Pronghorn Subdivision Traffic Impact Study

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IMEG #240001698.00

March 1, 2026

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For the
Pronghorn Subdivision Development

Prepared for:
Yellowstone County, Montana

IMEG #24001698.00

March 1, 2026

1 INTRODUCTION & EXECUTIVE SUMMARY

1.1 Purpose

The purpose of this Traffic Impact Study (TIS) is to determine the operational impact that the proposed Pronghorn Subdivision Development Traffic has on the surrounding major intersections and to recommend modifications, if required, that will allow the major intersections and access drives to function adequately as the population grows. The proposed development will have access locations to Lorraine Street, Bitterroot Drive, Rosecrans Drive, Highway 87, and Highway 312.

This TIS focuses solely on the Pronghorn Subdivision Development and does not take into consideration any other proposed or future residential, commercial, or industrial developments in the surrounding area. Future developments will need to prepare a separate traffic study.

1.2 Objective

To evaluate the necessary intersections and the development, IMEG performed the following initial tasks:

- Current traffic volumes were collected for 24 hours in 15-minute intervals at the following intersections:
    - HWY 87 and Lorraine Street (Intersection 1)
    - HWY 312, Bitterroot Dr, and Rosecrans Dr (Intersection 2)
- Reviewed the existing developments Site Plan, see Appendix A, and utilized the ITE Trip Generation Manual, 11th Edition, See Appendix E, to determine the number of AM and PM trips generated by the proposed development.
- Developed 2034 and 2054 traffic for the development. Refer to Appendix B for a summary of those traffic movements.
- Assigned trip distribution to the development traffic to determine entering and existing volume. Generated trips will not increase by the growth factor.
- Researched and collected traffic data and other background information from various sources, including:
    - Montana Department of Transportation (MDT)
    - Yellowstone County, MT
- Processed calculated traffic data using the Highway Capacity Software (HCS), Version 2024 for the following scenarios:
    - Existing 2024 AM and PM peak hour traffic using the existing lane geometry at the studied intersections. See Appendix C.

- Projected 2034 and 2054 AM and PM peak hour background traffic, see **Appendix C**, and total traffic operational capacity, see **Appendix D**, using existing lane geometry at the studied intersections.
- Projected 2034 AM and PM peak hour total traffic operational capacity, see **Appendix D**, for the proposed access location to HWY 87 as well as HWY 87 and Lorraine Street.
- Projected 2054 AM and PM peak hour total traffic operational capacity, see **Appendix D**, for the proposed access locations to HWY 87, HWY 87 and Lorraine St, as well as HWY 312 and Bitterroot Dr.

1.3 Executive Summary

The proposed development is planned to proceed in three distinct phases, referred to as Filings 1 through 3. Currently, filing 1 is in the design stage, with full build-out anticipated by the year 2034. The complete build-out of all three filings is projected by 2054. A detailed traffic impact analysis was conducted for Filing 1 individually, as well as for the combined full build-out scenario of all three filings under a comprehensive master plan TIS.

2 EXISTING CONDITIONS

2.1 Study Roadway(s)

The following roadways describe the intersections that are to be analyzed as part of this study. See **Figure 1** for the intersection study areas, **Figure 2** for the Montana Department of Transportation roadway classifications, and **Figure 2a** for the City of Billings roadway classifications. It is to note that Intersection 1 is not within the City of Billings MPO planning boundary. A high-level review from Google Earth measurements was used to approximate lane widths below for the existing roadways.

2.1.1 HWY 87

HWY 87 is classified as a "Principal Arterial – Non-Interstate" road by MDT and the City of Billings. It is an asphalt paved, two-lane highway with approximately 40-foot total surface width. The total surface width contains two 12-foot asphalt travel lanes and an eight 8-foot asphalt shoulder with a rumble strip that extends the length of the roadway on both sides. There is also a rumble strip on the center line of the roadway that separates the two travel lanes. A dashed and double-solid centerline is also present, indicating when passing is allowed. There are also residential and commercial drive approaches on both sides of the roadway with the addition of side streets. The posted speed limit is 70 MPH.

2.1.2 HWY 312

HWY 312 is classified as a "Minor Arterial" road by MDT and the City of Billings. It is an asphalt paved highway with a 62-foot asphalt surface width and a varying width gravel shoulder that extends the length of the roadway on both sides. This road consists of five (5) lanes; two (2) 12-foot SW bound lanes, two (2) 12-foot NE bound lanes, and one (1) 14-foot center two-way left turn lane. There are also residential and commercial drive approaches on both sides of the roadway with the addition of side streets. The posted speed limit is 50 MPH.

2.1.3 Lorraine Street

Lorraine Street is classified as a "Local" road by MDT. The roadway is not located within the City of Billings MPO Planning Boundary. The roadway is an asphalt paved roadway with a 24-foot asphalt surface width and a varying width gravel shoulder that extends the length of the roadway on both sides. There is currently no paint striping to indicate designated travel lanes. There are

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also residential drive approaches on both sides of the roadway with the addition of side streets. The posted speed limit is 25 MPH All Streets.

2.1.4 Bitterroot Drive

Bitterroot Drive is classified as a "Local" road by MDT and as a "Minor Arterial" by the City of Billings. It is an asphalt paved, two-lane roadway with approximately 24-foot asphalt surface width and a varying width gravel shoulder that extends the length of the roadway on both sides. Both travel lanes are approximately 12-foot width. The two travel lanes are separated by a double-solid painted centerline, indicating "no passing." There are also residential drive approaches on both sides of the roadway with the addition of side streets. The posted speed limit is 25 MPH.

2.1.5 Rosecrans Drive

Lorraine Street is classified as a "Local" road by MDT and the City of Billings. The roadway is a two-lane gravel roadway with a varying width approximately 24-foot. Asphalt paved approaches are also present at major intersections. There is currently no paint striping to indicate designated travel lanes. There are also residential drive approaches on both sides of the roadway with the addition of side streets. There is currently no posted speed limit.

2.2 Study Intersection(s)

The following describes the intersections that are analyzed as part of this study. The intersection study areas are shown in **Figure 1**.

2.2.1 Intersection 1 – HWY 87 and Lorraine St

The "T" intersection is stop-controlled on the westbound leg of Lorraine St. There are no additional turn lanes at the intersection. The intersection is currently not illuminated.

Traffic data for this intersection was collected on July 23rd, 2024. From the collected traffic data, it was determined that the AM peak hour for the intersection was between 9:45 and 10:45, while the PM peak hour was between 4:30 and 5:30.

2.2.2 Intersection 2 – HWY 312, Bitterroot Dr, and Rosecrans Dr

The intersection is a "2-way," stop-controlled intersection on the northwest bound leg of Rosecrans Dr and southbound leg of Bitterroot Dr. There is an additional two-way left turn lane for the southwest bound leg and northeast bound leg of HWY 312. The intersection is currently not illuminated.

Traffic data for this intersection was collected on July 23rd, 2024. From the collected traffic data, it was determined that the AM peak hour for the intersection was between 7:00 and 8:00, while the PM peak hour was between 4:45 and 5:45.

2.3 Study Area Land Uses

The proposed development is currently surrounded by agricultural land to the East, South, and West. Immediately to the north is a residential neighborhood that consists of single-family residences.

2.4 2024 Existing Site Conditions

The existing lane configurations and Peak Hour turning movement volumes are shown in **Figure 4**. IMEG collected the current traffic data using Miovision cameras and entered that data into Highway Capacity Software (HCS), Version 2024, to evaluate the current level of service. The

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collected Miovision data can be found in Appendix H. The Two-Way Stop Control (TWSC) module of HCS was used to determine the operational capacity of each leg and the studied intersections. A summary of the results for each intersection can be seen in Table 1.

The collected traffic volumes were adjusted per MDT 2023 seasonal factors. Those adjustment factors can be found in Appendix G.

2.5 Pedestrian and Bicycle Considerations

There are currently no pedestrian considerations including sidewalks and bicycle lanes at any of the intersections described above.

Table 1: 2024 Existing Traffic Peak Hour Capacity Analysis Summary

No.	Intersection	Approach	2024 Background Traffic Peak Hour Capacity Analysis Summary					
			AM PEAK HOUR			PM PEAK HOUR		
			Approach Delay (sec/veh)	Approach LOS	95th % Queue (veh)	Approach Delay (sec/veh)	Approach LOS	95th % Queue (veh)
Intersection Control			*One-Way Stop Control (WB)*					
1	HWY 87 & Lorraine St	EB						
		WB	10.3	B	1	11.0	B	1
		NB	FREE-FLOW/NO DELAY			FREE-FLOW/NO DELAY		
		SB	0.1	A	0	0.1	A	0
Intersection Control			*Two-Way Stop Control (NB/SB)*					
2	HWY 312 & Bitterroot Dr	EB	1	A	1	1.5	A	1
		WB	0	A	0	0	A	0
		NB	11.0	A	0	16.6	C	0
		SB	10.2	B	1	9.6	A	1

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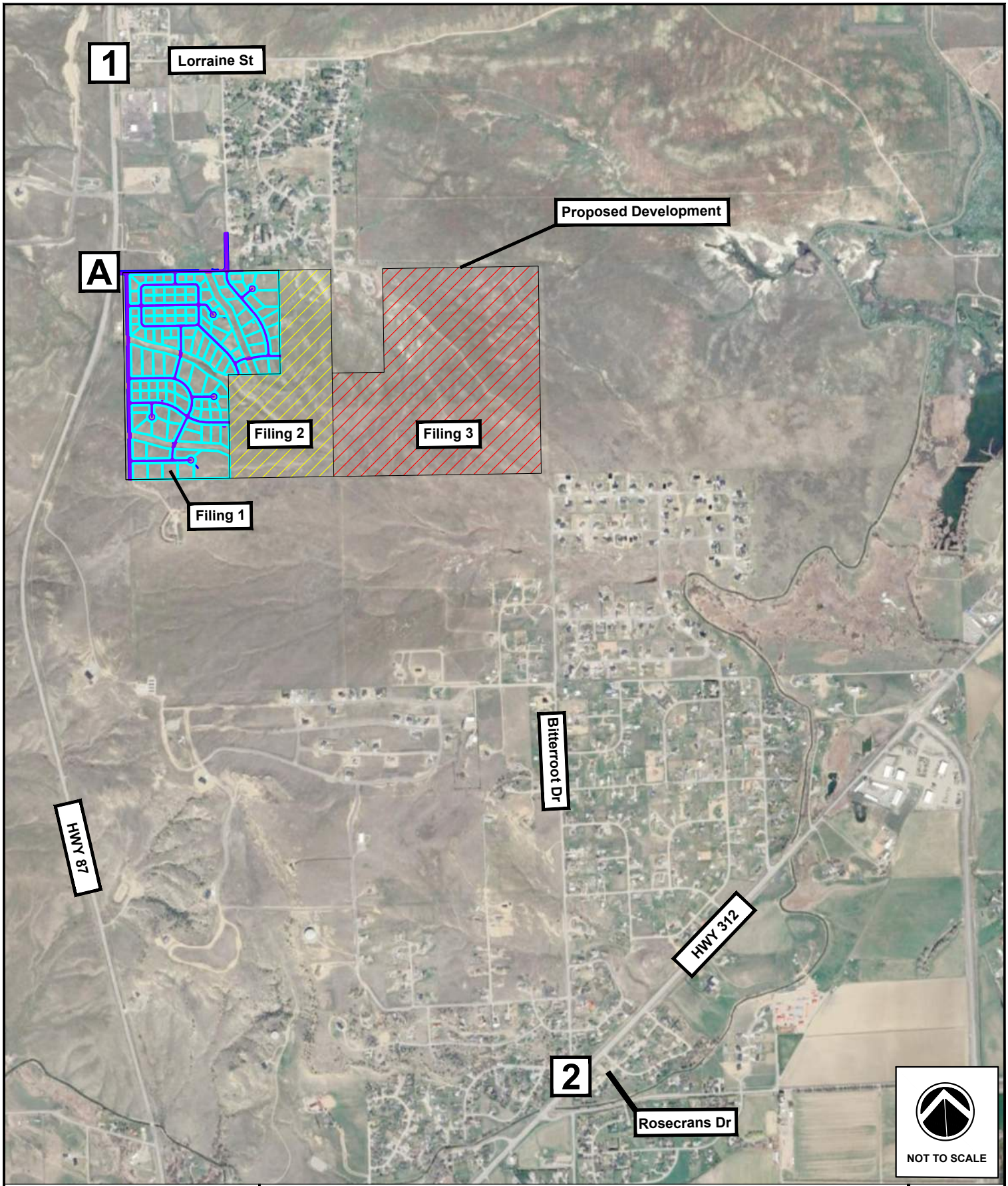

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STUDY LOCATION

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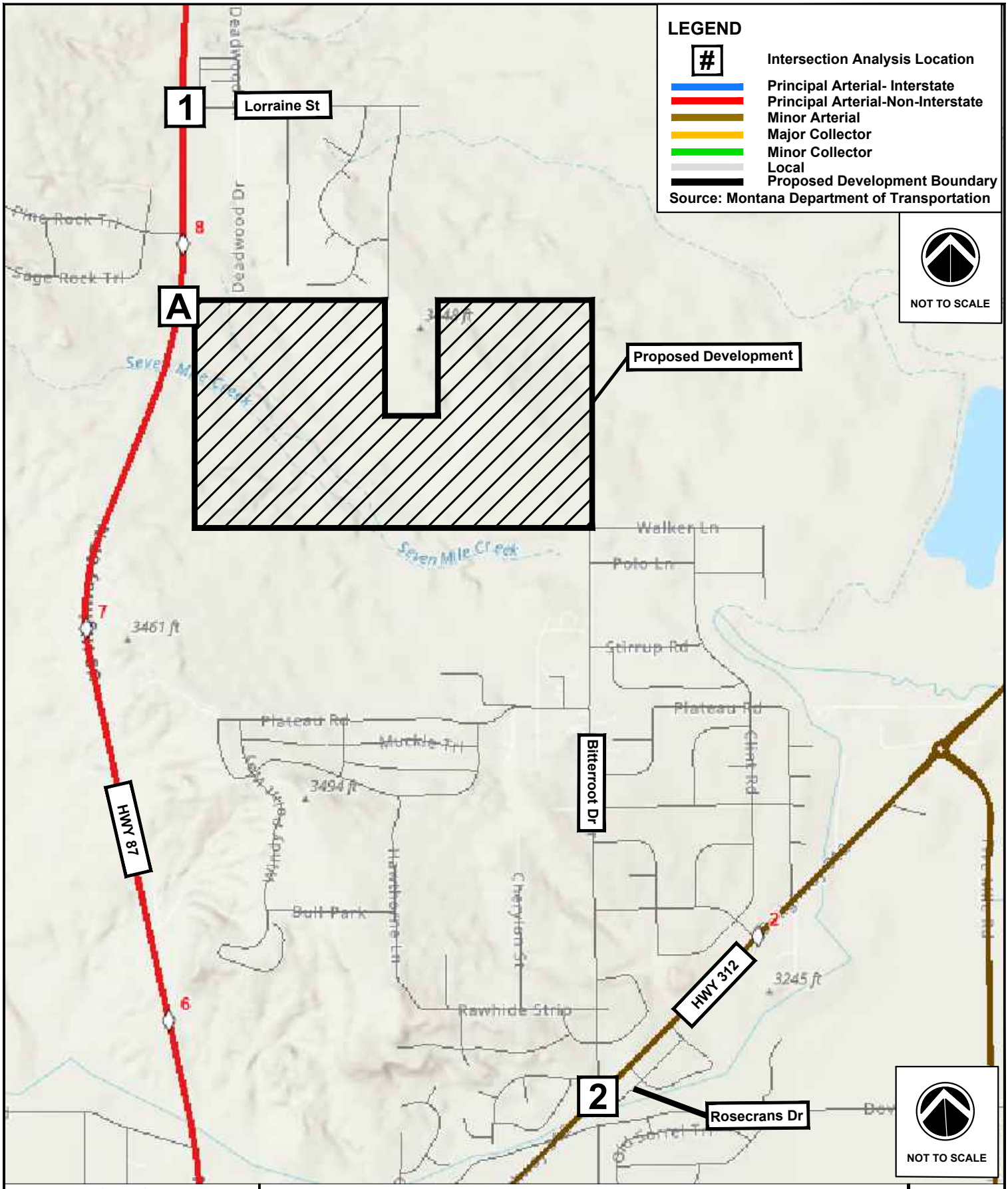
FIG - 1



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ROADWAY FUNCTIONAL CLASSIFICATION - MONTANA DEPARTMENT OF TRANSPORTATION

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	FIG - 2

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ROADWAY FUNCTIONAL CLASSIFICATION - CITY OF BILLINGS

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FIG - 2A

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2.6 Development Considerations

2.6.1 Crash Data

IMEG reached out to MDT on August 14, 2024, requesting additional information for historical crash data in the vicinity of the study area. MDT provided historical crash data for the two existing intersections within this study for the years between 2019-2023. No crash data was provided for the intersection of HWY 87 & Access A. The purpose of this section is to document the number of crashes, severity of crashes, and overall intersection crash rates at the two intersections being studied. The crash information was analyzed to identify intersections with crash characteristics that may warrant further study. General crash characteristics were evaluated along with potential causes. The crash information covers the five-year time period from 2019 to 2023. Appendix I contains the crash records provided by the Montana Department of Transportation. Table 2 shows the total number of crashes at each intersection.

To calculate the crash rate, severity index, and severity rate for the intersections described above, the formulas used by the Montana Department of Transportation Traffic and Safety Bureau were utilized, as defined by the following equations:

$$\boldsymbol{Intersection\ Crash\ Rate} = \frac{(Total\ \#\ of\ Crashes)(1{,}000{,}000\ Vehicles)}{(AADT\ Entering\ the\ Intersection)(Analysis\ Time\ Period)(365)}$$

$$\boldsymbol{MDT\ Severity\ Index} = \frac{(8 * Incap.\ \&\ F) + (3 * Non - Incap.\ \&\ PI) + (1 * PDO\ \&\ U)}{Total\ Crashes}$$

$$\boldsymbol{Severity\ Rate} = (Crash\ Rate)(Severity\ Index)$$

Where:

F = Fatal

PI = Possible Injury

Incap. = Incapacitated

PDO = Property Damage Only

U = Unknown

Table 2: Intersection Crashes in the Five-Year Period

INTERSECTION		# CRASHES
Intersection with 3-5 crashes		
HWY 312 & Bitterroot Drive/Rosecrans Drive	U-2W	4
Intersections with 0-2 crashes		
HWY 87 & Lorraine Street	U-1W	2
HWY 87 & Access A	U-1W	0

S=Signalized Intersection; U-1W=Unsignalized Intersection One-Way Stop Controlled; U-2W=Unsignalized Intersection Two-Way Stop Controlled; U-3W=Unsignalized Intersection Three-Way Stop Controlled; U-4W=Unsignalized Intersection Four-Way Stop Controlled.

Table 3 ranks the number of crashes against the annual average daily traffic (AADT) (provided by MDT's "MS2" traffic count software) entering each intersection, expressed as crashes per million entering vehicles (MEV). The formula above was used to determine the intersection rate, expressed in MEV. It is to note that the AADT utilized for each intersection was calculated by adding up the total AADT from 2019 to 2023 and dividing by five. Since both highways are "2-way" roads the final AADT was then divided by two to determine the AADT entering the intersection. For the data obtained at the intersection of HWY 87 and Lorraine St, MDT Traffic Count Station 56-4A-018 was used to determine AADT. For the data obtained at the intersection of HWY 312 & Bitterroot Dr & Rosecrans Dr, MDT Traffic Count Station 56-4A-282 was used to determine AADT.

Table 3: Intersection Crash Rate

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INTERSECTION		Number of Crashes	Volume*	Crash Rate
Intersections with 0.00 – 0.50 Intersection Crash Rate				
HWY 312 & Bitterroot Drive/Rosecrans Drive	U-2W	4	5,583	**0.39**
HWY 87 & Lorraine St	U-1W	2	2,936	**0.37**
HWY 87 & Access A	U-1W	0	2,936	**0.00**

S=Signalized Intersection; U-1W=Unsignalized Intersection One-Way Stop Controlled; U-2W=Unsignalized Intersection Two-Way Stop Controlled; U-3W=Unsignalized Intersection Three-Way Stop Controlled; U-4W=Unsignalized Intersection Four-Way Stop Controlled.

**AADT was calculated by adding up the total AADT from 2019 to 2023 and dividing by five. Since both highways are "2-way" roads the final AADT was then divided by two to determine the AADT entering the intersection.*

Table 4 illustrates a detailed look at the crashes to determine the MDT "severity index rating." The severity index is a ratio that shows where the most sever types of crashes occur. Crashes were put into five categories of severity: property damage (PDO), possible injury crash, minor injury crash, serious injury crash, and fatal injury crash. The severity index rating is then determined using the equation above. Also shown is the severity rate, which uses the equation above by multiplying the crash rate by the severity index.

Table 4: MDT Severity Index and Rate

INTERSECTION	PDO/Unknown	Possible Injury	Minor Injury	Serious Injury	Fatal Injury	Severity Index	Severity Rate
Intersection with 1.00 – 1.99 Severity Rate							
HWY 87 & Lorraine Street	1	0	1	0	0	3.50	**1.31**
Intersection with 0 – 0.99 Severity Rate							
HWY 312 & Bitterroot Drive/Rosecrans Drive	4	0	0	0	0	1.00	**0.39**
HWY 87 & Access A	0	0	0	0	0	0.00	**0.00**

2.6.2 Approach Site Triangles

The proposed site conditions, features, and structures were evaluated using the following sight distance equation:

$$b = 1.47 V_{major} t_g$$

Where:

b = length of leg of sight triangle along the major road (ft)

$\mathbf{V_{major}}$ = design speed of major road (mph)

$\mathbf{t_g}$ = travel time to reach and clear the major road (sec)

For evaluating the left turn from the Minor Road (Case B1) a value of 7.5 is provided for passenger cars, however a conservative 9.5 for single-unit trucks was used for t_g provided in Table 9.6. For evaluating the right turn from the Minor Road (Case B2) a value of 6.5 is provided for passenger cars, however a conservative 8.5 for single-unit trucks was used for t_g, provided in Table 9.8. Both Table 9.6 and 9.8 are from A Policy on Geometric Design of Highways and Streets, 2018 7th edition. The conservative design vehicle chosen for analysis was a Single-Unit Truck since the proposed development is intended for mainly residential use and large delivery vehicles are not expected on a frequent basis, but rather smaller residential delivery vehicles are expected more regularly. It is assumed the design speed equals the posted speed limit, which is 70 mph. Figure 3 below depicts the sight distance triangles for Intersection A. Currently there are no existing or proposed features that impact the drivers site triangle distance. As such, no further considerations are justified, and the current conditions are understood to be maintained through development.

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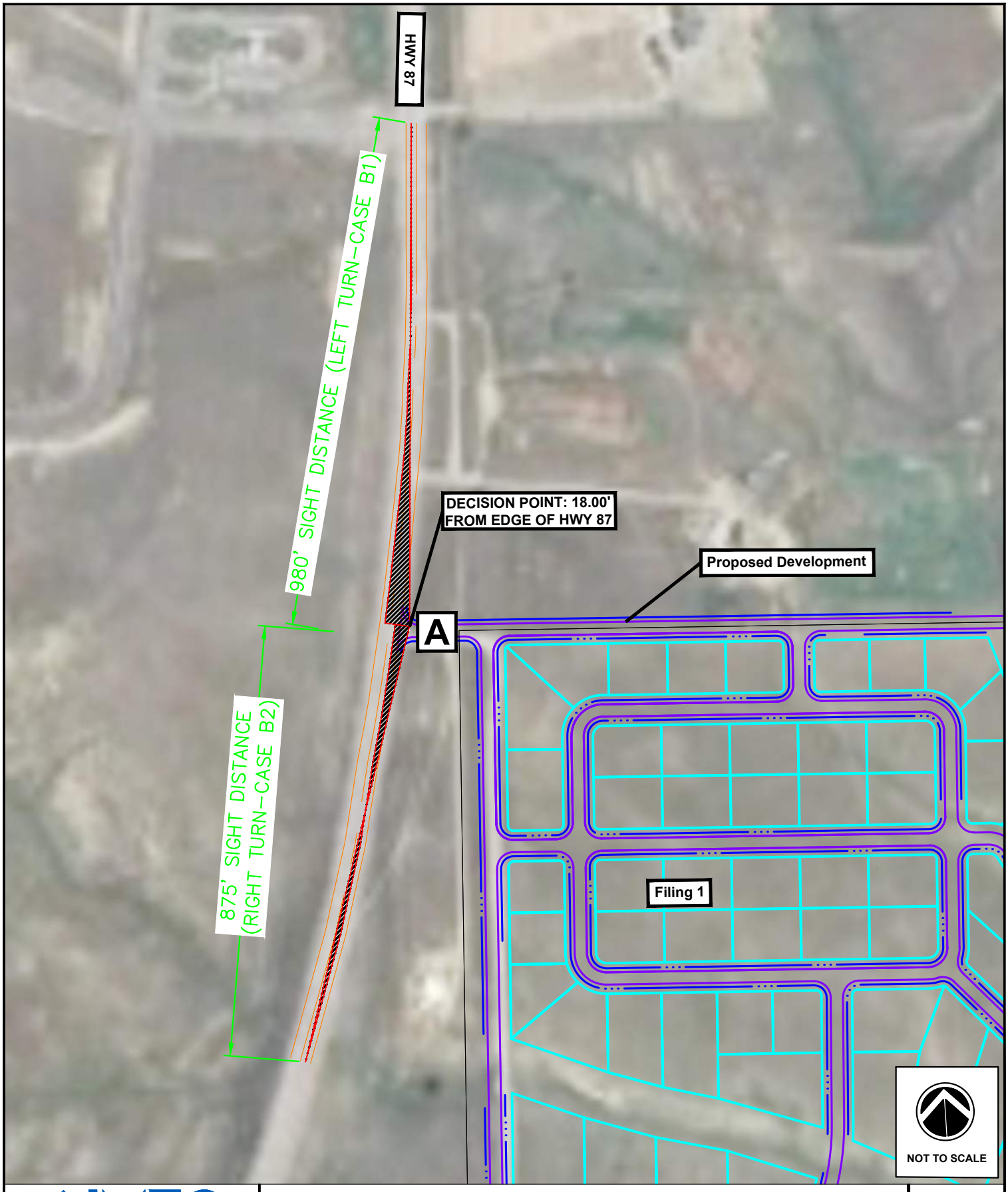

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PRONGHORN SUBDIVISION TRAFFIC IMPACT STUDY

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INTERSECTION A SIGHT DISTANCE

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FIG - 3

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3 PROJECTED TRAFFIC – TRIP GENERATION AND DISTRIBUTION

3.1 Roadway Traffic Forecast

Using the annualized growth rate equation below as well as the population data provided by the Census report, the initial population (2020) was 117,116 and the final population (2024) was 121,483. Making the growth rate of Billings, MT 0.92% and to be conservative, a growth rate of 1.00% was used. Beginning with the opening year of 2034 this growth factor will be used to project the peak hour turning movement volumes to the full build year of 2054.

The annualized growth factor was determined using the equation:

$$Growth\ Rate = \left(\frac{P_{final}}{P_{initial}}\right)^{\frac{1}{n}} - 1$$

Where:

P = Population final/initial

n = Number of Years

3.2 Proposed Development Site

The proposed development is located on four unplatted parcels in Section 35, Township 02 North, Range 26 East, Yellowstone County, Montana. The development is generally located east of HWY 87, south of the residential neighborhood described as Hidden Lake Subdivision east of HWY 87, and southeast of the residential neighborhood described as Pine Rock Subdivision west of HWY 87.

The proposed development will be completed in up to three (3) separate filings. The first filing will encompass a total gross area of 100.08 acres and will include 124 lots, of which 85 will be designated for commercial use and 39 for residential use. The remaining filings will consist exclusively of residential lots ranging in size from three-quarters of an acre to one acre.

The first filing of the proposed development is expected to be fully built out by 2034. Several lots are expected to include small personal-use lofts where each unit includes access to a small restroom. These features support the assumption that the commercial development will primarily cater to owner-operated, low-occupancy businesses rather than high-traffic commercial enterprises. Each subsequent filing is anticipated to require an additional 10 years for full build-out.

For the purpose of this study, all filings are included in the analysis as a master plan. The total number of residential lots for the subsequent filings was estimated based on a total area of 200 acres, accounting for a 10% park allocation and a 15% right-of-way allocation. This calculation resulted in an estimated additional 175 residential lots, evenly split between three-quarter-acre and one-acre lots.

Water and sewer services will be provided to each lot via individual cisterns and septic systems. To estimate trip generation for the development, land use codes from the Institute of Transportation Engineers (ITE) were applied. Specifically, ITE Code 140 – Manufacturing, ITE Code 151 – Mini-Warehouse, ITE Code 210 – Single-Family Detached Housing, and ITE Code 712 – Small Office Building were determined to be the most applicable. The site plan, provided in Appendix A, illustrates the proposed development area and the general location of one planned entrance/exit. IMEG previously completed a TIS for the Shop World 2 Subdivision in Billings, Montana. That development was similar to the commercial lots classified under ITE Code 140 – Manufacturing. As shown in Appendix K, IMEG counted existing trip generation

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rates at the Shop World 1 Subdivision, which is similar to both Shop World 2 and the proposed development. The recorded peak-hour trip movements were low, indicating that the trip generation used for the proposed development is conservative.

3.3 2034 (Filing 1) Trip Distribution

There are two proposed access locations for the development, Access A from HWY 87 and Lorraine St from HWY 87. It is assumed that approximately 92% of the development's trips will utilize Access A and 8% will utilize access to Lorraine St. Percentages were assumed based on the proximity to the access streets and the nearest major intersections.

Based on existing turning movements from the intersection of HWY 87 and Lorraine St, it is assumed that 96% of the traffic exiting the development at Access A will turn left onto HWY 87 and 4% will turn right during the AM peak hour. Return trips during the PM peak hour were assumed to enter the development using the same distribution. It is also assumed based on existing turning movements that 96% of traffic exiting from the development at Lorraine St will turn left onto HWY 87 and 4% will turn right during the AM peak hour. Return trips during the PM peak hour were assumed to enter the development using the same distribution.

Percentages were assumed based on the proximity to the access streets and the nearest major intersections as well as existing turning movements. Figure 5 shows the generated trip assignments for both the AM and PM peak hours. A summary of the trips generated can be found in Table 5. ITE Trip Generation Worksheets are shown in Appendix E.

3.4 2054 (Master Plan) Trip Distribution

There are three proposed access locations for the development, Access A from HWY 87, Lorraine St from HWY 87, and Bitterroot Dr from HWY 312. It is assumed that approximately 80% of the development's trips will utilize Access A, 15% will utilize access to Bitterroot Dr, and 5% will utilize access to Lorraine St. Percentages were assumed based on the proximity to the access streets and the nearest major intersections.

Based on existing turning movements, it is assumed that 96% of the traffic exiting the development at Access A will turn left onto HWY 87 and 4% will turn right during the AM peak hour. Return trips during the PM peak hour were assumed to enter the development using the same distribution. It is also assumed that 96% of traffic exiting from the development at Lorraine St will turn left onto HWY 87 and 4% will turn right during the AM peak hour. Return trips during the PM peak hour were assumed to enter the development using the same distribution.

Based on existing turning movements, it is assumed that 99% of the traffic exiting the development at Bitterroot Dr will turn right onto HWY 312 and 1% will turn left during the AM exiting peak hour. The exiting trips for the PM peak hour were assumed to use the same distribution. For the entering AM peak hour, it is assumed that 99% of the traffic entering the development at HWY 312 will turn left onto Bitterroot Dr and 1% will turn right from HWY 312 . For the entering PM peak hour, it is assumed that 85% of the traffic entering the development at HWY 312 will turn left onto Bitterroot Dr and 15% will turn right from HWY 312.

Percentages were assumed based on the proximity to the access streets and the nearest major intersections as well as existing turning movements. Figure 6 shows the generated trip assignments for both the AM and PM peak hours. A summary of the trips generated can be found in Table 6. ITE Trip Generation Worksheets are shown in Appendix E.

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Table 5: 2034 Full Occupancy Trip Generation Summary

2034 Trip Generation – Filing 1										
Time Period	Land Use	ITE Code	Variable	Quantity	Avg Rate	Total Trips	Trips In	Trips Out	% Enter	% Exit
AM	Mini-Warehouse	151	Storage Units	46	1.70	2	1	1	51%	49%
PM	Mini-Warehouse	151	Storage Units	46	8.33	9	4	5	50%	50%
AM	Single-Family Detached Housing	210	Dwelling Units	39	0.70	27	7	20	25%	75%
PM	Single-Family Detached Housing	210	Dwelling Units	39	0.94	37	23	14	63%	37%
AM	Manufacturing	140	1000 Sq. Ft. GFA	5/Lot (6 Lots)	0.51	18	14	4	76%	24%
PM	Manufacturing	140	1000 Sq. Ft. GFA	5/Lot (6 Lots)	0.63	18	6	12	31%	69%
AM	Manufacturing	140	1000 Sq. Ft. GFA	10/Lot (7 Lots)	0.51	35	27	8	76%	24%
PM	Manufacturing	140	1000 Sq. Ft. GFA	10/Lot (7 Lots)	0.63	42	13	29	31%	69%
AM	Small Office Building	712	Employees	2/Lot (26 Lots)	1.06	55	48	7	85%	15%
PM	Small Office Building	712	Employees	2/Lot (26 Lots)	1.08	56	19	37	33%	67%
					Totals	**299**	**162**	**137**		

Table 6: 2054 Full Occupancy Trip Generation Summary

2054 Trip Generation – Master Plan										
Time Period	Land Use	ITE Code	Variable	Quantity	Avg Rate	Total Trips	Trips In	Trips Out	% Enter	% Exit
AM	Mini-Warehouse	151	Storage Units	46	1.70	2	1	1	51%	49%
PM	Mini-Warehouse	151	Storage Units	46	8.33	9	4	5	50%	50%
AM	Single-Family Detached Housing	210	Dwelling Units	214	0.70	150	38	112	25%	75%
PM	Single-Family Detached Housing	210	Dwelling Units	214	0.94	201	127	74	63%	37%
AM	Manufacturing	140	1000 Sq. Ft. GFA	5/Lot (6 Lots)	0.51	18	14	4	76%	24%
PM	Manufacturing	140	1000 Sq. Ft. GFA	5/Lot (6 Lots)	0.63	18	6	12	31%	69%
AM	Manufacturing	140	1000 Sq. Ft. GFA	10/Lot (7 Lots)	0.51	35	27	8	76%	24%
PM	Manufacturing	140	1000 Sq. Ft. GFA	10/Lot (7 Lots)	0.63	42	13	29	31%	69%
AM	Small Office Building	712	Employees	2/Lot (26 Lots)	1.06	55	48	7	85%	15%
PM	Small Office Building	712	Employees	2/Lot (26 Lots)	1.08	56	19	37	33%	67%
					Totals	**586**	**297**	**289**		

3.5 Nearby Developments

IMEG reached out to Yellowstone County Public Works and, at the time of this TIS, there are no proposed nearby developments. Any future developments will need to perform a separate TIS.

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4 TRAFFIC OPERATIONAL ANALYSIS

4.1 Analysis Description

Traffic volumes provide a general view of where the traffic is coming and going through the intersection. The concept of Level of Service (LOS) is to take the traffic volumes and then provide an overall operational analysis of the intersection or each leg of the intersection based on travel delay.

For unsignalized intersections, the LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. LOS has a range of LOS "A" (best) to LOS "F" (worst). Table 7 shows the Level of Service definitions and delay for both signalized and unsignalized intersections.

Table 7: Level of Service Definitions

Level of Service	Signalized Intersection Control Delay (sec/veh)	All-way Stop, Two-Way Stop, and Roundabout Intersection Control Delay (sec/veh)
A	≤= 10	≤= 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55-80	> 35 - 50
F	> 80; Volume Exceeds Capacity	> 50; Volume Exceeds Capacity
Source: Highway Capacity Manual 7th Edition		

LOS "C" is typically considered a minimum acceptable level of service, although exceptions could be made in specific cases. In *Figure 30.2B* Chapter 30 Section 2 of the Road Design Manual produced by the Montana Department of Transportation the minimum LOS for a Urban Principal Arterial – Non-Interstate is an LOS C, and for an Urban Minor Arterial Road is an LOS C.

If the intersection LOS exceeds (worse) these study goals, it demonstrates operational, or capacity related needs to be addressed for any potential improvements.

