	0	1	0	3	0	3	5
Hourly Total	0	1	0	1	3	0	0	3	1	14	0	15	19
4:00AM	0	0	0	0	0	0	0	0	0	4	0	4	4
4:15AM	0	0	0	0	3	0	0	3	0	3	0	3	6
4:30AM	0	3	0	3	7	0	0	7	0	4	0	4	14
4:45AM	0	3	0	3	16	0	0	16	0	1	0	1	20
Hourly Total	0	6	0	6	26	0	0	26	0	12	0	12	44
5:00AM	0	1	0	1	11	0	0	11	0	7	0	7	19
5:15AM	0	2	0	2	17	0	0	17	0	6	0	6	25
5:30AM	0	1	0	1	30	1	0	31	0	7	0	7	39
5:45AM	0	3	0	3	32	0	0	32	0	16	0	16	51
Hourly Total	0	7	0	7	90	1	0	91	0	36	0	36	134
6:00AM	0	1	0	1	49	1	0	50	1	21	0	22	73
6:15AM	0	0	0	0	44	0	0	44	2	25	0	27	71
6:30AM	0	6	0	6	71	0	0	71	1	36	0	37	114
6:45AM	0	4	0	4	106	0	0	106	0	52	0	52	162
Hourly Total	0	11	0	11	270	1	0	271	4	134	0	138	420
7:00AM	0	5	0	5	105	0	0	105	0	55	0	55	165
7:15AM	1	6	0	7	134	0	0	134	0	78	0	78	219
7:30AM	0	7	0	7	139	0	0	139	0	63	0	63	209
7:45AM	0	8	0	8	144	0	0	144	1	70	0	71	223
Hourly Total	1	26	0	27	522	0	0	522	1	266	0	267	816
8:00AM	0	7	0	7	103	2	0	105	2	57	0	59	171
8:15AM	0	2	0	2	100	1	0	101	1	76	0	77	180
8:30AM	0	8	0	8	92	0	0	92	3	62	0	65	165
8:45AM	1	4	0	5	96	1	0	97	1	57	1	59	161
Hourly Total	1	21	0	22	391	4	0	395	7	252	1	260	677
9:00AM	0	3	0	3	72	0	0	72	1	82	0	83	158
9:15AM	0	4	0	4	68	1	0	69	0	65	0	65	138
9:30AM	0	2	0	2	64	1	0	65	0	58	1	59	126
9:45AM	0	8	0	8	71	1	0	72	0	34	0	34	114
Hourly Total	0	17	0	17	275	3	0	278	1	239	1	241	536
10:00AM	0	5	0	5	62	1	0	63	0	48	0	48	116
10:15AM	0	4	0	4	76	1	0	77	1	39	0	40	121
10:30AM	0	2	0	2	66	0	0	66	2	63	0	65	133
10:45AM	0	2	0	2	68	0	0	68	3	67	0	70	140

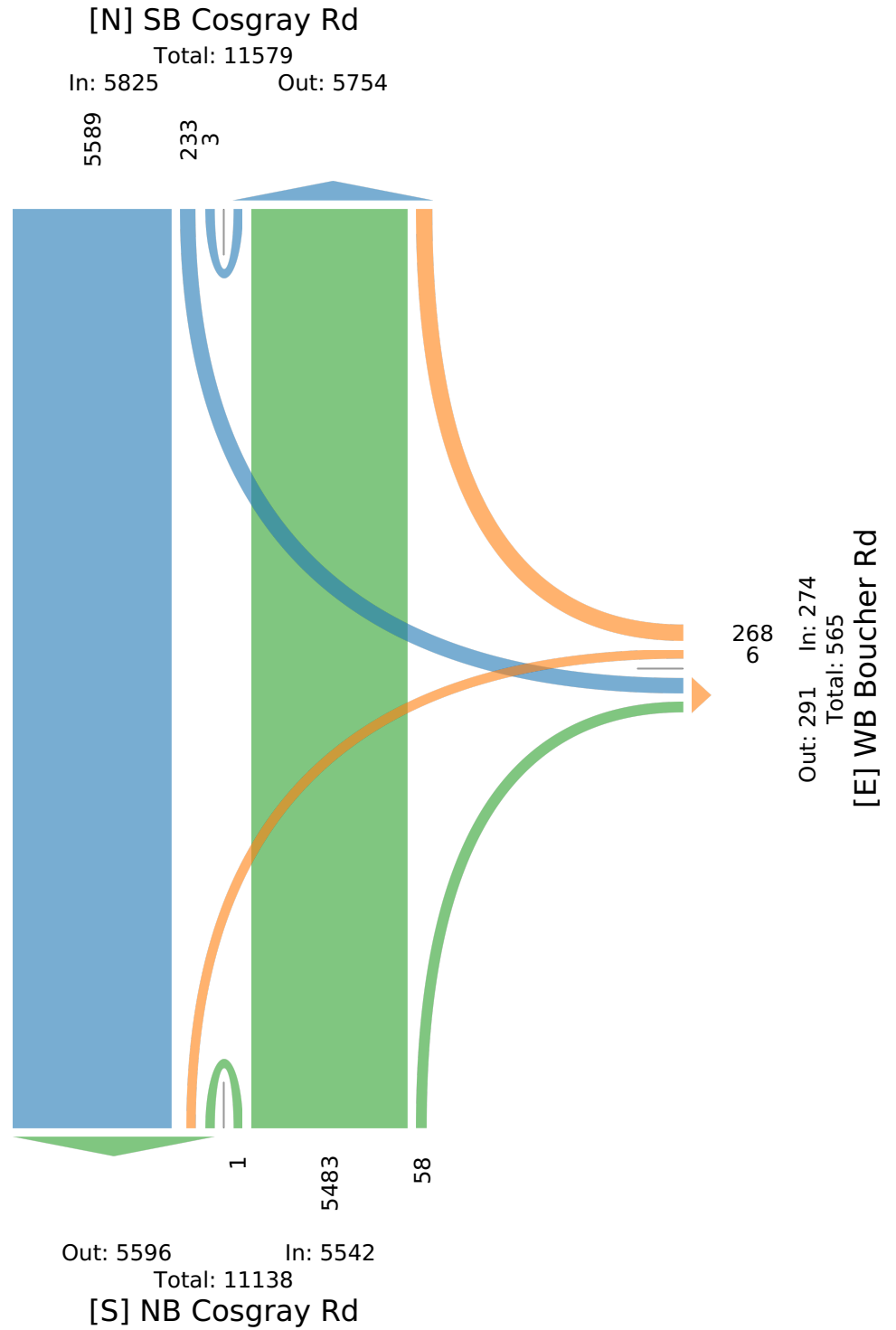
Leg Direction	WB Boucher Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
Hourly Total	0	13	0	13	272	2	0	274	6	217	0	223	510
11:00AM	1	3	0	4	61	2	0	63	1	73	0	74	141
11:15AM	1	4	0	5	57	0	0	57	4	69	0	73	135
11:30AM	0	4	0	4	75	0	0	75	5	67	0	72	151
11:45AM	0	7	0	7	73	2	0	75	3	84	0	87	169
Hourly Total	2	18	0	20	266	4	0	270	13	293	0	306	596
12:00PM	0	6	0	6	84	0	0	84	3	73	0	76	166
12:15PM	0	2	0	2	90	0	0	90	2	76	0	78	170
12:30PM	0	1	0	1	85	1	0	86	6	80	0	86	173
12:45PM	0	4	0	4	90	0	0	90	2	62	0	64	158
Hourly Total	0	13	0	13	349	1	0	350	13	291	0	304	667
1:00PM	1	6	0	7	67	1	0	68	6	78	0	84	159
1:15PM	0	3	0	3	78	2	1	81	3	62	0	65	149
1:30PM	0	6	0	6	72	0	0	72	2	70	1	73	151
1:45PM	0	1	0	1	60	1	0	61	0	72	0	72	134
Hourly Total	1	16	0	17	277	4	1	282	11	282	1	294	593
2:00PM	0	2	0	2	73	2	0	75	0	66	0	66	143
2:15PM	0	1	0	1	68	1	0	69	1	78	0	79	149
2:30PM	0	3	0	3	63	0	0	63	3	76	0	79	145
2:45PM	0	7	0	7	72	1	0	73	3	75	0	78	158
Hourly Total	0	13	0	13	276	4	0	280	7	295	0	302	595
3:00PM	0	2	0	2	90	2	0	92	2	90	0	92	186
3:15PM	0	3	0	3	76	3	0	79	5	140	0	145	227
3:30PM	1	4	0	5	91	1	0	92	3	113	0	116	213
3:45PM	0	6	0	6	91	5	0	96	5	134	0	139	241
Hourly Total	1	15	0	16	348	11	0	359	15	477	0	492	867
4:00PM	0	4	0	4	89	3	0	92	3	160	0	163	259
4:15PM	0	4	0	4	127	2	0	129	8	144	0	152	285
4:30PM	0	4	0	4	130	3	0	133	9	181	0	190	327
4:45PM	0	2	0	2	115	1	0	116	2	155	0	157	275
Hourly Total	0	14	0	14	461	9	0	470	22	640	0	662	1146
5:00PM	0	6	0	6	115	1	0	116	5	170	0	175	297
5:15PM	0	4	0	4	152	0	0	152	10	154	0	164	320
5:30PM	0	8	0	8	156	1	0	157	4	163	0	167	332
5:45PM	0	5	0	5	119	1	0	120	6	150	0	156	281
Hourly Total	0	23	0	23	542	3	0	545	25	637	0	662	1230
6:00PM	0	3	0	3	102	2	0	104	6	136	0	142	249
6:15PM	0	5	0	5	104	3	0	107	7	100	0	107	219
6:30PM	0	12	0	12	112	1	0	113	13	120	0	133	258
6:45PM	0	4	0	4	85	0	0	85	10	103	0	113	202
Hourly Total	0	24	0	24	403	6	0	409	36	459	0	495	928
7:00PM	0	3	0	3	85	0	0	85	8	125	0	133	221
7:15PM	0	7	0	7	87	1	0	88	5	101	0	106	201
7:30PM	0	1	0	1	52	0	0	52	4	110	0	114	167
7:45PM	0	4	0	4	80	1	0	81	9	102	0	111	196
Hourly Total	0	15	0	15	304	2	0	306	26	438	0	464	785
8:00PM	0	5	0	5	67	1	0	68	8	110	0	118	191
8:15PM	0	1	0	1	72	0	0	72	5	90	0	95	168
8:30PM	0	2	0	2	33	0	0	33	5	85	0	90	125
8:45PM	0	2	0	2	42	0	0	42	5	53	0	58	102
Hourly Total	0	10	0	10	214	1	0	215	23	338	0	361	586
9:00PM	0	1	0	1	32	1	0	33	4	45	0	49	83
9:15PM	0	1	0	1	31	0	0	31	2	49	0	51	83
9:30PM	0	1	0	1	19	0	0	19	2	36	0	38	58
9:45PM	0	0	0	0	18	0	0	18	4	22	0	26	44
Hourly Total	0	3	0	3	100	1	0	101	12	152	0	164	268
10:00PM	0	0	0	0	13	0	0	13	1	19	0	20	33
10:15PM	0	0	0	0	12	0	0	12	3	19	0	22	34
10:30PM	0	1	0	1	9	1	0	10	0	14	0	14	25
10:45PM	0	0	0	0	7	0	0	7	0	12	0	12	19

Leg Direction	WB Boucher Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
Hourly Total	0	1	0	1	41	1	0	42	4	64	0	68	111
11:00PM	0	0	0	0	6	0	0	6	0	9	0	9	15
11:15PM	0	0	0	0	13	0	0	13	3	9	0	12	25
11:30PM	0	1	0	1	7	0	0	7	0	6	0	6	14
11:45PM	0	0	0	0	1	0	0	1	2	4	0	6	7
Hourly Total	0	1	0	1	27	0	0	27	5	28	0	33	61
<b>Total</b>	6	268	0	274	5483	58	1	5542	233	5589	3	5825	11641
<b>% Approach</b>	2.2%	97.8%	0%	-	98.9%	1.0%	0%	-	4.0%	95.9%	0.1%	-	-
<b>% Total</b>	0.1%	2.3%	0%	2.4%	47.1%	0.5%	0%	47.6%	2.0%	48.0%	0%	50.0%	-
<b>Lights and Motorcycles</b>	6	259	0	265	5300	48	1	5349	232	5412	3	5647	11261
<b>% Lights and Motorcycles</b>	100%	96.6%	0%	96.7%	96.7%	82.8%	100%	96.5%	99.6%	96.8%	100%	96.9%	96.7%
<b>Heavy</b>	0	9	0	9	183	10	0	193	1	177	0	178	380
<b>% Heavy</b>	0%	3.4%	0%	3.3%	3.3%	17.2%	0%	3.5%	0.4%	3.2%	0%	3.1%	3.3%

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

01\_Cosgray Rd and Bocher Road - TMC  
 Wed Apr 19, 2023  
 Full Length (12 AM-12 AM (+1))  
 All Classes (Lights and Motorcycles, Heavy)  
 All Movements  
 ID: 1057420, Location: 40.067732, -83.183282

Provided by: Kimley-Horn and Associates, Inc.  
 767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US





01\_Cosgray Rd and Bocher Road - TMC

Wed Apr 19, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057420, Location: 40.067732, -83.183282

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	WB Boucher Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
2023-04-19 7:15AM	1	6	0	7	134	0	0	134	0	78	0	78	219
7:30AM	0	7	0	7	139	0	0	139	0	63	0	63	209
7:45AM	0	8	0	8	144	0	0	144	1	70	0	71	223
8:00AM	0	7	0	7	103	2	0	105	2	57	0	59	171
<b>Total</b>	1	28	0	29	520	2	0	522	3	268	0	271	822
<b>% Approach</b>	3.4%	96.6%	0%	-	99.6%	0.4%	0%	-	1.1%	98.9%	0%	-	-
<b>% Total</b>	0.1%	3.4%	0%	3.5%	63.3%	0.2%	0%	63.5%	0.4%	32.6%	0%	33.0%	-
<b>PHF</b>	0.250	0.875	-	0.906	0.903	0.250	-	0.906	0.375	0.859	-	0.869	0.922
<b>Lights and Motorcycles</b>	1	28	0	29	503	1	0	504	3	254	0	257	790
<b>% Lights and Motorcycles</b>	100%	100%	0%	100%	96.7%	50.0%	0%	96.6%	100%	94.8%	0%	94.8%	96.1%
<b>Heavy</b>	0	0	0	0	17	1	0	18	0	14	0	14	32
<b>% Heavy</b>	0%	0%	0%	0%	3.3%	50.0%	0%	3.4%	0%	5.2%	0%	5.2%	3.9%

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

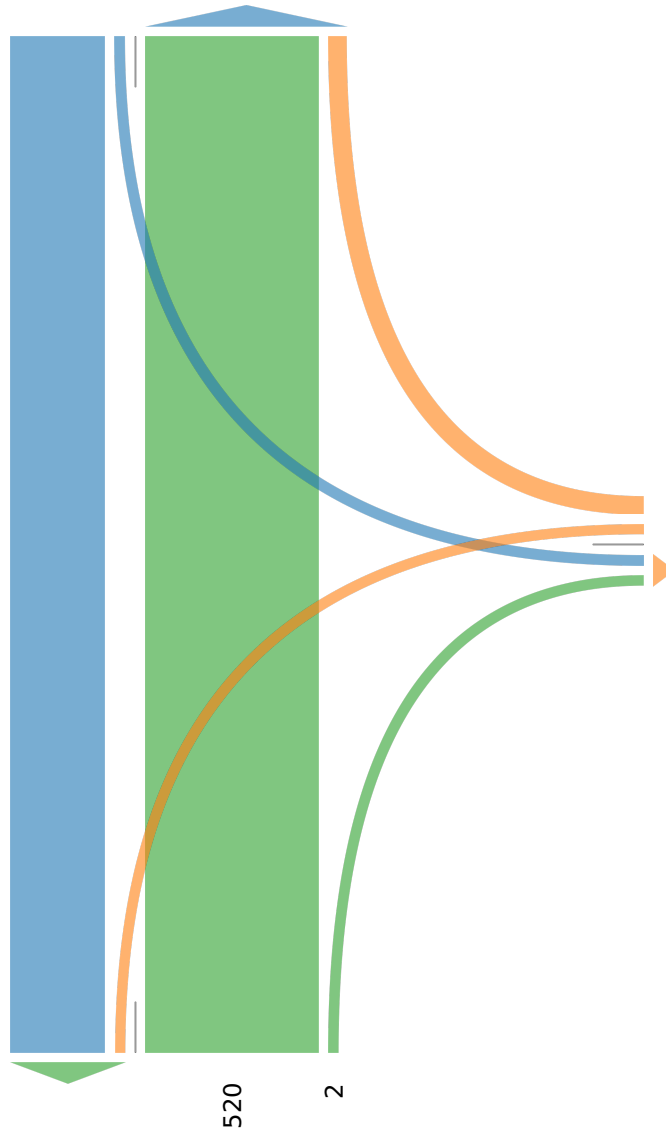
01\_Cosgray Rd and Bocher Road - TMC  
 Wed Apr 19, 2023  
 AM Peak (7:15 AM - 8:15 AM)  
 All Classes (Lights and Motorcycles, Heavy)  
 All Movements  
 ID: 1057420, Location: 40.067732, -83.183282

Provided by: Kimley-Horn and Associates, Inc.  
 767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

[N] SB Cosgray Rd

Total: 819  
 In: 271 Out: 548

268 3



Out: 5 In: 29  
 Total: 34

[E] WB Boucher Rd

Out: 269 In: 522  
 Total: 791  
 [S] NB Cosgray Rd

01\_Cosgray Rd and Bocher Road - TMC

Wed Apr 19, 2023

Midday Peak (11:45 AM - 12:45 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057420, Location: 40.067732, -83.183282

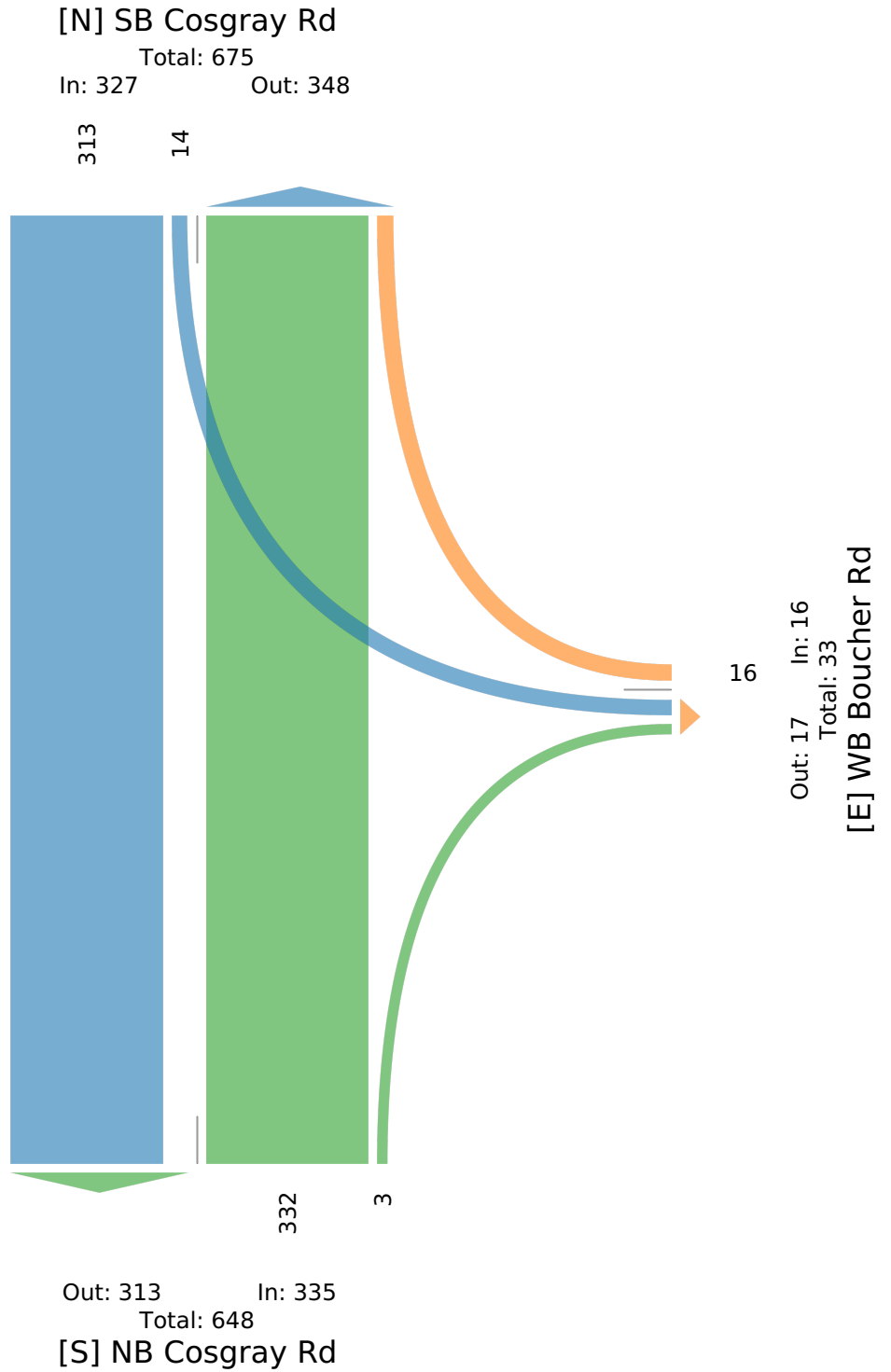
Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	WB Boucher Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
2023-04-19 11:45AM	0	7	0	7	73	2	0	75	3	84	0	87	169
12:00PM	0	6	0	6	84	0	0	84	3	73	0	76	166
12:15PM	0	2	0	2	90	0	0	90	2	76	0	78	170
12:30PM	0	1	0	1	85	1	0	86	6	80	0	86	173
<b>Total</b>	0	16	0	16	332	3	0	335	14	313	0	327	678
<b>% Approach</b>	0%	100%	0%	-	99.1%	0.9%	0%	-	4.3%	95.7%	0%	-	-
<b>% Total</b>	0%	2.4%	0%	2.4%	49.0%	0.4%	0%	49.4%	2.1%	46.2%	0%	48.2%	-
<b>PHF</b>	-	0.571	-	0.571	0.922	0.375	-	0.931	0.583	0.932	-	0.940	0.980
<b>Lights and Motorcycles</b>	0	16	0	16	319	3	0	322	14	306	0	320	658
<b>% Lights and Motorcycles</b>	0%	100%	0%	100%	96.1%	100%	0%	96.1%	100%	97.8%	0%	97.9%	97.1%
<b>Heavy</b>	0	0	0	0	13	0	0	13	0	7	0	7	20
<b>% Heavy</b>	0%	0%	0%	0%	3.9%	0%	0%	3.9%	0%	2.2%	0%	2.1%	2.9%

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

01\_Cosgray Rd and Bocher Road - TMC  
 Wed Apr 19, 2023  
 Midday Peak (11:45 AM - 12:45 PM)  
 All Classes (Lights and Motorcycles, Heavy)  
 All Movements  
 ID: 1057420, Location: 40.067732, -83.183282

Provided by: Kimley-Horn and Associates, Inc.  
 767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US



**01\_Cosgray Rd and Bocher Road - TMC**

Wed Apr 19, 2023

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057420, Location: 40.067732, -83.183282

