

RESIDENTIAL AND SCHOOL DEVELOPMENT

Traffic Impact Study

**Hampshire, Illinois
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Prepared for:

Crown Community Development

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EXECUTIVE SUMMARY

Kimley-Horn and Associates, Inc., (Kimley-Horn) was retained by Crown Community Development to perform a traffic study for a proposed residential and school development on the south side of Big Timber Road (Kane County Route 21) and east of U.S. Route 20 (Brier Hill Road) near the southeast corner of the intersection of US 20 / Big Timber Road in Hampshire, Illinois. The proposed development would be broken up into two phases, with Phase A to be completed in 2032 and Phase B expected to be completed in 2042. Phase A would provide mixed residential uses and elementary school, while Phase B would provide mixed residential uses only. A total of four (4) accesses will be constructed for the proposed development. Access A and Access B were evaluated during Phase A (2032) with Access C and D added during Phase B (2042).

Existing and future traffic conditions were evaluated for the signalized intersection of US 20 / Big Timber Road, and the unsignalized intersections of Big Timber Road / Ridgecrest Drive and US 20 / Allen Road. In addition, all accesses were evaluated during their appropriate development year. Based on a review of future traffic conditions, it is anticipated that the background traffic growth and the site-generated traffic would not materially impact the study intersections. Limited delay and queues are anticipated at the site driveways in the future conditions.

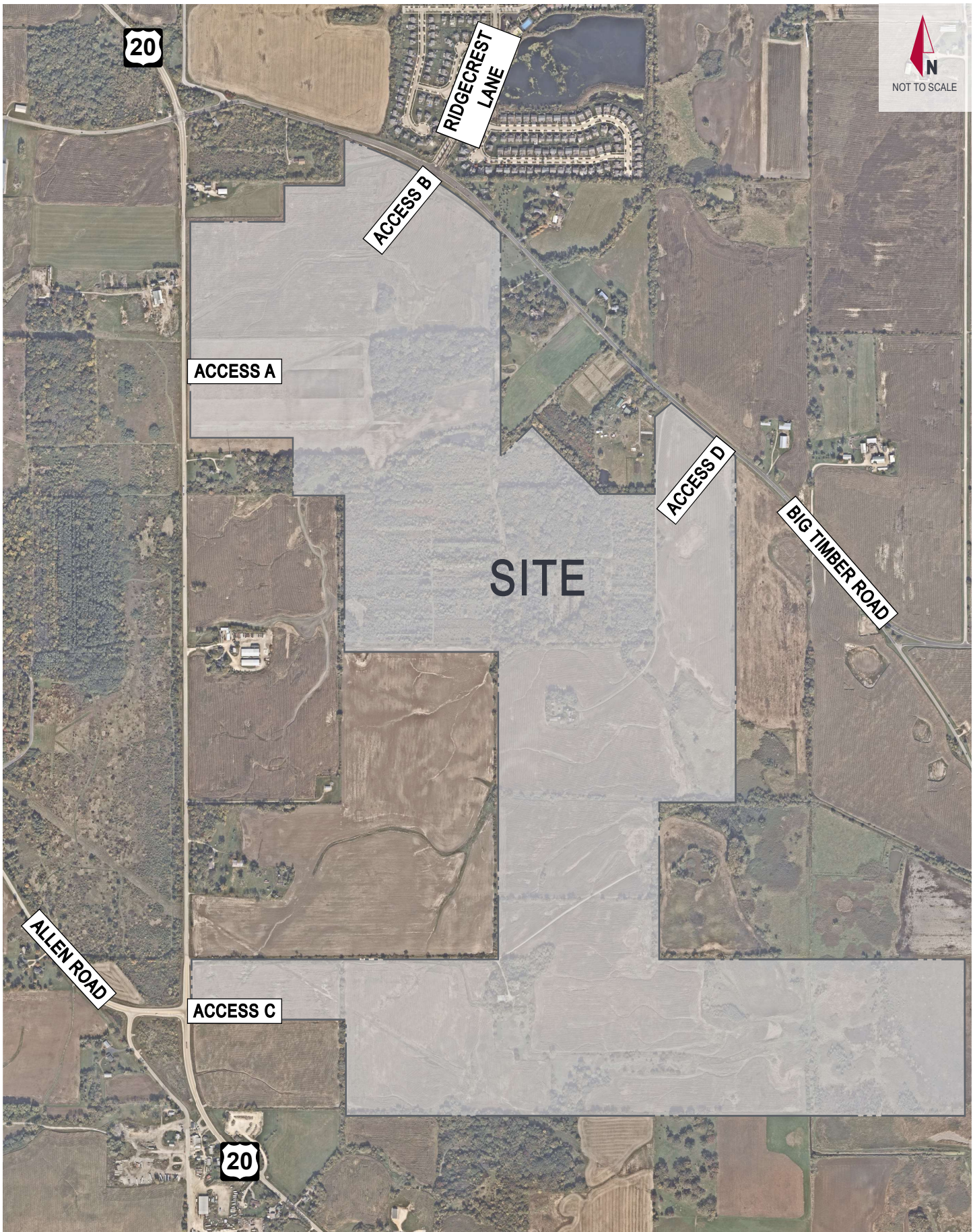
Turn lanes are warranted at all access driveways for the development, and no traffic signals are warranted at any of the unsignalized intersections. A Rectangular Rapid Flashing Beacon (RRFB) could be installed for the west leg of Big Timber / Ridgecrest Drive / Access B for pedestrians crossing Big Timber Road. The westbound approach at US 20 / Allen Road is proposed to be configured to an exclusive left-turn lane, exclusive thru lane, and an exclusive right-turn lane once Access C is constructed. Minor-leg stop control should be posted for the outbound traffic at all accesses.

