



Whipple Consulting Engineers
Spokane, WA

Traffic Impact Analysis
FOR

Grandview Addition

Spokane, Washington
July, 2025
2021-3017

TRAFFIC IMPACT ANALYSIS

Grandview Addition

City of Spokane, Washington

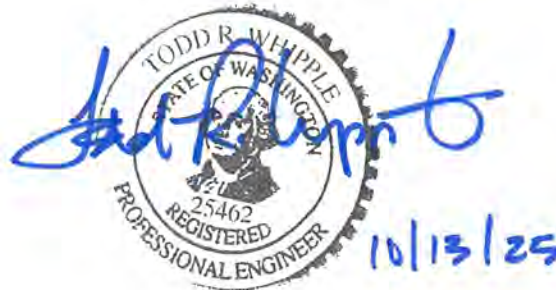
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EXECUTIVE SUMMARY

Supplemental to the SEPA Process for the proposed Grandview Addition a residential development, the following Traffic Impact Analysis applies:

1. The City of Spokane and WSDOT have established Level of Service D as the minimum acceptable level for signalized intersections and Level of Service E for unsignalized intersections.
2. The subject property is located on a portion of the NE ¼ Section 26, T 25 N., R 44 E., W.M. within the City of Spokane, Washington. The project proposes to develop approximately 22.35 acres +/- into 111 residential lots. The project site is currently undeveloped and covered in field grass, basalt rock, trees, and weeds. The expected build out year is 2026. Please see Figure 2, Preliminary Site Plan, for more information. Specifically, access and frontage improvements are as follows:
 - The City project will extend and construct Grandview Avenue to the 16th/17th intersection, as a part of the Capitol improvement project STR-2024-1691.
 - The project has very little existing street frontage to improve so with the exception of a small strip along Grandview at what was the H Street connection, there essentially is none.
 - The project will take access via an extension of F Street from 21st Avenue, Aldebaran Street and from Grandview Avenue via a new H Street.
 - Internal streets as proposed are proposed as Grandview Avenue, 18th, 19th, and 20th Avenues as well as F Street, Aldebaran Street, and Katy Street.
3. The site is currently zoned as Residential Single Family (RSF). The subject properties are located in a portion of NE ¼, Section 26, T25N., R42E., W.M. The parcel numbers for the project are 25261.2606, 25261.2607, 25261.2710, 25261.2901, 25261.2812, 25261.3005, 25261.3004, 25261.3003, 25261.3002, 25261.3001, 25261.3101, 25261.3305, 25261.3301, 25261.3204, and 25261.3203. The surrounding area is residential and undeveloped land uses.
4. The project study area intersections were identified through a public traffic scoping meeting held on March 03, 2022 and recent conversations with the City of Spokane. The scope of the study includes the level of service analysis of the AM and PM peak hours of the following intersections:
 - Sunset Boulevard & Rustle Street
 - I-90 WB Off Ramp & Rustle Street
 - Grandview Avenue/16th Avenue & 17th Avenue
 - 13th Avenue & Lindeke Street
 - 14th Avenue & Lindeke Street
 - 16th Avenue & US 195
5. The proposed development is anticipated to generate a total of 82 trips in the AM peak hour with 21 trips entering the site and 61 trips exiting the site. In the PM peak hour, the

proposed development is anticipated to generate a total of 110 trips, with 69 trips entering the site and 41 trips exiting the site. The proposed development is anticipated to generate a total of 1,111 average daily trip ends to/from the site.

6. Conclusions

This Traffic Impact Analysis (TIA) has reviewed and analyzed the study area per the scope established by the scoping meeting, the City of Spokane and WSDOT. Based upon the analysis, field observations, assumptions, methodologies and results which are provided in the body of this report, it is concluded that the development of the proposed project will generate new trips on the existing transportation system and that those trips will not have a significant impact on the level of service of the transportation system in the buildout year. This conclusion was reached and has been documented within the body of this report.

- Under the **year 2025 existing** conditions, all intersections are currently operating at an acceptable level of service.
- For the **year 2030 with background projects without the project** scenario, all intersections are anticipated to operate at acceptable levels of service. Except for the intersection of the recently reconstructed 16th Avenue & US 195 intersection which cannot be changed without closing the median to through and left westbound trips and the intersection of Sunset Boulevard & Rustle Street that can be improved with the signalization of the intersection. .
- For the **year 2030 with background projects with the project** scenario, all intersections are anticipated to operate at acceptable levels of service. Except for the intersection of the recently reconstructed 16th Avenue & US 195 intersection which cannot be changed without closing the median to through and left westbound trips and the intersection of Sunset Boulevard & Rustle Street that can be improved with the signalization of the intersection. .
- Additional analysis – Signal Warrant – a signal is not warranted at the intersection of Sunset Boulevard & Rustle street under the year 2025 conditions.

7. Recommendations

Based upon the conclusions within this study, the proposed project is recommended to complete all required conditions of approval including frontage improvement and payment to the mitigation fee at the time of building permit, and should be allowed to move forward without further traffic analysis, or offsite mitigation.

INTRODUCTION

Introduction, Purpose of Report and Study Area

This traffic impact analysis is required by the City of Spokane as part of the SEPA process for the proposed Grandview Addition development. The proposed development consists of 111 residential lots on 22.35 acres +/- site. Please see Figure 1 Vicinity Map and Figure 2 Preliminary Site Plan.

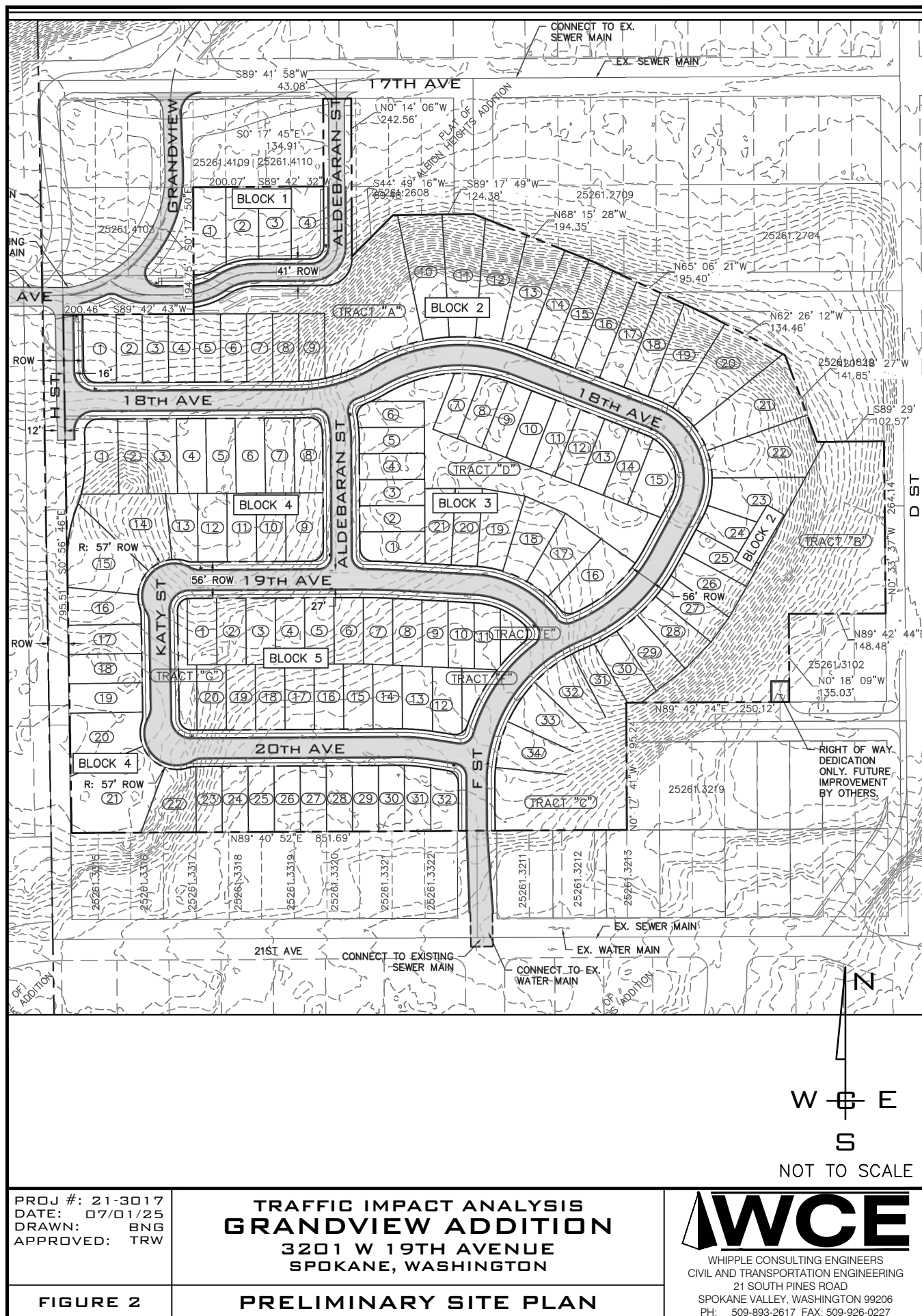
The purpose of this analysis is to review, assess, and identify the potential traffic related impacts that the proposed project may have on the transportation network and where possible minimize and/or mitigate any impact. This TIA will be completed in accordance with the current traffic guidelines from the City of Spokane and the Institute of Transportation Engineers (A Recommended Practice – Traffic Access and Impact Studies for Site Development, 2010) as well as their respective requirements.

Site Location and Development Description

The subject property is located on a portion of the NE ¼ Section 26, T 25 N., R 44 E., W.M. within the City of Spokane, Washington. The project proposes to develop approximately 22.35 acres +/- into 111 residential lots. The project site is currently undeveloped and covered in field grass, basalt rock, trees, and weeds. The expected build out year is 2026. Please see Figure 2, Preliminary Site Plan, for more information. Specifically, access and frontage improvements are as follows:

- The City project will extend and construct Grandview Avenue to the 16th/17th intersection, as a part of the Capitol improvement project STR-2024-1691.
- The project has very little existing street frontage to improve so with the exception of a small strip along Grandview at what was the H Street connection, there essentially is none.
- The project will take access via an extension of F Street from 21st Avenue, Aldebaran Street and from Grandview Avenue via a new H Street.
- Internal streets as proposed are proposed as Grandview Avenue, 18th, 19th, and 20th Avenues as well as F Street, Aldebaran Street, and Katy Street.

. The analysis year is 2030. Please see Figure 2, Preliminary Site Plan.



EXISTING AND PROPOSED CONDITIONS

Existing and Proposed Conditions within the Study Area

Land Use & Zoning

The site is currently zoned as Residential Single Family (RSF). The subject properties are located in a portion of NE ¼, Section 26, T25N., R42E., W.M. The parcel numbers for the project are 25261.2606, 25261.2607, 25261.2710, 25261.2901, 25261.2812, 25261.3005, 25261.3004, 25261.3003, 25261.3002, 25261.3001, 25261.3101, 25261.3305, 25261.3301, 25261.3204, and 25261.3203. The surrounding area are residential and undeveloped land uses.

Existing Roadways

The overall transportation network in this area consists of an urban major arterial, minor arterials, collectors, and local access roads. The project is proposed to be accessed via 17th Avenue, Grandview Avenue, and 21st Avenue. The proposed project trips are anticipated to use the following roadways:

H Street (Proposed) is a north/south, two-way, 2-lane local access road that extends south from Grandview Avenue into the project to 18th Avenue. H Street proposes to serve residential landuses. The proposed speed limit of H Street is 25 MPH.