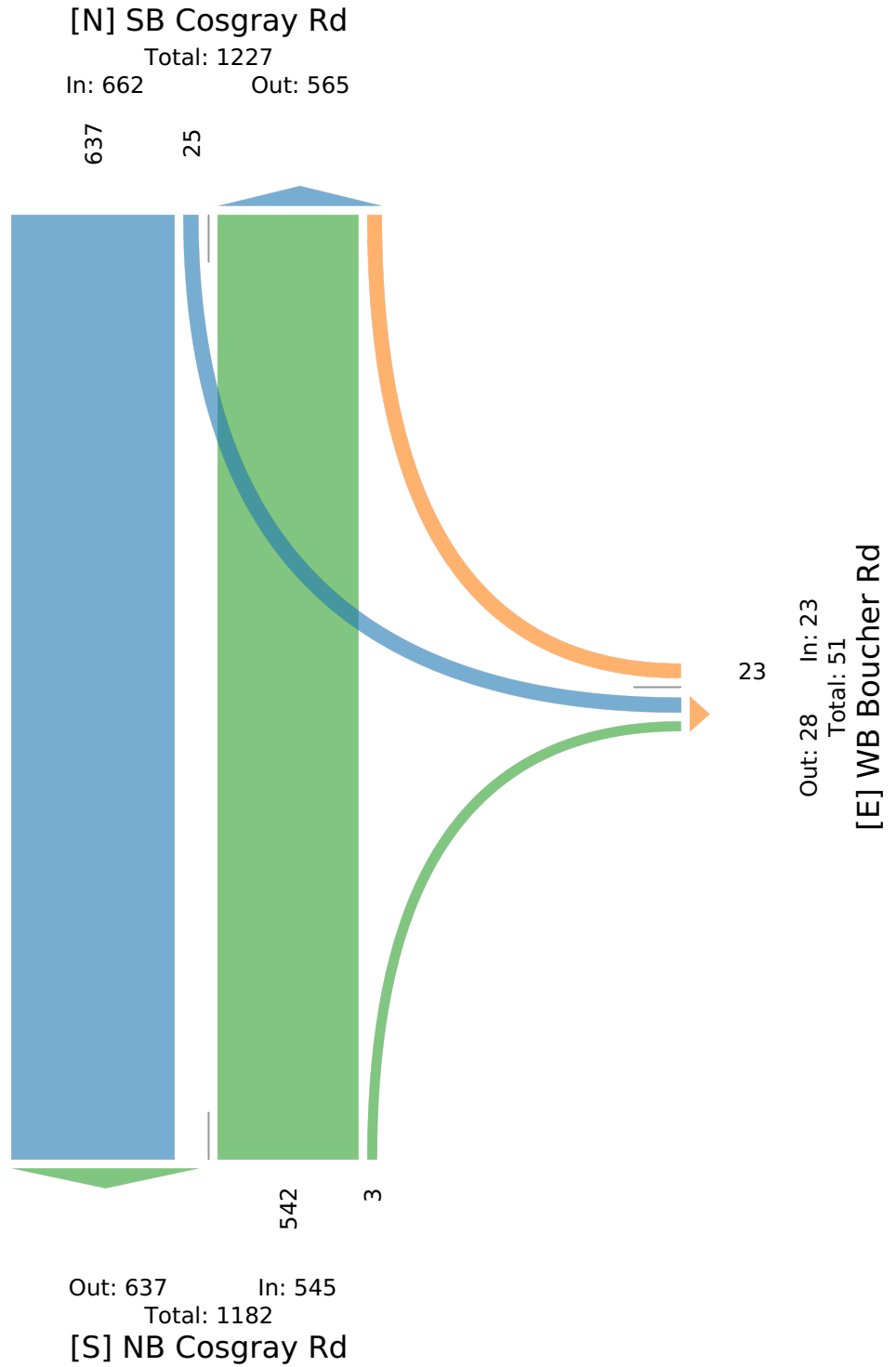
Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	WB Boucher Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				Int
	L	R	U	App	T	R	U	App	L	T	U	App	
2023-04-19 5:00PM	0	6	0	<b>6</b>	115	1	0	<b>116</b>	5	170	0	<b>175</b>	<b>297</b>
5:15PM	0	4	0	<b>4</b>	152	0	0	<b>152</b>	10	154	0	<b>164</b>	<b>320</b>
5:30PM	0	8	0	<b>8</b>	156	1	0	<b>157</b>	4	163	0	<b>167</b>	<b>332</b>
5:45PM	0	5	0	<b>5</b>	119	1	0	<b>120</b>	6	150	0	<b>156</b>	<b>281</b>
<b>Total</b>	0	23	0	<b>23</b>	542	3	0	<b>545</b>	25	637	0	<b>662</b>	<b>1230</b>
<b>% Approach</b>	0%	100%	0%	-	99.4%	0.6%	0%	-	3.8%	96.2%	0%	-	-
<b>% Total</b>	0%	1.9%	0%	<b>1.9%</b>	44.1%	0.2%	0%	<b>44.3%</b>	2.0%	51.8%	0%	<b>53.8%</b>	-
<b>PHF</b>	-	0.719	-	<b>0.719</b>	0.869	0.750	-	<b>0.868</b>	0.625	0.937	-	<b>0.946</b>	0.926
<b>Lights and Motorcycles</b>	0	23	0	<b>23</b>	538	3	0	<b>541</b>	25	634	0	<b>659</b>	1223
<b>% Lights and Motorcycles</b>	0%	100%	0%	<b>100%</b>	99.3%	100%	0%	<b>99.3%</b>	100%	99.5%	0%	<b>99.5%</b>	99.4%
<b>Heavy</b>	0	0	0	<b>0</b>	4	0	0	<b>4</b>	0	3	0	<b>3</b>	7
<b>% Heavy</b>	0%	0%	0%	<b>0%</b>	0.7%	0%	0%	<b>0.7%</b>	0%	0.5%	0%	<b>0.5%</b>	0.6%

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

01\_Cosgray Rd and Bocher Road - TMC  
 Wed Apr 19, 2023  
 PM Peak (5 PM - 6 PM) - Overall Peak Hour  
 All Classes (Lights and Motorcycles, Heavy)  
 All Movements  
 ID: 1057420, Location: 40.067732, -83.183282

Provided by: Kimley-Horn and Associates, Inc.  
 767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US



02\_Cosgray Rd and Hayden Run Rd - TMC

Provided by: Kimley-Horn and Associates, Inc.  
 767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Wed Apr 19, 2023

Full Length (12 AM-12 AM (+1))

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057421, Location: 40.060159, -83.182236

Leg Direction	EB Hayden Run Rd Eastbound					WB Hayden Run Rd Westbound					NB Cosgray Rd Northbound					SB Cosgray Rd Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-04-19 12:00AM	0	2	1	0	3	7	5	2	0	14	0	1	1	0	2	1	2	0	0	3	22
12:15AM	0	4	0	0	4	1	2	2	0	5	0	1	1	0	2	2	1	1	0	4	15
12:30AM	0	1	0	0	1	0	1	1	0	2	0	2	0	0	2	2	1	0	0	3	8
12:45AM	0	0	0	0	0	3	1	1	0	5	0	0	0	0	0	0	2	1	0	3	8
Hourly Total	0	7	1	0	8	11	9	6	0	26	0	4	2	0	6	5	6	2	0	13	53
1:00AM	1	1	0	0	2	1	0	2	0	3	1	0	1	0	2	0	1	0	0	1	8
1:15AM	0	0	0	0	0	2	2	1	0	5	0	3	0	0	3	1	0	0	0	1	9
1:30AM	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	3
1:45AM	1	1	0	0	2	2	1	0	0	3	0	0	0	0	0	1	3	0	0	4	9
Hourly Total	2	3	0	0	5	5	3	4	0	12	1	3	1	0	5	3	4	0	0	7	29
2:00AM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	3
2:15AM	0	0	0	0	0	2	1	2	0	5	0	2	1	0	3	0	0	0	0	0	8
2:30AM	0	1	0	0	1	0	0	3	0	3	0	3	0	0	3	2	1	0	0	3	10
2:45AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
Hourly Total	0	1	0	0	1	3	2	5	0	10	0	6	1	0	7	2	3	0	0	5	23
3:00AM	0	1	0	0	1	0	2	1	0	3	0	1	0	0	1	1	2	0	0	3	8
3:15AM	0	1	0	0	1	0	0	0	0	0	0	0	3	0	3	0	4	0	0	4	8
3:30AM	0	1	0	0	1	2	0	0	0	2	0	1	2	0	3	2	0	0	0	2	8
3:45AM	0	0	0	0	0	2	0	0	0	2	0	0	2	0	2	2	0	0	0	2	6
Hourly Total	0	3	0	0	3	4	2	1	0	7	0	2	7	0	9	5	6	0	0	11	30
4:00AM	0	1	0	0	1	1	0	0	0	1	0	0	1	0	1	4	0	0	0	4	7
4:15AM	0	0	0	0	0	1	0	1	0	2	0	2	0	0	2	2	0	0	0	2	6
4:30AM	1	4	0	0	5	6	1	2	0	9	0	3	2	0	5	5	0	0	0	5	24
4:45AM	1	11	0	0	12	1	2	7	0	10	0	7	0	0	7	0	1	0	0	1	30
Hourly Total	2	16	0	0	18	9	3	10	0	22	0	12	3	0	15	11	1	0	0	12	67
5:00AM	1	8	0	0	9	1	1	1	0	3	0	7	2	0	9	3	3	0	0	6	27
5:15AM	1	4	0	0	5	3	5	4	0	12	0	12	3	0	15	5	3	0	0	8	40
5:30AM	3	6	0	0	9	1	1	11	0	13	0	19	14	0	33	6	2	0	0	8	63
5:45AM	1	8	1	0	10	2	3	7	0	12	0	18	9	0	27	10	5	1	0	16	65
Hourly Total	6	26	1	0	33	7	10	23	0	40	0	56	28	0	84	24	13	1	0	38	195
6:00AM	4	8	0	0	12	11	15	14	0	40	1	31	10	0	42	14	8	1	0	23	117
6:15AM	2	10	4	0	16	13	18	14	0	45	0	30	14	0	44	14	6	1	0	21	126
6:30AM	3	28	0	0	31	7	22	23	0	52	4	49	22	0	75	19	16	4	0	39	197
6:45AM	6	25	2	0	33	13	11	32	0	56	7	59	29	0	95	30	17	4	0	51	235
Hourly Total	15	71	6	0	92	44	66	83	0	193	12	169	75	0	256	77	47	10	0	134	675
7:00AM	6	44	2	0	52	11	23	36	0	70	1	52	30	1	84	31	18	6	0	55	261
7:15AM	15	43	8	0	66	24	19	41	0	84	4	79	24	0	107	36	32	4	0	72	329
7:30AM	11	49	8	0	68	24	15	44	0	83	2	74	55	0	131	42	20	1	0	63	345
7:45AM	14	39	0	0	53	29	32	44	0	105	4	89	12	0	105	26	38	1	0	65	328
Hourly Total	46	175	18	0	239	88	89	165	0	342	11	294	121	1	427	135	108	12	0	255	1263
8:00AM	11	39	4	0	54	31	24	25	0	80	1	62	48	0	111	22	22	6	0	50	295
8:15AM	6	37	5	0	48	25	16	18	0	59	3	70	55	0	128	37	28	5	0	70	305
8:30AM	21	27	6	0	54	31	19	25	0	75	0	53	36	1	90	24	35	1	0	60	279
8:45AM	22	25	5	0	52	32	27	24	0	83	3	53	41	0	97	26	24	5	1	56	288
Hourly Total	60	128	20	0	208	119	86	92	0	297	7	238	180	1	426	109	109	17	1	236	1167
9:00AM	0	19	3	0	22	22	6	26	0	54	3	44	30	0	77	30	30	7	0	67	220
9:15AM	0	26	4	0	30	21	8	24	0	53	3	28	24	0	55	27	34	5	0	66	204
9:30AM	0	32	0	1	33	19	18	13	0	50	6	45	27	0	78	23	28	0	0	51	212
9:45AM	0	20	2	0	22	23	16	23	0	62	1	35	20	0	56	13	18	2	0	33	173
Hourly Total	0	97	9	1	107	85	48	86	0	219	13	152	101	0	266	93	110	14	0	217	809
10:00AM	7	13	2	1	23	26	13	31	0	70	4	30	26	0	60	17	17	7	0	41	194
10:15AM	3	21	0	1	25	19	17	26	0	62	2	41	24	0	67	18	18	6	0	42	196
10:30AM	13	14	0	1	28	16	12	29	0	57	1	36	23	0	60	28	24	7	0	59	204
10:45AM	5	19	3	0	27	26	13	23	0	62	1	34	18	0	53	31	29	6	2	68	210

Leg Direction	EB Hayden Run Rd Eastbound					WB Hayden Run Rd Westbound					NB Cosgray Rd Northbound					SB Cosgray Rd Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
Hourly Total	28	67	5	3	103	87	55	109	0	251	8	141	91	0	240	94	88	26	2	210	804
11:00AM	16	21	5	0	42	24	19	21	0	64	3	36	36	0	75	30	37	2	0	69	250
11:15AM	10	26	3	0	39	24	27	21	0	72	1	31	28	0	60	25	32	5	1	63	234
11:30AM	11	24	4	0	39	30	29	32	0	91	3	39	18	0	60	29	30	6	0	65	255
11:45AM	8	19	4	0	31	28	29	19	0	76	5	44	28	0	77	25	48	2	0	75	259
Hourly Total	45	90	16	0	151	106	104	93	0	303	12	150	110	0	272	109	147	15	1	272	998
12:00PM	7	23	5	0	35	21	21	35	0	77	1	48	27	0	76	35	33	2	1	71	259
12:15PM	17	18	3	0	38	30	26	27	0	83	4	50	28	0	82	29	35	6	0	70	273
12:30PM	5	23	3	0	31	36	25	29	0	90	2	36	30	0	68	35	34	3	0	72	261
12:45PM	3	23	7	0	33	32	19	40	0	91	4	46	30	0	80	29	31	1	0	61	265
Hourly Total	32	87	18	0	137	119	91	131	0	341	11	180	115	0	306	128	133	12	1	274	1058
1:00PM	12	12	2	0	26	25	21	32	0	78	5	38	26	0	69	31	33	2	0	66	239
1:15PM	8	25	8	0	41	39	19	33	0	91	5	40	24	0	69	25	25	5	1	56	257
1:30PM	8	33	2	0	43	27	26	32	0	85	8	36	19	0	63	29	38	1	1	69	260
1:45PM	7	17	3	0	27	41	24	27	0	92	2	35	21	0	58	28	31	1	0	60	237
Hourly Total	35	87	15	0	137	132	90	124	0	346	20	149	90	0	259	113	127	9	2	251	993
2:00PM	11	17	5	0	33	34	31	30	0	95	3	37	23	0	63	24	32	3	0	59	250
2:15PM	6	20	2	0	28	43	28	21	0	92	2	42	29	0	73	30	35	2	1	68	261
2:30PM	5	30	8	0	43	31	38	25	0	94	2	33	28	1	64	23	49	5	0	77	278
2:45PM	4	25	4	0	33	42	36	30	1	109	4	42	36	0	82	27	38	2	0	67	291
Hourly Total	26	92	19	0	137	150	133	106	1	390	11	154	116	1	282	104	154	12	1	271	1080
3:00PM	6	23	4	0	33	49	30	37	0	116	3	43	36	0	82	34	46	4	1	85	316
3:15PM	17	22	5	0	44	53	32	30	0	115	4	34	26	0	64	38	82	5	0	125	348
3:30PM	11	26	5	0	42	43	38	42	0	123	5	45	25	0	75	33	53	7	0	93	333
3:45PM	5	43	10	0	58	54	26	36	0	116	3	58	36	0	97	44	75	13	0	132	403
Hourly Total	39	114	24	0	177	199	126	145	0	470	15	180	123	0	318	149	256	29	1	435	1400
4:00PM	10	29	11	0	50	66	56	32	0	154	4	44	30	0	78	51	82	7	0	140	422
4:15PM	9	30	10	0	49	66	54	43	0	163	5	79	37	0	121	51	75	11	0	137	470
4:30PM	21	40	7	0	68	55	59	48	0	162	3	73	33	0	109	53	97	13	0	163	502
4:45PM	7	41	3	0	51	78	63	51	0	192	5	75	35	0	115	51	77	13	0	141	499
Hourly Total	47	140	31	0	218	265	232	174	0	671	17	271	135	0	423	206	331	44	0	581	1893
5:00PM	8	47	11	0	66	80	54	61	0	195	4	62	40	0	106	64	84	10	0	158	525
5:15PM	21	30	6	0	57	96	56	52	0	204	11	83	31	0	125	58	75	8	0	141	527
5:30PM	11	35	12	0	58	90	69	69	0	228	7	80	36	0	123	60	88	5	1	154	563
5:45PM	12	30	6	0	48	76	46	56	0	178	2	59	23	0	84	45	85	11	0	141	451
Hourly Total	52	142	35	0	229	342	225	238	0	805	24	284	130	0	438	227	332	34	1	594	2066
6:00PM	9	28	4	0	41	58	46	39	0	143	2	58	38	0	98	51	65	9	0	125	407
6:15PM	9	28	6	0	43	60	39	48	0	147	2	56	31	0	89	32	46	7	1	86	365
6:30PM	13	31	7	0	51	41	26	40	0	107	3	60	27	0	90	46	54	7	2	109	357
6:45PM	8	26	2	0	36	53	23	41	0	117	3	40	30	0	73	35	52	3	0	90	316
Hourly Total	39	113	19	0	171	212	134	168	0	514	10	214	126	0	350	164	217	26	3	410	1445
7:00PM	12	32	5	0	49	41	35	16	0	92	4	49	36	1	90	42	66	6	0	114	345
7:15PM	12	13	5	0	30	61	27	27	0	115	5	49	24	0	78	31	52	4	0	87	310
7:30PM	4	22	8	0	34	43	36	20	0	99	7	41	26	0	74	40	53	7	1	101	308
7:45PM	6	16	6	0	28	53	23	28	0	104	6	52	23	0	81	35	53	10	0	98	311
Hourly Total	34	83	24	0	141	198	121	91	0	410	22	191	109	1	323	148	224	27	1	400	1274
8:00PM	4	13	2	0	19	51	23	17	0	91	4	56	29	0	89	42	49	8	0	99	298
8:15PM	5	13	5	0	23	41	16	25	1	83	6	36	37	0	79	28	52	7	0	87	272
8:30PM	2	17	2	0	21	30	20	19	0	69	3	18	12	0	33	41	38	1	0	80	203
8:45PM	3	13	3	0	19	36	19	15	0	70	4	28	21	0	53	25	25	2	0	52	194
Hourly Total	14	56	12	0	82	158	78	76	1	313	17	138	99	0	254	136	164	18	0	318	967
9:00PM	1	10	0	0	11	22	25	17	0	64	2	19	32	0	53	18	23	2	0	43	171
9:15PM	0	9	3	0	12	18	3	13	0	34	3	16	40	0	59	19	24	3	0	46	151
9:30PM	1	12	1	0	14	22	8	7	0	37	2	13	18	0	33	17	15	1	1	34	118
9:45PM	0	6	2	0	8	22	3	7	1	33	0	17	13	0	30	7	10	4	0	21	92
Hourly Total	2	37	6	0	45	84	39	44	1	168	7	65	103	0	175	61	72	10	1	144	532
10:00PM	0	10	3	0	13	13	11	10	1	35	2	5	5	0	12	8	8	1	0	17	77
10:15PM	1	4	0	0	5	9	11	5	0	25	0	6	6	0	12	6	12	1	0	19	61
10:30PM	0	3	0	0	3	12	3	5	0	20	0	6	6	0	12	3	10	1	0	14	49
10:45PM	0	1	0	0	1	4	8	4	0	16	0	2	6	0	8	5	8	0	0	13	38



Leg Direction	EB Hayden Run Rd Eastbound					WB Hayden Run Rd Westbound					NB Cosgray Rd Northbound					SB Cosgray Rd Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
Hourly Total	1	18	3	0	22	38	33	24	1	96	2	19	23	0	44	22	38	3	0	63	225
11:00PM	0	1	0	0	1	10	5	3	0	18	1	3	4	0	8	0	7	1	0	8	35
11:15PM	0	1	0	0	1	24	10	7	0	41	0	8	1	0	9	4	5	1	0	10	61
11:30PM	1	4	0	0	5	14	6	3	0	23	1	1	3	0	5	3	3	0	0	6	39
11:45PM	0	2	0	0	2	6	2	1	0	9	1	1	2	0	4	1	3	0	0	4	19
Hourly Total	1	8	0	0	9	54	23	14	0	91	3	13	10	0	26	8	18	2	0	28	154
<b>Total</b>	526	1661	282	4	2473	2519	1802	2012	4	6337	223	3085	1899	4	5211	2133	2708	323	15	5179	19200
<b>% Approach</b>	21.3%	67.2%	11.4%	0.2%	-	39.8%	28.4%	31.8%	0.1%	-	4.3%	59.2%	36.4%	0.1%	-	41.2%	52.3%	6.2%	0.3%	-	-
<b>% Total</b>	2.7%	8.7%	1.5%	0%	12.9%	13.1%	9.4%	10.5%	0%	33.0%	1.2%	16.1%	9.9%	0%	27.1%	11.1%	14.1%	1.7%	0.1%	27.0%	-
<b>Lights and Motorcycles</b>	499	1633	269	0	2401	2488	1766	1901	4	6159	219	3035	1876	4	5134	2018	2671	299	14	5002	18696
<b>% Lights and Motorcycles</b>	94.9%	98.3%	95.4%	0%	97.1%	98.8%	98.0%	94.5%	100%	97.2%	98.2%	98.4%	98.8%	100%	98.5%	94.6%	98.6%	92.6%	93.3%	96.6%	97.4%
<b>Heavy</b>	27	28	13	4	72	31	36	111	0	178	4	50	23	0	77	115	37	24	1	177	504
<b>% Heavy</b>	5.1%	1.7%	4.6%	100%	2.9%	1.2%	2.0%	5.5%	0%	2.8%	1.8%	1.6%	1.2%	0%	1.5%	5.4%	1.4%	7.4%	6.7%	3.4%	2.6%

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

**02\_Cosgray Rd and Hayden Run Rd - TMC**

Wed Apr 19, 2023

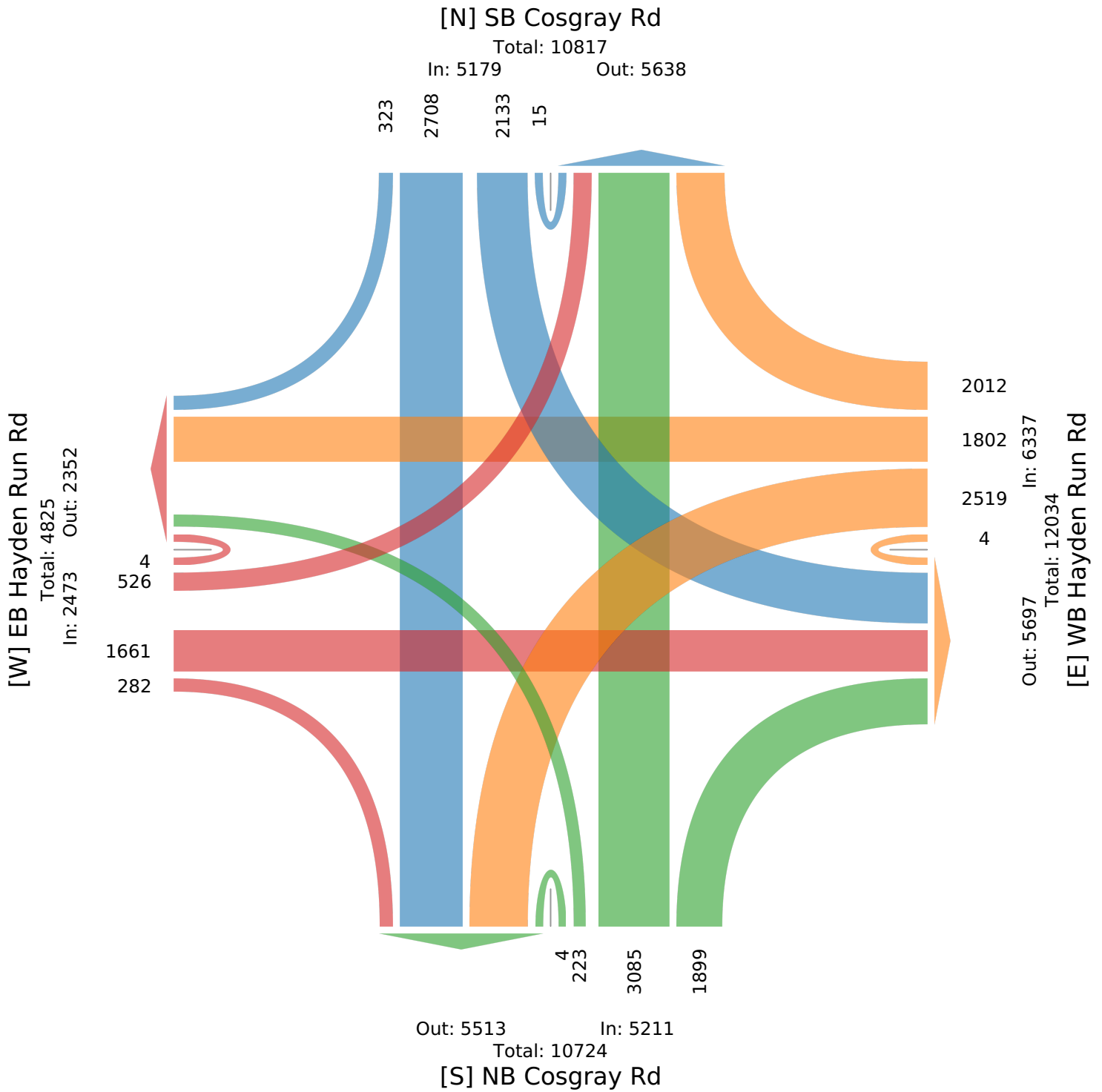
Full Length (12 AM-12 AM (+1))