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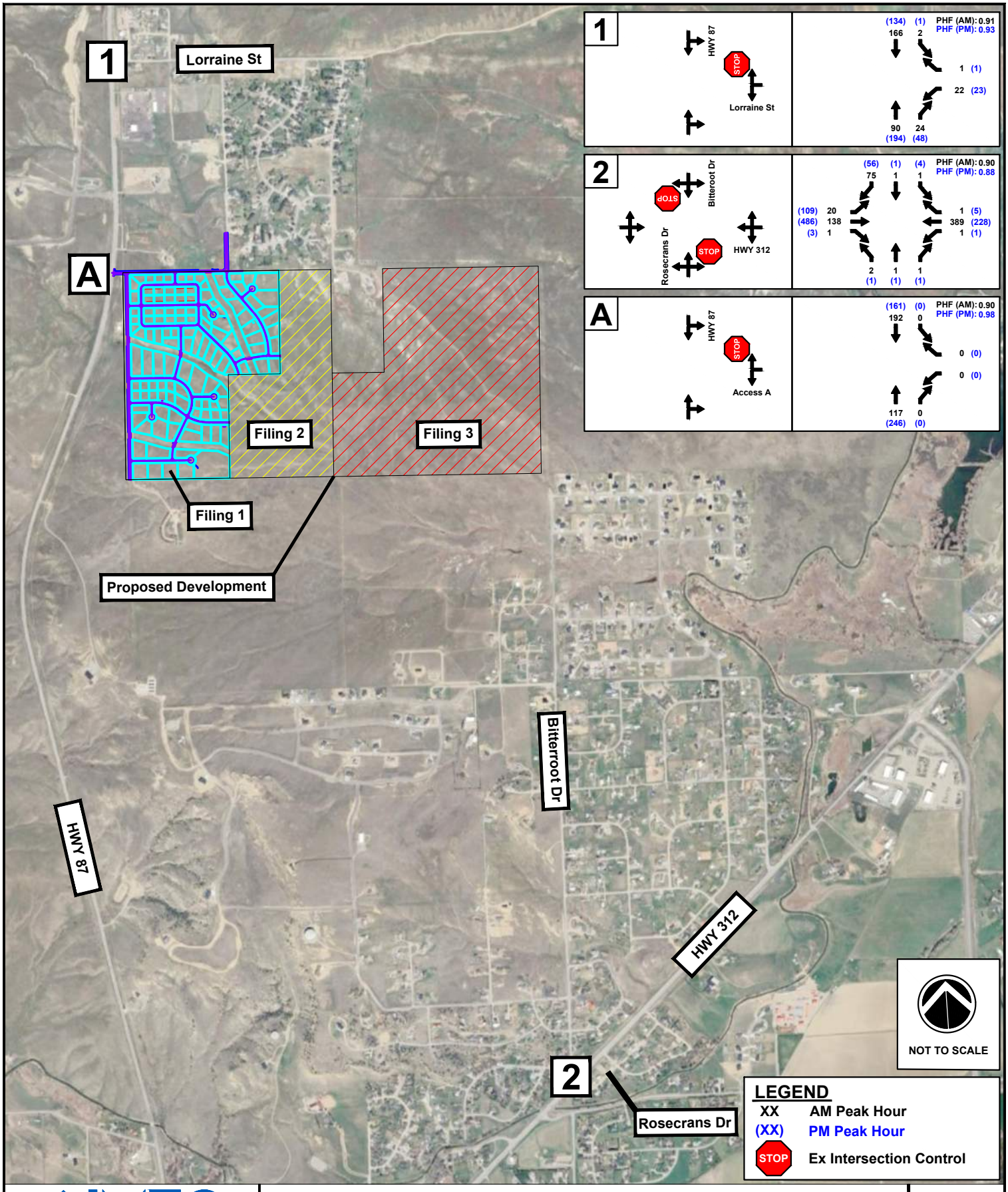

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PRONGHORN SUBDIVISION TRAFFIC IMPACT STUDY

BILLINGS, MONTANA

2024 EXISTING CONDITIONS PEAK HOUR TURNING MOVEMENT VOLUMES

IMEG Project No:	24001698.00
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Date:	05/12/2025
	FIG - 4

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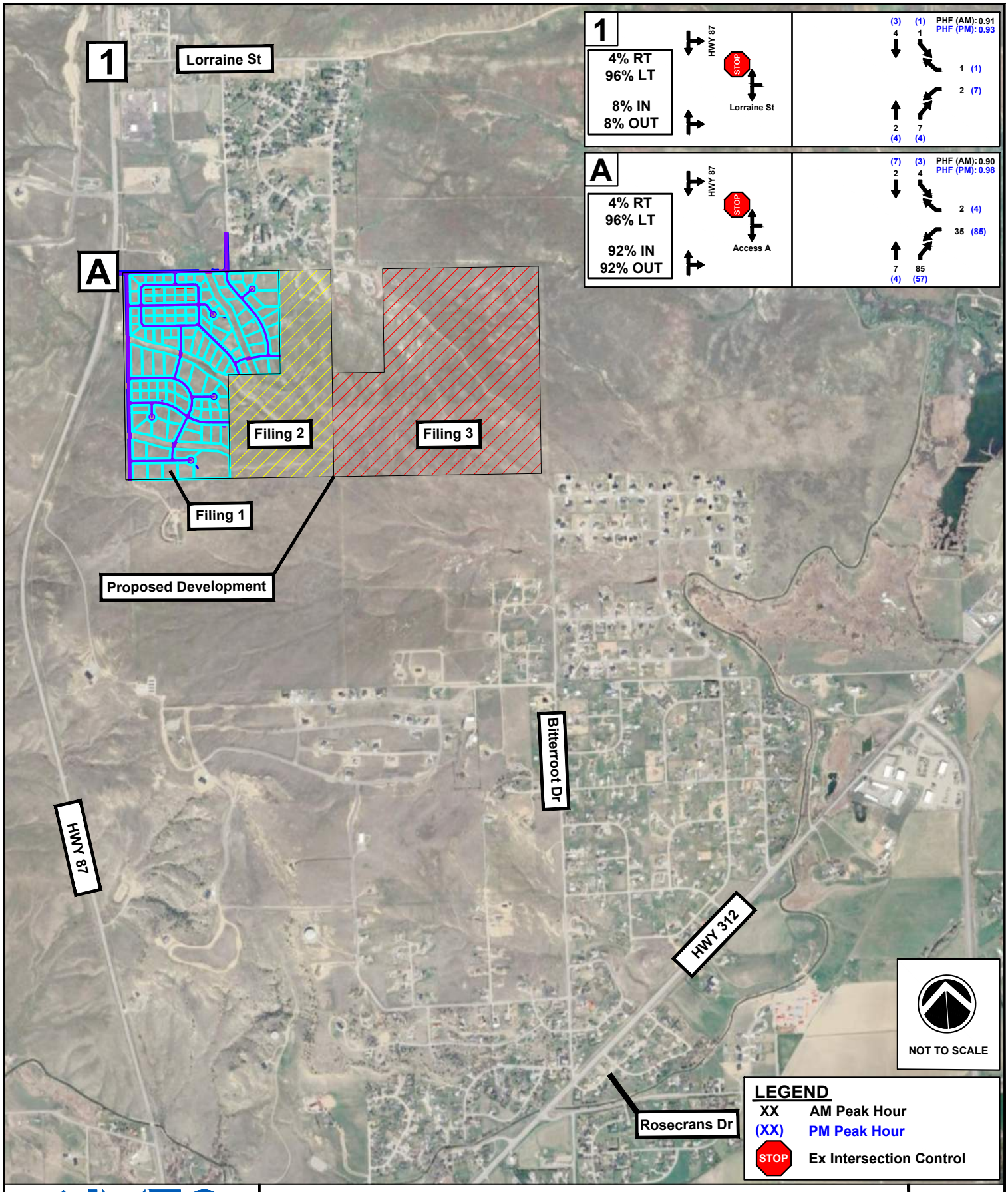

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PRONGHORN SUBDIVISION TRAFFIC IMPACT STUDY

BILLINGS, MONTANA

2034 TRIP DISTRIBUTION & TRAFFIC ASSIGNMENT SUMMARY

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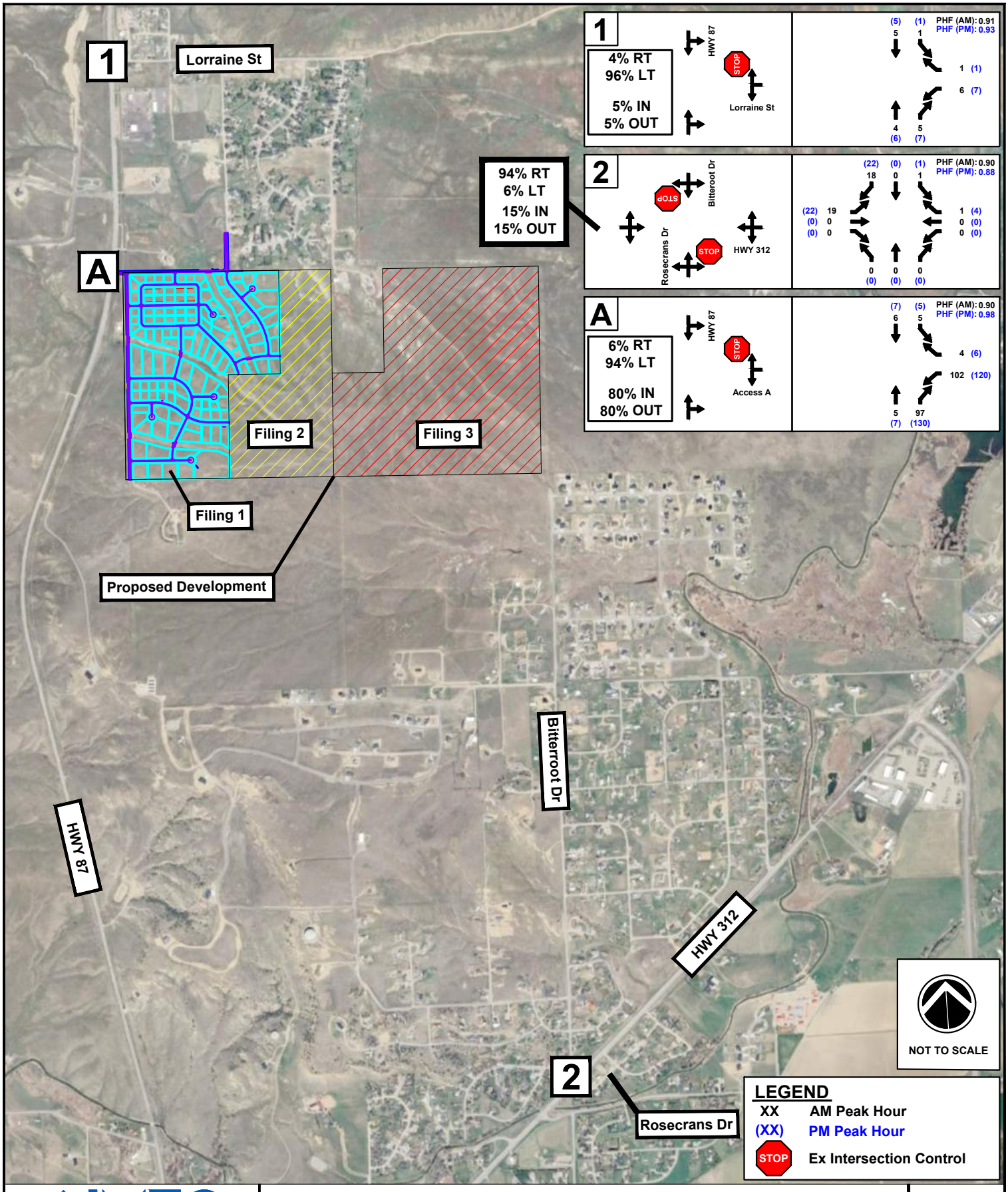
Date: 05/12/2025
FIG - 5



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PRONGHORN SUBDIVISION TRAFFIC IMPACT STUDY

BILLINGS, MONTANA

2054 TRIP DISTRIBUTION & TRAFFIC ASSIGNMENT SUMMARY

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	FIG - 6

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4.2 2034 and 2054 Capacity and Level of Service

A capacity analysis was performed for the projected 2034 and 2054 background traffic volumes based on a 1.00% population growth rate for the same lane configuration used for the existing 2024 capacity analysis. See **Figure 7**, **Figure 8, Figure 9,** and **Appendix D** for the Highway Capacity Software (HCS) results. **Table 8** and **Table 9** below summarize the Highway Capacity Software (HCS) results, which can also be found in **Appendix C**.

Table 8: 2034 Background Traffic Peak Hour Capacity Analysis Summary

No.	Intersection	Approach	2034 Background Traffic Peak Hour Capacity Analysis Summary					
			AM PEAK HOUR			PM PEAK HOUR		
			Approach Delay	Approach LOS	95th % Queue (veh)	Approach Delay	Approach LOS	95th % Queue (veh)
Intersection Control			*One-Way Stop Control (WB)*					
1	HWY 87 & Lorraine St	EB						
		WB	10.5	B	1	11.3	B	1
		NB	FREE-FLOW/NO DELAY			FREE-FLOW/NO DELAY		
		SB	0.1	A	0	0.1	A	0
Intersection Control			*Two-Way Stop Control (NB/SB)*					
2	HWY 312 & Bitterroot Dr	EB	1.2	A	1	1.9	A	1
		WB	0	A	0	0.1	A	0
		NB	11.6	B	0	16.7	C	1
		SB	10.6	B	1	10.2	B	1

Table 9: 2054 Background Traffic Peak Hour Capacity Analysis Summary

No.	Intersection	Approach	2054 Background Traffic Peak Hour Capacity Analysis Summary					
			AM PEAK HOUR			PM PEAK HOUR		
			Approach Delay	Approach LOS	95th % Queue (veh)	Approach Delay	Approach LOS	95th % Queue (veh)
Intersection Control			*One-Way Stop Control (WB)*					
1	HWY 87 & Lorraine St	EB						
		WB	11.2	B	1	12.3	B	1
		NB	FREE-FLOW/NO DELAY			FREE-FLOW/NO DELAY		
		SB	0.1	A	0	0.2	A	0
Intersection Control			*Two-Way Stop Control (NB/SB)*					
2	HWY 312 & Bitterroot Dr	EB	1.3	A	1	2.2	A	1
		WB	0	A	0	0.1	A	0
		NB	12.7	B	0	24.5	C	1
		SB	11.4	B	1	11.4	B	1
Intersection Control			*One-Way Stop Control (WB)*					
Access	HWY 87 & Access A	EB						
		WB	11.3	B	1	12.2	B	1
		NB	FREE-FLOW/NO DELAY			FREE-FLOW/NO DELAY		
		SB	0.1	A	0	0.2	A	0

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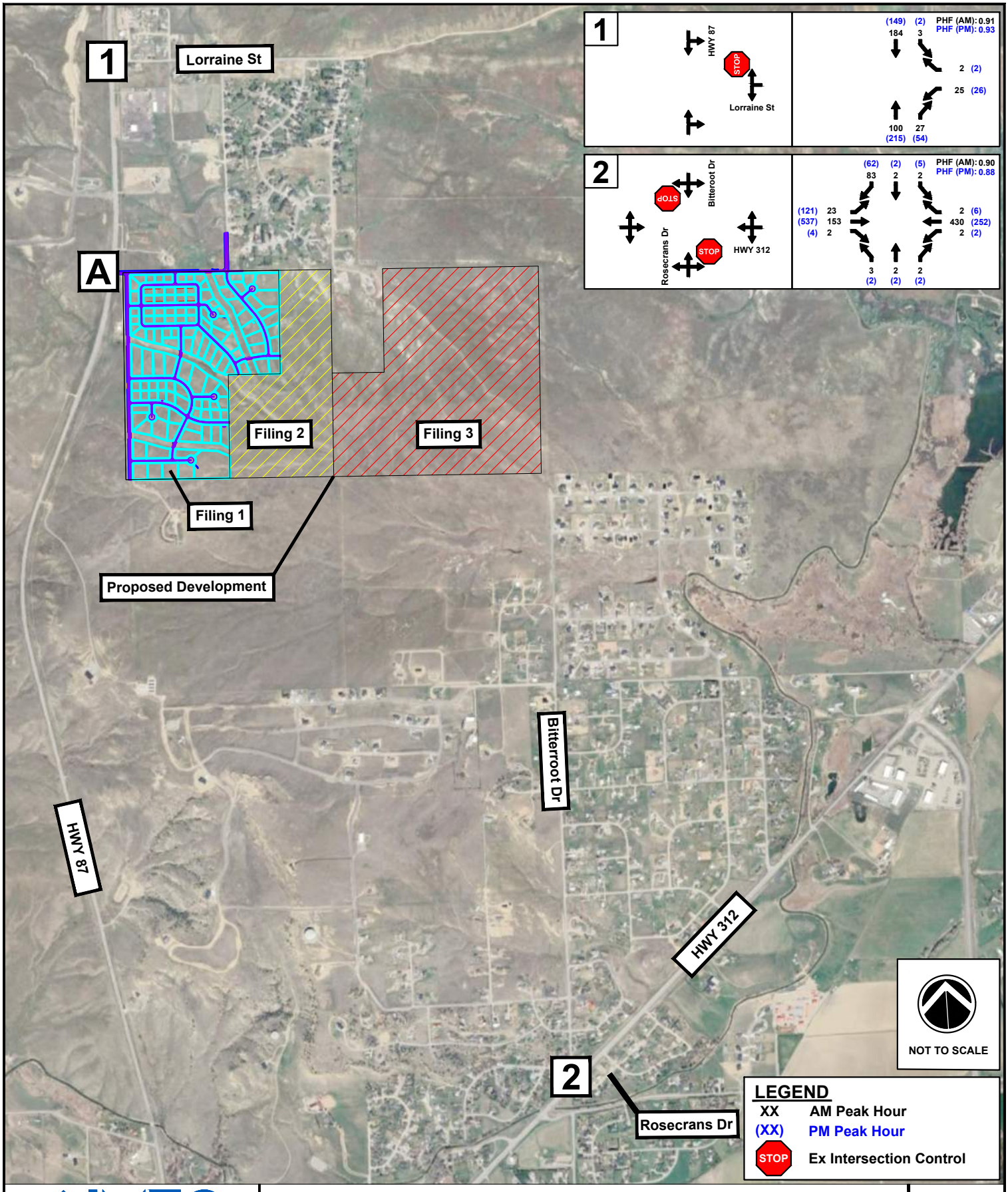

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PRONGHORN SUBDIVISION TRAFFIC IMPACT STUDY

BILLINGS, MONTANA

2034 Filing 1 BACKGROUND TRAFFIC MOVEMENTS

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FIG - 7

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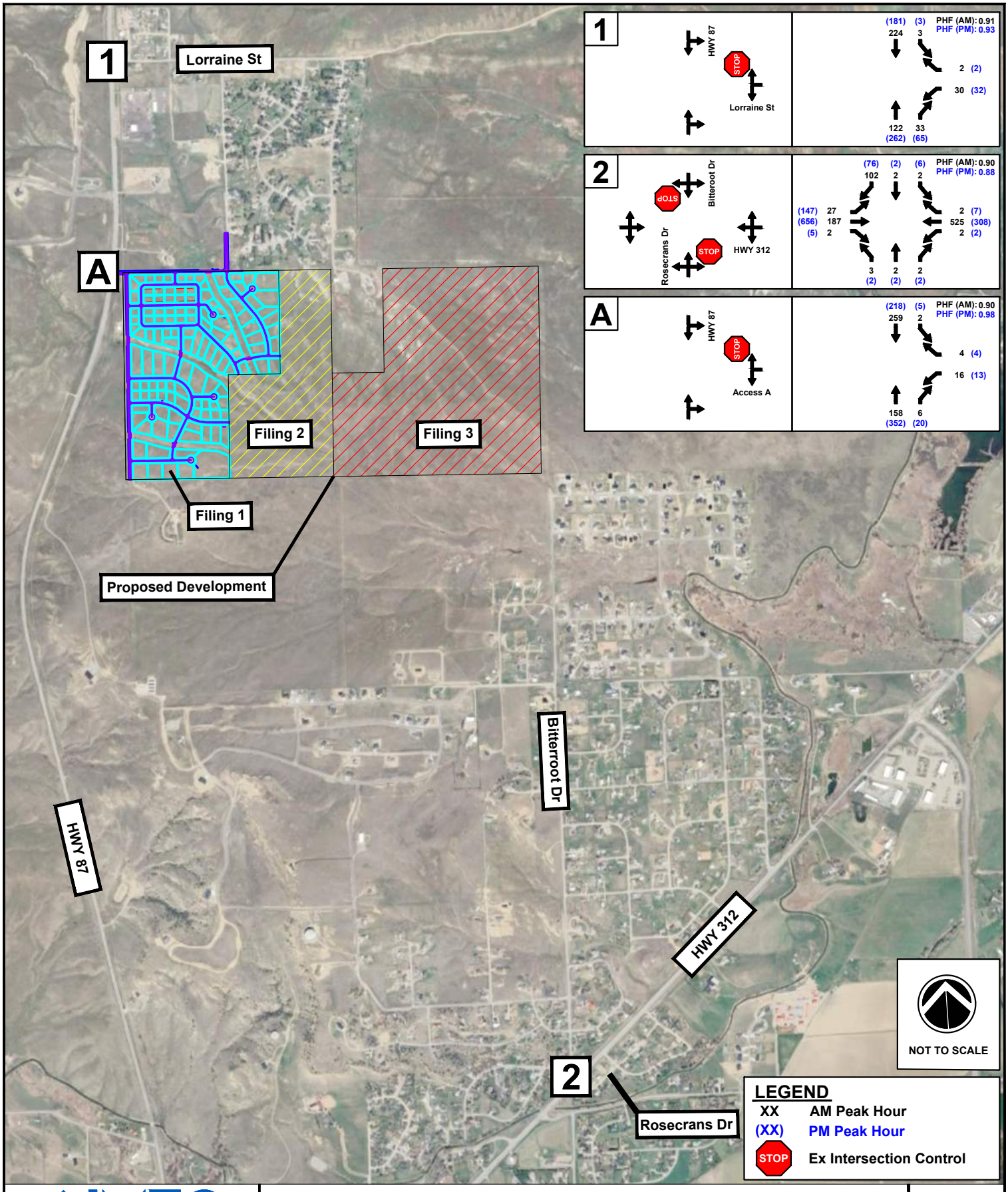

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BILLINGS, MONTANA

2054 BACKGROUND TRAFFIC MOVEMENTS

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FIG - 8

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4.3 2034 & 2054 Projected Traffic Capacity plus Development Traffic

A capacity analysis was performed for the 2034 and 2054 traffic volumes using the existing lane configurations for the intersection study locations. 2034 is the anticipated year that Filing 1 of development will be fully occupied. 2054 is the anticipated year that the whole development will be fully occupied. The 2024 traffic volumes were increased by the previously mentioned growth factor of 1.00%. See **Figure 9** and **Figure 10** and **Appendix D** for the Highway Capacity Software (HCS) results. A summary of the 2034 and 2054 projected traffic capacity calculations can be found in **Table 10** and **Table 11.**

Table 10: 2034 Future Capacity Analysis Summary Plus Development Traffic

No.	Intersection	Approach	2034 Capacity Analysis Summary Plus Development Traffic					
			AM PEAK HOUR			PM PEAK HOUR		
			Approach Delay (sec/veh)	Approach LOS	95th % Queue (veh)	Approach Delay (sec/veh)	Approach LOS	95th % Queue (veh)
Intersection Control			*One-Way Stop Control (WB)*					
1	HWY 87 & Lorraine St	EB						
		WB	10.6	B	1	11.5	B	1
		NB	FREE-FLOW/NO DELAY			FREE-FLOW/NO DELAY		
		SB	0.2	A	0	0.2	A	0
Intersection Control			*One-Way Stop Control (WB)*					
Access	HWY 87 & Access A	EB						
		WB	11.7	B	1	13.1	B	1
		NB	FREE-FLOW/NO DELAY			FREE-FLOW/NO DELAY		
		SB	0.2	A	0	0.1	A	0

Table 11: 2054 Future Capacity Analysis Summary Plus Development Traffic

No.	Intersection	Approach	2054 Capacity Analysis Summary Plus Development Traffic					
			AM PEAK HOUR			PM PEAK HOUR		
			Approach Delay	Approach LOS	95th % Queue (veh)	Approach Delay	Approach LOS	95th % Queue (veh)
Intersection Control			*One-Way Stop Control (WB)*					
1	HWY 87 & Lorraine St	EB						
		WB	11.4	B	1	12.6	B	1
		NB	FREE-FLOW/NO DELAY			FREE-FLOW/NO DELAY		
		SB	0.2	A	0	0.2	A	0
Intersection Control			*Two-Way Stop Control (NB/SB)*					
2	HWY 312 & Bitterroot Dr	EB	1.7	A	1	1.7	A	1
		WB	0	A	0	0.1	A	0
		NB	13.2	B	1	25.8	D	1
		SB	11.6	B	1	11.6	B	1
Intersection Control			*One-Way Stop Control (WB)*					
Access	HWY 87 & Access A	EB						
		WB	14.2	B	1	16.5	C	2
		NB	FREE-FLOW/NO DELAY			FREE-FLOW/NO DELAY		
		SB	0.2	A	0	0.2	A	0

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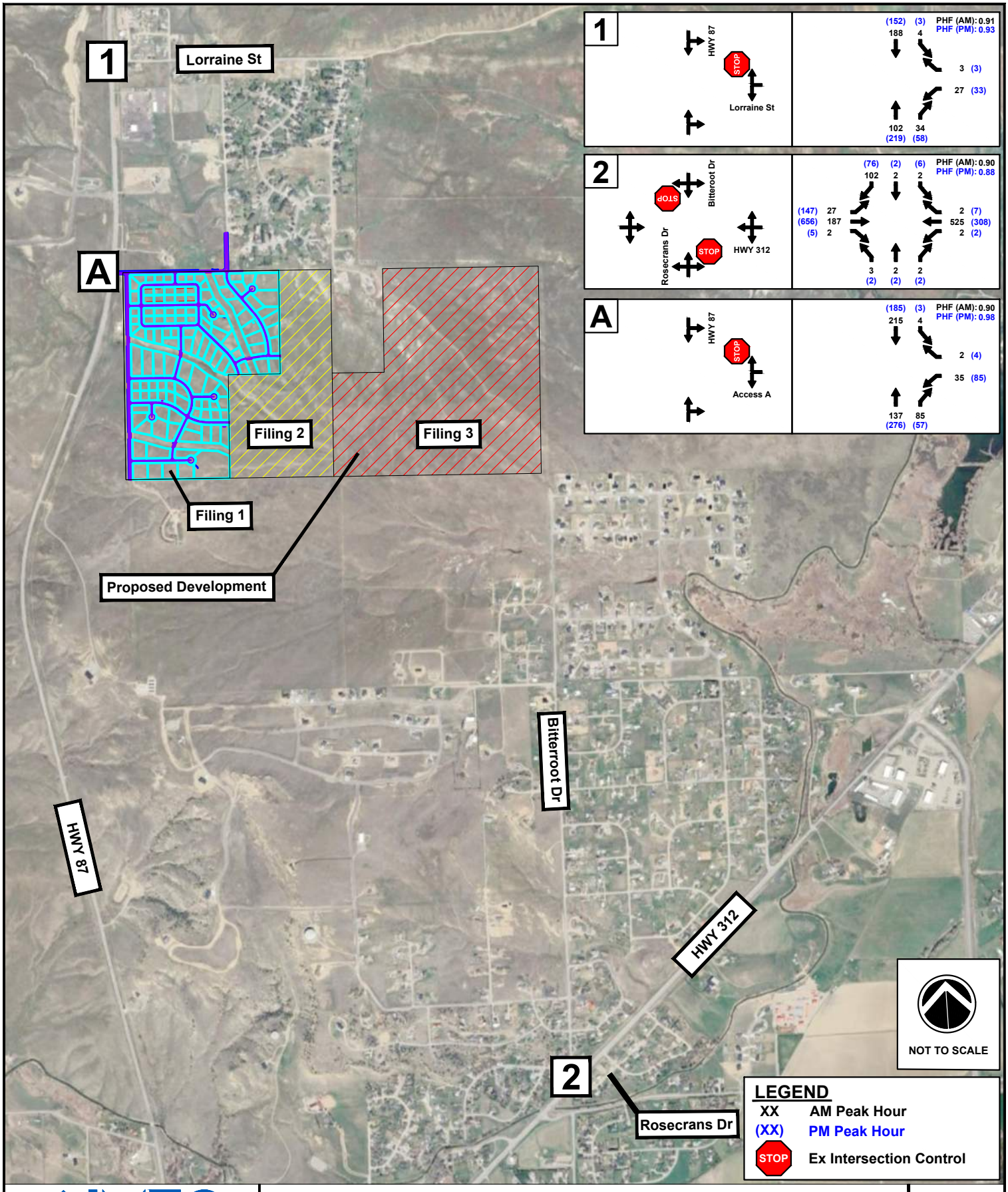

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PRONGHORN SUBDIVISION TRAFFIC IMPACT STUDY

BILLINGS, MONTANA

2034 FILING 1 FULL OCCUPANCY PEAK HOUR TURNING MOVEMENT PROJECTIONS

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	FIG - 9

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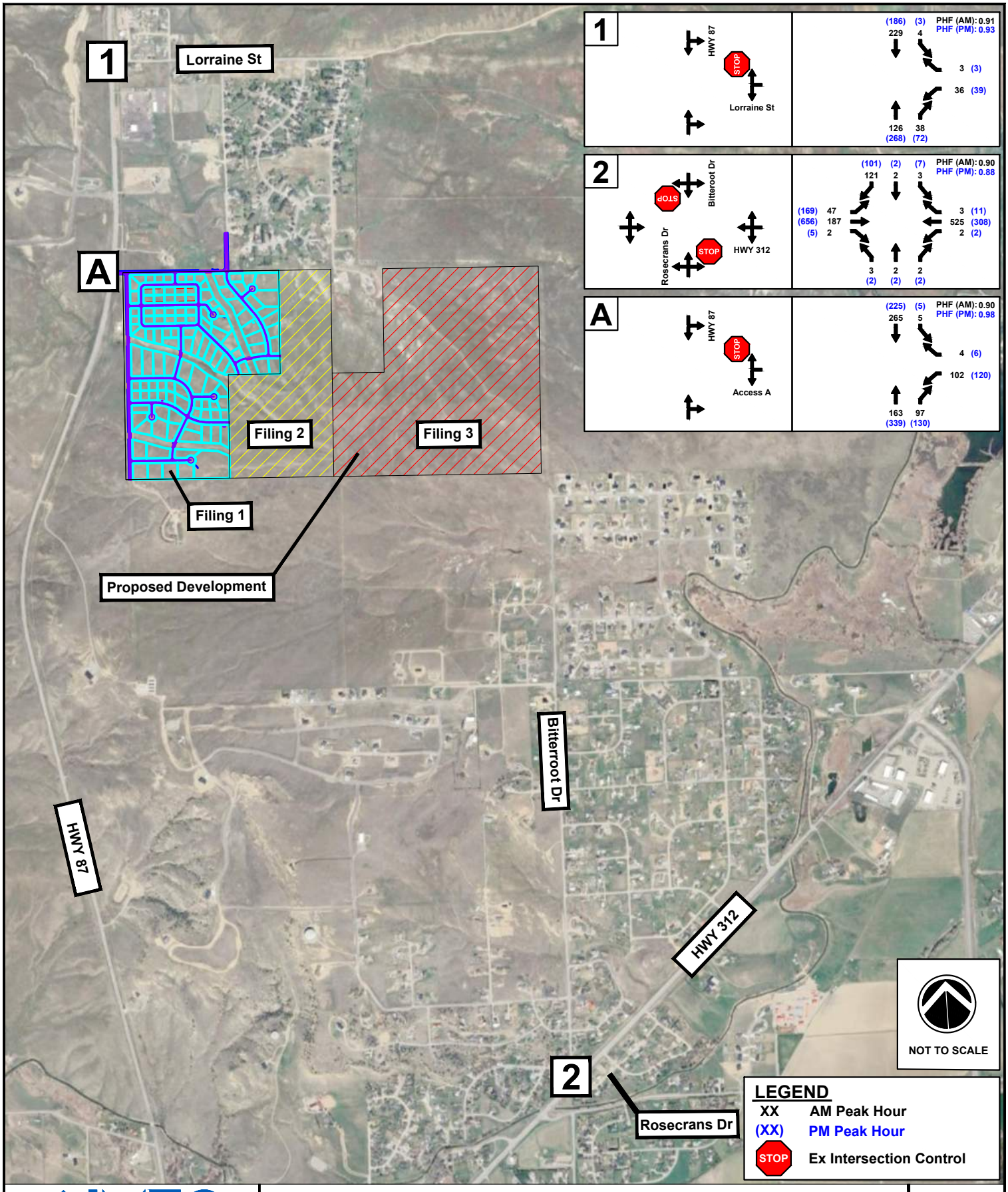

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BILLINGS, MONTANA

2054 FULL OCCUPANCY PEAK HOUR TURNING MOVEMENT PROJECTIONS

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FIG - 10

5 ADDITIONAL TRAFFIC OPERATIONAL ANALYSIS

5.1 Traffic Signal Warrant Analysis

A traffic signal warrant analysis was performed by using the Highway Capacity Software (HCS) MUTCD Warrants function. Meeting a signal warrant is an indication that the intersection could be considered for the installation of traffic signals. **Table 12** below summarizes the signal warrant calculations, taking into account seasonally adjusted traffic counts, pedestrian movements, and articulated trucks for each hour between 7:00 am and 6:00pm for both the existing 2024 development year and the full build year 2054. Additional signal warrant analysis information can be found in **Appendix E**.

Table 12: Signal Warrant Analysis Summary

Traffic Signal Warrants	2024	2054	2024	2054
	Intersection 1 HWY 87 & Lorraine St		Intersection 2 HWY 312 & Bitterroot Dr	
Warrant 1, Eight-Hour Vehicular Volume	NO	NO	NO	YES
Warrant 2, Four-Hour Vehicular Volume	NO	NO	NO	NO
Warrant 3, Peak Hour	NO	NO	NO	NO
Warrant 4, Pedestrian Volume				
Warrant 5, School Crossing				
Warrant 6, Coordinated Signal System				
Warrant 7, Crash History	NO	NO	NO	NO
Warrant 8, Roadway Network	NO	NO	NO	NO
Warrant 9, Intersection Near a Grade Crossing				

5.2 Right-Turn Lane Analysis

Referencing Chapter 28 of the *Traffic Engineering Manual,* and using Figure 28.4A, see **Appendix F**, the intersections of HWY 87 & Access A and HWY 87 & Lorraine St were analyzed to determine if a Right Turn Lane is justified. The intersection of HWY 312 was not analyzed due to the low volume of Right Turns for a four-lane highway.

5.3 Left-Turn Lane Analysis

Referencing Chapter 28 of the *Traffic Engineering Manual*, and using Figure 28.4C, see **Appendix F**, the intersections of HWY 87 & Access A and HWY 87 & Lorraine St were analyzed to determine if a Left Turn Lane is justified. The intersection of HWY 312 & Bitterroot Dr & Rosecrans Dr was not analyzed as there is an existing left turn lane.

As indicated on Figure 28.4A and Figure 28.4C, an exclusive Left-Turn Lane is not warranted at either intersection for the 2054 full build year. It can be seen in **Table 13** and Figure 28.4A that an exclusive Right-Turn Lane for the northbound approach at the intersection of HWY 87 and Access A may be justified by the final filing of the development.

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Table 13: Auxiliary Lane Warrant Summary

Turn Lane Warrants		2024 (Ex)		2034		2054	
		AM	PM	AM	PM	AM	PM
HWY 87 & Access A	EB RT						
	WB RT	No	No	No	No	No	No
	NB RT	No	No	No	No	Yes	Yes
	SB RT						
	EB LT						
	WB LT						
	NB LT						
	SB LT	No	No	No	No	No	No

Turn Lane Warrants		2024 (Ex)		2034		2054	
		AM	PM	AM	PM	AM	PM
HWY 87 & Lorraine St	EB RT						
	WB RT	No	No	No	No	No	No
	NB RT	No	No	No	No	No	No
	SB RT						
	EB LT						
	WB LT						
	NB LT						
	SB LT	No	No	No	No	No	No

From Table 13, the traffic data supports the considerations for an exclusive Right or Left Turn Lane. Auxiliary lane warrants worksheets for both Right Turn Lane and Left Turn Lane are included in Appendix F.