F Street (Proposed) is a north/south, two-way, 2-lane local access road that extends north from 21st Avenue to 18th Avenue. F Street proposes to serve residential land uses. The proposed speed limit of F Street is 25 MPH.

13th Avenue is an east/west, two-way, 2-lane local access road that extends east from Rosemond Avenue to Lindeke Street. 13th avenue serves residential land uses. The speed limit on 13th Avenue is 25 MPH.

14th Avenue is generally an east/west, two-way, 2-lane urban collector/local access road that starts next to I-90 southeast through South Loop Avenue, Milton Street, and Lindeke Street before terminating at Cochran Street. 14th Avenue serves residential and rural land uses. The speed limit on 14th Avenue is 25 MPH.

16th Avenue is generally an east/west, two-way, 2-lane urban collector that extends northeast and east from 17th Avenue through Milton Street before terminating at Canyon Woods Lane. 16th Avenue serves residential and rural land uses. The speed limit on 16th Avenue is 25 MPH.

17th Avenue is generally an east/west, two-way, 2-lane local access road that extends east from Grandview Avenue through 16th Avenue, F Street, D Street, and Grandview Avenue before terminating. 17th Avenue serves primarily residential land uses. The speed limit on 17th Avenue is 25 MPH.

21st Avenue is generally an east/west, two-way, 2-lane local access road that extends west from 22nd Avenue through D Street, Scenic Boulevard, and F Street before terminating at H Street Alignment. 21st Avenue is scheduled to be extended to Grandview at the H Street alignment as

part of the completion of the Westridge PUD phase 1. 21st Avenue serves residential land uses. The speed limit on 21st Avenue is 25 MPH.

Grandview Avenue is generally an east/west, two-way, 2-lane urban collector that extends east from Garden Springs Road to 17th Avenue. Grandview Avenue serves residential land uses. The speed limit on Grandview Avenue is 25 MPH.

Milton Street is generally a north/south, two-way, 2-lane urban collector that extends south from 14th Avenue through 16th Avenue before terminating. Milton Street serves residential land use. The speed limit on Grandview Avenue is 25 MPH.

Lindeke Street is generally a north/south, two-way, 2-&4-lane minor arterial that extends south from Sunset Boulevard through 9th Avenue, passing over I-90, through 13th Avenue, 14th Avenue, and 15th Avenue before terminating at 16th Avenue. Lindeke Street serves residential, institutional, and lodging land uses. The speed limit on Lindeke Street is 25 MPH.

Garden Springs Road is generally an east/west, two-way, 2-lane urban minor arterial and local access road. That extends south from the end of Rustle Road over I-90 and through Grandview Avenue and Assembly Road before turning north at Abbott Road, and then goes underneath I-90, as a local access road, before transitioning into Lawton Road. Garden Springs Road serves low-density residential and institutional land uses. The posted speed limit on Garden Springs Road in the project area is 25 MPH.

Rustle Street is generally a north/south, two-way, 2-lane urban minor arterial that extends south from Sunset Highway and then transitions into Garden Springs Road at Grandview Avenue. Rustle Street serves commercial and lodging land uses. The posted speed limit on Rustle Street in the project area is 25 MPH.

Sunset Highway/Boulevard is generally an east/west, two-way, 2-,3-, &4-lane urban major arterial that extends east from Highway 2 interchange through Lewis Street, Geiger Boulevard, Rustle Street, Lindeke Street, Inland Empire Way, and 4th Avenue before transitioning into 2nd and 3rd Avenues. Sunset Highway/Boulevard serves residential, commercial, and industrial land uses. The posted speed limit on Sunset Highway/Boulevard in the project area is 40 MPH.

US 195 is generally a north/south, two-way, 4-lane highway. US 195 extends south from Interstate 90 at Exit 279 and goes through 16th Avenue, Thorpe Road and the Cities of Spangle, Freedom, Plaza, Rosalia, Thornton, Cashup, Steptoe, Colfax, Pullman, Johnson, Colton, and Uniontown before merging with US 95. The posted speed limit on US 195 within the study area is 55mph.

Study Area Intersections

The project study area intersections were identified through a public traffic scoping meeting held on March 03, 2022 and recent conversations with the City of Spokane. The scope of the study includes the level of service analysis of the AM and PM peak hours of the following intersections:

- Sunset Boulevard & Rustle Street
- I-90 WB Off Ramp & Rustle Street
- Grandview Avenue/16th Avenue & 17th Avenue
- 13th Avenue & Lindeke Street
- 14th Avenue & Lindeke Street
- 16th Avenue & US 195

Traffic Control and Descriptions

Sunset Boulevard & Rustle Street is an unsignalized intersection with the following lane configuration. The eastbound approach has two receiving lanes, a raised left turn receiving lane, a through lane and a right turn pocket. The westbound approach has a single receiving lane, a raised left turn lane, a through lane, and a through-right turn lane. The Northbound approach has a single receiving lane and a left-right turn lane. The southbound approach has a single receiving lane and a right-turn lane.

I-90 WB Off Ramp & Rustle Street is an unsignalized intersection with the following lane configuration. The eastbound approach has a left-right lane. The northbound approach has a single receiving lane and a through lane. The southbound approach has a single receiving lane and through lane.

Grandview Avenue/16th Avenue & 17th Avenue (Proposed) is an unsignalized intersection with the following lane configuration: the east leg has one (1) receiving lane and a left-right turn lane. The south leg has one (1) receiving lane and a through-right lane. The north leg has one(1) receiving lane and a left-through lane. The City extension/construction project should create the following configuration: all legs have one (1) receiving lane and a left-through-right lane.

13th Avenue & Lindeke Street is an unsignalized intersection with the following lane configuration: all legs have one (1) receiving lane and a left-through-right lane.

14th Avenue & Lindeke Street is an unsignalized intersection with the following lane configuration: all legs have one (1) receiving lane and a left-through-right lane.

16th Avenue & SR 195 is an unsignalized 4-leg two-way-stop-controlled intersection with stop control on the east and westbound approaches with the following lane configuration: the east and westbound approaches have one receiving lane and one left-through-right lane. The north and southbound approaches have two receiving lanes, a left turn lane, a through lane, and a through-right lane. With the separated highway there is space for 1 vehicle within the median

Existing Intermodal Transportation System

The existing intermodal transportation system including public transit(bus), pedestrian sidewalks, bikeways, and on-street parking in this study area are described as follows.

Public Transit (Bus)

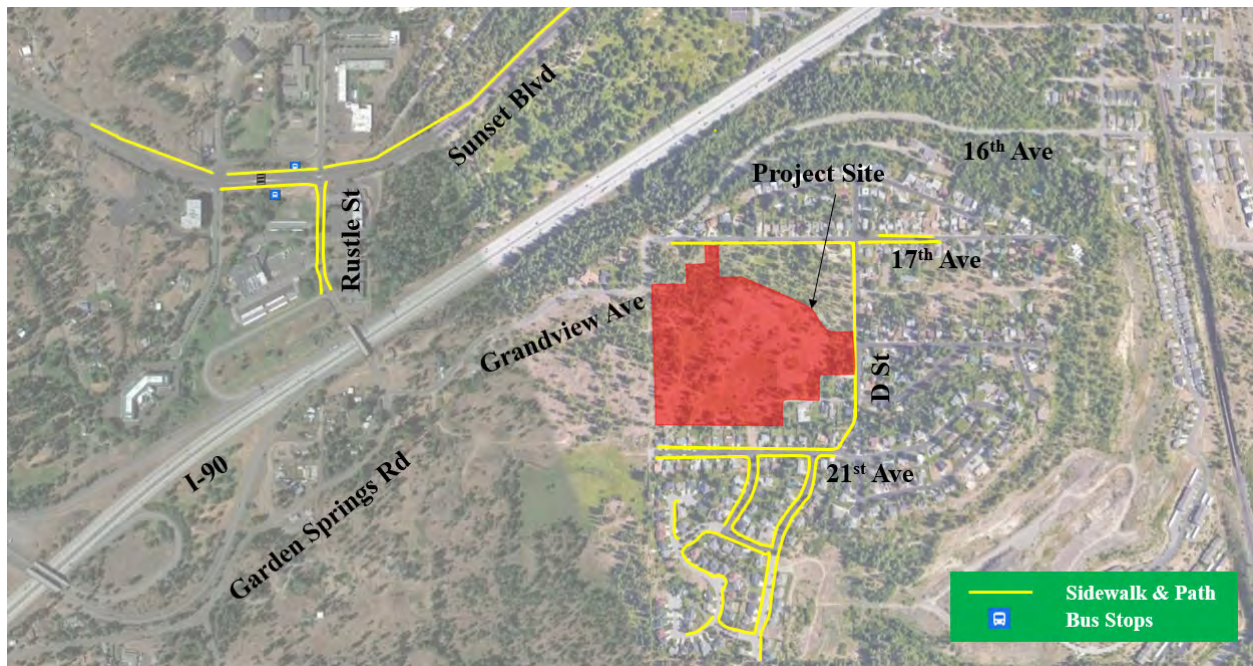
The existing bus routes nearest to the project site are Routes 60&61. The nearest bus stops from the project site to the route is 1.00 miles at Sunset Boulevard & Rustle Street. The bus stops can be accessed via Sunset Boulevard and Rustle Street. Please see the attached route map.



Source: Spokane Transit Authority

Pedestrian Sidewalks

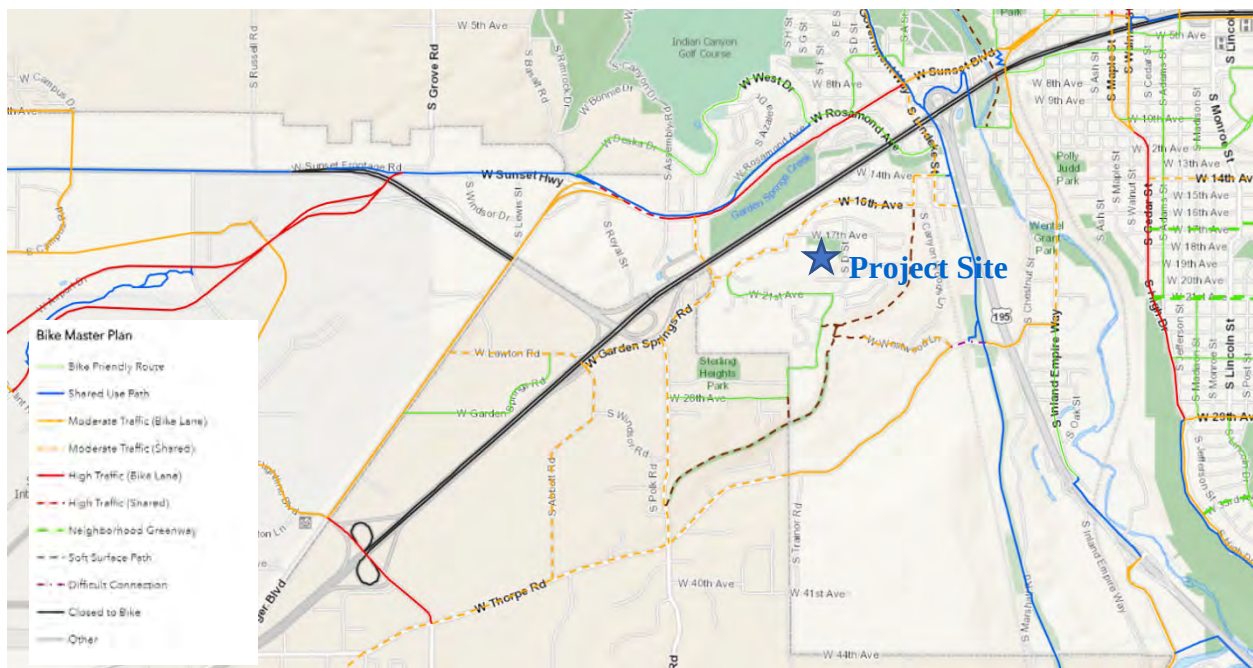
There are sidewalks along 17th Avenue from 16th Avenue to C Street, D Street from 17th Avenue to 21st Street, 21st Avenue from D Street to the west end, Rustle Street from I-90 Ramp to Sunset Boulevard, and Sunset Boulevard from Rustle Street to Assembly Road. There are no sidewalks along Garden Springs Road, Grandview Avenue, and 16th Avenue within the study area. Please see the following pedestrian sidewalk map.