Additional details related to the improvements are discussed in more detail in the *Recommendations & Conclusion* section of this report.

1. INTRODUCTION

Kimley-Horn and Associates, Inc., (Kimley-Horn) was retained by Crown Community Development to perform a traffic study for a proposed residential and school development on the south side of Big Timber Road (Kane County Route 21) and east of US 20 (Brier Hill Road) at the southeast corner of the intersection of US 20 / Big Timber Road in Hampshire, Illinois. The proposed development would be broken up into two phases, with Phase A expected to be completed in 2032 and Phase B expected to be completed in 2042. Phase A would provide 263 units of mixed residential developments and an 86,260 square-foot Elementary School. Phase B would provide 731 units of mixed residential developments. There are four (4) proposed driveway accesses that are for the development. Access A and Access B would be constructed and provide access to the development during Phase A, and Access C and Access D would be constructed during Phase B. All accesses are proposed to be full-movement accesses. An aerial view of the study location and the surrounding roadway network is presented in **Exhibit 1**.

As part of this study, the existing network was analyzed to determine the current operations at the study intersections. Future background traffic volumes were estimated with growth rates for the appropriate development years and construction of the proposed development. This report presents and documents data collection, summarizes the evaluation of existing and projected future traffic conditions on the surrounding roadways, and identifies recommendations to address the potential impact of site-generated traffic on the adjacent roadway network.



2. EXISTING CONDITIONS

Based on a review of previously performed traffic studies in the area as well as aerial imagery, Kimley-Horn conducted a review of the site, including existing land uses in the surrounding area, the adjacent street system, current traffic volumes and operating conditions, lane configurations and traffic controls at nearby intersections, and other key roadway characteristics. This section of the report details information on the existing conditions.

2.1. Area Land Uses & Connectivity

Located on the southeast quadrant of the US 20 / Big Timber Road intersection, the subject site is a vacant undeveloped parcel. The site is bounded by US 20 on the west, and Big Timber Road on the north and east. Located in Hampshire, the site is surrounded by a residential, commercial, and agriculture uses.