6 IMPACT MITIGATION FINANCIAL CONTRIBUTION ANALYSIS

Table 14 below illustrates the Impact Mitigation Financial Contribution Analysis for the three studied intersections. As stated in Section 4.6 C.4. B.8 of the Yellowstone County Subdivision Regulations, the Developer financial contributions will be required for all study area intersections for which the subject development project is projected to increase traffic by 2.0% or more using the "Vegas Method" calculation approach whereby only the per-lane sum total of left-turn and thru movements are compared to established critical lane volume thresholds of 1200 vehicles/hour for a four-legged intersection or 1140 vehicles/hour for a three-legged intersection.

The intersection of HWY 87 and Lorraine St as well as HWY 312 and Bitterroot Dr and Rosecrans Dr do not require a financial contribution as both intersections are below the stated 2.0%. For the purpose of the Impact Mitigation Financial Contribution Analysis for the development, the contribution was split between each filing so that the developer contributes per filing year.

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Table 14: Financial Contributions per Filing

Pronghorn Subdivision
Intersection Cost Contribution
Prepared by: IMEG Corp.
Revised: 03/01/2026

FILING 1

Intersection	Percent	Cost of Intersection	Contribution by Intersection
#1 HWY 87 & Lorraine St	1.05%	$ 500,000	$ -
HWY 87 & Access A	8.07%	$ 500,000	$ 40,350
		Total	**$ 40,350**

Pronghorn Subdivision
Intersection Cost Contribution
Prepared by: IMEG Corp.
Revised: 09/09/2025

FILING 2

Intersection	Percent	Cost of Intersection	Contribution by Intersection
#1 HWY 87 & Lorraine St	0.26%	$ 500,000	$ -
HWY 87 & Access A	2.37%	$ 500,000	$ 11,850
		Total	**$ 11,850**

Pronghorn Subdivision
Intersection Cost Contribution
Prepared by: IMEG Corp.
Revised: 09/09/2025

FILING 3

Intersection	Percent	Cost of Intersection	Contribution by Intersection
#1 HWY 87 & Lorraine St	0.44%	$ 500,000	$ -
#2 HWY 312 & Bitterroot Dr & Rosecrans Dr	0.92%	$ 500,000	$ -
HWY 87 & Access A	4.47%	$ 500,000	$ 22,350
		Total	**$ 22,350**

7 CONCLUSION

Analysis of the existing traffic volumes, lane configurations, and the impacts due to the projected traffic growth and proposed development result in the following general conclusions:

- The preceding analysis demonstrates that the Pronghorn Subdivision development will not generate a significant volume of new trips at the intersections studied. The studied intersections will operate at or above the minimum requirement of an LOS B as specified in *Figure 30.2B* of Chapter 30 Section 2 of the Road Design Manual produced by the Montana Department of Transportation.

Existing 2024 traffic:

- All studied intersection approaches are functioning above the minimum LOS requirement as stated in the MDT Road Design Manual.

Projected 2034 and 2054 background traffic:

For the projected 2034 background traffic volumes:

- Intersection 1 (HWY 87 & Lorraine St) operates at an LOS of A for the Southbound (SB) approach in the AM and PM peak hours. The Westbound (WB) approach operates at an LOS of B in the AM and PM peak hours.
- Intersection 2 (HWY 312 & Bitterroot Dr) operates at an LOS of A for the WB & EB approaches in the AM and PM peak hours. The Southbound (SB) approach operates at an LOS of B in the AM and PM peak hours. The Northbound (NB) approach operates at an LOS of B in the AM peak hour and an LOS of C in the PM peak hour.

For the projected 2054 background traffic volumes:

- Intersection 1 (HWY 87 & Lorraine St) operates at an LOS of A for the Southbound (SB) AM and PM approach. The Westbound (WB) approach operates at an LOS of B in the AM and PM peak hours.
- Intersection 2 (HWY 312 & Bitterroot Dr) operates at an LOS of A for the WB & EB approaches in the AM and PM peak hours. The Southbound (SB) approach operates at

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an LOS of B in the AM and PM peak hours. The Northbound (NB) approach operates at an LOS of B in the AM peak hour and an LOS of C in the PM peak hour.

- Access A (HWY 87 & Access A) will have been in operation for 20 years in 2054. It is considered in the 2054 background traffic volumes as HWY 87 continues to grow at the 1% growth rate. Access A operates at an LOS of B for the Westbound (WB) approach in the AM and PM peak hours. The Southbound (SB) approach operates at an LOS of A in the AM and PM peak hours.

Projected 2034 and 2054 total traffic:

For the projected 2034 total traffic volumes:

- Intersection 1 (HWY 87 & Lorraine St) was only analyzed as there would be no access to Intersection 2 directly from the proposed development until the year 2054. Intersection 1 operates at an LOS of A for the Southbound (SB) approach in the AM and PM peak hours. The Westbound (WB) approach operates at an LOS of B in the AM and PM peak hours. The Northbound (NB) approach operates with no delay (free flowing). It is unlikely that development trips will utilize the intersection of HWY 87 and Lorraine St. To be conservative, it is assumed that a small percentage (8%) will utilize the intersection during the peak hours.
- Access A (HWY 87 & Access A) operates at an LOS of B for the Westbound (WB) approach in the AM peak hour and an LOS of B in the PM peak hour. The Southbound (SB) approach operates at an LOS of A in the AM and PM peak hours. The Northbound (NB) approach operates with no delay (free flowing).

For the projected 2054 total traffic volumes:

- Intersection 1 (HWY 87 & Lorraine St) operates at an LOS of A for the Southbound (SB) approach in the AM and PM peak hours. The Westbound (WB) approach operates at an LOS of B in the AM and PM peak hours. The Northbound (NB) approach operates with no delay (free flowing). It is unlikely that development trips will utilize the intersection of HWY 87 and Lorraine St. To be conservative, it is assumed that a small percentage (5%) will utilize the intersection during the peak hours.
- Intersection 2 (HWY 312 & Bitterroot Dr) operates at an LOS of A for the WB & EB approaches in the AM and PM peak hours. The Southbound (SB) approach operates at an LOS of B in the AM and PM peak hours. The Northbound (NB) approach operates at an LOS of B in the AM peak hour and an LOS of D in the PM peak hour. It can be noted that the NB approach operates at an LOS of C in the PM peak hour in the existing year.
- Access A (HWY 87 & Access A) operates at an LOS of B for the Westbound (WB) approach in the AM peak hour and an LOS of C in the PM peak hour. The Southbound (SB) approach operates at an LOS of A in the AM and PM peak hours. The Northbound (NB) approach operates with no delay (free flowing).
- A worst-case scenario distribution analysis was performed for the intersection of HWY 312 & Access A. As shown in Appendix J, if 100% of the generated trips use only the intersection of HWY 312 & Access A and no other access points through the 2054 analysis year, the intersection is projected to operate at LOS B or better during the AM peak hour and LOS C or better during the PM peak hour.

Traffic Warrant Analysis:

- For Intersection 2, *Warrant 1: Eight-Hour Vehicular Volume* has been met for the 2054 full build year. After performing the TWSC analysis usings the HCS software, it can be seen that the northbound (NB) operates at an LOS of C in the 2024 existing year, an LOS of C in the 2054 background year, and an LOS of D in the 2054 total year. It can be noted

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that the northbound (NB) approach is operating below an LOS of B in the existing (2024) year before the development added trips.

- For Access A, a right-turn auxiliary lane for the northbound (NB) approach may be justified in the full-build year of 2054. It should be noted that the lane is not required in Filing 1 (2034) but may be justified by 2054.

8 RECOMMENDATIONS

Based on the data presented during this study, it is recommended that:

- All access from the development shall be stop-controlled by installing stop signs at the proposed access locations onto HWY 87.
- Based on the Right-Turn Lane Warrant Analysis, it is recommended that an auxiliary right-turn lane be designed and implemented for the northbound (NB) approach for the intersection of HWY 87 and Access A. The lane is not required in Filing 1 (2034) but may be justified by the final filing of the development.
- Any future obstructions that would pose an impact to the sight triangle distances at the proposed approach should be limited.
- Any additional improvements shall be designed in accordance with MTD and Yellowstone County standards and comply with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD).
- Any improvements such as auxiliary turn lanes would need to be evaluated by MDT.
- Should the proposed development go over a total of 586 added trips during the weekday peak hours, a new TIS shall be required.

9 REFERENCES

- *Montana Department of Transportation (MDT)*
- *Yellowstone County, MT*
- *City of Billings, MT*
- *ITE Trip Generation Manual, 11th edition*
- *Highway Capacity Software (HCS), Version 2024*
- *AASHTO A Policy on Highway Geometric Design and Streets (2018), 7th Edition*
- *MDT Road Design Manual*
- *MDT Montana Traffic Engineering Manual*

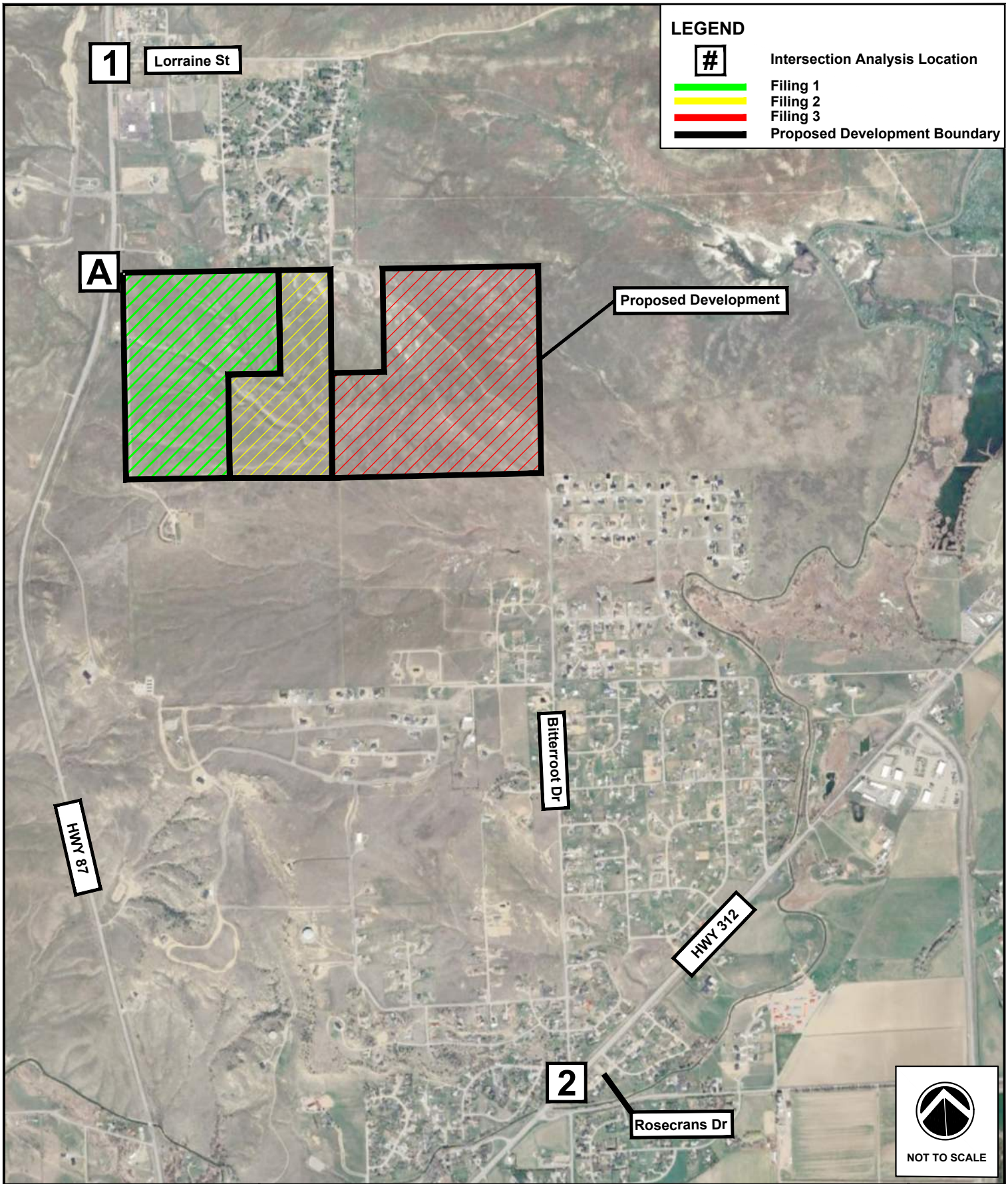
175 N 27th Street, Suite 1312, Billings, MT 59101
406.248.9000 Fax: 406.721.5224 imegcorp.com

Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX A

- Site Plan
- Preliminary Plat



IMEG
175 N 27th Street, Suite 1312
Billings, MT 59101
PH: 406.248.9000
www.imegcorp.com
Illinois Design Firm Registration #184.007637-0014

PRONGHORN SUBDIVISION TRAFFIC IMPACT STUDY

BILLINGS, MONTANA

SITE PLAN

IMEG Project No: 24001698.00
Drawn By: JTP
Checked By: ST
Date: 05/12/2025
APP-A

6/18/25 G:\2024\24001698.00\DESIGN\CIVIL_CALCSSTUDYS\TRAFFIC IMPACT STUDY\TRAFFIC FIGURES\24001698- TIS FIGURES FINAL.DWG

PRELIMINARY PLAT OF

PRONGHORN SUBDIVISION

LOCATED IN SECTION 35, TOWNSHIP 2 NORTH, RANGE 26 EAST, P.M.M., YELLOWSTONE COUNTY, MONTANA

BASIS OF BEARING
STATE PLANE MONTANA – ZONE 2500
GROUND (TRUE) DISTANCES

RECORD OWNER:
AG N KT'S PROPERTIES, L.L.C.

SUBDIVIDER:
AG N KT'S PROPERTIES, L.L.C.

DATE:
JUNE, 2025

TOTAL SUBDIVISION AREA:
100.08 ACRES (GROSS)
67.06 ACRES (NET)

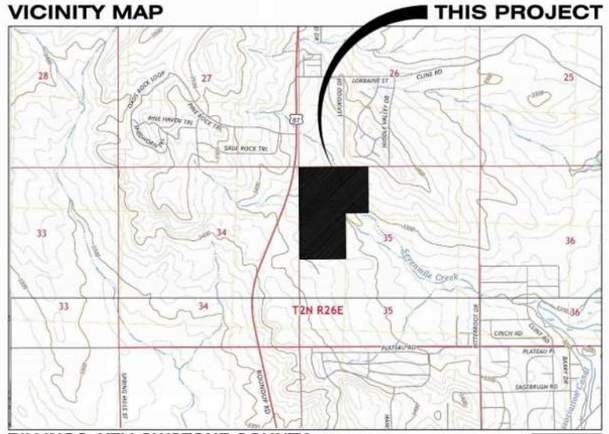
150 0 150 300
SCALE IN FEET

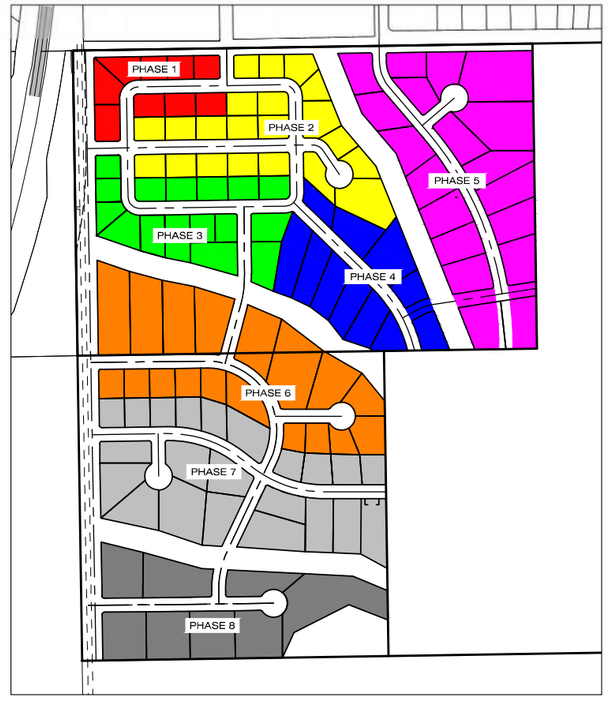
LEGEND

(E) = EXISTING
(P) = PROPOSED
R/W OR R.O.W. = RIGHT-OF-WAY
U.E. = UTILITY EASEMENT
N.A.S. = NO ACCESS STRIP
= CISTERN
= DRAINFIELD

SITE DATA	
NUMBER OF LOTS	124
MAXIMUM LOT AREA	1.86 AC
MINIMUM LOT AREA	10,928 SF
AREA OF OPEN SPACE	11.17 AC
LINEAR FEET OF STREETS	14,772 LF
NET ACREAGE	67.06 AC
GROSS ACREAGE	100.08 AC
EXISTING ZONING	UNZONED
PROPOSED ZONING	?
EXISTING LAND USE	AGRICULTURAL
PROPOSED LAND USE	RESIDENTIAL

VICINITY MAP — THIS PROJECT





PERIMETER LEGAL DESCRIPTION

TOWNSHIP 2 NORTH, RANGE 26 EAST, P.M.M.

1/4	SEC.	T.	R.
☒	35	2N	26E

SHEET 1 OF 2
GILMAN SUBDIVISION
(A SUBDIVISION OF YELLOWSTONE COUNTY)

PREPARED BY:
IMEG
175 N. 27TH ST., STE 1312
BILLINGS, MT
59101
PH: 406.545.6420
FAX: 406.256.1191
www.imegcorp.com
IMEG PROJECT NO. 24001698

Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX B

Traffic Volume Data and Lane Assignment Volumes

Project:	Pronghorn Subdivision						
County:	Yellowstone	**City:**	Billings	**State:**	MT	**Date:**	2/10/26
Location:	HWY 87 & Lorraine Street					**By:**	IMEG
North St.	HWY 87						
South St.	HWY 87	**Existing Year:**	2024			**Percent growth:**	1.00%
East St.	Lorraine St	**Filing 1**	2034	**10**	**YEARS**		1.104622
West St.		**Master Plan**	2054	**30**	**YEARS**		1.347849
Project No:	24001698.00						

Traffic Collected on: 7/23/2024 **Seasonal Adjustment Factor (Day & Month)** 0.842

AM Peak 9:45-10:45 **PHF:** 0.91 **PM Peak:** 4:30-5:30 **PHF:** 0.93

Notes: Current year traffic counts were adjusted for the seasonal day and month of the year, rounded to the nearest whole number. Minimum number of vehicles will be (1) if no collected data exists.

BACKGROUND TRAFFIC DATA

MOVEMENT	Existing Year:		ESTIMATED PERCENT INCREASE BY 1%	Filing 1		ESTIMATED PERCENT INCREASE BY 1%	Master Plan		ESTIMATED PERCENT INCREASE BY 1%		
	YEAR 2024			**YEAR 2034**			**YEAR 2054**			**YEAR**	
	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.
AD (L)	2	1		3	2		3	2			
AB (T)	166	134		184	149		224	181			
AC (R)											
BC (L)											
BA (T)	90	194		100	215		122	262			
BD (R)	24	48		27	54		33	65			
CA (L)											
CD (T)											
CB (R)											
DB (L)	22	23		25	26		30	32			
DC (T)											
DA (R)	1	1		2	2		2	2			
Total - A	259	330		289	368		351	447			
Total - B	302	399		336	444		409	540			
Total - C											
Total - D	49	73		57	84		68	101			
A - Ped											
B - Ped											
C - Ped											
D - Ped											

Existing Traffic was seasonally adjusted for the Day, Month and Year. The adjustment factor = 0.842

T = THROUGH, L = LEFT, R = RIGHT

IMEG | 24001698.00 | 2/10/2026

Background AM & PM Peak Hour Traffic Volumes

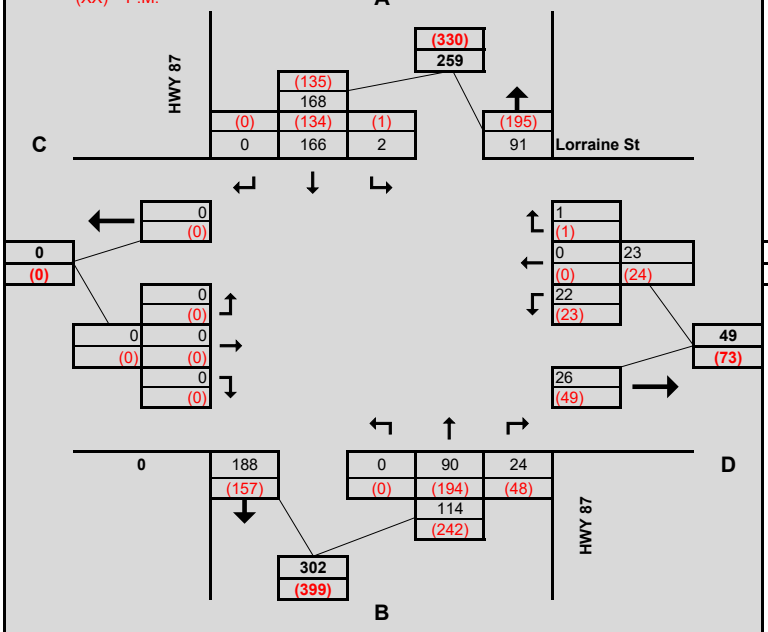
Pronghorn Subdivision

Forecasted by: IMEG
Phone: 406-248-9000

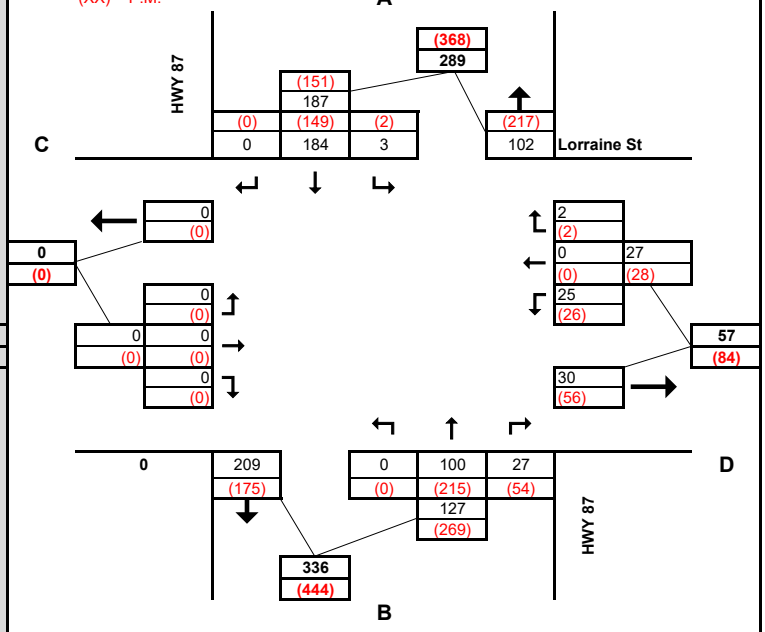
AM Peak Hour: 8:00 AM — AM PHF: 0.91
PM Peak Hour: 4:00 PM — PM PHF: 0.93
Date Traffic Collected: 3/19/2024
Date Calculated: 8/27/2025

Project No: 24001698.00
Route: HWY 87 & Lorraine St
County: Yellowstone State: MT
City of: Billings

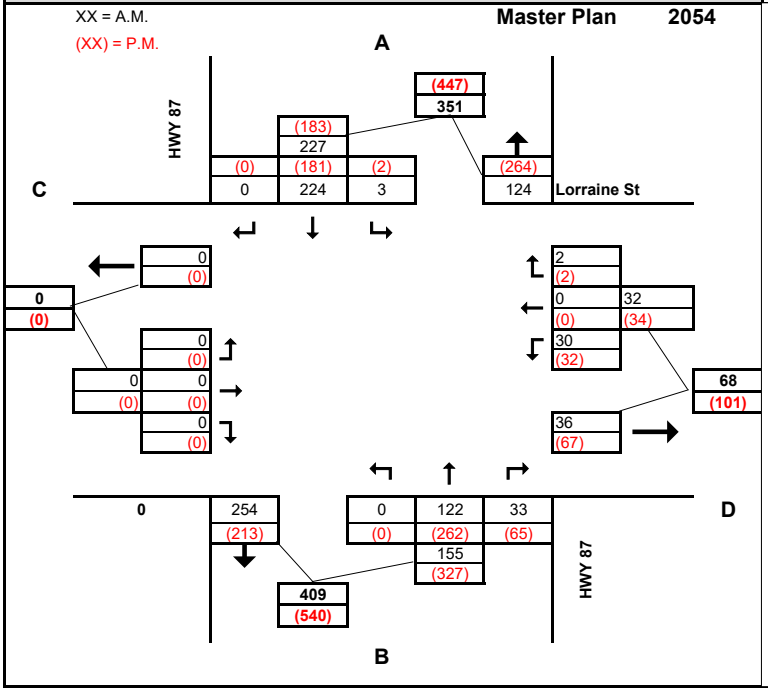
Existing Year: 2024



Filing 1 2034



Master Plan 2054



Project:	Pronghorn Subdivision					
County:	Yellowstone	**City:**	Billings	**State:**	MT	**Date:** 2/10/26
Location:	HWY 87 & Lorraine Street					**By:** IMEG
North St.	HWY 87					
South St.	HWY 87			**Existing Year:**	2024	
East St.	Lorraine St			**Filing 1**	2034	
West St.				**Master Plan**	2054	
Project No:	24001698.00					

Notes:

DEVELOPMENT TRAFFIC DATA

MOVEMENT	Existing Year:		ESTIMATED PERCENT INCREASE BY 0%	Filing 1		ESTIMATED PERCENT INCREASE BY 0%	Master Plan		ESTIMATED PERCENT INCREASE BY 0%		
	YEAR 2024			**YEAR 2034**			**YEAR 2054**			**YEAR 0**	
	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.
AD (L)				1	1		1	1			
AB (T)				4	3		5	5			
AC (R)											
BC (L)											
BA (T)				2	4		4	6			
BD (R)				7	4		5	7			
CA (L)											
CD (T)											
CB (R)											
DB (L)				2	7		6	7			
DC (T)											
DA (R)				1	1		1	1			
Total - A				8	9		8	9			
Total - B				15	18		15	18			
Total - C											
Total - D				11	13		11	13			

Existing Traffic was seasonally adjusted for the Day, Month and Year. The adjustment factor = 0.842

T = THROUGH, L = LEFT, R = RIGHT

IMEG | 24001698.00 | 2/10/2026

Total AM & PM Peak Hour Traffic Volumes

Pronghorn Subdivision

Forecasted by: IMEG
Phone: 406-248-9000

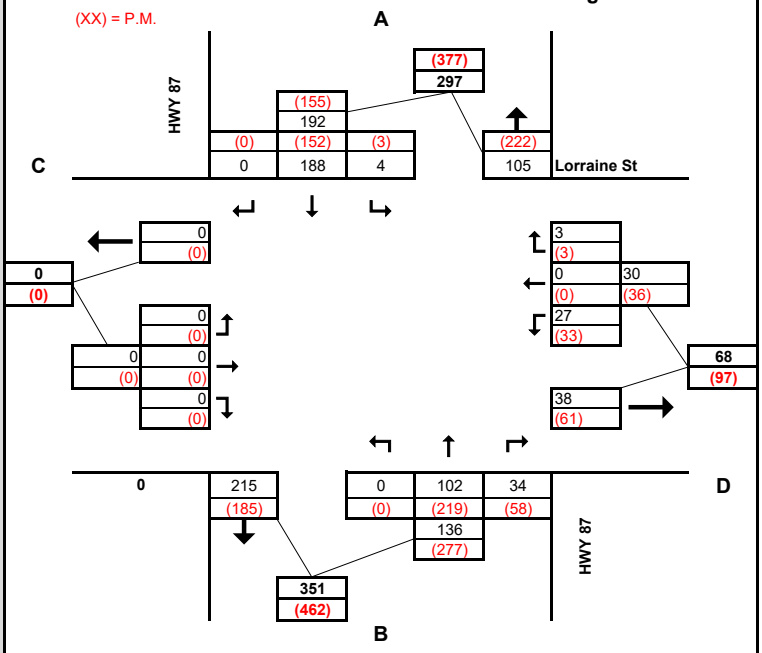
AM Peak Hour: 9:45-10:45
PM Peak Hour: 4:30-5:30

AM PHF: 0.91
PM PHF: 0.93

Project No: 24001698.00
Route: HWY 87 & Lorraine St
County: Yellowstone State: MT
City of: Billings

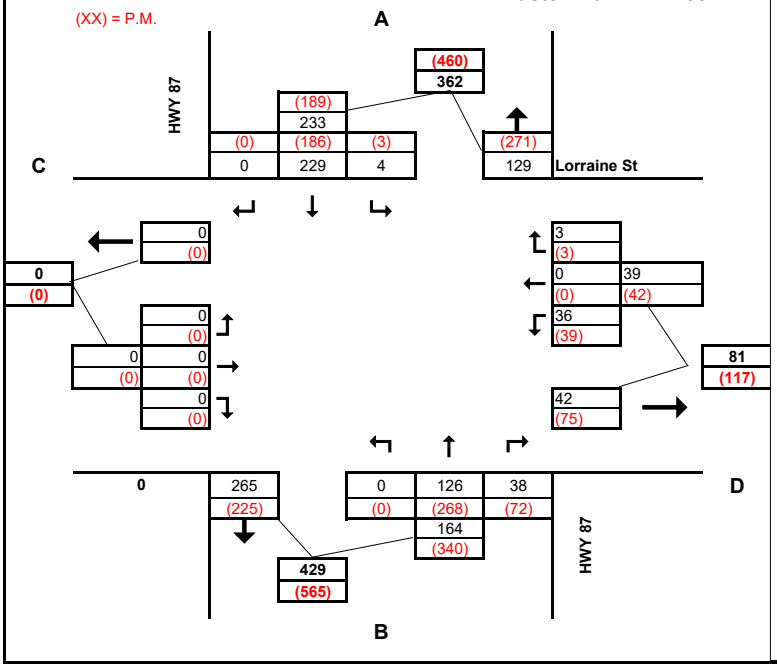
XX = A.M.
(XX) = P.M.

Filing 1 2034



XX = A.M.
(XX) = P.M.

Master Plan 2054



Project:	Pronghorn Subdivision						
County:	Yellowstone	**City:**	Billings	**State:**	MT	**Date:**	2/10/26
Location:	HWY 312 & Bitterroot Dr					**By:**	IMEG
North St.	Bitterroot Dr						
South St.	Rosecrans Dr	**Existing Year:**	2024			**Percent growth:**	1.00%
East St.	HWY 312	**Filing 1**	2034	**10**	**YEARS**		1.104622
West St.	HWY 312	**Master Plan**	2054	**30**	**YEARS**		1.347849
Project No:	24001698.00						

Traffic Collected on: 7/23/2024 **Seasonal Adjustment Factor (Day & Month)** 0.824

AM Peak 7:00-8:00 **PHF:** 0.90 **PM Peak:** 4:45-5:45 **PHF:** 0.88

Notes: Current year traffic counts were adjusted for the seasonal day and month of the year, rounded to the nearest whole number. Minimum number of vehicles will be (1) if no collected data exists.

BACKGROUND TRAFFIC DATA

MOVEMENT	Existing Year:		ESTIMATED PERCENT INCREASE BY 1%	Filing 1		ESTIMATED PERCENT INCREASE BY 1%	Master Plan		ESTIMATED PERCENT INCREASE BY 1%		
	YEAR 2024			**YEAR 2034**			**YEAR 2054**			**YEAR**	
	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.
AD (L)	1	4		2	5		2	6			
AB (T)	1	1		2	2		2	2			
AC (R)	75	56		83	62		102	76			
BC (L)	2	1		3	2		3	2			
BA (T)	1	1		2	2		2	2			
BD (R)	1	1		2	2		2	2			
CA (L)	20	109		23	121		27	147			
CD (T)	138	486		153	537		187	656			
CB (R)	1	3		2	4		2	5			
DB (L)	1	1		2	2		2	2			
DC (T)	389	228		430	252		525	308			
DA (R)	1	5		2	6		2	7			
Total - A	99	176		114	198		137	240			
Total - B	7	8		13	14		13	15			
Total - C	625	883		694	978		846	1194			
Total - D	531	725		591	804		720	981			
A - Ped											
B - Ped											
C - Ped											
D - Ped											

Existing Traffic was seasonally adjusted for the Day, Month and Year. The adjustment factor = 0.824

T = THROUGH, L = LEFT, R = RIGHT

IMEG | 24001698.00 | 2/10/2026

Background AM & PM Peak Hour Traffic Volumes

Pronghorn Subdivision

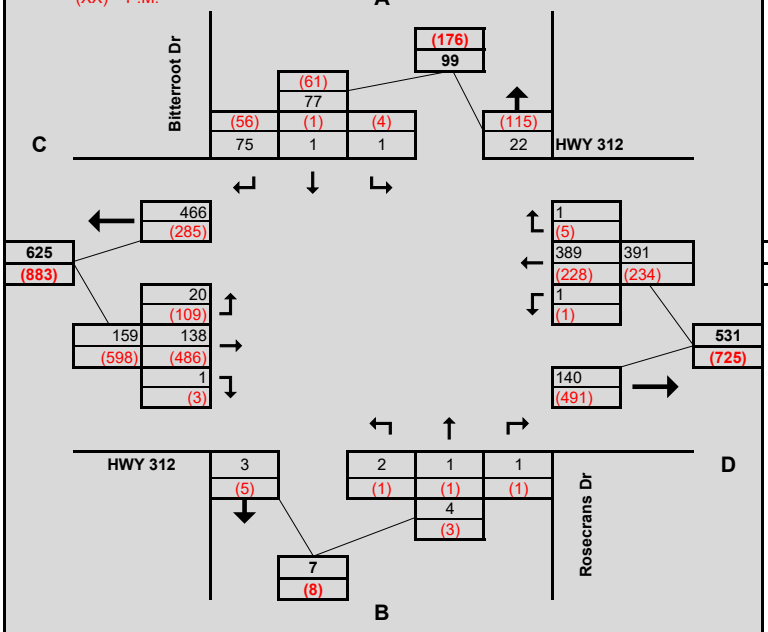
Forecasted by: IMEG
Phone: 406-248-9000

AM Peak Hour: 7:00-8:00 AM PHF: 0.90
PM Peak Hour: 4:45-5:45 PM PHF: 0.88
Date Traffic Collected: 7/23/2024
Date Calculated: 8/27/2025

Project No: 24001698.00
Route: Bitterroot Dr & HWY 312
County: Yellowstone State: MT
City of: Billings

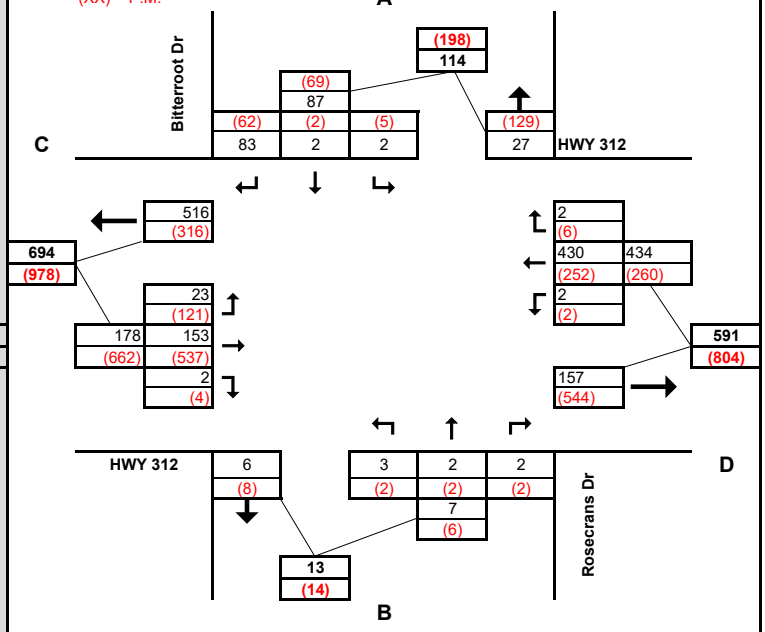
XX = A.M.
(XX) = P.M.