Source: Google Satellite Map

Bikeways

16th Avenue, Grandview Avenue, Garden Springs Road, and Rustle Street are assigned as shared roadways. There are bike lanes along Sunset Boulevard from Royal Street to Government Way within the study area. Please see the City of Spokane Bike Plans map.



Source: City of Spokane Bike Plans

Traffic Safety

For the intersections within the study area accident¹ report summaries were collected from WSDOT. Generally, accidents are documented by type of occurrence, such as property damage or injury. No fatalities were reported for the study intersections during the last five years.

ITE MEV Method

$$\text{Rate per MEV} = \frac{\text{number of accidents in one year} \times 1 \text{ million entering vehicles}}{24 \text{ hr intersection entering vehicle} \times 365 \times 1 \text{ years}}$$

Equation 4-2 of ITE manual of traffic engineering studies (fourth edition)

Lacking specific 24-hour count data of the intersection, it is usual and customary to consider the PM peak hour volume to generally represent 10% of the 24-hour volume (ADT- Average Daily Traffic)

Table 1 – ADT Calculation – 24 hr intersection entering vehicle 10%.

Intersection	Peak Hour Volume*	% of Peak Hour	24 hr (ADT) Volume
Sunset Boulevard & Rustle Street	1,274	10%	12,740
I-90 WB Off Ramp & Rustle Street	523	10%	5,230
17 th Avenue & 16 th Avenue	176	10%	1,760
13 th Avenue & Lindeke Street	418	10%	4,180
14 th Avenue & Lindeke Street	440	10%	4,400
16 th Avenue & US 195	2,299	10%	22,990

*Volume adjusted by background growth rate and seasonal factor

In this analysis accidents are measured based on frequency per million entering vehicles (MEV). This ratio is a function of the average daily traffic entering the intersection and the annual frequency of accidents. This method of analysis is also considered as an “exposure” analysis. This method of analysis is used to identify areas that need further review. A typical review threshold for accidents at an intersection is 1.00 accident per MEV.

The review of the accident data is looking for repeated accidents at the same location within the intersection, or with similar vehicles, or at similar times of day, as each instance maybe an indicator of a geometric condition, or a poor lighting condition that has contributed to the number of accidents. The accident data for the intersections within the study area are shown in Table 2.

¹ Accident (ac·ci·dent) noun

1. an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury.
2. an event that happens by chance or that is without apparent or deliberate cause.

Table 2 – Accident¹ Data for Intersections within the Study Area*

Intersection	2020		2021		2022		2023		2024		Avg MEV Per yr
	PDO	INJ	PDO	INJ	PDO	INJ	PDO	INJ	PDO	INJ	
Sunset Boulevard & Rustle Street	4	0	0	3	9	3*	0	1	1	1	
MEV @ 10% of Intx ADT	0.86		0.65		2.59		0.22		0.43		0.95
I-90 WB Off Ramp & Rustle Street	0	0	0	0	2	0	0	0	0	0	
MEV @ 10% of Intx ADT	0.00		0.00		1.05		0.00		0.00		0.21
17 th Avenue & 16 th Avenue	1	0	0	0	2	0	0	0	0	0	
MEV @ 10% of Intx ADT	1.56		0.00		3.11		0.00		0.00		0.93
13 th Avenue & Lindeke Street	0	0	0	0	0	1	0	0	0	0	
MEV @ 10% of Intx ADT	0.00		0.00		0.66		0.00		0.00		0.13
14 th Avenue & Lindeke Street	0	0	1	0	0	0	0	0	0	0	
MEV @ 10% of Intx ADT	0.00		0.62		0.00		0.00		0.00		0.12
16 th Avenue & US 195	4	0	6	2	4	1	4	0	0	0	
MEV @ 10% of Intx ADT	0.48		0.95		0.60		0.48		0.00		0.50

*One injury was also a fatality reported at the intersection involving a motorcycle and a passenger car, under wet and dark conditions, movements included a left turn from Rustle Street onto Sunset Boulevard. Based upon this report the accident was not a result of intersection geometry so no additional analysis is warranted.

It is noted that in 2020 and in 2022 that there was a spike in accidents that exceeded the threshold for analysis. These accidents may be due to weather conditions of the year and low traffic volumes.

While some yearly MEV do exceed the threshold, the standard for additional analysis is based upon the average rate. As shown in Table 2, all intersections within the study area do not meet or exceed the threshold for further review.

Traffic Volumes and Peak Hours of Operation

Traffic counts were collected in May 2025 under the direction of The City of Spokane (COS) by All Traffic Data and Whipple Consulting Engineers (WCE) and by Traffic Counts & Surveys at the following intersection:

- Sunset Boulevard & Rustle Street (COS)
- I-90 WB Ramp & Rustle Street (COS)
- Grandview Avenue/16th Avenue & 17th Avenue (WCE)*
- 13th Avenue & Lindeke Street (WCE)*
- 14th Avenue & Lindeke Street (WCE)*
- 16th Avenue & US 195 (WCE)

*the counts for these intersections occurred while public school was out of session. Given that there is no public school adjacent to these intersections the influence on counts would not vary greatly from the counts provided.

The AM & PM peak hours from these counts are shown on Figures 3 & 4. The raw data for these counts are located in the technical appendix.

LEVEL OF SERVICE

Level of Service (LOS) is an empirical premise developed by the transportation profession to quantify driver perception for such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles afforded to drivers who utilize the transportation network. It has been defined by the Transportation Research Board in the *Highway Capacity Manual 7th Edition*. This document has quantified level of service into a range from “A” which indicates little, if any, vehicle delay, to “F” which indicates significant vehicle delay and traffic congestion that may lead to system breakdown due to volumes that may exceed capacity.

Signalized Intersections

For signalized intersections, research has determined that average stopped delay per vehicle is the best available measure of Level of Service. The following tables identify the relationships between level of service and average stopped delay per vehicle. The City of Spokane and WSDOT have adopted level of service D as the minimum acceptable level for all signalized intersections.

Level of Service Criteria and Descriptions - Signalized

LOS	Delay Range (sec)	General Description
A	10	• Very low delay at intersection. • All signal cycles clear. • No vehicles wait through more than one signal cycle.
B	10 to 20	• Operating speeds beginning to be affected by other traffic. • Short traffic delays at intersections. • Higher average intersections delays resulting from more vehicles stopping.
C	20 to 35	• Operating speeds and maneuverability closely controlled by other traffic. • Higher delays at intersections than for LOS B due to a significant number of vehicles stopping. • Not all signal cycles clear the waiting vehicles.
D	35 to 55	• Tolerable operating speeds, but long traffic delays occur at intersections • The influence of congestion is noticeable. • Many vehicles stop and the proportion of vehicles not stopping declines. • The number of signal cycle failures, for which vehicles must wait through more than one signal cycle are noticeable.
E	55 to 80	• Speeds are restricted, very long traffic delays are experienced and traffic volumes are near capacity. • Traffic flow is unstable, any interruption, no matter how minor, will cause queues to form and service to deteriorate. • Traffic signal cycle failures are frequent occurrences.
F	80	• Extreme delays resulting in long queues which may interfere with other traffic movements • Stoppages of long duration and speeds may drop to zero. • Vehicle arrival rates are greater than capacity. • Considered unacceptable by most drivers.

Unsignalized Intersections

The calculation of Level of Service (LOS) at an unsignalized one/two-way stop-controlled intersection is examined in the Transportation Research Board's *Highway Capacity Manual 7th Edition*. For unsignalized intersections, Level of Service is based on the delay experienced by each movement and approach within the intersection. The concept of delay as presented for unsignalized intersections in the Highway Capacity Manual is based on the amount of time a vehicle must spend at the intersection. Vehicles passing straight through the intersection on the major (uncontrolled) street experience no delay at the intersection. On the other hand, vehicles which are turning left from the minor street, because they must yield the right of way to all right turning vehicles, all left turning vehicles from the major street and all through vehicles on both the minor and major streets, must spend more time at the intersection. Levels of Service are assigned to individual movements within the intersection, and are based upon the delay experienced by each movement or approach.

The Transportation Research Board has determined what Levels of Service for unsignalized intersections should be, by designating Level of Service A through F, where Level of Service A represents a facility where no vehicle in any movement is delayed very long and Level of Service F which represents a facility where there is excessive delay for the average vehicle in at least one movement in the intersection. The City of Spokane and WSDOT have adopted level of service E for all unsignalized intersections within the study area.

Level of Service Criteria and Descriptions - Unsignalized

LOS	Delay Range (sec)	Expected Delay to Minor Street Traffic	General Description
A	10	Little to No Delay	- Nearly all drivers find freedom of operation. - Very seldom is there more than one vehicle in the queue.
B	10 to 15	Short Traffic Delays	- Some drivers begin to consider the delay an inconvenience - Occasionally there is more than one vehicle in the queue.
C	15 to 25	Average Traffic Delays	- Many times, there is more than one vehicle in the queue. - Most drivers feel restricted, but not objectionably so.
D	25 to 35	Long Traffic Delays	- Often there is more than one vehicle in the queue. - Drivers feel quite restricted.
E	35 to 50	Very Long Traffic Delays	- Represents conditions in which, demand is near or equal capacity. - There is almost always more than one vehicle in the queue. - Drivers find the delays approaching intolerable levels.
F	50	Stop-and-Go Condition Delays Generally Longer than Acceptable	- Forced flow. - Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection

All Level of Service analyses described in this report were performed in accordance with the procedures described above. As a final note, the Highway Capacity Manual (HCM) analysis and procedures are based upon worst case conditions. Therefore, most of each weekday and the weekends will experience traffic conditions better than those described within this document, which are only for the peak hours of operation

EXISTING LEVEL OF SERVICE AND TRAFFIC ANALYSIS

Existing Level of Service and Traffic Analysis

The existing Levels of Service at the scoped intersections were calculated using the methods from the 7th Edition *Highway Capacity Manual* as implemented in Synchro, version 12.2.5. The existing Levels of Service for the intersection within the study area are summarized on the following tables. The existing traffic volumes used for this report are shown on Figures 3 & 4.

