Behle, Wertheim and Liberty LLC

2022

Trestles Phase 1, Phase 2, and Wildflower Subdivisions Traffic Impact Study (Updated Aug 2023)

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Management and Engineering

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Traffic Impact Study Disclaimer

All recommendations and/or advice presented in this document regarding probably project conditions are the opinions of Civilize, PLLC. Project conditions are based on information and data sources that are readily available from the public sector, provided by the project owner, previously published studies by other competent professionals, and other reliable sources including state agencies and local municipal government entities, all of which are relied upon as accurate. Our recommendations and/or advice are made on the basis of our experience and represent our judgment and opinions. We have no control over new and/or non-public information, changed conditions, cost of land, cost of labor, materials, equipment, and/or other construction costs, or over competitive bidding or market conditions. Therefore, we do not guarantee that actual conditions or actual costs will not vary from those presented in this report.

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I. Introduction

A. Site Location and Study Area

Trestles Phase 1 is a proposed subdivision located in Teton County. More particularly, the development is situated near the northeast corner of the intersection of Hwy 33 and W 2000 S in Teton County, Idaho. The parent parcels are 40.3 acres and 40.17 acres for a total of 80.47 acres and are zoned agriculture/rural residential 2.5. The proposed access is an approach on W 2000 S approximately 1/3 mile east of the intersection of Hwy. 33 and W 2000 S.

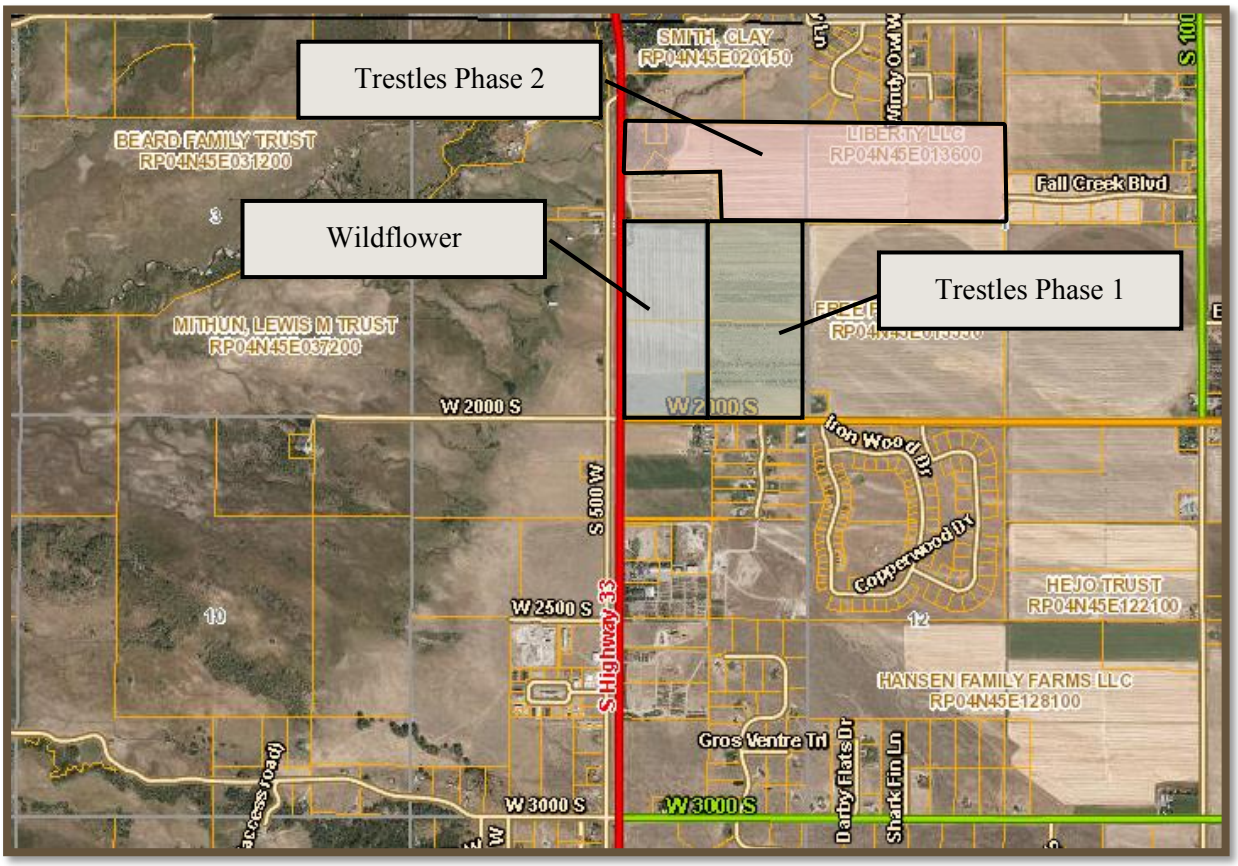

Figure 1: Location Map

Trestles Phase 2 is a proposed subdivision located in Teton County. More particularly, the development is situated directly north of Trestles Phase 1 in Teton County, Idaho. The parent parcels are 56.36 acres and 80 acres for a total of 136.36 acres and are zoned agriculture/rural residential 2.5. The proposed access is located at the connecting edge between Phase 1 and 2 approximately 1/3 mile east of Hwy33 and ½ mile north of W 2000 S.

Wildflower PUD is a proposed planned unit development (PUD) located in Teton County. More particularly, the development is situated on the northeast corner of the intersection of Hwy33 and W 2000 S in Teton County, Idaho and directly west of Trestles Phase 1. The parent parcels are 30.32 acres and 34.53 acres for a total of 64.85 acres and are zoned agriculture/rural residential 2.5. The proposed access is an approach on W 2000 S approximately 600 feet east of the intersection of Hwy. 33 and W 2000 S.

B. Methods

The TIS is conducted in accordance with the guidelines for a traffic impact study as published by the Idaho Transportation Department (ITD) in the document titled, *Requirements for Transportation Impact Studies* as well as the guidance document titled *Transportation Impact Analyses for Site Development* published by the Institute of Transportation Engineers (ITE).

1. Horizon Years

This traffic impact study evaluates the existing transportation conditions, the buildout condition projected for 2032, and a horizon year 20 years beyond the buildout year in 2052:

- 2022 existing background traffic,
- 2032 assumed full build-out year,
- 2052 horizon year

2. Traffic Flow

Highway 33 is a regional transportation route that provides access to Jackson, Wyoming for recreational as well as daily commuting traffic for work purposes, connects the Teton Basin with Rexburg and Idaho Falls, serves as a route to connect Yellowstone and Grand Teton National Parks, provides a cutoff route for travelers traversing between Montana and Wyoming, and serves local and out-of-town sportsmen and tourists in the Teton Basin including those accessing Grand Targhee for skiing and the west side of the Tetons for hiking and camping. Highway 32 serves much the same purposes, connecting Ashton, Idaho with Tetonia, Idaho and feeding into Highway 33 at Tetonia. As such, the route experiences significant seasonal variation in traffic flows with the peak month occurring in July. Because of the seasonal nature of the traffic flows, the relevant value selected for analysis was the Peak Hour Volume (PHV) for the Average Daily Traffic (ADT) for the peak month of July.

a. ITD Automated Traffic Recorders (ATR)

ITD maintains Automatic Traffic Recorders (ATRs) throughout the state including District 6, four of which are in the Teton Basin. The ATRs relevant to this project include ATR #239 located at Hatch's Corner, which is located between 2000 South and 3000 South. The monthly AADT for ATR #239 in 2021 ranged

from a low in January of 8,297 to a high in July of 13,527. This study will focus on the July MADT which is the peak season, rather than the annual ADT.

b. Adjustment for Proximity

ATR #239 is located reasonably close to the relevant intersection of 3500 South and Hwy 33 such that the traffic counts are applicable to the relevant intersection without any adjustment for proximity.

c. Existing Traffic Counts at Intersection of Hwy. 32 and Hwy. 33

From the ITD Monthly Traffic Volume Report for July 2021 (see Appendix F), it can be determined that the MADT for ATR #239 is 13,527 vpd. Furthermore, the maximum month average peak hour of the day was determined to be between 5:00 pm and 6:00 pm with a monthly average hourly volume of 1,047 vph with a directional split of 580 vph southbound and 467 vph northbound (54% southbound and 46% northbound)

3. Trips Generated by Development

a. Existing Development

Existing development in the area surrounding the proposed development can be classified as rural residential with several rural subdivisions within a one-mile radius. There is also a large commercial nursery operating approximately ½ mile south of the proposed development situated on the east side of Hwy. 33.

b. Proposed Development

Trestles Phase 1 is a proposed 24-lot subdivision located in Teton County one half a mile outside of the impact area of the city of Driggs. Trestles Phase 2 is a proposed 42-lot subdivision located directly north of Trestles Phase 1. Wildflower is a proposed 25-lot subdivision located directly west of Trestles Phase 1 and southwest of Trestles Phase 2. Currently, the Teton County lists the property as A/RR 2.5, which is designated for agriculture and for one and two-family structures on parcels with a minimum size of 2.5 acres. These developments do not propose to alter the zoning. While future development may occur in the area of the proposed project, that development is not currently defined and will not be considered in the traffic modeling, rather that responsibility will be relegated to future developers.

The differential in MADT for July for the project buildout in 2032 is 1,742 additional trips and the PHV differential is 138 additional trips in the am peak hour and 182 additional trips in the pm peak hour.

C. Principal Findings

The existing site is undeveloped with an existing unimproved agricultural approach but proposes an improved approach onto W 2000 South on the south side of the property. W 2000 South is a two-lane rural road that operates significantly below capacity. Approximately ¼ mile west of the intersection of Trestles Road and W 2000 South, W 2000 South intersects Hwy 33 in an existing four-leg intersection, albeit the west leg sees limited use as developed property west of Hwy 33 is sparse. The approach from Trestles Road onto W 2000 South should be design in accordance with the Land Development Code for Teton

County as well as the *Highway and Street Guidelines for Design and Construction in Teton County* (2013) requirements, while any improvements to the existing intersection of W 2000 South and Hwy. 33 should be located and designed in accordance with *IDAPA 39.03.42 – Rules Governing Highway Right-of-Way Encroachments on State Rights-of-Way*. Consulting with those referenced documents, we glean that:

- The State of Idaho designates Hwy. 33 as a Major Collector, a classification duplicated by Teton County.
- The state requirement for the distance downstream from an unsignalized public road intersection (W 2000 South) for a Major Collector in a rural area greater than 35 mph is 660 feet.
- W 2000 South is defined as a Major Collector with a ROW width between 60 and 80 feet.
- Approaches should be in conformance with the *Manual for Use of Public Right-of-Way Standard Approach Policy*, LHTAC, current edition.

D. Analysis

After evaluating the proposed development within the context of zoning; projected land use; existing transportation system; background traffic counts for the principal roadways within the study impact area; projected traffic for horizon year's corresponding with the project opening, project buildout, and a 20-year horizon year; the findings of the Traffic Impact Study are summarized below. In order to simplify the forecasted traffic conditions as they have progressed through this study, the following two (2) figures were produced. The first table shows the forecasted progression in terms of level of service (LOS) of the roadway segments and the second table shows the intersection's progression, also defined by LOS. Any cell highlighted in yellow represents a forecasted condition that is not considered acceptable. In addition, the mitigation measure's forecasted results are also shown in the following tables.

Table 1- Segment Traffic Conditions Progression Each Horizon Year

Segment 1: Highway 33	Southbound V/C Ratio	LOS	Northbound V/C Ratio	LOS
2022 Background Traffic (One Lane Each Way)	0.27	C	0.34	C
2032 Background Traffic (One Lanes Each Way)	0.35	D	0.44	D
2032 Background plus Site Traffic (One Lanes Each Way)	0.36	D	0.46	D
2052 Background Traffic (One Lanes Each Way)	0.71	E	0.57	D
2052 Background Traffic Mitigation (Add Southbound Lane)	0.36	C	0.57	D
2052 Background plus Site Traffic (One Lanes Each Way)	0.78	E	0.62	E
2052 Background Traffic Mitigation (Add South & Northbound Lane)	0.39	C	0.31	C

Segment 2: 2000 S	Eastbound V/C Ratio	LOS	Westbound V/C Ratio	LOS
2022 Background Traffic (One Lane Each Way)	0.014	A	0.025	A
2032 Background Traffic (One Lane Each Way)	0.019	A	0.039	A
2032 Background plus Site Traffic (One Lane Each Way)	0.059	A	0.062	A
2052 Background Traffic (One Lane Each Way)	0.023	A	0.052	A
2052 Background plus Site Traffic (One Lane Each Way)	0.084	A	0.082	A

Table *2- Intersection Traffic Conditions Progression Each Horizon Year*

Intersection 1: Hwy 33/2000 S	Eastbound Max LOS	Westbound Max LOS	Northbound Max LOS	Southbound Max LOS
2022 Background Traffic	B	B	A	A
2032 Background Traffic	C	C	A	A
2032 Background plus Site Traffic	C	E	A	A
2032 Mitigation Measures - Option 1 (Left Turn Lane)	C	E	A	A
2032 Mitigation Measures - Option 2 (Left Turn Lane & TWLTL)	B	C	A	A
2052 Background Traffic	C	D	A	A
2052 Background plus Site Traffic	D	D	A	A

Intersection 2: 2000 S/1000 E	Eastbound Max LOS	Westbound Max LOS	Northbound Max LOS	Southbound Max LOS
2022 Background Traffic	A	A	A	A
2032 Background Traffic	A	A	A	A
2032 Background plus Site Traffic	A	A	A	A
2052 Background Traffic	A	A	A	A
2052 Background plus Site Traffic	A	A	B	B

Intersection 3: 2000 S/Wildflower	Eastbound Max LOS	Westbound Max LOS	Northbound Max LOS	Southbound Max LOS
2022 Background Traffic	n/a	n/a	n/a	n/a
2032 Background Traffic	n/a	n/a	n/a	n/a
2032 Background plus Site Traffic	A	A	n/a	A
2052 Background Traffic	A	A	n/a	A
2052 Background plus Site Traffic	A	A	n/a	A

Intersection 4: 2000 S/Trestles	Eastbound Max LOS	Westbound Max LOS	Northbound Max LOS	Southbound Max LOS
2022 Background Traffic	n/a	n/a	n/a	n/a
2032 Background Traffic	n/a	n/a	n/a	n/a
2032 Background plus Site Traffic	A	A	n/a	A
2052 Background Traffic	A	A	n/a	A
2052 Background plus Site Traffic	A	A	n/a	A

E. Existing Traffic Conditions (2022)

1. Traffic Conditions

For the existing traffic conditions analyzed with the existing intersection control and lane configurations, all the road segments and intersections are within minimum operational thresholds.

a. Mitigating Measures

For traffic condition reasons, no improvements are warranted for the existing conditions.

2. Traffic Safety

For the existing traffic safety analyzed with the existing intersection control and lane configurations, the following have been determined to not meet the ITD minimum recommended standards.

- Segment 1: Highway 33 Northbound Traffic – A left turn lane is warranted
- Segment 1: Highway 33 Southbound Traffic – A left turn lane is warranted

a. Mitigating Measures

For safety reasons, left turn lanes for both northbound and southbound traffic are warranted on Hwy 33.

F. 2032 Buildout Year Traffic Conditions Results

1. Traffic Conditions

The roadway network was modeled the same as the existing conditions but with the increase in background traffic and the projected traffic from the proposed development. While the road segments remain an acceptable LOS, the model forecasts that for the Hwy 33 and 2000 South intersection, the westbound leg falls into an unacceptable level of service in the 2032 Buildout Year with the inclusion of the site generated traffic.

a. Mitigating Measures

Two (2) mitigation measures were modeled to improve the westbound traffic. The first model analyzed a left turn lane for the westbound traffic. This improved the through and right turning traffic but the left turning movement remained failed. The second model added a left turn lane and a Two Way Left Turn Lane (TWLTL) lane on Hwy 33. This resulted in all westbound turning movements being acceptable.

2. Traffic Safety

For the forecast 2032 traffic safety analyzed with the existing intersection control and lane configurations, the following have been determined to not meet the ITD minimum recommended standards.

- Segment 1: Highway 33 Northbound Traffic – A right turn lane is warranted

a. Mitigating Measures

For safety reasons, a right turn lane for the northbound is warranted.

G. 2052 Horizon Year Traffic Conditions Results

1. Traffic Conditions

The roadway network with an increase in background traffic from 2032 to 2052, with a westbound turning lane on 2000 S, and a TWLTL on Hwy 33 was modeled as recommended in the 2032 Buildout Year. With these improvements, it was found that the intersections are forecasted to operate at an acceptable level, with or without inclusion of traffic generated by the development, but Hwy 33 is projected to be over capacity.

a. Mitigating Measures

In order to increase capacity on Hwy 33, it is recommended that additional travel lanes be installed for both the southbound and northbound traffic.

2. Traffic Safety

For the forecast 2052 traffic safety analyzed with the existing intersection control and lane configurations, the following have been determined to not meet the ITD minimum recommended standards.

b. Mitigating Measures

For safety reasons, a right left turn lane for the southbound traffic is warranted.

- Segment 1: Highway 33 Southbound Traffic – A right turn lane is warranted

H. Overall Study Summary

This study has determined that the traffic within the study area is currently operating at an acceptable level during the pm peak hour of the day. ITD safety guidelines indicate that a left turn lane for both the northbound and southbound traffic are warranted on Hwy 33 for the existing conditions.

With the buildout of the proposed development in 2032 and the increase in background traffic from 2022 to 2032, it has been determined that a left turn lane for the westbound traffic on 2000 S along with a two-way left turn lane (TWLTL) is warranted on Hwy 33 to handle the forecasted traffic at buildout. For the 2032 forecasted traffic, the ITD safety guidelines indicate that the addition of a right turn lane for the northbound traffic will be warranted.

Lastly, for the 20-year horizon year analysis (2052), it was determined that with the addition of the left turn lane for the westbound traffic on 2000 S and the TWLTL (as recommended for the 2032 Buildout), the traffic is forecasted to operate at an acceptable level. However, Hwy 33 is projected to be over capacity and additional lanes for both the northbound and southbound traffic will be warranted. ITD safety guidelines indicate that a right turn lane for the southbound traffic will be warranted.

TRAFFIC IMPACT ANALYSIS

Behle & Wertheim

Trestles Phase 1, Phase 2, and Wildflower Subdivisions

I. Introduction and Summary

Trestles Phase 1 is a proposed 24-lot subdivision (with an additional 24 ADUs) located in Teton County and half a mile outside of the impact area of the city of Driggs. Trestles Phase 2 is a proposed 42-lot subdivision (with an additional 42 ADUs) located directly north of Trestles Phase 1. Wildflower is a proposed 25-lot subdivision (with an additional 25 ADUs) located directly west of Trestles Phase 1 and southwest of Trestles Phase 2. The Teton County Planning & Zoning Commission approved the Concept Plan for the subdivision and the Preliminary Plat submittal is currently being presented to the Teton County Planning & Zoning Commission for consideration; Civilize, PLLC has been retained by Behle & Wertheim to prepare a Traffic Impact Study for the Trestles project in accordance with the requirements of Teton County.

A. Project Identification

The following table lists important project identification information and contact information for the project.

Project Name	Victor Hotel and Workforce Housing
Owner	Behle & Wertheim
Owner Contact Person	Curt Behle / Karin Wertheim
Owner Address	436 Forest View Dr. Driggs, ID 83422 10 N. Main Street Driggs, ID 83422
Owner Telephone Number	(858) 361-0888 / (208) 201-5151
Owner Email	curtbehle@gmail.com tetonrealestate@gmail.com
Engineer	Civilize, PLLC
Engineer Contact Person	Brent E. “Husk” Crowther, P.E.
Engineer Address	3853 W. Mountain View Dr. Rexburg, ID 83440
Engineer Project Number	01-20-0030
Engineer Telephone Number	208-351-2824
Engineer Email	bcrowther@civilize.design

B. Location

Trestles Phase 1 is a proposed subdivision located in Teton County. More particularly, the development is situated near the northeast corner of the intersection of Hwy 33 and W 2000 S in Teton County, Idaho. The parent parcels are 40.3 acres and 40.17 acres for a total of 80.47 acres and are zoned agriculture/rural residential 2.5. The proposed access is an approach on W 2000 S approximately 1/3 mile east of the intersection of Hwy 33 and W 2000 S. Figure 1 shows the location of the proposed development.

Trestles Phase 2 is a proposed subdivision located in Teton County. More particularly, the development is situated directly north of Trestles Phase 1 in Teton County, Idaho. The parent parcels are 56.36 acres and 80 acres for a total of 136.36 acres and are zoned agriculture/rural residential 2.5. The proposed access is located at the connecting edge between Phase 1 and 2 approximately 1/3 mile east of Hwy33 and ½ mile north of W 2000 S. Figure 1 shows the location of the proposed development.

Wildflower is a proposed subdivision located in Teton County. More particularly, the development is situated on the northeast corner of the intersection of Hwy33 and W 2000 S in Teton County, Idaho and directly west of Trestles Phase 1. The parent parcels are 30.32 acres and 34.53 acres for a total of 64.85 acres and are zoned agriculture/rural residential 2.5. The proposed access is an approach on W 2000 S approximately 600 feet east of the intersection of Hwy 33 and W 2000 S. Figure 1 shows the location of the proposed development.

The TIS is conducted in accordance with the guidelines for a traffic impact study as published by the Idaho Transportation Department (ITD) in the document titled, *Requirements for Transportation Impact Studies* as well as the guidance document titled *Transportation Impact Analyses for Site Development* published by the Institute of Transportation Engineers (ITE).

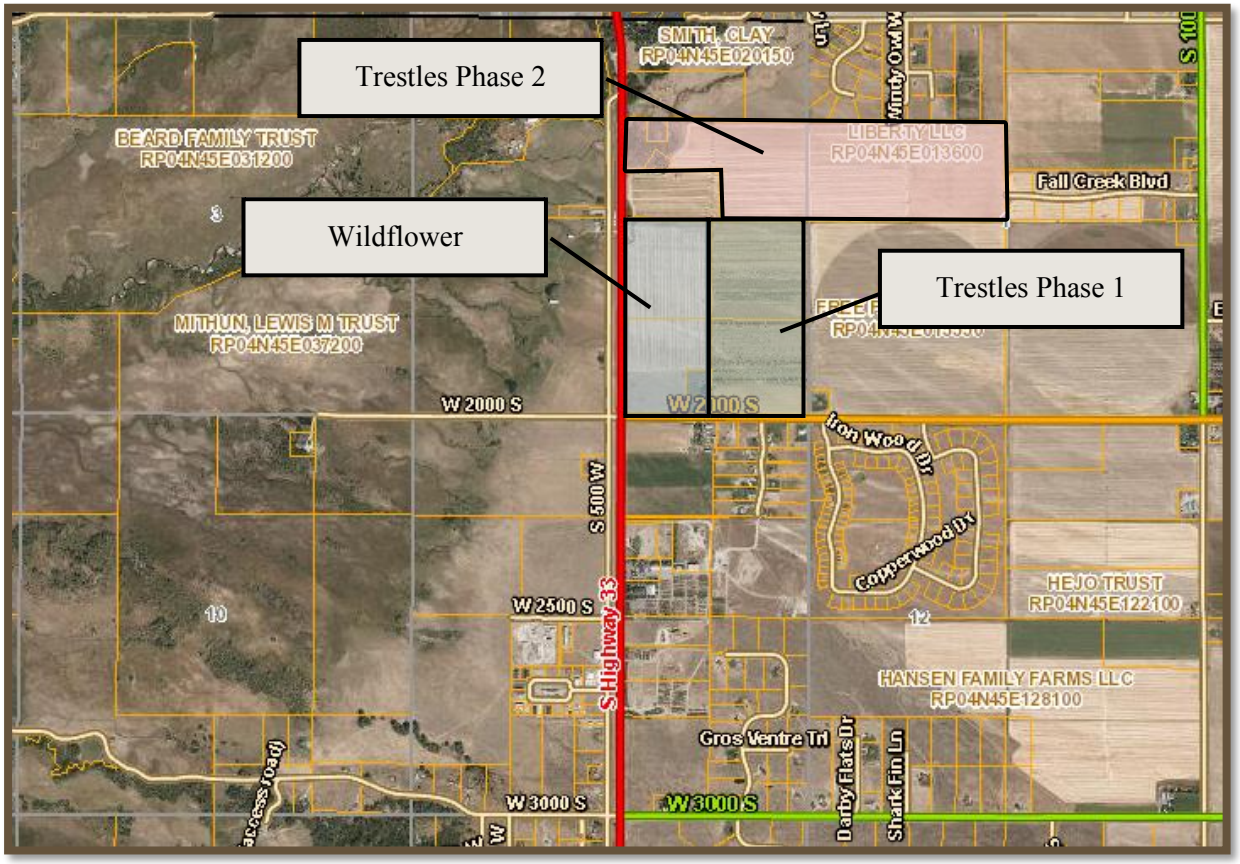

Figure 2: Location Map

C. Applicable Regulations

The Teton County Code, Title 9 Subdivision Regulations, Chapter 3 Procedure for Approval, Section 2 Subdivision or Planned Unit Development, Paragraph C Preliminary Plat Phase, Paragraph 3 Regulations That May Apply, Item d Traffic Impact Study states:

Due to the impact that a subdivision or PUD may have on traffic levels, congestion levels, and levels of service on roads, the applicant for a proposed subdivision containing more than ten (10) lots or a proposed PUD containing more than ten (10) lots or dwelling units shall traffic impact study prepared by a professional engineer. A TIS may also be required if the Planning Administrator, the Commission, or the Board think that the condition of one or more of the roads that would provide access between the proposed development and the nearest State Highway is so poor that traffic from ten (10) or fewer lots or dwelling units could create public safety risks or interfere with the efficient flow of traffic. Each required traffic impact study shall meet the following standards: (amd. 11-14-08)

The existing access for the property is an unimproved approach from W 2000 S located approximately ½ mile east of the intersection of Hwy. 33 and W 2000 S. The proposed access for the Trestles Phase 1 development is also from W 2000 S and located approximately 1/3 mile east of the intersection of Hwy. 33

and W 2000 S, and the proposed access for the Wildflower development is located 600 feet from the same intersection.

The internal road network for all three developments is planned for private roads given the current policy of Teton County not to accept new subdivision roads as county roads. The proposed developments utilize W 2000 South for immediate ingress or egress.

D. Purpose of Report and Study Objectives

The purpose of the Traffic Impact Study (TIS) is to evaluate the traffic impacts resulting from the proposed developments and to make recommendations for mitigation to the impacts if such prove necessary. The scope of the study includes the following:

- Characterization of the proposed developments in terms of land use and the type of development anticipated,
- Trip generation of the proposed developments, both daily and peak hour,
- Site traffic distribution and traffic assignment,
- Research and presentation of background traffic volumes, both daily and peak hour,
- Internal and off-site roadway traffic projections,
- Capacity analysis of existing and proposed intersections and approaches for existing conditions and three horizon years; project opening (existing background traffic), project buildout, and a 20-year planning horizon, and includes analysis of the following intersections:

    1. Segment 1: Hwy 33
    2. Segment 2: W 2000 S
    3. Intersection 1: Hwy 33 and W 2000 S (Existing)
    4. Intersection 2: W 2000 S and S 1000 E (Existing)
    5. Intersection 3: Wildflower Road and W 2000 S (New)
    6. Intersection 4: Trestles Road and W 2000 S (New)

- Analysis of turn lane and deceleration lane warrants,
- Development and analysis of traffic mitigation alternatives, and
- Recommendations for traffic mitigation.

II. Proposed Development

A. Off-Site Development

Existing development in the area surrounding the proposed developments consists of rural residential subdivisions and scattered residential structures along with dwindling agricultural operations. The semi-rural hamlet of Driggs lies approximately one-mile North of the development and there are some residential lots, including the 13-lot Mountain Meadow Ranches, some with homes, across W 2000 S from the development and Iron Wood PUD phases I and II consisting of 115 total lots located just east of Mountain Meadow Ranches. Figure 2 presents the location of Trestles Estates with respect to existing development.

Teton County has prepared a Transportaion Planning Study that may be referenced throughout the document along with information gleaned from the Hwy. 33 Corridor Study commissioned by the Idaho Transportation.

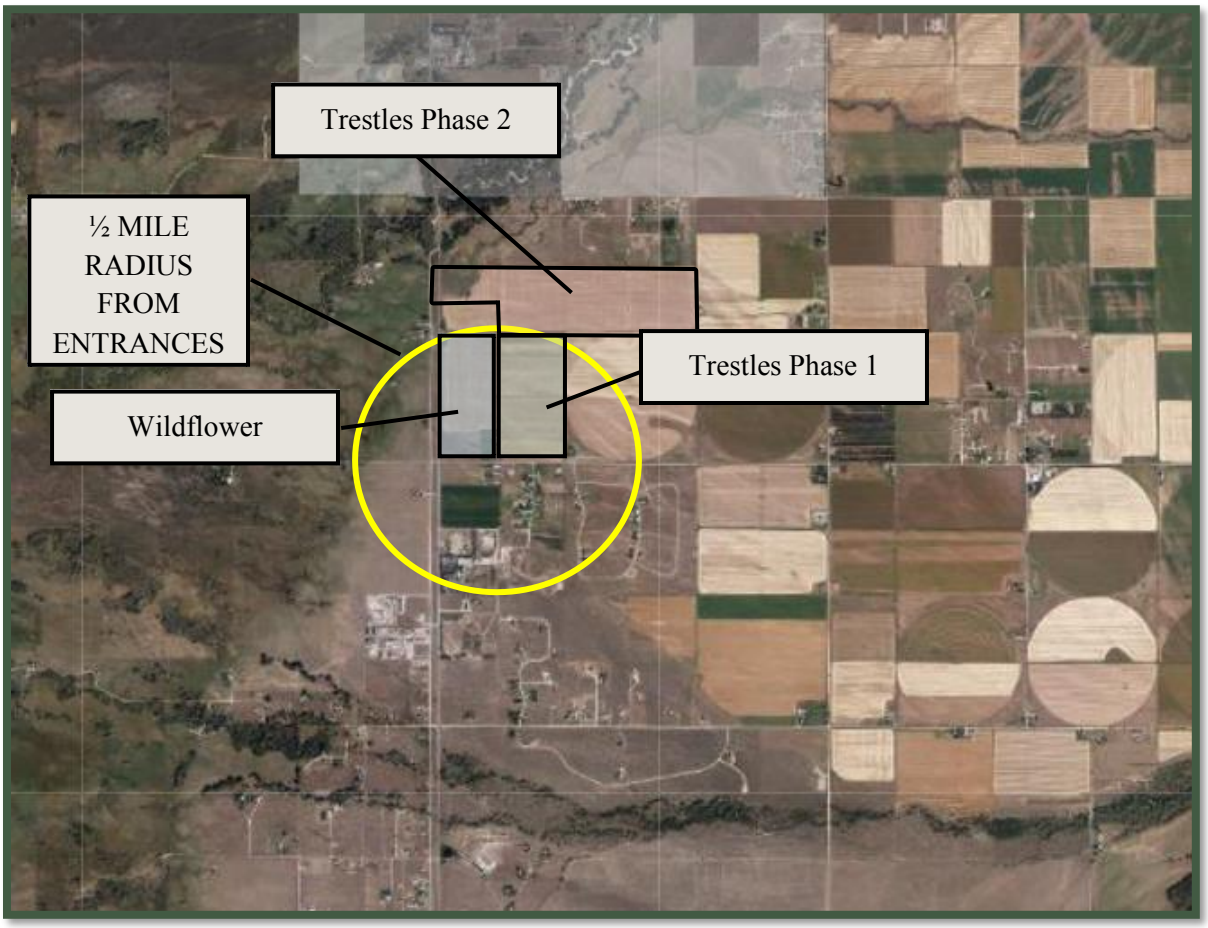

Figure 3 - Development in the Vicinity of the Proposed Project.