Existing Year: 2024



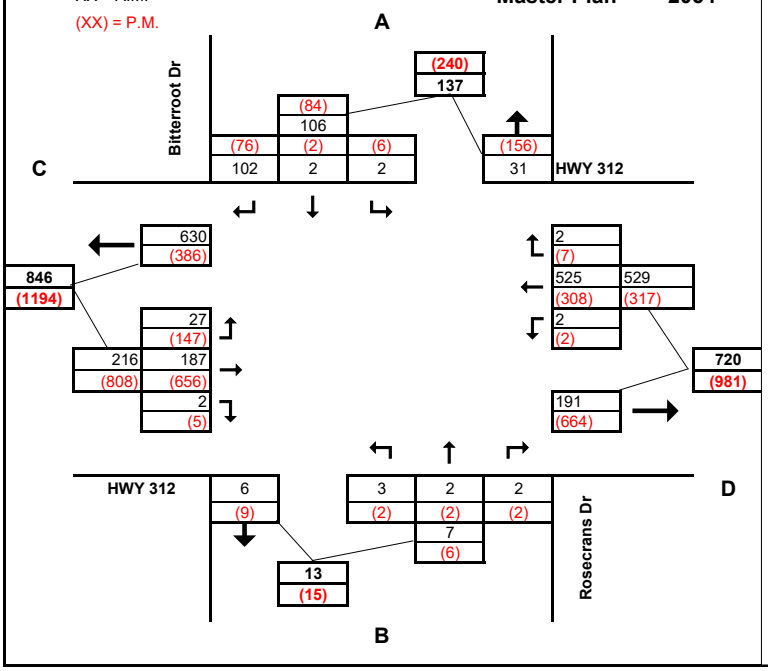
XX = A.M.
(XX) = P.M.

Filing 1 2034



XX = A.M.
(XX) = P.M.

Master Plan 2054



Project:	Pronghorn Subdivision						
County:	Yellowstone	**City:**	Billings	**State:**	MT	**Date:**	2/10/26
Location:	HWY 312 & Bitterroot Dr					**By:**	IMEG
North St.	Bitterroot Dr						
South St.	Rosecrans Dr			**Existing Year:**	2024		
East St.	HWY 312			**Filing 1**	2034		
West St.	HWY 312			**Master Plan**	2054		
Project No:	24001698.00						

Notes:

DEVELOPMENT TRAFFIC DATA

MOVEMENT	Existing Year:		ESTIMATED PERCENT INCREASE BY 0%	Filing 1		ESTIMATED PERCENT INCREASE BY 0%	Master Plan		ESTIMATED PERCENT INCREASE BY 0%		
	YEAR 2024			**YEAR 2034**			**YEAR 2054**			**YEAR 0**	
	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.
AD (L)							1	1			
AB (T)											
AC (R)							18	22			
BC (L)											
BA (T)											
BD (R)											
CA (L)							19	22			
CD (T)											
CB (R)											
DB (L)											
DC (T)											
DA (R)							1	4			
Total - A											
Total - B											
Total - C											
Total - D											

Existing Traffic was seasonally adjusted for the Day, Month and Year. The adjustment factor = 0.824

T = THROUGH, L = LEFT, R = RIGHT

IMEG | 24001698.00 | 2/10/2026

Total AM & PM Peak Hour Traffic Volumes

Pronghorn Subdivision

Forecasted by: IMEG
Phone: 406-248-9000

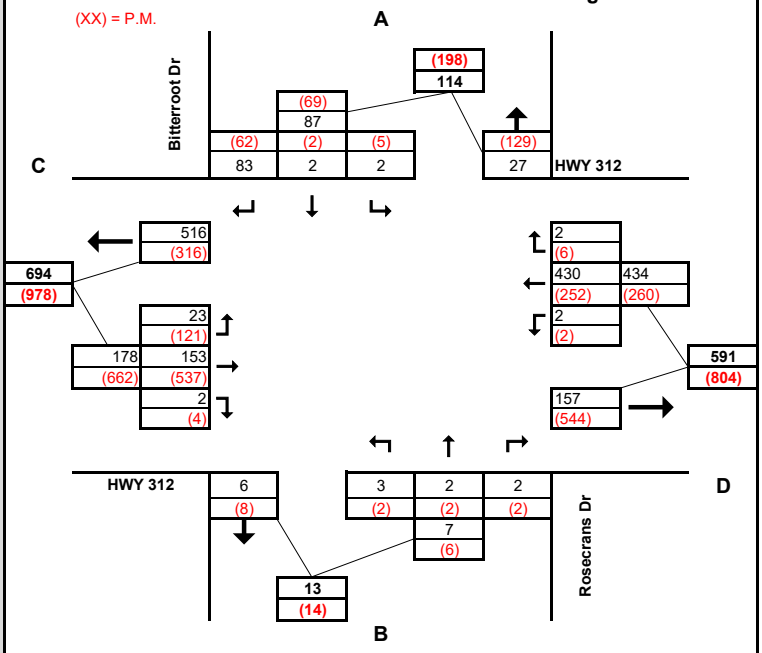
AM Peak Hour: 7:00-8:00
PM Peak Hour: 4:45-5:45

AM PHF: 0.90
PM PHF: 0.88

Project No: 24001698.00
Route: Bitterroot Dr & HWY 312
County: Yellowstone State: MT
City of: Billings

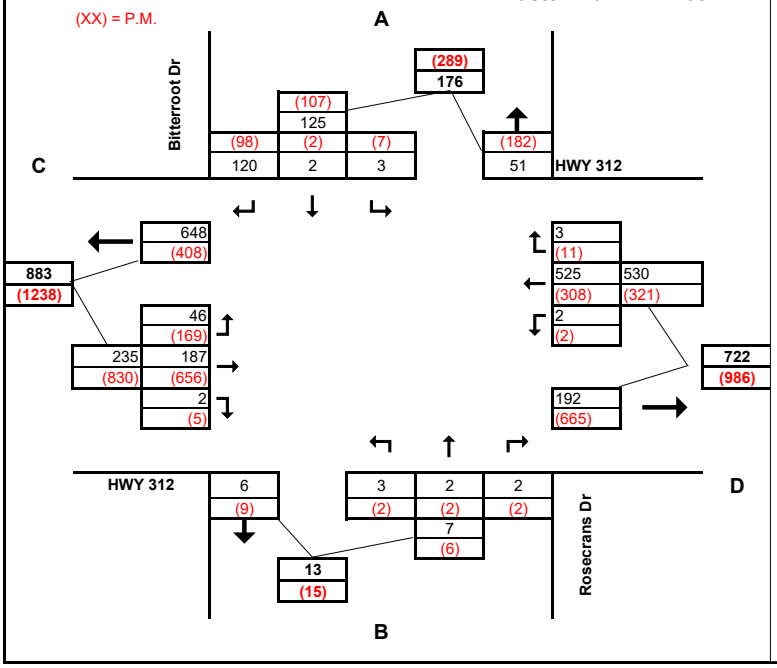
XX = A.M.
(XX) = P.M.

Filing 1 2034



XX = A.M.
(XX) = P.M.

Master Plan 2054



Project:	Pronghorn Subdivision						
County:	Yellowstone	**City:**	Billings	**State:**	MT	**Date:**	2/10/26
Location:	HWY 87 & Access A					**By:**	IMEG
North St.	HWY 87						
South St.	HWY 87	**Existing Year:**	2024			**Percent growth:**	1.00%
East St.	Access A	**Filing 1**	2034	**10**	**YEARS**		1.104622
West St.		**Master Plan**	2054	**30**	**YEARS**		1.347849
Project No:	24001698.00						

Traffic Collected on: 7/23/2024 **Seasonal Adjustment Factor (Day & Month)** 0.842

AM Peak 9:45-10:45 **PHF:** 0.90 **PM Peak:** 4:30-5:30 **PHF:** 0.98

Notes: Current year traffic counts were adjusted for the seasonal day and month of the year, rounded to the nearest whole number. Minimum number of vehicles will be (1) if no collected data exists.

BACKGROUND TRAFFIC DATA

MOVEMENT	Existing Year:		ESTIMATED PERCENT INCREASE BY 1%	Filing 1		ESTIMATED PERCENT INCREASE BY 1%	Master Plan		ESTIMATED PERCENT INCREASE BY 1%		
	YEAR 2024			**YEAR 2034**			**YEAR 2054**			**YEAR**	
	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.
AD (L)											
AB (T)	192	161		213	178		259	218			
AC (R)											
BC (L)											
BA (T)	117	246		130	272		158	332			
BD (R)											
CA (L)											
CD (T)											
CB (R)											
DB (L)											
DC (T)											
DA (R)											
Total - A	309	407		343	450		417	550			
Total - B	309	407		343	450		417	550			
Total - C											
Total - D											
A - Ped											
B - Ped											
C - Ped											
D - Ped											

Existing Traffic was seasonally adjusted for the Day, Month and Year. The adjustment factor = 0.842

T = THROUGH, L = LEFT, R = RIGHT

IMEG | 24001698.00 | 2/10/2026

Background AM & PM Peak Hour Traffic Volumes

Pronghorn Subdivision

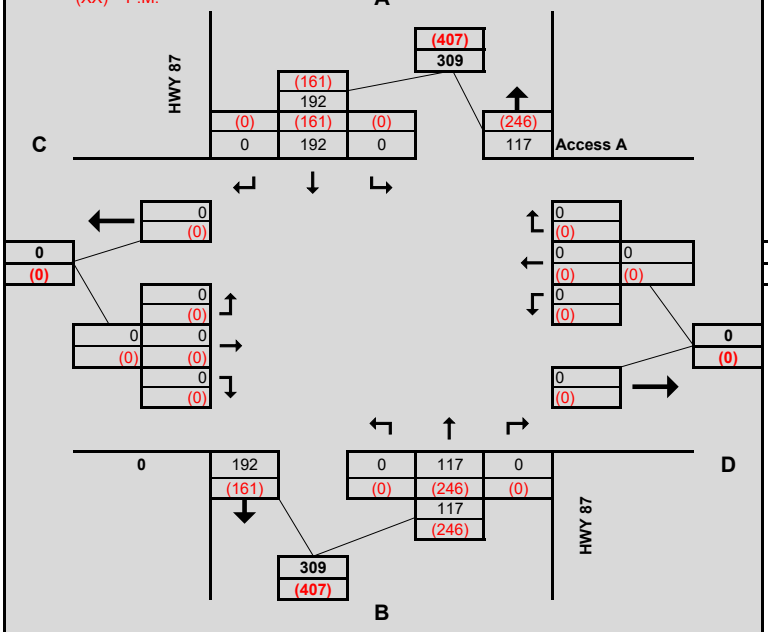
Forecasted by: IMEG
Phone: 406-248-9000

AM Peak Hour: 9:45-10:45 AM PHF: 0.90
PM Peak Hour: 4:30-5:30 PM PHF: 0.98
Date Traffic Collected: 7/23/2024
Date Calculated: 8/27/2025

Project No: 24001698.00
Route: HWY 87 & Access A
County: Yellowstone State: MT
City of: Billings

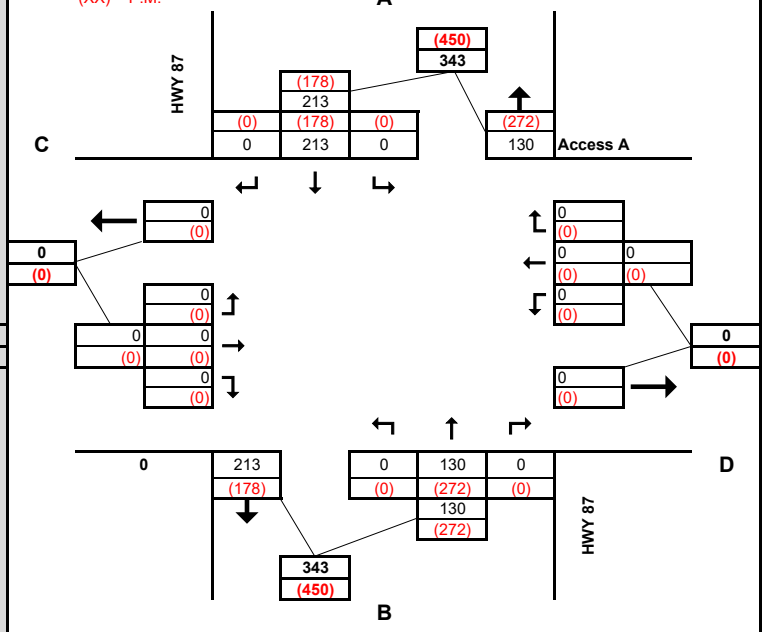
XX = A.M.
(XX) = P.M.

Existing Year: 2024



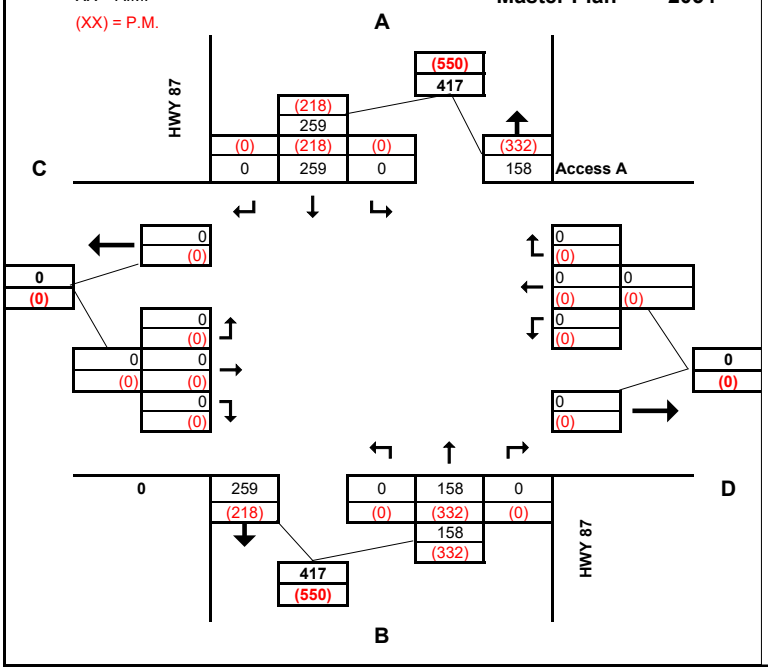
XX = A.M.
(XX) = P.M.

Filing 1 2034



XX = A.M.
(XX) = P.M.

Master Plan 2054



Project:	Pronghorn Subdivision					
County:	Yellowstone	**City:**	Billings	**State:**	MT	**Date:** 2/10/26
Location:	HWY 87 & Access A					**By:** IMEG
North St.	HWY 87					
South St.	HWY 87			**Existing Year:**	2024	
East St.	Access A			**Filing 1**	2034	
West St.				**Master Plan**	2054	
Project No:	24001698.00					

Notes:

DEVELOPMENT TRAFFIC DATA

MOVEMENT	Existing Year:		ESTIMATED PERCENT INCREASE BY 0%	Filing 1		ESTIMATED PERCENT INCREASE BY 0%	Master Plan		ESTIMATED PERCENT INCREASE BY 0%		
	YEAR 2024			**YEAR 2034**			**YEAR 2054**			**YEAR 0**	
	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.
AD (L)				4	3		5	5			
AB (T)				2	7		6	7			
AC (R)											
BC (L)											
BA (T)				7	4		5	7			
BD (R)				85	57		97	130			
CA (L)											
CD (T)											
CB (R)											
DB (L)				35	85		102	120			
DC (T)											
DA (R)				2	4		4	6			
Total - A				15	18		15	18			
Total - B				129	153		129	153			
Total - C											
Total - D				126	149		126	149			

Existing Traffic was seasonally adjusted for the Day, Month and Year. The adjustment factor = 0.842

T = THROUGH, L = LEFT, R = RIGHT

IMEG | 24001698.00 | 2/10/2026

Total AM & PM Peak Hour Traffic Volumes

Pronghorn Subdivision

Forecasted by: IMEG
Phone: 406-248-9000

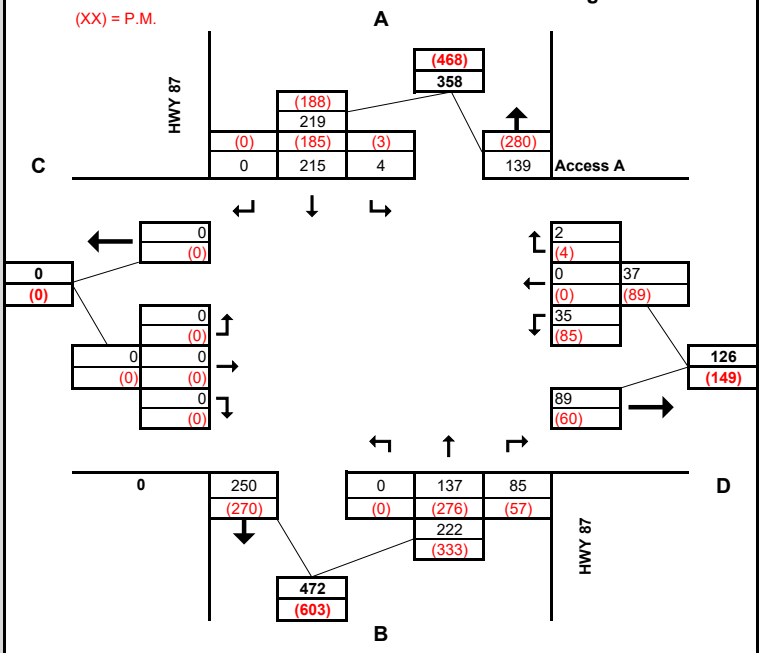
AM Peak Hour: 9:45-10:45
PM Peak Hour: 4:30-5:30

AM PHF: 0.90
PM PHF: 0.98

Project No: 24001698.00
Route: HWY 87 & Access A
County: Yellowstone State: MT
City of: Billings

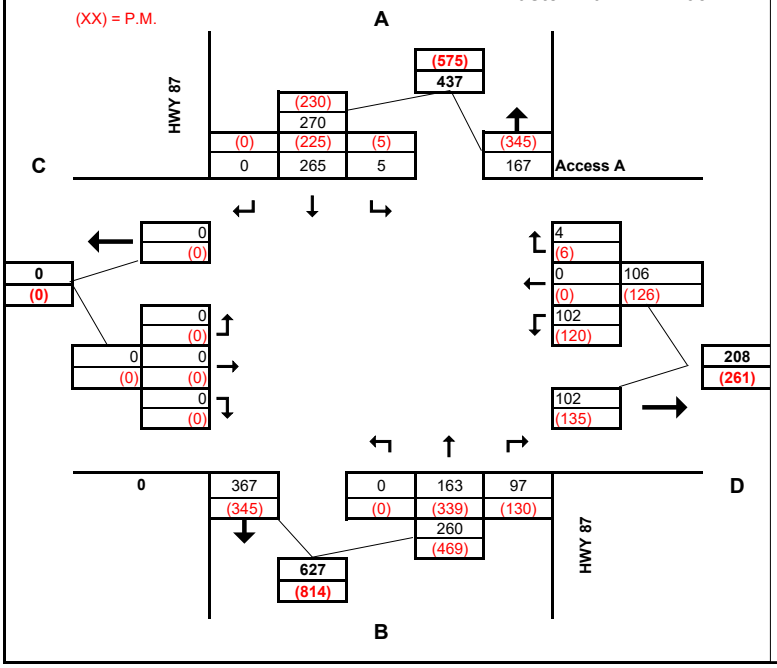
XX = A.M.
(XX) = P.M.

Filing 1 2034



XX = A.M.
(XX) = P.M.

Master Plan 2054



Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX C

Intersection Capacity Analysis - Background Traffic

- 2024 Existing Traffic
- 2034 Projected Background Traffic
- 2054 Projected Background Traffic

HCS Two-Way Stop-Control Report

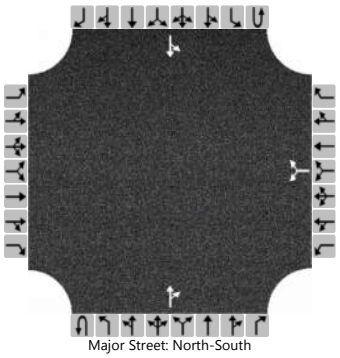
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2024
Time Analyzed	2024 INT 1 AM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.91
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						22		1			90	24		2	166	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							25							2		
Capacity, c (veh/h)							704							1474		
v/c Ratio							0.04							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
95% Queue Length, Q_{95} (ft)							2.5							0.0		
Control Delay (s/veh)							10.3							7.4	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						10.3								0.1		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

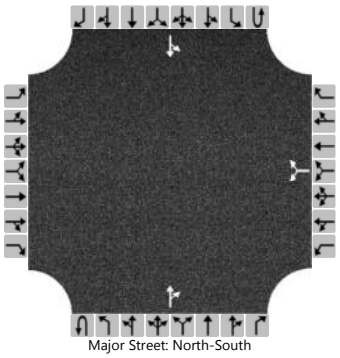
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2024
Time Analyzed	2024 INT 1 PM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						23		1			194	48		2	134	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							26							2		
Capacity, c (veh/h)							629							1316		
v/c Ratio							0.04							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
95% Queue Length, Q_{95} (ft)							2.5							0.0		
Control Delay (s/veh)							11.0							7.7	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						11.0								0.1		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

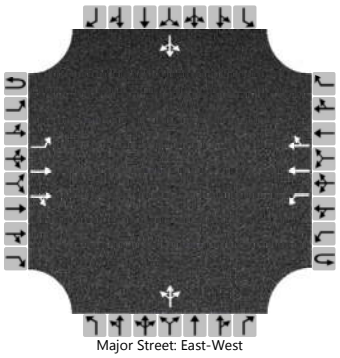
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2024
Time Analyzed	2024 INT 2 AM
Intersection Orientation	East-West
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 312 & Bitterroot Dr
Jurisdiction	COUNTY
East/West Street	HWY 312
North/South Street	Bitterroot Dr
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	20	138	1	0	1	389	1		2	1	1		1	1	75
Percent Heavy Vehicles (%)	3	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Left Only								9							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				1					4				86	
Capacity, c (veh/h)		1137				1438					604				780	
v/c Ratio		0.02				0.00					0.01				0.11	
95% Queue Length, Q_{95} (veh)		0.1				0.0					0.0				0.4	
95% Queue Length, Q_{95} (ft)		2.5				0.0					0.0				10.0	
Control Delay (s/veh)		8.2				7.5					11.0				10.2	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	1.0				0.0				11.0				10.2			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

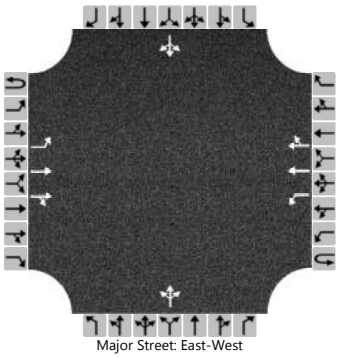
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2024
Time Analyzed	2024 INT 2 PM
Intersection Orientation	East-West
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 312 & Bitterroot Dr
Jurisdiction	COUNTY
East/West Street	HWY 312
North/South Street	Bitterroot Dr
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	109	486	3	0	1	228	5		1	1	1		4	1	56
Percent Heavy Vehicles (%)	3	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Left Only								9							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		124				1					3				69	
Capacity, c (veh/h)		1311				1025					315				802	
v/c Ratio		0.09				0.00					0.01				0.09	
95% Queue Length, Q_{95} (veh)		0.3				0.0					0.0				0.3	
95% Queue Length, Q_{95} (ft)		7.5				0.0					0.0				7.5	
Control Delay (s/veh)		8.0				8.5					16.6				9.9	
Level of Service (LOS)		A				A					C				A	
Approach Delay (s/veh)	1.5				0.0				16.6				9.9			
Approach LOS	A				A				C				A			

HCS Two-Way Stop-Control Report

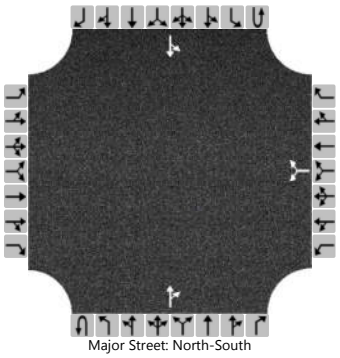
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2024
Time Analyzed	2024 Access A AM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		0			117	0		0	192	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							0							0		
Capacity, c (veh/h)							0							1468		
v/c Ratio														0.00		
95% Queue Length, Q_{95} (veh)														0.0		
95% Queue Length, Q_{95} (ft)																
Control Delay (s/veh)														7.5	0.0	
Level of Service (LOS)														A	A	
Approach Delay (s/veh)													0.0			
Approach LOS													A			

HCS Two-Way Stop-Control Report

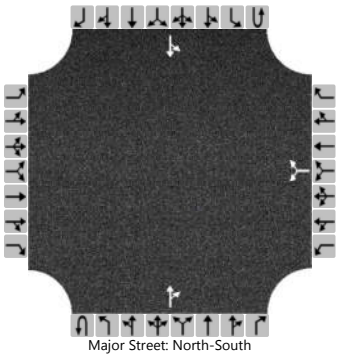
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2024
Time Analyzed	2024 Access A PM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		0			246	0		0	161	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							0							0		
Capacity, c (veh/h)							0							1326		
v/c Ratio														0.00		
95% Queue Length, Q_{95} (veh)														0.0		
95% Queue Length, Q_{95} (ft)																
Control Delay (s/veh)														7.7	0.0	
Level of Service (LOS)														A	A	
Approach Delay (s/veh)													0.0			
Approach LOS													A			

HCS Two-Way Stop-Control Report

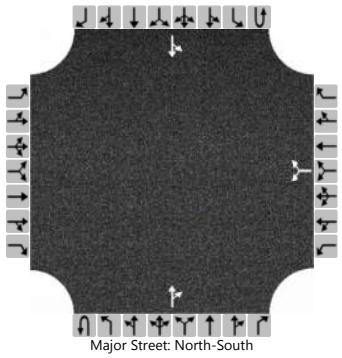
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2034
Time Analyzed	2034 INT 1 BACKGROUND AM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.91
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						25		2			100	27		3	184	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							30							3		
Capacity, c (veh/h)							678							1456		
v/c Ratio							0.04							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
95% Queue Length, Q_{95} (ft)							2.5							0.0		
Control Delay (s/veh)							10.5							7.5	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						10.5								0.1		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

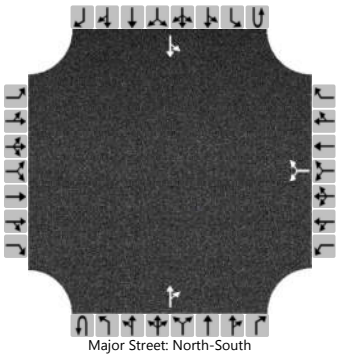
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2034
Time Analyzed	2034 INT 1 BACKGROUND PM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						26		2			215	54		2	149	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							30							2		
Capacity, c (veh/h)							600							1284		
v/c Ratio							0.05							0.00		
95% Queue Length, Q_{95} (veh)							0.2							0.0		
95% Queue Length, Q_{95} (ft)							5.0							0.0		
Control Delay (s/veh)							11.3							7.8	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						11.3								0.1		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

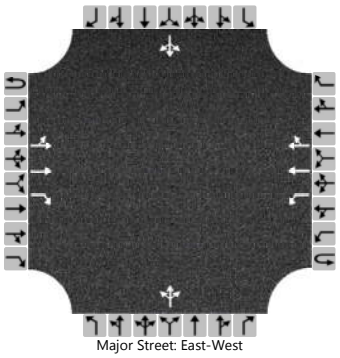
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2034
Time Analyzed	2034 INT 2 BACKGROUND AM
Intersection Orientation	East-West
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 312 & Bitterroot Dr
Jurisdiction	COUNTY
East/West Street	HWY 312
North/South Street	Bitterroot Dr
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	1	0	1	2	0		0	1	0		0	1	0
Configuration		LT	T	R		L	T	TR			LTR				LTR	
Volume (veh/h)		23	153	2	0	2	430	2		3	2	2		2	2	83
Percent Heavy Vehicles (%)		0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No														
Median Type | Storage		Left Only								9						

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		26				2					8				97	
Capacity, c (veh/h)		1093				1417					556				740	
v/c Ratio		0.02				0.00					0.01				0.13	
95% Queue Length, Q_{95} (veh)		0.1				0.0					0.0				0.4	
95% Queue Length, Q_{95} (ft)		2.5				0.0					0.0				10.0	
Control Delay (s/veh)		8.4	0.1			7.5					11.6				10.6	
Level of Service (LOS)		A	A			A					B				B	
Approach Delay (s/veh)		1.2				0.0				11.6				10.6		
Approach LOS		A				A				B				B		

HCS Two-Way Stop-Control Report

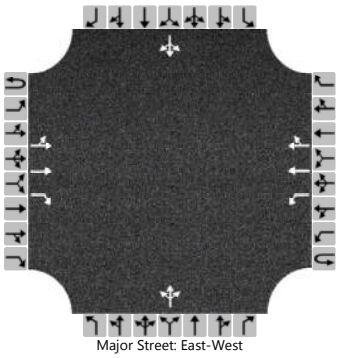
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2034
Time Analyzed	2034 INT 2 BACKGROUND PM
Intersection Orientation	East-West
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 312 & Bitterroot Dr
Jurisdiction	COUNTY
East/West Street	HWY 312
North/South Street	Bitterroot Dr
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	1	0	1	2	0		0	1	0		0	1	0
Configuration		LT	T	R		L	T	TR			LTR				LTR	
Volume (veh/h)		121	537	4	0	2	252	6		2	2	2		5	2	62
Percent Heavy Vehicles (%)		0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No														
Median Type | Storage		Left Only								9						

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		123				2					6				70	
Capacity, c (veh/h)		1313				1028					314				766	
v/c Ratio		0.09				0.00					0.02				0.09	
95% Queue Length, Q_{95} (veh)		0.3				0.0					0.1				0.3	
95% Queue Length, Q_{95} (ft)		7.5				0.0					2.5				7.5	
Control Delay (s/veh)		8.0	0.5			8.5					16.7				10.2	
Level of Service (LOS)		A	A			A					C				B	
Approach Delay (s/veh)		1.9				0.1				16.7				10.2		
Approach LOS		A				A				C				B		

HCS Two-Way Stop-Control Report

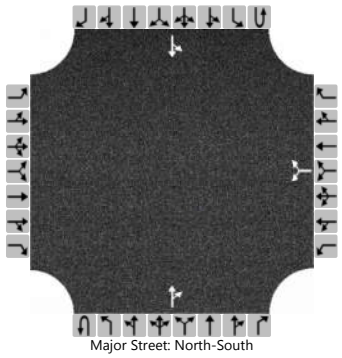
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2054
Time Analyzed	2054 INT 1 BACKGROUND AM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.91
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						30		2			122	33		3	224	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							35							3		
Capacity, c (veh/h)							617							1419		
v/c Ratio							0.06							0.00		
95% Queue Length, Q_{95} (veh)							0.2							0.0		
95% Queue Length, Q_{95} (ft)							5.0							0.0		
Control Delay (s/veh)							11.2							7.5	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						11.2								0.1		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

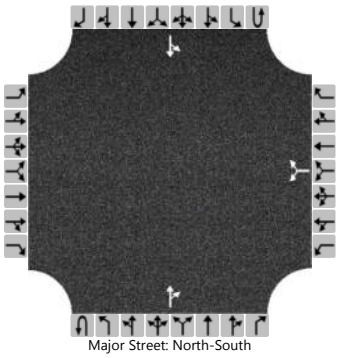
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2054
Time Analyzed	2054 INT 1 BACKGROUND PM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						32		2			262	65		3	181	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							37							3		
Capacity, c (veh/h)							529							1218		
v/c Ratio							0.07							0.00		
95% Queue Length, Q_{95} (veh)							0.2							0.0		
95% Queue Length, Q_{95} (ft)							5.0							0.0		
Control Delay (s/veh)							12.3							8.0	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						12.3								0.2		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

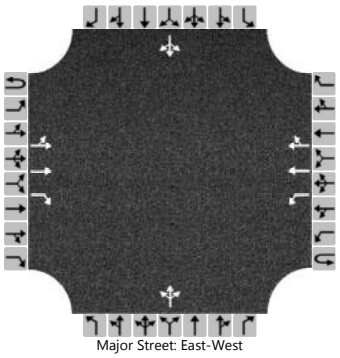
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2054
Time Analyzed	2054 INT 2 BACKGROUND AM
Intersection Orientation	East-West
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 312 & Bitterroot Dr
Jurisdiction	COUNTY
East/West Street	HWY 312
North/South Street	Bitterroot Dr
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	1	0	1	2	0		0	1	0		0	1	0
Configuration		LT	T	R		L	T	TR			LTR				LTR	
Volume (veh/h)		27	187	2	0	2	525	2		3	2	2		2	2	102
Percent Heavy Vehicles (%)		0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No														
Median Type | Storage		Left Only								9						

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		30				2					8				118	
Capacity, c (veh/h)		999				1373					477				684	
v/c Ratio		0.03				0.00					0.02				0.17	
95% Queue Length, Q_{95} (veh)		0.1				0.0					0.0				0.6	
95% Queue Length, Q_{95} (ft)		2.5				0.0					0.0				15.0	
Control Delay (s/veh)		8.7	0.2			7.6					12.7				11.4	
Level of Service (LOS)		A	A			A					B				B	
Approach Delay (s/veh)		1.3				0.0				12.7				11.4		
Approach LOS		A				A				B				B		

HCS Two-Way Stop-Control Report

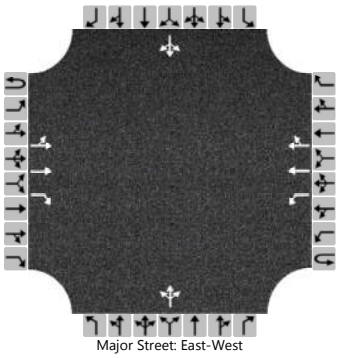
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	5/12/2025
Analysis Year	2054
Time Analyzed	2054 INT 2 BACKGROUND PM
Intersection Orientation	East-West
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 312 & Bitterroot Dr
Jurisdiction	COUNTY
East/West Street	HWY 312
North/South Street	Bitterroot Dr
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	1	0	1	2	0		0	1	0		0	1	0
Configuration		LT	T	R		L	T	TR			LTR				LTR	
Volume (veh/h)		147	656	5	0	2	308	7		2	2	2		6	2	76
Percent Heavy Vehicles (%)		0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No														
Median Type | Storage		Left Only								9						

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		167				2					7				95	
Capacity, c (veh/h)		1212				867					192				660	
v/c Ratio		0.14				0.00					0.04				0.14	
95% Queue Length, Q_{95} (veh)		0.5				0.0					0.1				0.5	
95% Queue Length, Q_{95} (ft)		12.5				0.0					2.5				12.5	
Control Delay (s/veh)		8.4	0.8			9.2					24.5				11.4	
Level of Service (LOS)		A	A			A					C				B	
Approach Delay (s/veh)		2.2				0.1				24.5				11.4		
Approach LOS		A				A				C				B		

Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX D

Intersection Capacity Analysis - Total Traffic

- 2034 Projected Background plus Development Traffic
- 2054 Projected Background plus Development Traffic

HCS Two-Way Stop-Control Report

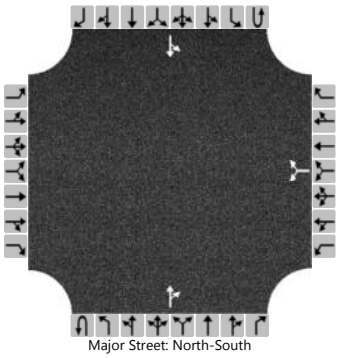
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2034
Time Analyzed	2034 INT 1 TOTAL AM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.91
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						27		3			102	34		4	188	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							33							4		
Capacity, c (veh/h)							672							1444		
v/c Ratio							0.05							0.00		
95% Queue Length, Q_{95} (veh)							0.2							0.0		
95% Queue Length, Q_{95} (ft)							5.0							0.0		
Control Delay (s/veh)							10.6							7.5	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						10.6								0.2		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

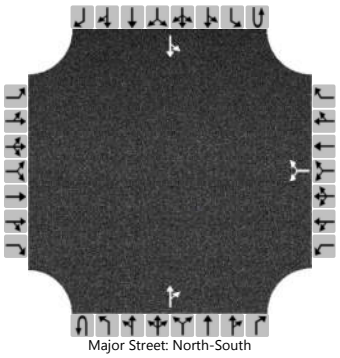
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2034
Time Analyzed	2034 INT 1 TOTAL PM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						33		3			219	58		3	152	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							39							3		
Capacity, c (veh/h)							592							1275		
v/c Ratio							0.07							0.00		
95% Queue Length, Q_{95} (veh)							0.2							0.0		
95% Queue Length, Q_{95} (ft)							5.0							0.0		
Control Delay (s/veh)							11.5							7.8	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						11.5								0.2		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