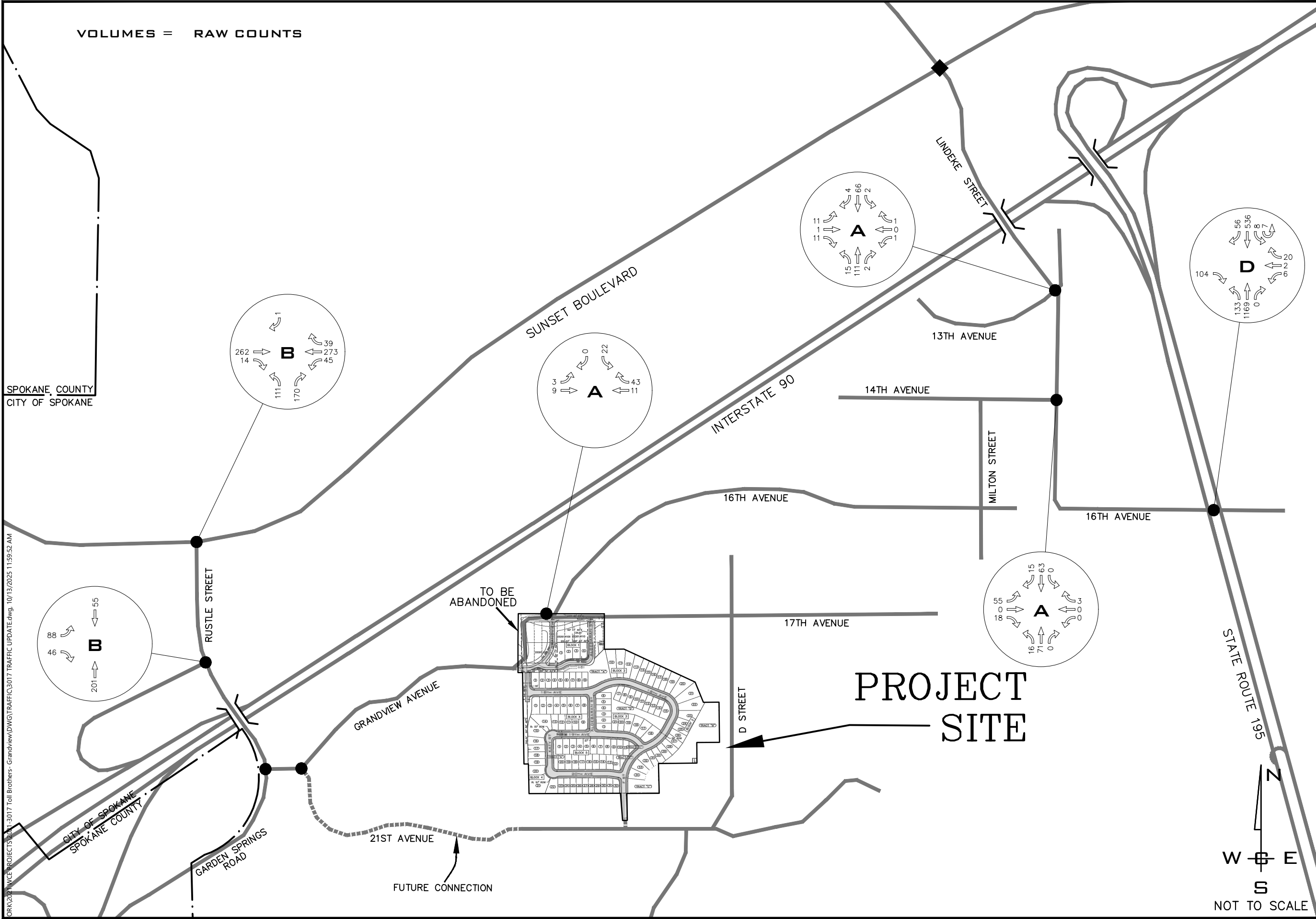
Table 3 – 2025 Existing Intersections Levels of Service (Figure 3&4)

INTERSECTION (S)ignalized (U)nsignalized		AM Peak Hour			PM Peak Hour		
		Delay (sec)	LOS	Mvmt	Delay (sec)	LOS	Mvmt
Sunset Boulevard & Rustle Street	U	12.9	B	NB	18.62	C	NB
I-90 WB Off Ramp & Rustle Street	U	11.27	B	EB	12.15	B	EB
17 th Avenue & 16 th Avenue	U	6.9	A	-	7.4	A	-
13 th Avenue & Lindeke Street	U	7.7	A	-	8.5	A	-
14 th Avenue & Lindeke Street	U	9.95	A	EB	11.75	B	EB
16 th Avenue & US 195	U	26.95	D	WB	33.97	D	WB

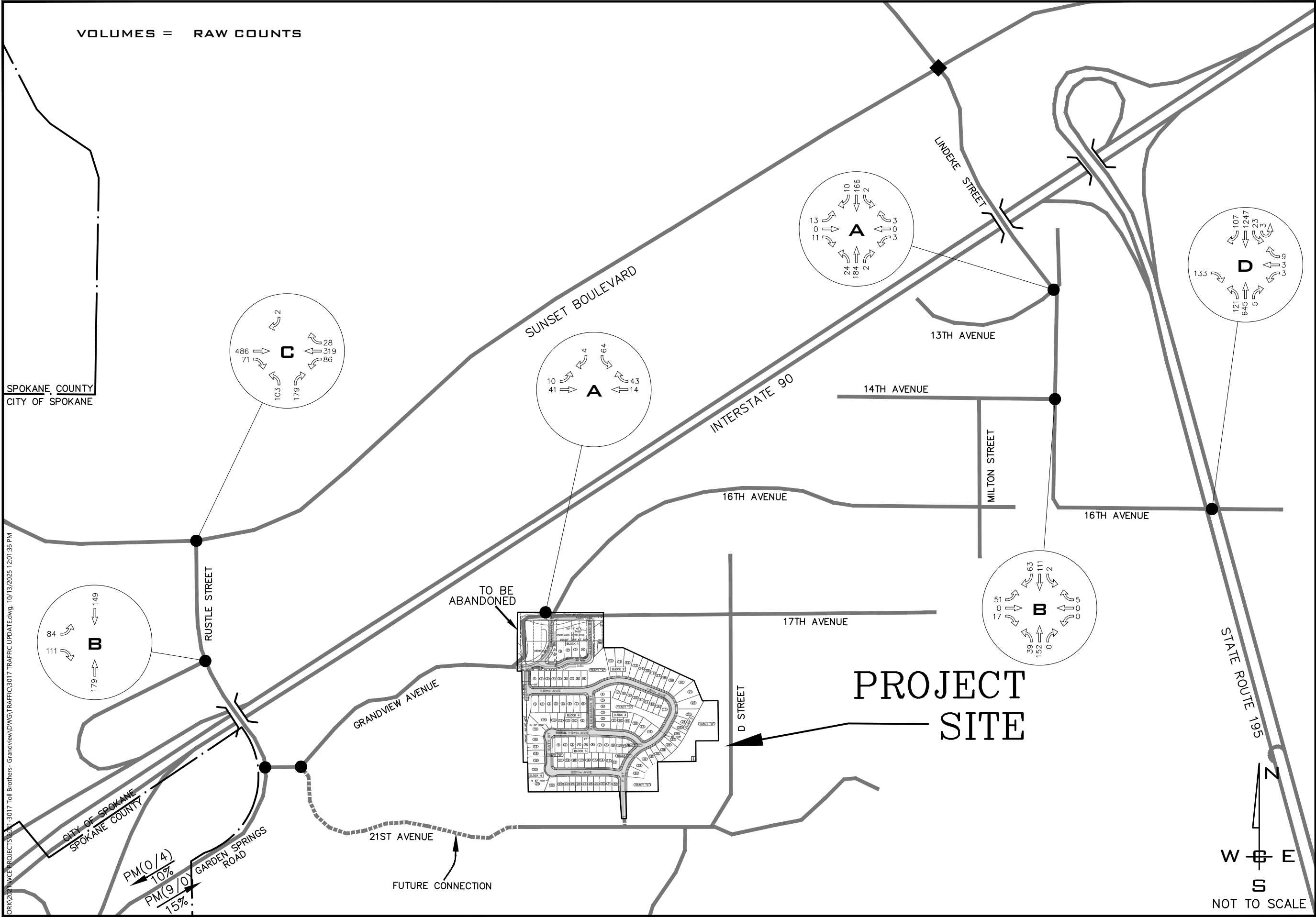
The City of Spokane and WSDOT have adopted level of service D as the minimum acceptable level for signalized intersections and level of service E as the minimum acceptable level for unsignalized intersections.

As shown in Table 3, the intersections are currently operating at an acceptable level of service.

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2025 AM EXISTING TRAFFIC VOLUMES & LOS	
FIGURE 3	



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TRAFFIC IMPACT ANALYSIS GRANDVIEW ADDITION 3201 W 19TH AVENUE SPOKANE, WASHINGTON	
2025 PM EXISTING TRAFFIC VOLUMES & LOS	
FIGURE 4	

FUTURE YEAR TRAFFIC IMPACT ANALYSIS

Future Year Traffic Impact Analysis Summary

The build out year analysis is required, per the scope of the TIA meeting. Two scenarios were examined for the build out year (2030) analysis. The first scenario assumes that the existing traffic volumes as shown on Figures 3 & 4 experience an increase above the existing volumes at the established background rate and the background project trips as shown on Figures 5 & 6. The second scenario assumes that the development has moved forward and analyzes the scoped intersection with the background growth rate, the background projects, and the project trips as shown on Figures 11 & 12. These scenarios will allow a determination to be made as to what the future conditions may be both with/without the background project trips and with/without the project trips.

Background Traffic Growth

Background traffic growth is an anticipated increase in traffic volume from year to year. As the existing land uses that surround a transportation facility mature, an increase in traffic results and may be due to either an increase in drivers per household, a household's purchase of an additional vehicle, unplatted lot development, etc. Many things can cause an increase in the traffic volumes of a facility. The objective of the background traffic growth rate is to anticipate what the traffic volumes may be in the future. The background traffic growth rate for an area or street is determined by means of physical counts collected by local governmental agencies. The counts are compared on a yearly basis and a rate of increase is calculated from the data.

The background growth rate was determined to be 1.0% per year. Based on a five-year build out, compounded annually, the total increase in traffic rate for the year 2030 is anticipated to be 1.051.

FUTURE ANALYSIS WITH BACKGROUND PROJECTS

Background Project Traffic

In addition to the natural increase in background growth, background projects that have already been approved or have made application and have been vested before this project have been included. The summary of background project traffic volumes used for this report are shown on Table 4. Please see Figures 7 & 8 for a graphical representation of this distribution.