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057421, Location: 40.060159, -83.182236

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US



02\_Cosgray Rd and Hayden Run Rd - TMC

Wed Apr 19, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057421, Location: 40.060159, -83.182236

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	EB Hayden Run Rd Eastbound					WB Hayden Run Rd Westbound					NB Cosgray Rd Northbound					SB Cosgray Rd Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-04-19 7:15AM	15	43	8	0	<b>66</b>	24	19	41	0	<b>84</b>	4	79	24	0	<b>107</b>	36	32	4	0	<b>72</b>	<b>329</b>
7:30AM	11	49	8	0	<b>68</b>	24	15	44	0	<b>83</b>	2	74	55	0	<b>131</b>	42	20	1	0	<b>63</b>	<b>345</b>
7:45AM	14	39	0	0	<b>53</b>	29	32	44	0	<b>105</b>	4	89	12	0	<b>105</b>	26	38	1	0	<b>65</b>	<b>328</b>
8:00AM	11	39	4	0	<b>54</b>	31	24	25	0	<b>80</b>	1	62	48	0	<b>111</b>	22	22	6	0	<b>50</b>	<b>295</b>
<b>Total</b>	51	170	20	0	<b>241</b>	108	90	154	0	<b>352</b>	11	304	139	0	<b>454</b>	126	112	12	0	<b>250</b>	<b>1297</b>
<b>% Approach</b>	21.2%	70.5%	8.3%	0%	-	30.7%	25.6%	43.8%	0%	-	2.4%	67.0%	30.6%	0%	-	50.4%	44.8%	4.8%	0%	-	-
<b>% Total</b>	3.9%	13.1%	1.5%	0%	<b>18.6%</b>	8.3%	6.9%	11.9%	0%	<b>27.1%</b>	0.8%	23.4%	10.7%	0%	<b>35.0%</b>	9.7%	8.6%	0.9%	0%	<b>19.3%</b>	-
<b>PHF</b>	0.850	0.867	0.625	-	<b>0.886</b>	0.871	0.703	0.875	-	<b>0.838</b>	0.688	0.854	0.632	-	<b>0.866</b>	0.750	0.737	0.500	-	<b>0.868</b>	0.940
<b>Lights and Motorcycles</b>	48	170	19	0	<b>237</b>	104	82	143	0	<b>329</b>	11	299	138	0	<b>448</b>	115	109	10	0	<b>234</b>	1248
<b>% Lights and Motorcycles</b>	94.1%	100%	95.0%	0%	<b>98.3%</b>	96.3%	91.1%	92.9%	0%	<b>93.5%</b>	100%	98.4%	99.3%	0%	<b>98.7%</b>	91.3%	97.3%	83.3%	0%	<b>93.6%</b>	96.2%
<b>Heavy</b>	3	0	1	0	<b>4</b>	4	8	11	0	<b>23</b>	0	5	1	0	<b>6</b>	11	3	2	0	<b>16</b>	49
<b>% Heavy</b>	5.9%	0%	5.0%	0%	<b>1.7%</b>	3.7%	8.9%	7.1%	0%	<b>6.5%</b>	0%	1.6%	0.7%	0%	<b>1.3%</b>	8.7%	2.7%	16.7%	0%	<b>6.4%</b>	3.8%

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

02\_Cosgray Rd and Hayden Run Rd - TMC

Wed Apr 19, 2023

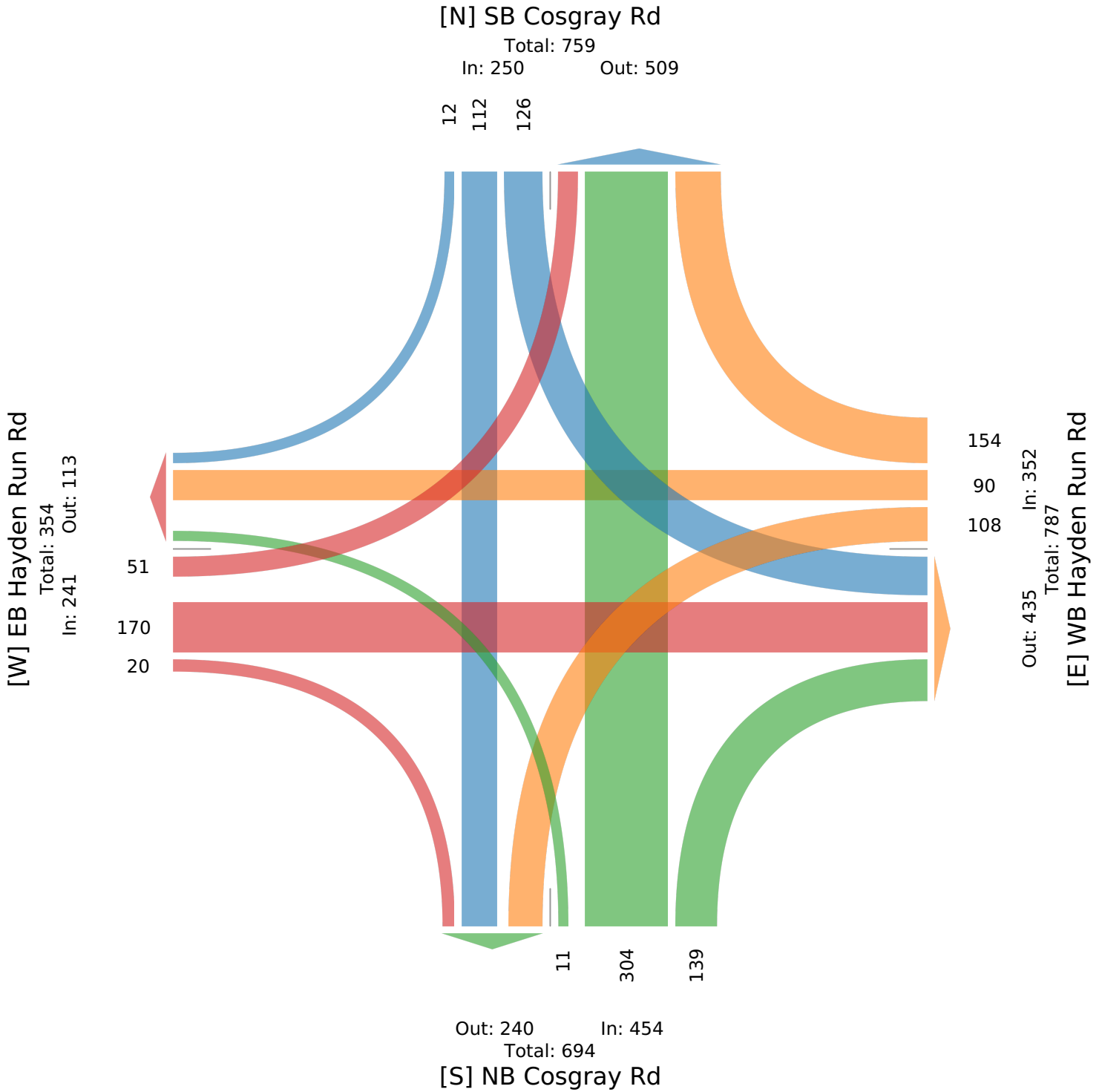
AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057421, Location: 40.060159, -83.182236

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US



**02\_Cosgray Rd and Hayden Run Rd - TMC**

Wed Apr 19, 2023

Midday Peak (12 PM - 1 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057421, Location: 40.060159, -83.182236

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	EB Hayden Run Rd Eastbound					WB Hayden Run Rd Westbound					NB Cosgray Rd Northbound					SB Cosgray Rd Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-04-19 12:00PM	7	23	5	0	<b>35</b>	21	21	35	0	<b>77</b>	1	48	27	0	<b>76</b>	35	33	2	1	<b>71</b>	<b>259</b>
12:15PM	17	18	3	0	<b>38</b>	30	26	27	0	<b>83</b>	4	50	28	0	<b>82</b>	29	35	6	0	<b>70</b>	<b>273</b>
12:30PM	5	23	3	0	<b>31</b>	36	25	29	0	<b>90</b>	2	36	30	0	<b>68</b>	35	34	3	0	<b>72</b>	<b>261</b>
12:45PM	3	23	7	0	<b>33</b>	32	19	40	0	<b>91</b>	4	46	30	0	<b>80</b>	29	31	1	0	<b>61</b>	<b>265</b>
<b>Total</b>	<b>32</b>	<b>87</b>	<b>18</b>	<b>0</b>	<b>137</b>	<b>119</b>	<b>91</b>	<b>131</b>	<b>0</b>	<b>341</b>	<b>11</b>	<b>180</b>	<b>115</b>	<b>0</b>	<b>306</b>	<b>128</b>	<b>133</b>	<b>12</b>	<b>1</b>	<b>274</b>	<b>1058</b>
<b>% Approach</b>	23.4%	63.5%	13.1%	0%	-	34.9%	26.7%	38.4%	0%	-	3.6%	58.8%	37.6%	0%	-	46.7%	48.5%	4.4%	0.4%	-	-
<b>% Total</b>	3.0%	8.2%	1.7%	0%	<b>12.9%</b>	11.2%	8.6%	12.4%	0%	<b>32.2%</b>	1.0%	17.0%	10.9%	0%	<b>28.9%</b>	12.1%	12.6%	1.1%	0.1%	<b>25.9%</b>	-
<b>PHF</b>	0.471	0.946	0.643	-	<b>0.901</b>	0.826	0.875	0.819	-	<b>0.937</b>	0.688	0.900	0.958	-	<b>0.933</b>	0.914	0.950	0.500	0.250	<b>0.951</b>	0.969
<b>Lights and Motorcycles</b>	30	85	16	0	<b>131</b>	118	89	119	0	<b>326</b>	10	173	113	0	<b>296</b>	126	130	11	1	<b>268</b>	1021
<b>% Lights and Motorcycles</b>	93.8%	97.7%	88.9%	0%	<b>95.6%</b>	99.2%	97.8%	90.8%	0%	<b>95.6%</b>	90.9%	96.1%	98.3%	0%	<b>96.7%</b>	98.4%	97.7%	91.7%	100%	<b>97.8%</b>	96.5%
<b>Heavy</b>	2	2	2	0	<b>6</b>	1	2	12	0	<b>15</b>	1	7	2	0	<b>10</b>	2	3	1	0	<b>6</b>	37
<b>% Heavy</b>	6.3%	2.3%	11.1%	0%	<b>4.4%</b>	0.8%	2.2%	9.2%	0%	<b>4.4%</b>	9.1%	3.9%	1.7%	0%	<b>3.3%</b>	1.6%	2.3%	8.3%	0%	<b>2.2%</b>	3.5%

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

02\_Cosgray Rd and Hayden Run Rd - TMC

Wed Apr 19, 2023

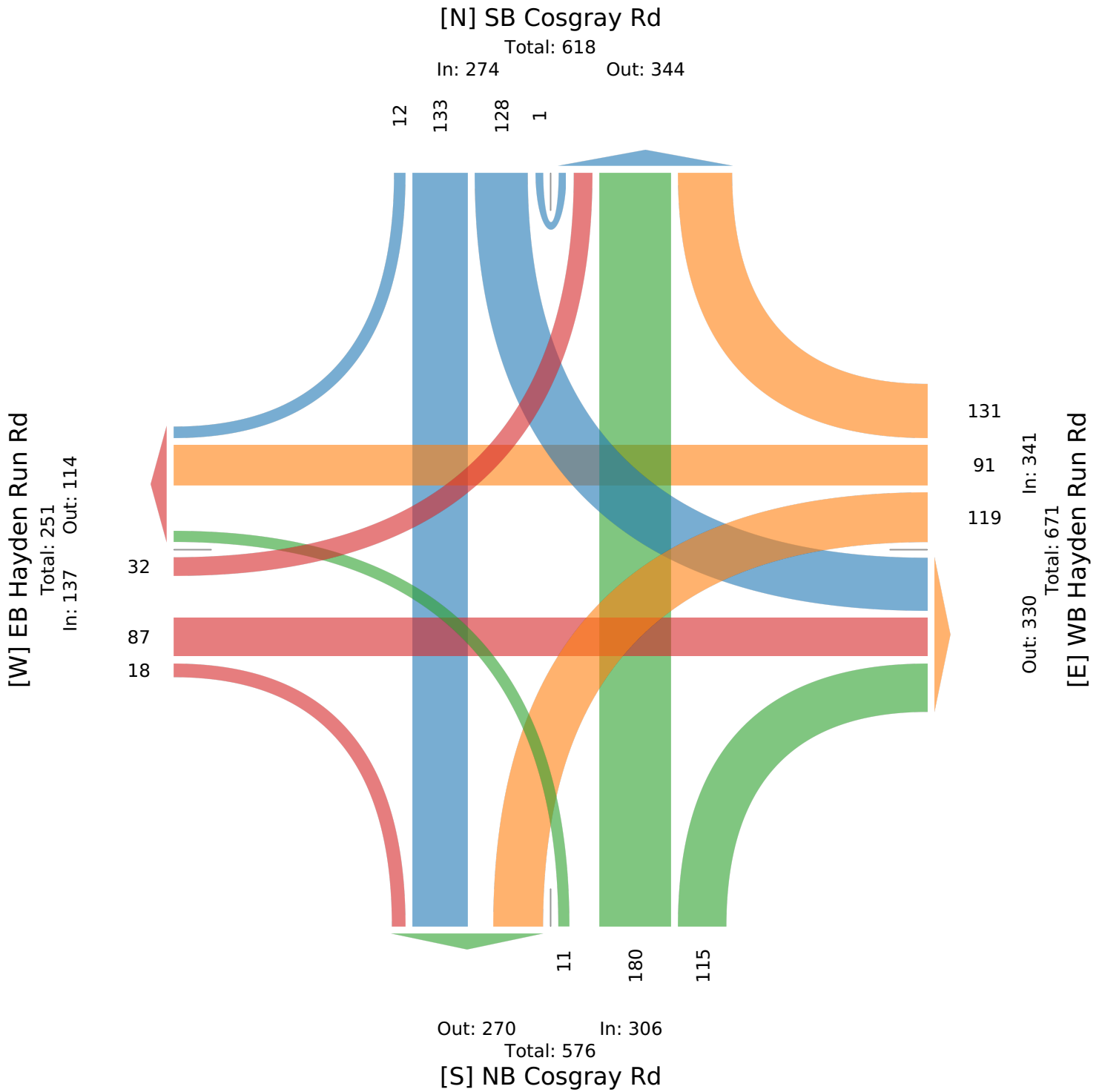
Midday Peak (12 PM - 1 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057421, Location: 40.060159, -83.182236

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US



**02\_Cosgray Rd and Hayden Run Rd - TMC**

Wed Apr 19, 2023

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057421, Location: 40.060159, -83.182236

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	EB Hayden Run Rd Eastbound					WB Hayden Run Rd Westbound					NB Cosgray Rd Northbound					SB Cosgray Rd Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2023-04-19 4:45PM	7	41	3	0	<b>51</b>	78	63	51	0	<b>192</b>	5	75	35	0	<b>115</b>	51	77	13	0	<b>141</b>	<b>499</b>
5:00PM	8	47	11	0	<b>66</b>	80	54	61	0	<b>195</b>	4	62	40	0	<b>106</b>	64	84	10	0	<b>158</b>	<b>525</b>
5:15PM	21	30	6	0	<b>57</b>	96	56	52	0	<b>204</b>	11	83	31	0	<b>125</b>	58	75	8	0	<b>141</b>	<b>527</b>
5:30PM	11	35	12	0	<b>58</b>	90	69	69	0	<b>228</b>	7	80	36	0	<b>123</b>	60	88	5	1	<b>154</b>	<b>563</b>
<b>Total</b>	47	153	32	0	<b>232</b>	344	242	233	0	<b>819</b>	27	300	142	0	<b>469</b>	233	324	36	1	<b>594</b>	<b>2114</b>
<b>% Approach</b>	20.3%	65.9%	13.8%	0%	-	42.0%	29.5%	28.4%	0%	-	5.8%	64.0%	30.3%	0%	-	39.2%	54.5%	6.1%	0.2%	-	-
<b>% Total</b>	2.2%	7.2%	1.5%	0%	<b>11.0%</b>	16.3%	11.4%	11.0%	0%	<b>38.7%</b>	1.3%	14.2%	6.7%	0%	<b>22.2%</b>	11.0%	15.3%	1.7%	0%	<b>28.1%</b>	-
<b>PHF</b>	0.560	0.814	0.667	-	<b>0.879</b>	0.896	0.877	0.844	-	<b>0.898</b>	0.614	0.904	0.888	-	<b>0.938</b>	0.910	0.920	0.692	0.250	<b>0.940</b>	0.939
<b>Lights and Motorcycles</b>	47	149	31	0	<b>227</b>	342	242	232	0	<b>816</b>	27	299	141	0	<b>467</b>	231	322	35	1	<b>589</b>	2099
<b>% Lights and Motorcycles</b>	100%	97.4%	96.9%	0%	<b>97.8%</b>	99.4%	100%	99.6%	0%	<b>99.6%</b>	100%	99.7%	99.3%	0%	<b>99.6%</b>	99.1%	99.4%	97.2%	100%	<b>99.2%</b>	99.3%
<b>Heavy</b>	0	4	1	0	<b>5</b>	2	0	1	0	<b>3</b>	0	1	1	0	<b>2</b>	2	2	1	0	<b>5</b>	15
<b>% Heavy</b>	0%	2.6%	3.1%	0%	<b>2.2%</b>	0.6%	0%	0.4%	0%	<b>0.4%</b>	0%	0.3%	0.7%	0%	<b>0.4%</b>	0.9%	0.6%	2.8%	0%	<b>0.8%</b>	0.7%

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

02\_Cosgray Rd and Hayden Run Rd - TMC

Wed Apr 19, 2023

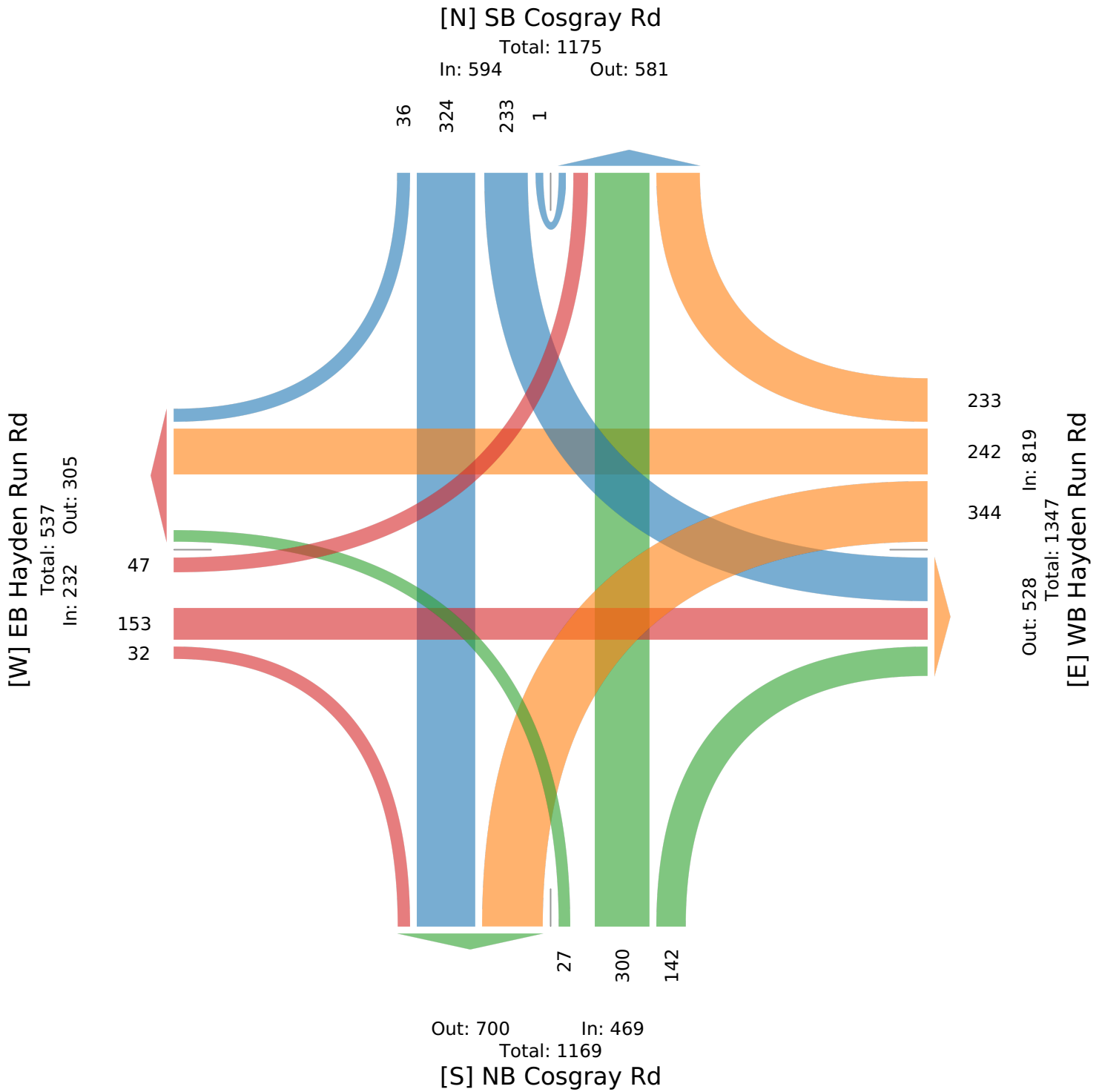
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1057421, Location: 40.060159, -83.182236

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US





01\_Cosgray Rd and Hayden Farms Rd - TMC

Wed Apr 26, 2023

Full Length (12 AM-12 AM (+1))

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1061266, Location: 40.065877, -83.183091