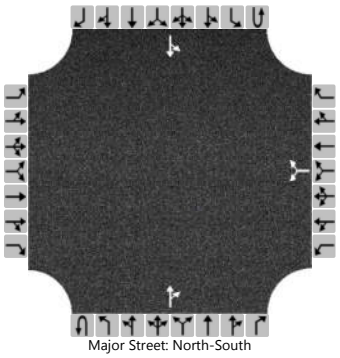
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2034
Time Analyzed	2034 A TOTAL AM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Access A
Jurisdiction	COUNTY
East/West Street	Access A
North/South Street	HWY 87
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						35		2			137	85		4	215	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							41							4		
Capacity, c (veh/h)							581							1331		
v/c Ratio							0.07							0.00		
95% Queue Length, Q_{95} (veh)							0.2							0.0		
95% Queue Length, Q_{95} (ft)							5.0							0.0		
Control Delay (s/veh)							11.7							7.7	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						11.7								0.2		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

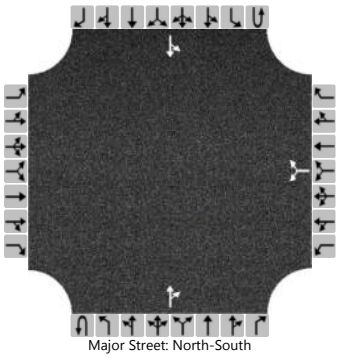
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2034
Time Analyzed	2034 A TOTAL PM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Access A
Jurisdiction	COUNTY
East/West Street	Access A
North/South Street	HWY 87
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						85		4			276	57		3	185	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							91							3		
Capacity, c (veh/h)							535							1231		
v/c Ratio							0.17							0.00		
95% Queue Length, Q_{95} (veh)							0.6							0.0		
95% Queue Length, Q_{95} (ft)							15.0							0.0		
Control Delay (s/veh)							13.1							7.9	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)					13.1								0.1			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

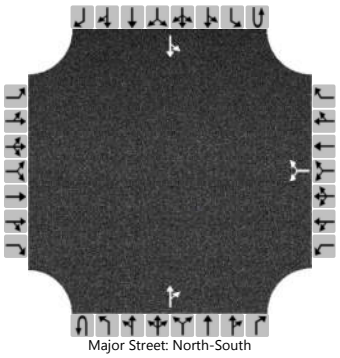
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2054
Time Analyzed	2054 INT 1 TOTAL AM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.91
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						36		3			126	38		4	229	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							43							4		
Capacity, c (veh/h)							607							1407		
v/c Ratio							0.07							0.00		
95% Queue Length, Q_{95} (veh)							0.2							0.0		
95% Queue Length, Q_{95} (ft)							5.0							0.0		
Control Delay (s/veh)							11.4							7.6	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						11.4								0.2		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

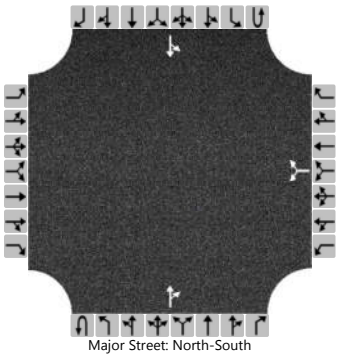
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2054
Time Analyzed	2054 INT 1 TOTAL PM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Lorraine St
Jurisdiction	COUNTY
East/West Street	Lorraine St
North/South Street	HWY 87
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						39		3			268	72		3	186	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							45							3		
Capacity, c (veh/h)							520							1204		
v/c Ratio							0.09							0.00		
95% Queue Length, Q_{95} (veh)							0.3							0.0		
95% Queue Length, Q_{95} (ft)							7.5							0.0		
Control Delay (s/veh)							12.6							8.0	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						12.6								0.2		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

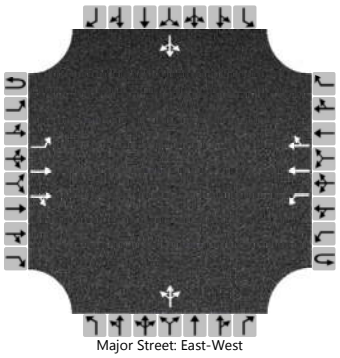
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2054
Time Analyzed	2054 INT 2 TOTAL AM
Intersection Orientation	East-West
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 312 & Bitterroot Dr
Jurisdiction	COUNTY
East/West Street	HWY 312
North/South Street	Bitterroot Dr
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	46	187	2	0	2	525	3		3	2	2		3	2	120
Percent Heavy Vehicles (%)	3	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Left Only								9							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		51				2					8				139	
Capacity, c (veh/h)		998				1373					446				682	
v/c Ratio		0.05				0.00					0.02				0.20	
95% Queue Length, Q_{95} (veh)		0.2				0.0					0.1				0.8	
95% Queue Length, Q_{95} (ft)		5.0				0.0					2.5				20.0	
Control Delay (s/veh)		8.8				7.6					13.2				11.6	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	1.7				0.0				13.2				11.6			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

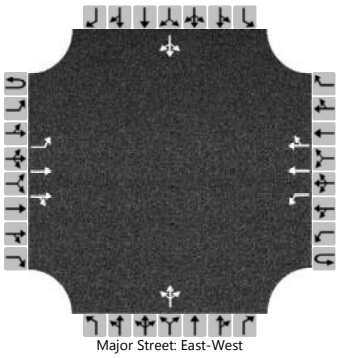
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2054
Time Analyzed	2054 INT 2 Total PM
Intersection Orientation	East-West
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 312 & Bitterroot Dr
Jurisdiction	COUNTY
East/West Street	HWY 312
North/South Street	Bitterroot Dr
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	169	656	5	0	2	308	11		2	2	2		7	2	98
Percent Heavy Vehicles (%)	3	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Left Only								9							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		192				2					7				122	
Capacity, c (veh/h)		1207				867					180				669	
v/c Ratio		0.16				0.00					0.04				0.18	
95% Queue Length, Q_{95} (veh)		0.6				0.0					0.1				0.7	
95% Queue Length, Q_{95} (ft)		15.0				0.0					2.5				17.5	
Control Delay (s/veh)		8.5				9.2					25.8				11.6	
Level of Service (LOS)		A				A					D				B	
Approach Delay (s/veh)	1.7				0.1				25.8				11.6			
Approach LOS	A				A				D				B			

HCS Two-Way Stop-Control Report

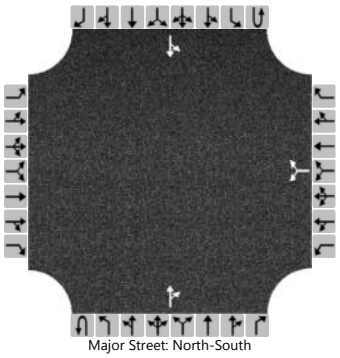
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2054
Time Analyzed	2054 ACCESS A TOTAL AM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Access A
Jurisdiction	COUNTY
East/West Street	Access A
North/South Street	HWY 87
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						102		4			163	97		5	265	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							118							6		
Capacity, c (veh/h)							511							1285		
v/c Ratio							0.23							0.00		
95% Queue Length, Q_{95} (veh)							0.9							0.0		
95% Queue Length, Q_{95} (ft)							22.5							0.0		
Control Delay (s/veh)							14.2							7.8	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)						14.2								0.2		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

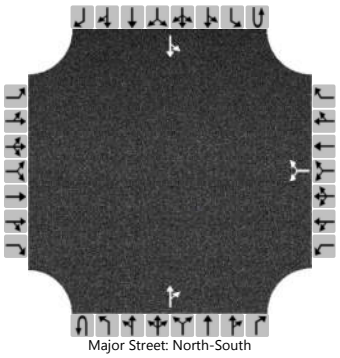
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/27/2025
Analysis Year	2054
Time Analyzed	2054 ACCESS A TOTAL PM
Intersection Orientation	North-South
Project Description	Pronghorn Subdivision

Site Information

Intersection	HWY 87 & Access A
Jurisdiction	COUNTY
East/West Street	Access A
North/South Street	HWY 87
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						120		6			339	130		5	225	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							129							5		
Capacity, c (veh/h)							440							1094		
v/c Ratio							0.29							0.00		
95% Queue Length, Q_{95} (veh)							1.2							0.0		
95% Queue Length, Q_{95} (ft)							30.0							0.0		
Control Delay (s/veh)							16.5							8.3	0.0	
Level of Service (LOS)							C							A	A	
Approach Delay (s/veh)						16.5								0.2		
Approach LOS						C								A		

Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX E

ITE Trip Generation Worksheets, 11th Edition

Filing 1

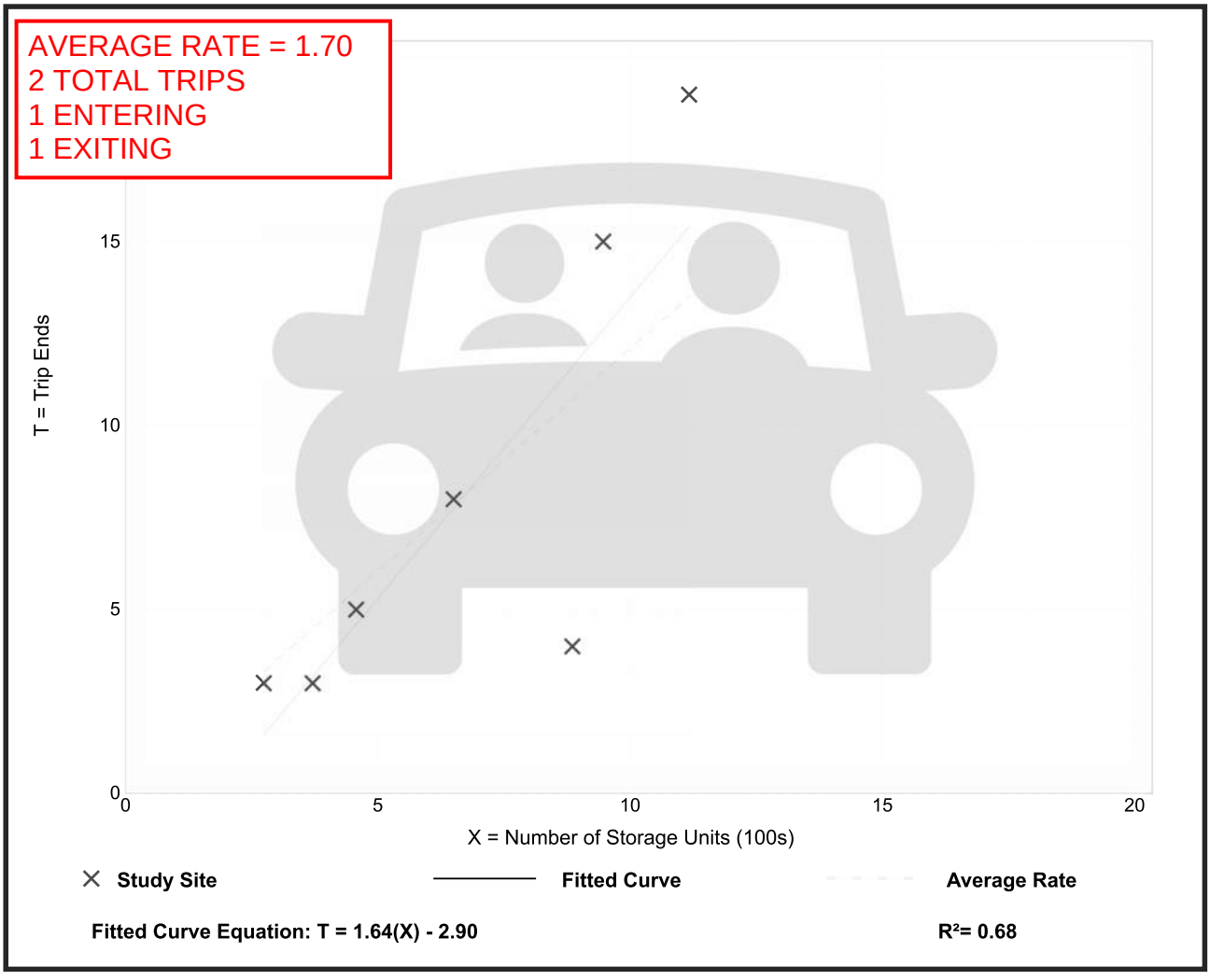
Mini-Warehouse
(151)

Vehicle Trip Ends vs:	**Storage Units (100s)**
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:	7
Avg. Num. of Storage Units (100s):	7
Directional Distribution:	51% entering, 49% exiting

Vehicle Trip Generation per Storage Unit (100s)

Average Rate	Range of Rates	Standard Deviation
1.21	0.45 - 1.70	0.49

Data Plot and Equation



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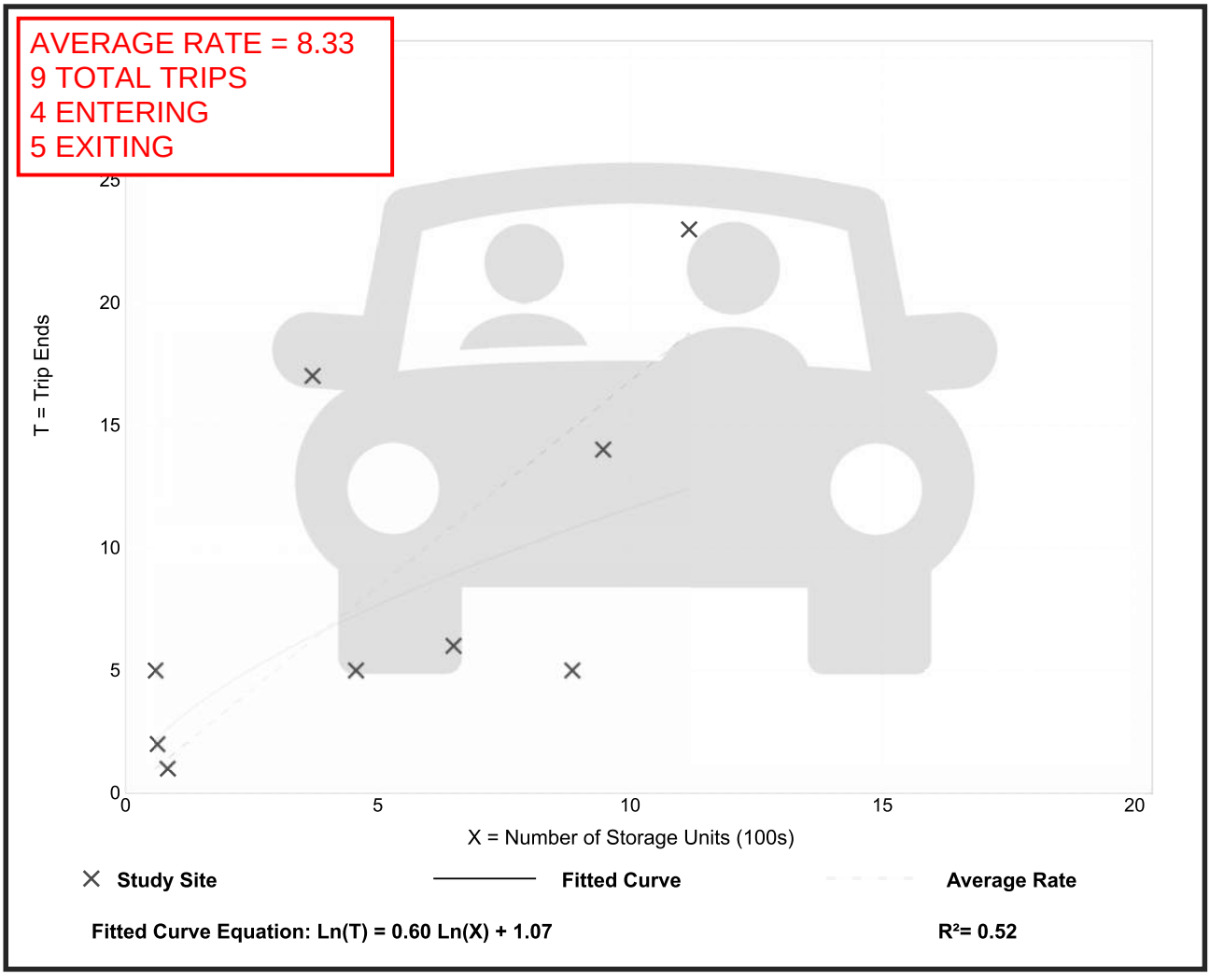
Mini-Warehouse
(151)

Vehicle Trip Ends vs: **Storage Units (100s)**
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: 9
Avg. Num. of Storage Units (100s): 5
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Storage Unit (100s)

Average Rate	Range of Rates	Standard Deviation
1.68	0.56 - 8.33	1.37

Data Plot and Equation



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Filing 1

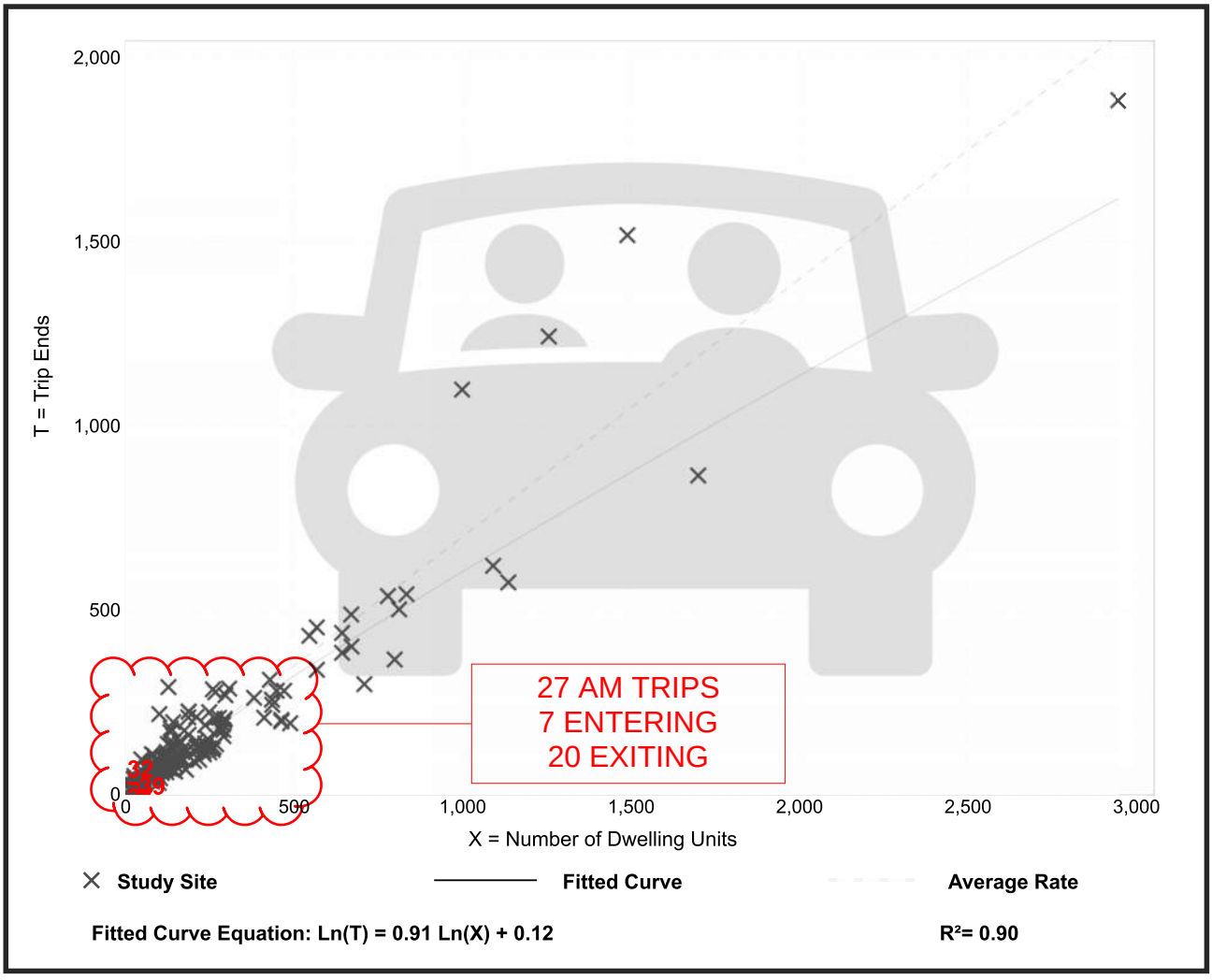
Single-Family Detached Housing
(210)

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: 25% entering, 75% 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



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Filing 1

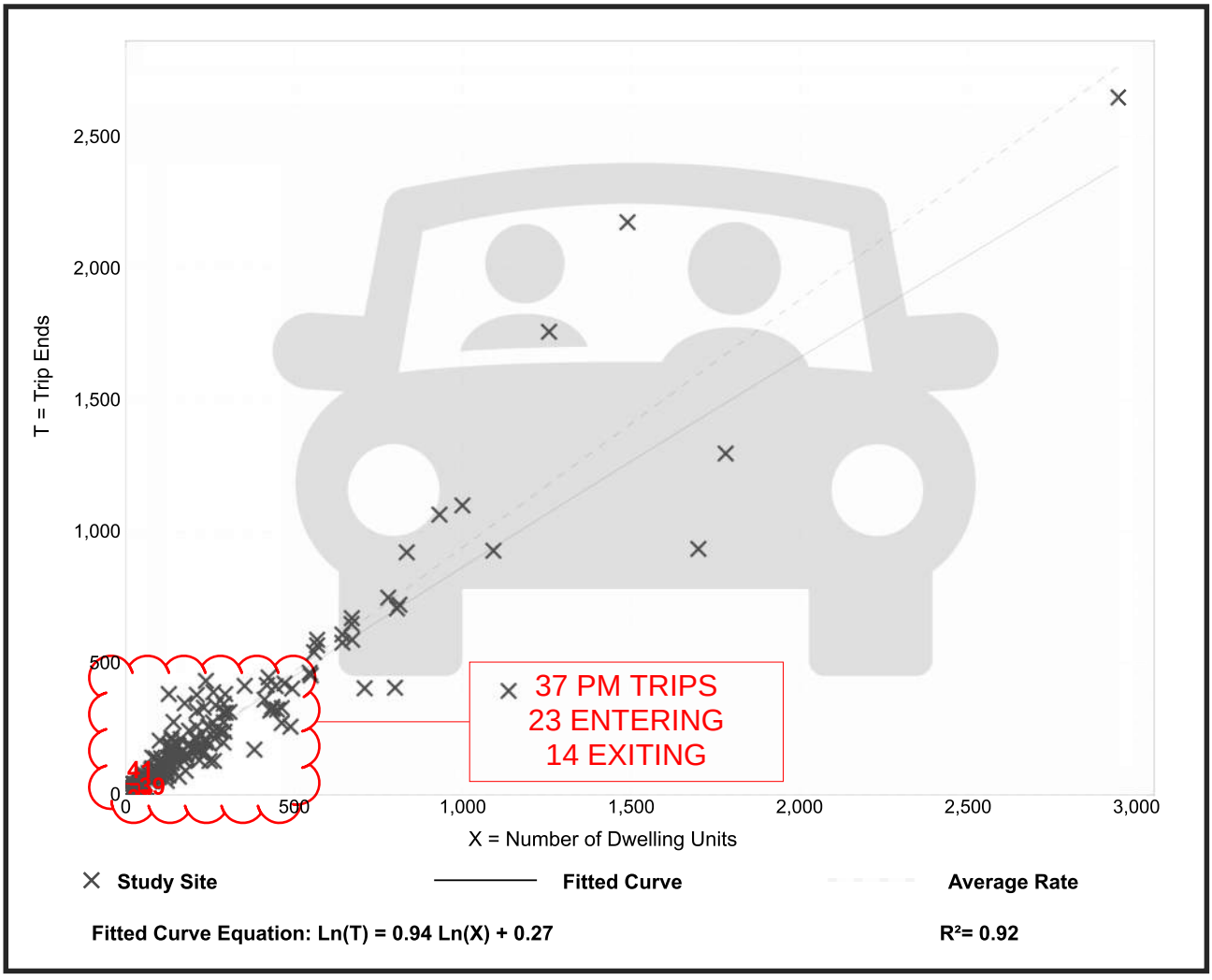
Single-Family Detached Housing
(210)

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



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Filing 1

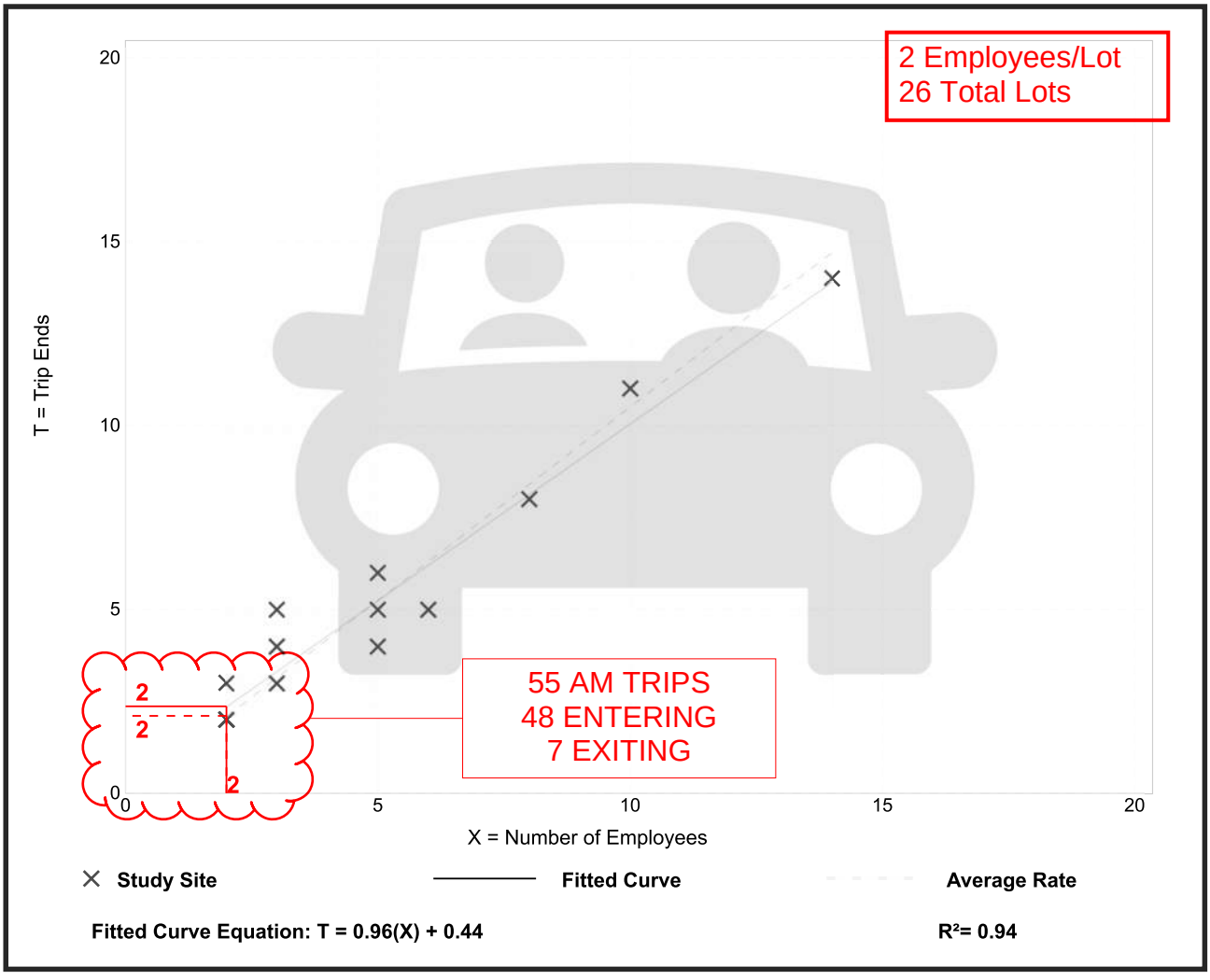
Small Office Building
(712)

Vehicle Trip Ends vs: **Employees**
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: 17
Avg. Num. of Employees: 5
Directional Distribution: 85% entering, 15% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.05	0.80 - 1.67	0.20

Data Plot and Equation



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Filing 1

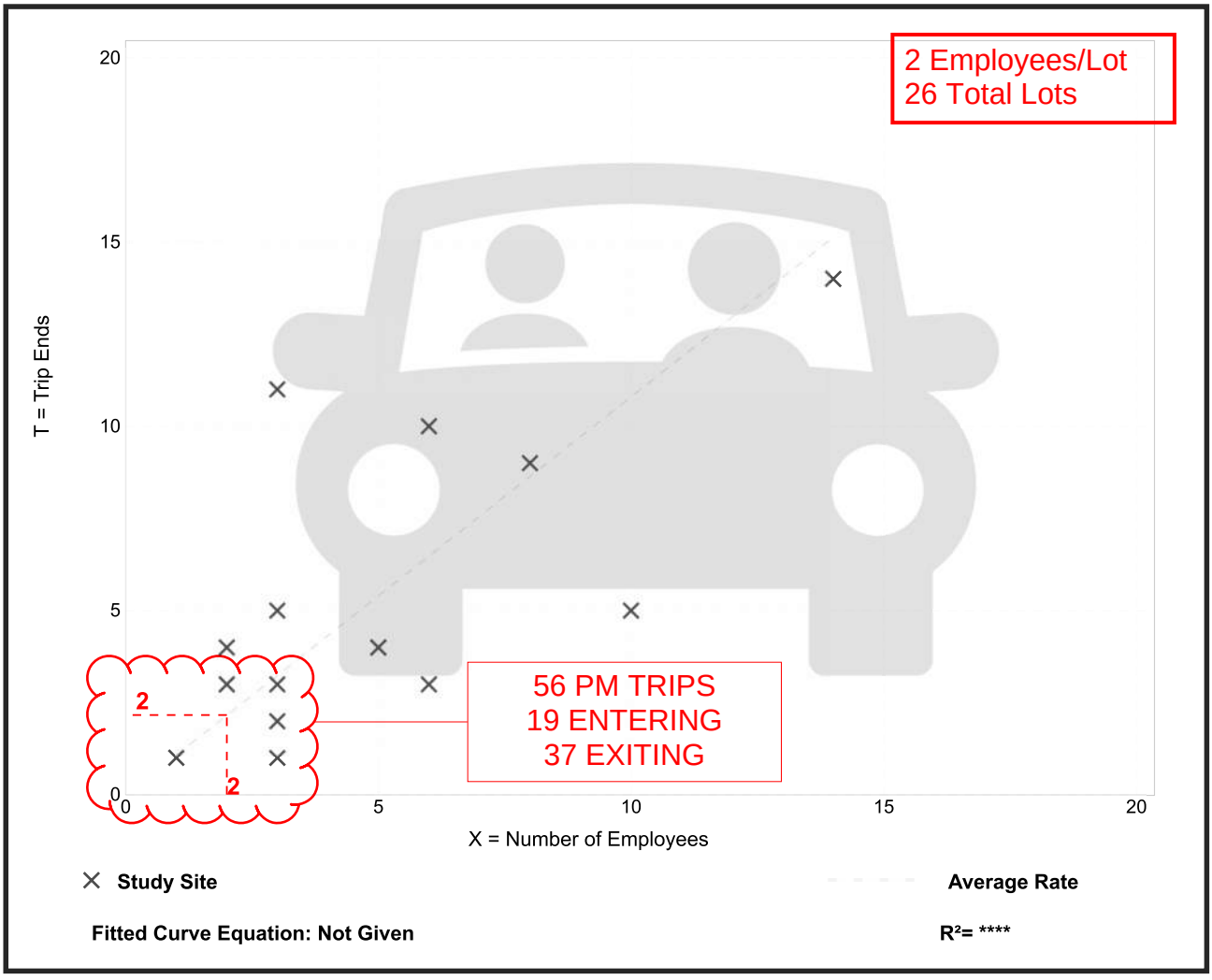
Small Office Building
(712)

Vehicle Trip Ends vs:	**Employees**
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:	16
Avg. Num. of Employees:	5
Directional Distribution:	33% entering, 67% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.08	0.33 - 3.67	0.69

Data Plot and Equation



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Filing 1

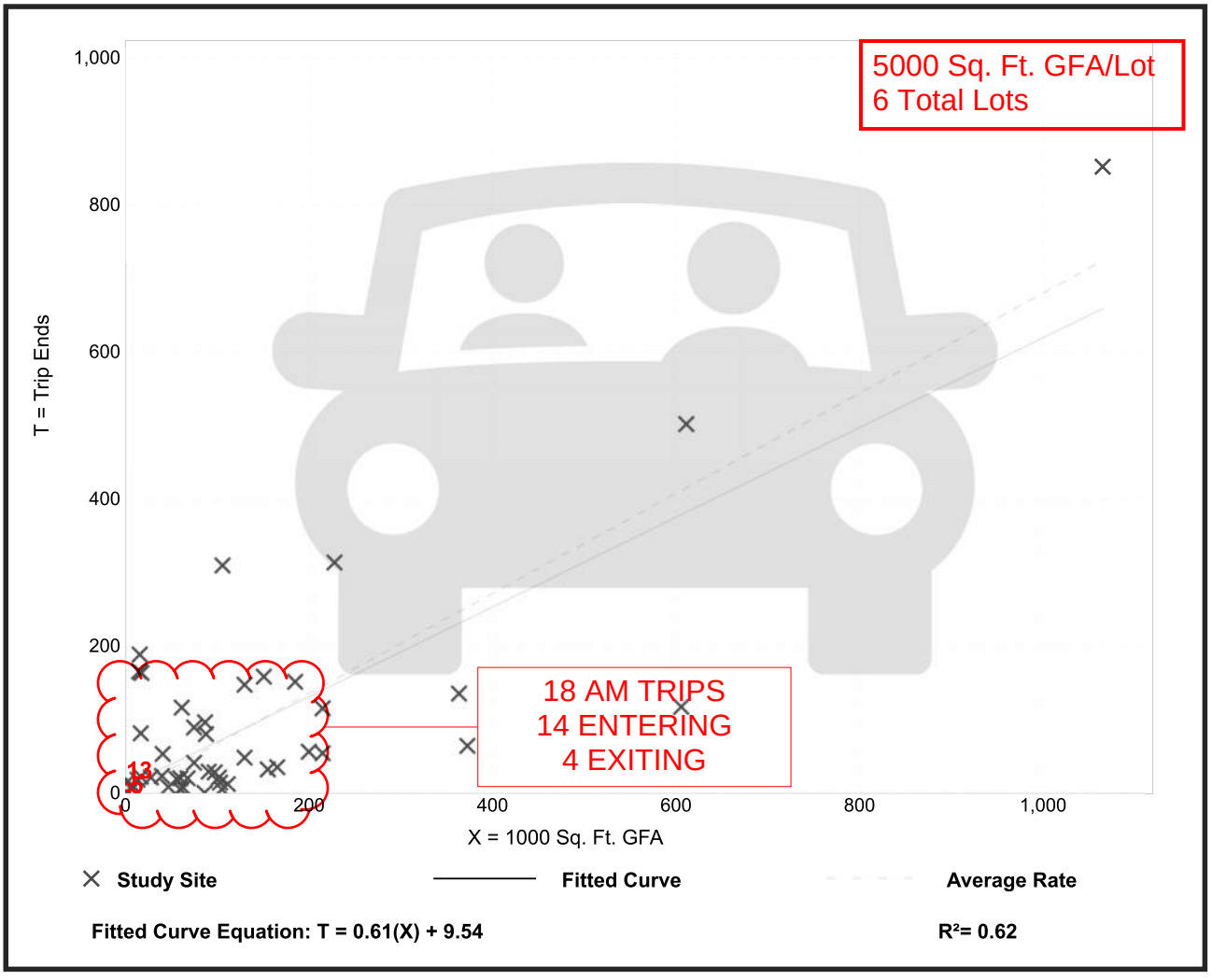
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 48
Avg. 1000 Sq. Ft. GFA: 138
Directional Distribution: 76% entering, 24% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.68	0.01 - 11.93	1.03