Table 4 – Summary of the Background Project Trip Generation (Figures 5 & 6)

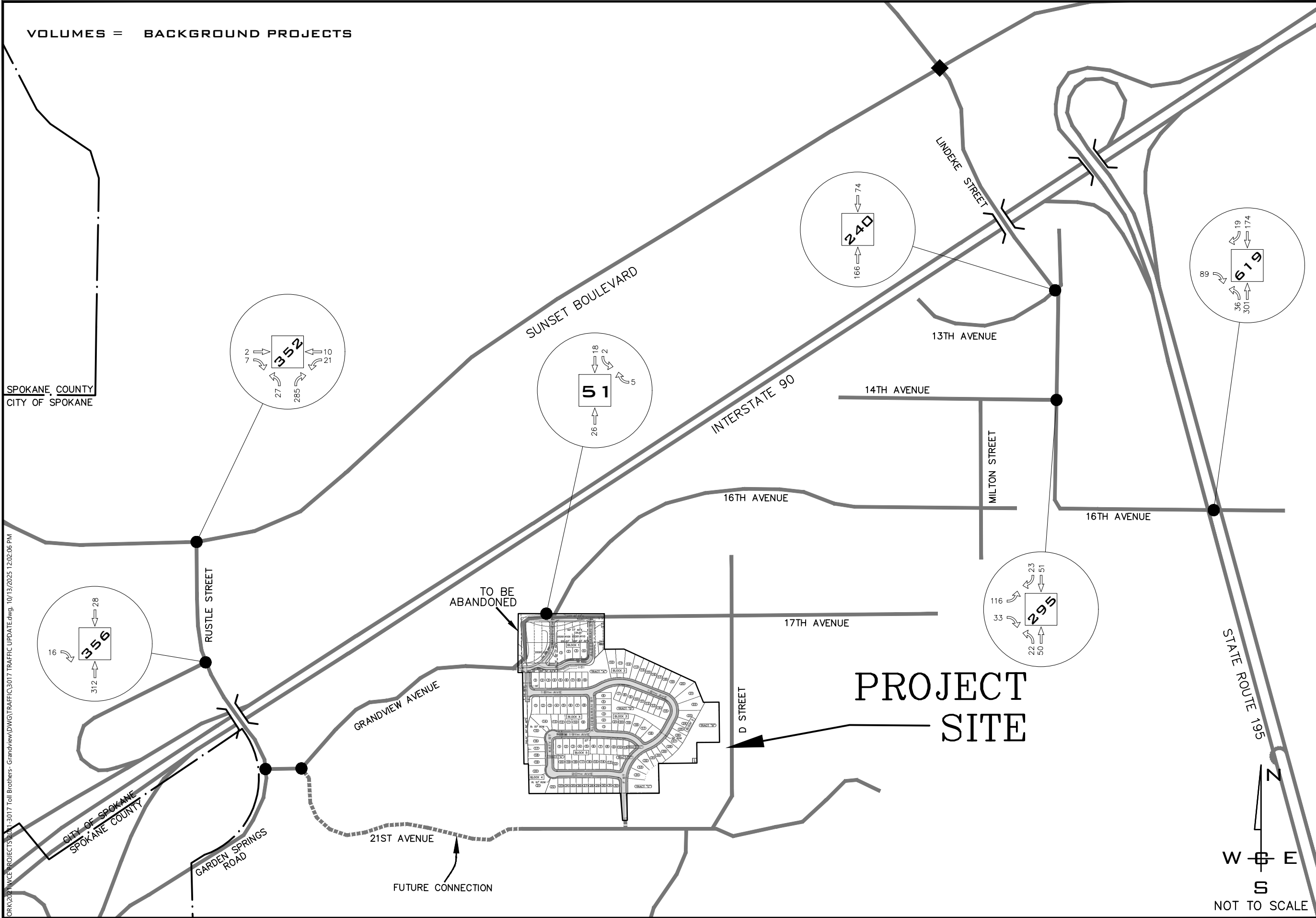
Background Projects	Land Use (ITE LUC)	Unit*	AM Peak Hour Trips			PM Peak Hour Trips		
			Vol. / LUC	Directional Distribution		Vol. / LUC	Directional Distribution	
				In	Out		In	Out
The Summit	Single-Family (210)	79*	60	15	45	80	50	30
Wheatland Estates	Single-Family (210)	197	138	35	103	188	118	70
Latah Glen	Single-Family (210)	142	99	25	74	133	84	49
Marshall Creek	Single-Family (210)	425	307	77	230	407	256	151
The Greens at Meadowlane 2	Single-Family (210)	26	22	6	16	29	18	11
Crystal Ridge	Single-Family (210)	56	45	11	34	56	35	21
Canyon Bluffs PUD	Single-Family (210) & Multifamily (220)	64 & 432	207	51	156	273	172	101
Qualchan View	Single-Family (210)	160	114	29	85	155	97	58
Prose Apartments	Multifamily (220)	348	127	30	97	165	104	61
Victory Heights	Single-Family (210) & Multifamily (220)	220 & 783	109 485	34 126	75 359	73 433	55 255	128 688
Beard Addition	Single-Family (210)	199	140	36	104	190	120	70
Total			955	239	716	1283	808	475

*Remaining Units

VOLUMES = BACKGROUND PROJECTS

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AM BACKGROUND PROJECT TRIPS

FIGURE

5

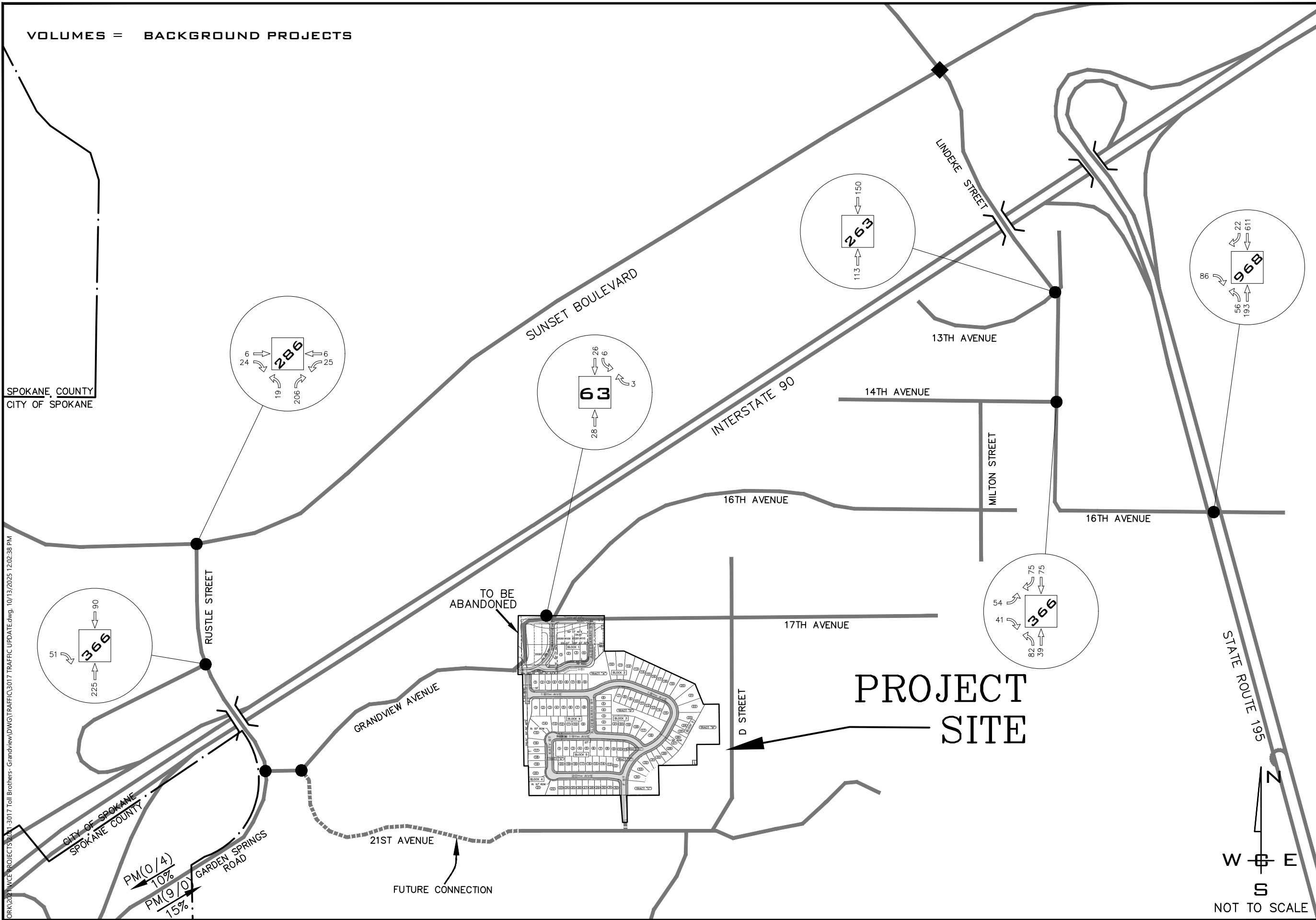
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VOLUMES = BACKGROUND PROJECTS

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FIGURE
6

W E
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Year 2030 with the Background Projects and without the Project

This scenario assumes that the development has not moved forward. The traffic volumes for this condition include the traffic volumes shown on Figures 3 & 4 multiplied by the background growth rate and adds the traffic from the background projects as shown on Figures 5 & 6. Please see Figures 7 & 8 for the traffic volumes used for this scenario. A summary of the Level of Service results is shown in the following table.

Table 5 – Year 2030 LOS, with the Background Projects and without the Project (Fig. 7&8)

INTERSECTION (S)ignalized (U)nsignalized		AM Peak Hour			PM Peak Hour		
		Delay (sec)	LOS	Mvmt	Delay (sec)	LOS	Mvmt
Sunset Boulevard & Rustle Street • Signalize	U (S)	95.84 (21.7)	F (C)	NB -	237.81 (40.9)	F (D)	NB -
I-90 WB Off Ramp & Rustle Street	U	17.84	C	EB	19.48	C	EB
17 th Avenue & 16 th Avenue	U	7.1	A	-	7.5	A	-
13 th Avenue & Lindeke Street • Change AWSC to TWSC	U	9.1 (11.33)	A (B)	- (WB)	10.8 (14.32)	B (B)	- (EB)
14 th Avenue & Lindeke Street	U	14.65	B	EB	23.23	C	EB
16 th Avenue & US 195	U	59.23	F	WB	130.43	F	EB

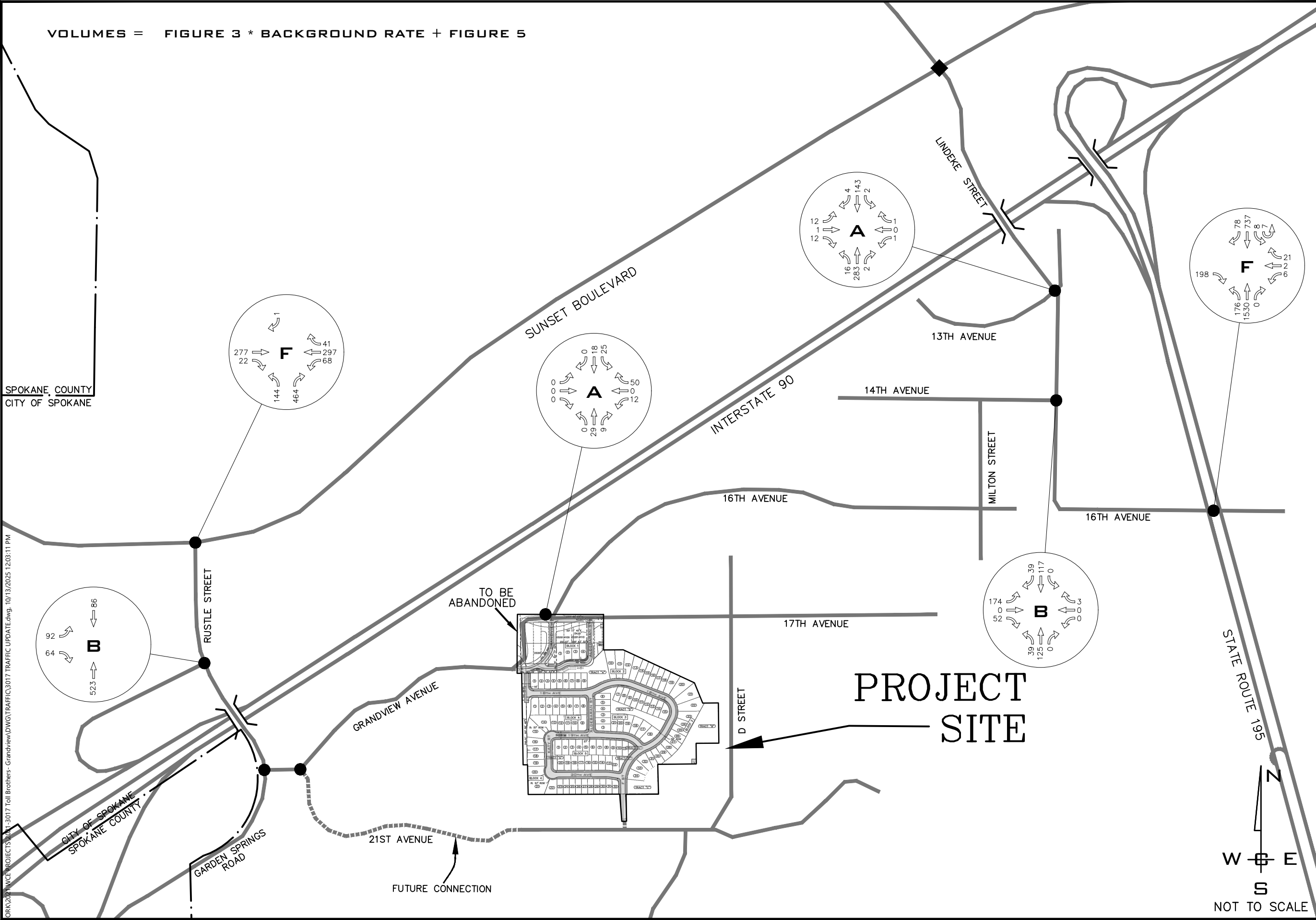
The City of Spokane and WSDOT have adopted level of service D as the minimum acceptable level for signalized intersections and level of service E as the minimum acceptable level for unsignalized intersections.