B. Description of On-Site Development

1. Description

The development plans call for 24 single family residences and 24 ADUs in Trestles Phase 1, 38 single family residences and 38 ADUs in Trestles Phase 2, and 22 single family residences and 22 ADUs in Wildflower. The Traffic Impact Study (TIS) will be based on this type of development.

2. Location

As presented previously, Trestles Phase 1 lots are 40.3 acres and 40.17 acres for a total of 80.47 acres Trestles Phase 2 lots are 56.36 acres and 80 acres for a total of 136.36 acres and Wildflower lots are 30.32 acres and 34.53 acres for a total of 64.85 acres. These are located near the northeast corner of the intersection of Hwy. 33 and W 2000 S as can be seen in Figure 1 and Figure 2. With respect to the public land survey system, the Trestles Phase 1 property is located in the East ½ of the Southeast ¼ of Section 2, Township 4 North, Range 45 East, B.M. Trestles Phase 2 property is located in the South ½ of the Northeast ¼ of Section 2 and the South ½ of the Northwest ¼ of section 1, Township 4 North, Range 45 East, B.M. Wildflower property is located in the West ½ of the Southeast ¼ of Section 2, Township 4 North, Range 45 East, B.M. These locations are illustrated below in Figure 3.

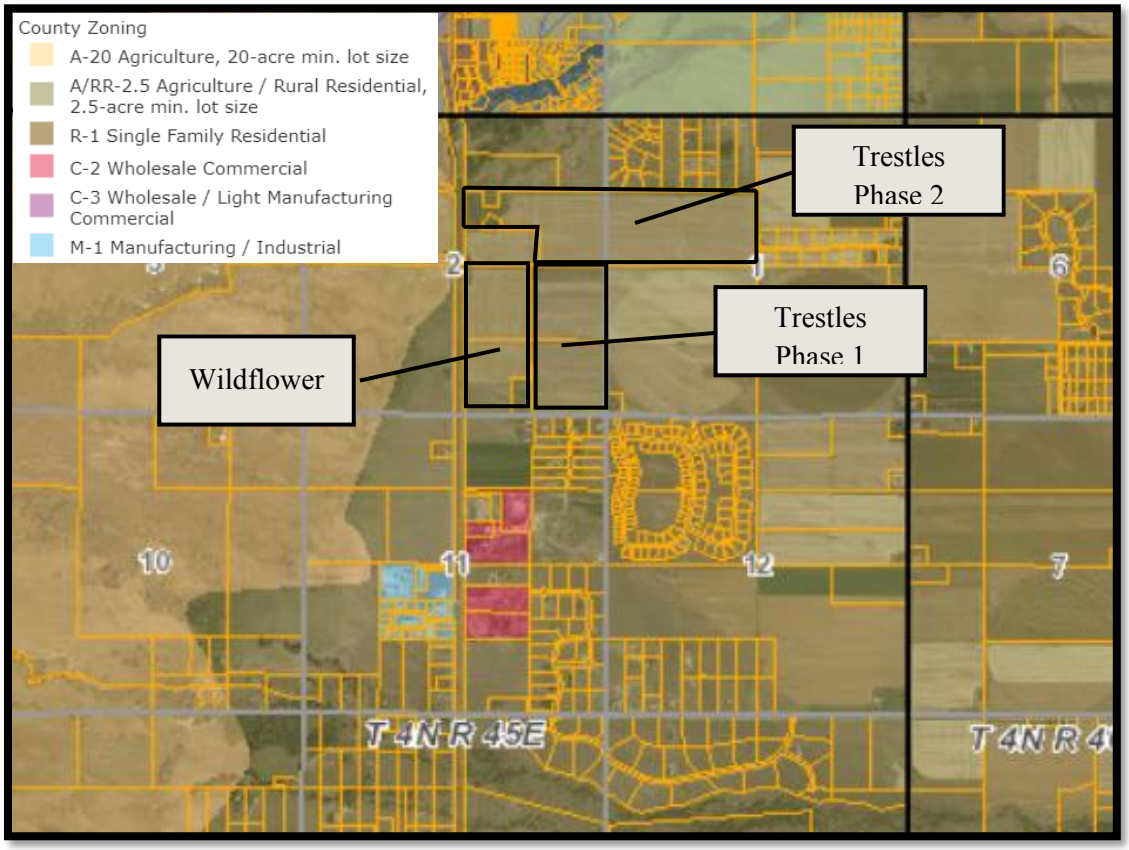

Figure 4 - Zoning Map for the City of Driggs, Idaho.

3. Zoning

Currently, the Teton County lists the property as A/RR 2.5, which is designated for agriculture and for one and two-family structures on parcels with a minimum size of 2.5 acres. Trestles Estates does not propose altering the zoning.

Quoting from the *Teton County Zoning Ordinance, Title 8*, adopted on September 09, 2013, the purpose and intent of the A/RR 2.5 zone is:

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1. Purpose: The purpose of this district is to designate and provide opportunity for development of residential land use on marginal agricultural land.

2. Intent: The intent of this district is to be used where small increment agriculture or rural residential activities are the primary use of the land.

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4. Site Plan

The master plan has been prepared and presented to Teton County. That plan is presented in Figure 5 and a larger version presented in Appendix A – Proposed Site Plan. Although the site configuration may change slightly in the future, the Site Master Plan represents the best information regarding anticipated future development for land use and will be the basis of traffic projections generated by the proposed development.

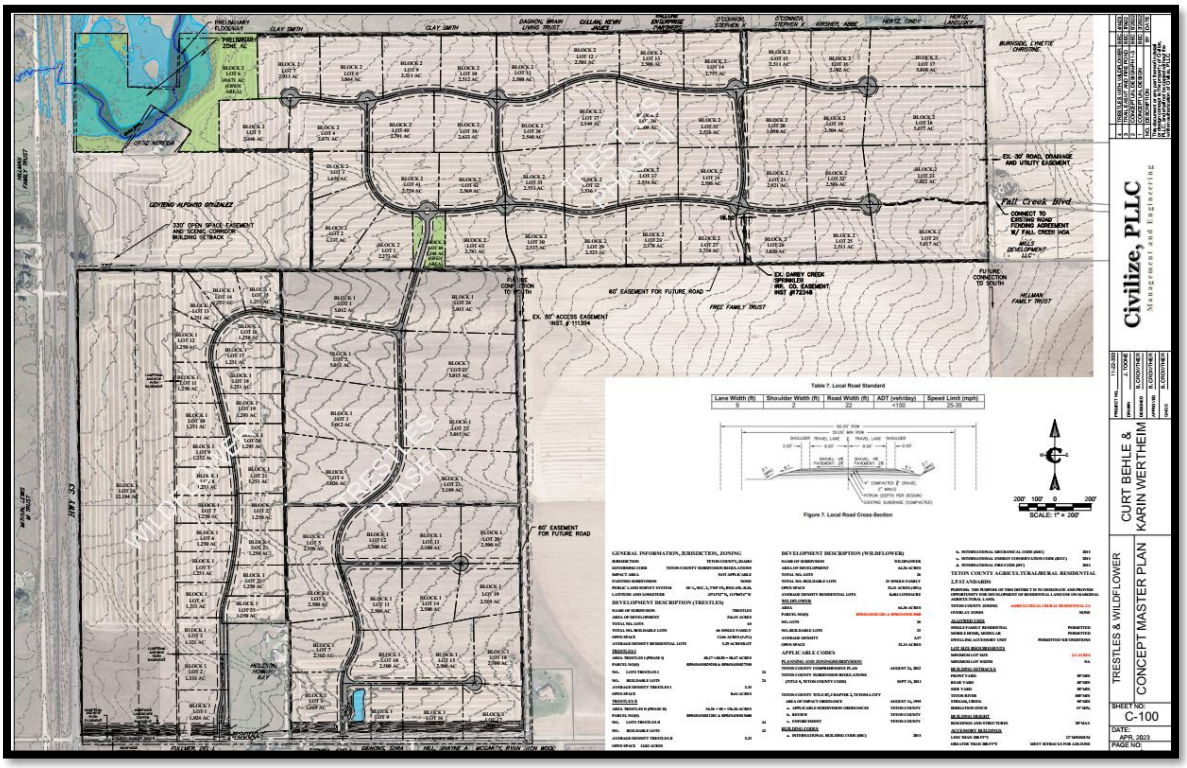


Figure 5 - Proposed Site Plan

5. Land Use and Intensity

The proposed Trestles Phase 1 development is 80.47 acres, Phase 2 is 136.36 acres, and Wildflower is 64.85 acres. The developments as proposed consist of 24, 38, and 22 single-family residences respectively. While future development may occur in the area of the proposed project, that development is not currently defined and will not be considered in the traffic modeling, rather that responsibility will be relegated to future developers.

Table 3 - Land Use and Intensity

Name.	Development Use	% of Total	Acres
Trestles Phase 1.	Single-Family Residences and ADUs	100%	80.47
Trestles Phase 2	Single-Family Residences and ADUs	100%	136.36
Wildflower	Single-Family Residences and ADUs	100%	64.85
	Totals	**100%**	**281.68**

6. Phasing and Timing

a. Existing Conditions

Existing conditions for the subject properties are described as rural residential with traffic associated with residents traveling to and from work and typical local destinations for school and shopping, along with agricultural land use with seasonal traffic generated for farming activity which will be considered negligible with respect to existing traffic conditions. The existing conditions for Hwy 33 will be ascertained from traffic counts conducted by ITD as well as Teton County.

The existing conditions generate a baseline level of traffic and create the traffic conditions as they currently exist.

b. Buildout Conditions

The initial buildout of the projects will entail all 24 lots of Trestles Phase 1, 42 lots of Trestles Phase II, and all 25 lots of Wildflower to be constructed with single-family homes. For the purpose of the TIS, this is assumed to occur in 2032.

c. Horizon Year 2052

Longer term traffic conditions will be projected to year 2052. The proposed developments will remain as described for buildout. Hwy 33 traffic conditions will be extrapolated from the planning documents developed by ITD and Teton County. As mentioned earlier, this TIS will not consider additional traffic that may be generated from unknown development west of the proposed project.

III. Study Approach

The scope of this TIS is based on ITD's *Requirements for Transportation Impact Studies* (Supplement to Board Policy B-12-06) as well as the guidance document titled *Transportation Impact Analyses for Site Development* published by the Institute of Transportation Engineers (ITE). The specific parameters and requirements for the TIS were also based on verbal consultation with the Traffic Engineer for ITD District VI in Rigby, Idaho.

A. Study Period

The following study periods were identified for analysis:

1. 2022 (Existing)
2. 2032 (Project Buildout)
3. 2052 (Horizon year)

The following time intervals were identified for analysis:

1. Weekend AM peak hour.
2. Weekend PM peak hour

B. Study Methodology, Limitations and Assumptions

The following methodology, limitations and assumptions were used for this analysis:

- The Traffic Impact Study includes two (2) road segments and four (4) intersections:
  - Segment 1: Hwy 33, 2022 Horizon Year, as well as the 2032 and 2052 Horizon Year
  - Segment 2: W 2000 S, 2022 Horizon Year, as well as the 2032 and 2052 Horizon Year
  - Intersection 1: Hwy 33/W 2000 S, a four-leg intersection for the 2022 Horizon Year, as well as the 2032 and 2052 Horizon Year.
  - Intersection 2: W 2000 S/S 1000 East, a four-leg intersection for the 2022 Horizon Year, as well as the 2032 and 2052 Horizon Year.
  - Intersection 3: W 2000 S/Wildflower Road, a three-leg intersection for the 2032 and 2052 Horizon Years.
  - Intersection 4: W 2000 S/Trestles Road, a three-leg intersection for the 2032 and 2052 Horizon Years.
- No other segments or intersections were included in the TIS. ITD or Teton County may require analysis of additional segments or intersections which will require an amendment to this TIS.
- A separate phasing analysis may be required by ITD or Teton County to identify when mitigation improvements are triggered. Phasing analysis in addition to the study periods identified above is not included in this TIS and will be conducted in a separate study if required.

- The Transportation Research Board's *2016 Highway Capacity Manual (2016 HCM)* methodologies were utilized to determine the level of service (LOS) for signalized and unsignalized intersections. LOS ratings are based on the average control delay per vehicle and a volume to capacity ratio (v/c). Synchro 11 was used for signalized, stop-controlled, and roundabout analysis.
- Right-hand turn and left-hand turn warrant analysis followed the guidance found in ITD's *Traffic Manual: Idaho's Supplementary Guide to the MUTCD*, which references *NCHRP Report 745 – Left-Turn Accommodations at Unsignalized Intersections*. In addition, the *NCHRP 457 – Evaluating Intersection Improvements: An Engineering Study Guide* was utilized for right-turn movements.

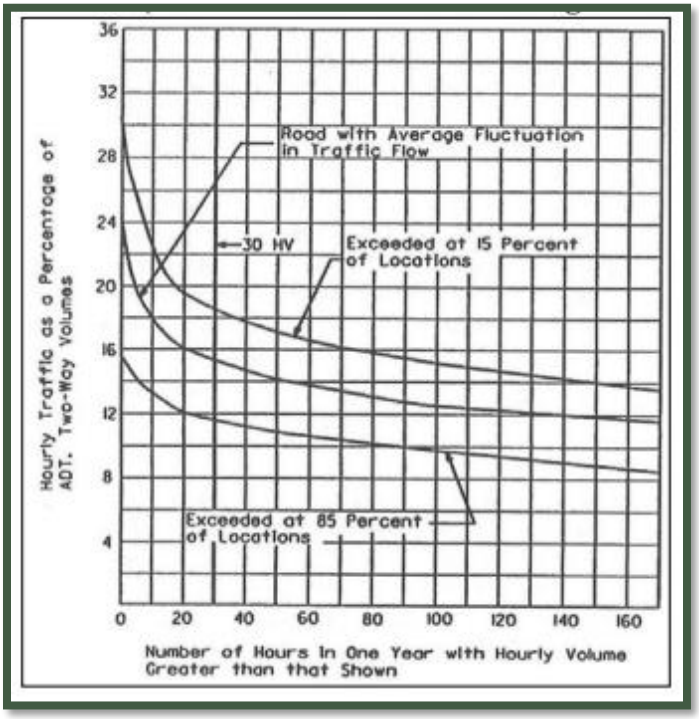


Figure 6 - Relationship of Highest Hourly Volume and ADT on Rural Arterials (The Green Book).

- The traffic volumes were modeled using the Peak Hour Volume (PHV) defined as the highest hourly volume during an average day.
- The Design Hourly Volume (DHV) is typically defined as the 30th highest hourly volume in a design year. The choice of the 30th highest hourly volume is a long-held concept which stems from research published in *A Policy on Geometric Design of Rural Highways* from the American Association of State Highway Officials (AASHO) in 1965 (pages 54-56).
- The data from which FIGURE 5 was developed represent a multitude of rural arterials covering a wide range of volumes and geographic conditions. The horizontal axis of the figure indicates the 170 highest number of traffic hours in a typical year of 8,760 total hours. The vertical axis shows the value of the volume of traffic during these hours as a percentage of the average daily traffic (ADT) at the study locations. The vast amount of data points included in the study are bracketed by trend lines that capture the bulk of the results (70 percent as indicated by the curve labels), as shown by the upper and lower curves in the figure. The middle line represents sites that exhibited an average fluctuation in traffic flow. Visually comparing all of the trend lines together indicates that drastic traffic flow changes occurred near the 30th highest hour of the year, as the steepness of the curves indicates between the 1st highest hourly volume and the 30th. For the remainder of the hours between the 30th and the 170th, there is very little change in the slope of the curves, indicating that designing for that 30th hour would cover the expected traffic volume at almost any given hour in a given day of a given week in a given month of a given year.

IV. Area Conditions

A. Study Area

1. Area of Influence

A one-half mile buffer was placed around the proposed development entrances as the area of influence. The area of influence is presented in Figure 6.

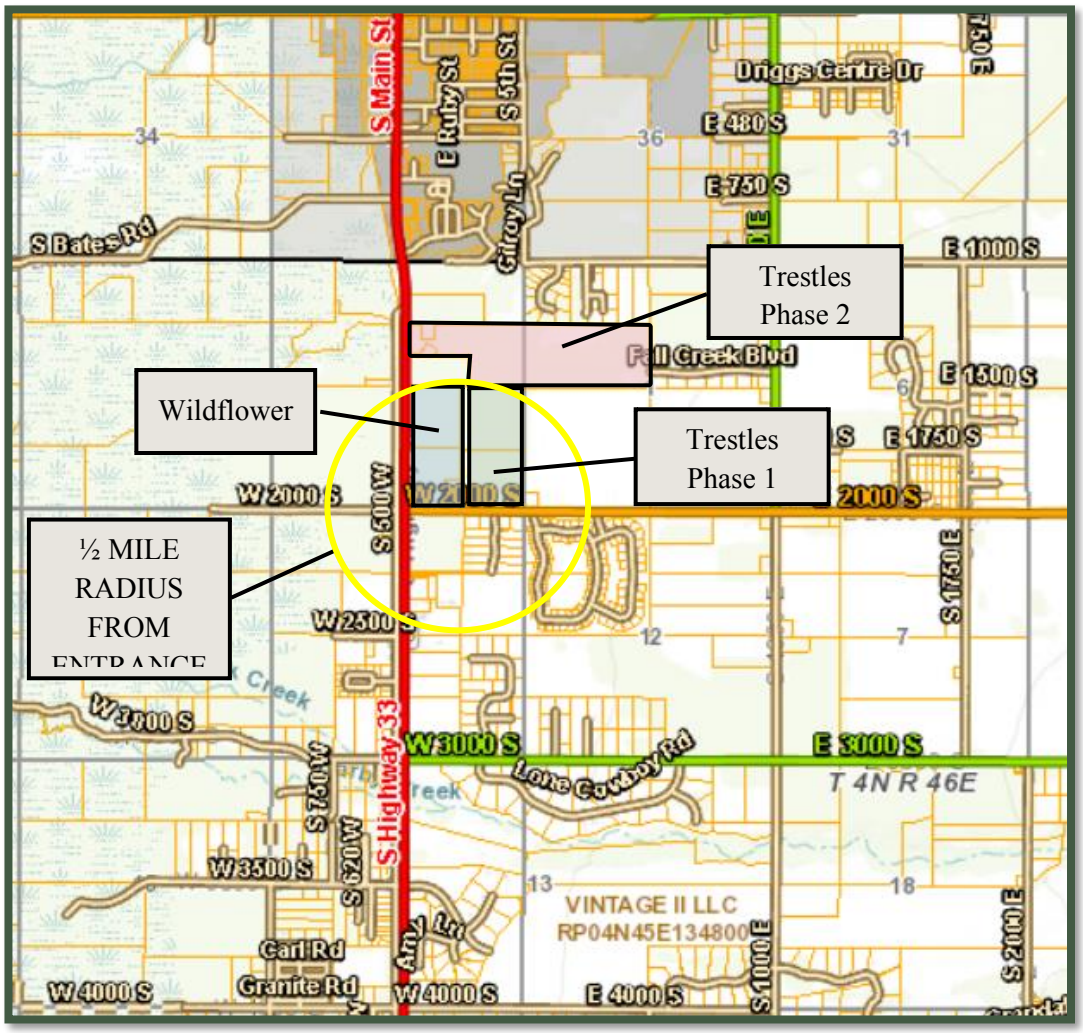


Figure 7 - Area of Influence.

B. Area of Significant Traffic Impact

The area of influence selected for evaluation of traffic impacts is ½ mile surrounding the proposed developments. The area that will be studied includes the intersection at Hwy 33. In addition, because it is the only other intersection of significance along a route the residents of the proposed project may use to

access the development, the intersection on E 2000 South east of the development will also be included in the analysis. The following segments and intersections will be analyzed:

1. Segment 1: Hwy 33
2. Segment 2: W 2000 S
3. Intersection 1: Hwy 33 and W 2000 S (Existing)
4. Intersection 2: W 2000 S and S 1000 E (Existing)
5. Intersection 3: Wildflower Road and W 2000 S (New)
6. Intersection 4: Trestles Road and W 2000 S (New)

C. Study Area Land Use

1. Existing Land Uses

The current land use is agricultural interspersed with scattered rural residential use. The City of Driggs is a small rural community located about one-mile North of the development. The use can be observed in the various figures presented and in viewing the parcels using various commercial mapping platforms available to the public such as Google Earth, Bing Maps, and the Teton County GIS parcel viewer.

2. Existing Zoning

According to the Teton County zoning map, the parcel is zoned Agricultural / Rural Residential with a 2.5-acre minimum lot size (A/RR 2.5), as is all the land surrounding the proposed developments. The use of the land reflects that zone.

3. Anticipated Future Development

While other developments may be planned for the area, those developments are not the responsibility of the developers of this subdivision and this analysis; therefore, focuses on the traffic this development will generate that will utilize the intersections listed. As stated previously, the proposed developments, which are comprised of the 24, 42, and 25 single-family lots that comply with the current zoning, will be included in the analysis. Reference Appendix A for a site plan of the proposed development.

D. Site Accessibility

The Concept Plan for the proposed development presents two approaches from W 2000 S onto private streets and connections between the three developments.

1. Site Access

As found in IDAPA 39.03.42 Rules Governing Highway Right-of-Way Encroachments on State Rights-of-Way, the State of Idaho requires an Encroachment Permit for an entity to perform any work within the State Right-of-Way and any new approach as well as any modification, relocation, or removal of an existing

approach. Depending upon the scope and scale of the proposed development, that application may require the preparation of a Traffic Impact Study (TIS).

IDAPA 39.03.42.200.01 To help preserve the highways as constructed and provide responsible growth where allowed, any individual, business, or other entity planning to add, modify, change use, relocate, maintain, or remove an encroachment on the state highway or use highway right-of-way for any purpose other than normal travel, shall obtain a permit to use state highway right-of-way. Encroachment permits approved by the Department are required for private and public approaches (driveways and streets), utilities and other miscellaneous encroachments.

---

a. Road Network Functional Classification.

For access guidelines, the Road Classification Map published by Teton County and IDAPA 39.03.42 Rules Governing Highway Right-of-Way Encroachments on State Rights-of-Way. (See Appendix C).

(1) Teton County

Teton County labels Hwy 33 as a state highway or a minor arterial and W 2000 S as a major collector as seen in Figure 7.

(2) Idaho Transportation Department

The State of Idaho (ITD) classifies Hwy 33 as a Minor Arterial and W 2000 S as a Major collector road. In the manual Idaho Transportation Department Systems Procedures published in 2016, Chapter 3.0 Functional Classifications, ITD defines a Minor Arterial as thus:

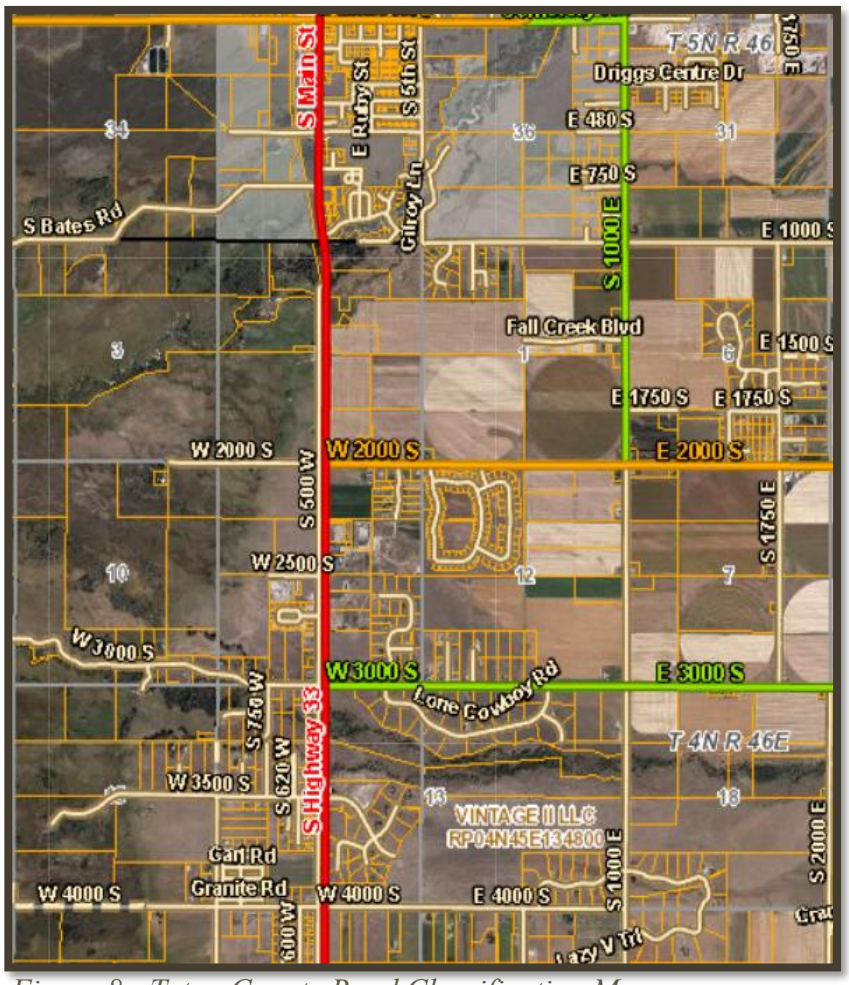


Figure 8 - Teton County Road Classification Map

Minor arterials provide service for trips of moderate length, serve geographic areas that are smaller than their higher arterial counterparts and offer connectivity to the higher arterial system. Through a series of routes, they are expected to provide for relatively high, overall travel speeds with minimum interference to through movement. Minor arterials interconnect and augment the higher arterial system, provide intra-community connectivity and may carry local bus routes. They should be identified and spaced at intervals consistent with population density, so that all developed areas are within a reasonable distance of a higher-level arterial.

The same publication defines a collector road as follows:

Collector streets provide both land access and traffic circulation for residential, commercial, and industrial areas. Their access function is more important than that of arterials, and unlike arterials, their operation is not always dominated by traffic signals. Collectors are broken down into two categories: Major Collectors and Minor Collectors. Collectors generally serve intra-county travel (rather than statewide) and constitute those routes on which (independent of traffic volume) predominant travel distances are shorter than on arterial routes; consequently, more moderate speeds may be posted.

(3) Information Required by ITD for Modifications to an Approach

Modifications of an approach by a permittee shall include a design describing the width, grade, surface type, landscaping, and drainage.

2. Access Management

Access management within a city is intended to facilitate safe and convenient access and circulation for vehicular traffic, pedestrians, and bicycles within a jurisdiction. Access management for the state highway system intended to provide safe transit for regional and interstate traffic. As such, the objectives of access management within a city can sometimes be different than those for a state highway system.

a. Idaho Transportation Department

Access on the State Highway System is defined in *IDAPA Rules 39.03.42 Rules for Governing Highway Right-of-Way Encroachments on State Rights-of-Way* and managed by the Idaho Transportation Department. IDAPA 39.03.42.300 requires an encroachment permit for any new, modified, or relocated approach.

IDAPA 39.03.43.200.01. Required. To help preserve the highways as constructed and provide responsible growth where allowed, any individual, business, or other entity planning to add, modify, relocate, maintain, or remove an encroachment on the State highway or use highway right-of-way for any purpose other than normal travel, shall obtain a permit to use State highway right-of-way. Encroachment permits approved by the Department are required for private and public approaches (driveways and streets), utilities and other miscellaneous encroachments

IDAPA 39.03.42.300 describes the requirement that an applicant must obtain a right-of-way use permit and meet all access requirements that correspond to the state highway being affected for all new or additional approaches.

> *IDAPA 39.03.43.300.01. All new or additional approaches, or the modification in design or use, relocation or removal of existing approaches require an approved State highway right-of-way use permit and shall meet all access control requirements that correspond to the state highway being affected.*

Access to a Major Collector requires a Type I access which excerpting from IDAPA 39.03.42 is described as follows:

> *IDAPA 39.03.42.011.02 Type I (Major Collector). Type I access control is applicable to segments of the State Highway System functionally classified as major collectors. All major collectors shall be upgraded to a minor arterial or higher class once located within an urban area. (3-30-01)*

Access to a Minor Arterial requires a Type II access which excerpting from IDAPA 39.03.42 is described as follows:

> *IDAPA 39.03.42.011.02 Type II (Minor Arterial). Type II access control is applicable to segments of the State Highway System functionally classified as minor arterials and some selected segments classified as major collectors that exhibit characteristics of minor arterials. Public highway connections and new private approaches may be permitted in accordance with Department spacing standards. Joint-use approaches are encouraged. As land uses change, existing approaches should be reviewed to encourage development of frontage roads.*

The access from Trestles Phase 1 and Wildflower to W 2000 S, a Major Collector, will need to conform with a Type I access.

b. Teton County

Access management for Teton County is governed by the publication *Highway & Street Guidelines for Design and Construction in Teton County, Idaho* as amended April 11, 2013. A review of that publication does not reveal any specific requirements for access management.

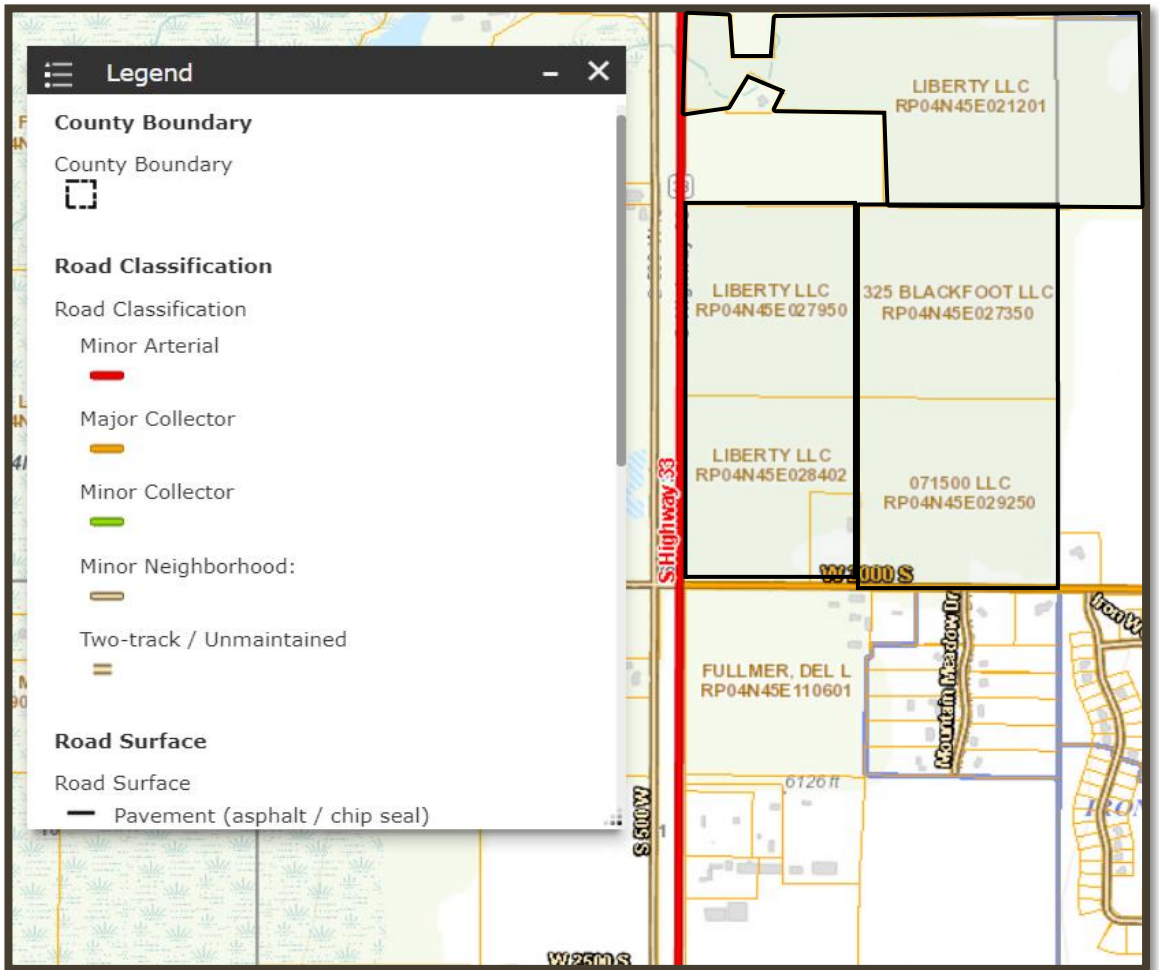


Figure 9: Teton County Road Classification (Teton County GIS, 2021)

3. Location and Design Standards for Approaches

For state highways, ITD has jurisdiction regarding the approval of all approaches including: location, design, construction, and operation of all approaches. When reviewing an application for an approach, ITD follows guidelines such as current and future property access requirements and reduction of conflicts associated with access points including channelization, auxiliary lanes, joint-use approaches, frontage and other local roads, restricted on-street parking and off-street traffic circulation.

a. Access Spacing

According to approach spacing found in IDAPA 39.03.42 Rules Governing Highway Right-of-Way Encroachments on State Rights-of-Way, the minimum recommended spacing for public roads on a Regional Route (Hwy 33) in a transitional area is 1,320 feet (1/4 mile), the driveway distance upstream from a public road intersection is 690 feet, the driveway distance downstream from an unsignalized public road intersection is 360 feet, and the distance between unsignalized accesses other than public roads is 360 feet as shown in Figure 9.