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Filing 1

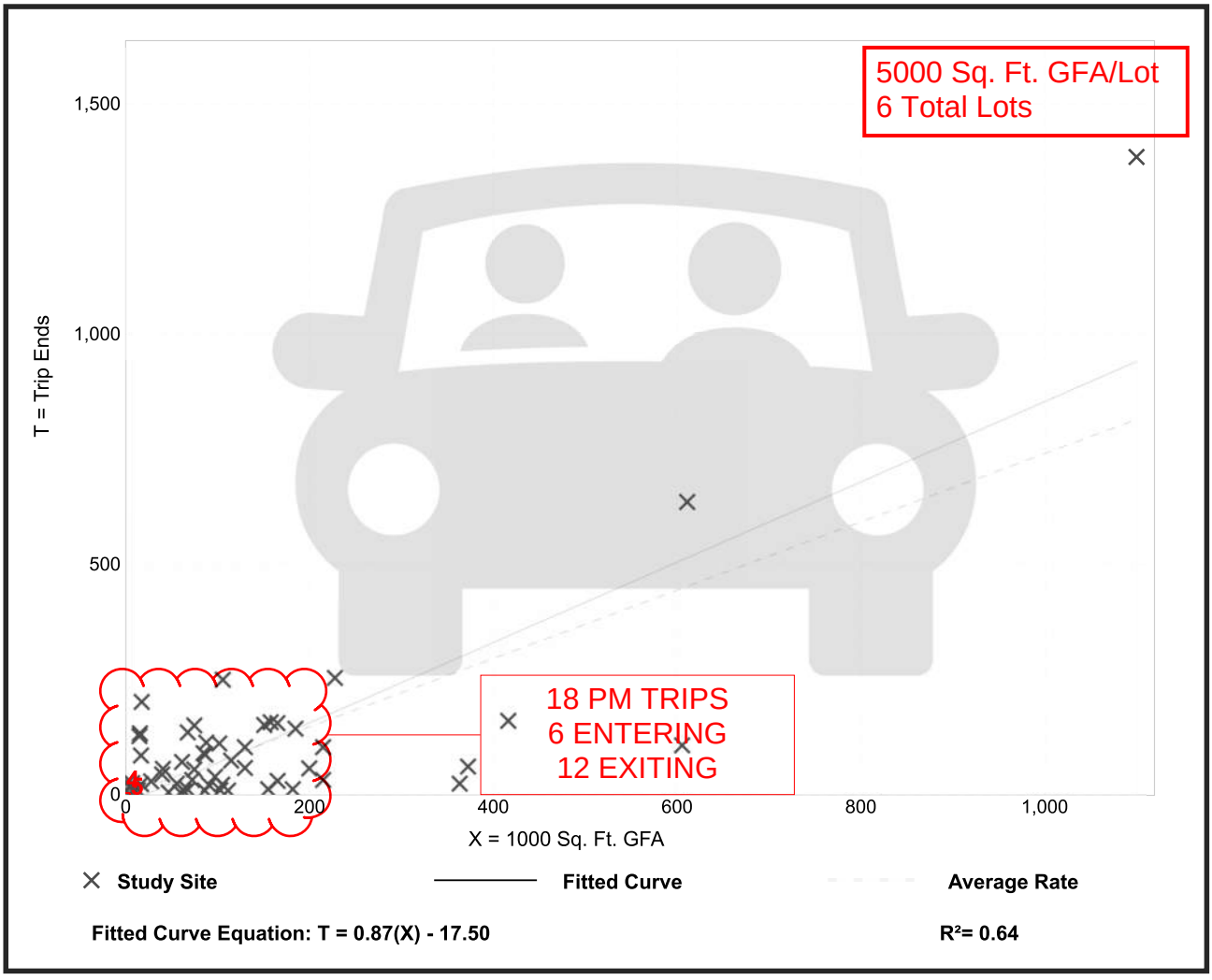
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 55
Avg. 1000 Sq. Ft. GFA: 142
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.74	0.07 - 11.37	0.93

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Filing 1

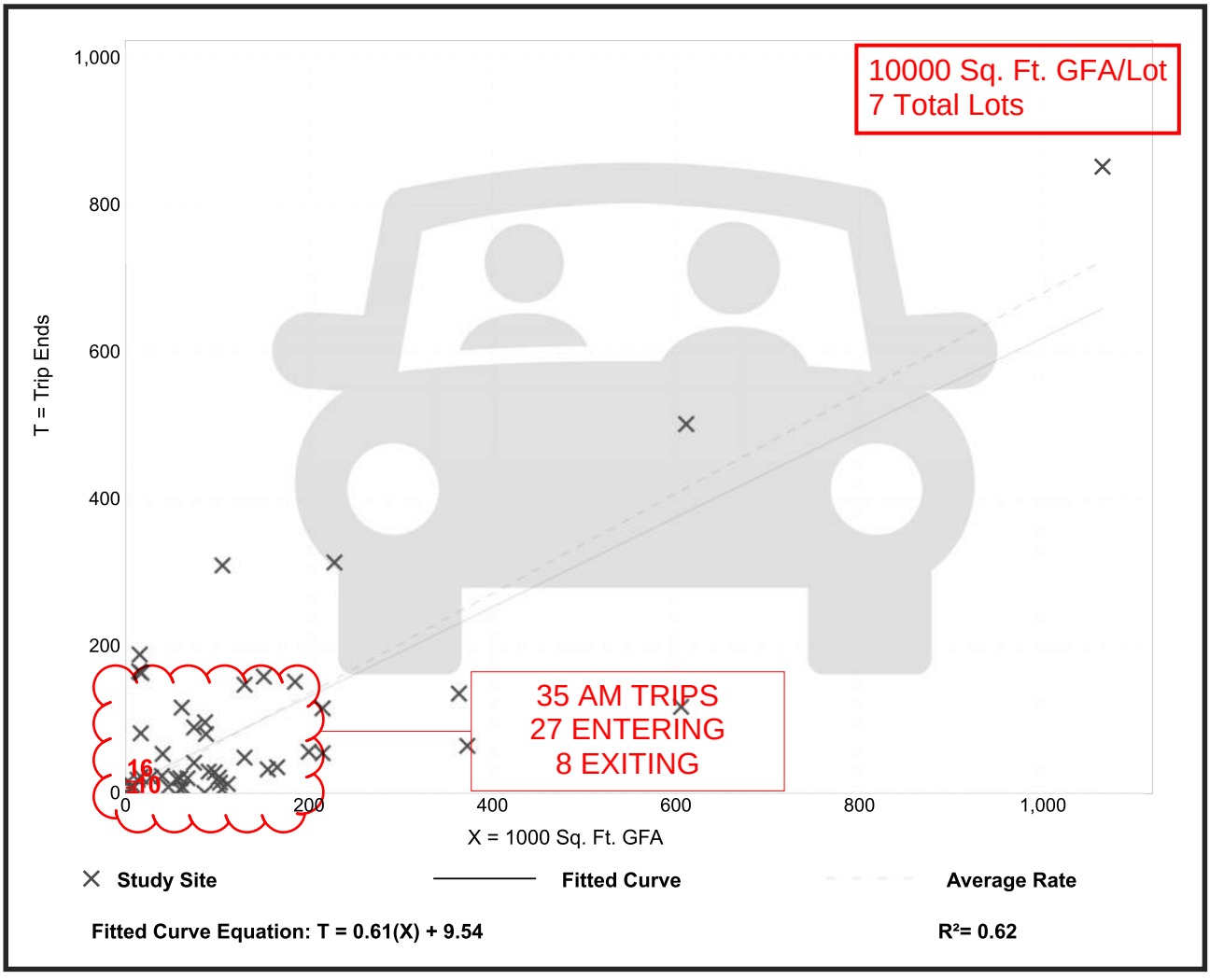
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 48
Avg. 1000 Sq. Ft. GFA: 138
Directional Distribution: 76% entering, 24% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.68	0.01 - 11.93	1.03

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Filing 1

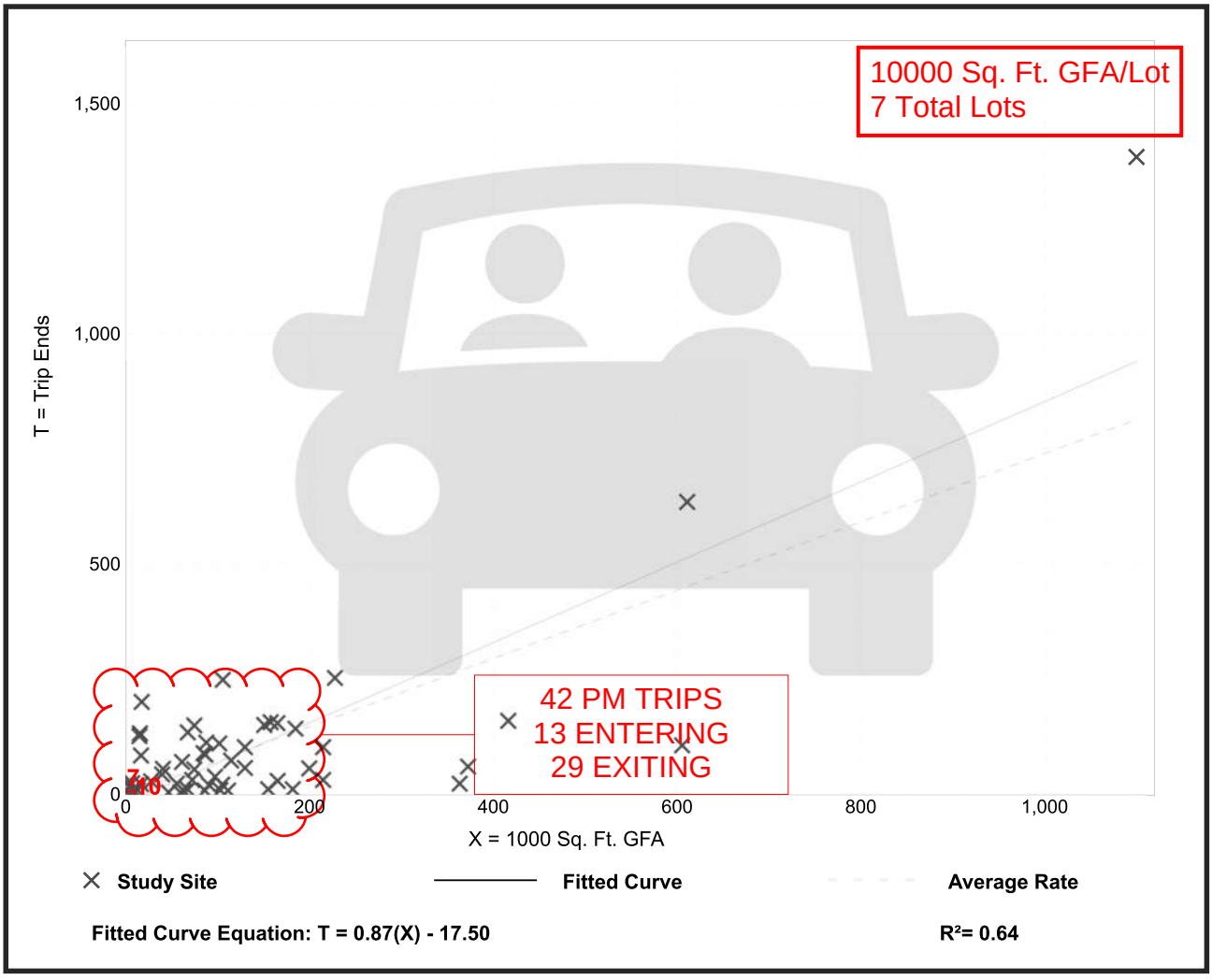
Manufacturing
(140)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
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:	55
Avg. 1000 Sq. Ft. GFA:	142
Directional Distribution:	31% entering, 69% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.74	0.07 - 11.37	0.93

Data Plot and Equation



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Filing 2

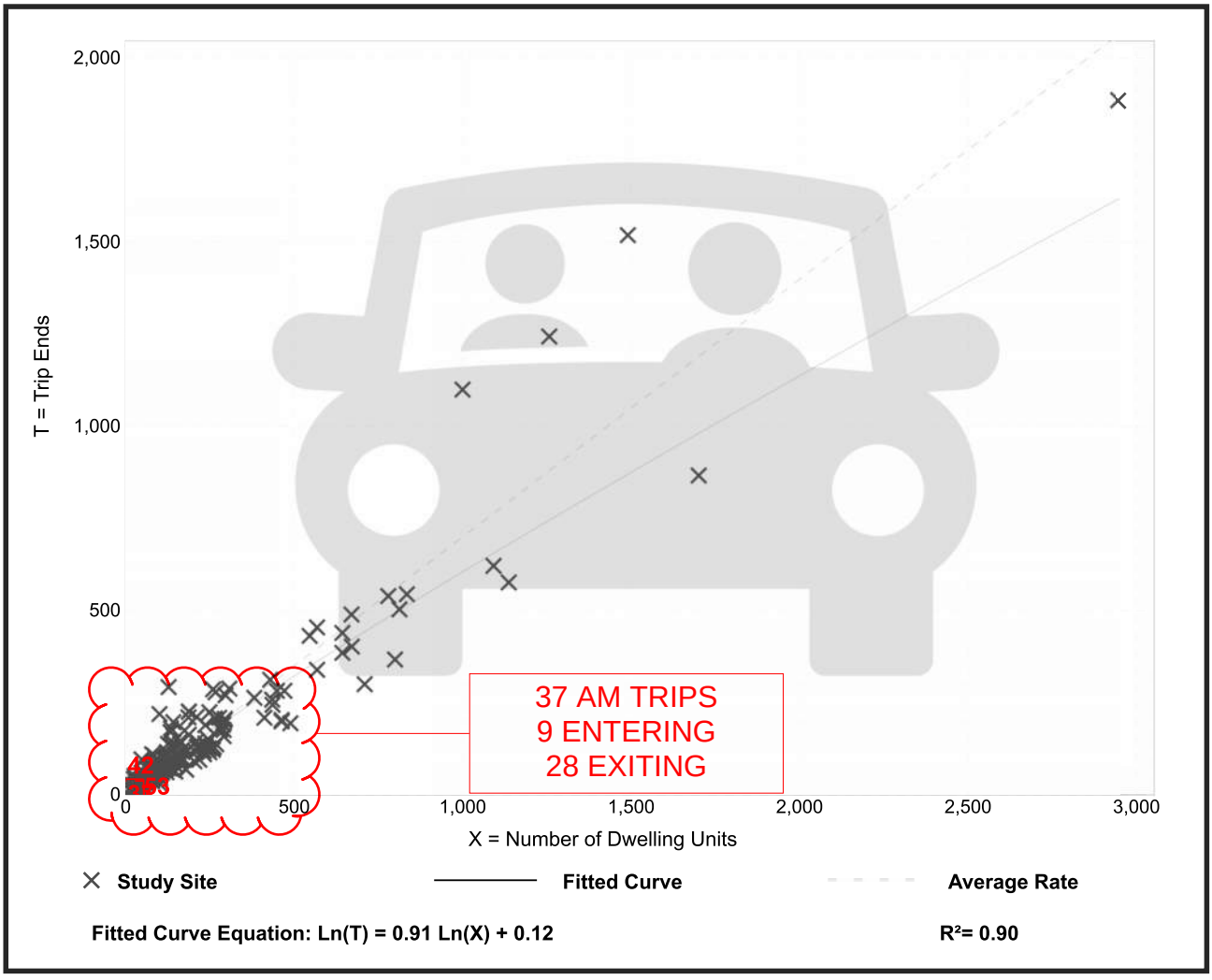
Single-Family Detached Housing
(210)

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: 25% entering, 75% 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



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Filing 2

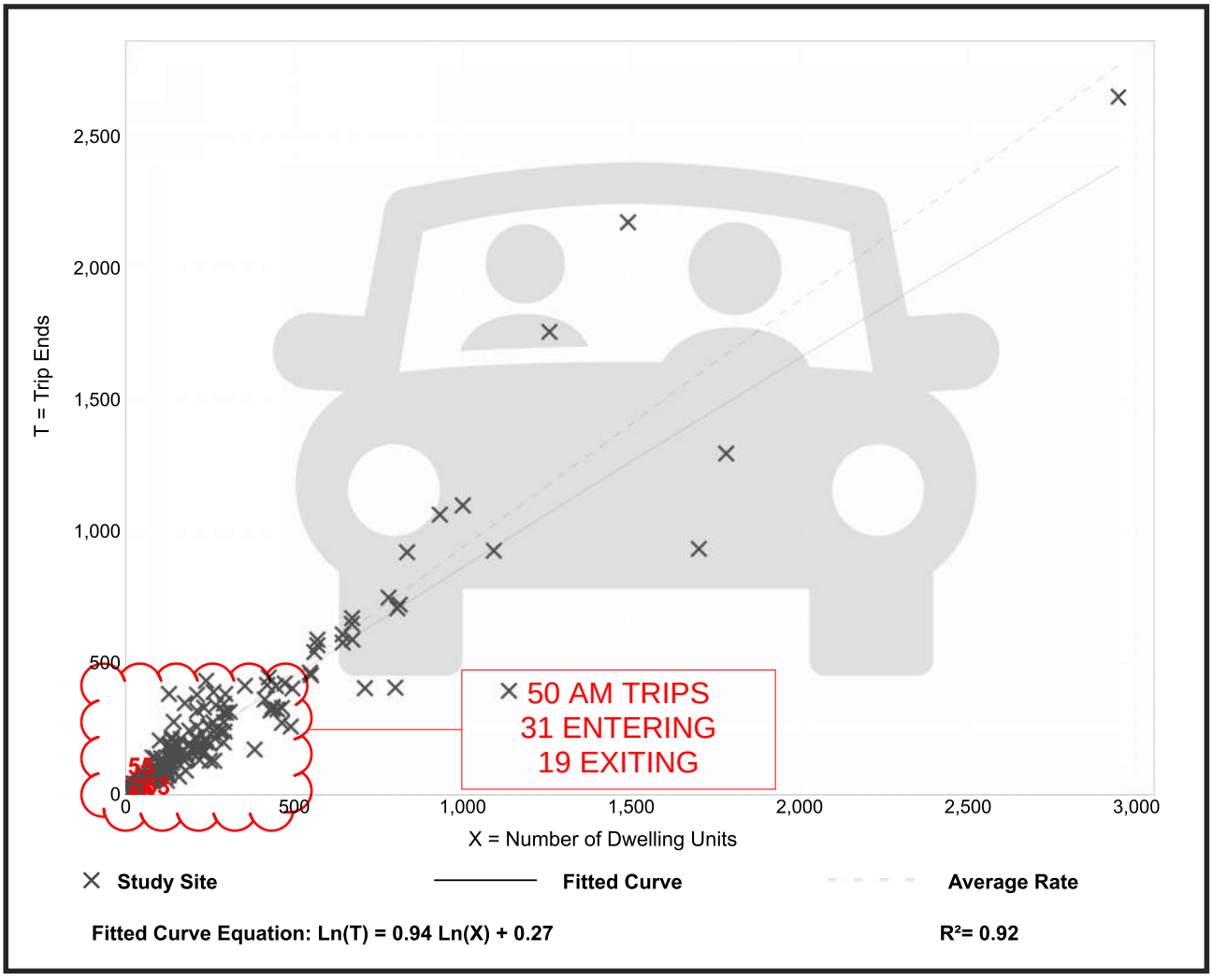
Single-Family Detached Housing
(210)

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



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Filing 3

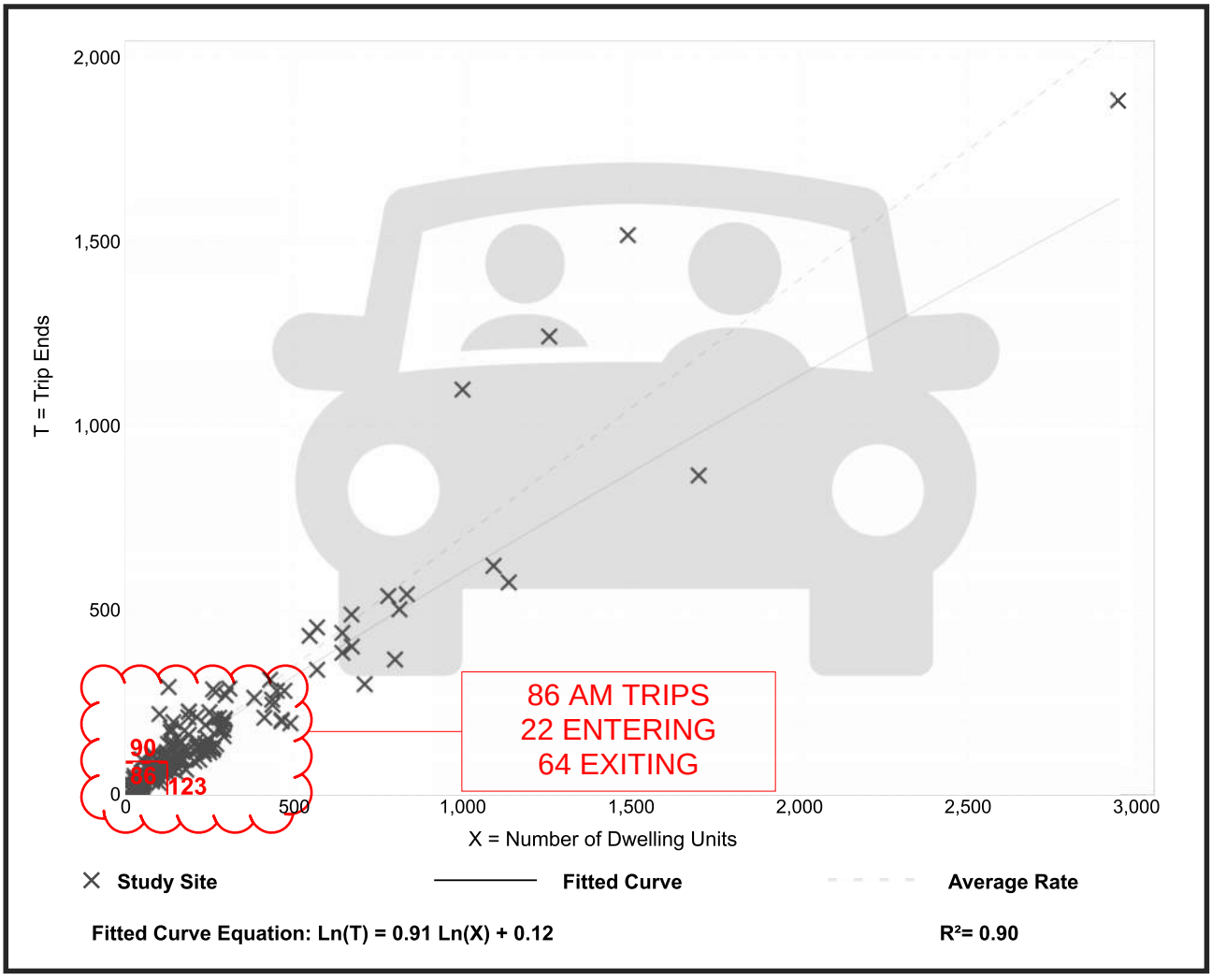
Single-Family Detached Housing
(210)

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: 25% entering, 75% 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



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Filing 3

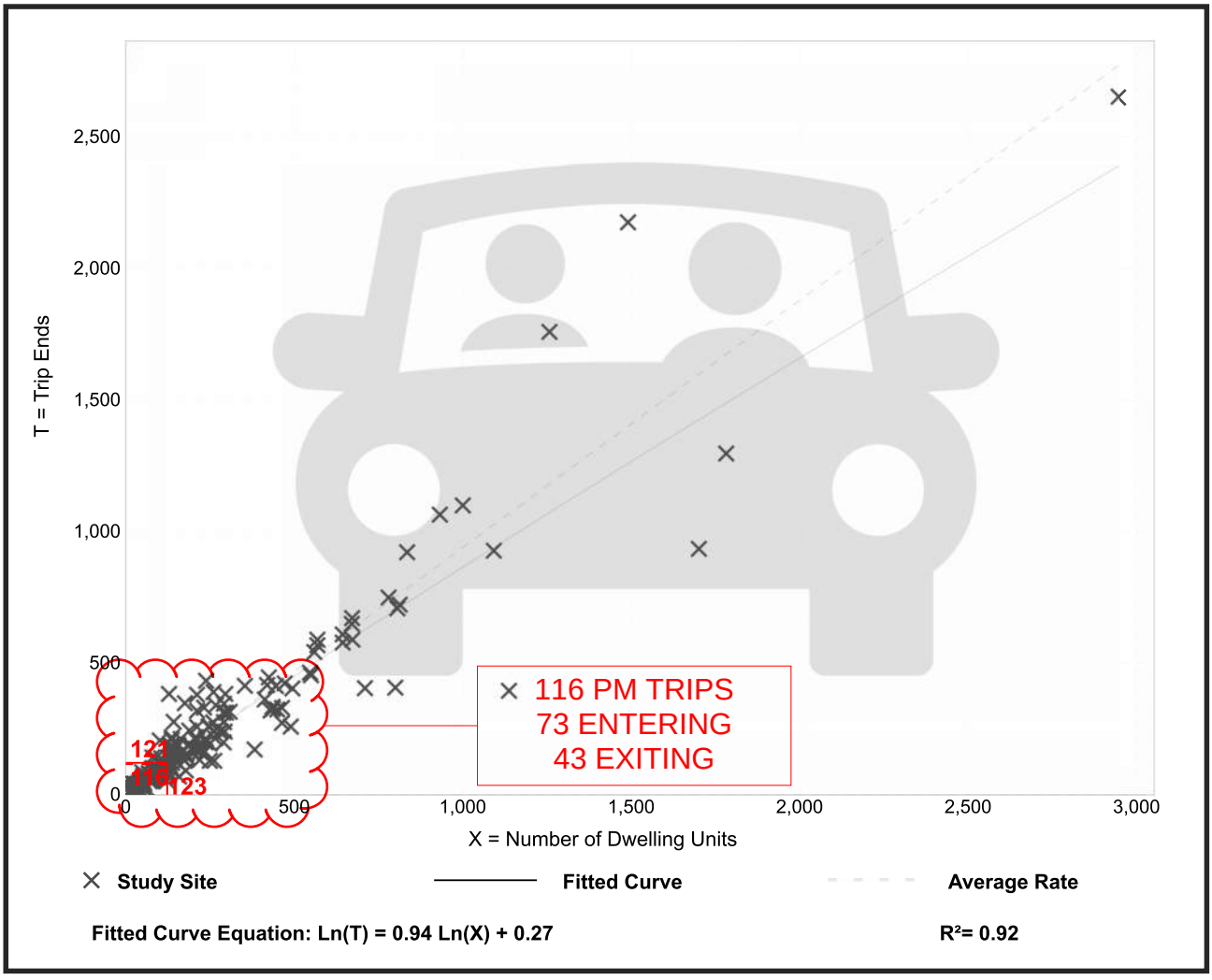
Single-Family Detached Housing
(210)

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



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Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX F

- Auxiliary Turn Lane
- Traffic Signal Warrant Analysis

HWY 87 & Lorraine St

2024 Background Background Traffic Volumes - Right Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM				PM			
		Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)	Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)
HWY 87 & Lorraine St	NB	114	24	90	N	242	48	90	N
	SB	168	0	90	N	135	0	90	N
	EB	0	0	90	N	0	0	90	N
	WB	23	1	90	N	24	1	90	N

2024 Background ffic Volumes - Left Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM					PM				
		Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)	Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)
HWY 87 & Lorraine St	NB	114	0	0.0%	168	N	242	0	0.0%	135	N
	SB	168	2	1.2%	114	N	135	1	0.7%	242	N
	EB	0	0	0.0%	23	N	0	0	0.0%	24	N
	WB	23	22	95.7%	0	Y	24	23	95.8%	0	Y

2034 Total Traffic Volumes - Right Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM				PM			
		Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)	Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)
HWY 87 & Lorraine St	NB	136	34	90	N	277	58	90	N
	SB	192	0	90	N	155	0	90	N
	EB	0	0	90	N	0	0	90	N
	WB	30	3	90	N	36	3	90	N

2034 Total Traffic Volumes - Left Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM					PM				
		Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)	Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)
HWY 87 & Lorraine St	NB	136	0	0.0%	192	N	277	0	0.0%	155	N
	SB	192	4	2.1%	136	N	155	3	1.9%	277	N
	EB	0	0	0.0%	30	N	0	0	0.0%	36	N
	WB	30	27	90.0%	0	Y	36	33	91.7%	0	Y

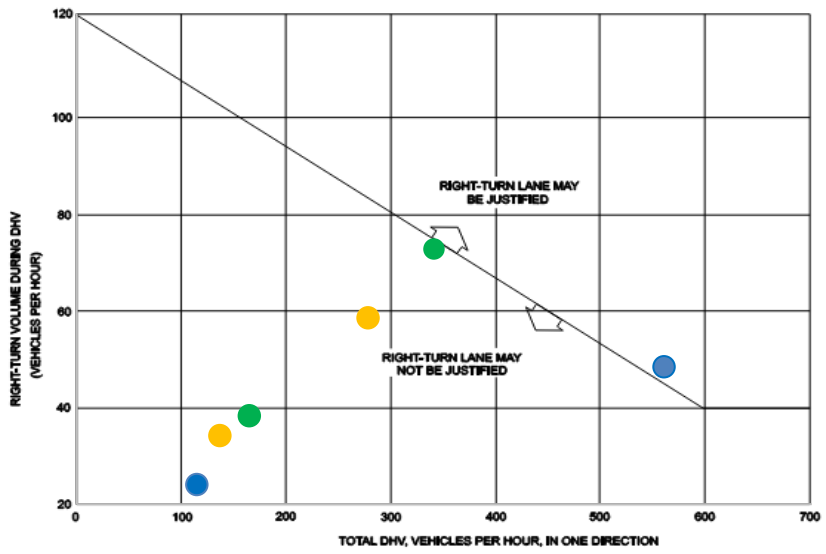
2054 Total Traffic Volumes - Right Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM				PM			
		Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)	Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)
HWY 87 & Lorraine St	NB	164	38	90	N	340	72	90	N
	SB	233	0	90	N	189	0	90	N
	EB	0	0	90	N	0	0	90	N
	WB	39	3	90	N	42	3	90	N

2054 Total Traffic Volumes - Left Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM					PM				
		Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)	Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)
HWY 87 & Lorraine St	NB	164	0	0.0%	233	N	340	0	0.0%	189	N
	SB	233	4	1.7%	164	N	189	3	1.6%	340	N
	EB	0	0	0.0%	39	N	0	0	0.0%	42	N
	WB	39	36	92.3%	0	Y	42	39	92.9%	0	Y

HWY 87 & Lorraine St



Note: For highways with a design speed below 50 mph (80 km/h) with a DHV < 300 and where right turns are > 40, an adjustment should be used. To read the vertical axis of the chart, subtract 20 from the actual number of right turns.

HWY 87 & Lorraine St

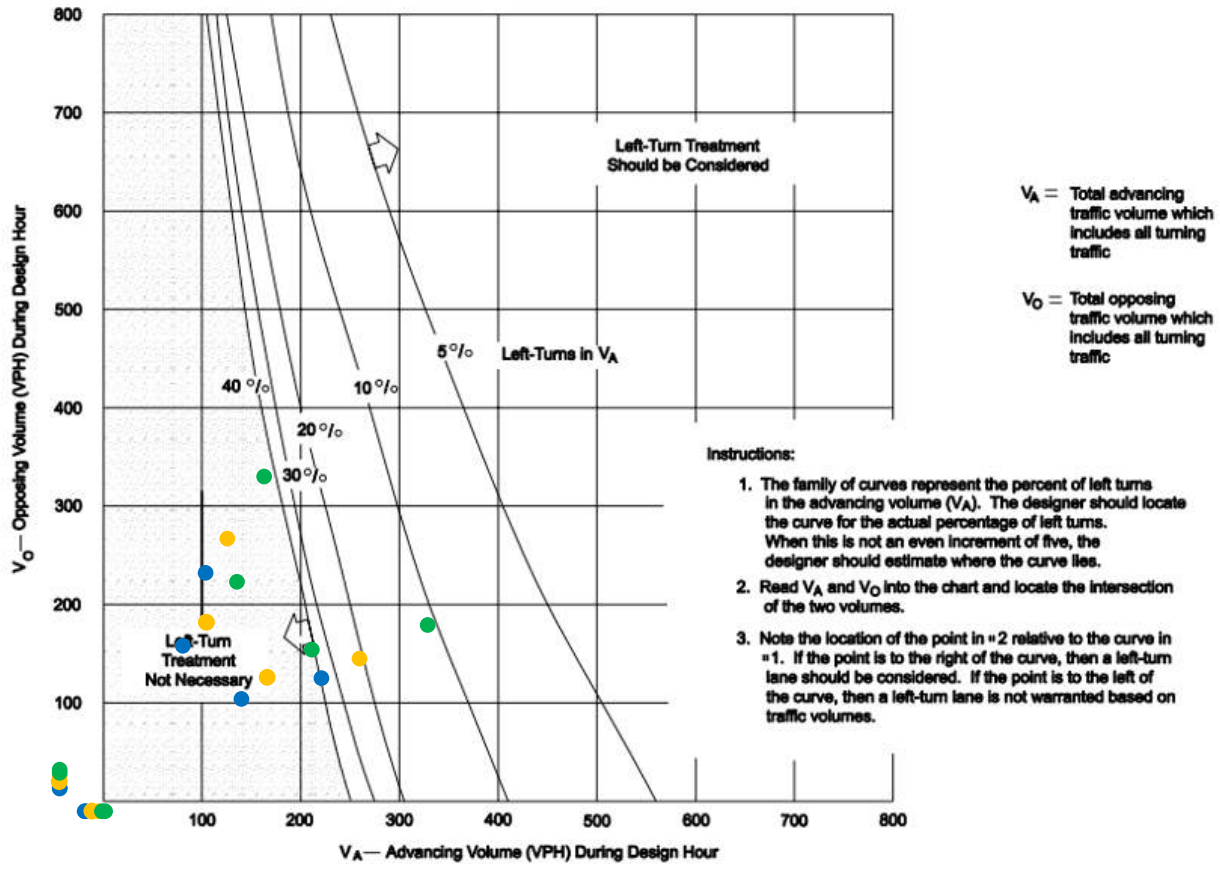
2024 Background Traffic

2034 Total Traffic

2054 Total Traffic

Note: Points outside the limits of the chart are not plotted and need to be verified if a right-turn may be needed

HWY 87 & Lorraine St



VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON 2-LANE HIGHWAYS (60 MPH)
(US Customary)

Figure 28.4C

HWY 87 & Lorraine St

2024 Background TRAFFIC
2034 Total TRAFFIC
2054 Total TRAFFIC

Note: Points outside the limits of the chart are not plotted and are assumed to indicate a left-turn may be needed

HWY 87 & Access A

2024 Background Background Traffic Volumes - Right Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM				PM			
		Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)	Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)
HWY 87 & Access A	NB	117	0	90	N	246	0	90	N
	SB	192	0	90	N	161	0	90	N
	EB	0	0	90	N	0	0	90	N
	WB	0	0	90	N	0	0	90	N

2024 Background ffic Volumes - Left Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM					PM				
		Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)	Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)
HWY 87 & Access A	NB	117	0	0.0%	192	N	246	0	0.0%	161	N
	SB	192	0	0.0%	117	N	161	0	0.0%	246	N
	EB	0	0	0.0%	0	N	0	0	0.0%	0	N
	WB	0	0	0.0%	0	N	0	0	0.0%	0	N

2034 Total Traffic Volumes - Right Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM				PM			
		Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)	Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)
HWY 87 & Access A	NB	222	85	90	N	333	57	90	N
	SB	219	0	90	N	188	0	90	N
	EB	0	0	90	N	0	0	90	N
	WB	37	2	90	N	89	4	90	N

2034 Total Traffic Volumes - Left Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM					PM				
		Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)	Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)
HWY 87 & Access A	NB	222	0	0.0%	219	N	333	0	0.0%	188	N
	SB	219	4	1.8%	222	N	188	3	1.6%	333	N
	EB	0	0	0.0%	37	N	0	0	0.0%	89	N
	WB	37	35	94.6%	0	Y	89	85	95.5%	0	Y

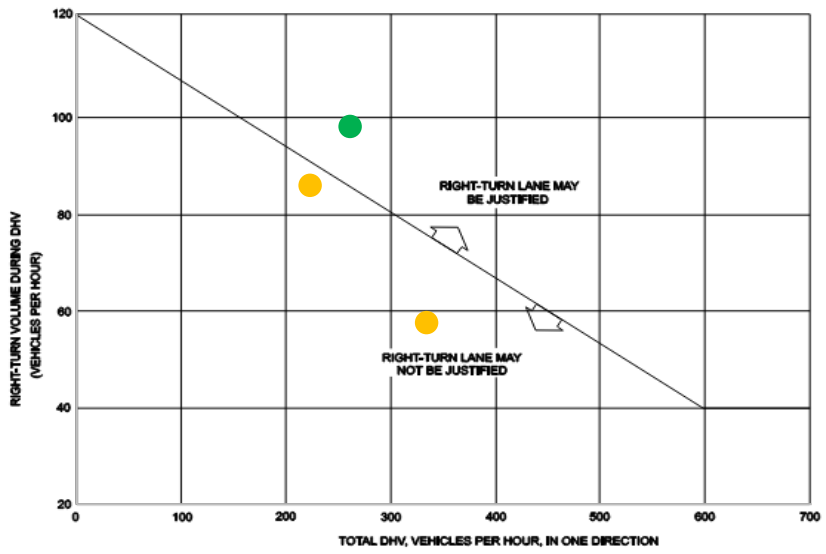
2054 Total Traffic Volumes - Right Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM				PM			
		Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)	Total DHV	RT Vol During DHV	Required RT Vol for Warranted Lane	Warranted RT Lane (Y/N)
HWY 87 & Access A	NB	260	97	90	Y	469	130	90	Y
	SB	270	0	90	N	230	0	90	N
	EB	0	0	90	N	0	0	90	N
	WB	106	4	90	N	126	6	90	N

2054 Total Traffic Volumes - Left Turn Lanes at Unsignalized Intersections on 2-Lane Highways Summary

Intersection	Approach	AM					PM				
		Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)	Va = Tot Advancing Traffic Vol	Va(L) = Tot LT vol in advancing traffic	% LT in Va	Vo = Tot opposing traffic Vol	Warranted LT Lane (Y/N)
HWY 87 & Access A	NB	260	0	0.0%	270	N	469	0	0.0%	230	N
	SB	270	5	1.9%	260	N	230	5	2.2%	469	N
	EB	0	0	0.0%	106	N	0	0	0.0%	126	N
	WB	106	102	96.2%	0	Y	126	120	95.2%	0	Y

HWY 87 & Access A



Note: For highways with a design speed below 50 mph (80 km/h) with a DHV < 300 and where right turns are > 40, an adjustment should be used. To read the vertical axis of the chart, subtract 20 from the actual number of right turns.