As shown in Table 5, with the reconfiguration at the intersection of SR 195 & 16th Avenue, all intersections are anticipated to operate at acceptable levels of service, except for the recently reconfigured intersection of 16th Avenue & US 195, which cannot be modified any further without closing the median to WB Through and left turns.

13th Avenue & Lindeke Street is proposed to be changed from an all-way stop control (AWSC) to a two way stop control (TWSC) as a part of a development project or as a City improvement project. The change in stop control is proposed to be in conjunction with a change in the alignment of Lindeke Street. 13th Avenue will operate with stop control, while Lindeke Street will operate free flowing. This change will allow a greater progression of trips through the arterial link.

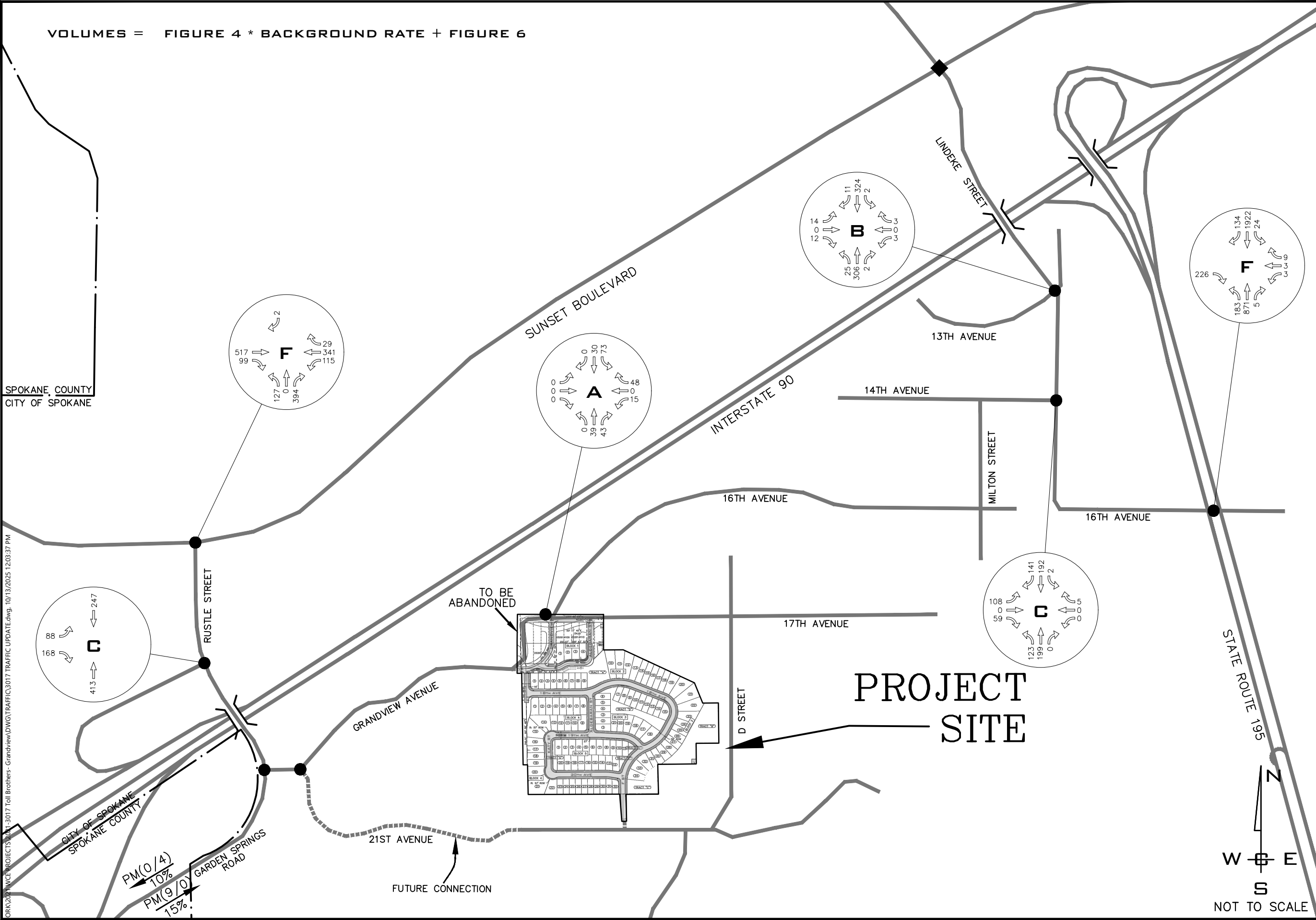
Sunset Boulevard & Rustle Street with the background growth and approved background projects is anticipated to fall below an acceptable level of service. Signalization of the intersection will raise the intersection level of service to an acceptable level.

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2030 AM W-O PROJECT TRAFFIC VOLUMES & LOS	
FIGURE 7	

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TRAFFIC IMPACT ANALYSIS GRANDVIEW ADDITION 3201 W 19TH AVENUE SPOKANE, WASHINGTON	
2030 PM W-O PROJECT TRAFFIC VOLUMES & LOS	
FIGURE 00	

FUTURE ANALYSIS WITH BACKGROUND PROJECTS & THE PROJECT

Trip Generation and Distribution

As noted earlier, trip generation rates for the AM and PM peak hours are determined by the use of the *Trip Generation Manual, 11th Edition* published by the Institute of Transportation Engineers (ITE). The purpose of the *Trip Generation Manual* is to compile and quantify empirical data into trip generation rates for specific land uses within the US, UK, and Canada.

Proposed Land Uses

For the proposed 111 single family residential units, ITE Land Use Code LUC#210, Single-Family Detached Housing was used to establish the number of potential trips generated by the proposed land use. Based upon Section 4.4 in ITE - Trip Generation Handbook, the fitted curve equation was used to calculate new project trips. The fitted curve equation and the anticipated number of AM & PM peak hour trips for the proposed land use are shown on Table 6.

**Table 6-Trip Generation Rates for LUC # 210 –
Single-Family Detached Housing (Fig 9B & 10B)**

Dwelling Units	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ Fitted Curve Equation / Unit	Directional Distribution		Vol. @ Fitted Curve Equation / Unit	Directional Distribution	
		26% In	74% Out		63% In	37% Out
111	82	21	61	110	69	41
Average Daily Trip Ends (ADT)				Fitted Curve Equation AM – $\ln(T) = 0.91 \ln(x) + 0.12$ PM - $\ln(T) = 0.94 \ln(x) + 0.27$ ADT – $\ln(T) = 0.92 \ln(x) + 2.68$ T = Trips/units, x = Dwelling Units		
Units	Fitted Curve Equation		ADT			
111			1,111			

As shown on Table 6, the proposed development is anticipated to generate a total of 82 trips in the AM peak hour with 21 trips entering the site and 61 trips exiting the site. In the PM peak hour, the proposed development is anticipated to generate a total of 110 trips, with 69 trips entering the site and 41 trips exiting the site. The proposed development is anticipated to generate a total of 1,111 average daily trip ends to/from the site.

Trip Distribution Characteristics of the Proposed Project

Considering many factors such as the surrounding transportation facilities, typical commuting patterns, existing development in the area, and Average Daily Traffic counts as well as coordination with the City Traffic Engineer, traffic for the proposed development is anticipated as follows:

Entering

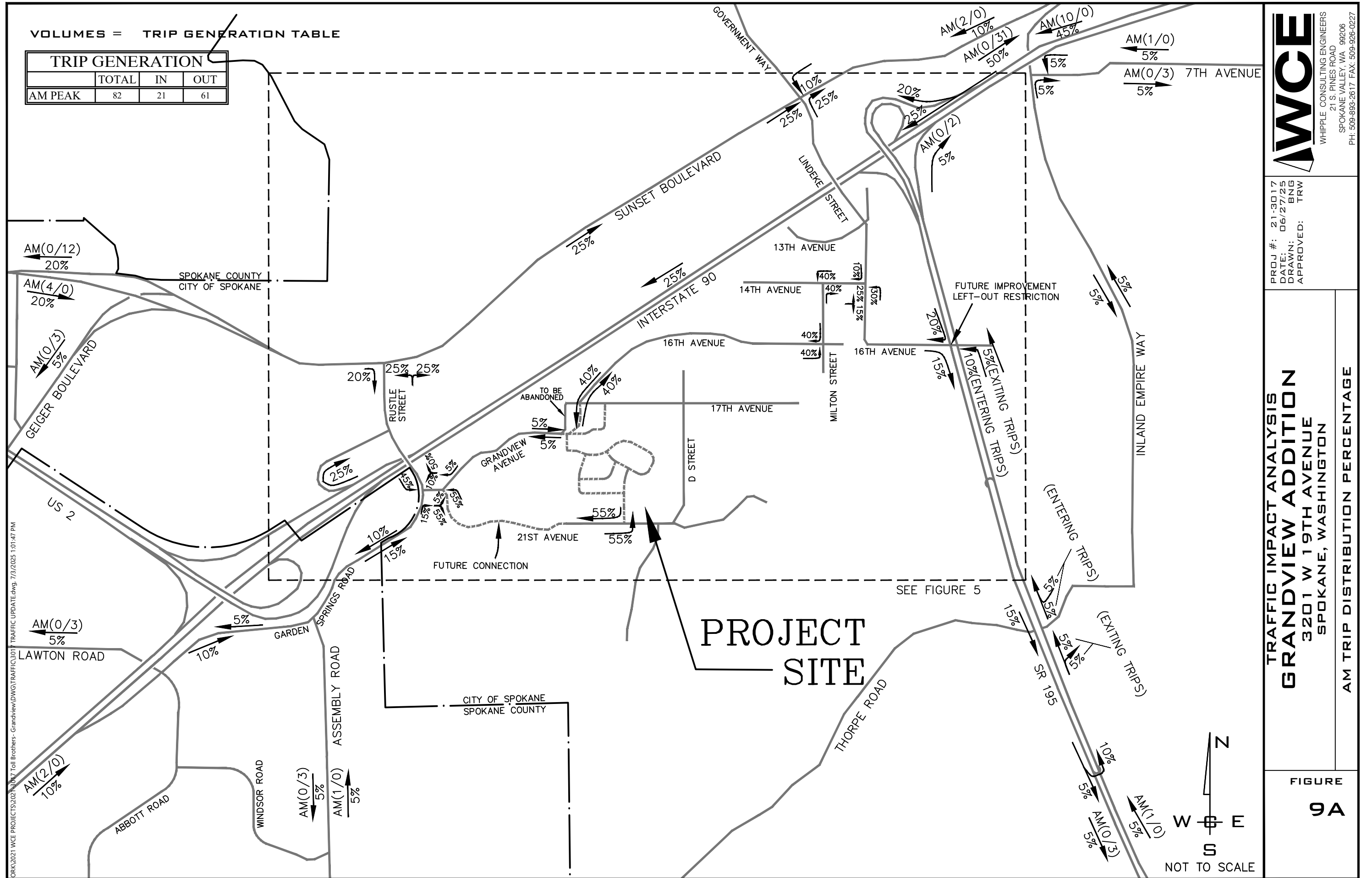
20% of trips are anticipated to come from the northwest via Sunset Boulevard, 10% of trips are anticipated to come from the west via I-90, 5% of trips are anticipated to come from the south via Assembly Road, 5% of trips are anticipated to come from the south via SR 195, 5% of trips are anticipated to come from the South Hill area by way of Inland Empire Way, 45% of trips are anticipated to come from the east via I-90, and 10% of the trips are anticipated to come from the east via Sunset Boulevard.