The District Engineer has authority to approve a decrease in the minimum access spacing distances provided the basis for any exception is justified and documented.

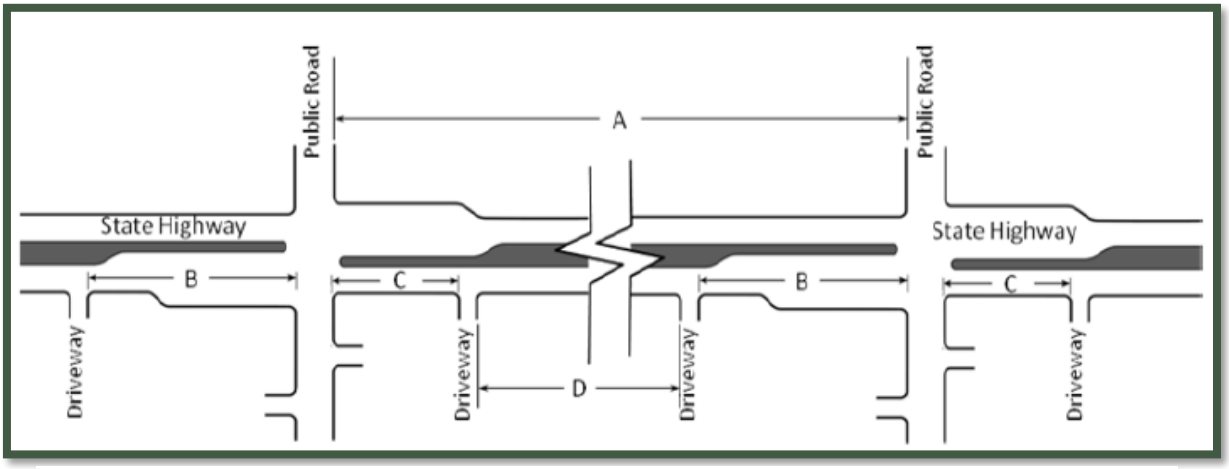


TABLE 1 – ACCESS SPACING*

HIGHWAY TYPE	AREA TYPE	Signalized Road Spacing	Public Road Spacing (A)	Driveway Distance Upstream From Public Road Intersection (B)	Driveway Distance Downstream From Unsignalized Public Road Intersection (C)	Distance Between Unsignalized Accesses Other Than Public Roads (D)
Interstate	All	Accessible only by interchanges (ramps) and requires approval by the Board and Federal Highway Administration.				
Freeway	All	Accessible only by interchanges (ramps).				
Expressway	All	Accessible only at locations specified by the Department.				
Statewide Route	Rural	5,280 ft	5,280 ft	1,000 ft	650 ft	650 ft
	Transitional	5,280 ft	2,640 ft	760 ft	500 ft	500 ft
	Urban >35 mph	2,640 ft	1,320 ft	790 ft	500 ft	500 ft
	Urban ≤35 mph	2,640 ft	1,320 ft	790 ft	250 ft**	250 ft**
Regional Route	Rural	5,280 ft	2,640 ft	1,000 ft	650 ft	650 ft
	Transitional	2,640 ft	1,320 ft	690 ft	360 ft**	360 ft**
	Urban >35 mph	2,640 ft	660 ft	660 ft	360 ft**	360 ft**
	Urban ≤35 mph	2,640 ft	660 ft	660 ft	250 ft**	250 ft**
District Route	Rural	2,640 ft	1,320 ft	760 ft	500 ft	500 ft
	Transitional	2,640 ft	660 ft	660 ft	360 ft**	360 ft**
	Urban >35 mph	1,320 ft	660 ft	660 ft	360 ft**	360 ft**
	Urban ≤35 mph	1,320 ft	660 ft	660 ft	250 ft**	250 ft**

*Distances in table are minimums based on optimal operational and safety conditions such as adequate sight distance and level grade. Definitions of spacing designated by (A), (B), (C), and (D) are represented on Figure 1.

** Where the public road intersection or private access intersection is signalized, the distances in the table are for driveways restricted to right-in/right-out movements only. For unrestricted driveways the minimum distance shall be 500 feet from a signalized intersection.

Figure 10 - Access Configuration and Spacing per IDAPA 39.03.42.

b. Corner Clearance

Approaches should be located as far from corners as practicable to preserve visibility at the intersection.

c. Approach Alignment

Whenever possible, approaches should intersect the state highway at right angles and be aligned with the existing approaches to facilitate safety and the development of turn lanes. The existing alignment of W 2000 South with Hwy. 33 satisfies this criterion.

d. Width and Radius

The minimum and maximum recommended approach widths and radii per IDAPA 39.03.42 are presented in the following table. For a multiple residential approach accessing a roadway with a posted speed >35 mph, the minimum throat width is 28 feet, and the maximum width is 40 feet. The minimum radius is 20 feet, and the maximum radius is 30 feet. The existing alignment of W 2000 South with Hwy. 33 satisfies this criterion.

Table 4 – Minimum and Maximum Approach Widths and Radii per IDAPA 39.03.42.

APPROACH USE	< 35 MPH		≥ 35 MPH		RADII	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Single Residential, Farmyard, Field	12ft	40ft	20ft	40ft	20ft	30ft
Multiple Residential	28ft	40ft	28ft	40ft	20ft	30ft
Commercial (One-Way)	15ft	30ft	20ft	30ft	30ft	40ft
Commercial (Two-Way)	25ft	40ft	25ft	40ft	30ft	40ft
Boulevard Approach	84ft	84ft	84ft	84ft	Contact Department	
Joint-Use Residential/Farm	25ft	40ft	25ft	40ft	20ft	30ft
Joint-Use Commercial	12ft	40ft	20ft	40ft	30ft	40ft
Public Highways	28ft	N/A	28ft	N/A	30ft	50ft

4. Existing Roadway Network

There are two (2) main roadways traversing the area of influence: Hwy 33 situated near the west boundary of the proposed developments and W 2000 South situated on the south boundary of the proposed developments. If we reference the *Teton County Transportation Plan*, we can discern the functional classification of the existing road network and determine some characteristics for the roads in the area of impact for this development.

- Hwy 33 has a speed limit of 55 mph in the area of influence with no bicycle or pedestrian facilities.

- Hwy 33. This roadway serves as a Regional Route with one travel lane in each direction at the intersection of Hwy. 33 and W 2000 S.
- W 2000 South has a speed limit of 45 mph in the area of influence with no bicycle or pedestrian facilities.
- W 2000 South serves as a collector with one travel lane in each direction.

a. Transit Service

TRPTA operates public transit services in the area.

b. Bicycle and Pedestrian Facilities

There are no bicycle or pedestrian facilities on the roads in the vicinity of the development.

c. Future

Other than the roads for the proposed development including the approach onto W 2000 S, there are no known future road improvements in the vicinity.

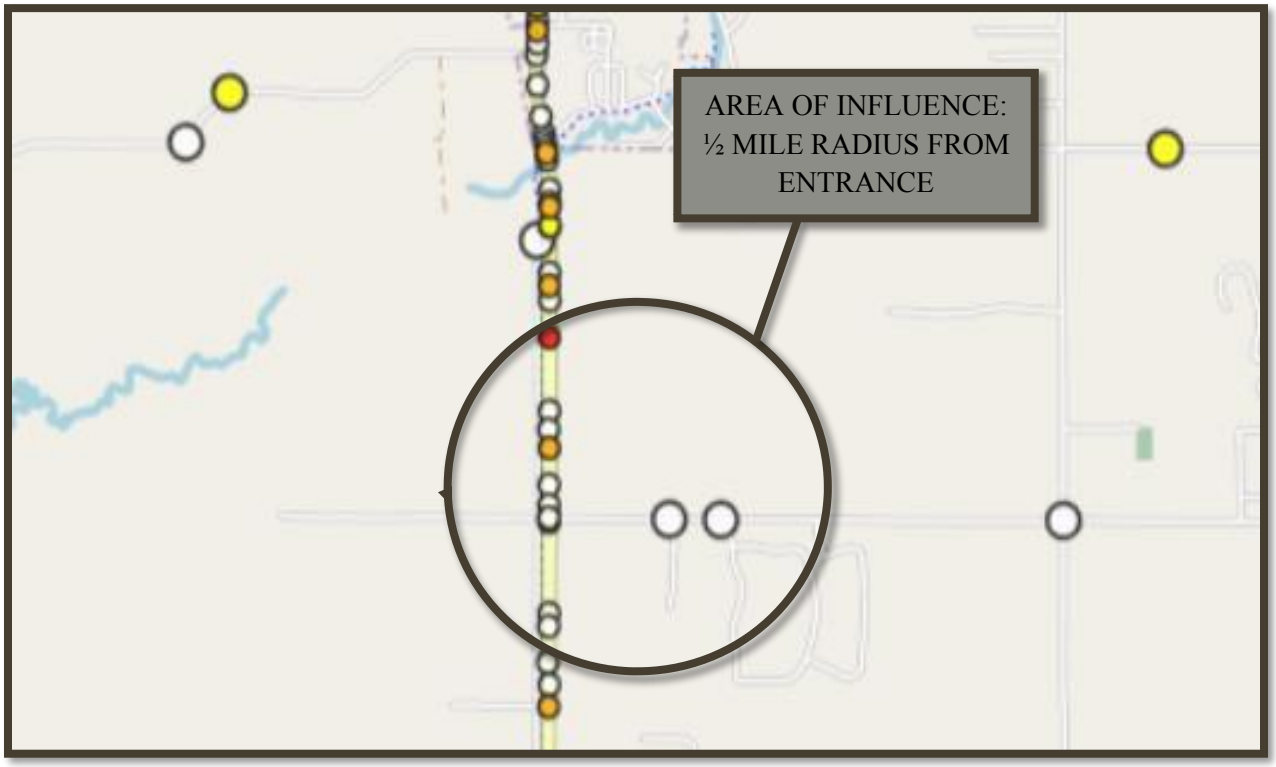


Figure 11 - LHTAC Crash Data 2016-2020

5. Accident History

a. ITD Crash Data

According to the Idaho Local Road Crash Data that was obtained from the Local Highway Technical Assistance Council (LHTAC), between 2016 and 2020 there have been eleven (11) crashes within the area of influence for this study on Hwy. 33, and two (2) on W 2000 S as depicted in Figure 9 (also see Appendix

A summary describing the year, severity, driver action and the event if presented in the following table.

Table 5 - Crash Data for Hwy. 33 from 2016 to 2020 (LHTAC).

Date	Severity	Intersection	Driver Action	Impaired	Most Harmful Event	Events
5/28/2016	Property Dmg Report	Not at intersection	Going Straight	FALSE	Embankment	Embankment,
1/14/2017	Property Dmg Report	Not at intersection	Going Straight	FALSE	Rear-End	Loss of Control, Rear-End,
10/14/2017	Property Dmg Report	Not at intersection	Going Straight	FALSE	Overturn	Loss of Control, Ran Off Road, Overturn,
10/18/2017	Property Dmg Report	Not at intersection	Turning Left	FALSE	Rear-End Turning	
7/27/2018	Property Dmg Report	Not at intersection	Going Straight	FALSE	Fence	Fence,
8/21/2018	Property Dmg Report	Not at intersection	Going Straight	FALSE	Ditch	Ran Off Road, Ditch,
8/28/2018	Property Dmg Report	T-Intersection	Going Straight	FALSE	Rear-End	Rear-End,
11/13/2018	C Injury Accident	Four-way Intersection	Turning Left	FALSE	Angle Turning	Angle Turning,
4/24/2019	C Injury Accident	Not at intersection	Slowing in Traffic	FALSE	Rear-End	
10/15/2019	Property Dmg Report	Not at intersection	Starting in Traffic	FALSE	Rear-End	Rear-End,
8/30/2020	Property Dmg Report	Not at intersection	Going Straight	FALSE	Animal - Domestic	Animal - Domestic,
8/28/2020	Property Dmg Report	Not at intersection	Going Straight	FALSE	Animal - Domestic	Animal - Domestic,

There were no reported fatalities at the study area intersections between 2016 and 2020. Existing crash rates for the study area intersections are below the base rate for a similar intersection type in Idaho

V. Existing 2022 Traffic Volumes and Conditions

A. Traffic Forecasting

There are diverse ways to forecast future traffic flow and patterns. A common forecasting method is to take the historic population and forecast the traffic from those values. However, in this situation, recreation and tourism is a major factor, therefore using traffic data trends from ITD traffic counts will provide more satisfactory results from which to draw conclusions and make recommendations for mitigation. This study will use traffic data obtained from the ITD to determine traffic conditions for the 2022 (existing), 2032 (Project buildout), and the 2052 (Future) horizon years.

B. Roadway Network

Within the area of influence there will be two (2) roadway segments and four (4) intersections examined. The segments and the intersections that will be analyzed are:

1. Segment 1: Hwy 33
2. Segment 2: W 2000 S
3. Intersection 1: Hwy 33 and W 2000 S (Existing)
4. Intersection 2: W 2000 S and S 1000 E (Existing)
5. Intersection 3: Wildflower Road and W 2000 S (New)
6. Intersection 4: Trestles Road and W 2000 S (New)

C. Existing Segment Traffic Volumes

This section discusses the ADT, the peak hour flows, and the trip distribution for the existing traffic.

1. Segment 1: Hwy 33

a. Average Daily Traffic (ADT) and Monthly Average Daily Traffic (MADT)

As a recreational destination, the traffic volumes fluctuate throughout the year with the summer months exhibiting the highest ADT. The ITD website for Road Data features an interactive map that allows a query by road milepost for Average Annual Daily Traffic (AADT), which is the total volume of traffic on a road for a year divided by the number of days (365) in a year. ITD reports the following AADT values at the mileposts bracketing the intersection of W 2000 South.

- Milepost 143: Just north of the Hwy 33/W 2000 South intersection the AADT is 8,000.
- Milepost 144: Just south of the Hwy. 33/W 2000 South intersection the AADT is 10,000.

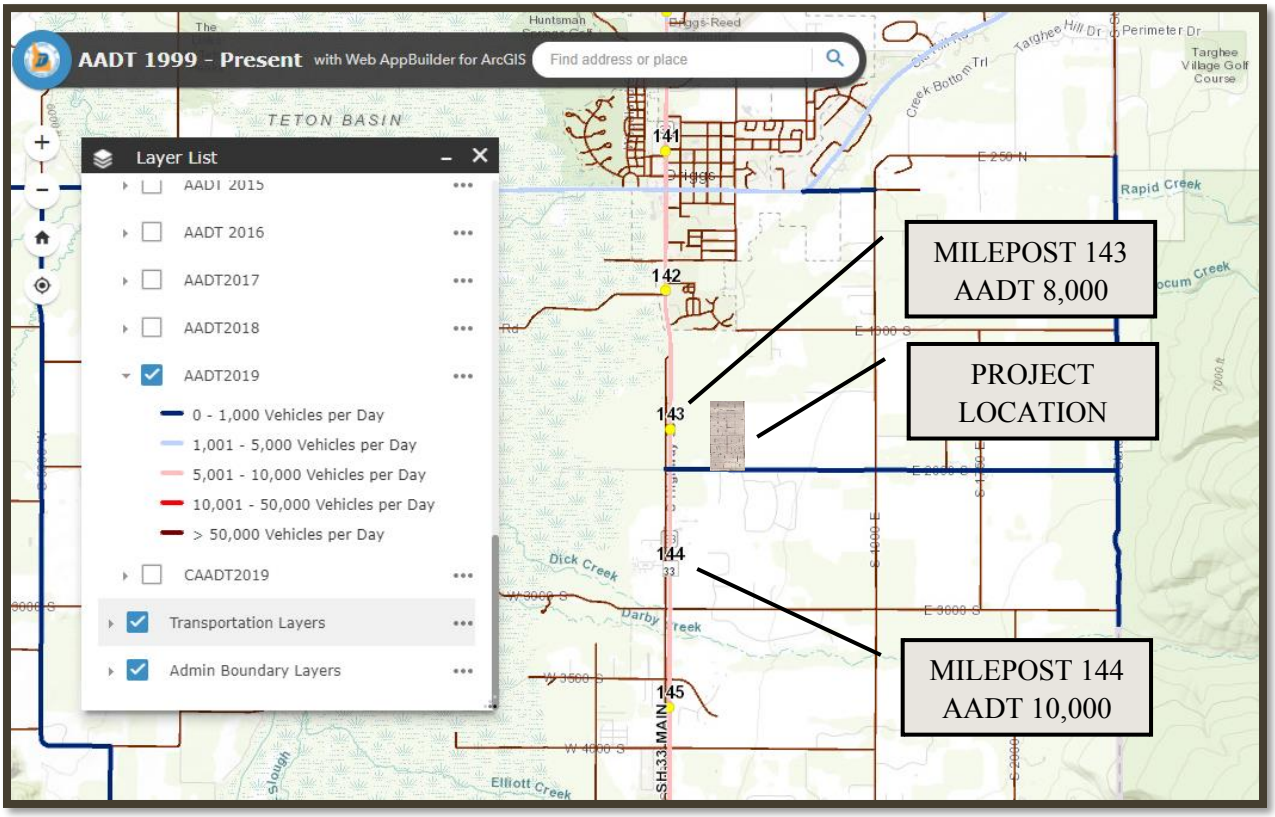


Figure 12: Map for Annual Average Daily Traffic (AADT) by Milepost per ITD for 2019

Therefore, the relevant traffic count for 2019 is estimated at 10,000 annual average daily traffic (AADT) with 9,200 (92.0%) classified as passenger vehicles and 800 classified as other than passenger vehicles (8.0%).

However, these values are annual averages rather than peak days that reflect summertime travel. ITD maintains Automatic Traffic Recorders (ATRs) throughout the state including District 6, four of which are in the Teton Basin. The ATR most relevant to this project is ATR #239 located at Hatch's Corner, which is located between 2000 South and 3000 South. The monthly AADT for ATR #239 in 2021 ranged from a low in January of 8,297 to a high in July of 13,527. This study will focus on the July MADT or peak season and not the ADT. (See Appendix E)

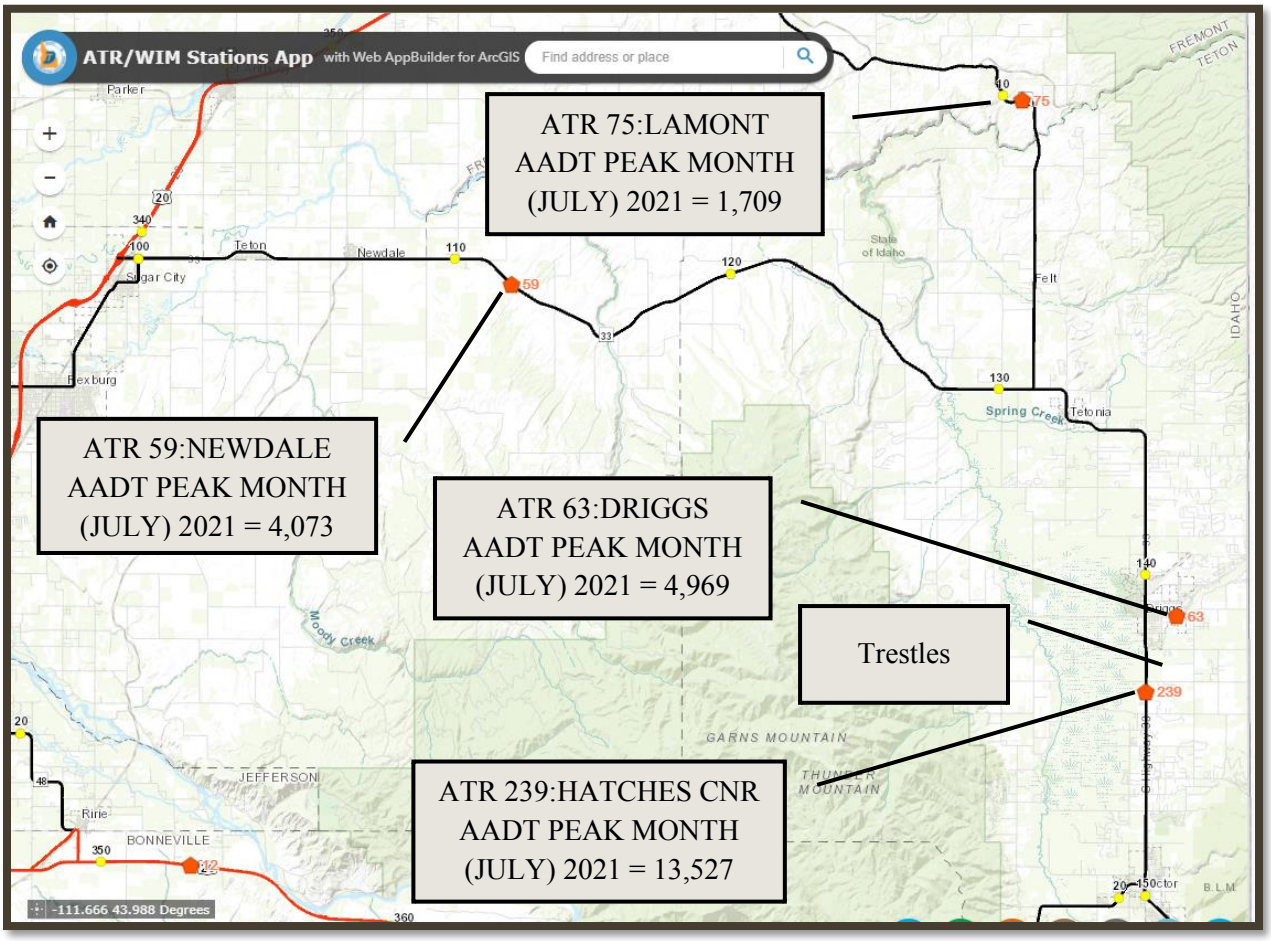


Figure 13 - ITD District 6 Automatic Traffic Recorder (ATR) Locations near Project.

Based on the AADT at Hatch's Corner, the traffic for that segment of Hwy. 33 reflects an increase of 4.83% 2012 to 2021 with 2012 being the first full year of traffic counts for ATR #239. The last five years the increase in traffic has been less at 2.47%. The shorter-term trend will be used for future traffic projections. The annual average daily traffic counts for ATR #239, Hatch's Corner, for 2012 through 2021, with December of 2021 estimated, are presented in Figure 13 along with the Average Monthly Daily Traffic for that same time period. Additional data can be found in Appendices D and E.

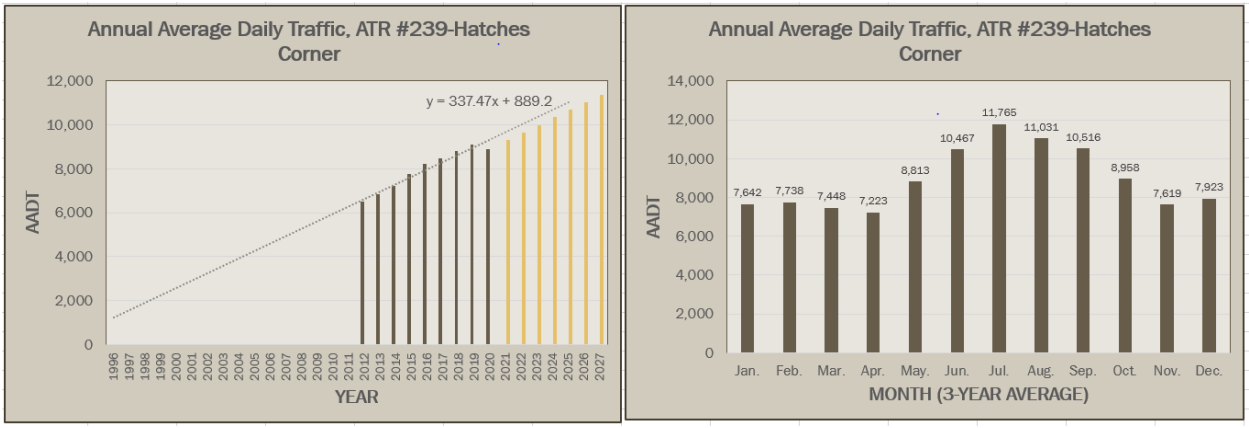


Figure 14: Annual Average Day Traffic Trends for ATR #239.

The first step is to use the data collected by ITD in 2021 and extract the MADT for the peak month of July for Hwy 33. From the ITD Monthly Traffic Volume Report for July 2021 (see Appendix E), it can be determined that the MADT for AR #239 is 13,527 vpd. Furthermore, the maximum month average peak hour of the day was determined to be between 5:00 pm and 6:00 pm with a monthly average hourly volume of 1,047 vph with a directional split of 580 vph southbound and 467 vph northbound (54% southbound and 46% northbound).

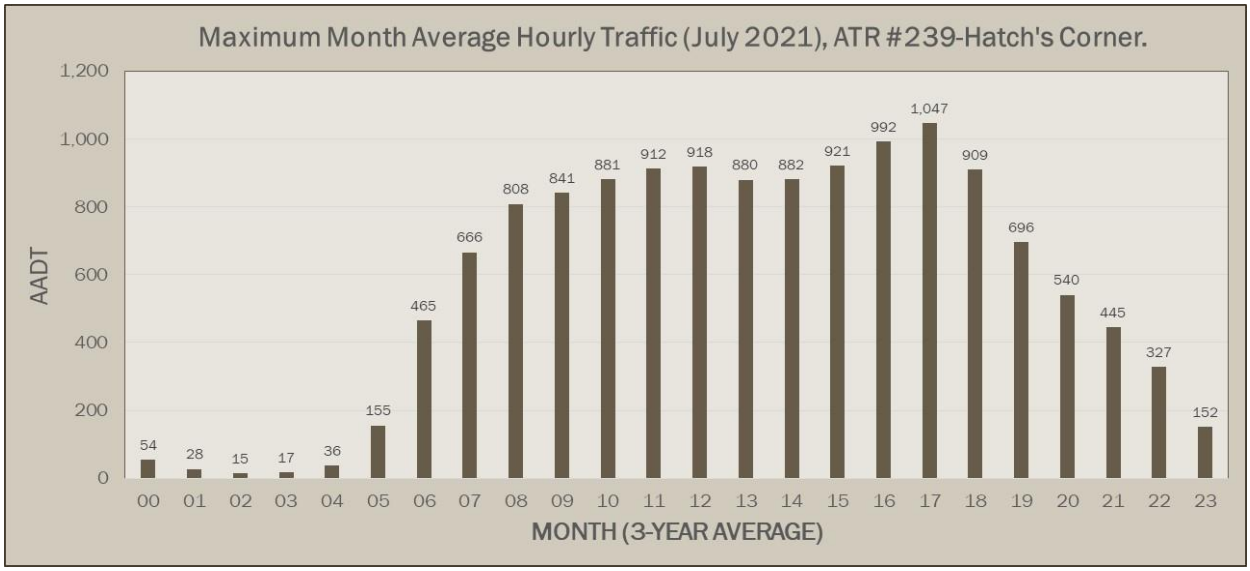


Figure 15: Maximum Month Average Hourly Traffic, ATR #59-Newdale.

The MMADT and the MMAPH traffic volumes for Hwy. 33 near the intersection of W 2000 South are summarized in the following table.

Table 6 - Existing Segment MADT, Peak Hour, and Trip Distribution Traffic Volumes

Parameter	Units	Year	Traffic Volume	Southbound	Northbound
Max. Month ADT (MADT)	VPD	2022	13,527	6,806	6,803
Max. Month Peak Hour Ave. (PH)	VPH	2022	1,047	580	467

2. Segment 2: 2000 S

The ADT and MADT for W 2000 South were not available, therefore, visual counts were performed and are identified in the following section. In summary, the visual counts show that there are 43 vph eastbound and 19 vph westbound during the PM peak.

D. Existing 2022 PM Peak Intersection Traffic Volumes

1. Intersection 1: Hwy 33/2000 S Existing 2022 PM Peak Hour Flow Turning Movements

Intersection 1, Hwy. 33/2000 S is a major four-way intersection. Visual counts of traffic and turning movements were taken on Tuesday, January 10, 2022, during the PM Peak hour. These counts can be seen in the following figure and used later in this chapter. They will be used as the base counts for this analysis from Trestles.

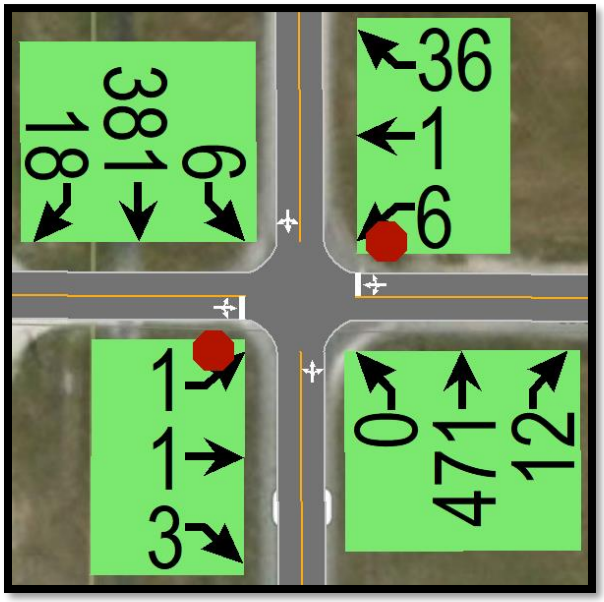


Figure 16: Hwy 33/2000 S Existing 2022 PM Peak Hour Traffic Volume

2. Intersection 2: 2000 S/1000 E Existing 2022 PM Peak Hour Turning Movements

Visual counts of traffic and turning movements were taken on Tuesday, January 10, 2022, during the PM Peak hour. These counts can be seen in the following figure and used later in this chapter. They will be used as the base counts for this analysis from Trestles.