HWY 87 & Access A

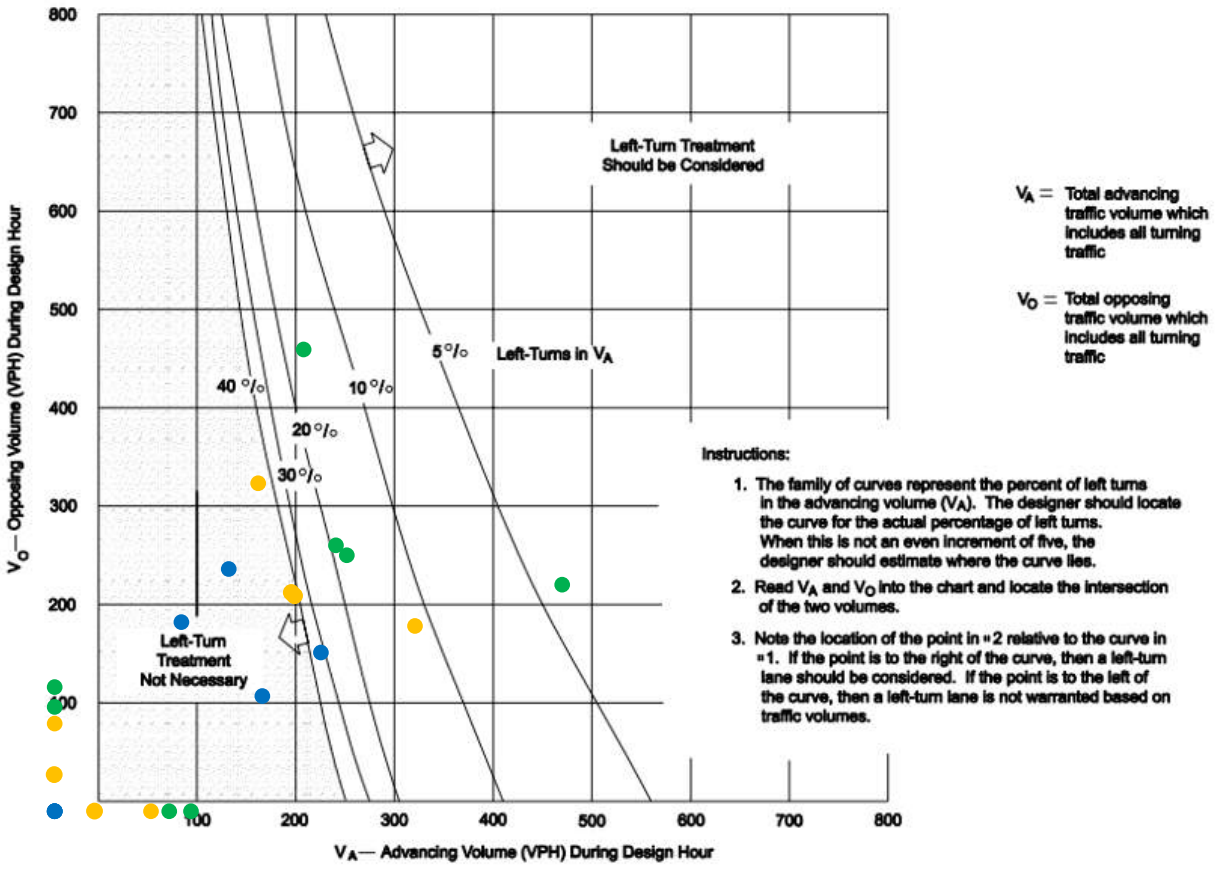
2024 Background Traffic

2034 Total Traffic

2054 Total Traffic

Note: Points outside the limits of the chart are not plotted and need to be verified if a right-turn may be needed

HWY 87 & Access A



VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON 2-LANE HIGHWAYS (60 MPH)
(US Customary)

Figure 28.4C

HWY 87 & Access A

2024 Background TRAFFIC
2034 Total TRAFFIC
2054 Total TRAFFIC

Note: Points outside the limits of the chart are not plotted and are assumed to indicate a left-turn may be needed

HCS Warrants Report

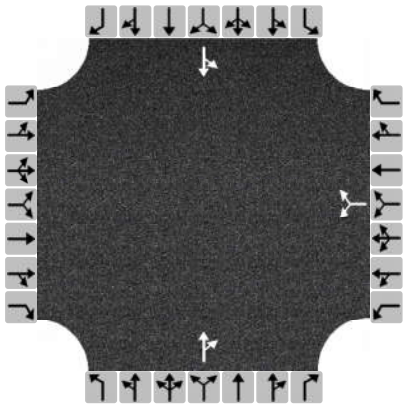
Project Information

Analyst	JTP	Date	5/15/2025
Agency	IMEG	Analysis Year	2024
Jurisdiction	COUNTY	Time Period Analyzed	12 Hr
Project Description	2024 INT 1 EXISTING		

General

Major Street Direction	North-South	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	2
Major Street Speed (mi/h)	70	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	0	0	0	0	0	0	1	0	0	1	0
Lane Usage					LR			TR			LT	
Vehicle Volumes Averages (veh/h)	0	0	0	1	0	24	0	111	23	1	110	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	0.0			9.1			0.0			0.1		
Delay Averages (veh-hrs)	0.0			0.1			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	0

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A (70%)	4B (56%)
07 - 08	208	47	255	0	0	No	No	No	No	No	No	No	No	No
08 - 09	185	26	211	0	0	No	No	No	No	No	No	No	No	No
09 - 10	224	25	249	0	0	No	No	No	No	No	No	No	No	No
10 - 11	268	26	294	0	0	No	No	No	No	No	No	No	No	No
11 - 12	215	29	244	0	0	No	No	No	No	No	No	No	No	No
12 - 13	240	14	254	0	0	No	No	No	No	No	No	No	No	No
13 - 14	227	16	243	0	0	No	No	No	No	No	No	No	No	No
14 - 15	236	22	258	0	0	No	No	No	No	No	No	No	No	No
15 - 16	260	30	290	0	0	No	No	No	No	No	No	No	No	No
16 - 17	344	19	363	0	0	No	No	No	No	No	No	No	No	No
17 - 18	339	27	366	0	0	No	No	No	No	No	No	No	No	No
18 - 19	211	23	234	0	0	No	No	No	No	No	No	No	No	No
Total	2957	304	3261	0	0	0	0	0	0	0	0	0	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS Warrants Report

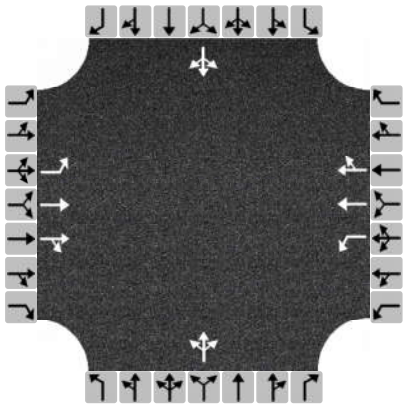
Project Information

Analyst	JTP	Date	5/15/2025
Agency	IMEG	Analysis Year	2024
Jurisdiction	COUNTY	Time Period Analyzed	12 Hr
Project Description	2024 INT 2 EXISTING		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	2
Major Street Speed (mi/h)	50	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	1	2	0	1	2	0	0	1	0	0	1	0
Lane Usage	L	TR		L	TR			LTR			LTR	
Vehicle Volumes Averages (veh/h)	48	260	1	0	246	2	1	0	0	1	0	49
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	1.2			0.1			9.7			9.4		
Delay Averages (veh-hrs)	0.1			0.0			0.0			0.1		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	1

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	0

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A (70%)	4B (56%)
07 - 08	548	76	627	0	0	No	No	No	Yes	No	No	No	No	No
08 - 09	465	54	520	0	0	No	No	No	No	No	No	No	No	No
09 - 10	445	65	512	0	0	No	No	No	No	No	No	No	No	No
10 - 11	501	46	551	0	0	No	No	No	No	No	No	No	No	No
11 - 12	542	44	588	0	0	No	No	No	Yes	No	No	No	No	No
12 - 13	603	47	651	0	0	No	No	No	Yes	No	No	No	No	No
13 - 14	542	53	596	0	0	No	No	No	Yes	No	No	No	No	No
14 - 15	505	47	552	0	0	No	No	No	Yes	No	No	No	No	No
15 - 16	612	33	645	0	0	No	No	No	No	No	No	No	No	No
16 - 17	662	45	707	0	0	No	No	No	Yes	No	No	No	No	No
17 - 18	796	64	861	0	0	No	No	Yes	Yes	No	No	No	No	No
18 - 19	501	49	552	0	0	No	No	No	No	No	No	No	No	No
Total	6722	623	7362	0	0	0	0	1	7	0	0	0	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS Warrants Report

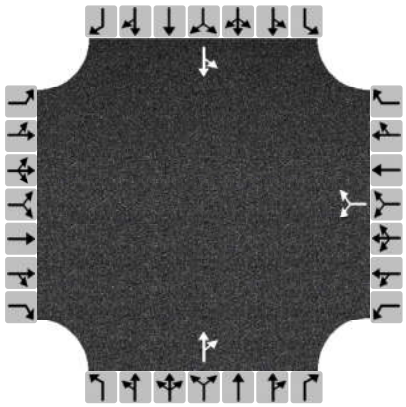
Project Information

Analyst	JTP	Date	5/15/2025
Agency	IMEG	Analysis Year	2054
Jurisdiction	COUNTY	Time Period Analyzed	12 Hr
Project Description	2054 INT 1 Full Build		

General

Major Street Direction	North-South	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	2
Major Street Speed (mi/h)	70	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	0	0	0	0	0	0	1	0	0	1	0
Lane Usage					LR			TR			LT	
Vehicle Volumes Averages (veh/h)	0	0	0	1	0	32	0	149	32	1	144	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	0.0			9.4			0.0			0.1		
Delay Averages (veh-hrs)	0.0			0.1			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	1

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	0

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A (70%)	4B (56%)
07 - 08	280	64	344	0	0	No	No	No	No	No	No	No	No	No
08 - 09	250	35	285	0	0	No	No	No	No	No	No	No	No	No
09 - 10	302	33	335	0	0	No	No	No	No	No	No	No	No	No
10 - 11	362	35	397	0	0	No	No	No	No	No	No	No	No	No
11 - 12	290	39	329	0	0	No	No	No	No	No	No	No	No	No
12 - 13	324	19	343	0	0	No	No	No	No	No	No	No	No	No
13 - 14	306	21	327	0	0	No	No	No	No	No	No	No	No	No
14 - 15	319	30	349	0	0	No	No	No	No	No	No	No	No	No
15 - 16	350	40	390	0	0	No	No	No	No	No	No	No	No	No
16 - 17	404	26	430	0	0	No	No	No	No	No	No	No	No	No
17 - 18	456	36	492	0	0	No	No	No	No	No	No	No	No	No
18 - 19	284	31	315	0	0	No	No	No	No	No	No	No	No	No
Total	3927	409	4336	0	0	0	0	0	0	0	0	0	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS Warrants Report

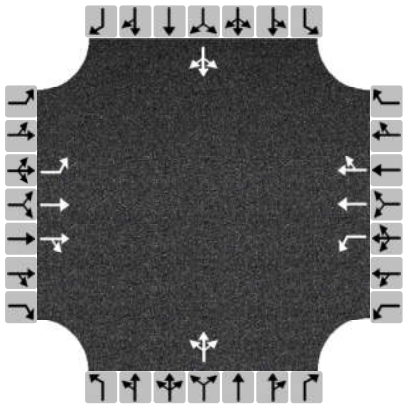
Project Information

Analyst	JTP	Date	5/15/2025
Agency	IMEG	Analysis Year	2054
Jurisdiction	COUNTY	Time Period Analyzed	12 Hr
Project Description	2054 INT 2 Full Build		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	2
Major Street Speed (mi/h)	50	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	1	2	0	1	2	0	0	1	0	0	1	0
Lane Usage	L	TR		L	TR			LTR			LTR	
Vehicle Volumes Averages (veh/h)	65	351	2	0	332	3	1	0	0	2	0	67
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	1.2			0.0			11.3			10.0		
Delay Averages (veh-hrs)	0.2			0.0			0.0			0.2		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	1

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	0

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A (70%)	4B (56%)
07 - 08	738	102	844	0	0	No	Yes	Yes	Yes	Yes	No	No	No	No
08 - 09	627	73	701	0	0	No	No	No	Yes	No	No	No	No	No
09 - 10	600	88	690	3	0	No	Yes	No	Yes	No	No	No	No	No
10 - 11	675	62	742	1	0	No	No	Yes	Yes	No	No	No	No	No
11 - 12	730	59	792	0	0	No	No	Yes	Yes	No	No	No	No	No
12 - 13	812	64	877	0	0	No	No	Yes	Yes	No	No	No	No	No
13 - 14	731	71	803	0	0	No	No	Yes	Yes	No	No	No	No	No
14 - 15	681	63	744	0	0	No	No	Yes	Yes	No	No	No	No	No
15 - 16	824	44	868	0	0	No	No	No	Yes	No	No	No	No	No
16 - 17	892	61	954	0	0	No	No	Yes	Yes	No	No	No	No	No
17 - 18	1073	87	1161	0	0	No	Yes	Yes	Yes	Yes	No	No	No	No
18 - 19	677	66	746	0	0	No	No	Yes	Yes	No	No	No	No	No
Total	9060	840	9922	4	0	0	3	9	12	2	0	0	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	✓
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	✓
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	✓
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX G

- 2024 Seasonal Adjustment Factors
- Appendix E of the Road Design Manual Produced by MDT

2024 Seasonal Factors [1]								
Group	Month	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
UMA_UC	January	1.648	1.110	1.003	0.990	0.978	1.013	1.378
	February	1.523	1.058	1.057	1.058	1.026	0.981	1.286
	March	1.571	1.039	1.007	0.983	0.966	0.971	1.313
	April	1.311	0.932	0.904	0.907	0.917	0.883	1.134
	May	1.220	0.856	0.826	0.821	0.826	0.828	1.099
	June	1.227	0.880	0.822	0.808	0.820	0.854	1.123
	July	1.235	0.882	0.824	0.838	0.838	0.838	1.124
	August	1.244	0.884	0.844	0.838	0.842	0.854	1.100
	September	1.325	0.885	0.854	0.858	0.865	0.853	1.141
	October	1.414	0.942	0.901	0.953	0.957	0.917	1.193
	November	1.503	0.976	0.943	0.941	0.950	1.013	1.309
	December	1.499	1.002	0.998	0.978	0.965	0.954	1.301

Note 1: Data obtained from the Montana Department of Transportation, for the dates of 1/1/2023 - 12/31/2023

2024 Seasonal Factors [1]								
Group	Month	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
UPA	January	1.709	1.140	1.022	0.990	0.980	0.979	1.340
	February	1.563	1.048	1.030	1.036	0.997	0.945	1.204
	March	1.547	1.030	0.977	0.970	0.962	0.944	1.197
	April	1.391	0.964	0.925	0.918	0.901	0.867	1.106
	May	1.298	0.912	0.878	0.870	0.863	0.835	1.083
	June	1.247	0.903	0.863	0.853	0.842	0.828	1.066
	July	1.233	0.871	0.842	0.837	0.832	0.822	1.056
	August	1.269	0.906	0.873	0.862	0.852	0.845	1.071
	September	1.334	0.916	0.880	0.875	0.870	0.835	1.092
	October	1.413	0.952	0.912	0.939	0.931	0.889	1.137
	November	1.498	0.966	0.933	0.934	0.925	0.957	1.225
	December	1.548	0.996	1.000	0.958	0.952	0.922	1.219

Note 1: Data obtained from the Montana Department of Transportation, for the dates of 1/1/2023 - 12/31/2023

TYPE OF FACILITY	LEVEL-OF-SERVICE CRITERIA	
Freeways (NHS — Interstate)	Rural: B	Urban: B
Principal Arterials (NHS — Non-Interstate)	Level/Rolling: B	Mountainous: C
Minor Arterials (Non-NHS — Primary)	Level/Rolling: B	Mountainous: C
Rural Collector Roads (Non-NHS — Secondary)	Desirable: B	Minimum: C
Urban Principle Arterials (NHS — Non-Interstate) 2-Lane and Multi-Lane	Desirable: B	Minimum: C
Urban Minor Arterials (Non-NHS) 2-Lane and Multi-Lane	Desirable: B	Minimum: C
Urban Collector Streets (Non-NHS)	Desirable: C	Minimum: D

LEVEL-OF-SERVICE CRITERIA

Figure 30.2B

Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX H

Miovision Data

HWY 87 and Loraine St - TMC

Tue Jul 23, 2024
AM Peak (Jul 23 2024 9:45AM - 10:45 AM)
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1212282, Location: 45.892711, -108.467172

Provided by: IMEG Corp.
401 E. State Street, 4th Floor,
Rockford, IL, 61104, US

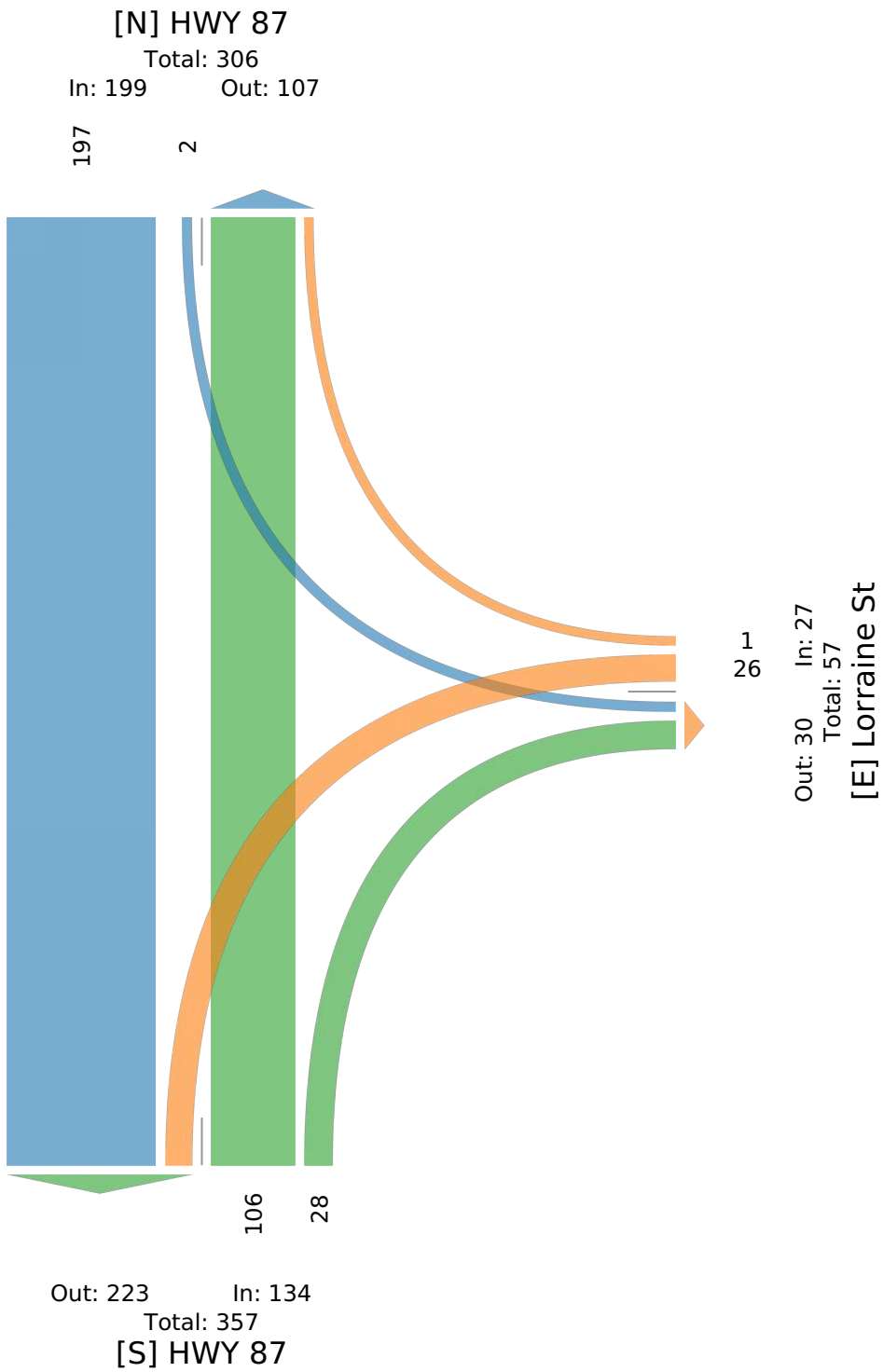
Leg Direction	HWY 87 Southbound					Lorraine St Westbound					HWY 87 Northbound					
Time	T	L	U	**App**	Ped*	R	L	U	**App**	Ped*	R	T	U	**App**	Ped*	**Int**
2024-07-23 9:45AM	61	0	0	**61**	0	0	10	0	**10**	0	8	20	0	**28**	0	**99**
10:00AM	42	1	0	**43**	0	1	3	0	**4**	0	9	27	0	**36**	0	**83**
10:15AM	50	0	0	**50**	0	0	7	0	**7**	0	8	29	0	**37**	0	**94**
10:30AM	44	1	0	**45**	0	0	6	0	**6**	0	3	30	0	**33**	0	**84**
Total	197	2	0	**199**	0	1	26	0	**27**	0	28	106	0	**134**	0	**360**
% Approach	99.0%	1.0%	0%	**-**	-	3.7%	96.3%	0%	**-**	-	20.9%	79.1%	0%	**-**	-	-
% Total	54.7%	0.6%	0%	**55.3%**	-	0.3%	7.2%	0%	**7.5%**	-	7.8%	29.4%	0%	**37.2%**	-	-
PHF	0.807	0.500	-	**0.816**	-	0.250	0.650	-	**0.675**	-	0.778	0.883	-	**0.905**	-	0.909
Motorcycles	0	0	0	**0**	-	0	0	0	**0**	-	0	3	0	**3**	-	3
% Motorcycles	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	2.8%	0%	**2.2%**	-	0.8%
Lights	186	1	0	**187**	-	1	26	0	**27**	-	27	94	0	**121**	-	335
% Lights	94.4%	50.0%	0%	**94.0%**	-	100%	100%	0%	**100%**	-	96.4%	88.7%	0%	**90.3%**	-	93.1%
Single-Unit Trucks	4	1	0	**5**	-	0	0	0	**0**	-	1	2	0	**3**	-	8
% Single-Unit Trucks	2.0%	50.0%	0%	**2.5%**	-	0%	0%	0%	**0%**	-	3.6%	1.9%	0%	**2.2%**	-	2.2%
Articulated Trucks	7	0	0	**7**	-	0	0	0	**0**	-	0	7	0	**7**	-	14
% Articulated Trucks	3.6%	0%	0%	**3.5%**	-	0%	0%	0%	**0%**	-	0%	6.6%	0%	**5.2%**	-	3.9%
Buses	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Buses	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

HWY 87 and Loraine St - TMC

Tue Jul 23, 2024
AM Peak (Jul 23 2024 9:45AM - 10:45 AM)
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1212282, Location: 45.892711, -108.467172

Provided by: IMEG Corp.
401 E. State Street, 4th Floor,
Rockford, IL, 61104, US



HWY 87 and Loraine St - TMC

Tue Jul 23, 2024
PM Peak (Jul 23 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1212282, Location: 45.892711, -108.467172

Provided by: IMEG Corp.
401 E. State Street, 4th Floor,
Rockford, IL, 61104, US

Leg Direction	HWY 87 Southbound					Lorraine St Westbound					HWY 87 Northbound					
Time	T	L	U	**App**	Ped*	R	L	U	**App**	Ped*	R	T	U	**App**	Ped*	**Int**
2024-07-23 4:30PM	43	0	0	**43**	0	0	6	0	**6**	0	11	49	0	**60**	0	**109**
4:45PM	49	0	0	**49**	0	1	3	0	**4**	0	13	61	0	**74**	0	**127**
5:00PM	28	0	0	**28**	0	0	10	0	**10**	0	15	61	0	**76**	0	**114**
5:15PM	39	0	0	**39**	0	0	8	0	**8**	0	18	59	0	**77**	0	**124**
Total	159	0	0	**159**	0	1	27	0	**28**	0	57	230	0	**287**	0	**474**
% Approach	100%	0%	0%	**-**	-	3.6%	96.4%	0%	**-**	-	19.9%	80.1%	0%	**-**	-	**-**
% Total	33.5%	0%	0%	**33.5%**	-	0.2%	5.7%	0%	**5.9%**	-	12.0%	48.5%	0%	**60.5%**	-	**-**
PHF	0.811	-	-	**0.811**	-	0.250	0.675	-	**0.700**	-	0.792	0.943	-	**0.932**	-	0.933
Motorcycles	5	0	0	**5**	-	0	0	0	**0**	-	1	0	0	**1**	-	6
% Motorcycles	3.1%	0%	0%	**3.1%**	-	0%	0%	0%	**0%**	-	1.8%	0%	0%	**0.3%**	-	1.3%
Lights	143	0	0	**143**	-	1	27	0	**28**	-	52	229	0	**281**	-	452
% Lights	89.9%	0%	0%	**89.9%**	-	100%	100%	0%	**100%**	-	91.2%	99.6%	0%	**97.9%**	-	95.4%
Single-Unit Trucks	4	0	0	**4**	-	0	0	0	**0**	-	3	1	0	**4**	-	8
% Single-Unit Trucks	2.5%	0%	0%	**2.5%**	-	0%	0%	0%	**0%**	-	5.3%	0.4%	0%	**1.4%**	-	1.7%
Articulated Trucks	7	0	0	**7**	-	0	0	0	**0**	-	1	0	0	**1**	-	8
% Articulated Trucks	4.4%	0%	0%	**4.4%**	-	0%	0%	0%	**0%**	-	1.8%	0%	0%	**0.3%**	-	1.7%
Buses	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Buses	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

HWY 87 and Loraine St - TMC

Tue Jul 23, 2024
PM Peak (Jul 23 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1212282, Location: 45.892711, -108.467172

Provided by: IMEG Corp.
401 E. State Street, 4th Floor,
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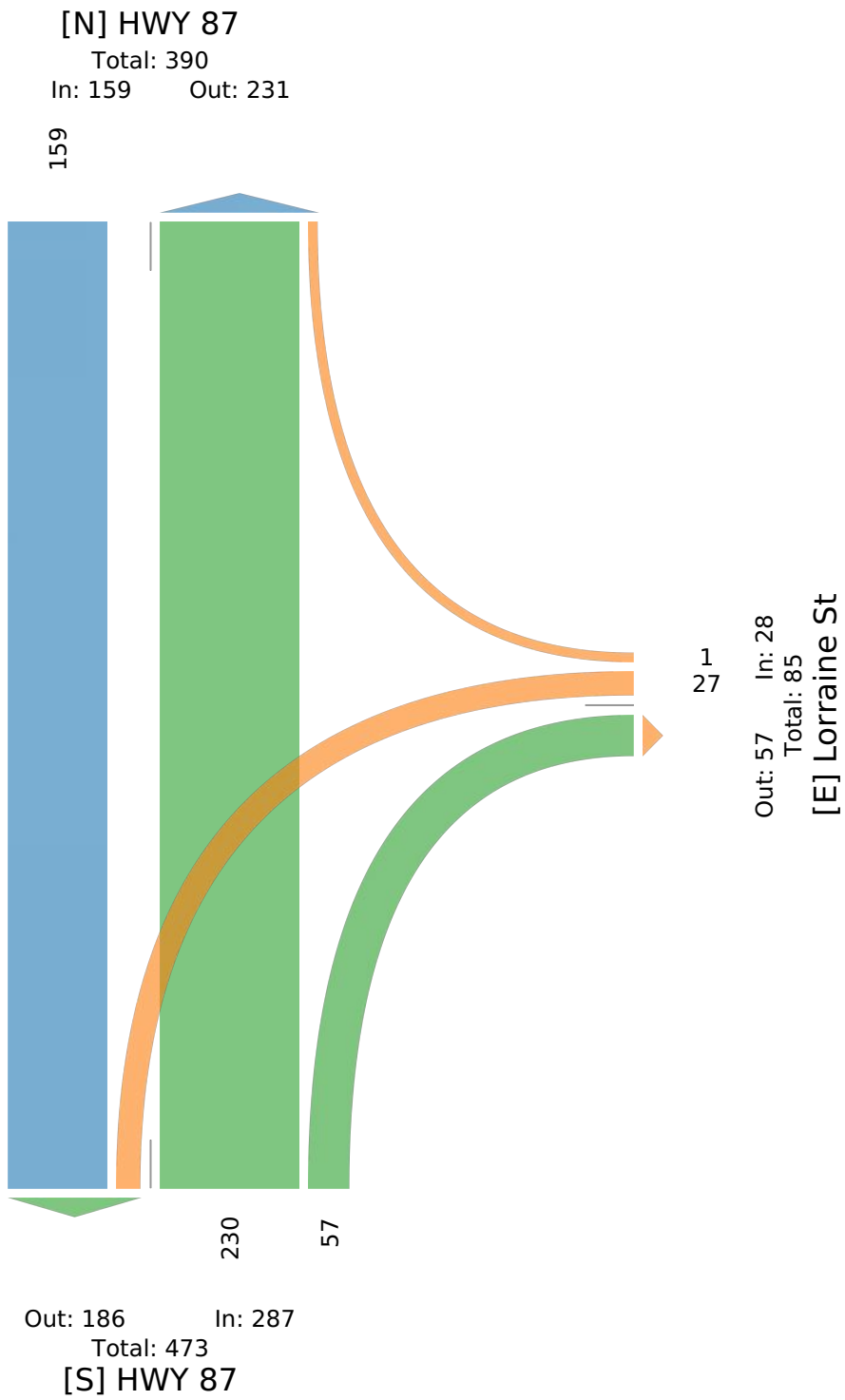


HWY 312 and Bitterroot - TMC

Tue Jul 23, 2024
AM Peak (Jul 23 2024 7AM - 8 AM)
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1212278, Location: 45.857115, -108.445417

Provided by: IMEG Corp.
401 E. State Street, 4th Floor,
Rockford, IL, 61104, US

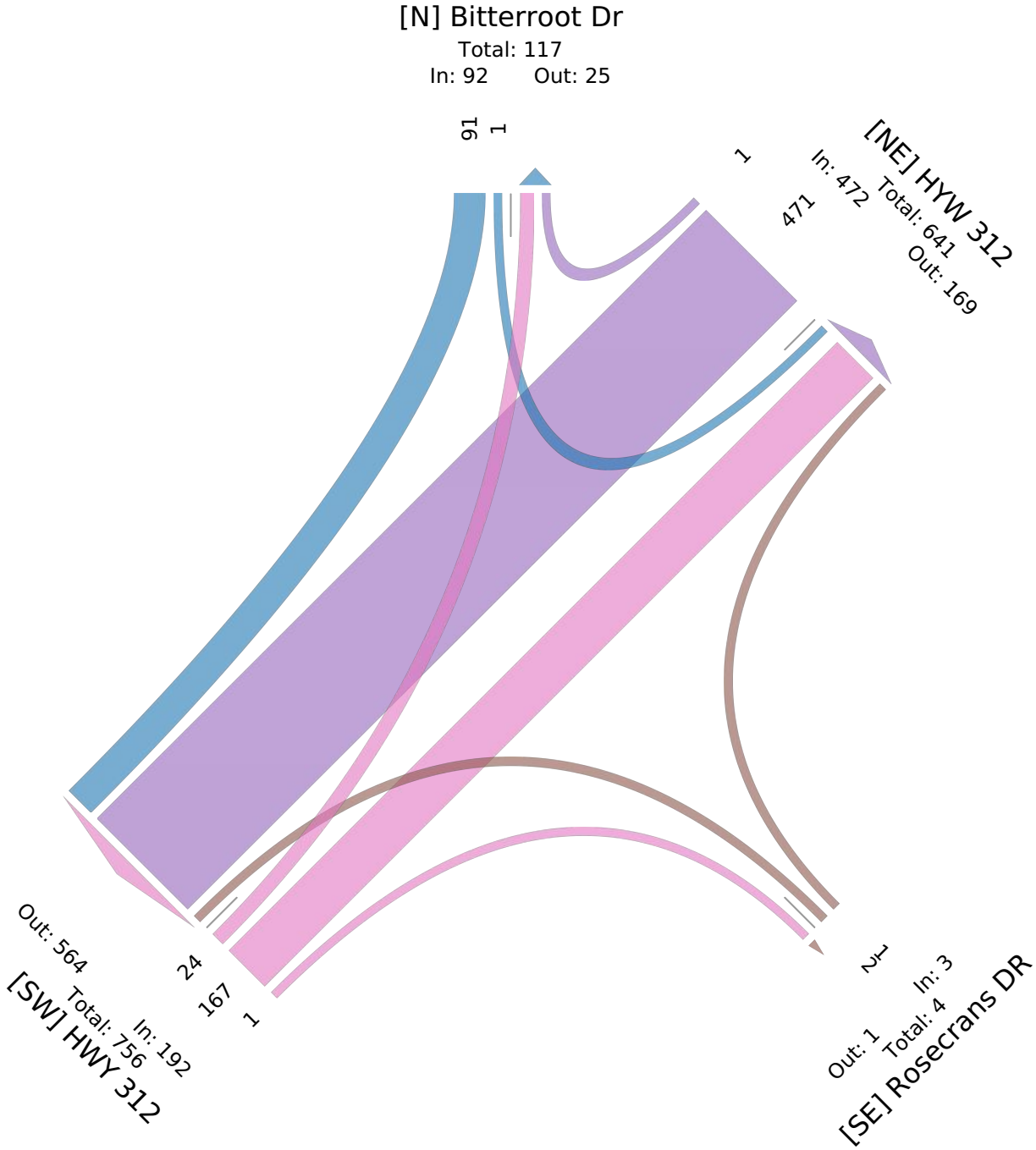
Leg Direction	Bitterroot Dr Southbound						HYW 312 Southwestbound						Rosecrans DR Northwestbound						HWY 312 Northeastbound						
Time	BR	BL	HL	U	**App**	Ped*	HR	T	L	U	**App**	Ped*	R	BR	L	U	**App**	Ped*	R	T	BL	U	**App**	Ped*	**Int**
2024-07-23 7:00AM	24	0	0	0	**24**	0	0	106	0	0	**106**	0	0	0	0	0	**0**	0	0	39	4	0	**43**	0	**173**
7:15AM	15	0	0	0	**15**	0	0	124	0	0	**124**	0	0	0	0	0	**0**	0	0	38	8	0	**46**	0	**185**
7:30AM	23	0	1	0	**24**	0	1	139	0	0	**140**	0	0	0	2	0	**2**	0	1	37	7	0	**45**	0	**211**
7:45AM	29	0	0	0	**29**	0	0	102	0	0	**102**	0	1	0	0	0	**1**	0	0	53	5	0	**58**	0	**190**
Total	91	0	1	0	**92**	0	1	471	0	0	**472**	0	1	0	2	0	**3**	0	1	167	24	0	**192**	0	**759**
% Approach	98.9%	0%	1.1%	0%	**-**	-	0.2%	99.8%	0%	0%	**-**	-	33.3%	0%	66.7%	0%	**-**	-	0.5%	87.0%	12.5%	0%	**-**	-	-
% Total	12.0%	0%	0.1%	0%	**12.1%**	-	0.1%	62.1%	0%	0%	**62.2%**	-	0.1%	0%	0.3%	0%	**0.4%**	-	0.1%	22.0%	3.2%	0%	**25.3%**	-	-
PHF	0.784	-	0.250	-	**0.793**	-	0.250	0.847	-	-	**0.843**	-	0.250	-	0.250	-	**0.375**	-	0.250	0.788	0.750	-	**0.828**	-	0.899
Motorcycles	2	0	0	0	**2**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	2
% Motorcycles	2.2%	0%	0%	0%	**2.2%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.3%
Lights	87	0	1	0	**88**	-	1	456	0	0	**457**	-	0	0	2	0	**2**	-	0	162	24	0	**186**	-	733
% Lights	95.6%	0%	100%	0%	**95.7%**	-	100%	96.8%	0%	0%	**96.8%**	-	0%	0%	100%	0%	**66.7%**	-	0%	97.0%	100%	0%	**96.9%**	-	96.6%
Single-Unit Trucks	2	0	0	0	**2**	-	0	10	0	0	**10**	-	1	0	0	0	**1**	-	1	3	0	0	**4**	-	17
% Single-Unit Trucks	2.2%	0%	0%	0%	**2.2%**	-	0%	2.1%	0%	0%	**2.1%**	-	100%	0%	0%	0%	**33.3%**	-	100%	1.8%	0%	0%	**2.1%**	-	2.2%
Articulated Trucks	0	0	0	0	**0**	-	0	5	0	0	**5**	-	0	0	0	0	**0**	-	0	2	0	0	**2**	-	7
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	1.1%	0%	0%	**1.1%**	-	0%	0%	0%	0%	**0%**	-	0%	1.2%	0%	0%	**1.0%**	-	0.9%
Buses	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Buses	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