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	WB Hayden Farms Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
2023-04-26 12:00AM	0	0	0	0	3	0	0	3	0	1	0	1	4
12:15AM	0	0	0	0	2	0	0	2	0	3	0	3	5
12:30AM	0	0	0	0	0	0	0	0	0	5	0	5	5
12:45AM	0	0	0	0	0	0	0	0	0	2	0	2	2
Hourly Total	0	0	0	0	5	0	0	5	0	11	0	11	16
1:00AM	0	0	0	0	0	0	0	0	0	1	0	1	1
1:15AM	0	0	0	0	1	0	0	1	0	1	0	1	2
1:30AM	0	0	0	0	3	0	0	3	0	0	0	0	3
1:45AM	0	0	0	0	1	0	0	1	0	0	0	0	1
Hourly Total	0	0	0	0	5	0	0	5	0	2	0	2	7
2:00AM	0	0	0	0	7	0	0	7	0	2	0	2	9
2:15AM	0	0	0	0	3	0	0	3	0	3	0	3	6
2:30AM	0	0	0	0	1	0	0	1	0	2	0	2	3
2:45AM	0	0	0	0	0	0	0	0	0	4	0	4	4
Hourly Total	0	0	0	0	11	0	0	11	0	11	0	11	22
3:00AM	0	0	0	0	1	0	0	1	0	2	0	2	3
3:15AM	0	0	0	0	1	0	0	1	0	5	0	5	6
3:30AM	1	0	0	1	4	0	0	4	0	0	0	0	5
3:45AM	0	0	0	0	1	0	0	1	0	2	0	2	3
Hourly Total	1	0	0	1	7	0	0	7	0	9	0	9	17
4:00AM	0	0	0	0	1	0	0	1	0	3	0	3	4
4:15AM	0	0	0	0	4	0	0	4	0	2	0	2	6
4:30AM	0	0	0	0	9	0	0	9	0	2	0	2	11
4:45AM	0	0	0	0	16	0	0	16	0	1	0	1	17
Hourly Total	0	0	0	0	30	0	0	30	0	8	0	8	38
5:00AM	0	0	0	0	15	0	0	15	0	4	0	4	19
5:15AM	0	0	0	0	9	0	0	9	0	6	0	6	15
5:30AM	1	0	0	1	40	0	0	40	0	10	0	10	51
5:45AM	0	0	0	0	28	0	0	28	0	9	0	9	37
Hourly Total	1	0	0	1	92	0	0	92	0	29	0	29	122
6:00AM	2	0	0	2	45	0	0	45	0	23	0	23	70
6:15AM	0	0	0	0	47	0	0	47	0	26	0	26	73
6:30AM	1	0	0	1	60	2	0	62	0	33	0	33	96
6:45AM	3	0	0	3	97	0	0	97	0	47	0	47	147
Hourly Total	6	0	0	6	249	2	0	251	0	129	0	129	386
7:00AM	0	0	0	0	91	0	0	91	0	48	0	48	139
7:15AM	1	0	0	1	147	1	0	148	0	84	0	84	233
7:30AM	0	0	0	0	122	0	0	122	0	80	0	80	202
7:45AM	0	1	0	1	147	0	0	147	0	65	0	65	213
Hourly Total	1	1	0	2	507	1	0	508	0	277	0	277	787
8:00AM	0	0	0	0	106	1	0	107	1	74	1	76	183
8:15AM	0	0	0	0	92	1	0	93	0	69	1	70	163
8:30AM	1	0	0	1	102	1	0	103	0	53	0	53	157
8:45AM	0	0	0	0	99	4	1	104	0	60	0	60	164
Hourly Total	1	0	0	1	399	7	1	407	1	256	2	259	667
9:00AM	2	1	0	3	65	1	1	67	0	71	0	71	141
9:15AM	1	0	0	1	78	1	0	79	0	45	0	45	125
9:30AM	0	2	0	2	53	1	0	54	1	62	0	63	119
9:45AM	0	1	0	1	76	2	0	78	0	54	0	54	133
Hourly Total	3	4	0	7	272	5	1	278	1	232	0	233	518
10:00AM	2	0	0	2	61	0	0	61	0	45	0	45	108
10:15AM	1	0	0	1	48	0	0	48	0	53	0	53	102
10:30AM	3	1	0	4	56	2	1	59	1	57	0	58	121
10:45AM	0	0	0	0	67	1	0	68	0	47	0	47	115

Leg Direction	WB Hayden Farms Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
Hourly Total	6	1	0	7	232	3	1	236	1	202	0	203	446
11:00AM	2	0	0	2	60	0	0	60	0	64	1	65	127
11:15AM	0	0	0	0	56	0	0	56	0	53	0	53	109
11:30AM	0	0	0	0	75	0	1	76	0	76	0	76	152
11:45AM	2	0	0	2	102	3	0	105	3	79	0	82	189
Hourly Total	4	0	0	4	293	3	1	297	3	272	1	276	577
12:00PM	1	1	0	2	76	0	0	76	2	67	0	69	147
12:15PM	0	0	0	0	79	1	0	80	3	85	0	88	168
12:30PM	3	0	0	3	74	3	1	78	1	61	0	62	143
12:45PM	0	1	0	1	74	0	2	76	1	83	0	84	161
Hourly Total	4	2	0	6	303	4	3	310	7	296	0	303	619
1:00PM	0	0	0	0	76	1	1	78	0	63	0	63	141
1:15PM	4	0	0	4	82	2	0	84	1	70	2	73	161
1:30PM	0	0	0	0	64	1	0	65	0	67	0	67	132
1:45PM	0	0	0	0	58	0	1	59	0	62	0	62	121
Hourly Total	4	0	0	4	280	4	2	286	1	262	2	265	555
2:00PM	2	0	0	2	63	1	0	64	0	77	0	77	143
2:15PM	0	0	0	0	81	1	0	82	0	60	0	60	142
2:30PM	1	1	0	2	76	0	0	76	1	75	0	76	154
2:45PM	2	0	0	2	92	4	2	98	1	93	0	94	194
Hourly Total	5	1	0	6	312	6	2	320	2	305	0	307	633
3:00PM	0	0	0	0	103	0	0	103	0	103	0	103	206
3:15PM	0	1	0	1	93	0	0	93	3	120	0	123	217
3:30PM	1	0	0	1	96	2	1	99	0	148	0	148	248
3:45PM	1	0	0	1	112	3	0	115	0	145	0	145	261
Hourly Total	2	1	0	3	404	5	1	410	3	516	0	519	932
4:00PM	1	1	0	2	120	0	1	121	0	136	0	136	259
4:15PM	1	0	0	1	132	3	0	135	0	137	1	138	274
4:30PM	0	1	0	1	115	5	0	120	1	194	0	195	316
4:45PM	0	0	0	0	146	0	1	147	1	156	0	157	304
Hourly Total	2	2	0	4	513	8	2	523	2	623	1	626	1153
5:00PM	1	0	0	1	129	1	0	130	0	173	0	173	304
5:15PM	1	0	0	1	191	2	0	193	0	173	0	173	367
5:30PM	1	0	0	1	161	0	0	161	0	165	0	165	327
5:45PM	1	0	0	1	179	2	0	181	2	135	0	137	319
Hourly Total	4	0	0	4	660	5	0	665	2	646	0	648	1317
6:00PM	1	1	0	2	121	0	0	121	1	136	0	137	260
6:15PM	1	0	0	1	113	1	1	115	1	119	0	120	236
6:30PM	2	0	0	2	101	1	1	103	0	90	0	90	195
6:45PM	1	0	0	1	115	1	0	116	1	107	0	108	225
Hourly Total	5	1	0	6	450	3	2	455	3	452	0	455	916
7:00PM	1	0	0	1	90	5	0	95	0	130	0	130	226
7:15PM	2	0	0	2	83	0	1	84	0	124	0	124	210
7:30PM	0	2	0	2	60	3	1	64	0	111	0	111	177
7:45PM	1	0	0	1	87	2	0	89	0	103	0	103	193
Hourly Total	4	2	0	6	320	10	2	332	0	468	0	468	806
8:00PM	2	0	0	2	88	0	0	88	0	91	0	91	181
8:15PM	0	0	0	0	43	1	0	44	0	89	0	89	133
8:30PM	0	0	0	0	48	2	0	50	1	82	0	83	133
8:45PM	0	0	0	0	31	1	0	32	0	61	0	61	93
Hourly Total	2	0	0	2	210	4	0	214	1	323	0	324	540
9:00PM	3	0	0	3	29	0	0	29	0	45	0	45	77
9:15PM	1	0	0	1	23	1	0	24	0	37	0	37	62
9:30PM	1	0	0	1	17	0	0	17	0	31	0	31	49
9:45PM	0	0	0	0	18	1	1	20	0	21	0	21	41
Hourly Total	5	0	0	5	87	2	1	90	0	134	0	134	229
10:00PM	0	0	0	0	14	2	0	16	0	19	0	19	35
10:15PM	0	0	0	0	6	0	0	6	0	14	0	14	20
10:30PM	0	0	0	0	14	0	0	14	0	22	0	22	36
10:45PM	0	0	0	0	6	0	0	6	0	8	0	8	14

Leg Direction	WB Hayden Farms Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
Hourly Total	0	0	0	0	40	2	0	42	0	63	0	63	105
11:00PM	0	0	0	0	2	0	0	2	0	13	0	13	15
11:15PM	0	0	0	0	6	0	0	6	0	10	0	10	16
11:30PM	0	0	0	0	5	0	0	5	0	6	0	6	11
11:45PM	0	0	0	0	5	0	0	5	0	5	0	5	10
Hourly Total	0	0	0	0	18	0	0	18	0	34	0	34	52
<b>Total</b>	60	15	0	75	5699	74	19	5792	27	5560	6	5593	11460
<b>% Approach</b>	80.0%	20.0%	0%	-	98.4%	1.3%	0.3%	-	0.5%	99.4%	0.1%	-	-
<b>% Total</b>	0.5%	0.1%	0%	<b>0.7%</b>	49.7%	0.6%	0.2%	<b>50.5%</b>	0.2%	48.5%	0.1%	<b>48.8%</b>	-
<b>Lights and Motorcycles</b>	54	14	0	<b>68</b>	5528	70	15	<b>5613</b>	26	5401	5	<b>5432</b>	11113
<b>% Lights and Motorcycles</b>	90.0%	93.3%	0%	<b>90.7%</b>	97.0%	94.6%	78.9%	<b>96.9%</b>	96.3%	97.1%	83.3%	<b>97.1%</b>	97.0%
<b>Heavy</b>	6	1	0	7	171	4	4	<b>179</b>	1	159	1	<b>161</b>	347
<b>% Heavy</b>	10.0%	6.7%	0%	<b>9.3%</b>	3.0%	5.4%	21.1%	<b>3.1%</b>	3.7%	2.9%	16.7%	<b>2.9%</b>	3.0%

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

01\_Cosgray Rd and Hayden Farms Rd - TMC

Wed Apr 26, 2023

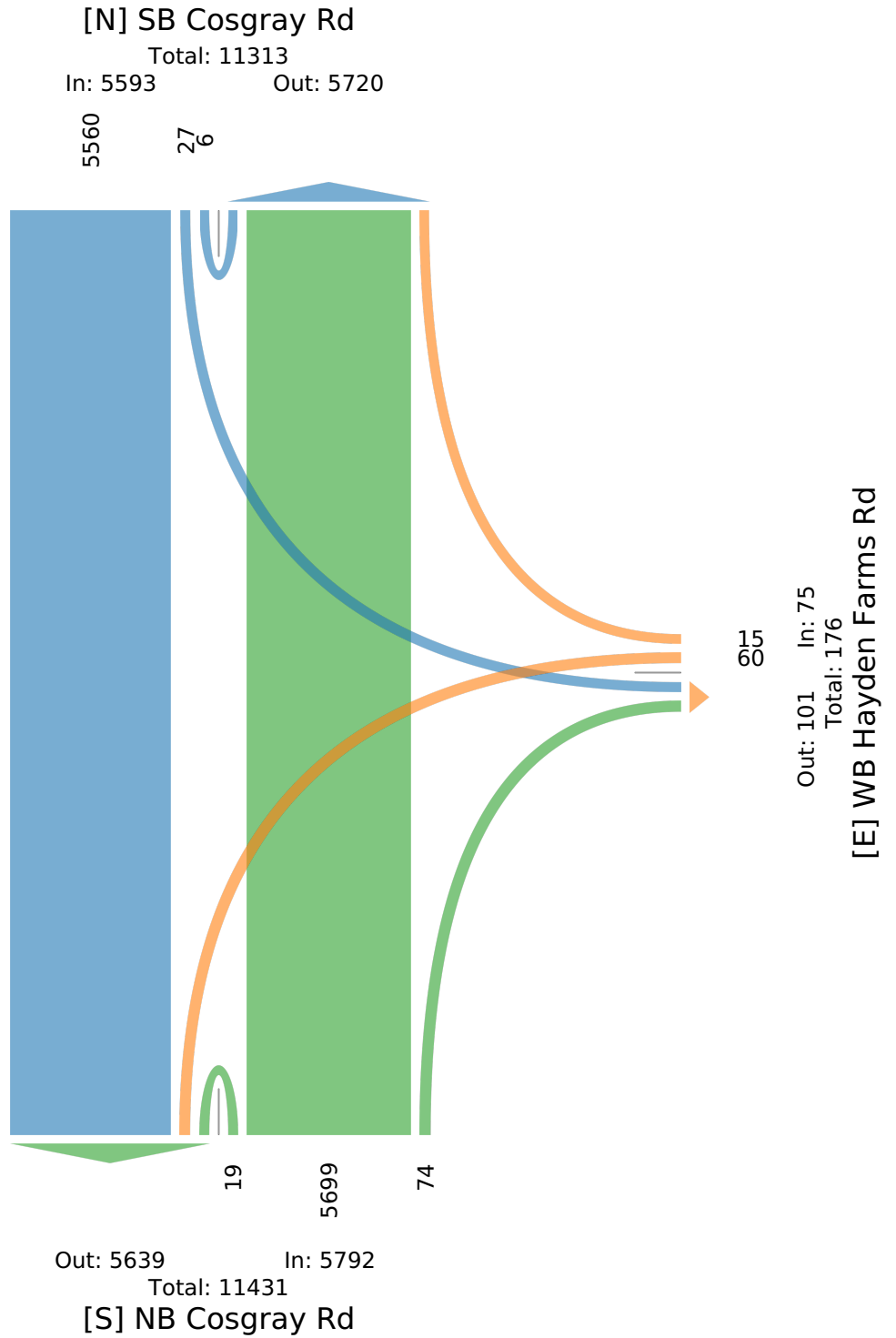
Full Length (12 AM-12 AM (+1))

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1061266, Location: 40.065877, -83.183091

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US



01\_Cosgray Rd and Hayden Farms Rd - TMC

Wed Apr 26, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1061266, Location: 40.065877, -83.183091

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	WB Hayden Farms Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
2023-04-26 7:15AM	1	0	0	1	147	1	0	148	0	84	0	84	233
7:30AM	0	0	0	0	122	0	0	122	0	80	0	80	202
7:45AM	0	1	0	1	147	0	0	147	0	65	0	65	213
8:00AM	0	0	0	0	106	1	0	107	1	74	1	76	183
<b>Total</b>	1	1	0	2	522	2	0	524	1	303	1	305	831
<b>% Approach</b>	50.0%	50.0%	0%	-	99.6%	0.4%	0%	-	0.3%	99.3%	0.3%	-	-
<b>% Total</b>	0.1%	0.1%	0%	0.2%	62.8%	0.2%	0%	63.1%	0.1%	36.5%	0.1%	36.7%	-
<b>PHF</b>	0.250	0.250	-	0.500	0.888	0.500	-	0.885	0.250	0.902	0.250	0.908	0.892
<b>Lights and Motorcycles</b>	1	1	0	2	508	2	0	510	1	287	1	289	801
<b>% Lights and Motorcycles</b>	100%	100%	0%	100%	97.3%	100%	0%	97.3%	100%	94.7%	100%	94.8%	96.4%
<b>Heavy</b>	0	0	0	0	14	0	0	14	0	16	0	16	30
<b>% Heavy</b>	0%	0%	0%	0%	2.7%	0%	0%	2.7%	0%	5.3%	0%	5.2%	3.6%

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

01\_Cosgray Rd and Hayden Farms Rd - TMC

Wed Apr 26, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1061266, Location: 40.065877, -83.183091

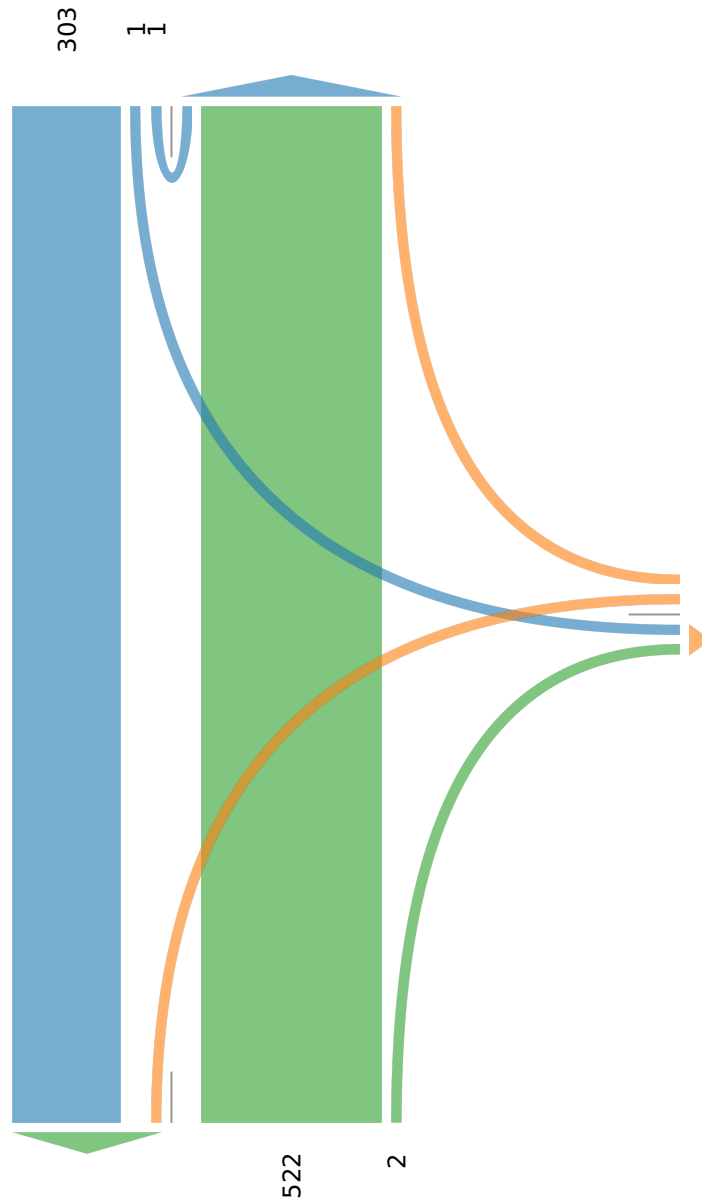
Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

[N] SB Cosgray Rd

Total: 829

In: 305

Out: 524



Out: 3 In: 2

Total: 5

[E] WB Hayden Farms Rd

Out: 304 In: 524  
Total: 828  
[S] NB Cosgray Rd

01\_Cosgray Rd and Hayden Farms Rd - TMC

Wed Apr 26, 2023

Midday Peak (11:30 AM - 12:30 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1061266, Location: 40.065877, -83.183091

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	WB Hayden Farms Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
2023-04-26 11:30AM	0	0	0	0	75	0	1	76	0	76	0	76	152
11:45AM	2	0	0	2	102	3	0	105	3	79	0	82	189
12:00PM	1	1	0	2	76	0	0	76	2	67	0	69	147
12:15PM	0	0	0	0	79	1	0	80	3	85	0	88	168
<b>Total</b>	3	1	0	4	332	4	1	337	8	307	0	315	656
<b>% Approach</b>	75.0%	25.0%	0%	-	98.5%	1.2%	0.3%	-	2.5%	97.5%	0%	-	-
<b>% Total</b>	0.5%	0.2%	0%	0.6%	50.6%	0.6%	0.2%	51.4%	1.2%	46.8%	0%	48.0%	-
<b>PHF</b>	0.375	0.250	-	0.500	0.814	0.333	0.250	0.802	0.667	0.903	-	0.895	0.868
<b>Lights and Motorcycles</b>	2	1	0	3	320	4	1	325	8	290	0	298	626
<b>% Lights and Motorcycles</b>	66.7%	100%	0%	75.0%	96.4%	100%	100%	96.4%	100%	94.5%	0%	94.6%	95.4%
<b>Heavy</b>	1	0	0	1	12	0	0	12	0	17	0	17	30
<b>% Heavy</b>	33.3%	0%	0%	25.0%	3.6%	0%	0%	3.6%	0%	5.5%	0%	5.4%	4.6%

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

01\_Cosgray Rd and Hayden Farms Rd - TMC

Wed Apr 26, 2023

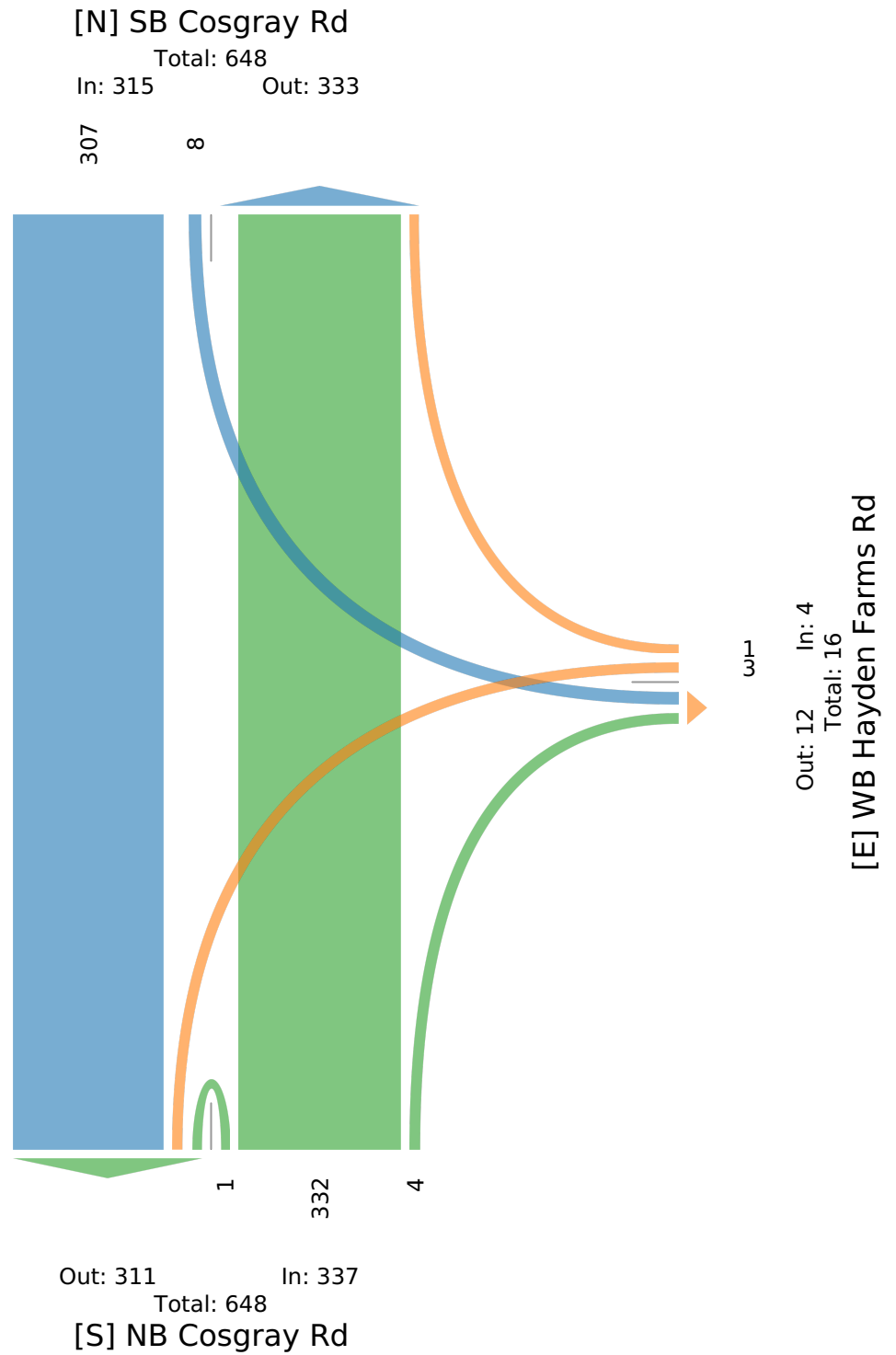
Midday Peak (11:30 AM - 12:30 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1061266, Location: 40.065877, -83.183091

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US





01\_Cosgray Rd and Hayden Farms Rd - TMC

Wed Apr 26, 2023

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1061266, Location: 40.065877, -83.183091

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US

Leg Direction	WB Hayden Farms Rd Westbound				NB Cosgray Rd Northbound				SB Cosgray Rd Southbound				
Time	L	R	U	App	T	R	U	App	L	T	U	App	Int
2023-04-26 5:00PM	1	0	0	1	129	1	0	130	0	173	0	173	304
5:15PM	1	0	0	1	191	2	0	193	0	173	0	173	367
5:30PM	1	0	0	1	161	0	0	161	0	165	0	165	327
5:45PM	1	0	0	1	179	2	0	181	2	135	0	137	319
<b>Total</b>	4	0	0	4	660	5	0	665	2	646	0	648	1317
<b>% Approach</b>	100%	0%	0%	-	99.2%	0.8%	0%	-	0.3%	99.7%	0%	-	-
<b>% Total</b>	0.3%	0%	0%	0.3%	50.1%	0.4%	0%	50.5%	0.2%	49.1%	0%	49.2%	-
<b>PHF</b>	1.000	-	-	1.000	0.864	0.625	-	0.861	0.250	0.934	-	0.936	0.897
<b>Lights and Motorcycles</b>	4	0	0	4	654	5	0	659	2	644	0	646	1309
<b>% Lights and Motorcycles</b>	100%	0%	0%	100%	99.1%	100%	0%	99.1%	100%	99.7%	0%	99.7%	99.4%
<b>Heavy</b>	0	0	0	0	6	0	0	6	0	2	0	2	8
<b>% Heavy</b>	0%	0%	0%	0%	0.9%	0%	0%	0.9%	0%	0.3%	0%	0.3%	0.6%