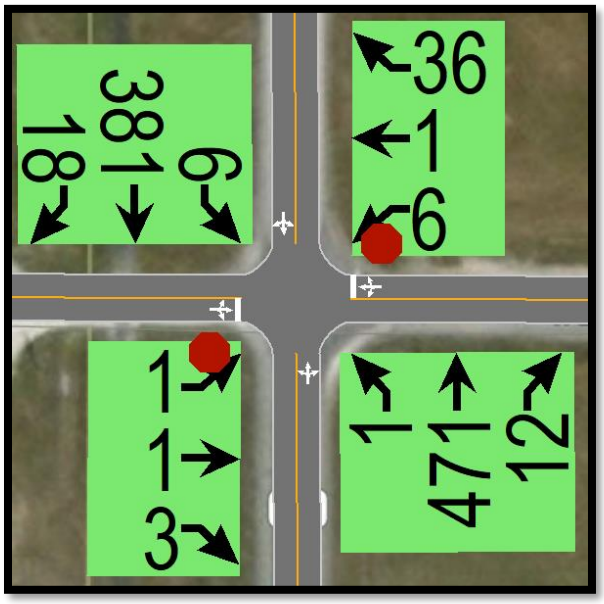


Figure 17: 2000 S/1000 E Existing 2022 PM Peak Hour Traffic Volume

E. Existing 2022 PM Peak Traffic Conditions

1. Existing Segment 2022 PM Peak Analysis

At the time of this study, the free flow speed (FFS) was not available for the specific road segment being analyzed. Therefore, in order to determine the LOS for the road segment through this area, the volume to capacity ratio (v/c ratio) will be used. In order to determine the v/c ratio, we divide the volume of the roadway by the capacity. According to the Highway Capacity Manual, the capacity of a two-lane highway is 1,700 vehicles per hour for each direction of travel. By dividing the peak hour by the peak hour capacity, we get a v/c ratio. The following table shows the correlation between the v/c ratio and the LOS.

Table 7 Level of Service Criteria for General Two-Lane Highway Segments

Level of Service Criteria for General Two-Lane Highway Segments

		V/C Ratio[a]																		
		Level Terrain							Rolling Terrain							Mountainous Terrain						
			% No-Passing Zone							% No-Passing Zone							% No-Passing Zone					
LOS	% Time Delay	Avg.[b] Speed	0	20	40	60	80	100	Avg.[b] Speed	0	20	40	60	80	100	Avg.[b] Speed	0	20	40	60	80	100
A	≤ 30	≥ 58	0.15	0.12	0.09	0.07	0.05	0.04	≥ 57	0.15	0.10	0.07	0.05	0.04	0.03	≥ 56	0.14	0.09	0.07	0.04	0.02	0.01
B	≤ 45	≥ 55	0.27	0.24	0.21	0.19	0.17	0.16	≥ 54	0.26	0.23	0.19	0.17	0.15	0.13	≥ 54	0.25	0.20	0.16	0.13	0.12	0.10
C	≤ 60	≥ 52	0.43	0.39	0.36	0.34	0.33	0.32	≥ 51	0.42	0.39	0.35	0.32	0.30	0.28	≥ 49	0.39	0.33	0.28	0.23	0.20	0.16
D	≤ 75	≥ 50	0.64	0.62	0.60	0.59	0.58	0.57	≥ 49	0.62	0.57	0.52	0.48	0.46	0.43	≥ 45	0.58	0.50	0.45	0.40	0.37	0.33
E	> 75	≥ 45	1.00	1.00	1.00	1.00	1.00	1.00	≥ 40	0.97	0.94	0.92	0.91	0.90	0.90	≥ 35	0.91	0.87	0.84	0.82	0.80	0.78
F	100	< 45	--	--	--	--	--	--	< 40	--	--	--	--	--	--	< 35	--	--	--	--	--	--

a. Segment 1: Hwy 33 Existing 2022 Traffic Conditions

It was found earlier that the monthly average peak hour flow during the 5:00 to 6:00 p.m. peak hour is 580 vph for southbound traffic and 467 vph for the northbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.34 for southbound and 0.27 for northbound. The terrain within the study area is considered level and a 60% no passing zone will be used. This results in a LOS of C for southbound and LOS of C for northbound directions.

(1) Segment 1: Hwy 33 Existing 2022 Mitigation Measures

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is a C. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions.

b. Segment 2: 2000 S Existing 2022 Traffic Conditions

It was found earlier that the monthly average peak hour flow during the 5:00 to 6:00 p.m. peak hour is 24 vph for eastbound traffic and 43 vph for the westbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.014 for eastbound and 0.025 for westbound. The terrain within the study area is considered level and a 0% no passing zone will be used. This results in a LOS of A for both the eastbound and west bound traffic.

(1) Segment 2: 2000 S Existing 2022 Mitigation Measures

The worst Level of Service for the existing road segment on 2000 S adjacent to the proposed development is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions.

2. Existing Intersection 2022 PM Peak Traffic Conditions

In order to determine how well an intersection is functioning, the intersection's Measures of Effectiveness (MOEs) for the peak hour is analyzed. The MOEs include:

1. Level of Service (LOS)

2. Control Delay
3. Volume/Capacity Ratio (V/C Ratio)
4. 95th Percentile Queue

Using the traffic volumes and turning movements shown previously, the 2022 existing MOEs for the two intersections can be calculated.

a. Intersection #1 - Hwy 33/2000 S PM Peak Traffic Conditions

(1) Intersection #1 – Hwy 33/2000 S 2022 PM Peak Analysis Results

The traffic volumes, identified at the beginning of this chapter, were entered into the computer modeling software Synchro. The results from the model for Intersection 1 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	1	1	3	6	1	36	1	471	12	6	381	18
Future Volume (vph)	1	1	3	6	1	36	1	471	12	6	381	18
Sign Control	—	Stop	—	—	Stop	—	—	Free	—	—	Free	—
Median Width (ft)	—	0	—	—	0	—	—	0	—	—	0	—
TWLTL Median	—		—	—		—	—		—	—		—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	—	—	4.1	—	—
Follow Up Time, tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	—	—	2.2	—	—
Volume to Capacity Ratio	0.01	0.01	0.01	0.10	0.10	0.10	0.00	0.00	0.00	0.01	0.01	0.01
Control Delay (s)	14.9	14.9	14.9	13.9	13.9	13.9	0.0	0.0	0.0	0.1	0.2	0.2
Level of Service	B	B	B	B	B	B	A	A	A	A	A	A
Queue Length 95th (ft)	1	1	1	9	9	9	0	0	0	1	1	1
Approach Delay (s)	—	14.9	—	—	13.9	—	—	0.0	—	—	0.2	—

Figure 18: Hwy 33/2000 S 2022 Existing Intersection PM Peak Hour Flows

(2) Intersection #1 – Hwy 33/2000 S 2022 PM Peak Mitigation Measures

The worst Level of Service at this intersection is a B. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions.

b. Intersection #2 - 2000 S/1000 E PM Peak Traffic Conditions

(1)Intersection #2 – 2000 S/1000 E 2022 PM Peak Analysis Results

The traffic volumes, identified at the beginning of this chapter, were entered into the computer modeling software Synchro. The results from the model for Intersection 2 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	6	12	6	6	15	1	3	3	1	12	15	
Future Volume (vph)	6	12	6	6	15	1	3	3	1	12	15	
Sign Control	—	Free	—	—	Free	—	—	Stop	—	—	Stop	—
Median Width (ft)	—	0	—	—	0	—	—	0	—	—	0	—
TWLTL Median	—		—	—		—	—		—	—		—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	Non
Critical Gap, tC (s)	4.1	—	—	4.1	—	—	7.1	6.5	6.2	7.1	6.5	6.
Follow Up Time, tF (s)	2.2	—	—	2.2	—	—	3.5	4.0	3.3	3.5	4.0	3.
Volume to Capacity Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.04	0.04	0.0
Control Delay (s)	0.0	1.9	1.9	0.0	2.1	2.1	9.1	9.1	9.1	9.3	9.3	9.
Level of Service	A	A	A	A	A	A	A	A	A	A	A	
Queue Length 95th (ft)	0	0	0	0	0	0	1	1	1	3	3	
Approach Delay (s)	—	1.9	—	—	2.1	—	—	9.1	—	—	9.3	—

Figure 19: 2000 S/1000 E 2022 Existing Intersection PM Peak Hour Flows

(2) Intersection #2 – 2000 S/1000 E 2022 PM Peak Mitigation Measures

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions.

3. Turn Lane Warrants Based on Safety Analysis of Intersections

a. Existing Conditions Hwy. 33/2000 S Left Turn Lane Analysis

Intersection #1 was evaluated for safety using ITD guidelines which recommend using the *National Cooperative Highway Research Report 745 –Left-Turn Accommodations at Unsignalized Intersections* (*NCHRP 745) to evaluate left-hand turns and* National Cooperative Highway Research Report 457: Evaluating Intersection Improvements: An Engineering Study Guide (NCHRP 457) *to evaluate right-turn movements to determine if turning movements are consistent with national standards for safety based on traffic volumes*. Based on these guidelines, both the northbound and southbound traffic exceed the 200 vph threshold for a four-leg intersection warranting a left turn lane for the existing conditions (See Appendix K).

b. Existing Conditions Hwy. 33/2000 S Right Turn Lane Analysis

The Right-hand turn warrant analysis follows the guidance found in ITD's *Traffic Manual: Idaho's Supplementary Guide to the MUTCD*. To simplify these guidelines, if a highway has more than 20 vph turning right in the peak hour of the day, a right turn lane is warranted. Based on these guidelines, both the northbound and southbound traffic do not exceed the 20 vph threshold for a four-leg intersection warranting a right turn lane for the existing conditions (See Appendix K).

F. Analysis of Existing 2022 PM Peak Traffic Conditions Summary

This chapter has identified the following:

- Segment 1: Hwy 33

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is a C. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions.

- Segment 2: 2000 S

The worst Level of Service for the existing road segment on 2000 S adjacent to the proposed development is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions.

- Intersection 1: Hwy 33/2000 S

The worst Level of Service at this intersection is a B. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions due to traffic conditions.

- Intersection 2: 2000 S/1000 E

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions.

- Hwy 33 Left Turn Lane Analysis

Left Turns lanes are warranted for both the northbound and southbound traffic for the existing conditions.

- Hwy 33 Right Turn Lane Analysis

Right turn lanes are not warranted for both the northbound and southbound traffic for the existing conditions.

VI. Projected Traffic

A. Site Traffic

1. Trip Generation

In order to determine the trips generated by the proposed development, the ITE Trip Generation 10th Edition Manual was used. This study will use traffic data obtained from the ITD to determine traffic conditions for the 2022 (existing), 2032 (Project buildout), and the 2052 (Future) horizon years. It should be noted that since the PM Peak has the highest traffic volume, only the PM Peak will be analyzed.

a. Buildout (2032)

The following two (2) tables show the land use and trip generation for the ADT and the peak hour.

Table 8- Land Use and Trip Generation (ADT) for Buildout (2032)

Development	Land Use Category	ITE Code	Size	Units	Trip Generation per unit	Total Trips	Internal Capture Trips		Pass-by Trips		Primary Trips Total
	Weekday Trips										
Trestles Phase I	Single-Family Detached Housing	210	24	Dwelling Units	9.57	230	0%	0	0%	0	230
Trestles Phase I	ADUs	210	24	Dwelling Units	9.57	230	0%	0	0%	0	230
Trestles Phase II	Single-Family Detached Housing	210	42	Dwelling Units	9.57	402	0%	0	0%	0	402
Trestles Phase II	ADUs	210	42	Dwelling Units	9.57	402	0%	0	0%	0	402
Wildflower	Single-Family Detached Housing	210	25	Dwelling Units	9.57	239	0%	0	0%	0	239
Wildflower	ADUs	210	25	Dwelling Units	9.57	239	0%	0	0%	0	239

Table 9- Land Use and Trip Generation (Peak Hour) for Buildout (2032)

Development	Land Use Category	ITE Code	Size	Units	Trip Generation per unit	Total Trips	Internal Capture Trips		Pass-by Trips		Primary Trips Total
	Peak Hour										
Trestles Phase I	**Single Family Detached Housing, AM Peak**	**210**	**24**	**Dwelling Untis**	**0.76**	**18**	**0%**	**0**	**0%**	**0**	**18**
	ADUs, AM Peak	**210**	**24**	**Dwelling Untis**	**0.76**	**18**	**0%**	**0**	**0%**	**0**	**18**
	Single Family Detached Housing, PM Peak	**210**	**24**	**Dwelling Untis**	**1**	**24**	**0%**	**0**	**0%**	**0**	**24**
	ADUs, PM Peak	**210**	**24**	**Dwelling Untis**	**1**	**24**	**0%**	**0**	**0%**	**0**	**24**
Trestles Phase II	**Single Family Detached Housing, AM Peak**	**210**	**42**	**Dwelling Untis**	**0.76**	**32**	**0%**	**0**	**0%**	**0**	**32**
	ADUs, AM Peak	**210**	**42**	**Dwelling Untis**	**0.76**	**32**	**0%**	**0**	**0%**	**0**	**32**
	Single Family Detached Housing, PM Peak	**210**	**42**	**Dwelling Untis**	**1**	**42**	**0%**	**0**	**0%**	**0**	**42**
	ADUs, AM Peak	**210**	**42**	**Dwelling Untis**	**1**	**42**	**0%**	**0**	**0%**	**0**	**42**
Wildflower	**Single Family Detached Housing, AM Peak**	**210**	**25**	**Dwelling Untis**	**0.76**	**19**	**0%**	**0**	**0%**	**0**	**19**
	ADUs, AM Peak	**210**	**25**	**Dwelling Untis**	**0.76**	**19**	**0%**	**0**	**0%**	**0**	**19**
	Single Family Detached Housing, PM Peak	**210**	**25**	**Dwelling Untis**	**1**	**25**	**0%**	**0**	**0%**	**0**	**25**
	ADUs, AM Peak	**210**	**25**	**Dwelling Untis**	**1**	**25**	**0%**	**0**	**0%**	**0**	**25**

2. Trip Distribution

Trip distribution is a percentage indicating what percentage of traffic is entering or exiting the study area. The ITE Trip Generation Handbook outlines the trip distribution for each land use. The following two (2) tables show the land use, trip generation, and trip distribution for the ADT and the peak hour.

Table 10- Trip Distribution (ADT) for Buildout (2032)

Development	Land Use Category	ITE Code	Size	Units	Trip Generation per unit	Total Trips	Internal Capture Trips		Pass-by Trips		Primary Trips Total	Primary Trips Entering		Primary Trips Exiting	
	Weekday Trips														
Trestles Phase I	Single-Family Detached Housing	210	24	Dwelling Units	9.57	230	0%	0	0%	0	230	50%	115	50%	115
Trestles Phase I	ADUs	210	24	Dwelling Units	9.57	230	0%	0	0%	0	230	50%	115	50%	115
Trestles Phase II	Single-Family Detached Housing	210	42	Dwelling Units	9.57	402	0%	0	0%	0	402	50%	201	50%	201
Trestles Phase II	ADUs	210	42	Dwelling Units	9.57	402	0%	0	0%	0	402	50%	201	50%	201
Wildflower	Single-Family Detached Housing	210	25	Dwelling Units	9.57	239	0%	0	0%	0	239	50%	120	50%	120
Wildflower	ADUs	210	25	Dwelling Units	9.57	239	0%	0	0%	0	239	50%	120	50%	120

Table 11- Trip Distribution (Peak Hour) for Buildout (2032)

Development	Land Use Category	ITE Code	Size	Units	Trip Generation per unit	Total Trips	Internal Capture Trips		Pass-by Trips		Primary Trips Total	Primary Trips Entering		Primary Trips Exiting	
	Peak Hour														
Trestles Phase I	**Single Family Detached Housing, AM Peak**	**210**	**24**	**Dwelling Untis**	**0.76**	**18**	**0%**	**0**	**0%**	**0**	**18**	**26%**	**5**	**74%**	**13**
	ADUs, AM Peak	**210**	**24**	**Dwelling Untis**	**0.76**	**18**	**0%**	**0**	**0%**	**0**	**18**	**26%**	**5**	**74%**	**13**
	Single Family Detached Housing, PM Peak	**210**	**24**	**Dwelling Untis**	**1**	**24**	**0%**	**0**	**0%**	**0**	**24**	**64%**	**15**	**36%**	**9**
	ADUs, PM Peak	**210**	**24**	**Dwelling Untis**	**1**	**24**	**0%**	**0**	**0%**	**0**	**24**	**64%**	**15**	**36%**	**9**
Trestles Phase II	**Single Family Detached Housing, AM Peak**	**210**	**42**	**Dwelling Untis**	**0.76**	**32**	**0%**	**0**	**0%**	**0**	**32**	**26%**	**8**	**74%**	**24**
	ADUs, AM Peak	**210**	**42**	**Dwelling Untis**	**0.76**	**32**	**0%**	**0**	**0%**	**0**	**32**	**26%**	**8**	**74%**	**24**
	Single Family Detached Housing, PM Peak	**210**	**42**	**Dwelling Untis**	**1**	**42**	**0%**	**0**	**0%**	**0**	**42**	**64%**	**27**	**36%**	**15**
	ADUs, AM Peak	**210**	**42**	**Dwelling Untis**	**1**	**42**	**0%**	**0**	**0%**	**0**	**42**	**64%**	**27**	**36%**	**15**
Wildflower	**Single Family Detached Housing, AM Peak**	**210**	**25**	**Dwelling Untis**	**0.76**	**19**	**0%**	**0**	**0%**	**0**	**19**	**26%**	**5**	**74%**	**14**
	ADUs, AM Peak	**210**	**25**	**Dwelling Untis**	**0.76**	**19**	**0%**	**0**	**0%**	**0**	**19**	**26%**	**5**	**74%**	**14**
	Single Family Detached Housing, PM Peak	**210**	**25**	**Dwelling Untis**	**1**	**25**	**0%**	**0**	**0%**	**0**	**25**	**64%**	**16**	**36%**	**9**
	ADUs, AM Peak	**210**	**25**	**Dwelling Untis**	**1**	**25**	**0%**	**0**	**0%**	**0**	**25**	**64%**	**16**	**36%**	**9**

3. Modal Split

Modal split is the determination of different travel modes (automobile, heavy vehicles, walk, etc.) from an origin to a given destination. Analyzing the pedestrian traffic is outside the scope of this study and it is assumed that no heavy vehicles will be generated from the development. A standard 5% heavy vehicle percentage will be applied to this study.

4. Trip Assignment

a. Intersection 1: Hwy 33/2000 S

When traffic from the development reaches this intersection, it is assumed that the trips will follow current Hwy 33 percentages (55% will head southbound and 45% will head northbound); for a visual of this, reference the Total Traffic section of this chapter.

b. Intersection 2: 2000 S/1000 E

When traffic from the development reaches this intersection, it is assumed that the eastbound and westbound traffic will be assigned evenly; for a visual of this, reference the Total Traffic section of this chapter.

c. Intersection 3: Wildflower Road/2000 S (New)

It is assumed that 80% of the generated traffic from the development will travel to or from Hwy 33 on 2000 S and the other 20% will travel to or from the east. It should be noted that since the trips generated are

relatively low resulting in some turning movements at the intersections showing zero (0) vph generated, a minimum of one (1) vph will be used for each turning movement.

d. Intersection 4: Trestles Road/2000 S (New)

It is assumed that 80% of the generated traffic from the development will travel to or from Hwy 33 on 2000 S and the other 20% will travel to or from the east. It should be noted that since the trips generated are relatively low resulting in some turning movements at the intersections showing zero (0) vph generated, a minimum of one (1) vph will be used for each turning movement.

B. Through Traffic (Non-Site Traffic)

1. Non-Site Traffic for anticipated Development in Study Area

a. Method of Projections

Pass-by trips are made as intermediate stops on the way from an origin to a destination without a route diversion. In other words, a pass-by trip is when the traffic on an adjacent roadway is attracted to a certain land use in a development as non-site traffic. The trip generally goes from origin to generator and then returns to the origin. The proposed development does not have any land uses that would be considered pass-by trips.

b. Trip Distribution

This section is not applicable due to the fact that single-family detached housing is not considered a non-site traffic generator.

c. Modal Split

This section is not applicable due to the fact that single-family detached housing is not considered a non-site traffic generator.

d. Trip Assignment

This section is not applicable due to the fact that single-family detached housing is not considered a non-site traffic generator.

C. Total Traffic

The total trips generated by the development and the impact to each intersection for the 2032 Buildout are shown in the following figures.

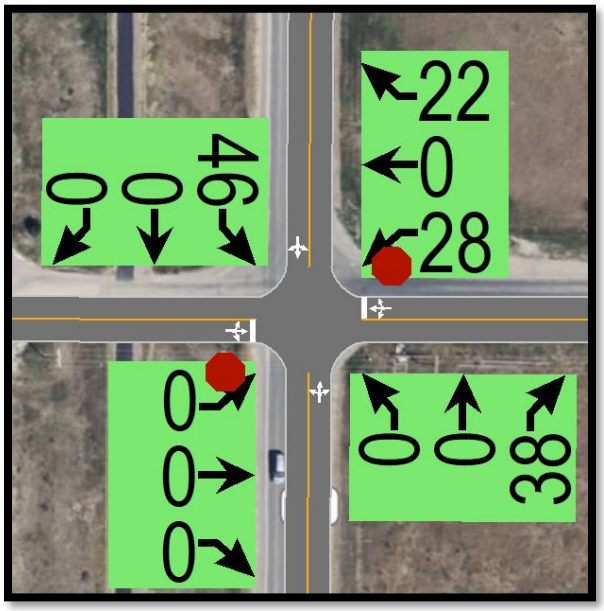


Figure 20- Intersection 1 Hwy 33/2000 S PM Peak Generated Traffic

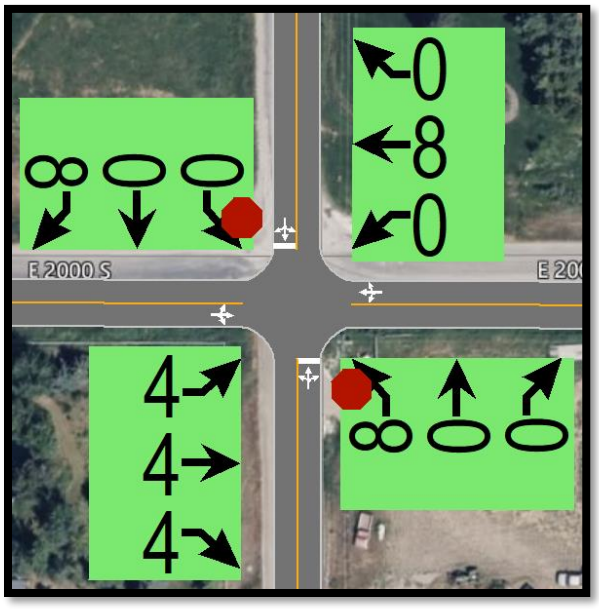


Figure 21- Intersection 2 2000 S/1000 E PM Peak Generated Traffic

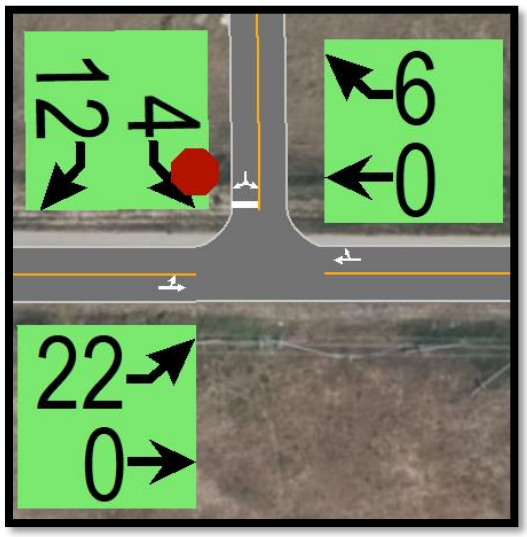


Figure 22- Intersection 3 Wildflower/2000 S PM Peak Generated Traffic

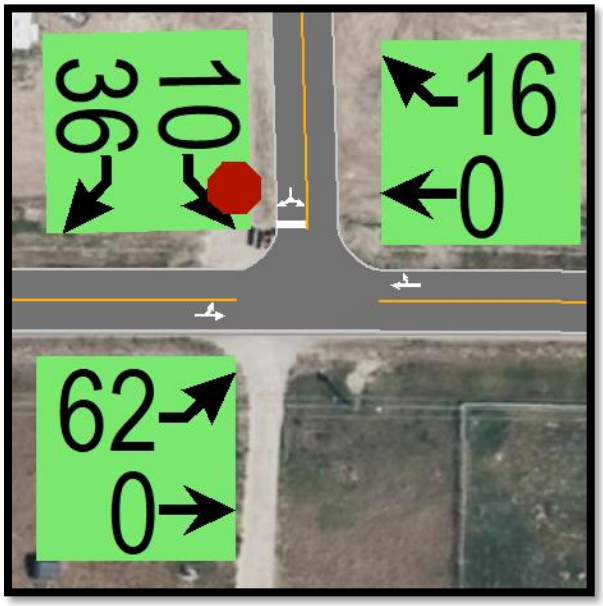


Figure 23- Intersection 4 Trestles/2000 S PM Peak Generated Traffic

VII. 2032 Horizon Year Traffic Analysis (Buildout)

A. Traffic Forecasting

The traffic counts from Chapter 5 were increased by the recommended trendline percentages. The traffic counts in this chapter represent the background traffic increased to forecast the 2032 buildout conditions for both the background (without the development) and background plus site traffic analyzes.

B. Analysis of 2032 Buildout Traffic Volumes

Within the area of influence there will be two (2) segments and four (4) intersections examined; the segments will be analyzed with the intersections. The segments and intersections are:

1. Segment 1: Hwy 33
2. Segment 2: W 2000 S
3. Intersection 1: Hwy 33 and W 2000 S (Existing)
4. Intersection 2: W 2000 S and S 1000 E (Existing)
5. Intersection 3: Wildflower Road and W 2000 S (New)
6. Intersection 4: Trestles Road and W 2000 S (New)

1. 2032 Buildout Segment Traffic Volumes

This section discusses the ADT, the peak hour flows, and the trip distribution for the existing traffic.

a. Segment 1: Hwy 33 2032 Buildout Background Traffic

The background traffic is basically the existing traffic forecasted to a horizon year without the development. The Hwy 33 background traffic for 2032 is shown in the following table.

Table 12- Hwy 33 2032 Background Traffic

Parameter	Units	Year	Traffic Volume	Southbound	Northbound
Max. Month ADT (MADT)	VPD	2022	13,527	6,806	6,803
Max. Month Peak Hour Ave. (PH)	VPH	2022	1,047	580	467
Max. Month ADT (MADT)	VPD	2032	17,262	8,685	8,681
Max. Month Peak Hour Ave. (PH)	VPH	2032	1,336	740	596

b. Segment 1: Hwy 33 2032 Background plus Site Traffic

The Hwy 33 background plus site traffic for 2032 is shown in the following table.

Table 13- Hwy 33 2032 Background plus Site Traffic

Parameter	Units	Year	Traffic Volume	Southbound	Northbound
Max. Month ADT (MADT)	VPD	2022	13,527	6,806	6,803
Max. Month Peak Hour Ave. (PH)	VPH	2022	1,047	580	467
Max. Month ADT (MADT)	VPD	2032	17,492	8,800	8,796
Max. Month Peak Hour Ave. (PH)	VPH	2032	1,404	786	618

c. Segment 2: 2000 S 2032 Background Traffic

The 2022 counts were multiplied by the recommended trendline percentages with the results showing that 2032 background traffic for 2000 S is forecasted to have 55 vph heading eastbound and 24 vehicles heading westbound.

d. Segment 2: 2000 S 2032 Background plus Site Traffic

The 2022 counts were multiplied by the recommended trendline percentages with the results showing that 2032 background traffic for 2000 S is forecasted to have 139 vph heading eastbound and 46 vehicles heading westbound.

2. 2032 Buildout PM Peak Intersection Traffic Volumes

a. Intersection 1: Hwy 33/2000 S 2032 PM Peak Hour Background Turning Movements

The 2022 counts were multiplied by the recommended trendline percentages with the results shown in the following figure.

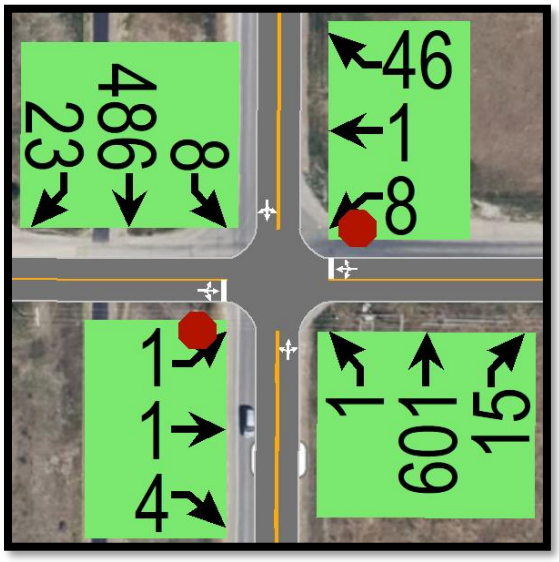


Figure 24: Hwy 33/2000 S 2032 PM Peak Hour Background Traffic Volume

b. Intersection 1: Hwy 33/2000 S 2032 PM Peak Hour Background plus Site Traffic Turning Movements

The generated traffic shown in the previous chapter was added to the background traffic with the results shown in the following figure.

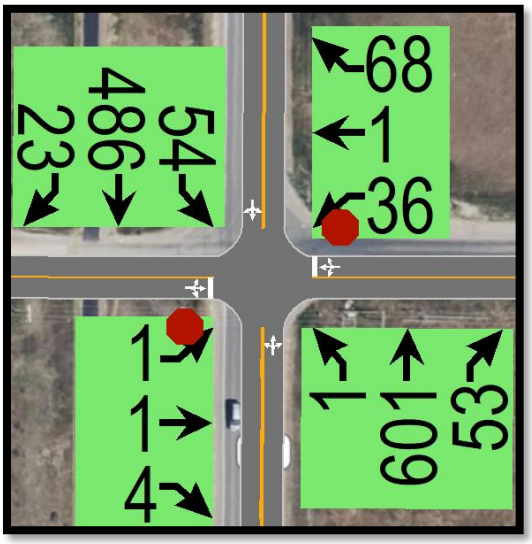


Figure 25: Hwy 33/2000 S 2032 PM Peak Hour Background plus Site Traffic Volume

c. Intersection 2: 2000 S/1000 E 2032 PM Peak Hour Background Turning Movements

The 2022 counts were multiplied by the recommended trendline percentages with the results shown in the following figure.

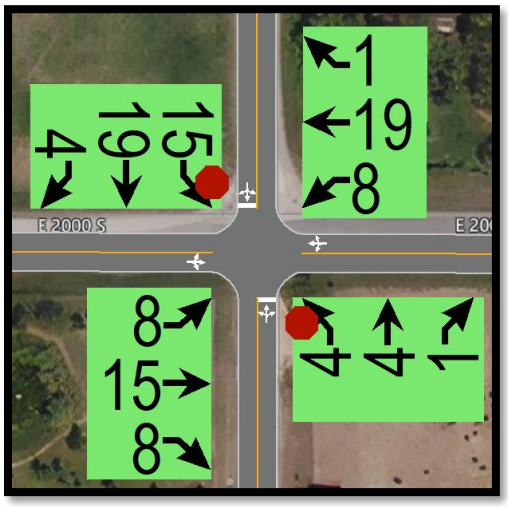


Figure 26: 2000 S/1000 E 2032 PM Peak Hour Background Traffic Volume

d. Intersection 2: 2000 S/1000 E 2032 PM Peak Hour Background plus Site Traffic Turning Movements

The generated traffic shown in the previous chapter was added to the background traffic with the results shown in the following figure.