HWY 312 and Bitterroot - TMC

Tue Jul 23, 2024
AM Peak (Jul 23 2024 7AM - 8 AM)
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1212278, Location: 45.857115, -108.445417

Provided by: IMEG Corp.
401 E. State Street, 4th Floor,
Rockford, IL, 61104, US



HWY 312 and Bitterroot - TMC

Tue Jul 23, 2024
PM Peak (Jul 23 2024 4:45PM - 5:45 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1212278, Location: 45.857115, -108.445417

Provided by: IMEG Corp.
401 E. State Street, 4th Floor,
Rockford, IL, 61104, US

Leg Direction	Bitterroot Dr Southbound						HYW 312 Southwestbound						Rosecrans DR Northwestbound						HWY 312 Northeastbound						
Time	BR	BL	HL	U	**App**	Ped*	HR	T	L	U	**App**	Ped*	R	BR	L	U	**App**	Ped*	R	T	BL	U	**App**	Ped*	**Int**
2024-07-23 4:45PM	9	0	1	0	**10**	0	4	68	1	0	**73**	0	0	0	0	0	**0**	0	1	119	31	0	**151**	0	**234**
5:00PM	19	0	0	0	**19**	0	1	67	0	0	**68**	0	0	0	0	0	**0**	0	0	141	36	0	**177**	0	**264**
5:15PM	15	0	1	0	**16**	0	0	65	0	0	**65**	0	0	0	0	0	**0**	0	1	160	33	0	**194**	0	**275**
5:30PM	24	0	2	0	**26**	0	1	76	0	0	**77**	0	0	0	0	0	**0**	0	1	169	32	0	**202**	0	**305**
Total	67	0	4	0	**71**	0	6	276	1	0	**283**	0	0	0	0	0	**0**	0	3	589	132	0	**724**	0	**1078**
% Approach	94.4%	0%	5.6%	0%	**-**	-	2.1%	97.5%	0.4%	0%	**-**	-	0%	0%	0%	0%	**-**	-	0.4%	81.4%	18.2%	0%	**-**	-	-
% Total	6.2%	0%	0.4%	0%	**6.6%**	-	0.6%	25.6%	0.1%	0%	**26.3%**	-	0%	0%	0%	0%	**0%**	-	0.3%	54.6%	12.2%	0%	**67.2%**	-	-
PHF	0.698	-	0.500	-	**0.683**	-	0.375	0.908	0.250	-	**0.919**	-	-	-	-	-	**-**	-	0.750	0.871	0.917	-	**0.896**	-	0.884
Motorcycles	0	0	0	0	**0**	-	0	2	0	0	**2**	-	0	0	0	0	**0**	-	0	1	0	0	**1**	-	3
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0.7%	0%	0%	**0.7%**	-	0%	0%	0%	0%	**-**	-	0%	0.2%	0%	0%	**0.1%**	-	0.3%
Lights	67	0	4	0	**71**	-	6	266	1	0	**273**	-	0	0	0	0	**0**	-	3	583	131	0	**717**	-	1061
% Lights	100%	0%	100%	0%	**100%**	-	100%	96.4%	100%	0%	**96.5%**	-	0%	0%	0%	0%	**-**	-	100%	99.0%	99.2%	0%	**99.0%**	-	98.4%
Single-Unit Trucks	0	0	0	0	**0**	-	0	7	0	0	**7**	-	0	0	0	0	**0**	-	0	3	1	0	**4**	-	11
% Single-Unit Trucks	0%	0%	0%	0%	**0%**	-	0%	2.5%	0%	0%	**2.5%**	-	0%	0%	0%	0%	**-**	-	0%	0.5%	0.8%	0%	**0.6%**	-	1.0%
Articulated Trucks	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	2	0	0	**2**	-	3
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0.4%	0%	0%	**0.4%**	-	0%	0%	0%	0%	**-**	-	0%	0.3%	0%	0%	**0.3%**	-	0.3%
Buses	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Buses	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

HWY 312 and Bitterroot - TMC

Tue Jul 23, 2024
PM Peak (Jul 23 2024 4:45PM - 5:45 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1212278, Location: 45.857115, -108.445417

Provided by: IMEG Corp.
401 E. State Street, 4th Floor,
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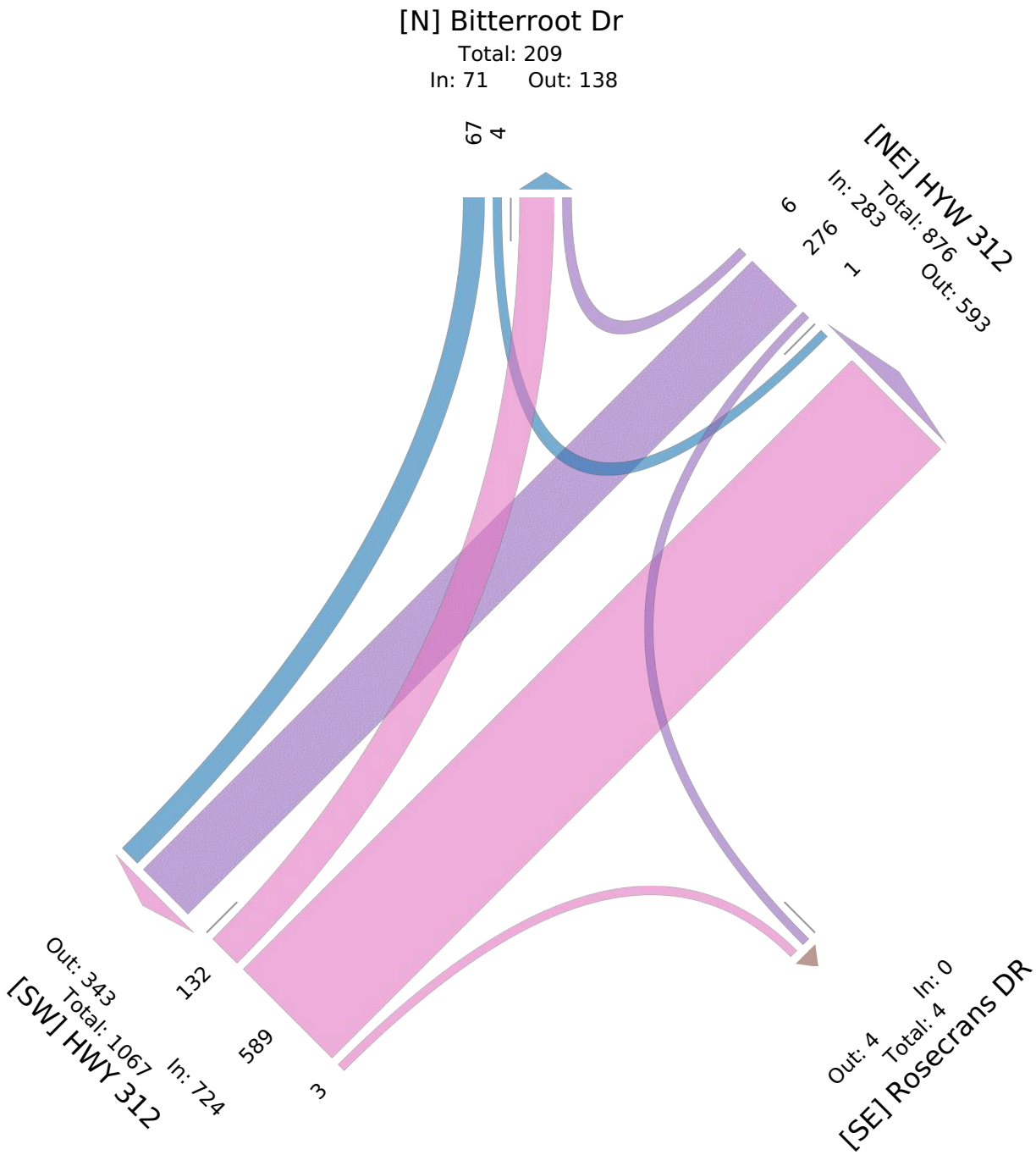


Pronghorn Subdivision Development

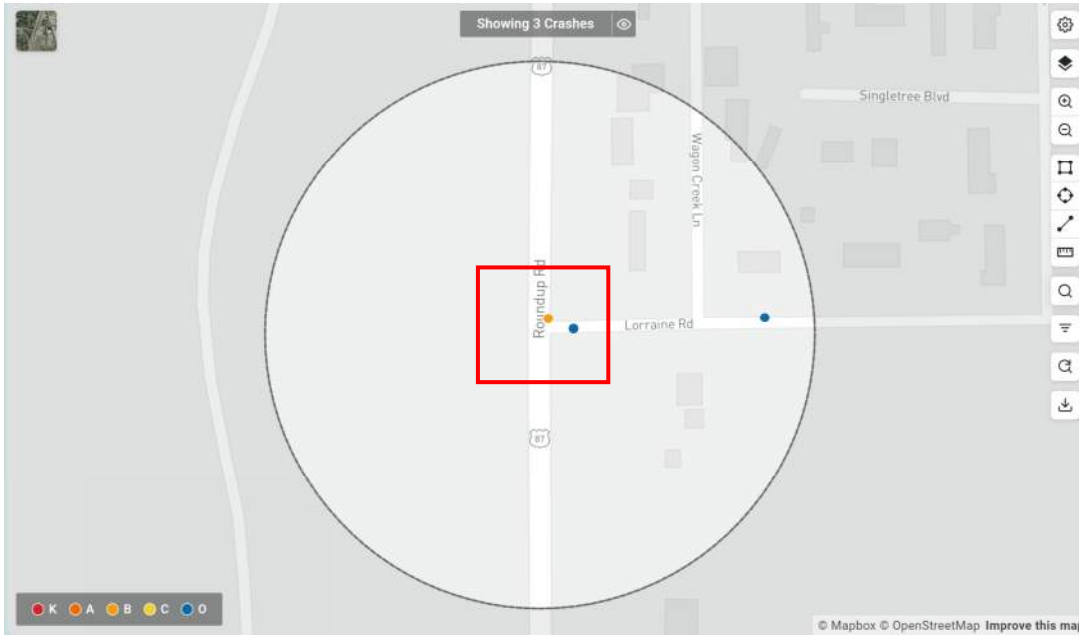
Traffic Impact Study

APPENDIX I

MDT 2019-2023 Historical Crash Data

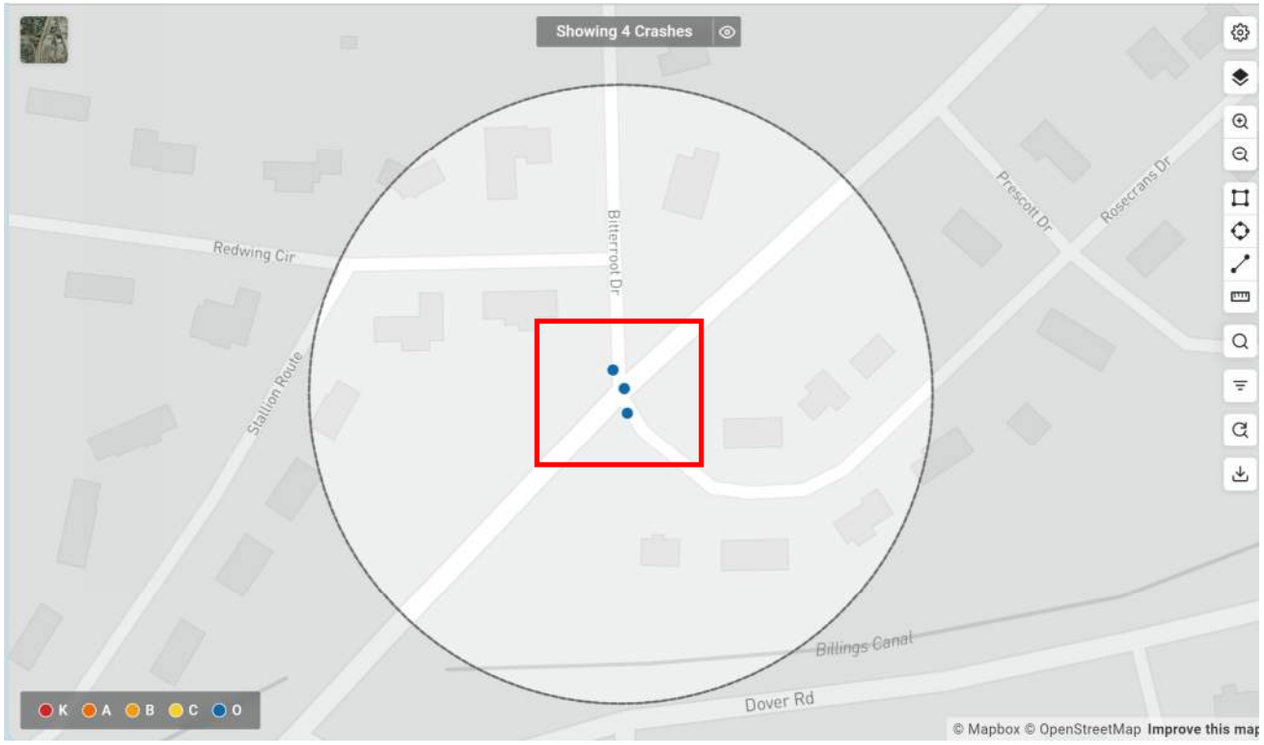
HWY 87 & Lorraine St

Crash Record Number	Crash Date	Collision Type	Road Surface Condition	Crash Injury Severity	Type A Inj Crash?	Type B Inj Crash?	Type C Inj Crash?	Fatal Crash?
50161433	1/27/2021	Left Turn, Opposite Direction	Wet	Suspected Minor Injury	No	No	Yes	No
50159955	5/31/2021	Rear-End	Dry	No apparent Injury (property damage only crash)	No	No	No	No



HWY 312 & Bitterroot Dr & Rosecrans Dr

Crash Record Number	Crash Date	Collision Type	Road Surface Condition	Crash Injury Severity	Type A Inj Crash?	Type B Inj Crash?	Type C Inj Crash?	Fatal Crash?
50195283	11/21/2023	Right Angle	Dry	No apparent Injury (property damage only crash)	No	No	No	No
50173259	2/16/2022	Sideswipe, Same Direction	Ice/Frost	No apparent Injury (property damage only crash)	No	No	No	No
50131267	8/19/2019	Rear-End	Dry	No apparent Injury (property damage only crash)	No	No	No	No
50130499	2/17/2020	Rear-End	Ice/Frost	No apparent Injury (property damage only crash)	No	No	No	No



Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX J

100% Worst Case Scenario Distributions – HCS Worksheets

HCS Two-Way Stop-Control Report

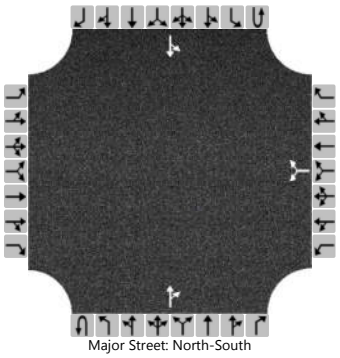
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/20/2025
Analysis Year	2054
Time Analyzed	2054 Access A AM 100 Dist
Intersection Orientation	North-South
Project Description	Gilman Major Subdivision

Site Information

Intersection	HWY 87 & Access A
Jurisdiction	COUNTY
East/West Street	Access A
North/South Street	HWY 87
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						127		5			158	123		5	259	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							147							6		
Capacity, c (veh/h)							509							1260		
v/c Ratio							0.29							0.00		
95% Queue Length, Q_{95} (veh)							1.2							0.0		
95% Queue Length, Q_{95} (ft)							30.0							0.0		
Control Delay (s/veh)							14.9							7.9	0.0	
Level of Service (LOS)							B							A	A	
Approach Delay (s/veh)					14.9								0.2			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

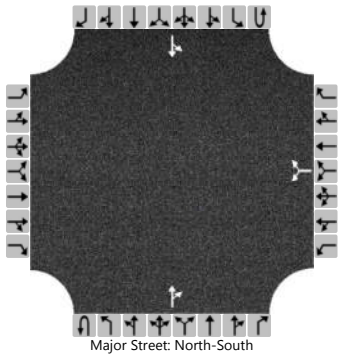
General Information

Analyst	JTP
Agency/Co.	IMEG
Date Performed	8/20/2025
Analysis Year	2054
Time Analyzed	2054 Access A PM 100 Dist
Intersection Orientation	North-South
Project Description	Gilman Major Subdivision

Site Information

Intersection	HWY 87 & Access A
Jurisdiction	COUNTY
East/West Street	Access A
North/South Street	HWY 87
Peak Hour Factor	0.98
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						151		6			332	162		7	218	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							160							7		
Capacity, c (veh/h)							434							1071		
v/c Ratio							0.37							0.01		
95% Queue Length, Q_{95} (veh)							1.7							0.0		
95% Queue Length, Q_{95} (ft)							42.5							0.0		
Control Delay (s/veh)							18.1							8.4	0.1	
Level of Service (LOS)							C							A	A	
Approach Delay (s/veh)						18.1								0.3		
Approach LOS						C								A		

Pronghorn Subdivision Development

Traffic Impact Study

APPENDIX K

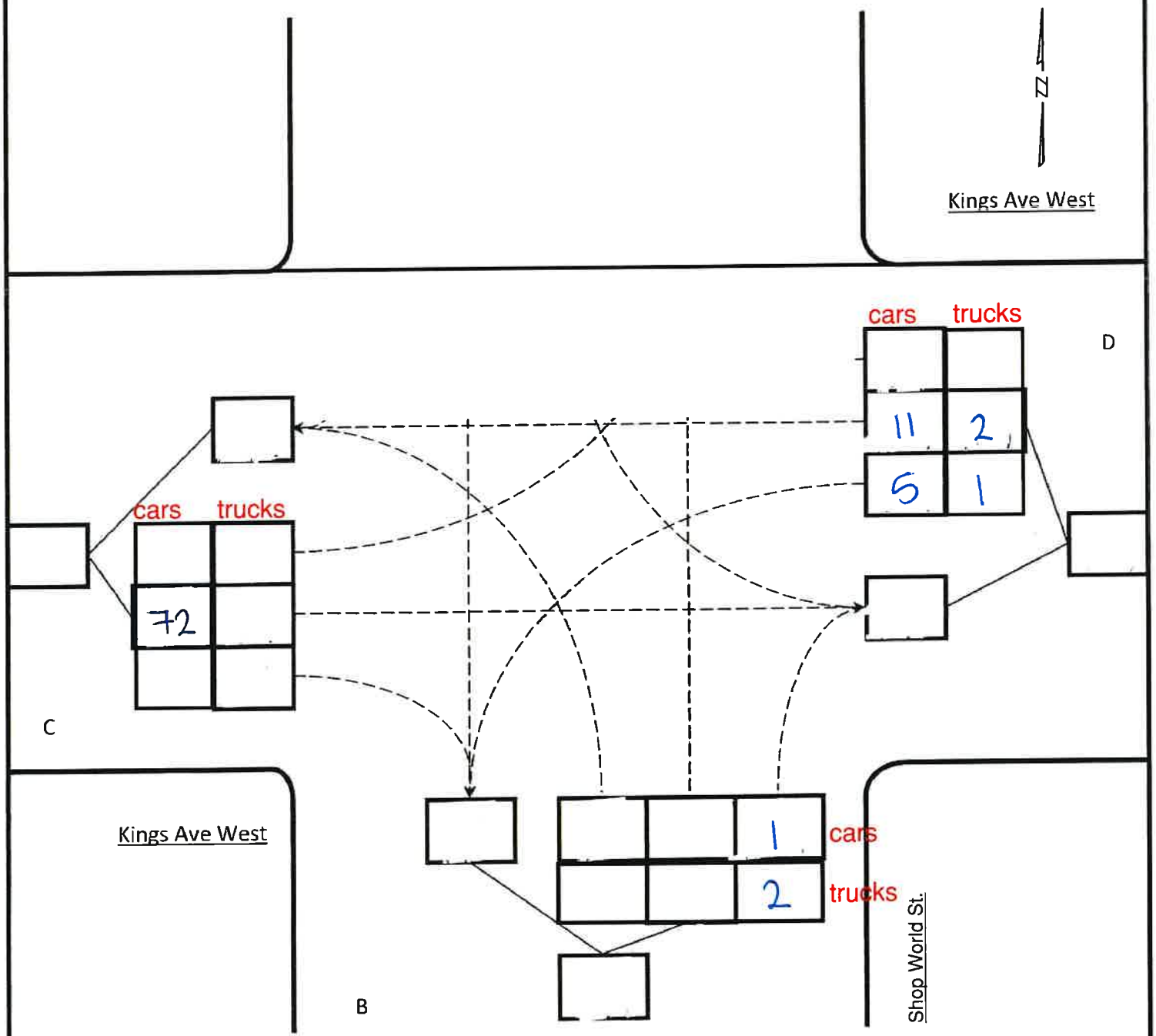
Shop World 1 Trip Generation Rates

7:00am - 8:00am

INTERSECTION OF

Shop World St. AND Kings Ave West

COUNTY: Yellowstone STATE: Montana



XXX = A.M.

(XXX) = P.M.

NOTE: VOLUMES INCLUDE S.U. AND M.U. VEHICLES

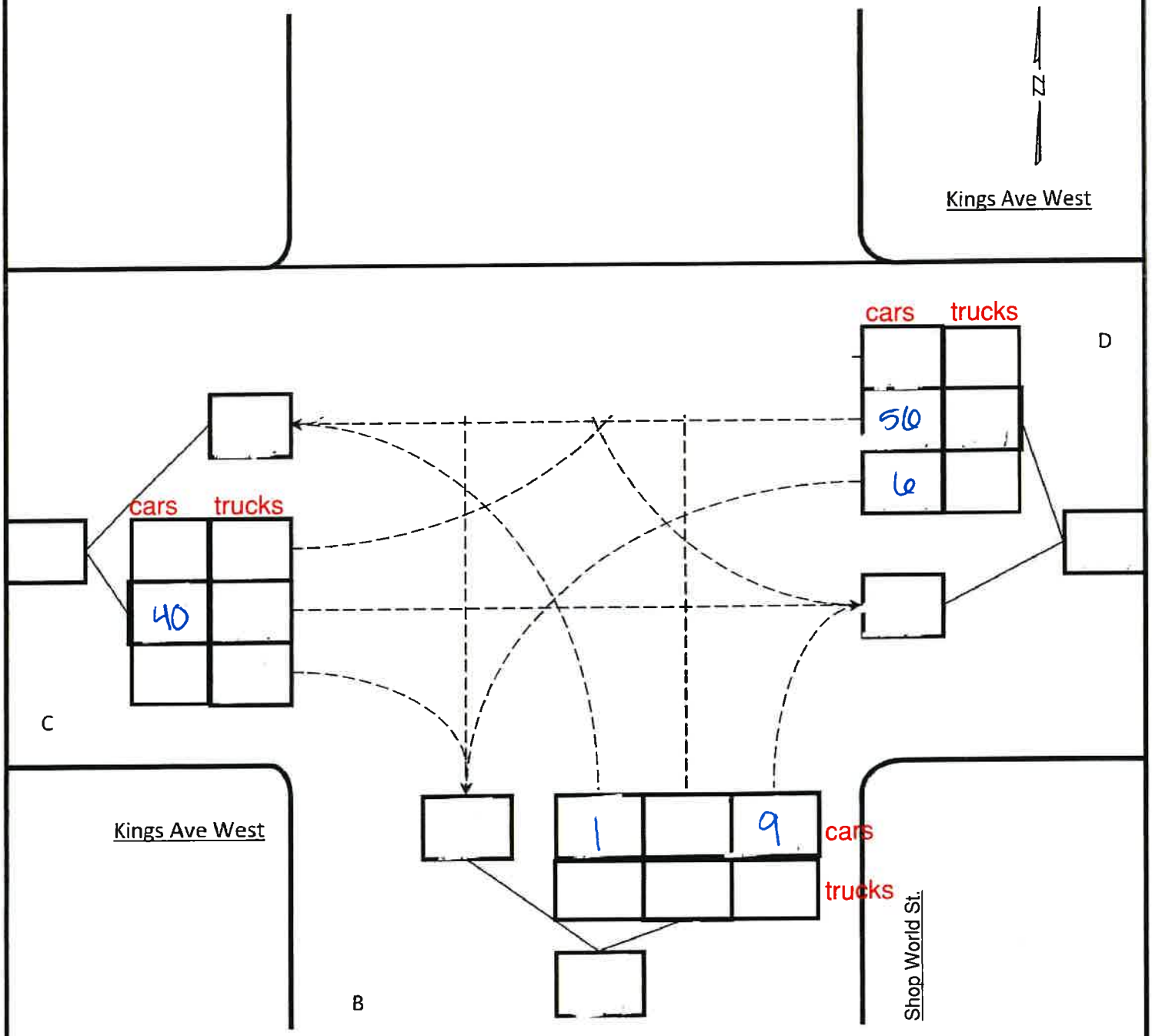
2022 Existing Peak Hour Traffic Volume Summary
Background Traffic
Shop World 2 Subdivision

IMEG	21007868.00	10/04/22	

5:00pm - 6:00pm

INTERSECTION OF Shop World St. AND Kings Ave West

COUNTY: Yellowstone STATE: Montana



XXX = A.M.
(XXX) = P.M.

NOTE: VOLUMES INCLUDE S.U. AND M.U. VEHICLES

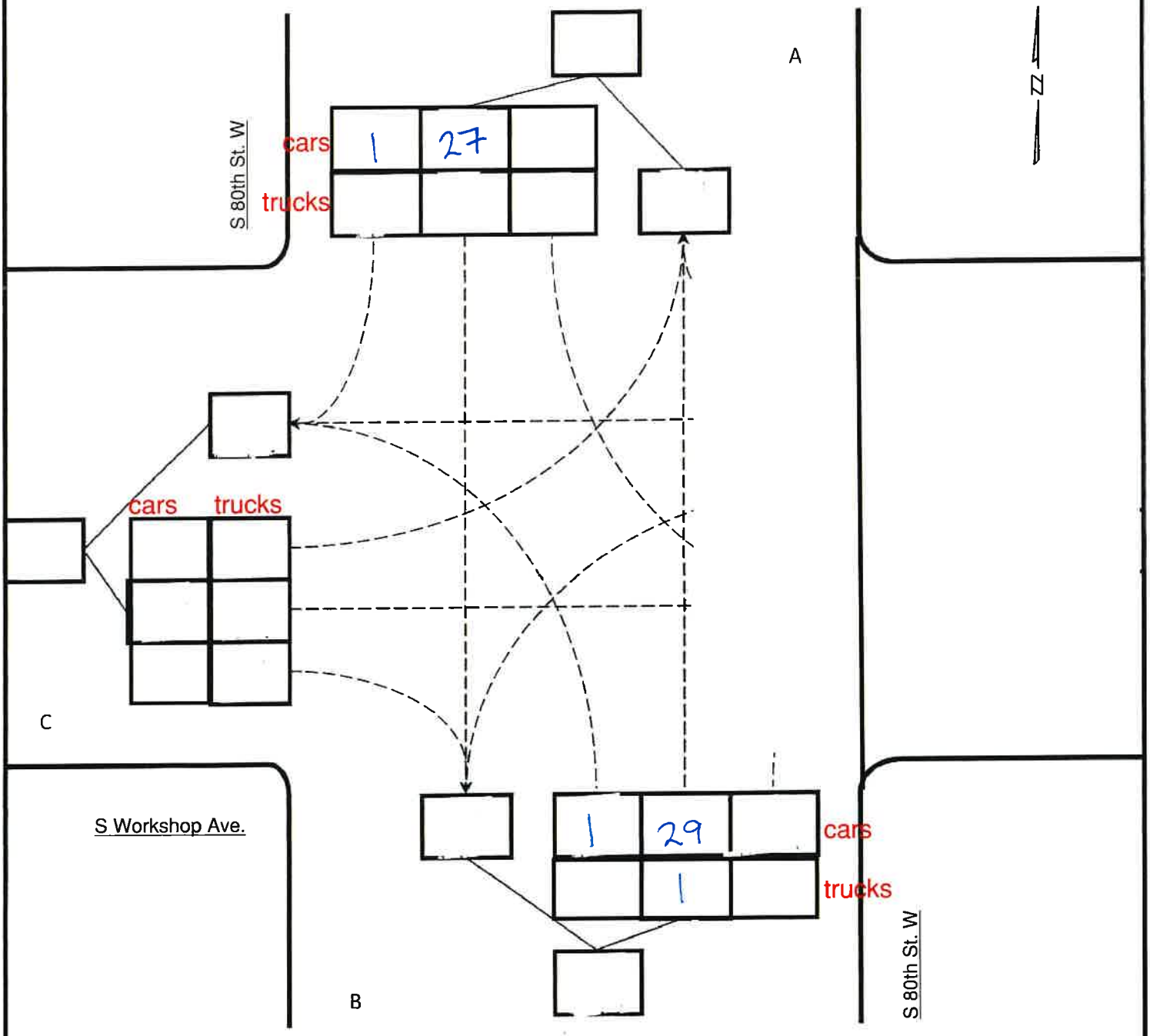
2022 Existing Peak Hour Traffic Volume Summary
Background Traffic
Shop World 2 Subdivision

IMEG	21007868.00	10/04/22	

7:00am - 8:00am

INTERSECTION OF S 80th St. West AND S Workshop Ave.

COUNTY: Yellowstone STATE: Montana



XXX = A.M.
(XXX) = P.M.

NOTE: VOLUMES INCLUDE S.U. AND M.U. VEHICLES

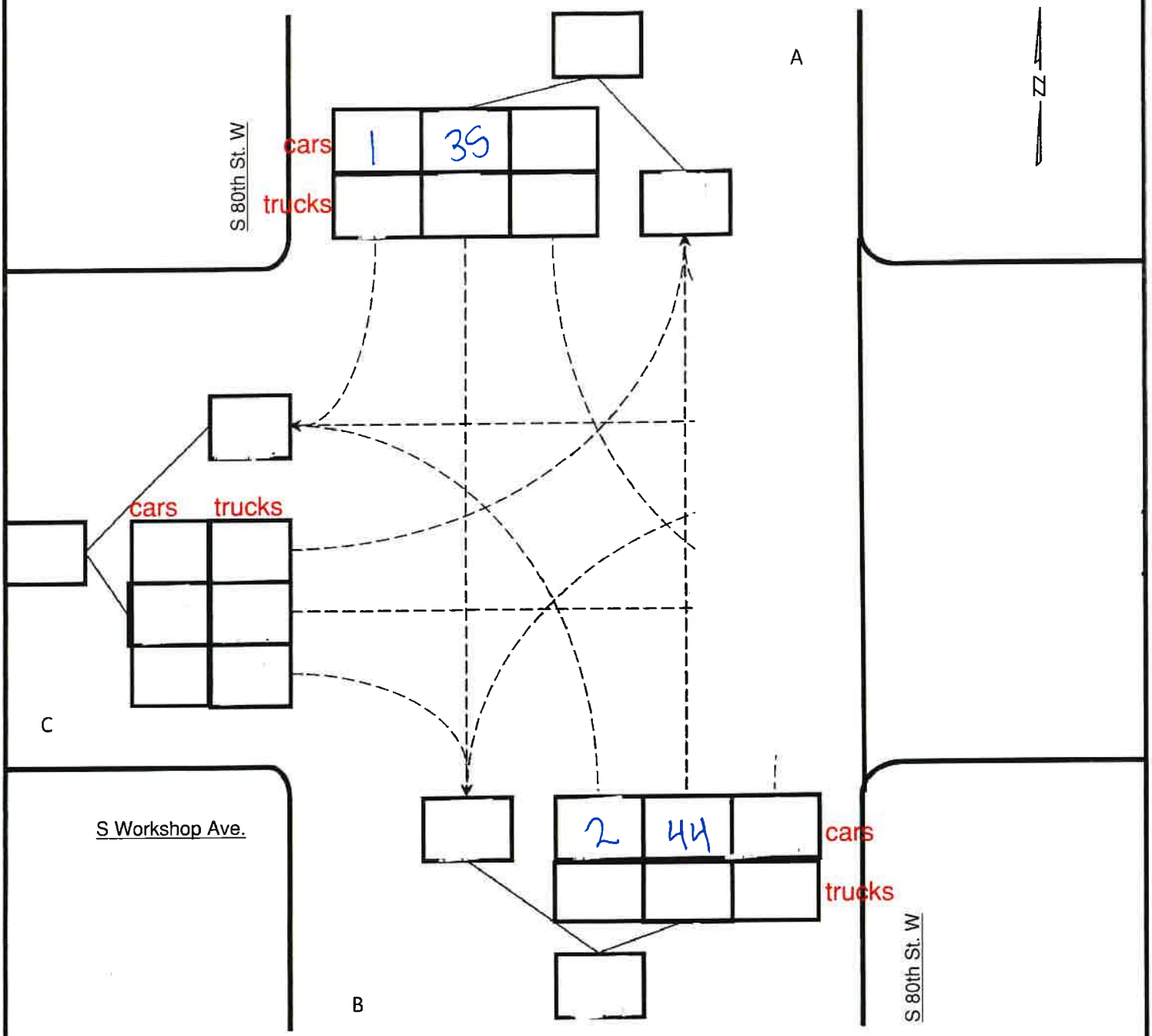
2022 Existing Peak Hour Traffic Volume Summary
Background Traffic
Shop World 2 Subdivision

IMEG	21007868.00	10/05/22	

5:00pm - 6:00pm

INTERSECTION OF S 80th St. West AND S Workshop Ave.

COUNTY: Yellowstone STATE: Montana



XXX = A.M.
(XXX) = P.M.

NOTE: VOLUMES INCLUDE S.U. AND M.U. VEHICLES

2022 Existing Peak Hour Traffic Volume Summary
Background Traffic
Shop World 2 Subdivision

IMEG	21007868.00	10/05/22	