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

01\_Cosgray Rd and Hayden Farms Rd - TMC

Wed Apr 26, 2023

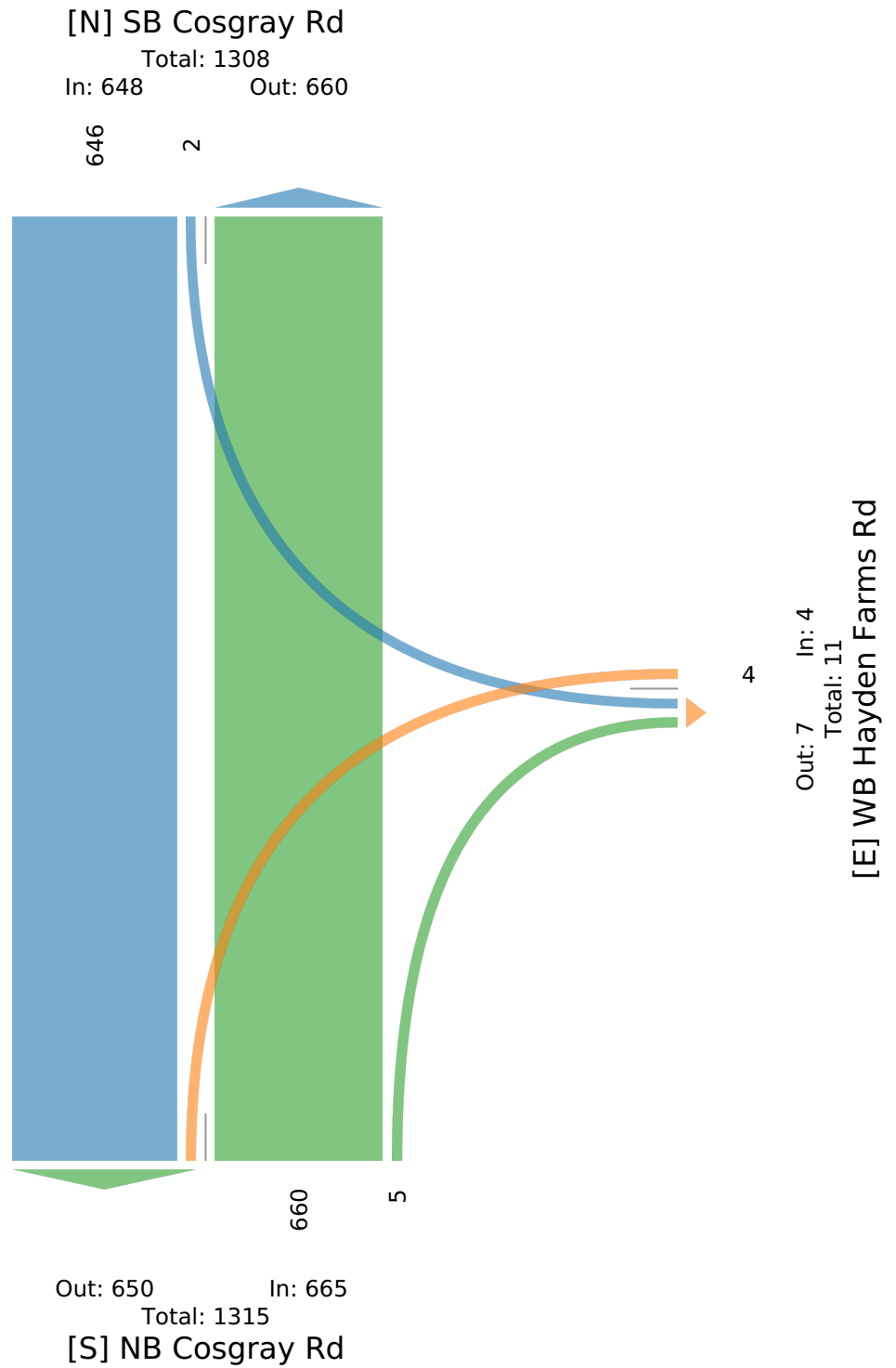
PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1061266, Location: 40.065877, -83.183091

Provided by: Kimley-Horn and Associates, Inc.  
767 Eustis Street, Suite 100, Saint Paul, MN, 55114, US



APPENDIX

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**D.**

## MORPC Traffic Count Data

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Peak Hour Data for Intersection

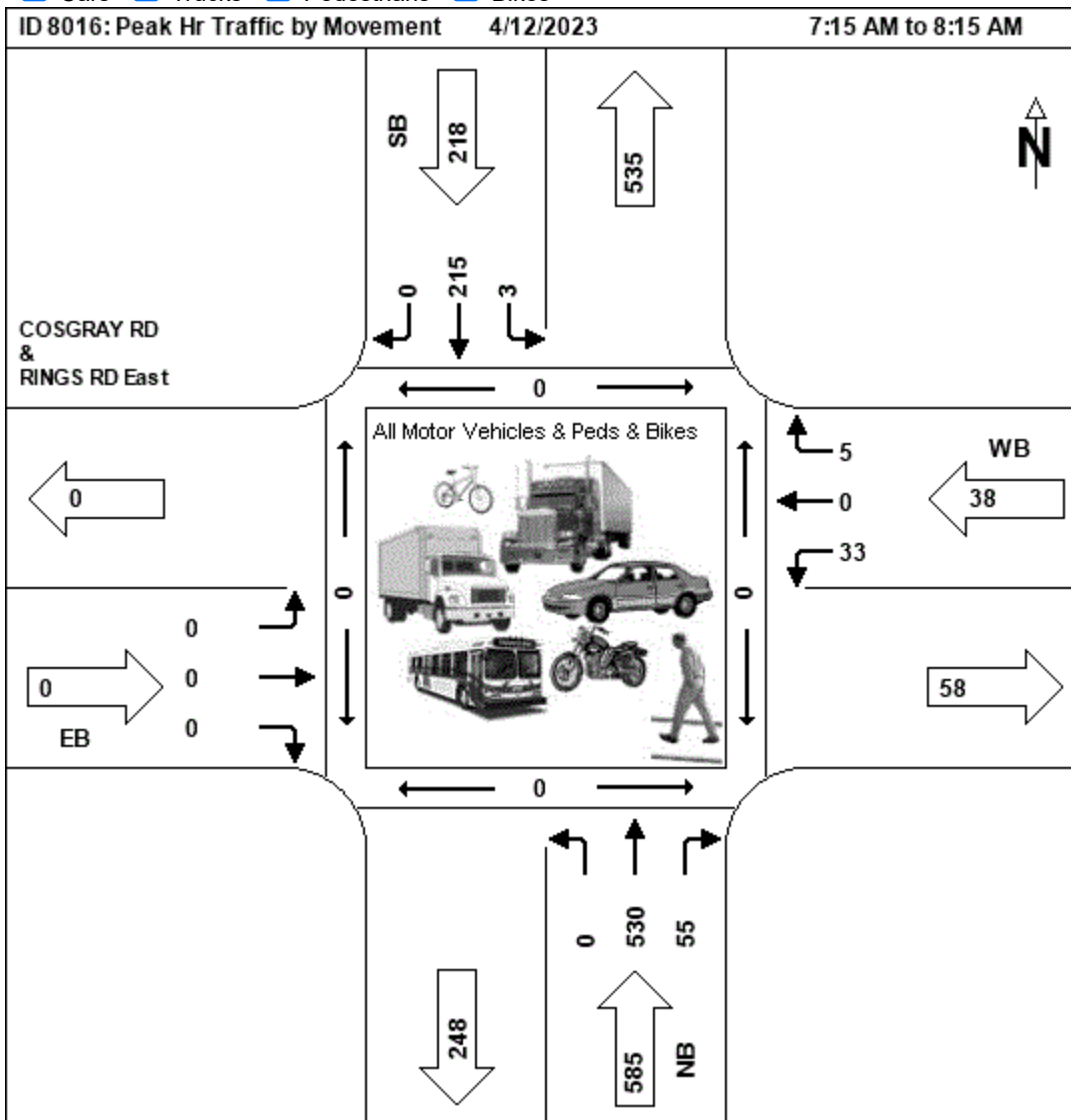
Int ID: 8016  
 Community: FRANKLIN  
 Road 1: COSGRAY RD  
 Road 2: RINGS RD East

Corridor:  
 Road 3:  
 Road 4:

AM Peak Hour  
 04/12/2023

Start Time	NB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
7:15 AM	0	129	13	0	142	0	45	0	0	45	7	0	1	0	8	195
7:30 AM	0	130	10	0	140	0	53	0	0	53	5	0	2	0	7	200
7:45 AM	0	165	20	0	185	1	55	0	0	56	13	0	1	0	14	255
8:00 AM	0	106	12	0	118	2	62	0	0	64	8	0	1	0	9	191
Total	0	530	55	0	585	3	215	0	0	218	33	0	5	0	38	841
PHF		0.80	0.69		0.79	0.38	0.87			0.85	0.63		0.63		0.68	
HV %		0	0		0	0				0			0			

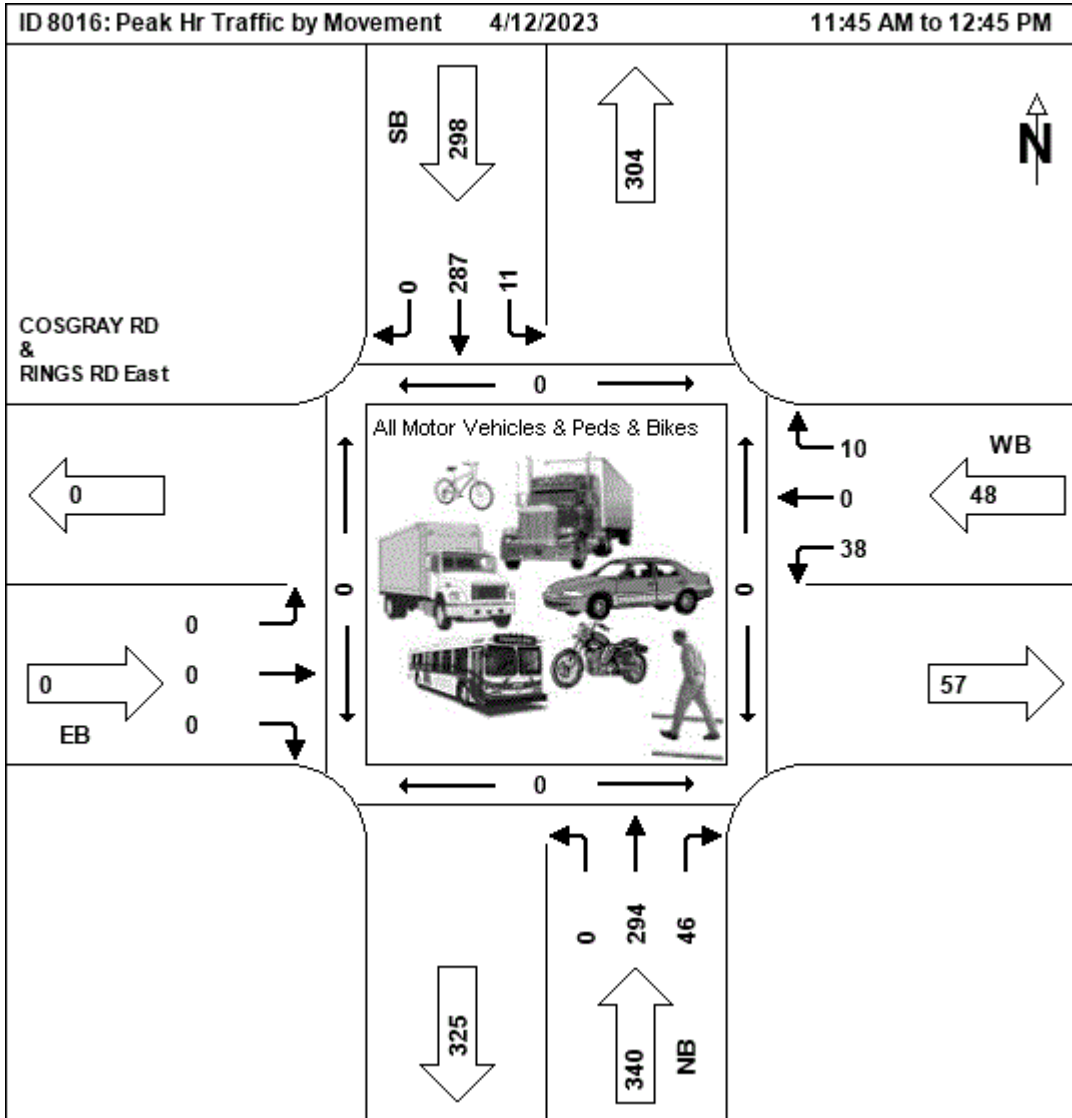
- Cars
- Trucks
- Pedestrians
- Bikes



**Midday Peak Hour  
04/12/2023**

Start Time	NB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
11:45 AM	0	65	11	0	76	3	70	0	0	73	6	0	4	0	10	159
12:00 PM	0	62	15	0	77	3	65	0	0	68	12	0	2	0	14	159
12:15 PM	0	79	12	0	91	3	69	0	0	72	9	0	1	0	10	173
12:30 PM	0	88	8	0	96	2	83	0	0	85	11	0	3	0	14	195
<b>Total</b>	0	294	46	0	340	11	287	0	0	298	38	0	10	0	48	686
PHF		0.84	0.77		0.89	0.92	0.86			0.88	0.79		0.63		0.86	
HV %		0	0		0	0				0	0		0			

Cars    Trucks    Pedestrians    Bikes



**PM Peak Hour  
04/12/2023**

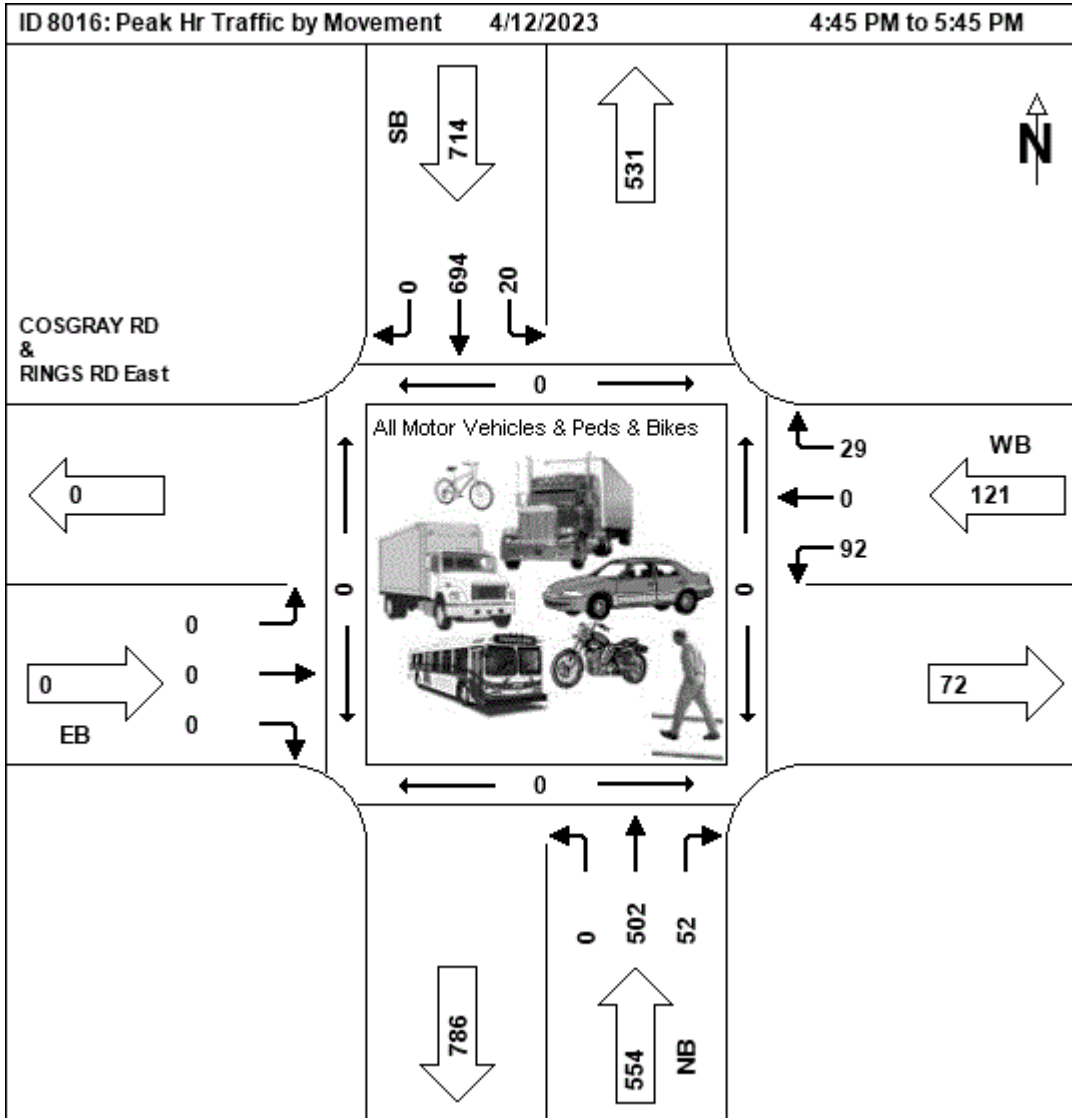
**NB**

**SB**

**WB**

Start Time	NB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
4:45 PM	0	111	13	0	124	4	182	0	0	186	26	0	1	0	27	337
5:00 PM	0	116	11	0	127	5	178	0	0	183	25	0	4	0	29	339
5:15 PM	0	145	17	0	162	7	170	0	0	177	22	0	15	0	37	376
5:30 PM	0	130	11	0	141	4	164	0	0	168	19	0	9	0	28	337
<b>Total</b>	0	502	52	0	554	20	694	0	0	714	92	0	29	0	121	1389
PHF		0.87	0.76		0.85	0.71	0.95		0.96	0.88		0.48		0.82		
HV %		0	0		0	0			0	0		0				

- Cars  
  Trucks  
  Pedestrians  
  Bikes



Peak Hour Data for Intersection

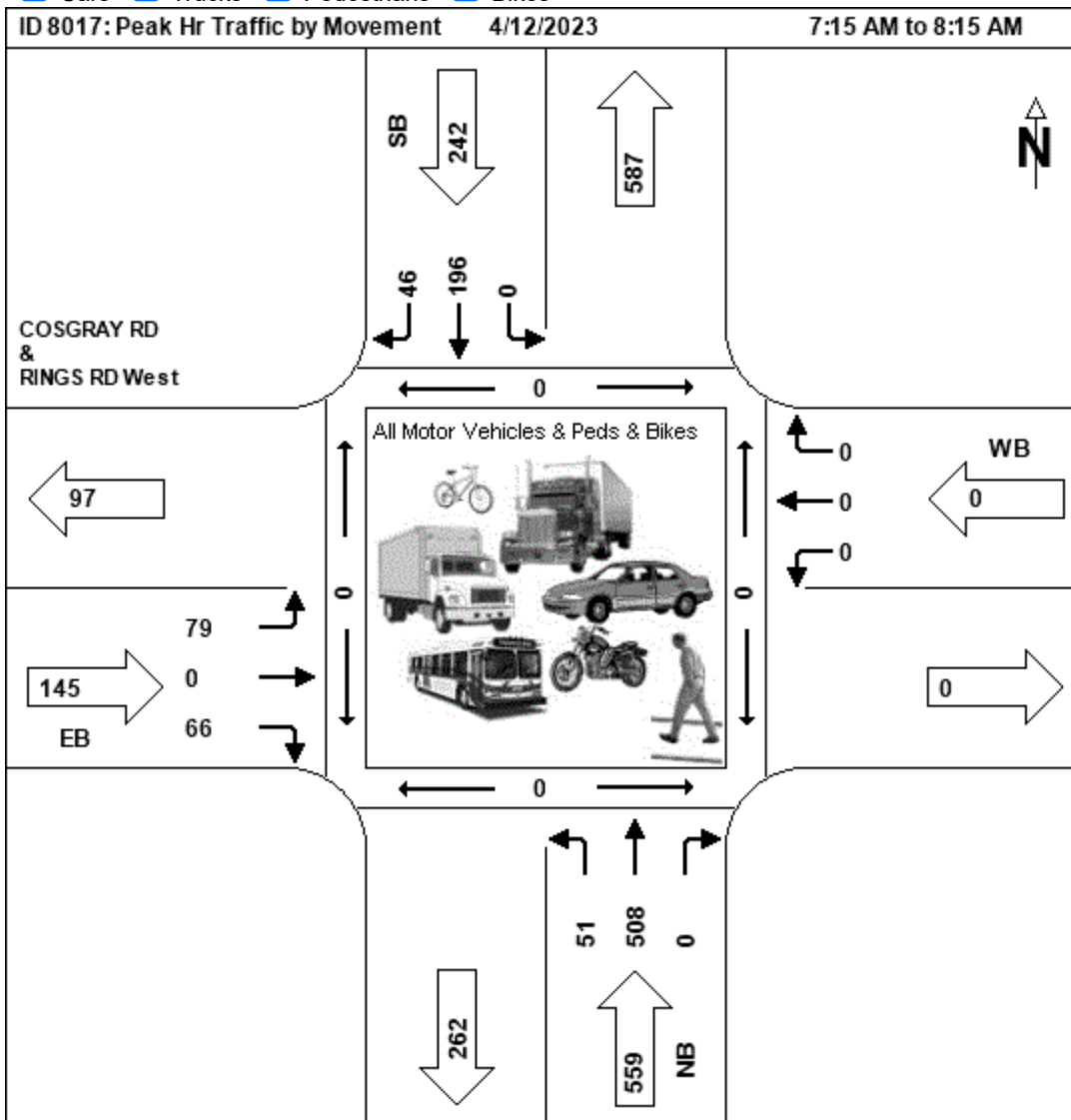
Int ID: 8017  
 Community: FRANKLIN  
 Road 1: COSGRAY RD  
 Road 2: RINGS RD West

Corridor:  
 Road 3:  
 Road 4:

AM Peak Hour  
 04/12/2023

Start Time	NB				EB				SB				App Total	Int Total		
	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped				
7:15 AM	14	117	0	0	131	25	0	12	0	37	0	48	5	0	53	221
7:30 AM	11	121	0	0	132	19	0	21	0	40	0	47	12	0	59	231
7:45 AM	18	166	0	0	184	19	0	18	0	37	0	52	16	0	68	289
8:00 AM	8	104	0	0	112	16	0	15	0	31	0	49	13	0	62	205
Total	51	508	0	0	559	79	0	66	0	145	0	196	46	0	242	946
PHF	0.71	0.77			0.76	0.79		0.79		0.91		0.94	0.72		0.89	
HV %	0	0			0	0		0		0		0	0		0	