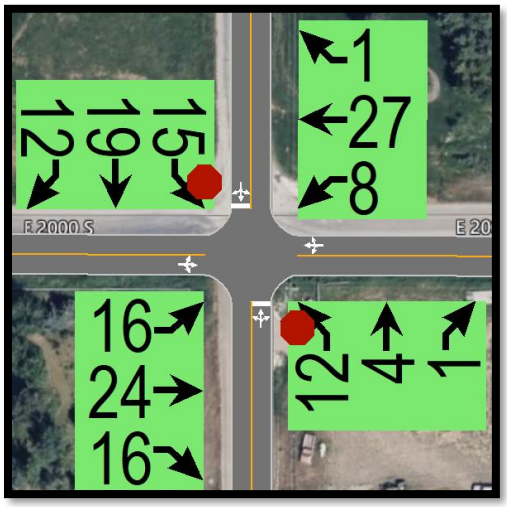


Figure 27: 2000 S/1000 E 2032 PM Peak Hour Background plus Site Traffic Volume

e. Intersection 3: 2000 S/Wildflower 2032 PM Peak Hour Background Turning Movements

There are no background volumes for this intersection because they will not exist until the construction of the Wildflower development.

f. Intersection 3: 2000 S/Wildflower 2032 PM Peak Hour Background plus Site Traffic Turning Movements

The generated traffic shown in the previous chapter was added to the through traffic with the results shown in the following figure.

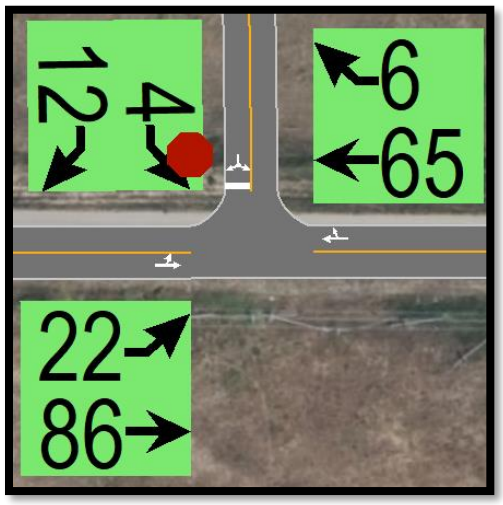


Figure 28: 2000 S/Wildflower 2032 PM Peak Hour Background plus Site Traffic Volume

g. Intersection 4: 2000 S/Trestles 2032 PM Peak Hour Background Turning Movements

There are no background volumes for this intersection because they will not exist until the construction of the Trestles development.

h. Intersection 4: 2000 S/Trestles 2032 PM Peak Hour Background plus Site Traffic Turning Movements

The generated traffic shown in the previous chapter was added to the through traffic with the results shown in the following figure.

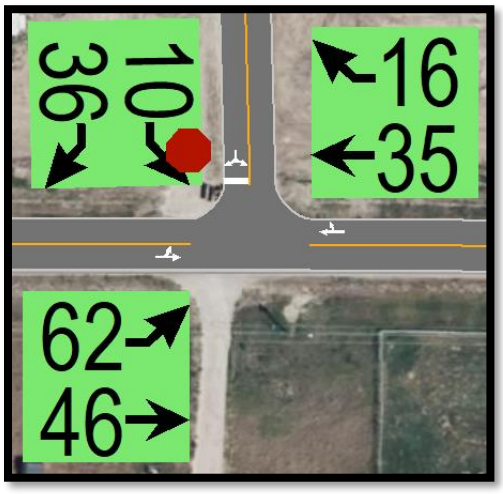


Figure 29: 2000 S/Trestles 2032 PM Peak Hour Background plus Site Traffic Volume

3. 2032 Buildout Segment Traffic Conditions

Using the same technique and the data from Table 6 from Chapter 5, the v/c ratio and LOS for the two segment's background and background plus site traffic can be forecasted.

a. Segment 1: Hwy 33 2032 Buildout Background Traffic Conditions

The traffic for this segment has been forecasted to have 740 vph for southbound traffic and 596 vph for the northbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.44 for southbound and 0.35 for northbound. The terrain within the study area is considered level and a 60% no passing zone will be used. This results in a LOS of D for southbound and LOS of D for northbound directions.

(1) Segment 1: Hwy 33 2032 Background Mitigation Measures

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is a D. Therefore, in accordance with ITD guidelines, no improvements are warranted for the existing conditions.

b. Segment 1: Hwy 33 2032 Buildout Background plus site Traffic Conditions

The traffic for this segment has been forecasted to have 786 vph for southbound traffic and 618 vph for the northbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.46 for southbound and 0.36 for northbound. The terrain within the study area is considered level and a 60% no passing zone will be used. This results in a LOS of D for southbound and LOS of D for northbound directions.

(1) Segment 1: Hwy 33 2032 Background plus Site Traffic Mitigation Measures

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is a D. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

c. Segment 2: 2000 S 2032 Buildout Background Traffic Conditions

The traffic for this segment has been forecasted to have 32 vph for eastbound traffic and 55 vph for the westbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.014 for eastbound and 0.039 for westbound. The terrain within the study area is considered level and a 0% no passing zone will be used. This results in a LOS of A for eastbound and LOS of A for westbound directions.

(1) Segment 2: 2000 S 2032 Background Mitigation Measures

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

d. Segment 2: 2000 S 2032 Buildout Background plus site Traffic Conditions

The traffic for this segment has been forecasted to have 100 vph for eastbound traffic and 105 vph for the westbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.059 for eastbound and 0.062 for

westbound. The terrain within the study area is considered level and a 0% no passing zone will be used. This results in a LOS of A for eastbound and LOS of A for westbound directions.

(1) Segment 2: 2000 S 2032 Background plus Site Traffic Mitigation Measures

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

4. 2032 Buildout Intersection Traffic Conditions

In order to determine how well an intersection is functioning, the intersection's Measures of Effectiveness (MOEs) for the peak hour is analyzed. The MOEs include:

1. Level of Service (LOS)
2. Control Delay
3. Volume/Capacity Ratio (V/C Ratio)
4. 95th Percentile Queue

Using the background and the background plus site traffic volumes and turning movements shown previously, the 2032 buildout MOEs for the three intersections can be calculated.

a. Intersection #1 - Hwy 33/2000 S 2032 PM Peak Background Traffic

The background traffic volumes, identified at the beginning of this chapter, were entered into the computer modeling software Synchro. The results from the model for Intersection 1 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	1	1	4	8	1	46	1	601	15	8	486	23
Future Volume (vph)	1	1	4	8	1	46	1	601	15	8	486	23
Sign Control	—	Stop	—	—	Stop	—	—	Free	—	—	Free	—
Median Width (ft)	—	0	—	—	0	—	—	0	—	—	0	—
TWLTL Median	—		—	—		—	—		—	—		—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	—	—	4.1	—	—
Follow Up Time, tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	—	—	2.2	—	—
Volume to Capacity Ratio	0.02	0.02	0.02	0.18	0.18	0.18	0.00	0.00	0.00	0.01	0.01	0.01
Control Delay (s)	18.0	18.0	18.0	17.7	17.7	17.7	0.0	0.0	0.0	0.1	0.3	0.3
Level of Service	C	C	C	C	C	C	A	A	A	A	A	A
Queue Length 95th (ft)	2	2	2	16	16	16	0	0	0	1	1	1
Approach Delay (s)	—	18.0	—	—	17.7	—	—	0.0	—	—	0.3	—

Figure 30: Hwy 33/2000 S 2032 Buildout Intersection PM Peak Background Traffic Conditions

(1) Intersection #1 – Hwy 33/ 2000 S 2032 PM Peak Background Mitigation Measures

The worst Level of Service at this intersection is a C. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

b. Intersection #1 - Hwy 33/2000 S 2032PM Peak Background plus Site Traffic

The background traffic volumes and the site traffic, identified at the beginning of this chapter, were combined and entered into the computer modeling software Synchro. The results from the model for Intersection 1 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	1	1	4	36	1	68	1	601	53	54	486	23
Future Volume (vph)	1	1	4	36	1	68	1	601	53	54	486	23
Sign Control	—	Stop	—	—	Stop	—	—	Free	—	—	Free	—
Median Width (ft)	—	0	—	—	0	—	—	0	—	—	0	—
TWLTL Median	—		—	—		—	—		—	—		—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	—	—	4.1	—	—
Follow Up Time, tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	—	—	2.2	—	—
Volume to Capacity Ratio	0.03	0.03	0.03	0.50	0.50	0.50	0.00	0.00	0.00	0.07	0.07	0.07
Control Delay (s)	21.1	21.1	21.1	36.0	36.0	36.0	0.0	0.0	0.0	0.9	1.8	1.8
Level of Service	C	C	C	E	E	E	A	A	A	A	A	A
Queue Length 95th (ft)	2	2	2	64	64	64	0	0	0	5	5	5
Approach Delay (s)	—	21.1	—	—	36.0	—	—	0.0	—	—	1.8	—

Figure 31: Hwy 33/2000 S 2032 Buildout Intersection PM Peak Background plus Site Traffic Conditions

(1) Intersection #1 – Hwy 33/2000 S 2032 PM Peak Background plus Site Traffic Mitigation Measures

The worst level of service at this intersection is an E. A LOS of E is below the acceptable level. The following shows two (2) mitigation measures to improve the LOS.

(a) Mitigation Measures Option 1 – Turn Lanes

A left turn lane for the westbound traffic was entered into the traffic model. The following two figures show the layout of the new left turn lane and the results of the model. It can be seen that even though the LOS improves for the through and right turning westbound traffic, the left turn traffic remains at an unacceptable level.

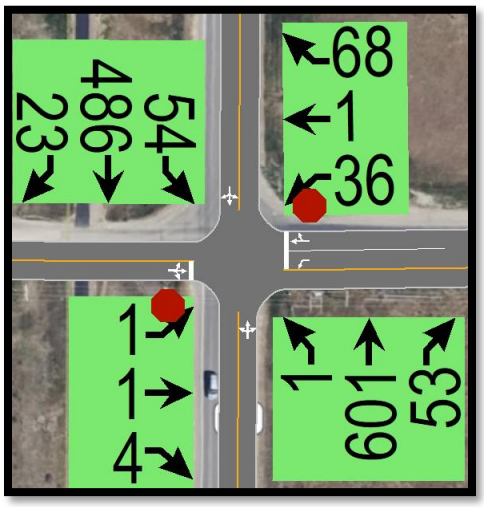


Figure 32: Hwy 33/2000 S 2032 Mitigations Measures Option 1 – Add Left Turn Lanes

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	1	1	4	36	1	68	1	601	53	54	486	23
Future Volume (vph)	1	1	4	36	1	68	1	601	53	54	486	23
Sign Control	—	Stop	—	—	Stop	—	—	Free	—	—	Free	—
Median Width (ft)	—	0	—	—	12	—	—	0	—	—	0	—
TWLTL Median	—		—	—		—	—		—	—		—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	—	—	4.1	—	—
Follow Up Time, tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	—	—	2.2	—	—
Volume to Capacity Ratio	0.03	0.03	0.03	0.33	0.17	0.17	0.00	0.00	0.00	0.07	0.07	0.07
Control Delay (s)	21.1	21.1	21.1	49.8	15.1	15.1	0.0	0.0	0.0	0.9	1.8	1.8
Level of Service	C	C	C	E	C	C	A	A	A	A	A	A
Queue Length 95th (ft)	2	2	2	33	16	16	0	0	0	5	5	5
Approach Delay (s)	—	21.1	—	—	27.0	—	—	0.0	—	—	1.8	—

Figure 33: Hwy 33/2000 S 2032 Mitigations Measures Option 1 – Add Left Turn Lane Traffic Conditions

(a) Mitigation Measures Option 2 – Add Left Turn Lane and a Two-Way Left-Turn Lane (TWLTL)

This analysis will add a left turn lane for the westbound traffic and will also add a TWLTL for the northbound and southbound traffic on Hwy 33. The following two figures show the proposed layout and the results of the model. It can be seen that by adding a left turn lane on 2000 S for the westbound traffic and a TWLTL on Hwy 33 the roadway is forecasted to operate at an acceptable level after buildout.

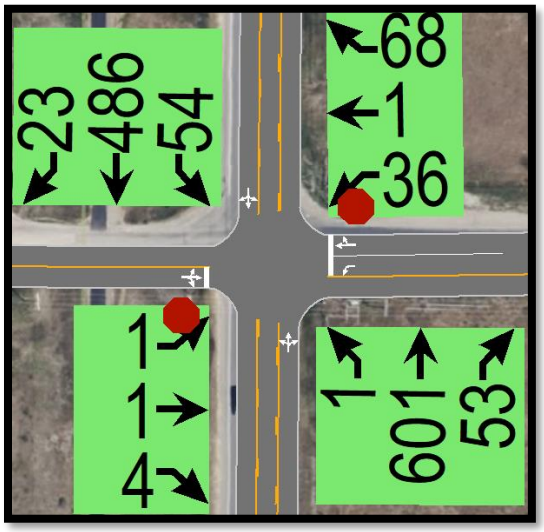


Figure 34: Hwy 33/2000 S 2032 Mitigations Measures Option 2 – Add Left Turn Lane and TWLTL

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	1	1	4	36	1	68	1	601	53	54	486	23
Future Volume (vph)	1	1	4	36	1	68	1	601	53	54	486	23
Sign Control	—	Stop	—	—	Stop	—	—	Free	—	—	Free	—
Median Width (ft)	—	0	—	—	12	—	—	12	—	—	12	—
TWLTL Median	—	☐	—	—	☐	—	—	☑	—	—	☑	—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	—	—	4.1	—	—
Follow Up Time, tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	—	—	2.2	—	—
Volume to Capacity Ratio	0.02	0.02	0.02	0.12	0.17	0.17	0.00	0.00	0.00	0.07	0.07	0.07
Control Delay (s)	14.2	14.2	14.2	18.1	14.8	14.8	0.0	0.0	0.0	0.9	1.8	1.8
Level of Service	B	B	B	C	B	B	A	A	A	A	A	A
Queue Length 95th (ft)	1	1	1	11	15	15	0	0	0	5	5	5
Approach Delay (s)	—	14.2	—	—	15.9	—	—	0.0	—	—	1.8	—

Figure 35: Hwy 33/2000 S 2032 Mitigations Measures Option 2 – Add Left Turn Lanes and TWLTL Traffic Conditions

c. Intersection #2 – 2000 S/1000 E 2032 PM Peak Background Traffic

The background traffic volumes, identified at the beginning of this chapter, were entered into the computer modeling software Synchro. The results from the model for Intersection 2 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	8	15	8	8	19	1	4	4	1	15	19	4
Future Volume (vph)	8	15	8	8	19	1	4	4	1	15	19	4
Sign Control	—	Free	—	—	Free	—	—	Stop	—	—	Stop	—
Median Width (ft)	—	0	—	—	0	—	—	0	—	—	0	—
TWLTL Median	—		—	—		—	—		—	—		—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	4.1	—	—	4.1	—	—	7.1	6.5	6.2	7.1	6.5	6.2
Follow Up Time, tF (s)	2.2	—	—	2.2	—	—	3.5	4.0	3.3	3.5	4.0	3.3
Volume to Capacity Ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.05	0.05
Control Delay (s)	0.0	2.0	2.0	0.0	2.2	2.2	9.3	9.3	9.3	9.5	9.5	9.5
Level of Service	A	A	A	A	A	A	A	A	A	A	A	A
Queue Length 95th (ft)	0	0	0	0	0	0	1	1	1	4	4	4
Approach Delay (s)	—	2.0	—	—	2.2	—	—	9.3	—	—	9.5	—

Figure 36: 2000 S/1000 E 2032 Buildout Intersection PM Peak Background Traffic Conditions

(1) Intersection #2 – 2000 S/1000 E 2032 PM Peak Background Mitigation Measures

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

d. Intersection #2 – 2000 S/1000 E 2032 PM Peak Background plus Site Traffic

The background traffic volumes and the site traffic, identified at the beginning of this chapter, were combined and entered into the computer modeling software Synchro. The results from the model for Intersection 2 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	16	24	16	8	27	1	12	4	1	15	19	12
Future Volume (vph)	16	24	16	8	27	1	12	4	1	15	19	12
Sign Control	—	Free	—	—	Free	—	—	Stop	—	—	Stop	—
Median Width (ft)	—	0	—	—	0	—	—	0	—	—	0	—
TWLTL Median	—		—	—		—	—		—	—		—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	4.1	—	—	4.1	—	—	7.1	6.5	6.2	7.1	6.5	6.2
Follow Up Time, tF (s)	2.2	—	—	2.2	—	—	3.5	4.0	3.3	3.5	4.0	3.3
Volume to Capacity Ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.06	0.06	0.06
Control Delay (s)	0.1	2.1	2.1	0.0	1.7	1.7	9.7	9.7	9.7	9.6	9.6	9.6
Level of Service	A	A	A	A	A	A	A	A	A	A	A	A
Queue Length 95th (ft)	1	1	1	0	0	0	2	2	2	5	5	5
Approach Delay (s)	—	2.1	—	—	1.7	—	—	9.7	—	—	9.6	—

Figure 37: 2000 S/1000 E 2032 Buildout Intersection PM Peak Background plus Site Traffic Conditions

(1) Intersection #2 – 2000 S/1000 E 2032 PM Peak Background plus Site Traffic Mitigation Measures

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

e. Intersection #3 - 2000 S/Wildflower 2032 PM Peak Background Traffic

There are no background conditions for this intersection because they will not exist until the construction of the Wildflower development. Therefore, all delay times are zero (0) and the LOS is A.

f. Intersection #3 - 2000 S/Wildflower 2032 PM Peak Background plus Site Traffic

The background traffic volumes and the site traffic, identified at the beginning of this chapter, were combined and entered into the computer modeling software Synchro. The results from the model for Intersection 3 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	WBT	WBR	SBL	SBR
Lanes and Sharing (#RL)						
Traffic Volume (vph)	22	86	65	6	4	12
Future Volume (vph)	22	86	65	6	4	12
Sign Control	—	Free	Free	—	Stop	—
Median Width (ft)	—	0	0	—	12	—
TWLTL Median	—	☐	☐	—	☐	—
Right Turn Channelized	—	None	—	None	—	None
Critical Gap, tC (s)	4.1	—	—	—	6.4	6.2
Follow Up Time, tF (s)	2.2	—	—	—	3.5	3.3
Volume to Capacity Ratio	0.02	0.02	0.05	0.05	0.02	0.02
Control Delay (s)	0.1	1.6	0.0	0.0	9.0	9.0
Level of Service	A	A	A	A	A	A
Queue Length 95th (ft)	1	1	0	0	1	1
Approach Delay (s)	—	1.6	0.0	—	9.0	—

Figure 38: 2000 S/Wildflower 2032 Buildout Intersection PM Peak Background plus Site Traffic Conditions

(1) Intersection #3 – 2000 S/Wildflower 2032 PM Peak Background Mitigation Measures

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

g. Intersection #4 - 2000 S/Trestles 2032 PM Peak Background Traffic

There are no background conditions for this intersection because they will not exist until the construction of the Trestles development. Therefore, all delay times are zero (0) and the LOS is A.

h. Intersection #4 - 2000 S/Trestles 2032 PM Peak Background plus Site Traffic

The background traffic volumes and the site traffic, identified at the beginning of this chapter, were combined and entered into the computer modeling software Synchro. The results from the model for Intersection 4 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	WBT	WBR	SBL	SBR
Lanes and Sharing (#RL)						
Traffic Volume (vph)	62	46	35	16	10	36
Future Volume (vph)	62	46	35	16	10	36
Sign Control	—	Free	Free	—	Stop	—
Median Width (ft)	—	0	0	—	12	—
TWLTL Median	—	☐	☐	—	☐	—
Right Turn Channelized	—	None	—	None	—	None
Critical Gap, tC (s)	4.1	—	—	—	6.4	6.2
Follow Up Time, tF (s)	2.2	—	—	—	3.5	3.3
Volume to Capacity Ratio	0.04	0.04	0.03	0.03	0.05	0.05
Control Delay (s)	0.3	4.4	0.0	0.0	9.1	9.1
Level of Service	A	A	A	A	A	A
Queue Length 95th (ft)	3	3	0	0	4	4
Approach Delay (s)	—	4.4	0.0	—	9.1	—

Figure 39: 2000 S/Trestles 2032 Buildout Intersection PM Peak Background plus Site Traffic Conditions

(1) Intersection #4 – 2000 S/Wildflower 2032 PM Peak Background Mitigation Measures

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

i. Turn Lane Warrants Based on Safety Analysis of Intersections

(1) 2032 Hwy. 33/2000 S

Left turn lanes were determined to be warranted at this intersection for the existing conditions in 2022. However, no new turn lanes are warranted due to the increased background traffic plus site traffic over the next 10 years until buildout (2032 Horizon Year).

A right turn lane is warranted for the northbound traffic but not the southbound traffic.

C. Analysis of 2032 Buildout PM Peak Traffic Conditions Summary

This chapter has identified the following:

- Segment 1: Hwy 33 (Background and Background plus Site Traffic)

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is a D. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

❖ Segment 2: 2000 S (Background and Background plus Site Traffic)

The worst Level of Service for the existing road segment on 2000 S adjacent to the proposed development is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

❖ Intersection 1: Hwy 33/2000 S (Background and Background plus Site Traffic)

The worst Level of Service at this intersection is an E. A LOS of E is below the acceptable standards. Two (2) mitigation measures were analyzed. This analysis shows that a left turn lane for the westbound traffic is not sufficient to improve the intersection to an acceptable level. It was found that by adding a left turn lane for the westbound traffic and by adding a TWLTL on Hwy 33, the LOS can be improved to an acceptable level.

❖ Intersection 2: 2000 S/1000 E (Background and Background plus Site Traffic)

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

❖ Intersection 3: 2000 S/Wildflower (Background and Background plus Site Traffic)

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

❖ Intersection 4: 2000 S/Trestles (Background and Background plus Site Traffic)

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2032 forecasted conditions.

❖ Left Turn Lane Analysis (Background and Background plus Site Traffic)

This study has identified that left turn lanes are warranted on Hwy 33 for the existing conditions (2022) for safety reasons as outlined by the ITD. No new lanes are warranted from the 2022 Existing to the 2032 Buildout Year.

❖ Right Turn Lane Analysis (Background and Background plus Site Traffic)

A right turn lane is warranted for the northbound traffic from the 2022 Existing to the 2032 Buildout Year.

VIII. 2052 Horizon Year Traffic Analysis

A. Traffic Forecasting

The traffic counts from Chapter 8 were increased by the recommended annual trendline percentages. The traffic counts in this chapter represent the background traffic increased to forecast the 2052 buildout conditions for both the background (without the development) and background plus site traffic analyzes.

B. Analysis of 2052 Horizon Year Traffic Volumes

Within the area of influence there will be two (2) segment and four (4) intersections examined; the segments will be analyzed with the intersections. The segments and intersections are:

1. Segment 1: Hwy 33
2. Segment 2: W 2000 S
3. Intersection 1: Hwy 33 and W 2000 S (Existing)
4. Intersection 2: W 2000 S and S 1000 E (Existing)
5. Intersection 3: Wildflower Road and W 2000 S (New)
6. Intersection 4: Trestles Road and W 2000 S (New)

1. 2052 Horizon Year Segment Traffic Volumes

This section discusses the ADT, the peak hour flows, and the trip distribution for the existing traffic.

a. Segment 1: Hwy 33 2052 Background Traffic

The background traffic is basically the existing traffic forecasted to a horizon year without the development. The Hwy 33 background traffic for 2052 is shown in the following table.

Table 14- Hwy 33 2052 Background Traffic

Parameter	Units	Year	Traffic Volume	Southbound	Northbound
Max. Month ADT (MADT)	VPD	2022	13,527	6,806	6,803
Max. Month Peak Hour Ave. (PH)	VPH	2022	1,047	580	467
Max. Month ADT (MADT)	VPD	2032	17,262	8,685	8,681
Max. Month Peak Hour Ave. (PH)	VPH	2032	1,336	740	596
Max. Month ADT (MADT)	**VPD**	**2052**	**28,110**	**14,143**	**14,137**
Max. Month Peak Hour Ave. (PH)	**VPH**	**2052**	**2,176**	**1,205**	**970**

b. Segment 1: Hwy 33 2052 Background plus Site Traffic

The Hwy 33 background plus site traffic for 2052 is shown in the following table.

Table 15- Hwy 33 2052 Background plus Site Traffic

Parameter	Units	Year	Traffic Volume	Southbound	Northbound
Max. Month ADT (MADT)	VPD	2022	13,527	6,806	6,803
Max. Month Peak Hour Ave. (PH)	VPH	2022	1,047	580	467
Max. Month ADT (MADT)	VPD	2032	18,870	8,800	8,796
Max. Month Peak Hour Ave. (PH)	VPH	2032	1,404	786	618
Max. Month ADT (MADT)	**VPD**	**2052**	**29,718**	**15,156**	**14,562**
Max. Month Peak Hour Ave. (PH)	**VPH**	**2052**	**2,378**	**1,326**	**1,052**

c. Segment 2: 2000 S 2052 Background Traffic

The 2032 counts were multiplied by the recommended trendline percentages with the results showing that 2052 background traffic for 2000 S is forecasted to have 39 vph heading eastbound and 89 vehicles heading westbound.

d. Segment 2: 2000 S 2052 Background plus Site Traffic

The 2052 background counts were added to the site traffic resulting in the 2052 background plus site traffic for 2000 S forecasted at 143 vph heading eastbound and 139 vehicles heading westbound.

2. 2052 Horizon Year PM Peak Intersection Traffic Volumes

a. Intersection 1: Hwy 33/2000 S 2052 PM Peak Hour Background Turning Movements

The 2032 counts were multiplied by the recommended trendline percentages with the results shown in the following figure for 2052.

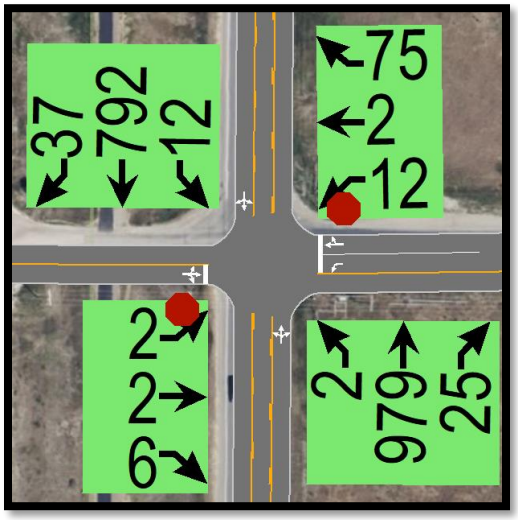


Figure 40: Hwy 33/2000 S 2052 PM Peak Hour Background Traffic Volume

b. Intersection 1: Hwy 33/2000 S 2052 PM Peak Hour Background plus Site Traffic Turning Movements

The generated traffic was added to the 2052 background traffic with the results shown in the following figure.

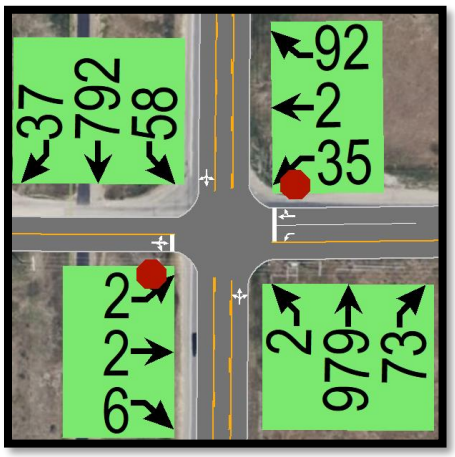


Figure 41: Hwy 33/2000 S 2052 PM Peak Hour Background plus Site Traffic Volume

c. Intersection 2: 2000 S/1000 E 2052 PM Peak Hour Background Turning Movements

The 2032 counts were multiplied by the recommended trendline percentages with the results shown in the following figure for 2052.

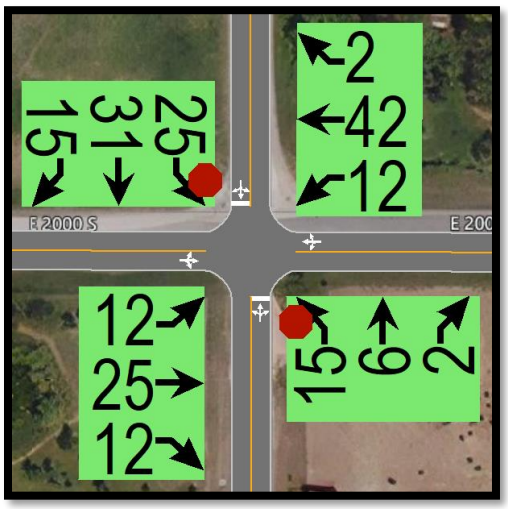


Figure 42: 2000 S/1000 E 2052 PM Peak Hour Background Traffic Volume

d. Intersection 2: 2000 S/1000 E 2052 PM Peak Hour Background plus Site Traffic Turning Movements

The generated traffic was added to the 2052 background traffic with the results shown in the following figure.

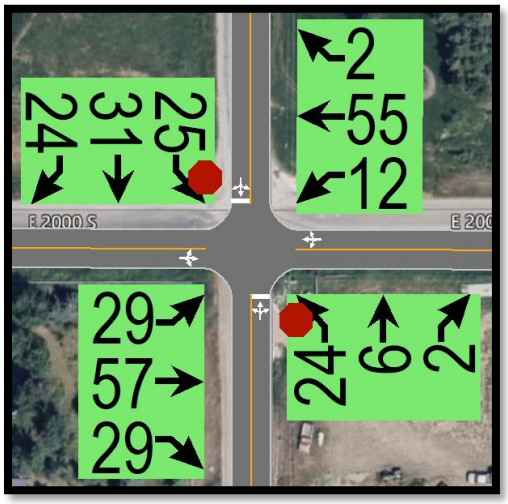


Figure 43: 2000 S/1000 E 2052 PM Peak Hour Background plus Site Traffic Volume

e. Intersection 3: 2000 S/Wildflower 2052 PM Peak Hour Background Turning Movements

There are no background volumes for this intersection because they will not exist until the construction of the Wildflower development.

f. Intersection 3: 2000 S/Wildflower 2052 PM Peak Hour Background plus Site Traffic Turning Movements

The generated traffic shown in the previous chapter was added to the through traffic with the results shown in the following figure.

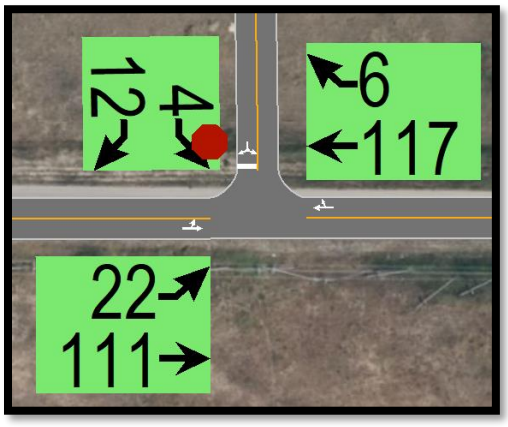


Figure 44: 2000 S/Wildflower 2052 PM Peak Hour Background plus Site Traffic Volume

g. Intersection 4: 2000 S/Trestles 2052 PM Peak Hour Background Turning Movements

There are no background volumes for this intersection because they will not exist until the construction of the Trestles development.

h. Intersection 4: 2000 S/Trestles 2052 PM Peak Hour Background plus Site Traffic Turning Movements

The generated traffic shown in the previous chapter was added to the through traffic with the results shown in the following figure.