Exiting

20% of trips are anticipated to go to the northwest via Sunset Boulevard, 5% of trips are anticipated to go to the west via Geiger Boulevard, 5% of trips are anticipated to go to the west via Lawton Road, 5% of trips are anticipated to go to the south via Assembly Road, 5% of trips are anticipated to go to the south via SR 195, 5% of trips are anticipated to go to the South Hill area by way of Inland Empire Way, 5% of trips are anticipated to go to the east via SR 195 & I-90, and 50% of trips are anticipated to go to the east via Sunset Boulevard.

VOLUMES = TRIP GENERATION TABLE

TRIP GENERATION			
	TOTAL	IN	OUT
AM PEAK	82	21	61



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AM TRIP DISTRIBUTION PERCENTAGE

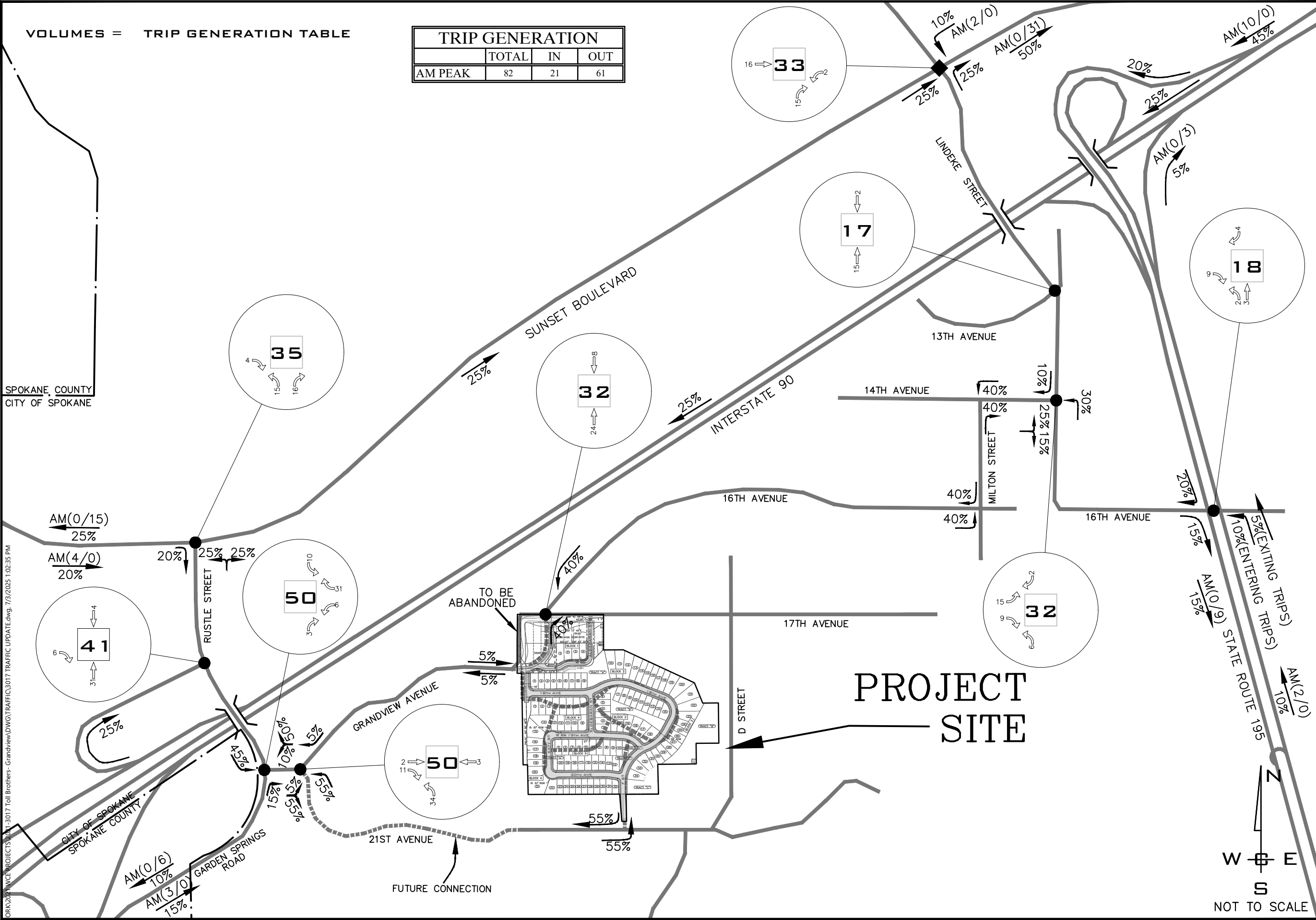
FIGURE
9A

VOLUMES = TRIP GENERATION TABLE

TRIP GENERATION			
	TOTAL	IN	OUT
AM PEAK	82	21	61

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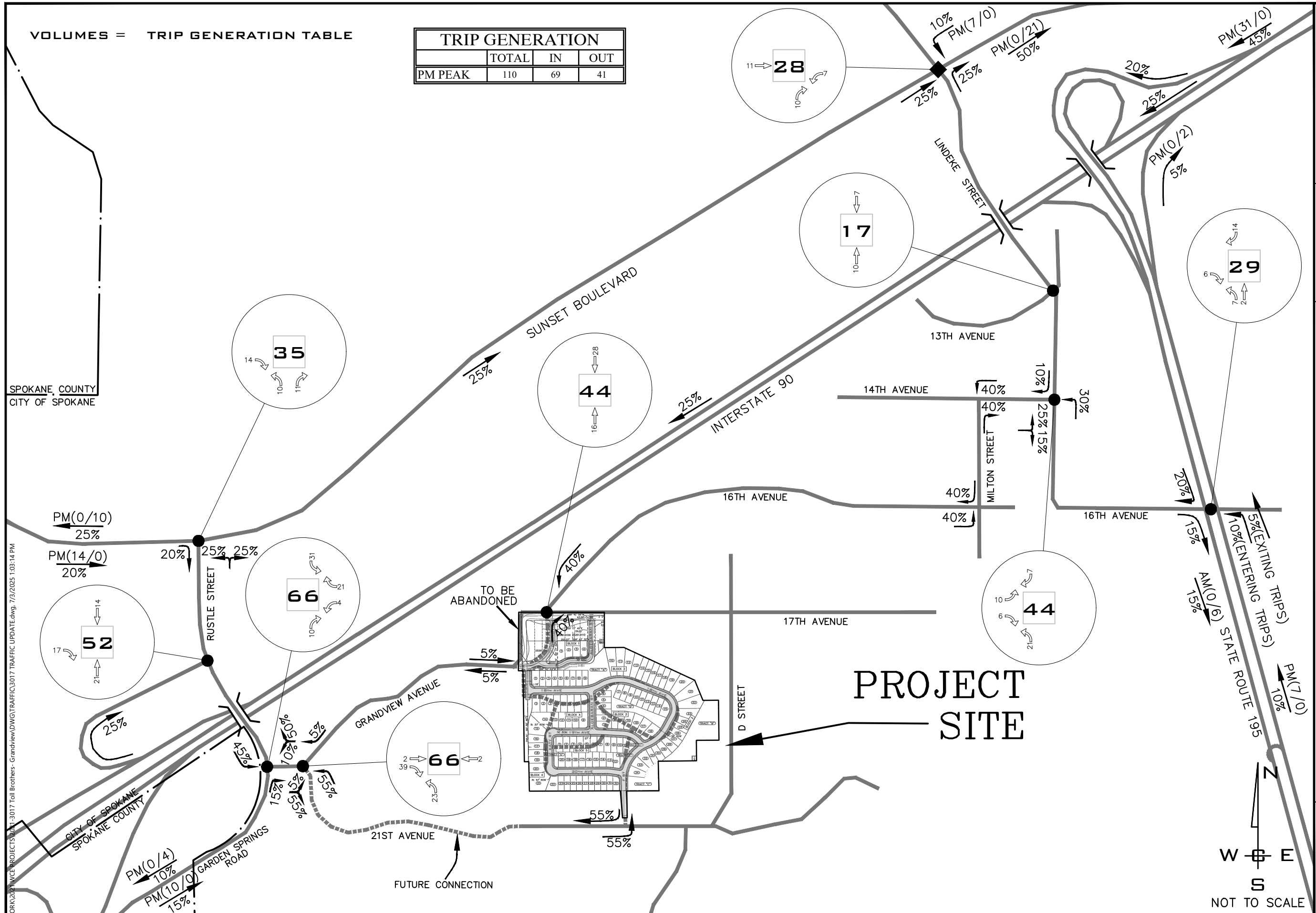
FIGURE
9B

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TRIP GENERATION			
	TOTAL	IN	OUT
PM PEAK	110	69	41



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GRANDVIEW ADDITION
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PM TRIP DISTRIBUTION PERCENTAGE

FIGURE 10B

W — E
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Year 2030 with the Background Projects and the Project

This scenario assumes that the project has moved forward and is added to the previously established baseline. The traffic volume for this condition includes the traffic volumes shown on Figures 7 & 8 and adds the project trips as shown on Figures 9B & 10B. Please see Figures 11 & 12 for the traffic volumes used for this scenario. A summary of the Level of Service results is shown in the following table.