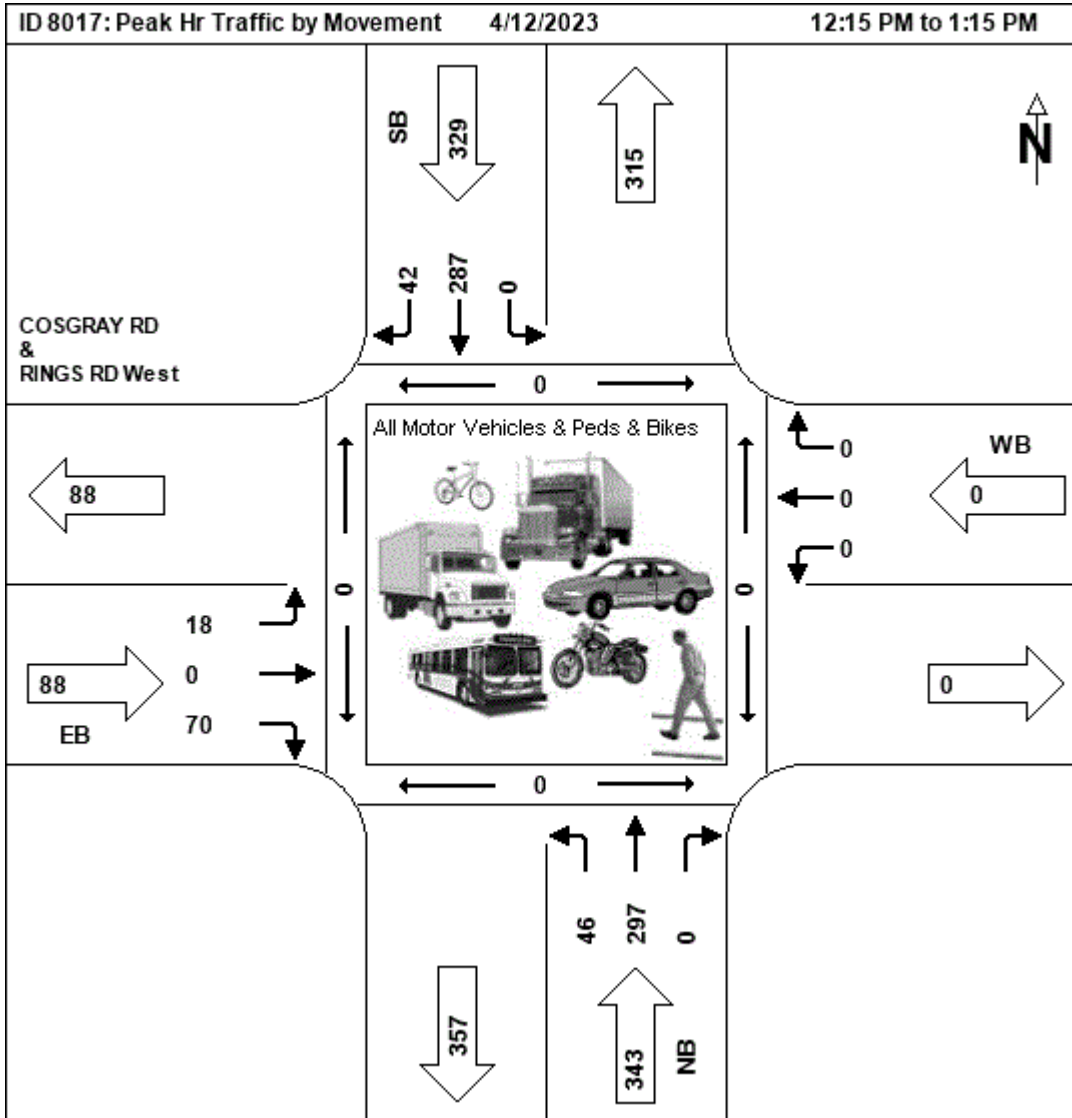
Cars  Trucks  Pedestrians  Bikes



**Midday Peak Hour  
04/12/2023**

Start Time	NB				App Total	EB				App Total	SB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
12:15 PM	11	83	0	0	94	6	0	13	0	19	0	64	14	0	78	191
12:30 PM	8	88	0	0	96	7	0	22	0	29	0	80	13	0	93	218
12:45 PM	16	63	0	0	79	2	0	17	0	19	0	64	10	0	74	172
1:00 PM	11	63	0	0	74	3	0	18	0	21	0	79	5	0	84	179
<b>Total</b>	<b>46</b>	<b>297</b>	<b>0</b>	<b>0</b>	<b>343</b>	<b>18</b>	<b>0</b>	<b>70</b>	<b>0</b>	<b>88</b>	<b>0</b>	<b>287</b>	<b>42</b>	<b>0</b>	<b>329</b>	<b>760</b>
PHF	0.72	0.84			0.89	0.64	0.80			0.76	0.90	0.75			0.88	
HV %	0	0			0	0				0	0					

Cars    Trucks    Pedestrians    Bikes

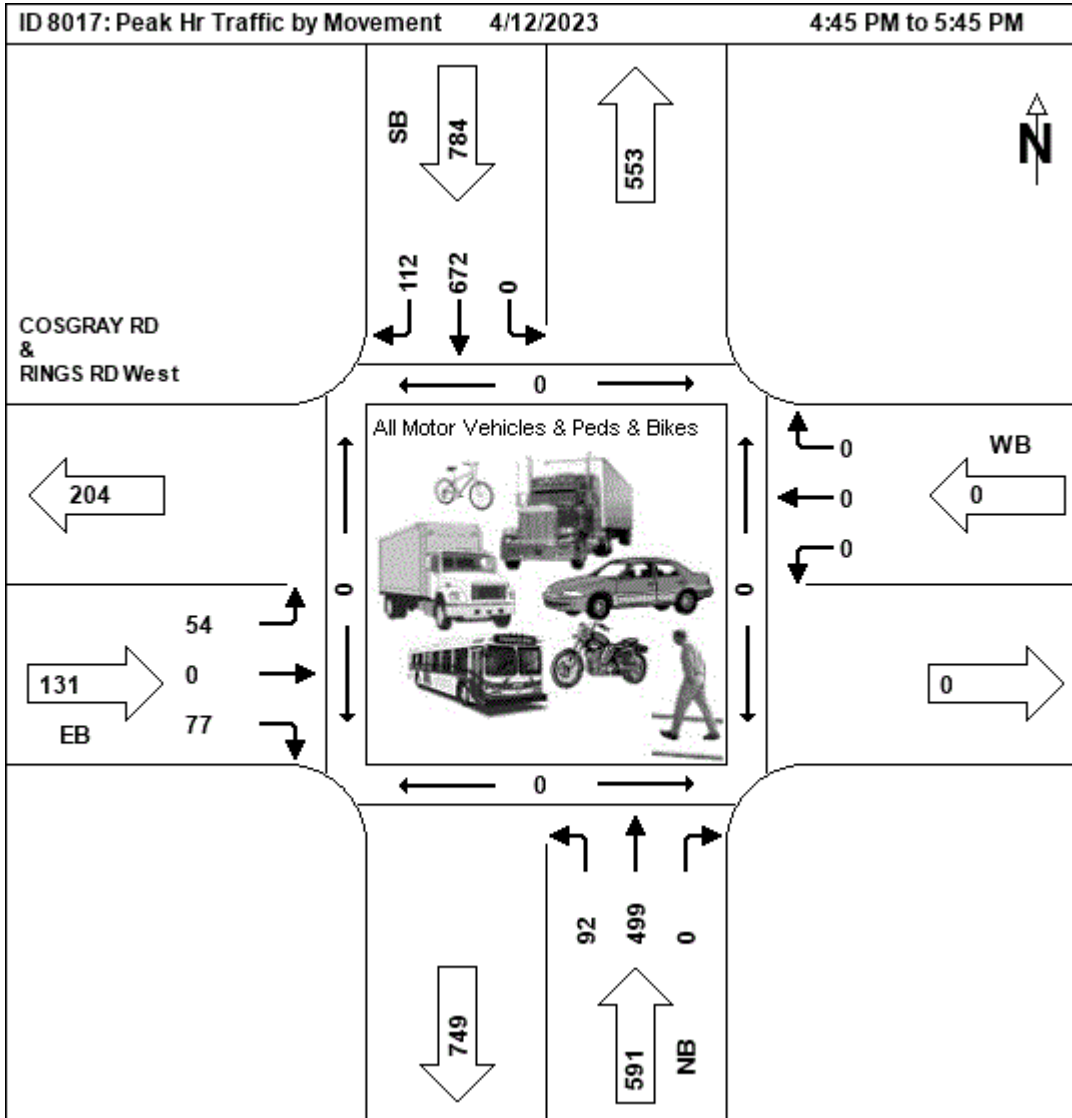




**PM Peak Hour  
04/12/2023**

Start Time	NB				App Total	EB				App Total	SB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
4:45 PM	16	107	0	0	123	17	0	23	0	40	0	178	28	0	206	369
5:00 PM	26	117	0	0	143	10	0	15	0	25	0	168	31	0	199	367
5:15 PM	17	145	0	0	162	16	0	24	0	40	0	162	30	0	192	394
5:30 PM	33	130	0	0	163	11	0	15	0	26	0	164	23	0	187	376
Total	92	499	0	0	591	54	0	77	0	131	0	672	112	0	784	1506
PHF	0.70	0.86			0.91	0.79		0.80		0.82		0.94	0.90		0.95	
HV %	0	0			0	0		0		0		0	0		0	

Cars    Trucks    Pedestrians    Bikes



APPENDIX

**E.**

---

# Data from ITE Trip Generation 11th Edition

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# Single-Family Detached Housing (210)

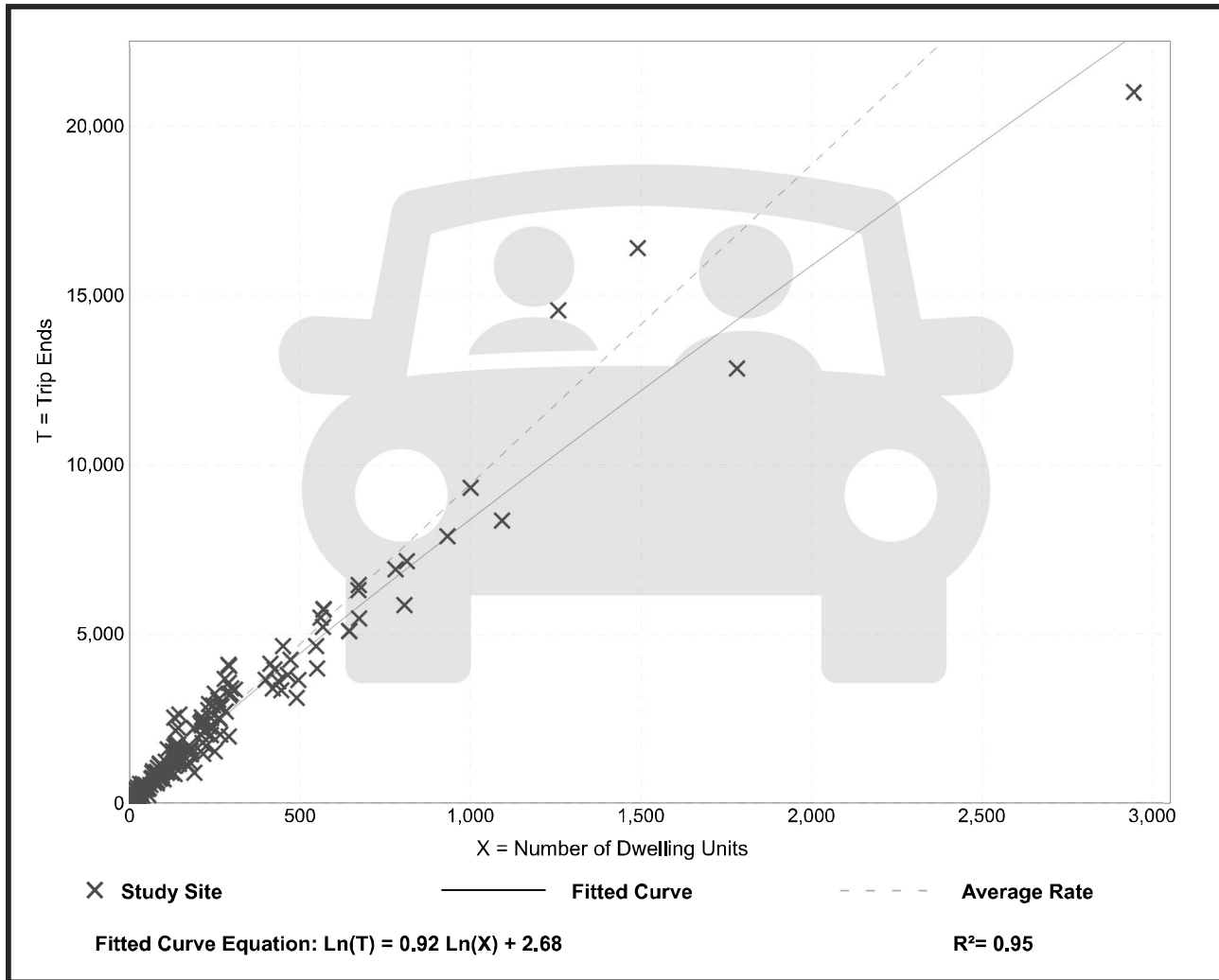
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 174  
Avg. Num. of Dwelling Units: 246  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

## Data Plot and Equation



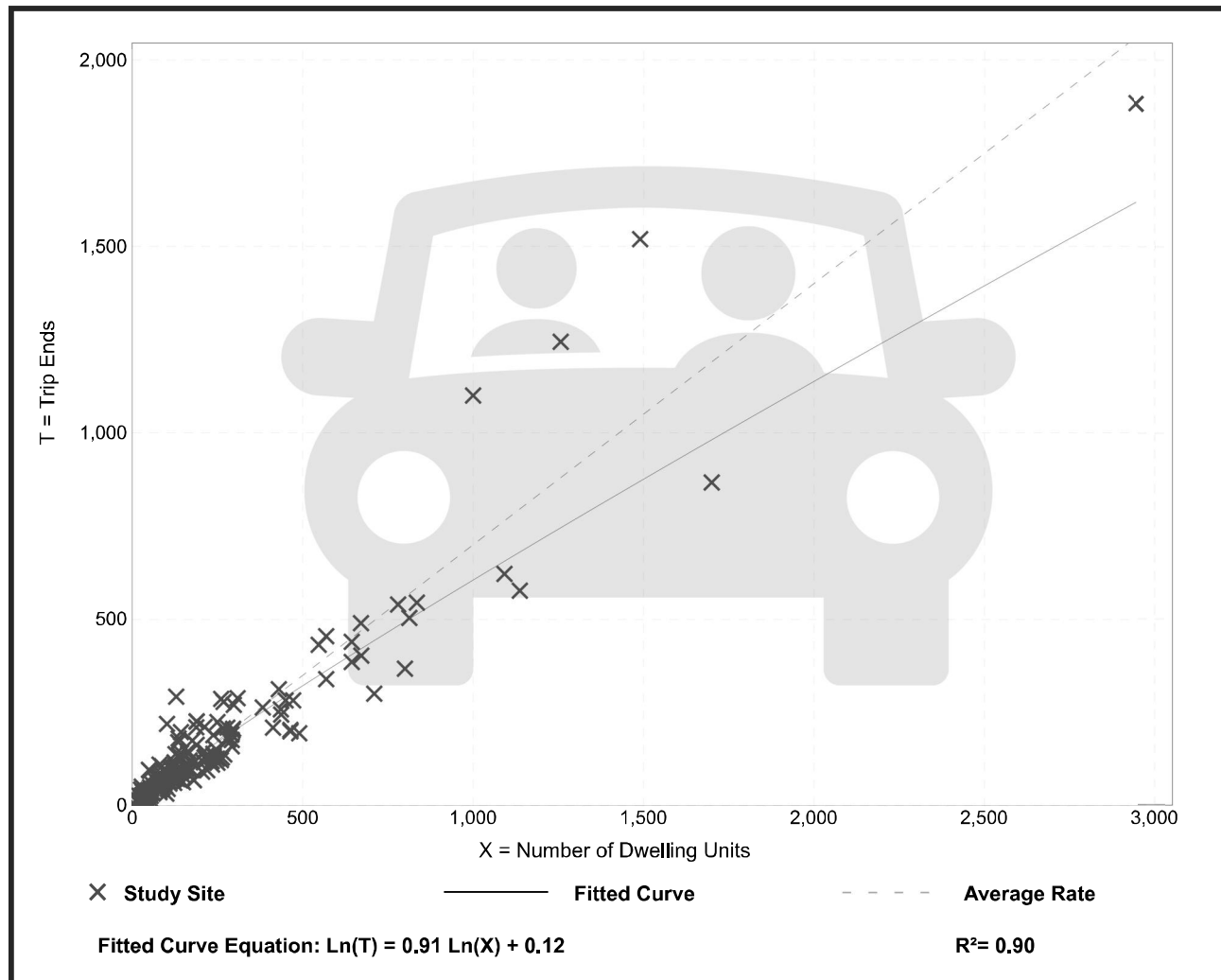
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 192  
 Avg. Num. of Dwelling Units: 226  
 Directional Distribution: 26% entering, 74% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation



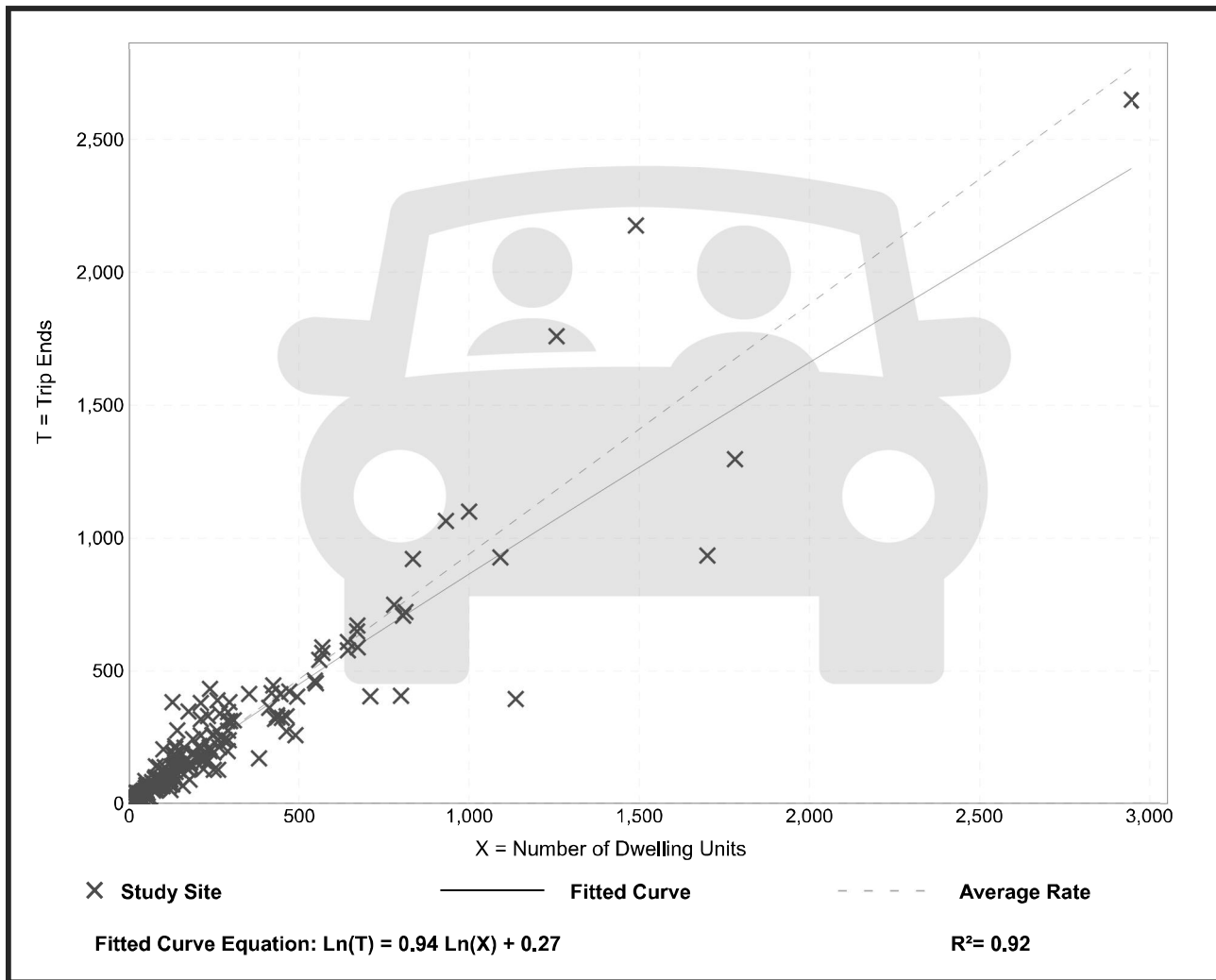
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 208  
 Avg. Num. of Dwelling Units: 248  
 Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation



# Single-Family Attached Housing (215)

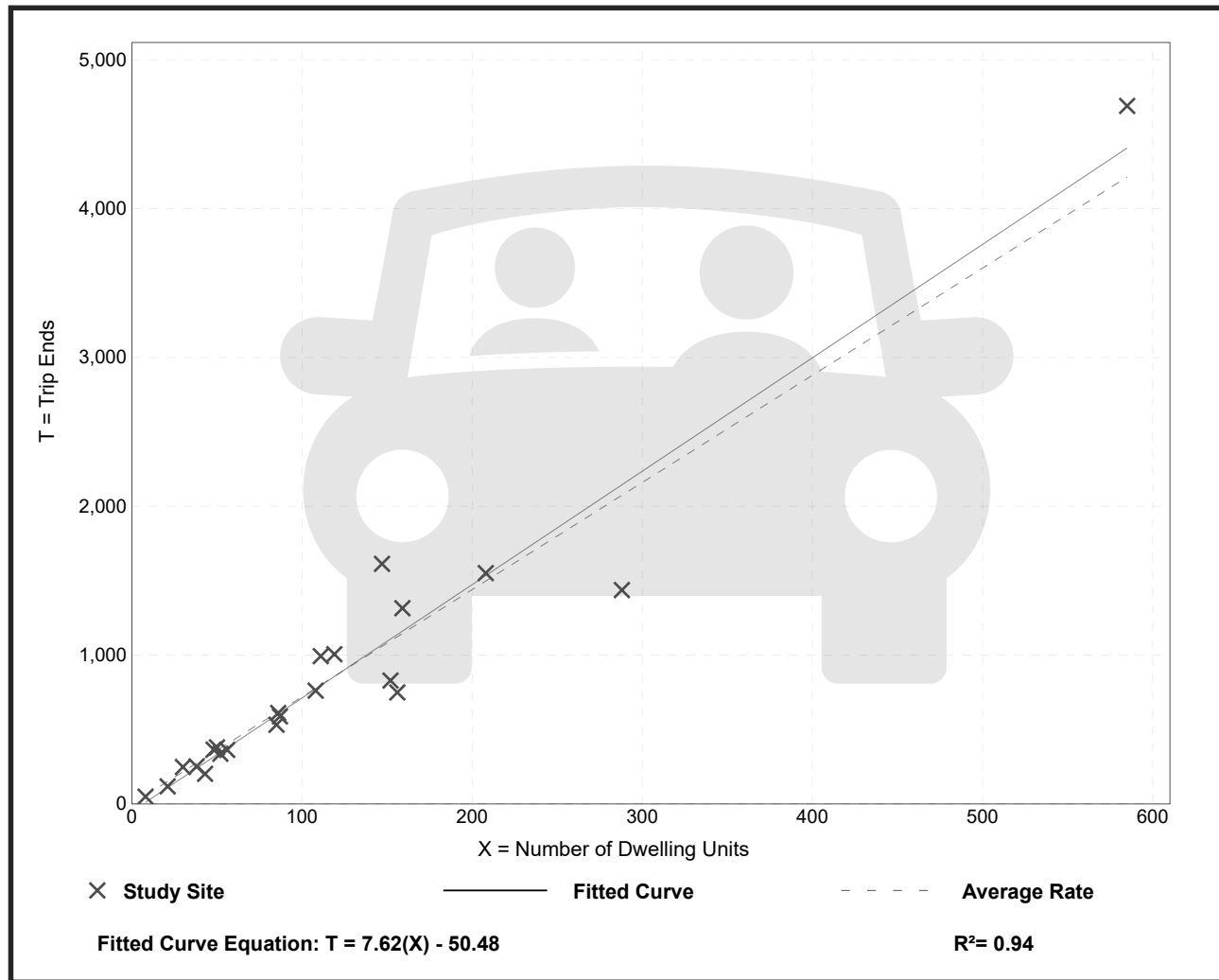
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 22  
Avg. Num. of Dwelling Units: 120  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