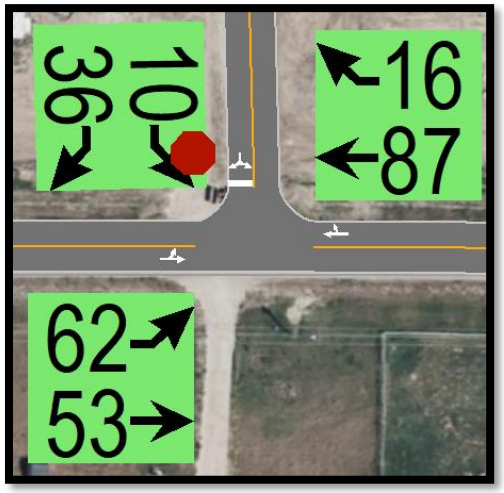


Figure 45: 2000 S/Trestles 2052 PM Peak Hour Background plus Site Traffic Volume

3. 2052 Horizon Year Segment Traffic Conditions

Using the same technique and the data from Table 6 from Chapter 5, the v/c ratio and LOS for the two segment's background and background plus site traffic can be forecasted.

a. Segment 1: Hwy 33 2052 Buildout Background Traffic Conditions

The traffic for this segment has been forecasted to have 1,205 vph for southbound traffic and 970 vph for the northbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.71 for southbound and 0.57 for northbound. The terrain within the study area is considered level and a 60% no passing zone will be used. This results in a LOS of E for southbound and LOS of D for northbound directions.

(1) Segment 1: Hwy 33 2052 Background Mitigation Measures

The worst Level of Service for the existing road segment layout on Hwy. 33 adjacent to the proposed development is an E for the southbound traffic. In order to increase capacity that will improve the LOS for the segment an additional southbound lane is warranted.

b. Segment 1: Hwy 33 2052 Buildout Background plus site Traffic Conditions

The traffic for this segment has been forecasted to have 1,326 vph for southbound traffic and 1,052 vph for the northbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.78 for southbound and 0.62 for northbound. The terrain within the study area is considered level and a 60% no passing zone will be used. This results in a LOS of E for southbound and LOS of E for northbound directions.

(1) Segment 1: Hwy 33 2052 Background plus Site Traffic Mitigation Measures

The worst Level of Service for the existing road segment layout on Hwy. 33 adjacent to the proposed development is an E for both the southbound and northbound traffic. In order to increase capacity that will improve the LOS for the segment the addition of southbound lane and a northbound lane is warranted.

c. Segment 2: 2000 S 2052 Buildout Background Traffic Conditions

The traffic for this segment has been forecasted to have 39 vph for eastbound traffic and 89 vph for the westbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.023 for eastbound and 0.052 for westbound. The terrain within the study area is considered level and a 0% no passing zone will be used. This results in a LOS of A for eastbound and LOS of A for westbound directions.

(1) Segment 2: 2000 S 2052 Background Mitigation Measures

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

d. Segment 2: 2000 S 2052 Buildout Background plus site Traffic Conditions

The traffic for this segment has been forecasted to have 143 vph for eastbound traffic and 139 vph for the westbound traffic. Dividing these volumes by 1700 vph, the v/c ratio is 0.084 for eastbound and 0.082 for westbound. The terrain within the study area is considered level and a 0% no passing zone will be used. This results in a LOS of A for eastbound and LOS of A for westbound directions.

(1) Segment 2: 2000 S 2052 Background plus Site Traffic Mitigation Measures

The worst Level of Service for the existing road segment on Hwy. 33 adjacent to the proposed development is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

4. 2052 Horizon Year Intersection Traffic Conditions

In order to determine how well an intersection is functioning, the intersection's Measures of Effectiveness (MOEs) for the peak hour is analyzed. The MOEs include:

1. Level of Service (LOS)
2. Control Delay
3. Volume/Capacity Ratio (V/C Ratio)
4. 95th Percentile Queue

Using the background and the background plus site traffic volumes and turning movements shown previously, the 2052 Horizon Year MOEs for the three intersections can be calculated.

a. Intersection #1 - Hwy 33/2000 S 2052 PM Peak Background Traffic

The background traffic volumes, identified at the beginning of this chapter, were entered into the computer modeling software Synchro. Additionally, the westbound left turn lane on 2000 S and the TWLTL on Hwy 33 was recommended for mitigation measures at buildout in the 2032 Horizon Year. The layout for the scenarios in this chapter will show these improvements. The results from the model for Intersection 1 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	2	2	6	12	2	75	2	979	25	12	792	37
Future Volume (vph)	2	2	6	12	2	75	2	979	25	12	792	37
Sign Control	—	Stop	—	—	Stop	—	—	Free	—	—	Free	—
Median Width (ft)	—	0	—	—	12	—	—	12	—	—	12	—
TWLTL Median	—	☐	—	—	☐	—	—	☑	—	—	☑	—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	—	—	4.1	—	—
Follow Up Time, tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	—	—	2.2	—	—
Volume to Capacity Ratio	0.05	0.05	0.05	0.07	0.32	0.32	0.00	0.00	0.00	0.02	0.02	0.02
Control Delay (s)	20.5	20.5	20.5	24.7	25.2	25.2	0.1	0.1	0.1	0.5	0.6	0.6
Level of Service	C	C	C	C	D	D	A	A	A	A	A	A
Queue Length 95th (ft)	4	4	4	5	34	34	0	0	0	2	2	2
Approach Delay (s)	—	20.5	—	—	25.1	—	—	0.1	—	—	0.6	—

Figure 46: Hwy 33/2000 S 2052 Buildout Intersection PM Peak Background Traffic Conditions

(1) Intersection #1 – Hwy 33/2000 S 2052 PM Peak Background Mitigation Measures

With the proposed improvements to the roadway as outlined in the previous chapter, the worst Level of Service at this intersection is a D. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

b. Intersection #1 – Hwy 33/2000 S 2052 PM Peak Background plus Site Traffic

The background traffic volumes and the site traffic, identified at the beginning of this chapter, were combined and entered into the computer modeling software Synchro. The results from the model for Intersection 1 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	2	2	6	35	2	92	2	979	73	58	792	37
Future Volume (vph)	2	2	6	35	2	92	2	979	73	58	792	37
Sign Control	—	Stop	—	—	Stop	—	—	Free	—	—	Free	—
Median Width (ft)	—	0	—	—	12	—	—	12	—	—	12	—
TWLTL Median	—	☐	—	—	☐	—	—	☑	—	—	☑	—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	—	—	4.1	—	—
Follow Up Time, tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	—	—	2.2	—	—
Volume to Capacity Ratio	0.06	0.06	0.06	0.22	0.41	0.41	0.00	0.00	0.00	0.10	0.10	0.10
Control Delay (s)	27.0	27.0	27.0	31.8	28.7	28.7	0.1	0.1	0.1	2.6	3.2	3.2
Level of Service	D	D	D	D	D	D	A	A	A	A	A	A
Queue Length 95th (ft)	5	5	5	20	46	46	0	0	0	9	9	9
Approach Delay (s)	—	27.0	—	—	29.5	—	—	0.1	—	—	3.2	—

Figure 47: Hwy 33/2000 S 2052 Buildout Intersection PM Peak Background plus Site Traffic Conditions

(1) Intersection #1 – Hwy 33/2000 S 2052 PM Peak Background plus Site Traffic Mitigation Measures

With the proposed improvements to the roadway as outlined in the previous chapter, the worst Level of Service at this intersection is a D. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

c. Intersection #2 – 2000 S/1000 E 2052 PM Peak Background Traffic

The background traffic volumes, identified at the beginning of this chapter, were entered into the computer modeling software Synchro. The results from the model for Intersection 2 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	12	25	12	12	42	2	15	6	2	25	31	15
Future Volume (vph)	12	25	12	12	42	2	15	6	2	25	31	15
Sign Control	—	Free	—	—	Free	—	—	Stop	—	—	Stop	—
Median Width (ft)	—	0	—	—	0	—	—	0	—	—	0	—
TWLTL Median	—	☐	—	—	☐	—	—	☐	—	—	☐	—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	4.1	—	—	4.1	—	—	7.1	6.5	6.2	7.1	6.5	6.2
Follow Up Time, tF (s)	2.2	—	—	2.2	—	—	3.5	4.0	3.3	3.5	4.0	3.3
Volume to Capacity Ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.03	0.03	0.10	0.10	0.10
Control Delay (s)	0.1	1.9	1.9	0.1	1.6	1.6	9.9	9.9	9.9	9.9	9.9	9.9
Level of Service	A	A	A	A	A	A	A	A	A	A	A	A
Queue Length 95th (ft)	1	1	1	1	1	1	3	3	3	8	8	8
Approach Delay (s)	—	1.9	—	—	1.6	—	—	9.9	—	—	9.9	—

Figure 48: 2000 S/1000 E 2052 Buildout Intersection PM Peak Background Traffic Conditions

(1) Intersection #2 – 2000 S/1000 E 2052 PM Peak Background Mitigation Measures

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

d. Intersection #2 - 2000 S/1000 E 2052 PM Peak Background plus Site Traffic

The background traffic volumes and the site traffic, identified at the beginning of this chapter, were combined and entered into the computer modeling software Synchro. The results from the model for Intersection 2 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)												
Traffic Volume (vph)	29	57	29	12	55	2	24	6	2	25	31	24
Future Volume (vph)	29	57	29	12	55	2	24	6	2	25	31	24
Sign Control	—	Free	—	—	Free	—	—	Stop	—	—	Stop	—
Median Width (ft)	—	0	—	—	0	—	—	0	—	—	0	—
TWLTL Median	—	☐	—	—	☐	—	—	☐	—	—	☐	—
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Critical Gap, tC (s)	4.1	—	—	4.1	—	—	7.1	6.5	6.2	7.1	6.5	6.2
Follow Up Time, tF (s)	2.2	—	—	2.2	—	—	3.5	4.0	3.3	3.5	4.0	3.3
Volume to Capacity Ratio	0.02	0.02	0.02	0.01	0.01	0.01	0.06	0.06	0.06	0.12	0.12	0.12
Control Delay (s)	0.2	2.0	2.0	0.1	1.3	1.3	11.0	11.0	11.0	10.6	10.6	10.6
Level of Service	A	A	A	A	A	A	B	B	B	B	B	B
Queue Length 95th (ft)	2	2	2	1	1	1	4	4	4	10	10	10
Approach Delay (s)	—	2.0	—	—	1.3	—	—	11.0	—	—	10.6	—

Figure 49: 2000 S/1000 E 2052 Buildout Intersection PM Peak Background plus Site Traffic Conditions

(1) Intersection #2 – 2000 S/1000 E 2052 PM Peak Background plus Site Traffic Mitigation Measures

The worst Level of Service at this intersection is a B. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions

e. Intersection #3 - 2000 S/Wildflower 2052 PM Peak Background Traffic

There are no background conditions for this intersection because they will not exist until the construction of the Wildflower development. Therefore, all delay times are zero (0) and the LOS is A.

f. Intersection #3 - 2000 S/Wildflower 2052 PM Peak Background plus Site Traffic

The background traffic volumes and the site traffic, identified at the beginning of this chapter, were combined and entered into the computer modeling software Synchro. The results from the model for Intersection 3 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	WBT	WBR	SBL	SBR
Lanes and Sharing (#RL)						
Traffic Volume (vph)	22	111	117	6	4	12
Future Volume (vph)	22	111	117	6	4	12
Sign Control	—	Free	Free	—	Stop	—
Median Width (ft)	—	0	0	—	12	—
TWLTL Median	—	☐	☐	—	☐	—
Right Turn Channelized	—	None	—	None	—	None
Critical Gap, tC (s)	4.1	—	—	—	6.4	6.2
Follow Up Time, tF (s)	2.2	—	—	—	3.5	3.3
Volume to Capacity Ratio	0.02	0.02	0.08	0.08	0.02	0.02
Control Delay (s)	0.1	1.4	0.0	0.0	9.4	9.4
Level of Service	A	A	A	A	A	A
Queue Length 95th (ft)	1	1	0	0	2	2
Approach Delay (s)	—	1.4	0.0	—	9.4	—

Figure 50: 2000 S/Wildflower 2052 Buildout Intersection PM Peak Background plus Site Traffic Conditions

(1) Intersection #3 – 2000 S/Wildflower 2052 PM Peak Background Mitigation Measures

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

g. Intersection #4 - 2000 S/Trestles 2052 PM Peak Background Traffic

There are no background conditions for this intersection because they will not exist until the construction of the Trestles development. Therefore, all delay times are zero (0) and the LOS is A.

h. Intersection #4 – 2000 S/Trestles 2052 PM Peak Background plus Site Traffic

The background traffic volumes and the site traffic, identified at the beginning of this chapter, were combined and entered into the computer modeling software Synchro. The results from the model for Intersection 4 are shown in the following figure.

HCM 2000 SIGNING SETTINGS	EBL	EBT	WBT	WBR	SBL	SBR
Lanes and Sharing (#RL)						
Traffic Volume (vph)	62	53	87	16	10	36
Future Volume (vph)	62	53	87	16	10	36
Sign Control	—	Free	Free	—	Stop	—
Median Width (ft)	—	0	0	—	12	—
TWLTL Median	—			—		—
Right Turn Channelized	—	None	—	None	—	None
Critical Gap, tC (s)	4.1	—	—	—	6.4	6.2
Follow Up Time, tF (s)	2.2	—	—	—	3.5	3.3
Volume to Capacity Ratio	0.05	0.05	0.07	0.07	0.06	0.06
Control Delay (s)	0.4	4.2	0.0	0.0	9.4	9.4
Level of Service	A	A	A	A	A	A
Queue Length 95th (ft)	4	4	0	0	5	5
Approach Delay (s)	—	4.2	0.0	—	9.4	—

Figure 51: 2000 S/Trestles 2052 Buildout Intersection PM Peak Background plus Site Traffic Conditions

(1) Intersection #4 – 2000 S/Wildflower 2052 PM Peak Background Mitigation Measures

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

i. Turn Lane Warrants Based on Safety Analysis of Intersections

(2) 2052 Hwy. 33/2000 S

Left turn lanes were determined to be warranted at this intersection for the existing conditions (2022). A right turn lane for the northbound traffic was warranted in the 2032 Buildout Year. For the 2052 Horizon Year, a right turn lane for the southbound traffic is warranted.

C. Analysis of 2052 Horizon Year PM Peak Traffic Conditions Summary

This chapter has identified the following:

- Segment 1: Hwy 33 (Background and Background plus Site Traffic)
- The worst Level of Service for the existing road segment layout on Hwy. 33 adjacent to the proposed development is an E for both the southbound and northbound traffic. In order to increase

capacity that will improve the LOS for the segment, the addition of southbound lane and a northbound lane is warranted.

❖ Segment 2: 2000 S (Background and Background plus Site Traffic)

The worst Level of Service for the existing road segment layout on Hwy. 33 adjacent to the proposed development is an E for both the southbound and northbound traffic. In order to increase capacity that will improve the LOS for the segment, the addition of a southbound lane and a northbound lane is warranted.

❖ Intersection 1: Hwy 33/2000 S (Background and Background plus Site Traffic)

With the proposed improvements to the roadway as outlined in the previous chapter, the worst Level of Service at this intersection is a D. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

❖ Intersection 2: 2000 S/500 W (Background and Background plus Site Traffic)

The worst Level of Service at this intersection is a B. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

❖ Intersection 3: 2000 S/Wildflower (Background and Background plus Site Traffic)

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

❖ Intersection 4: 2000 S/Trestles (Background and Background plus Site Traffic)

The worst Level of Service at this intersection is an A. Therefore, in accordance with ITD guidelines, no improvements are warranted for the 2052 forecasted conditions.

❖ Left Turn Lane Analysis (Background and Background plus Site Traffic)

This study has identified that left turn lanes are warranted on Hwy 33 for the existing conditions (2022) for safety reasons as outlined by the ITD. No new lanes are warranted from the 2032 Buildout Year to the 2052 Horizon Year

❖ Right Turn Lane Analysis (Background and Background plus Site Traffic)

This study has identified that a right turn lane is warranted on Hwy 33 for the 2032 Buildout Year for safety reasons as outlined by the ITD. A right turn lane for the southbound traffic is warranted from the 2032 Buildout Year to the 2052 Horizon Year

IX. Conclusions

After evaluating the proposed development within the context of zoning; projected land use; existing transportation system; background traffic counts for the principal roadways within the study impact area; projected traffic for horizon year's corresponding with project opening, project buildout, and a 20-year horizon year; the findings of the Traffic Impact Study are summarized below. In order to simplify the forecasted traffic conditions as they have progressed through this study, the following two (2) figures were produced. The first table shows the forecasted progression of the roadway segments, and the second table shows the intersection's progression. Any cell highlighted in yellow represents a forecasted condition that is not considered acceptable. In addition, the mitigation measure's forecasted results are also shown in the following tables.

Table 16- Segment Traffic Conditions Progression Each Horizon Year

Segment 1: Highway 33	Southbound V/C Ratio	LOS	Northbound V/C Ratio	LOS
2022 Background Traffic (One Lane Each Way)	0.27	C	0.34	C
2032 Background Traffic (One Lanes Each Way)	0.35	D	0.44	D
2032 Background plus Site Traffic (One Lanes Each Way)	0.36	D	0.46	D
2052 Background Traffic (One Lanes Each Way)	0.71	E	0.57	D
2052 Background Traffic Mitigation (Add Southbound Lane)	0.36	C	0.57	D
2052 Background plus Site Traffic (One Lanes Each Way)	0.78	E	0.62	E
2052 Background Traffic Mitigation (Add South & Northbound Lane)	0.39	C	0.31	C

Segment 2: 2000 S	Eastbound V/C Ratio	LOS	Westbound V/C Ratio	LOS
2022 Background Traffic (One Lane Each Way)	0.014	A	0.025	A
2032 Background Traffic (One Lane Each Way)	0.019	A	0.039	A
2032 Background plus Site Traffic (One Lane Each Way)	0.059	A	0.062	A
2052 Background Traffic (One Lane Each Way)	0.023	A	0.052	A
2052 Background plus Site Traffic (One Lane Each Way)	0.084	A	0.082	A

Table *17- Intersection Traffic Conditions Progression Each Horizon Year*

Intersection 1: Hwy 33/2000 S	Eastbound Max LOS	Westbound Max LOS	Northbound Max LOS	Southbound Max LOS
2022 Background Traffic	B	B	A	A
2032 Background Traffic	C	C	A	A
2032 Background plus Site Traffic	C	E	A	A
2032 Mitigation Measures - Option 1 (Left Turn Lane)	C	E	A	A
2032 Mitigation Measures - Option 2 (Left Turn Lane & TWLTL)	B	C	A	A
2052 Background Traffic	C	D	A	A
2052 Background plus Site Traffic	D	D	A	A

Intersection 2: 2000 S/1000 E	Eastbound Max LOS	Westbound Max LOS	Northbound Max LOS	Southbound Max LOS
2022 Background Traffic	A	A	A	A
2032 Background Traffic	A	A	A	A
2032 Background plus Site Traffic	A	A	A	A
2052 Background Traffic	A	A	A	A
2052 Background plus Site Traffic	A	A	B	B

Intersection 3: 2000 S/Wildflower	Eastbound Max LOS	Westbound Max LOS	Northbound Max LOS	Southbound Max LOS
2022 Background Traffic	n/a	n/a	n/a	n/a
2032 Background Traffic	n/a	n/a	n/a	n/a
2032 Background plus Site Traffic	A	A	n/a	A
2052 Background Traffic	A	A	n/a	A
2052 Background plus Site Traffic	A	A	n/a	A

Intersection 4: 2000 S/Trestles	Eastbound Max LOS	Westbound Max LOS	Northbound Max LOS	Southbound Max LOS
2022 Background Traffic	n/a	n/a	n/a	n/a
2032 Background Traffic	n/a	n/a	n/a	n/a
2032 Background plus Site Traffic	A	A	n/a	A
2052 Background Traffic	A	A	n/a	A
2052 Background plus Site Traffic	A	A	n/a	A

A. Existing Traffic Conditions (2022)

1. Traffic Conditions

For the existing traffic conditions analyzed with the existing intersection control and lane configurations, all the road segments and intersections are within minimum operational thresholds.

a. Mitigating Measures

For traffic condition reasons, no improvements are warranted for the existing conditions.

2. Traffic Safety

For the existing traffic safety analyzed with the existing intersection control and lane configurations, the following have been determined to not meet ITD minimum recommended standards.

- Segment 1: Hwy 33 Northbound Traffic – A left turn lane is warranted
- Segment 1: Hwy 33 Southbound Traffic – A left turn lane is warranted

a. Mitigating Measures

For safety reasons, left turn lanes for both northbound and southbound traffic are warranted.

B. 2032 Buildout Year Traffic Conditions Results

1. Traffic Conditions

The roadway network was modeled the same as the existing conditions but with the increase in background traffic and the projected traffic from the proposed development. It has been forecasted that the westbound traffic on 2000 S will fall into an unacceptable level in the 2032 Buildout Year.

a. Mitigating Measures

Two (2) mitigation measures were modeled to improve the westbound traffic. The first model analyzed a left turn lane for the westbound traffic. This improved the through and right turning traffic but the left turning movement remained failed. The second model added a left turn lane and a Two Way Left Turn Lane (TWLTL) lane on Hwy 33. This resulted in all westbound turning movements being acceptable.

2. Traffic Safety

For the forecasted 2032 traffic safety analyzed with the existing intersection control and lane configurations, the following have been determined to not meet ITD minimum recommended standards.

- Segment 1: Hwy 33 Northbound Traffic – A right turn lane is warranted

a. Mitigating Measures

For safety reasons, a right left turn lane for the northbound traffic is warranted.

C. 2052 Horizon Year Traffic Conditions Results

1. Traffic Conditions

The roadway network with an increase in background traffic from 2032 to 2052, with a westbound turning lane on 2000 S, and a TWLTL on Hwy 33 was modeled as recommended in the 2032 Buildout Year. With these improvements, it was found that the intersections are forecasted to operate at an acceptable level, but Hwy 33 is projected to be over capacity.

a. Mitigating Measures

In order to increase capacity on Hwy 33, it is recommended that additional travel lanes be installed for both the southbound and northbound traffic.

2. Traffic Safety

For the forecasted 2052 traffic safety analyzed with the existing intersection control and lane configurations, the following have been determined to not meet ITD minimum recommended standards.

- Segment 1: Hwy 33 Southbound Traffic – A right turn lane is warranted

a. Mitigating Measures

For safety reasons, a right left turn lane for the southbound traffic is warranted.

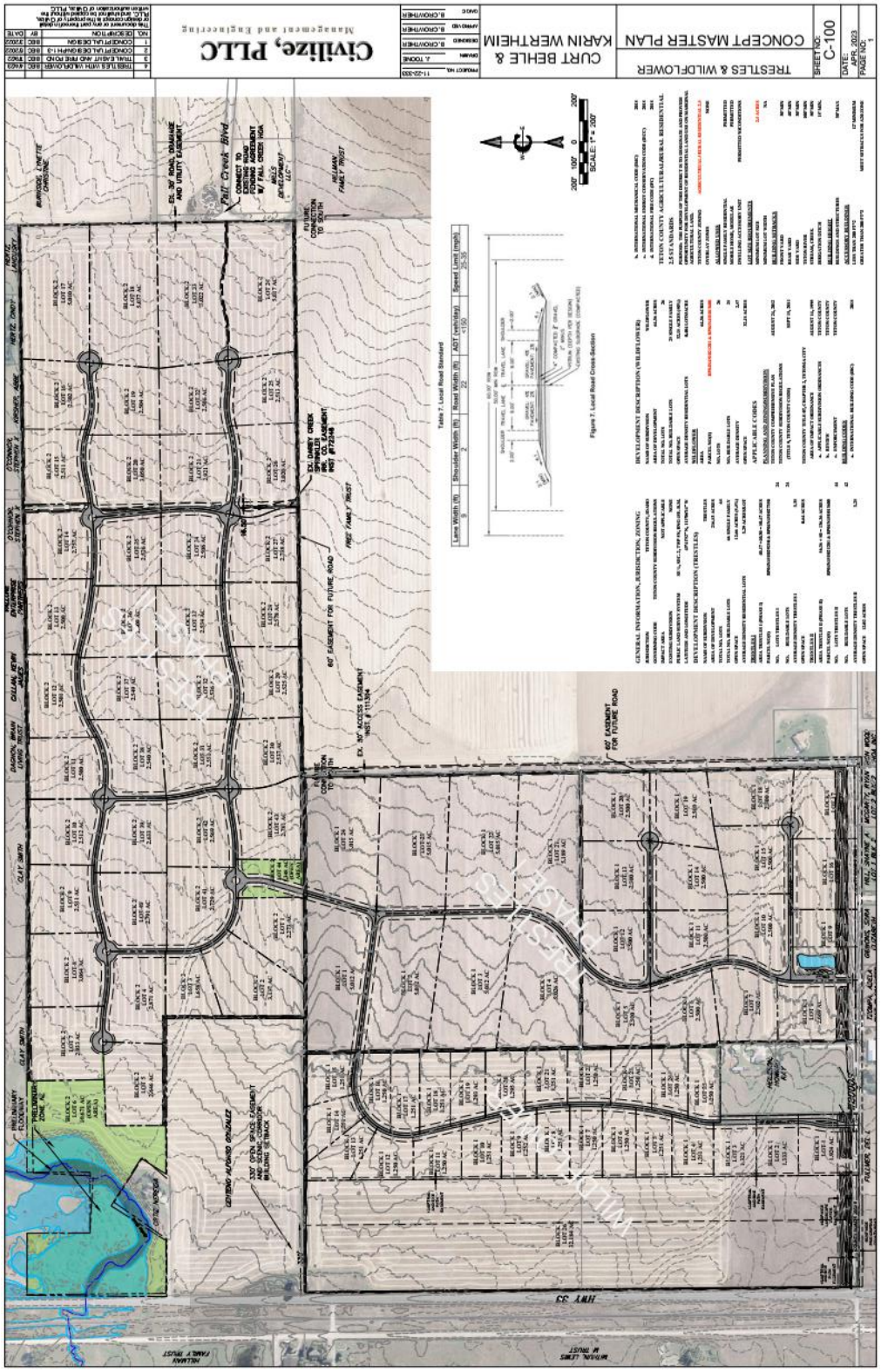
D. Overall Study Summary

This study has determined that the traffic within the study area is currently operating at an acceptable level during the pm peak hour of the day. ITD safety guidelines indicate that a left turn lane for both the northbound and southbound traffic is warranted on Hwy 33 for the existing conditions.

With the buildout of the proposed development in 2032 and the increase in background traffic from 2022 to 2032, it has been determined that a left turn lane for the westbound traffic on 2000 S along with a two-way left turn lane (TWLTL) is warranted on Hwy 33 to handle the forecasted traffic at buildout. For the 2032 forecasted traffic, the ITD safety guidelines indicate that the addition of a right turn lane for the northbound traffic will be warranted.

Lastly, for the 20-year horizon year analysis (2052), it was determined that with the addition of the left turn lane for the westbound traffic on 2000 S and the TWLTL (as recommended for the 2032 Buildout), the traffic is forecasted to operate at an acceptable level. However, Hwy 33 is projected to be over capacity and additional lanes for both the northbound and southbound traffic will be warranted. ITD safety guidelines indicate that a right turn lane for the southbound traffic will be warranted.

Appendix A: Site Plan


TRESTLES & WILDFLOWER
CONCEPT MASTER PLAN
C-100
CURT BEHLE & KARIN WERTHEIM
Civilize, PLLC
Management and Engineering
Table 7. Local Road Standard
Figure 7. Local Road Cross-Section
Peil Creek Blvd
HWY 33

Appendix B
Encroachment Permit Application

Your Safety • Your Mobility
Your Economic Opportunity

Right-of-Way Encroachment Application And Permit Approaches Or Public Streets

ITD 2109 (Rev. 05-18)
itd.idaho.gov

ITD Permit Application Number _____

For ITD Use

Project Number From ITD Highway Plan		Date Application Received	In City Limits
Route	Segment	C/L Milepost ☐ Right ☐ Left	C/L Station ☐ Right ☐ Left
Traffic Impact Study Required ☐ Yes ☐ No	Appraisal Required ☐ Yes ☐ No	Number of Lanes	Access Purchased ☐ Yes ☐ No
Distance From Nearest Approach (Both sides, both directions of roadway)			
Site Distance Right Left	Reason if Restricted to Right Or Left	Culvert Needed ☐ Yes ☐ No	If Yes, Enter Minimum Size Dia. Length

Applicant Information (Please Print or Type)

Applicant(s) Name (Printed)	Mailing Address or P.O. Box	City	State	Zip Code
E-Mail Address (If available)	Daytime Phone Number	Alternate Phone Number		
Property Owner's Name (Printed)	Property Address and TAX ID Number	City (If in city limits)	County	
Nearest Public Street/Road	Current Property Use	Current Zoning	Proposed Property Use	Proposed Zoning
How is Access Currently Gained?	Property Owner Owns Adjacent Properties ☐ Yes ☐ No If Yes, Describe			

Request Details

Is this a new approach? ☐ Yes ☐ No	Is this a temporary approach ☐ Yes ☐ No	If this is a proposed modification to an existing approach, check all that apply ☐ Location ☐ Width ☐ Use ☐ Remove ☐ Consolidate Multiple
Desired Approach Width (Without flares at property line)	Type of Approach Requested ☐ Agricultural ☐ SF Residential ☐ Joint Use ☐ MF Residential ☐ Subdivision ☐ Commercial ☐ Public Street ☐ Other	
Additional information you would like ITD to be aware of - Attach additional sheets if necessary.		

Contacts			
	Construction Contractor	Phone Number	E-Mail Address
	Traffic Control Contractor	Phone Number	E-Mail Address
	Traffic Control Plan Submitted ☐ Yes ☐ No	Projected Start Date	Project Duration

ITD 2109, Rev. 05-18

Page 1 of 3

List any conditions of approval
List reason(s) for denial recommendation

Acceptance and Approval to Work **ITD Permit Application Number** _____

By signing this permit, the permittee or his authorized representative certify that they have been made aware of and agree with all requirements of the permit, including any and all restrictions and further agree to indemnify, save harmless, and defend regardless of outcome ITD from the expenses of and against all suits or claims, including costs, expenses, and attorney fees that may be incurred by reason of any act or omission, neglect, or misconduct of the permittee or its contractor in the design, construction, and maintenance of the work, which is the subject of this permit.