Table 7 – Year 2030 LOS, with the Background Projects & the Project (Figures 11&12)

INTERSECTION (S)ignalized (U)nsignalized		AM Peak Hour			PM Peak Hour		
		Delay (sec)	LOS	Mvmt	Delay (sec)	LOS	Mvmt
Sunset Boulevard & Rustle Street • Signalize	U	119.28 (21.6)	F (C)	NB -	268.66 (40.7)	F (D)	NB -
I-90 WB Off Ramp & Rustle Street	U	18.94	C	EB	21.48	C	EB
17 th Avenue & 16 th Avenue	U	7.3	A	-	7.7	A	-
13 th Avenue & Lindeke Street • Change AWSC to TWSC	U	9.3 (11.54)	A (B)	- (WB)	11.2 (14.77)	B (B)	- (EB)
14 th Avenue & Lindeke Street	U	15.61	C	EB	27.52	D	EB
16 th Avenue & US 195	U	60.69	F	WB	137.74	F	EB

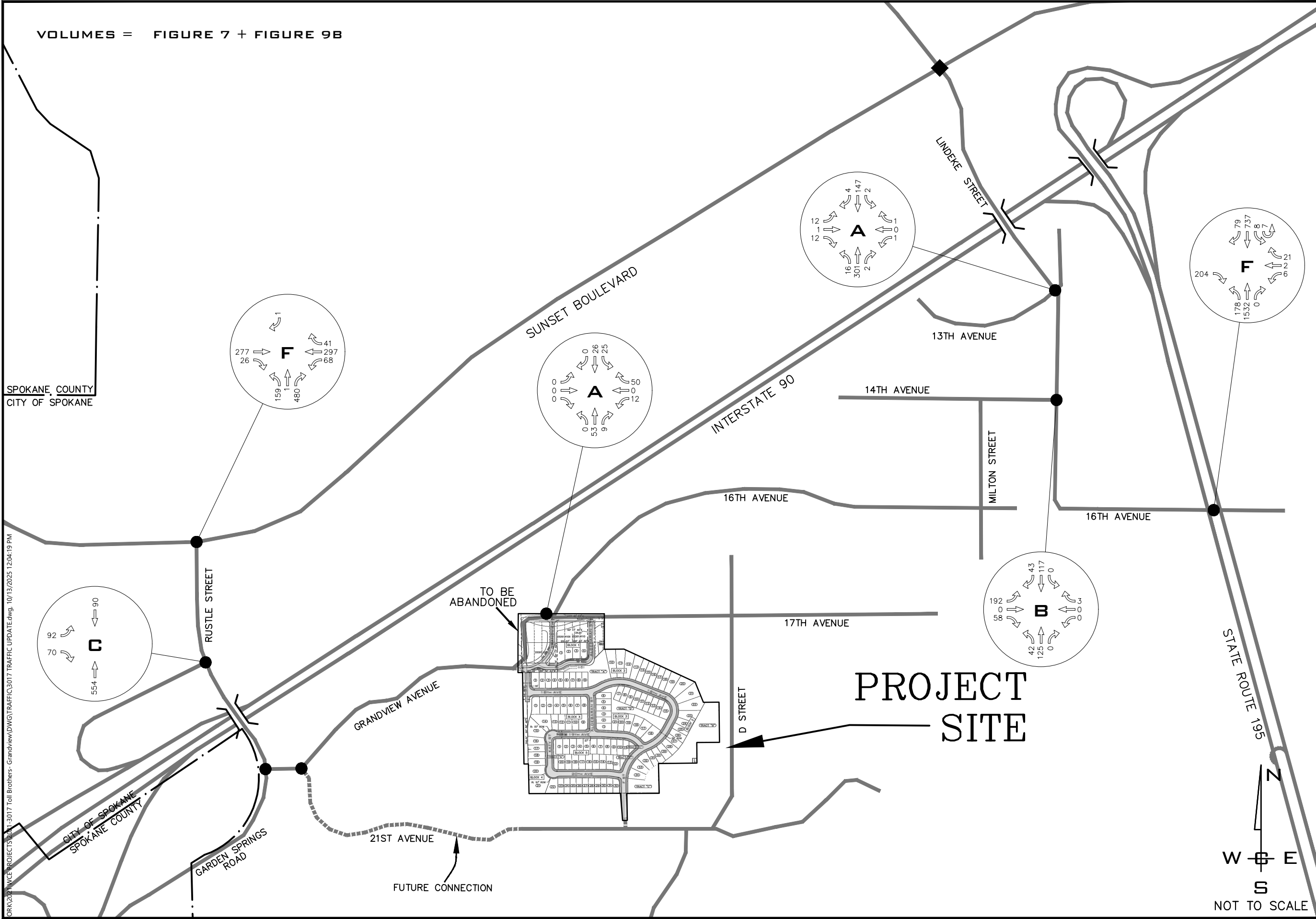
The City of Spokane and WSDOT have adopted level of service D as the minimum acceptable level for signalized intersections and level of service E as the minimum acceptable level for unsignalized intersections.

As shown in Table 9, with the reconfiguration at the intersection of SR 195 & 16th Avenue, all intersections are anticipated to operate at acceptable levels of service, except for the recently reconfigured intersection of 16th Avenue & US 195, which cannot be modified any further without closing the median to WB Through and left turns.

As stated in the without project scenario the intersection of 13th Avenue & Lindeke Street is to be modified from an all-way stop control (AWSC) to a two-way stop control (TWSC) as a part of a development project or as a City improvement project.

As stated in the without project scenario the intersection of Sunset Boulevard & Rustle Street is anticipated to fall below an acceptable Level of service. The signalization of the intersection will raise the LOS to an acceptable level.

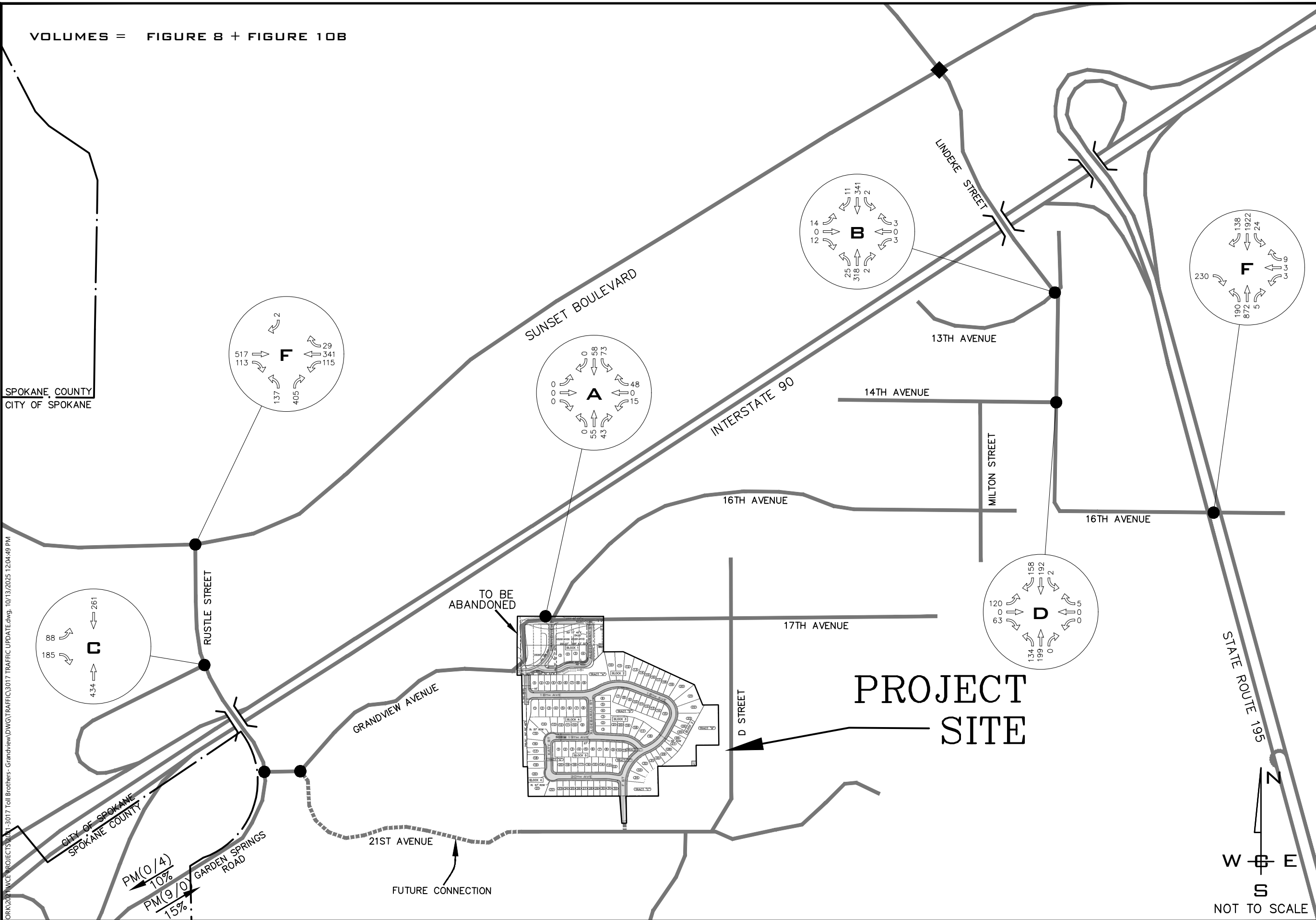
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2030 AM W- PROJECT TRAFFIC VOLUMES & LOS	
FIGURE 11	

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**TRAFFIC IMPACT ANALYSIS
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FIGURE
12

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2030 PM W- PROJECT TRAFFIC VOLUMES & LOS

ADDITIONAL ANALYSIS

Based upon the TIA comment the additional analysis includes a Signal Warrant Analysis for the intersection of Sunset Boulevard & Rustle Street

Signal Warrant Analysis

City of Spokane Six Year Transportation Plan does not include the installation of a signal at the intersection of Sunset Boulevard & Rustle Street. The improvement is anticipated to raise the intersection level of service. Please see the appendix for the Warrant Analysis for the intersection. The results are summarized in Table 8.

Table 8 – Signal Warrant for the Intersection of Sunset Boulevard & Rustle Street

Warrant	2025 Counts
Warrant 1 – Eight Hour Warrant	Not Satisfied
Warrant 2 – Four Hour Warrant	Not Satisfied
Warrant 3 – PM Peak Hour	Satisfied
Warrant 4 – Pedestrian Volume	Not Satisfied
Warrant 5 – School Crossing	Not Satisfied
Warrant 6 – Coordinated Signal System	Not Satisfied
Warrant 7 – Crash Experience	Satisfied
Warrant 8 – Roadway Network	Satisfied
Warrant 9 – Intersection Near A Grade Crossing	Not Satisfied

As shown in Table 8, based upon signal warrant analysis, the intersection meets 3 of the 9 warrants. But it does not satisfy warrants 1 & 2 therefore a signal is not warranted at this time

CONCLUSIONS & RECOMMENDATIONS

Conclusions

This Traffic Impact Analysis (TIA) has reviewed and analyzed the study area per the scope established by the scoping meeting, the City of Spokane and WSDOT. Based upon the analysis, field observations, assumptions, methodologies and results which are provided in the body of this report, it is concluded that the development of the proposed project will generate new trips on the existing transportation system and that those trips will not have a significant impact on the level of service of the transportation system in the buildout year. This conclusion was reached and has been documented within the body of this report.

- Under the **year 2025 existing** conditions, all intersections are currently operating at an acceptable level of service.
- For the **year 2030 with background projects without the project** scenario, all intersections are anticipated to operate at acceptable levels of service. Except for the intersection of the recently reconstructed 16th Avenue & US 195 intersection which cannot be changed without closing the median to through and left westbound trips and the intersection of Sunset Boulevard & Rustle Street that can be improved with the signalization of the intersection. .
- For the **year 2030 with background projects with the project** scenario, all intersections are anticipated to operate at acceptable levels of service. Except for the intersection of the recently reconstructed 16th Avenue & US 195 intersection which cannot be changed without closing the median to through and left westbound trips and the intersection of Sunset Boulevard & Rustle Street that can be improved with the signalization of the intersection. .
- Additional analysis – Signal Warrant – a signal is not warranted at the intersection of Sunset Boulevard & Rustle street under the year 2025 conditions.

Recommendations

Based upon the conclusions within this study, the proposed project is recommended to complete all required conditions of approval including frontage improvement and payment to the mitigation fee at the time of building permit, and should be allowed to move forward without further traffic analysis, or offsite mitigation.