## Data Plot and Equation



# Single-Family Attached Housing (215)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**

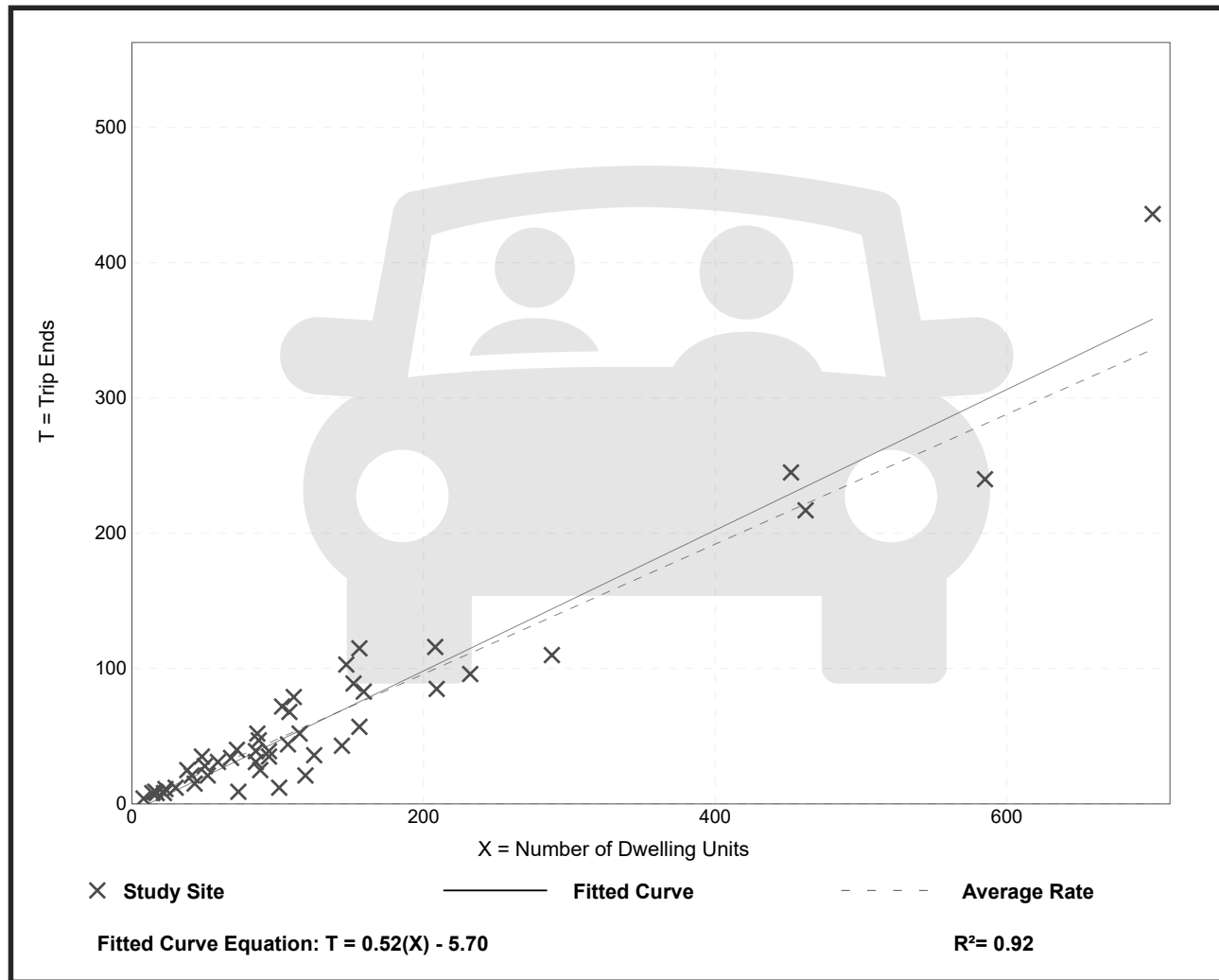
**Setting/Location: General Urban/Suburban**

Number of Studies: 46  
 Avg. Num. of Dwelling Units: 135  
 Directional Distribution: 25% entering, 75% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

## Data Plot and Equation



# Single-Family Attached Housing (215)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**

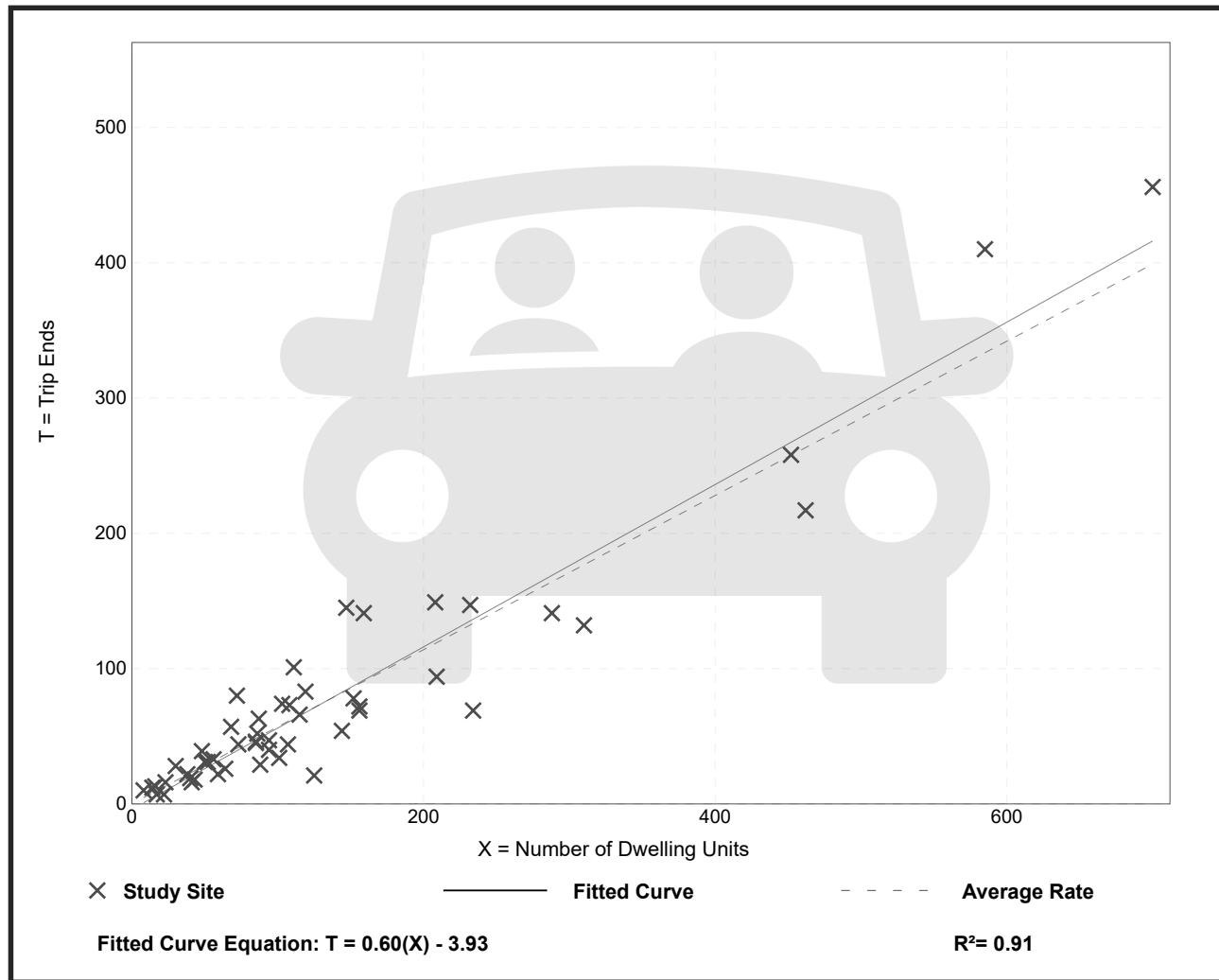
**Setting/Location: General Urban/Suburban**

Number of Studies: 51  
 Avg. Num. of Dwelling Units: 136  
 Directional Distribution: 59% entering, 41% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

## Data Plot and Equation





APPENDIX

---

**F.**

## MORPC Growth Rate Data

---

## Campbell, Jacob

---

From: Hwashik Jang <hjang@morpc.org>  
Sent: Tuesday, May 23, 2023 5:14 PM  
To: Campbell, Jacob  
Cc: Morgan, Perry; Reeves, Mike; Wilson, Jessica; Nick Gill; Cheri Mansperger  
Subject: RE: Growth Rate Request - Amlin Crossing, Dublin, OH

Follow Up Flag: Follow up  
Flag Status: Flagged

Categories: External

Jacob,

We have completed processing growth rates for your traffic study intersections.

Please use linear annual growth rates as summarized below.

<u>Location</u>	<u>Linear Annual Growth Rate</u>
Rings Rd East e/o Cosgray Rd	2.70%
Cosgray Rd n/o Rings Rd East	1.90%
Cosgray Rd s/o Rings Rd East	1.80%
Cosgray Rd n/o Rings Rd West	1.80%
Rings Rd West w/o Cosgray Rd	2.60%
Cosgray Rd s/o Rings Rd West	1.60%
Cosgray Rd n/o Boucher Rd	1.60%
Cosgray Rd s/o Boucher Rd	1.60%
Cosgray Rd n/o Hayden Farms Rd	1.60%
Cosgray Rd s/o Hayden Farms Rd	1.50%
Hayden Run Rd e/o Cosgray Rd	2.30%
Cosgray Rd n/o Hayden Run Rd	1.60%
Hayden Run Rd w/o Cosgray Rd	3.40%
Cosgray Rd s/o Hayden Run Rd	0.90%

Note: The above rate was derived based on planning level analysis by using MORPC's regional travel demand model.

If you have any questions, please let me know.

Thanks,

**HWASHIK JANG**

Senior Planner | Mid-Ohio Regional Planning Commission

T: 614.233.4145 | [hjang@morpc.org](mailto:hjang@morpc.org)

111 Liberty Street, Suite 100 | Columbus, OH 43215



---

From: Campbell, Jacob <Jacob.Campbell@kimley-horn.com>  
Sent: Wednesday, May 3, 2023 1:15 PM  
To: Hwashik Jang <hjang@morpc.org>  
Cc: Morgan, Perry <Perry.Morgan@kimley-horn.com>; Reeves, Mike <Mike.Reeves@kimley-horn.com>; Wilson, Jessica <Jessica.Wilson@kimley-horn.com>  
Subject: Growth Rate Request - Amlin Crossing, Dublin, OH

**Caution:** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. When in doubt, contact the IT team

Good afternoon Hwashik,

Kimley-Horn is performing a Preliminary Traffic Impact Study for the Amlin Crossing residential development in Dublin, Ohio. The development is located east of Cosgray Road, and south of Rings Road, as illustrated in the attached document

Please assist in providing growth rates for Cosgray Road, Hayden Run Road, and Rings Road. We anticipate that these growth rates have already been developed by MORPC, and were provided for the FCEO Rings Road Study. Our assumption is that there wouldn't be growth for both Hayden Farms Road and Boucher Road, as the neighborhoods using these streets are built out.

1. Traffic counts (24-hour turning movement counts) have been collected at the study intersections.

Kimley-Horn collected traffic counts at the following locations:

- Cosgray Road and Hayden Farms Road
- Cosgray Road and Boucher Road
- Cosgray Road and Hayden Run Road

The MORPC Traffic Count Database includes counts (4/12/2023) for the following locations:

- Cosgray Road and Rings Rd (East Leg) – Location ID - 8016
- Cosgray Road and Rings Rd (West Leg) – Location ID – 8017

MioVision 24-hour Traffic Count Data, and referenced MORPC traffic data is attached. An exhibit providing the 2023 Raw traffic counts is also attached.

2. Open year and design year of the study.
  - Opening Year – 2025
  - Design Year – 2035

3. Roadway network assumptions (any future roadway assumptions in the vicinity, such as changes in number of lanes or new roadways, etc).
  - Per the City of Dublin Community Plan, Tuttle Crossing Boulevard is anticipated to be constructed as illustrated in the attachments. We will perform traffic analysis at the study intersections, with and without the extension of Tuttle Crossing Boulevard. An exhibit from the City of Dublin Feasibility Study (2020) is attached, to provide detail regarding the future Tuttle Crossing Boulevard extension.
  - Future developments are anticipated along Cosgray Road; these are shown as Area X and Area Y in the attached exhibit (2023 Raw Traffic Counts). Volumes for these sites will be projected as part of this study.
  - We will be coordinating with the FCEO Rings Road study that is being completed by Arcadis. It was for this study that the 4-12-23 counts were conducted.
4. Land use assumptions (general information on site location/development, e.g., site map).

Study Intersections (see image above):

1. Cosgray Rd and Rings Road (East Leg)
2. Cosgray Rd and Rings Road (West Leg)
3. Cosgray Rd and Site Access A
4. Cosgray Rd and Tuttle Crossing Blvd
5. Cosgray Rd and Boucher Rd
6. Cosgray Rd and Hayden Farms Run Rd
7. Cosgray Rd and Hayden Run Rd
8. Tuttle Crossing Blvd and Site Access B
9. Tuttle Crossing Blvd and Site Access C

ITE land use codes of 210 and 215 were utilized in calculating the trip generation for the proposed development. The table below outlines the projected trips for the proposed development.

ITE Land Use	Units	Vehicle Type	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Single-Family Detached Housing (210)	150	All	1,465	27	81	108	92	54	146
Single-Family Detached Housing (210)	50	All	533	10	30	40	33	19	52
Single-Family Attached Housing (215)	240	All	1,778	30	89	119	83	57	140
<i>Total Trips</i>			3,776	67	200	267	208	130	338

5. Project review contact person (the person from local/city/county/state government agency who would review the study).

City of Dublin  
 Tina Wawszkiewicz  
[twawszkiewicz@dublin.oh.us](mailto:twawszkiewicz@dublin.oh.us)

City of Columbus  
 Dan Blechschmidt  
[DRBlechschmidt@columbus.gov](mailto:DRBlechschmidt@columbus.gov)

Franklin County  
 Bill Hebble  
[whebble@franklincountyengineer.org](mailto:whebble@franklincountyengineer.org)

Let us know if you have any questions.

Thanks,

**Jacob D. Campbell, PE.**

**Kimley-Horn** | 7965 N. High Street, Suite 200, Columbus, OH 43235  
Direct: 614.472.8935 | Mobile: 937.654.3892  
Connect with us: [Twitter](#) | [LinkedIn](#) | [Facebook](#) | [YouTube](#)

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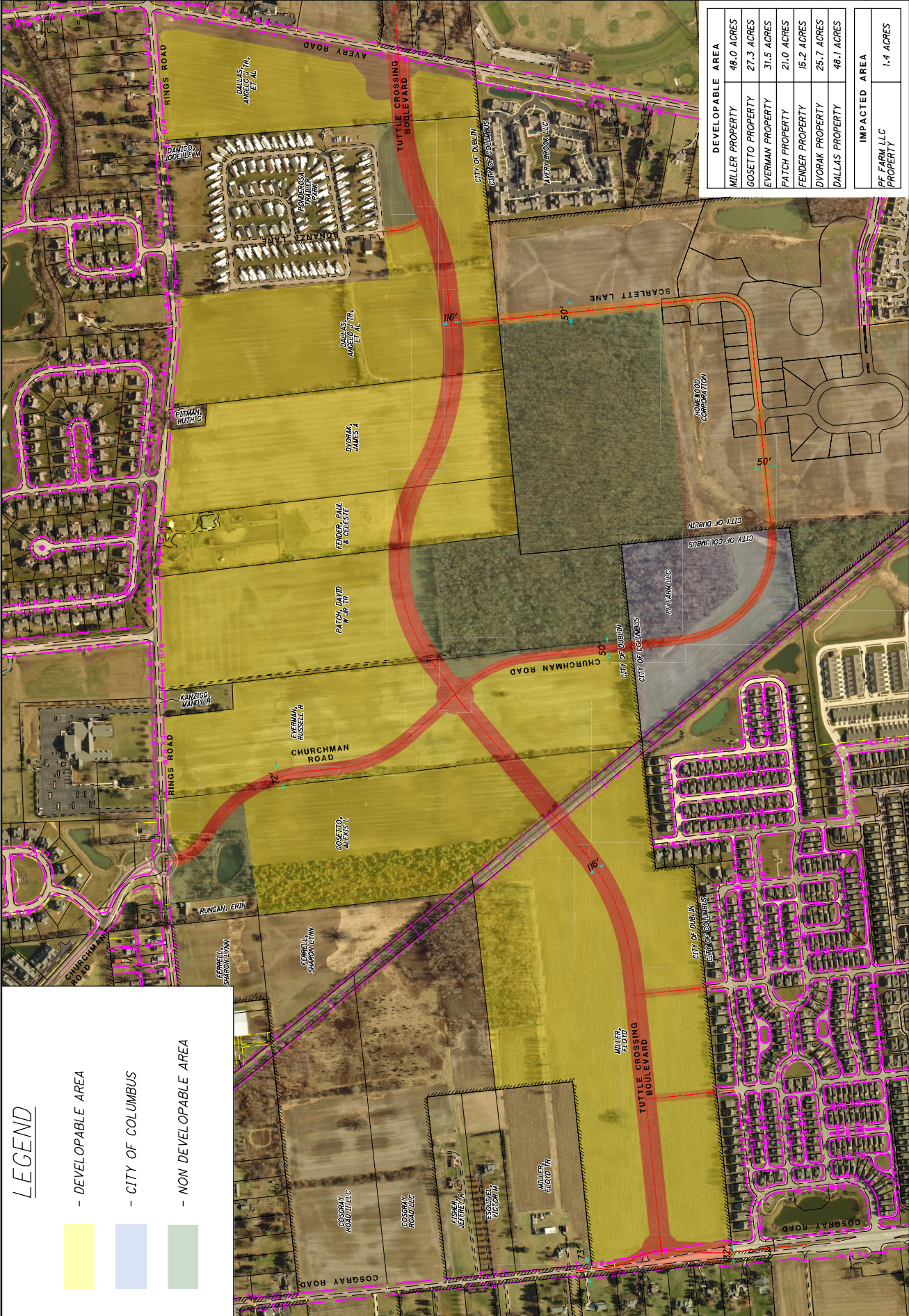
APPENDIX

**G.**

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Excerpts from Tuttle Crossing  
Boulevard Ext., Feasibility Study

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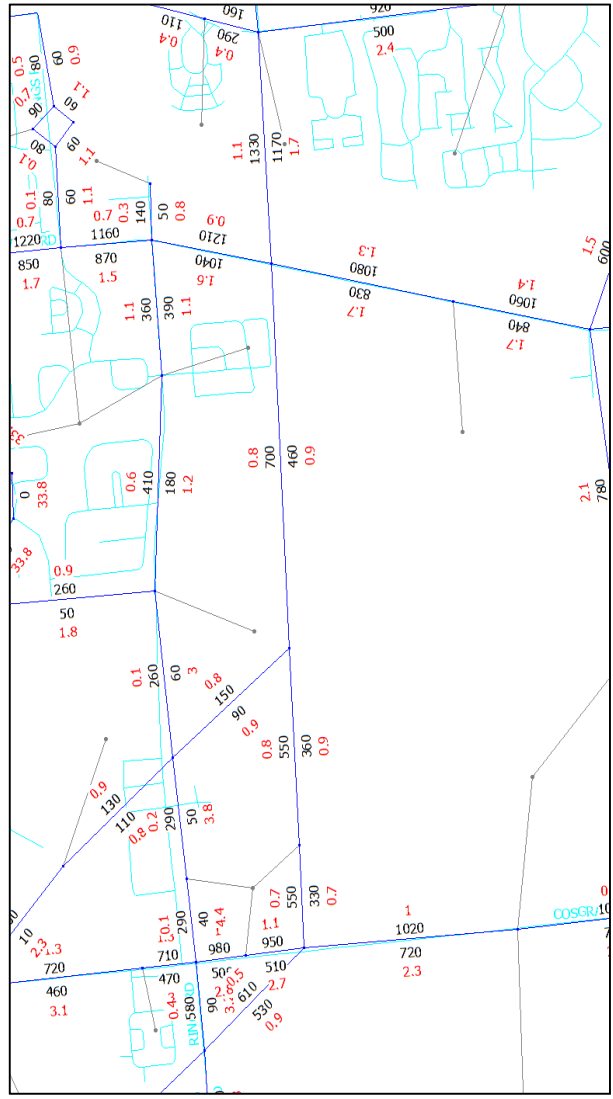
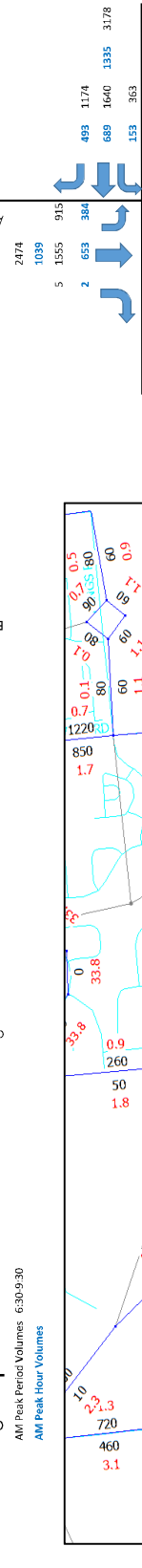
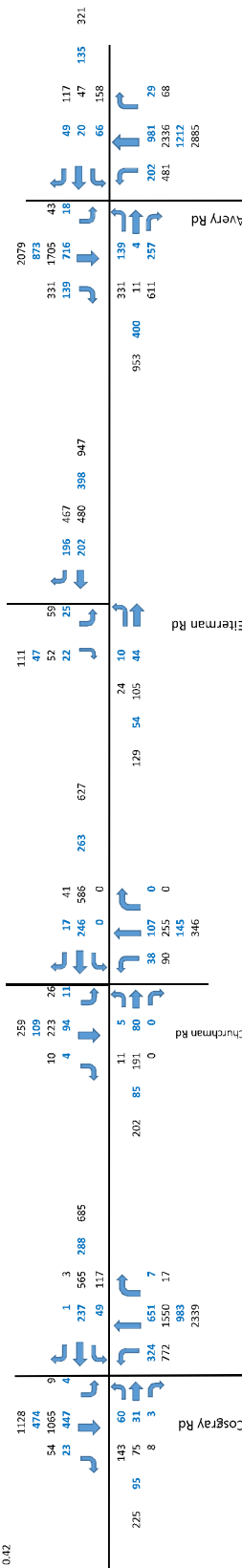


DEVELOPABLE AREA		IMPACTED AREA	
MILLER PROPERTY	48.0 ACRES	P.F. FARM LLC PROPERTY	1.4 ACRES
GOSETTO PROPERTY	27.3 ACRES		
EVERMAN PROPERTY	31.5 ACRES		
PATCH PROPERTY	21.0 ACRES		
FENDER PROPERTY	15.2 ACRES		
DIVORAK PROPERTY	25.7 ACRES		
DALLAS PROPERTY	48.1 ACRES		

**LEGEND**

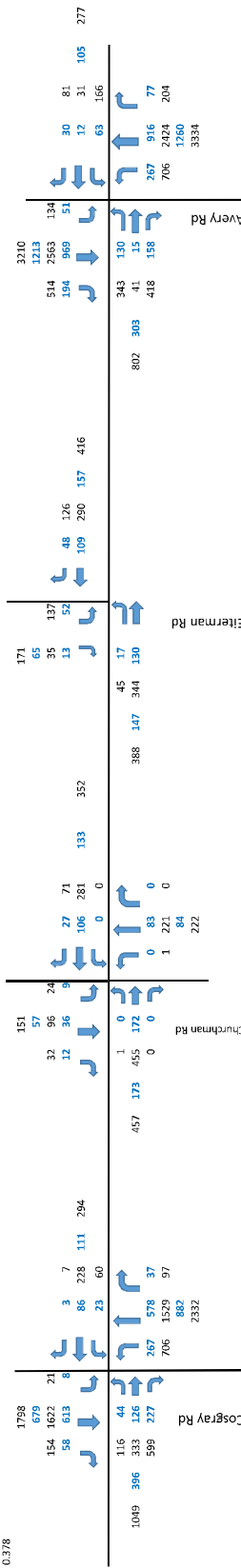
-  - DEVELOPABLE AREA
-  - CITY OF COLUMBUS
-  - NON DEVELOPABLE AREA