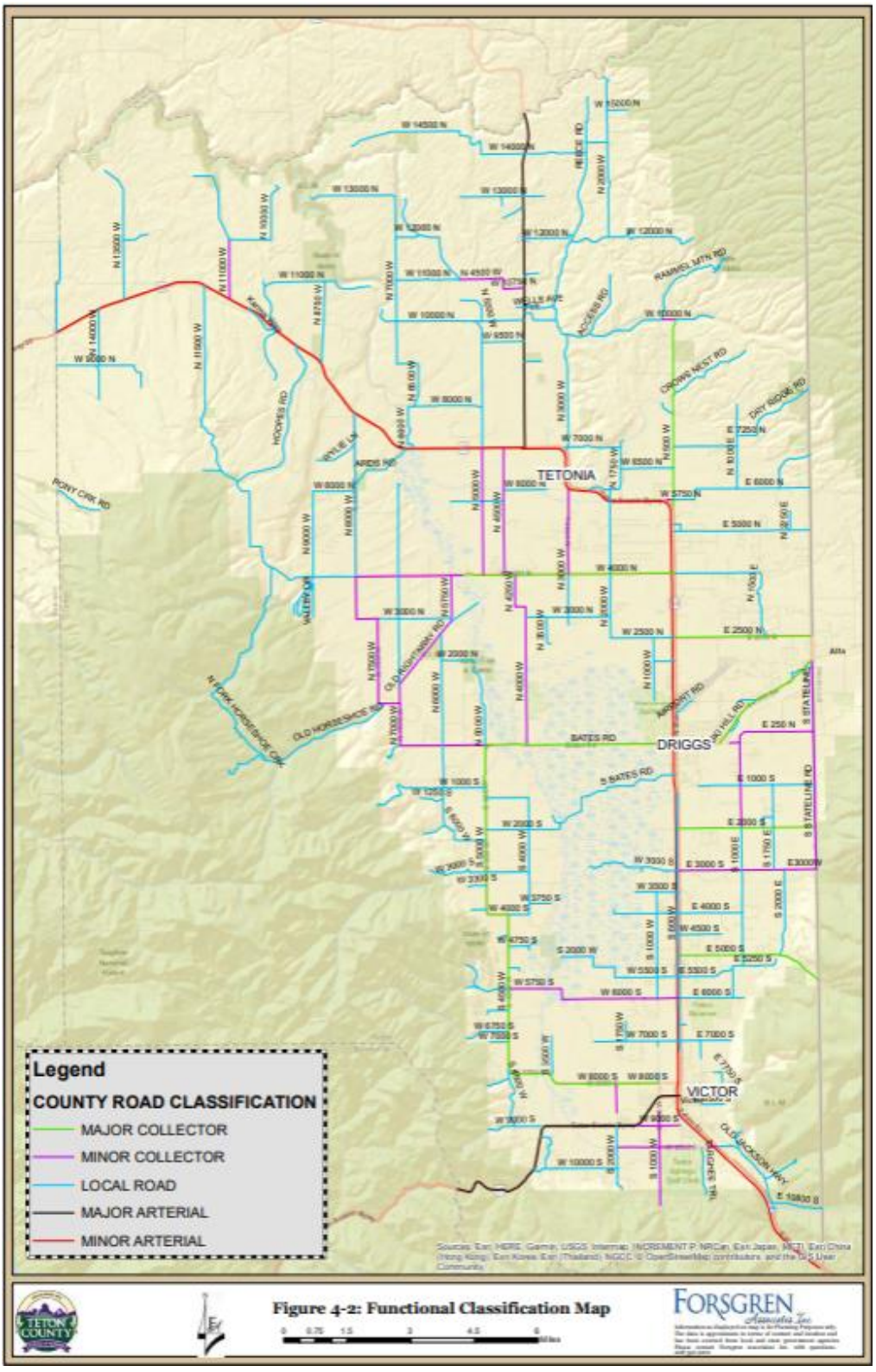
Property Owner/Authorized Representative's Signature	Company Name (If applicable)	Phone Number	Date
X			

Subject to all terms, conditions, and provisions of this permit or attachments, permission is hereby granted to begin work within the State Highway Right-of-Way.

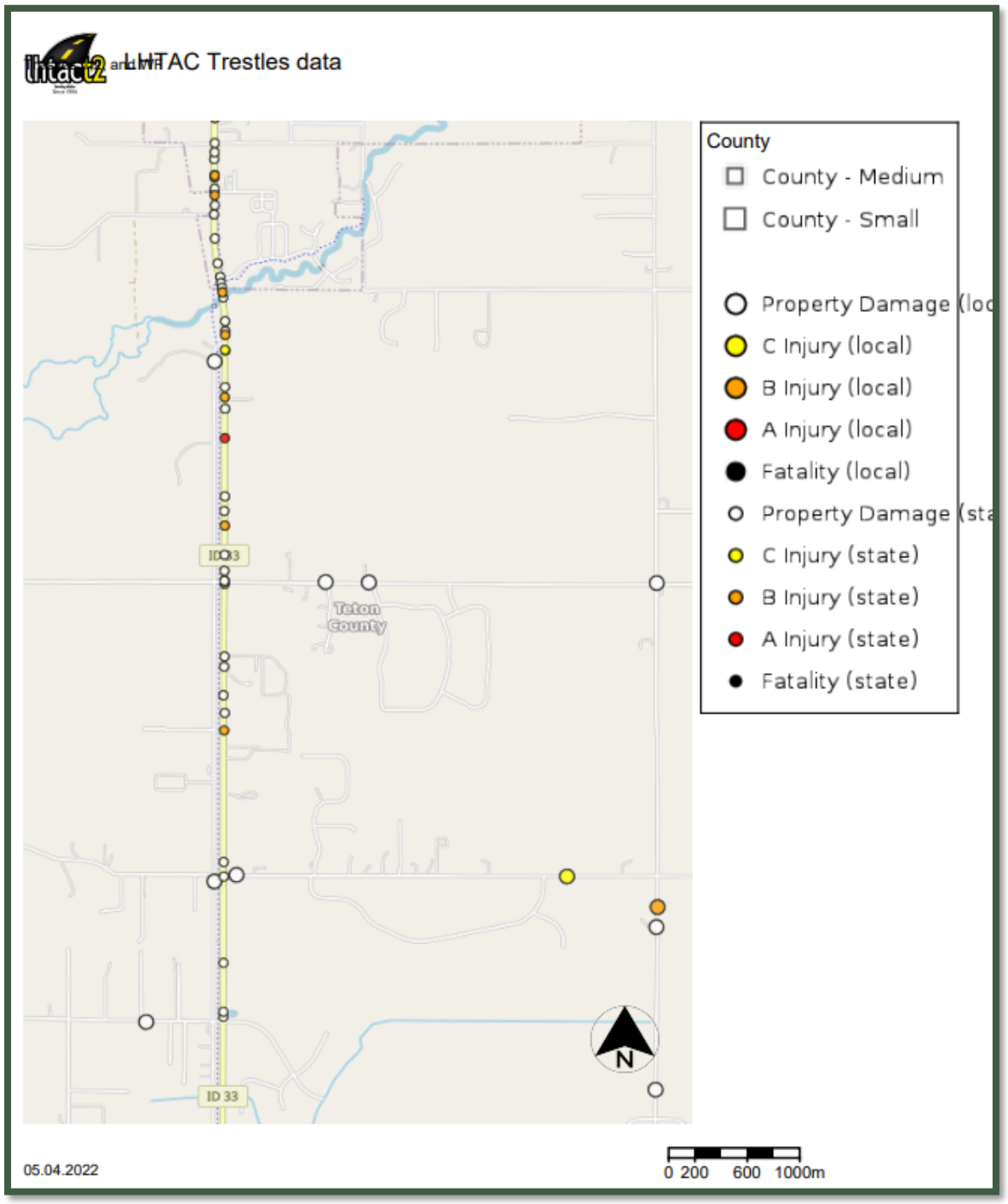
Idaho Transportation Department Authorized Representative's Signature	Title	Date
X		

ITD 2109, Rev. 05-18 Page 2 of 3

Appendix C
Existing Transportation System Mapping


TETONIA
DRIGGS
VICTOR
Legend
COUNTY ROAD CLASSIFICATION
MAJOR COLLECTOR
MINOR COLLECTOR
LOCAL ROAD
MAJOR ARTERIAL
MINOR ARTERIAL
Figure 4-2: Functional Classification Map
TETON COUNTY
FORSGREN

Appendix D
LHTAC Crash Data


LHTAC Trestles data
County
County - Medium
County - Small
Property Damage (loc
C Injury (local)
B Injury (local)
A Injury (local)
Fatality (local)
Property Damage (sta
C Injury (state)
B Injury (state)
A Injury (state)
Fatality (state)
ID 33
Teton County
ID 33
N
05.04.2022
0 200 600 1000m

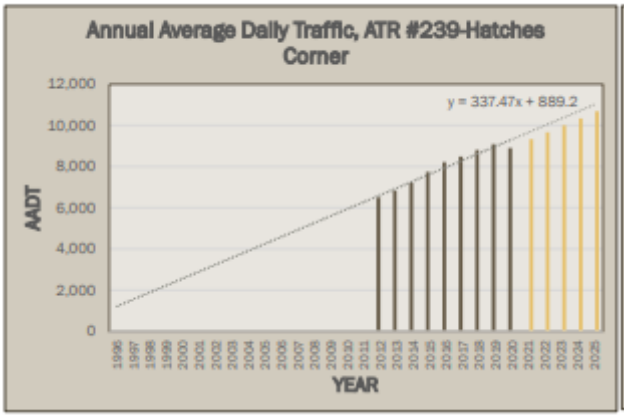
Appendix E
Historical Traffic Volumes

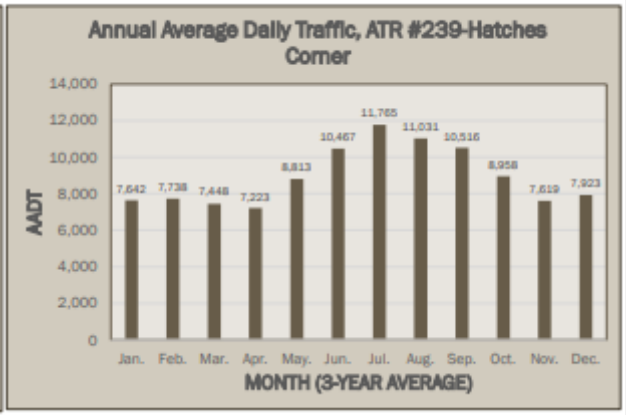
Civilize, PLLC
Management and Engineering

Project Analysis Worksheet
Tranportation Engineering
AADT by Month, 1990 to 2021
ATR #239, Hatches Corner, Idaho

Client:	3000 North Partners	DESIGNED	BEC
Project:	Alpenglo	CHECKED	BEC
Project No.:	01-21-0043	DATE:	10/20/2021

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	24-Hour Annual Avg.
1990													
1991													
1992													
1993													
1994													
1995													
1996													
1997													
1998													
1999													
2000													
2001													
2002													
2003													
2004													
2005													
2006													
2007													
2008													
2009													
2010													
2011												5,467	
2012	5,281	5,529	5,530	5,881	6,470	7,409	8,638	8,149	7,425	6,379	5,604	5,734	6,502
2013	5,556	5,877	5,874	6,018	6,769	7,894	9,023	8,521	7,565	6,864	5,929	6,053	6,829
2014	6,094	6,146	6,194	6,473	7,304	8,388	9,326	8,740	8,262	7,273	6,032	6,344	7,215
2015	6,342	6,894	6,984	7,011	7,753	9,071	10,011	9,337	8,645	7,621	6,587	6,732	7,749
2016	6,862	7,179	7,138	7,388	8,430	9,604	10,528	10,235	9,327	7,902	7,107	6,876	8,215
2017	6,809	7,122	7,301	7,541	8,798	9,860	10,976	10,758	9,500	8,326	7,275	7,593	8,488
2018	7,630	7,664	7,536	7,773	9,051	10,381	11,520	10,479	10,033	8,579	7,451	7,656	8,813
2019	7,656	7,347	7,861	8,101	9,141	10,800	11,987	11,145	10,308	8,874	7,829	7,965	9,084
2020	7,641	8,203	6,947	5,795	8,247	10,221	11,789	11,468	11,206	9,421	7,576	8,148	8,889
2021	8,297	8,503	8,901	9,057	10,891	12,878	13,527	12,279	11,761				9,326
2022													9,663
2023													10,001
2024													10,338
2025	2,519												10,676
Three-Year Average	7,642	7,738	7,448	7,223	8,813	10,467	11,765	11,031	10,516	8,958	7,619	7,923	8,929





Appendix F
Existing Conditions (2022) Traffic Volumes

2022 Existing Conditions_ Intersection Hwy 33/2000S

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	3	6	1	36	1	471	12	6	381	18
Future Volume (Veh/h)	1	1	3	6	1	36	1	471	12	6	381	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	3	7	1	39	1	512	13	7	414	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	998	965	424	962	968	518	434			525		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	998	965	424	962	968	518	434			525		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	93	100			99		
cM capacity (veh/h)	205	253	630	232	252	557	1126			1042		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	47	526	441
Volume Left	1	7	1	7
Volume Right	3	39	13	20
cSH	368	451	1126	1042
Volume to Capacity	0.01	0.10	0.00	0.01
Queue Length 95th (ft)	1	9	0	1
Control Delay (s)	14.9	13.9	0.0	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	14.9	13.9	0.0	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	36.1%	ICU Level of Service	A	
Analysis Period (min)	15			

2022 Existing Conditions_ Intersection 2000S/1000E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	12	6	6	15	1	3	3	1	12	15	3
Future Volume (Veh/h)	6	12	6	6	15	1	3	3	1	12	15	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	13	7	7	16	1	3	3	1	13	16	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	17			20			72	62	16	64	64	16
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	17			20			72	62	16	64	64	16
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	98	100
cM capacity (veh/h)	1600			1596			897	822	1063	921	819	1063

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	27	24	7	32
Volume Left	7	7	3	13
Volume Right	7	1	1	3
cSH	1600	1596	882	877
Volume to Capacity	0.00	0.00	0.01	0.04
Queue Length 95th (ft)	0	0	1	3
Control Delay (s)	1.9	2.1	9.1	9.3
Lane LOS	A	A	A	A
Approach Delay (s)	1.9	2.1	9.1	9.3
Approach LOS			A	A

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Appendix H
Buildout (2032) Horizon Year Traffic Analysis

Trestles - 2032 Background - Int 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	4	8	1	46	1	601	15	8	486	23
Future Volume (Veh/h)	1	1	4	8	1	46	1	601	15	8	486	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	4	9	1	50	1	653	16	9	528	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1272	1230	540	1226	1234	661	553			669		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1272	1230	540	1226	1234	661	553			669		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	94	99	89	100			99		
cM capacity (veh/h)	125	173	536	150	172	457	1002			907		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	6	60	670	562
Volume Left	1	9	1	9
Volume Right	4	50	16	25
cSH	283	343	1002	907
Volume to Capacity	0.02	0.18	0.00	0.01
Queue Length 95th (ft)	2	16	0	1
Control Delay (s)	18.0	17.7	0.0	0.3
Lane LOS	C	C	A	A
Approach Delay (s)	18.0	17.7	0.0	0.3
Approach LOS	C	C		

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	44.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Trestles - 2032 Background Plus Site - Int 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	4	36	1	68	1	601	53	54	486	23
Future Volume (Veh/h)	1	1	4	36	1	68	1	601	53	54	486	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	4	39	1	74	1	653	58	59	528	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1417	1372	540	1347	1355	682	553			711		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1417	1372	540	1347	1355	682	553			711		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	67	99	83	100			93		
cM capacity (veh/h)	89	134	536	118	137	445	1002			875		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	6	114	712	612
Volume Left	1	39	1	59
Volume Right	4	74	58	25
cSH	229	226	1002	875
Volume to Capacity	0.03	0.50	0.00	0.07
Queue Length 95th (ft)	2	64	0	5
Control Delay (s)	21.1	36.0	0.0	1.8
Lane LOS	C	E	A	A
Approach Delay (s)	21.1	36.0	0.0	1.8
Approach LOS	C	E		

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	86.4%	ICU Level of Service	E	
Analysis Period (min)	15			

Trestles - 2032 Mitigation Option 1 - Int 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	4	36	1	68	1	601	53	54	486	23
Future Volume (Veh/h)	1	1	4	36	1	68	1	601	53	54	486	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	4	39	1	74	1	653	58	59	528	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1417	1372	540	1347	1355	682	553			711		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1417	1372	540	1347	1355	682	553			711		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	67	99	83	100			93		
cM capacity (veh/h)	89	134	536	118	137	445	1002			875		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	6	39	75	712	612
Volume Left	1	39	0	1	59
Volume Right	4	0	74	58	25
cSH	229	118	432	1002	875
Volume to Capacity	0.03	0.33	0.17	0.00	0.07
Queue Length 95th (ft)	2	33	16	0	5
Control Delay (s)	21.1	49.8	15.1	0.0	1.8
Lane LOS	C	E	C	A	A
Approach Delay (s)	21.1	27.0		0.0	1.8
Approach LOS	C	D			

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			

Trestles - 2032 Mitigation Option 2 - Int 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	4	36	1	68	1	601	53	54	486	23
Future Volume (Veh/h)	1	1	4	36	1	68	1	601	53	54	486	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	4	39	1	74	1	653	58	59	528	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1417	1372	540	1347	1355	682	553			711		
vC1, stage 1 conf vol	658	658		684	684							
vC2, stage 2 conf vol	758	713		663	671							
vCu, unblocked vol	1417	1372	540	1347	1355	682	553			711		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	88	100	83	100			93		
cM capacity (veh/h)	234	301	536	313	325	445	1002			875		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	6	39	75	712	612
Volume Left	1	39	0	1	59
Volume Right	4	0	74	58	25
cSH	398	313	443	1002	875
Volume to Capacity	0.02	0.12	0.17	0.00	0.07
Queue Length 95th (ft)	1	11	15	0	5
Control Delay (s)	14.2	18.1	14.8	0.0	1.8
Lane LOS	B	C	B	A	A
Approach Delay (s)	14.2	15.9		0.0	1.8
Approach LOS	B	C			

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			

Trestles - 2032 Background - Int 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	15	8	8	19	1	4	4	1	15	19	4
Future Volume (Veh/h)	8	15	8	8	19	1	4	4	1	15	19	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	16	9	9	21	1	4	4	1	16	21	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	22			25			92	78	20	81	82	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	22			25			92	78	20	81	82	22
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	99	100	98	97	100
cM capacity (veh/h)	1574			1570			855	797	1049	887	793	1047

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	34	31	9	41
Volume Left	9	9	4	16
Volume Right	9	1	1	4
cSH	1574	1570	845	848
Volume to Capacity	0.01	0.01	0.01	0.05
Queue Length 95th (ft)	0	0	1	4
Control Delay (s)	2.0	2.2	9.3	9.5
Lane LOS	A	A	A	A
Approach Delay (s)	2.0	2.2	9.3	9.5
Approach LOS			A	A

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Trestles - 2032 Background plus Site- Int 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	24	16	8	27	1	12	4	1	15	19	12
Future Volume (Veh/h)	16	24	16	8	27	1	12	4	1	15	19	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	26	17	9	29	1	13	4	1	16	21	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	30			43			140	116	34	119	124	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	30			43			140	116	34	119	124	30
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	99	100	98	97	99
cM capacity (veh/h)	1564			1547			786	755	1030	835	748	1037

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	60	39	18	50
Volume Left	17	9	13	16
Volume Right	17	1	1	13
cSH	1564	1547	789	836
Volume to Capacity	0.01	0.01	0.02	0.06
Queue Length 95th (ft)	1	0	2	5
Control Delay (s)	2.1	1.7	9.7	9.6
Lane LOS	A	A	A	A
Approach Delay (s)	2.1	1.7	9.7	9.6
Approach LOS			A	A

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	14.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Trestles - 2032 Background plus Site- Int 3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	86	65	6	4	12
Future Volume (Veh/h)	22	86	65	6	4	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	93	71	7	4	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	78				216	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78				216	74
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	99
cM capacity (veh/h)	1502				754	979

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	117	78	17
Volume Left	24	0	4
Volume Right	0	7	13
cSH	1502	1700	915
Volume to Capacity	0.02	0.05	0.02
Queue Length 95th (ft)	1	0	1
Control Delay (s)	1.6	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	1.6	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

Trestles - 2032 Background plus Site- Int 4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	46	35	16	10	36
Future Volume (Veh/h)	62	46	35	16	10	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	50	38	17	11	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	55				230	46
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	55				230	46
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				98	96
cM capacity (veh/h)	1531				718	1014

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	117	55	50
Volume Left	67	0	11
Volume Right	0	17	39
cSH	1531	1700	930
Volume to Capacity	0.04	0.03	0.05
Queue Length 95th (ft)	3	0	4
Control Delay (s)	4.4	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	4.4	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix I
2052 Horizon Year Traffic Analysis

Trestles - 2052 Backgrounds - Int 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	2	6	12	2	75	2	979	25	12	792	37
Future Volume (Veh/h)	2	2	6	12	2	75	2	979	25	12	792	37
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	13	2	82	2	1064	27	13	861	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2072	2002	881	1996	2008	1078	901			1091		
vC1, stage 1 conf vol	907	907		1082	1082							
vC2, stage 2 conf vol	1164	1095		915	927							
vCu, unblocked vol	2072	2002	881	1996	2008	1078	901			1091		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	99	98	93	99	69	100			98		
cM capacity (veh/h)	130	215	341	196	220	262	742			628		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	11	13	84	1093	914
Volume Left	2	13	0	2	13
Volume Right	7	0	82	27	40
cSH	243	196	261	742	628
Volume to Capacity	0.05	0.07	0.32	0.00	0.02
Queue Length 95th (ft)	4	5	34	0	2
Control Delay (s)	20.5	24.7	25.2	0.1	0.6
Lane LOS	C	C	D	A	A
Approach Delay (s)	20.5	25.1		0.1	0.6
Approach LOS	C	D			

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Trestles - 2052 Backgrounds plus Site - Int 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	2	6	35	2	92	2	979	73	58	792	37
Future Volume (Veh/h)	2	2	6	35	2	92	2	979	73	58	792	37
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	38	2	100	2	1064	79	63	861	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2216	2154	881	2122	2134	1104	901			1143		
vC1, stage 1 conf vol	1007	1007		1108	1108							
vC2, stage 2 conf vol	1208	1147		1015	1027							
vCu, unblocked vol	2216	2154	881	2122	2134	1104	901			1143		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	98	78	99	61	100			90		
cM capacity (veh/h)	66	166	341	172	195	253	742			600		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	11	38	102	1145	964
Volume Left	2	38	0	2	63
Volume Right	7	0	100	79	40
cSH	175	172	252	742	600
Volume to Capacity	0.06	0.22	0.41	0.00	0.10
Queue Length 95th (ft)	5	20	46	0	9
Control Delay (s)	27.0	31.8	28.7	0.1	3.2
Lane LOS	D	D	D	A	A
Approach Delay (s)	27.0	29.5		0.1	3.2
Approach LOS	D	D			

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	103.4%	ICU Level of Service	G	
Analysis Period (min)	15			

Trestles - 2052 Background - Int 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	25	12	12	42	2	15	6	2	25	31	15
Future Volume (Veh/h)	12	25	12	12	42	2	15	6	2	25	31	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	27	13	13	46	2	16	7	2	27	34	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	48			40			166	134	34	138	139	47
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48			40			166	134	34	138	139	47
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	99	100	97	95	98
cM capacity (veh/h)	1540			1550			743	739	1031	808	734	1014

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	53	61	25	77
Volume Left	13	13	16	27
Volume Right	13	2	2	16
cSH	1540	1550	759	806
Volume to Capacity	0.01	0.01	0.03	0.10
Queue Length 95th (ft)	1	1	3	8
Control Delay (s)	1.9	1.6	9.9	9.9
Lane LOS	A	A	A	A
Approach Delay (s)	1.9	1.6	9.9	9.9
Approach LOS			A	A

Intersection Summary					
Average Delay			5.6		
Intersection Capacity Utilization			14.5%	ICU Level of Service	A
Analysis Period (min)			15		

Trestles - 2052 Background plus Site - Int 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	57	29	12	55	2	24	6	2	25	31	24
Future Volume (Veh/h)	29	57	29	12	55	2	24	6	2	25	31	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	62	32	13	60	2	26	7	2	27	34	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	62			94			272	230	78	234	245	61
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62			94			272	230	78	234	245	61
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			96	99	100	96	95	97
cM capacity (veh/h)	1522			1481			616	645	974	691	633	996

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	126	75	35	87
Volume Left	32	13	26	27
Volume Right	32	2	2	26
cSH	1522	1481	635	731
Volume to Capacity	0.02	0.01	0.06	0.12
Queue Length 95th (ft)	2	1	4	10
Control Delay (s)	2.0	1.3	11.0	10.6
Lane LOS	A	A	B	B
Approach Delay (s)	2.0	1.3	11.0	10.6
Approach LOS			B	B

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	20.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Trestles - 2052 Background plus Site - Int 3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	111	117	6	4	12
Future Volume (Veh/h)	22	111	117	6	4	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	121	127	7	4	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	134				300	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	134				300	130
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	99
cM capacity (veh/h)	1432				674	911

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	145	134	17
Volume Left	24	0	4
Volume Right	0	7	13
cSH	1432	1700	842
Volume to Capacity	0.02	0.08	0.02
Queue Length 95th (ft)	1	0	2
Control Delay (s)	1.4	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	1.4	0.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	26.9%	ICU Level of Service	A
Analysis Period (min)	15		

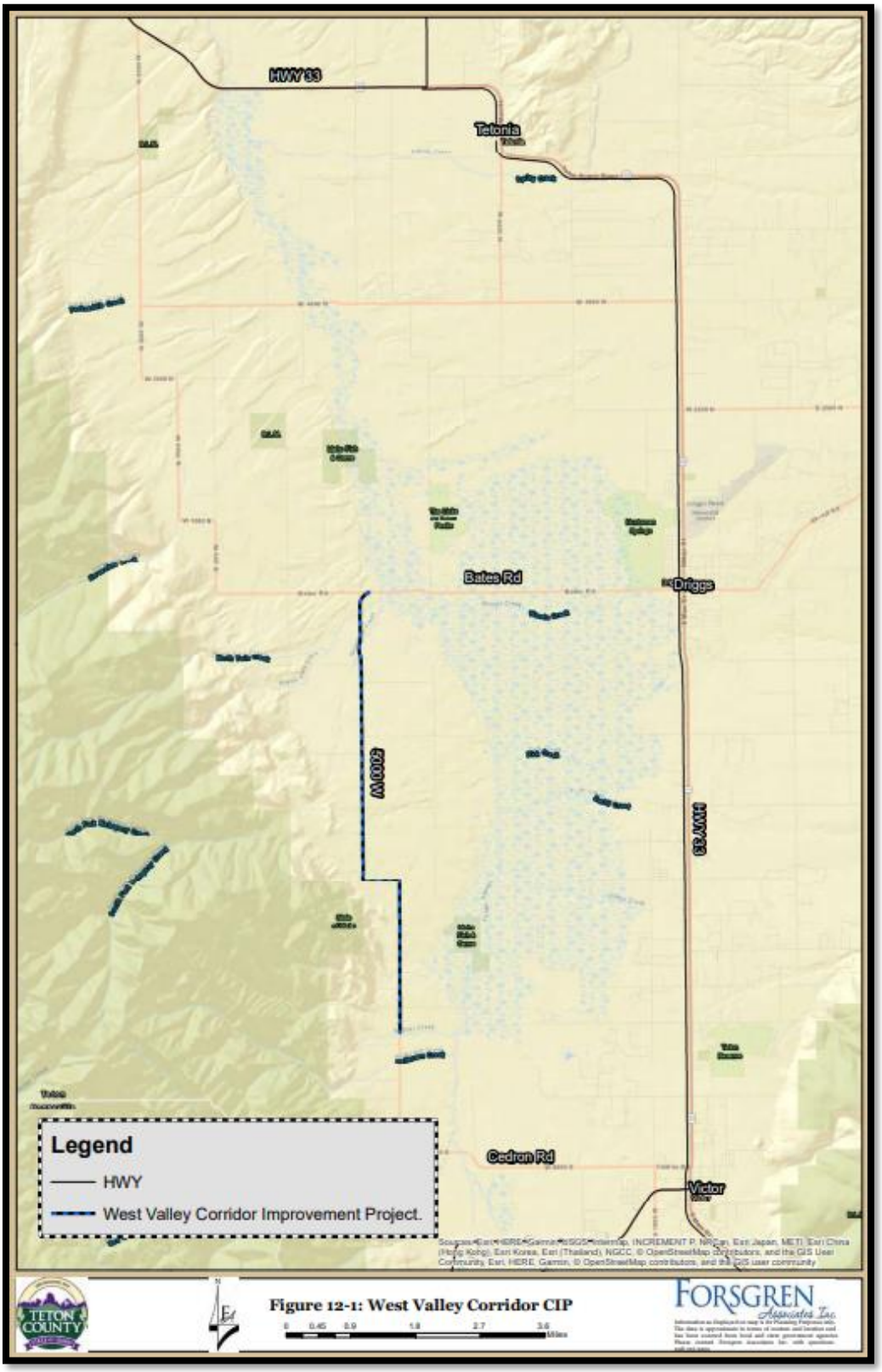
Trestles - 2052 Background plus Site - Int 4

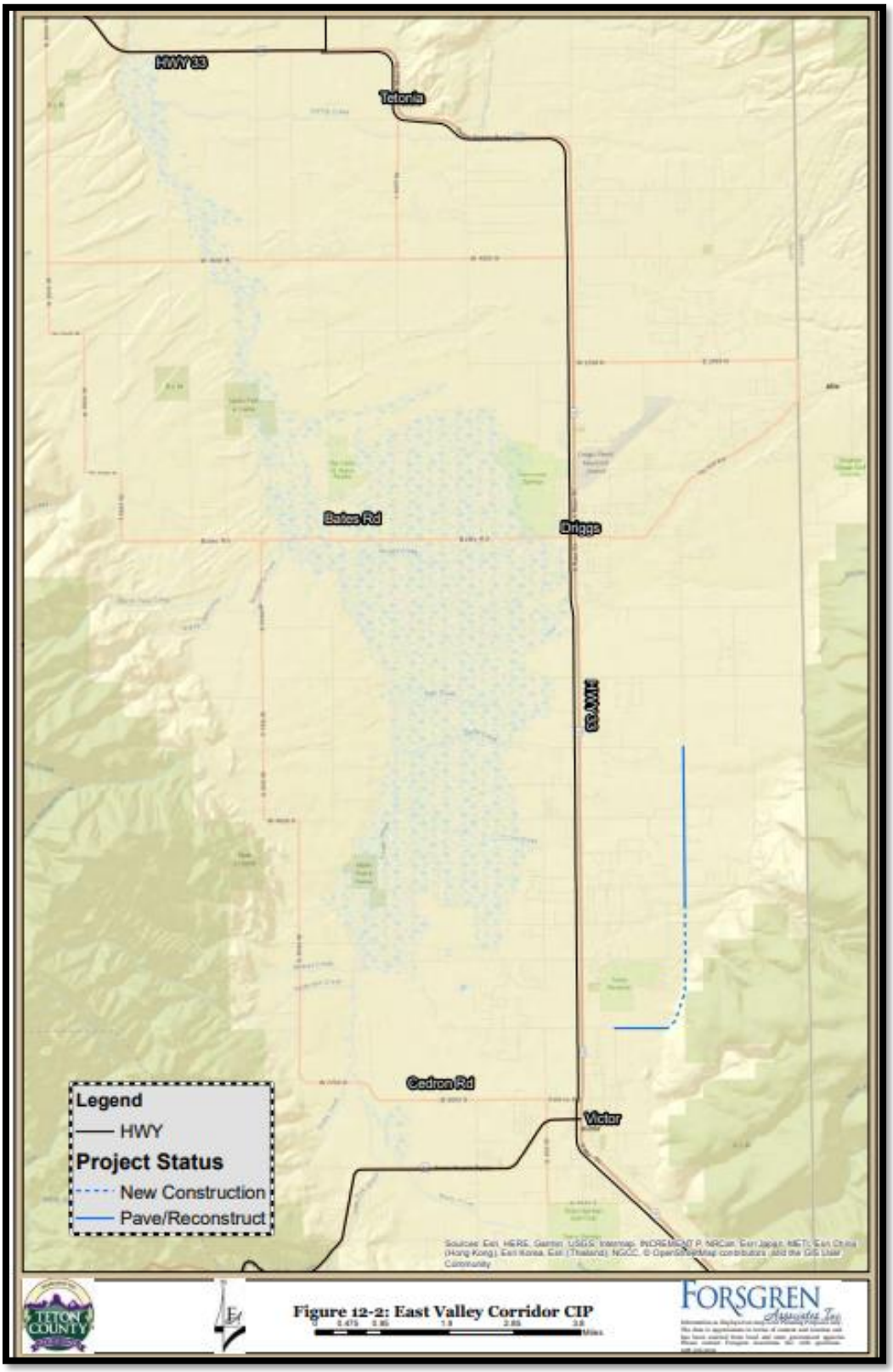
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	53	87	16	10	36
Future Volume (Veh/h)	62	53	87	16	10	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	58	95	17	11	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	112				296	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	112				296	104
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				98	96
cM capacity (veh/h)	1459				658	943

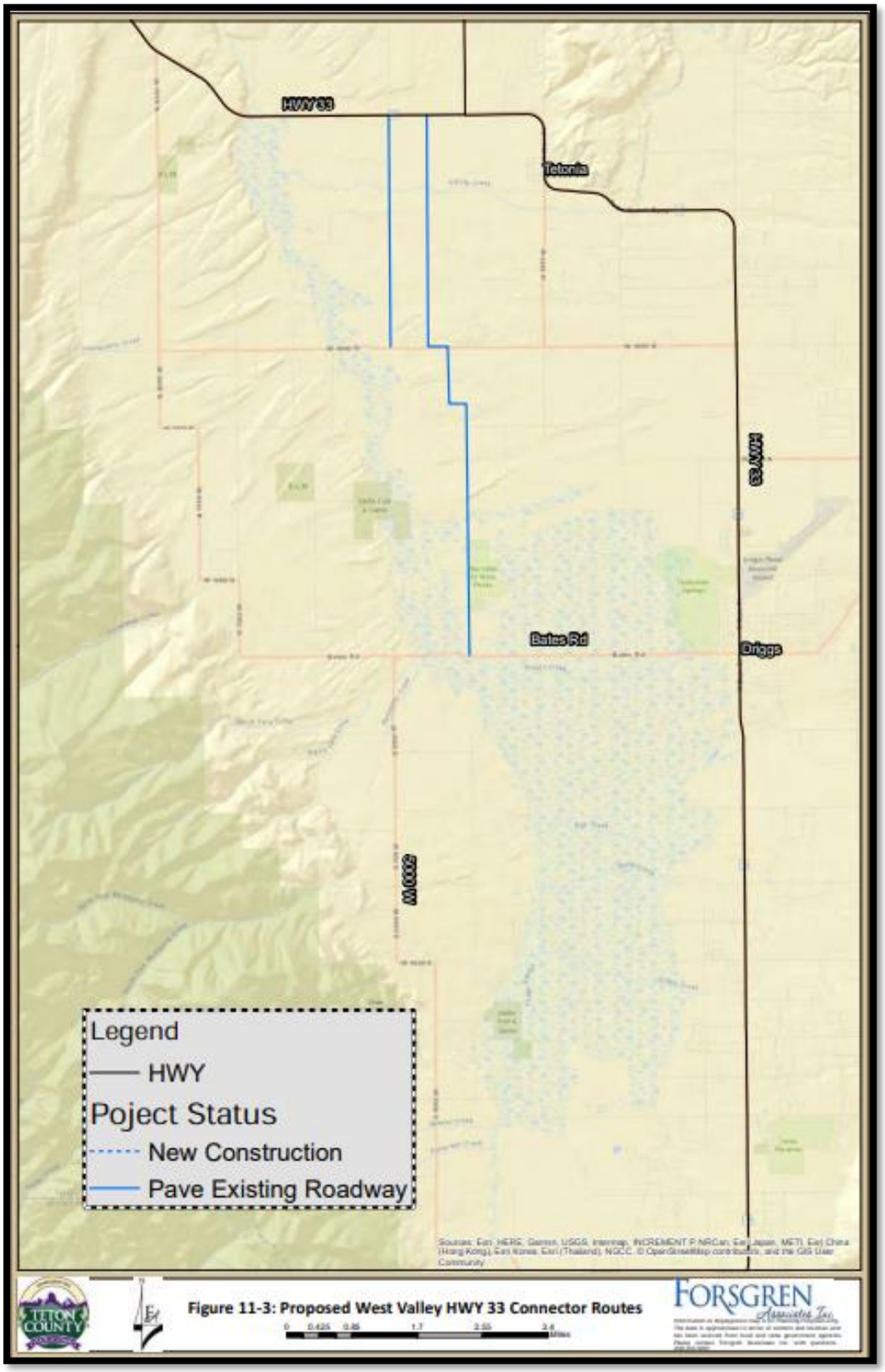
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	125	112	50
Volume Left	67	0	11
Volume Right	0	17	39
cSH	1459	1700	861
Volume to Capacity	0.05	0.07	0.06
Queue Length 95th (ft)	4	0	5
Control Delay (s)	4.2	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	4.2	0.0	9.4
Approach LOS			A

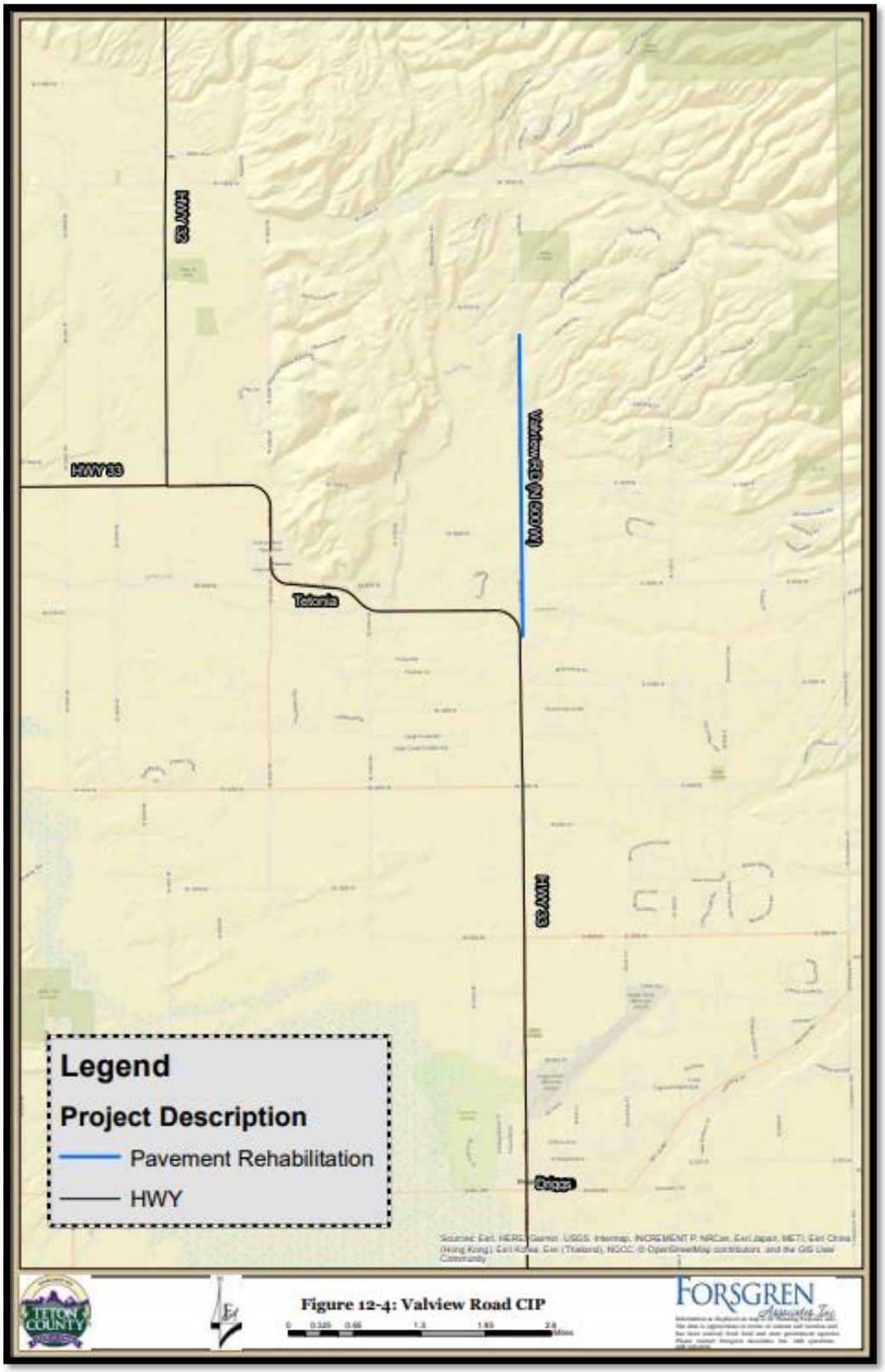
Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		

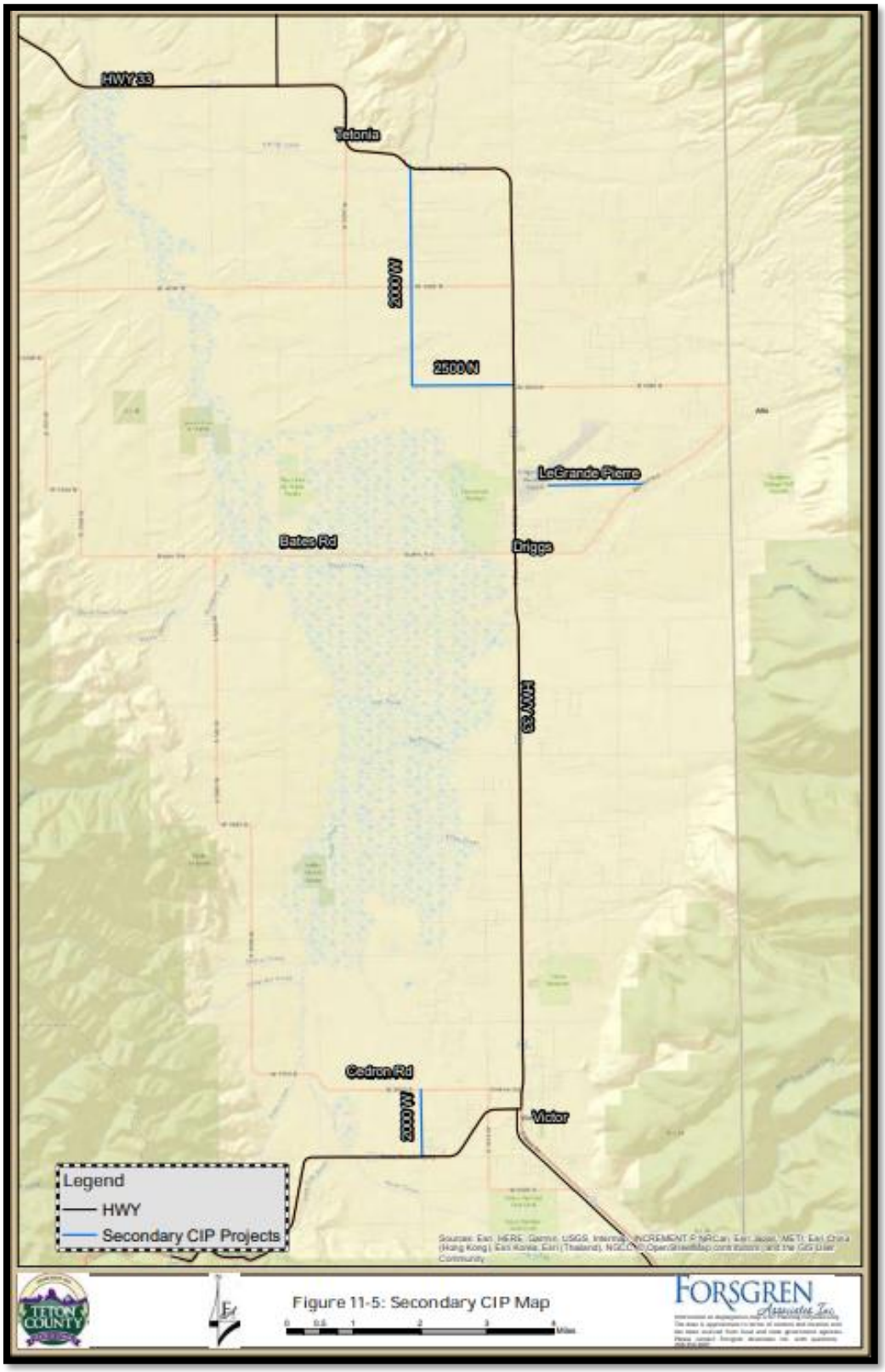
Appendix J
Teton County Transportation Planning Study – Proposed Improvements


HWY 33
Tetonia
Bates Rd
Driggs
6000W
HWY 33
Cedron Rd
Victor
Legend
HWY
West Valley Corridor Improvement Project.
Figure 12-1: West Valley Corridor CIP
FORSGREN Associates Inc.


HWY 33
Tetonia
Bates Rd
Driggs
SR 33
Cedron Rd
Victor
Legend
HWY
Project Status
New Construction
Pave/Reconstruct
Figure 12-2: East Valley Corridor CIP
FORSGREN


HWY 33
Tetonia
HWY 33
Bates Rd
Driggs
6000 W
Legend
HWY
Poject Status
New Construction
Pave Existing Roadway
Figure 11-3: Proposed West Valley HWY 33 Connector Routes
FORSGREN


HWY 33
Valview Rd (6000W)
Tetonia
HWY 33
Driggs
Legend
Project Description
Pavement Rehabilitation
HWY
Figure 12-4: Valview Road CIP
FORSGREN Associates Inc


HWY 33
Tetonia
2000 W
2500 N
LeGrande Pierre
Bates Rd
Driggs
3000 W
Cedron Rd
2000 W
Victor
Legend
HWY
Secondary CIP Projects
Figure 11-5: Secondary CIP Map
FORSGREN

Appendix K
Turn Lane Warrant Analyses

Civilize, PLLC
Management and Engineering

Project Analysis Worksheet
Tranportation Engineering
Left Hand Turn Analysis/Warrant at Unsignalized Intersections
Based on ITD Traffic Manual / NCHRP Report 745

Client:
Project: **Trestles**
Project No.:

DESIGNED
CHECKED
DATE:

Description: Southbound on Highway 33 — **Horizon Years:** 2022, 2032, 2052

ITD Traffic Manual, Section 3B.04 White Lane Line Pavement Markings and Warrants
Warrants for left-turn lanes on uncontrolled highways can be found in "NCHRP Report 745 – Left-Turn Accommodations at Unsignalized Intersections."

NCHRP Report 745 - Left-Turn Accommodations at Unsignalized Intersections
Before installing a left-turn lane (or any other roadway improvement), it is necessary to consider the characteristics of the location where it would be installed. These characteristics guide the practitioner's decisions about whether to install the lane and what specific design criteria need to be emphasized to optimize the operation of the lane at that location.

The basic geometry of the intersection needed for use with the warrants is the number of lanes on the major roadway and the number of approaches to the intersection. The number of approaches and the development type (rural or urban/ suburban) are included in the warrants because the crash prediction methodology used to develop the warrants varied by these features. Rural crash prediction equations vary by number of lanes on the major roadway, so the warrants for rural highways also vary by number of lanes.

Technical warrants are an important element of the decision-making process; however, other factors should also be considered when deciding whether to install a left-turn lane, including:
- Sight distance relative to the position of the driver and
- Design consistency within the corridor.

These factors should be considered in conjunction with the numerical warrants.

DESIGN CRITERIA (Input the following based on observation, historical data, and/or results of a site specific study)

1	Jurisdiction	ITD	Horizon or Planning Year	2022	2032	2052	
2	Subdivision or Development Name	Trestles	Development Type	Rural	Rural	Rural	
3	Name of Major Roadway	Hwy 33	No. of lanes on the major	Two	Two	Two	
4	Name of Minor Roadway/Approach	2000 S	Number of Legs	Four	Four	Four	
5	Peak Hour	PM	Peak-hr, left-turn lane vol	6	48	50	(vehicles per hour)
6	Posted Speed Limit (MPH)	55	Major Roadway Peak-hr vc	405	563	890	(veh/hour/lane).

Analysis - Table and graph reproduced from NCHRP Report 745 (Axes on the graph are reversed from source)

Intersection Southbound on Highway 33 — **Horizon Years** 2022, 2032, 2052

1 Consult chart below and evaluate the type of intersection and the left-turn, peak-hour volume

Left Turn Peak Hour Volume (Veh/hr)	Three Leg Intersection, Major Two-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Four Leg Intersection, Major Two-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Three Leg Intersection, Major Four-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Four Leg Intersection, Major Four-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Three Leg Intersection, Major Four-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Four Leg Intersection, Major Four-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)
5	200	150	75	50	450	50
10	100	50	75	25	300	50
15	100	50	50	25	250	50
20	50	<50	50	25	200	50
25	50	<50	50	<25	200	50
30	50	<50	50	<25	150	50
35	50	<50	50	<25	150	50
40	50	<50	50	<25	150	50
45	50	<50	50	<25	150	<50
50	50	<50	50	<25	100	<50

2 Check the plotted point(s) on the chart below against the anticpated intersection of major-road volume and peak-hour left-turn volume in the volume advancing.

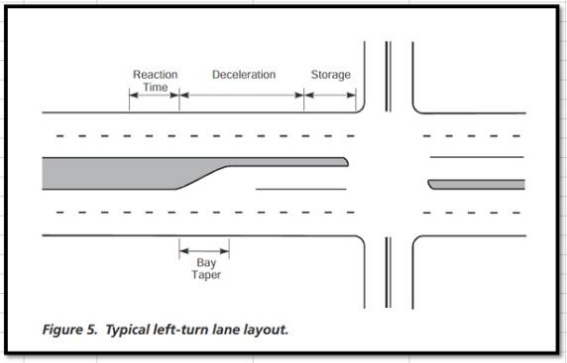
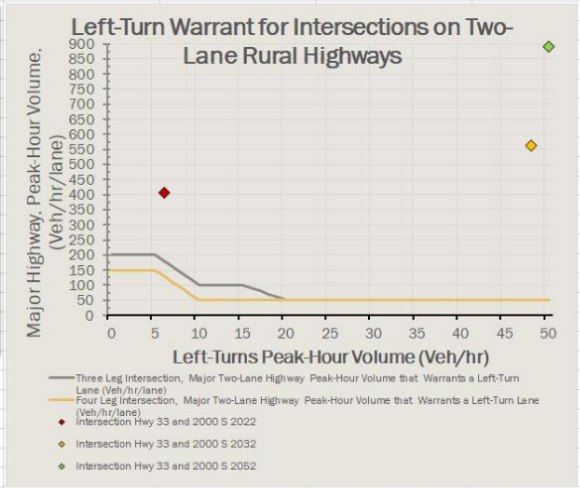


Figure 5. Typical left-turn lane layout.



LEFT-TURN WARRANTED Yes

Civilize, PLLC
Management and Engineering

Project Analysis Worksheet
Tranportation Engineering
Left Hand Turn Analysis/Warrant at Unsignalized Intersections
Based on ITD Traffic Manual / NCHRP Report 745

Client:
Project: **Trestles**
Project No.:
DESIGNED
CHECKED
DATE:

Description: Northbound on Highway 33 **Horizon Years:** 2022, 2032, 2052

ITD Traffic Manual, Section 3B.04 White Lane Line Pavement Markings and Warrants
Warrants for left-turn lanes on uncontrolled highways can be found in "NCHRP Report 745 – Left-Turn Accommodations at Unsignalized Intersections."

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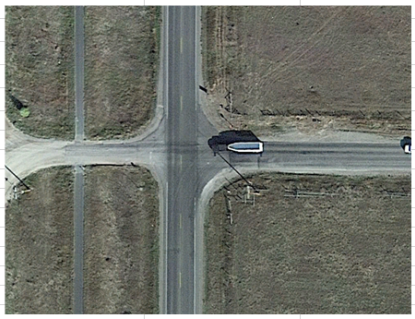
- Sight distance relative to the position of the driver and
- Design consistency within the corridor.

These factors should be considered in conjunction with the numerical warrants.



DESIGN CRITERIA (Input the following based on observation, historical data, and/or results of a site specific study)

1	Jurisdiction	ITD	Horizon or Planning Year	2022	2032	2052	
2	Subdivision or Development Name	Trestles	Development Type	Rural	Rural	Rural	
3	Name of Major Roadway	Hwy 33	No. of lanes on the major	Two	Two	Two	
4	Name of Minor Roadway/Approach	2000 S	Number of Legs	Four	Four	Four	
5	Peak Hour	PM	Peak-hr, left-turn lane vol	1	1	2	(vehicles per hour)
6	Posted Speed Limit (MPH)	55	Major Roadway Peak-hr vc	484	655	1054	(veh/hour/lane).

Analysis - Table and graph reproduced from NCHRP Report 745 (Axes on the graph are reversed from source)

Intersection Northbound on Highway 33 **Horizon Years** 2022, 2032, 2052

1 Consult chart below and evaluate the type of intersection and the left-turn, peak-hour volume

Left Turn Peak Hour Volume (Veh/hr)	Three Leg Intersection, Major Two-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Four Leg Intersection, Major Two-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Three Leg Intersection, Major Four-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Four Leg Intersection, Major Four-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Three Leg Intersection, Major Four-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)	Four Leg Intersection, Major Four-Lane Highway Peak-Hour Volume that Warrants a Left-Turn Lane (Veh/hr/lane)
5	200	150	75	50	450	50
10	100	50	75	25	300	50
15	100	50	50	25	250	50
20	50	<50	50	25	200	50
25	50	<50	50	<25	200	50
30	50	<50	50	<25	150	50
35	50	<50	50	<25	150	50
40	50	<50	50	<25	150	50
45	50	<50	50	<25	150	<50
50	50	<50	50	<25	100	<50

2 Check the plotted point(s) on the chart below against the anticpated intersection of major-road volume and peak-hour left-turn volume in the volume advancing.

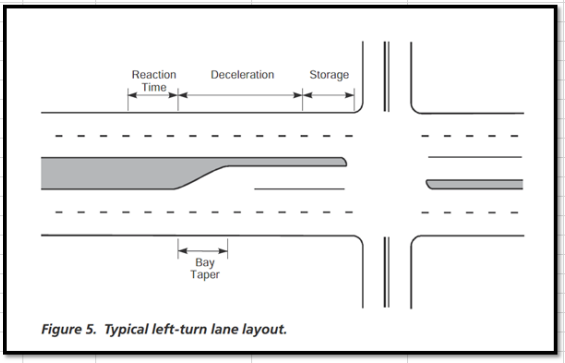
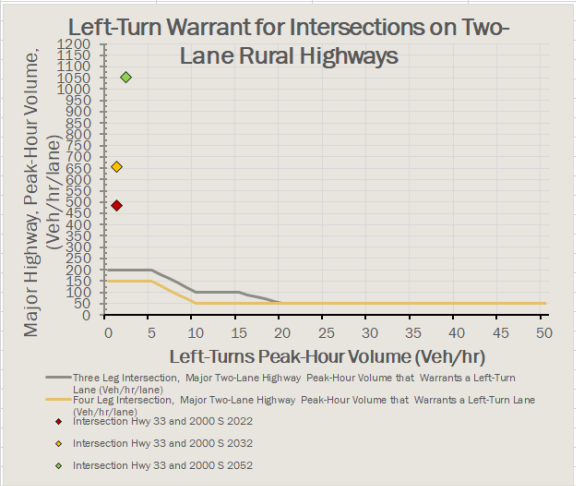


Figure 5. Typical left-turn lane layout.



LEFT-TURN WARRANTED **Yes**

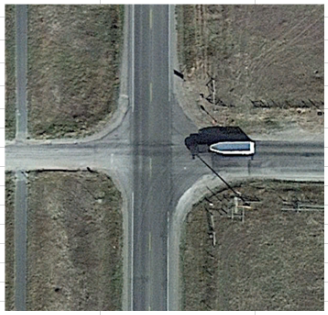
Civilize, PLLC
Management and Engineering

Project Analysis Worksheet
Tranportation Engineering
Right-Hand Turn Analysis/Warrant for Uncontrolled Roads Intersecting with Public Highways/Approaches
Based on ITD Traffic Manual

Client:
Project: **Trestles**
Project No.:
DESIGNED
CHECKED
DATE:

Description: Southbound on Hwy 33 — **Horizon Years:** 2022, 2032, 2052

ITD Traffic Manual, Section 3B.04 White Lane Line Pavement Markings and Warrants
A right-turn lane warrant is shown in Figure 3B-1 that can be used for uncontrolled highways intersecting with public roads or approaches. Right-turn lanes can be further analyzed using the economic analysis procedure for right-turn deceleration lanes described in the article "Operational and Safety Effects of Right-Turn Deceleration Lanes on Urban and Suburban Arterials" that was published in the "Transportation Research Record, Volume 2023." The methodology can be used for rural highways in addition to urban and suburban arterials



DESIGN CRITERIA (Input the following based on observation, historical data, and/or results of a site specific study)

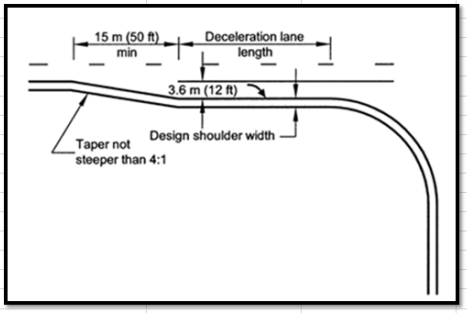
1	Jurisdiction	ITD	Horizon or Planning Year	2022	2032	2052	
2	Subdivision or Development Name	Trestles	Development Type	Rural	Rural	Rural	
3	Name of Major Roadway	Hwy 33	No. of lanes on the major	Two	Two	Two	
4	Name of Minor Roadway/Approach	2000 S	Number of legs	Four	Four	Four	
5	Peak Hour	PM	Major roadway volume	405	563	887	(veh/hour/lane).
6	Posted Speed Limit (MPH)	55	Right-Turn, Peak Hour Vol	18	23	37	(veh/hour).

Analysis - Table and graph reproduced from NCHRP Report 745 (Axes on the graph are reversed from source)

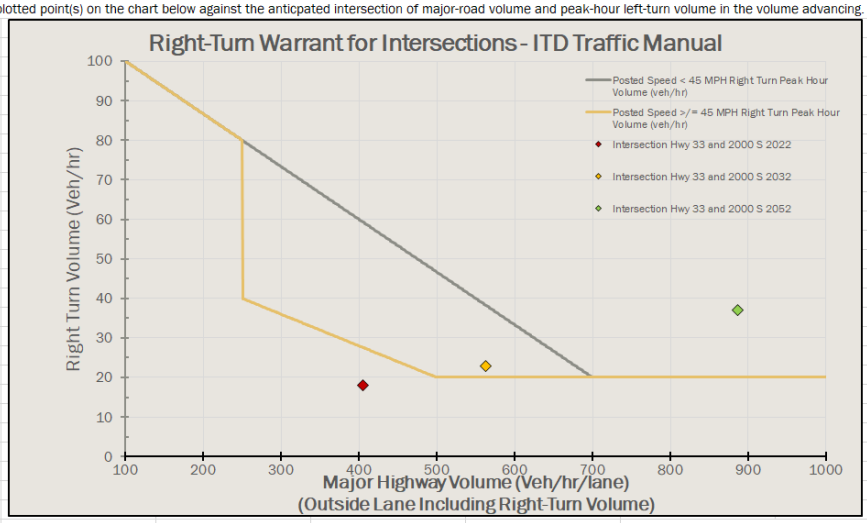
Intersection Southbound on Hwy 33 — **Horizon Years** 2022, 2032, 2052

1 Consult chart below and evaluate the type of intersection and the left-turn, peak-hour volume

Posted Speed < 45 MPH Highway Volume Outside Lane Only Including R-T Volume (Veh/hr/lane)	Posted Speed < 45 MPH Right Turn Peak Hour Volume (veh/hr)	Posted Speed >/= 45 MPH Right Turn Peak Hour Volume (veh/hr)
0	100	100
100	100	100
200	87	87
300	73	35
400	60	25
500	47	20
600	33	<20
700	20	<20
800	<20	<20
900	<20	<20
1000	<20	<20



2 Check the plotted point(s) on the chart below against the anticipated intersection of major-road volume and peak-hour left-turn volume in the volume advancing.



RIGHT-TURN WARRANTED **Yes**

Civilize, PLLC
Management and Engineering

Project Analysis Worksheet
Tranportation Engineering
Right-Hand Turn Analysis/Warrant for Uncontrolled Roads Intersecting with Public Highways/Approaches
Based on ITD Traffic Manual

Client:
Project: **Trestles**
Project No.:

DESIGNED
CHECKED
DATE:

Description: Southbound on Hwy 33 — **Horizon Years:** 2022, 2032, 2052

ITD Traffic Manual, Section 3B.04 White Lane Line Pavement Markings and Warrants
A right-turn lane warrant is shown in Figure 3B-1 that can be used for uncontrolled highways intersecting with public roads or approaches. Right-turn lanes can be further analyzed using the economic analysis procedure for right-turn deceleration lanes described in the article "Operational and Safety Effects of Right-Turn Deceleration Lanes on Urban and Suburban Arterials" that was published in the "Transportation Research Record, Volume 2023." The methodology can be used for rural highways in addition to urban and suburban arterials

DESIGN CRITERIA (Input the following based on observation, historical data, and/or results of a site specific study)

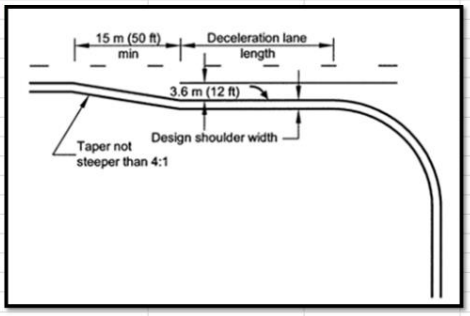
				2022	2032	2052	
1	Jurisdiction	ITD	Horizon or Planning Year				
2	Subdivision or Development Name	Trestles	Development Type	Rural	Rural	Rural	
3	Name of Major Roadway	Hwy 33	No. of lanes on the major	Two	Two	Two	
4	Name of Minor Roadway/Approach	2000 S	Number of legs	Four	Four	Four	
5	Peak Hour	PM	Major roadway volume	484	655	980	(veh/hour/lane).
6	Posted Speed Limit (MPH)	55	Right-Turn, Peak Hour Vol	12	53	73	(veh/hour).

Analysis - Table and graph reproduced from NCHRP Report 745 (Axes on the graph are reversed from source)

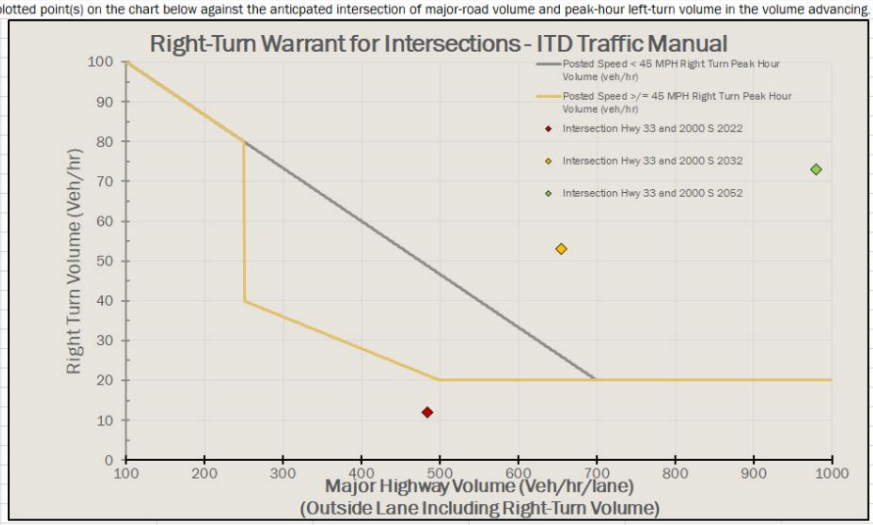
Intersection Southbound on Hwy 33 — **Horizon Years** 2022, 2032, 2052

1 Consult chart below and evaluate the type of intersection and the left-turn, peak-hour volume

Posted Speed < 45 MPH Highway Volume Outside Lane Only Including R-T Volume (Veh/hr/lane)	Posted Speed < 45 MPH Right Turn Peak Hour Volume (veh/hr)	Posted Speed >/= 45 MPH Right Turn Peak Hour Volume (veh/hr)
0	100	100
100	100	100
200	87	87
300	73	35
400	60	25
500	47	20
600	33	<20
700	20	<20
800	<20	<20
900	<20	<20
1000	<20	<20



2 Check the plotted point(s) on the chart below against the anticpated intersection of major-road volume and peak-hour left-turn volume in the volume advancing.



RIGHT-TURN WARRANTED Yes