0.42



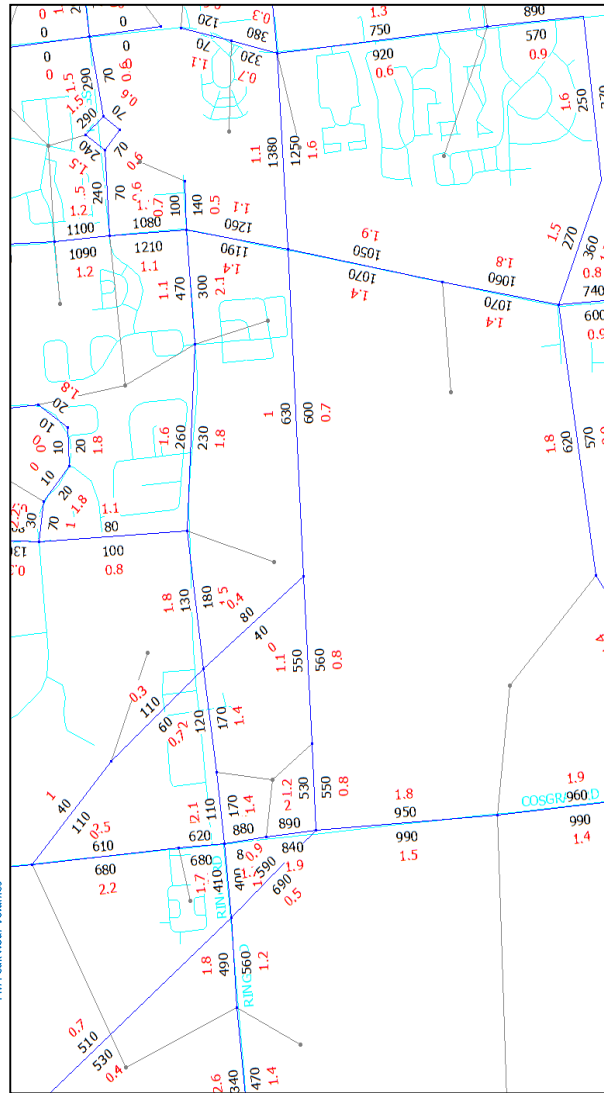


0.378



PM Peak Period Volumes: 3:30-6:30

PM Peak Hour Volumes



APPENDIX

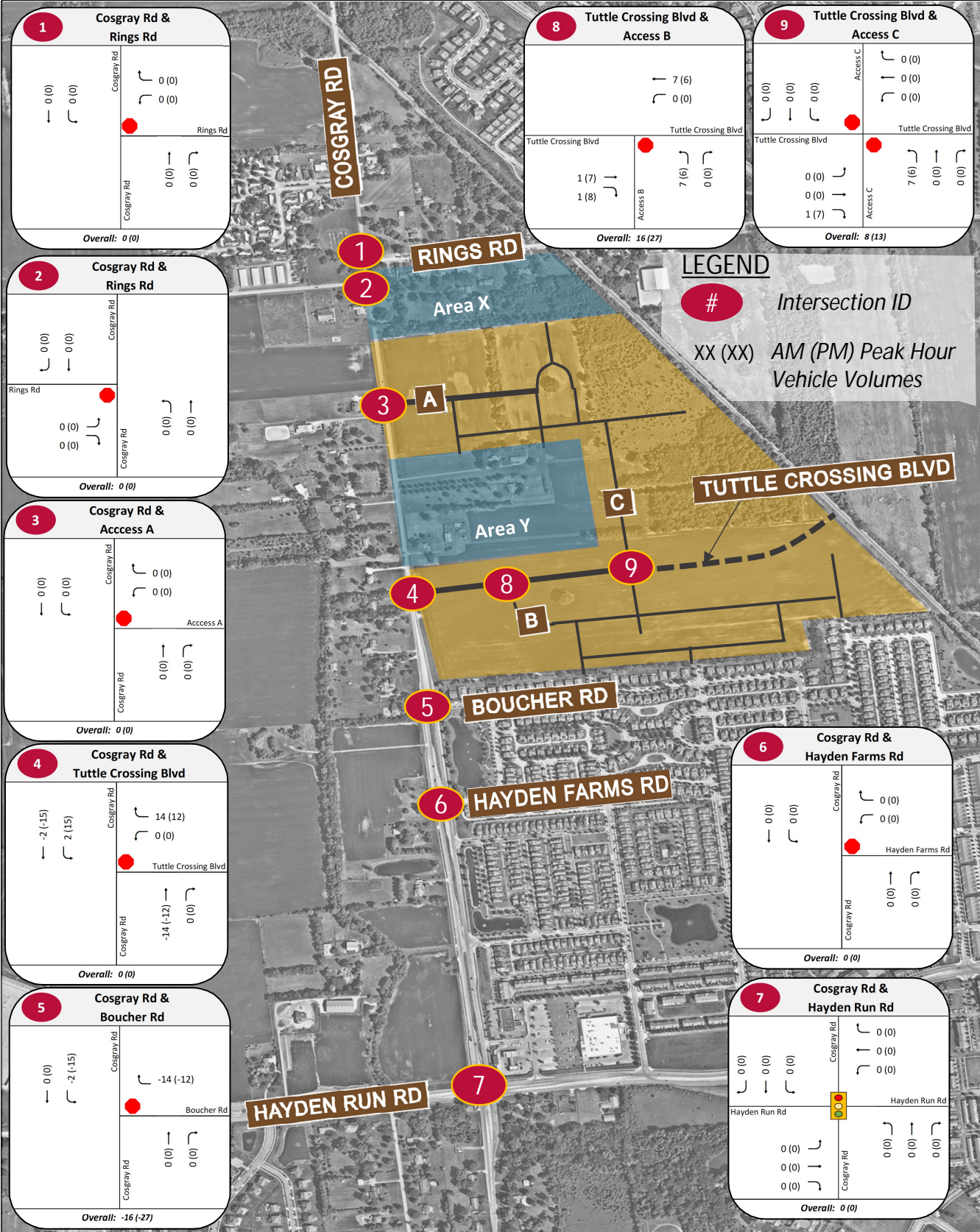
**H.**

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## Relocated Background Traffic Volume Calculations

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# Appendix: Relocated Background Trips AM & PM Peak Hour Vehicle Volumes



APPENDIX

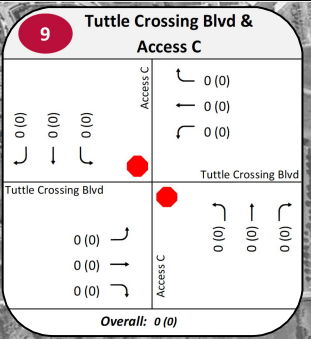
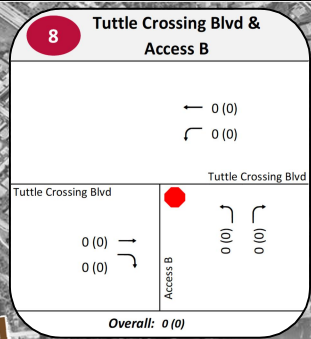
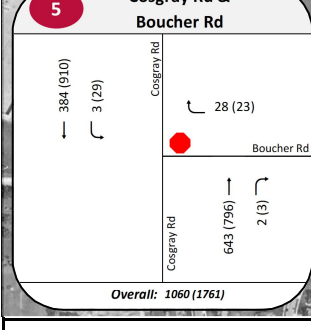
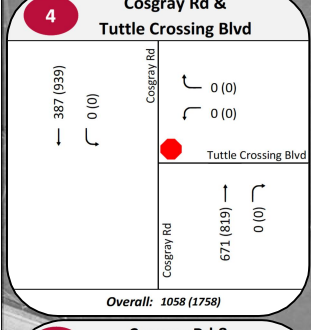
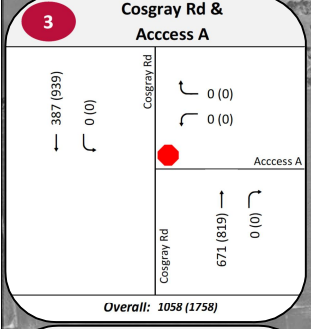
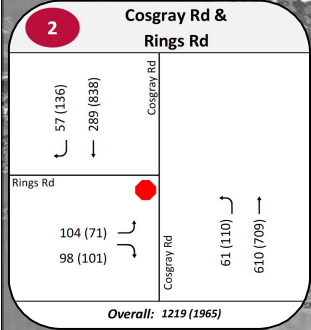
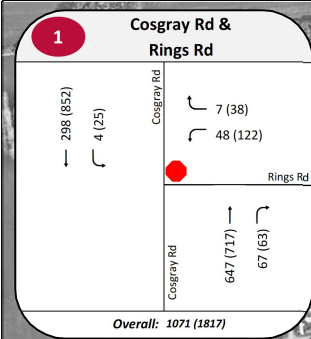
I.

---

# 2035 No Build Balanced Traffic Volumes

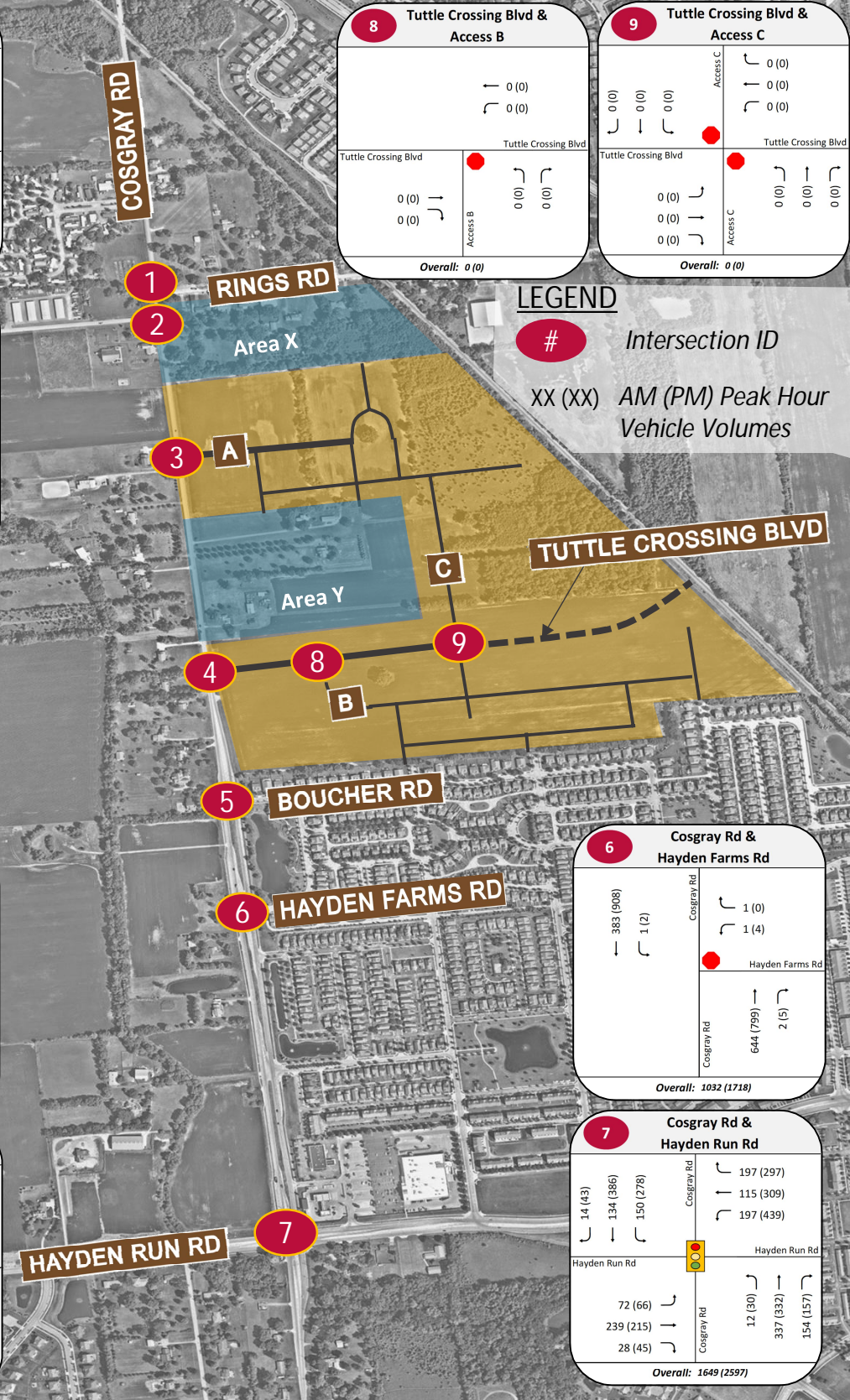
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# Appendix: Relocated Background Trips AM & PM Peak Hour Vehicle Volumes



## LEGEND

# Intersection ID  
 XX (XX) AM (PM) Peak Hour Vehicle Volumes



APPENDIX

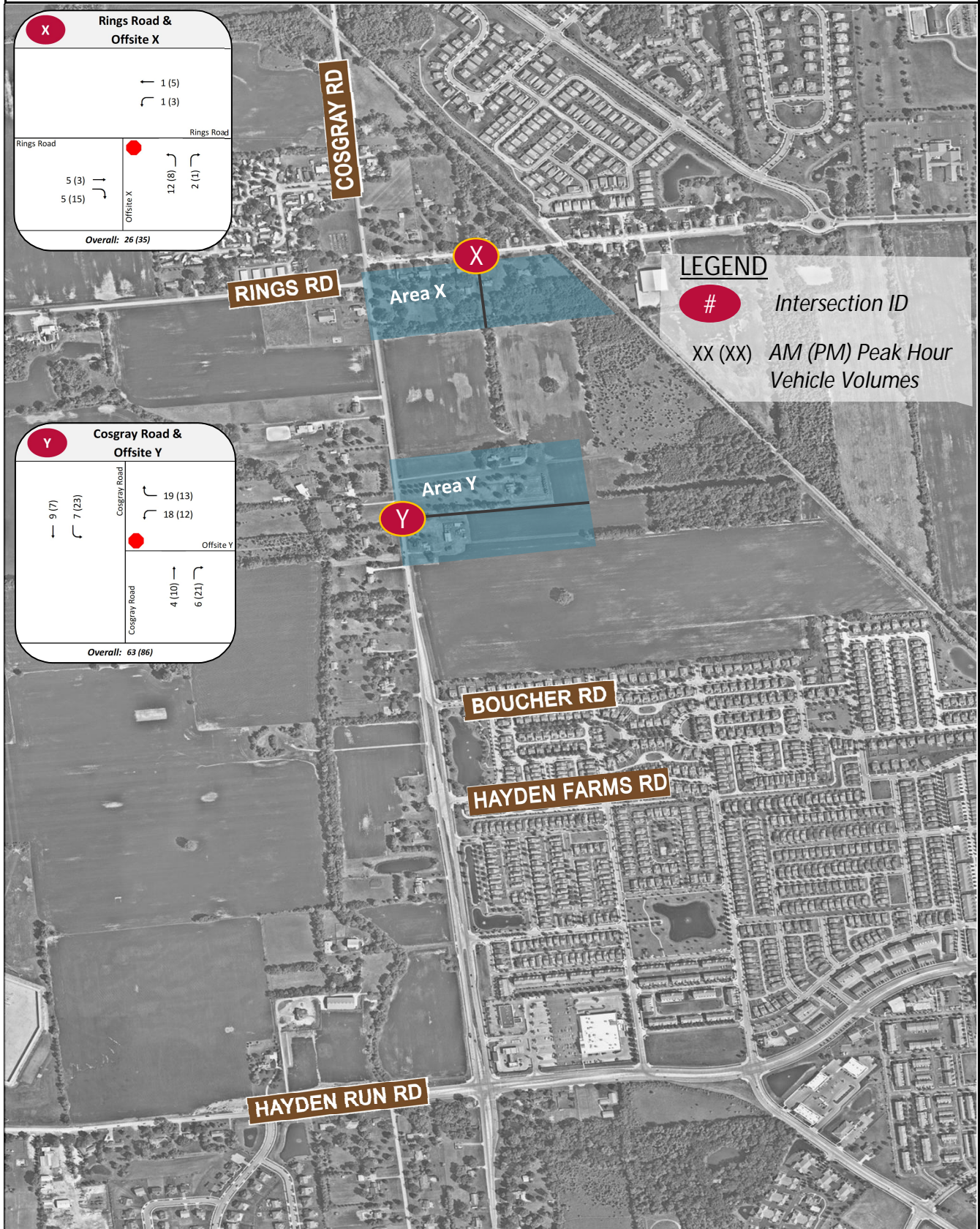
**J.**

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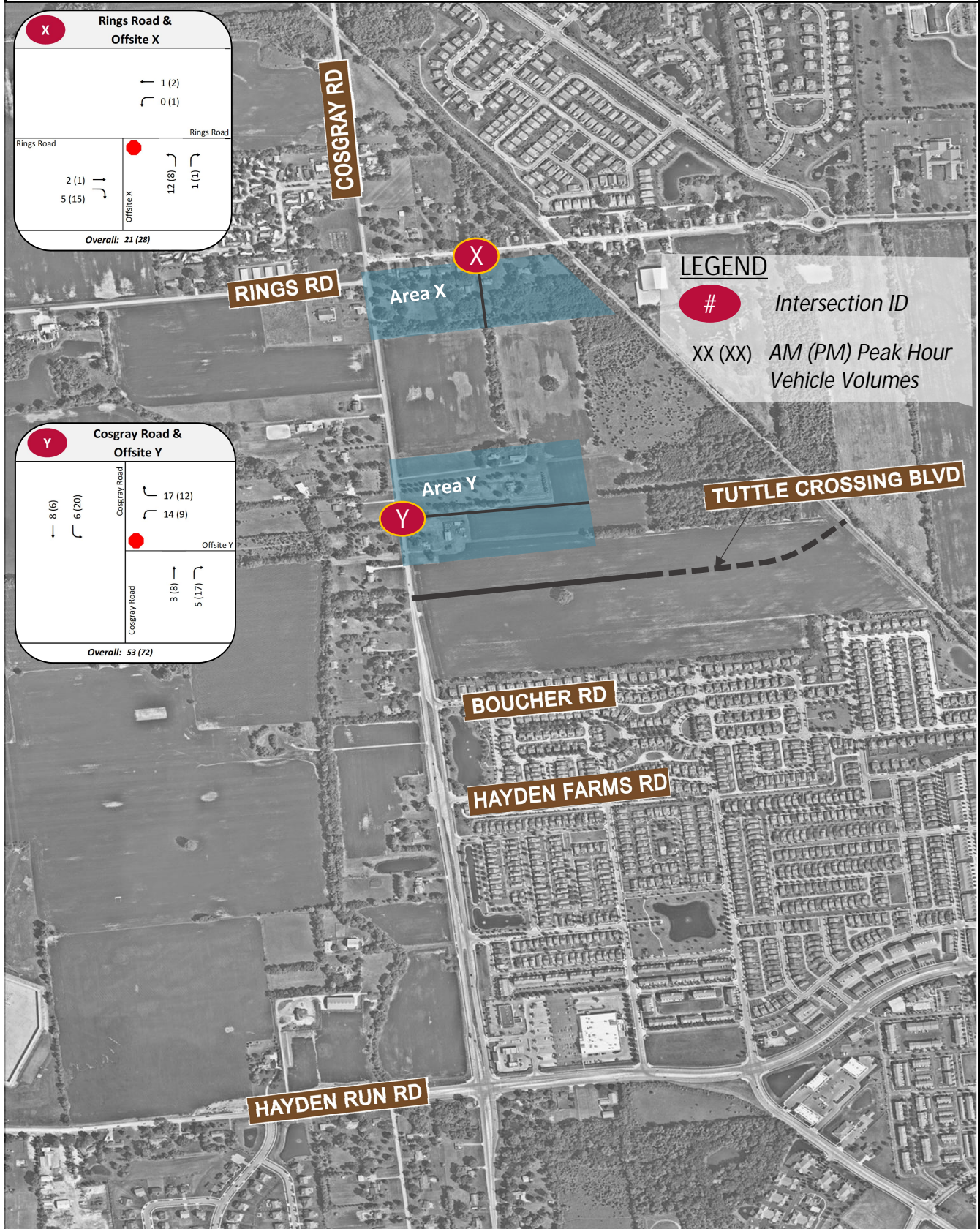
## Offsite Trip Calculations

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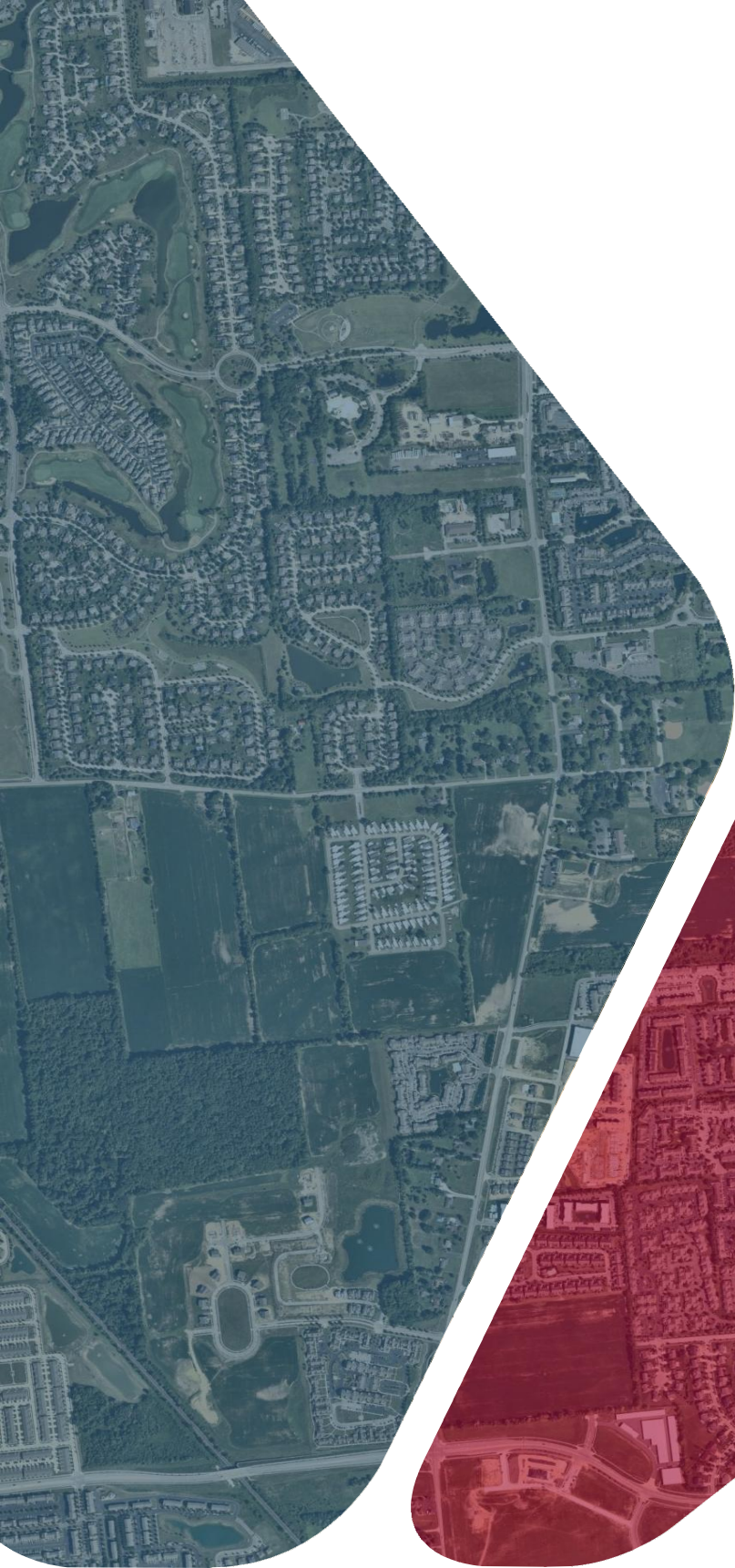
# Appendix: Offsite Trips (w/o Tuttle Ext.) AM & PM Peak Hour Vehicle Volumes



# Appendix: Offsite Trips (with Tuttle Ext.) AM & PM Peak Hour Vehicle Volumes







# Kimley»»Horn

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380-867-0815