Metra commuter rail service is located approximately 10 miles southeast of US 20 in Elgin, providing connectivity between Hampshire and Chicago. The train station connects passengers to Pace Suburban Bus Route 550. The subject site's proximity to the Metra Station does offers convenience to residents who may be commuting into Chicago via rail.

US 20 provides access to Interstate 90 (I-90) approximately three (3) miles north of the subject site. Big Timber Road provides access to Route 47, which provides access to a full interchange with Interstate 90 (I-90) approximately three (3) miles east of the subject site.

2.2. Existing Roadway Characteristics

The subject site is currently accessed via US 20, Big Timber Road, Allen Road, and Ridgecrest Drive. A summary of the existing roadway network is outlined below.

US 20 (Brier Hill Road) is a north-south Other Principal Arterial roadway that runs along the western boundary of the subject site. For purposes of this study, US 20 is referred to as a north-south roadway. The Illinois Department of Transportation (IDOT) classifies US 20 as a Strategic Regional Arterial (SRA) roadway. The SRA system was established by IDOT to promote mobility on key routes throughout the Chicago area by applying various strategies, such as access control and limited signalization. Through the study area, one travel lane is provided in each direction with dedicated left-turn lanes at key intersections. At its signalized intersection with Big Timber Road, US 20 has a dedicated left-turn lane and one shared through/right-turn lane on both the north and south legs. The dedicated left-turn lanes operate with protected/permissive phasing. A crosswalk and pedestrian signal are not provided on any of the legs of the intersection. At its TWSC intersection with Allen Road, US 20 provides a dedicated left-turn lane and one through lane on its south leg. On the north leg, US 20 provides one shared through/right-turn lane. A 55 miles per hour (MPH) speed limit is posted on US 20 through the study area. US 20 is under IDOT jurisdiction.

Big Timber Road (County Highway 21) is a northwest-southeast Other Minor Arterial roadway that runs along the northern and eastern boundary of the subject site. For purposes of this study, Big Timber Road is referred to as an east-west roadway. Through the study area, one travel lane is

provided in each direction with dedicated left-turn lanes at key intersections. At its signalized intersection with US 20, Big Timber Road has one shared left/through/right-turn lane on both the east and west legs. At its intersection with Ridgecrest Drive, Big Timber Road provides one exclusive left-turn lane and one exclusive through lane for the west leg. On the east leg, Big Timber Road provides one exclusive right-turn lane, and one exclusive through lane. Pavement is provided for a future westbound left-turn lane and an eastbound right-turn lane for a planned access on the south side of the roadway. A 50 MPH speed limit is posted on Big Timber Road through the study area. Ridgecrest Drive is under Kane County Department of Transportation (KDOT) jurisdiction.

Allen Road is an east-west Major Collector located southwest of the subject site. Through the study area, one travel lane is provided in each direction. At its intersection with US 20, Allen Road provides one exclusive left-turn lane and one exclusive channelized right-turn lane. Allen Road operates under minor-leg stop control at its intersection with US 20. A 55 MPH speed limit is posted on Allen Road through the study area. Allen Road is under Kane County Department of Transportation (KDOT) jurisdiction.

Ridgecrest Drive is a north-south Local Road located north of the subject site. Through the study area, one travel lane is provided in each direction. At its intersection with Big Timber Road, Ridgecrest Drive provides one exclusive left-turn lane and one exclusive right-turn lane. Ridgecrest Drive operates under minor-leg stop control at its intersection with Big Timber Road. A 25 MPH speed limit is posted on Ridgecrest Drive through the study area. Ridgecrest Drive is under The Village of Hampshire jurisdiction.

2.3. Traffic Count Data

24-hour weekday traffic counts were conducted on December 3, 2020 at the following intersections:

- US 20 / Big Timber Road
- US 20 / Allen Road
- Big Timber Road / Ridgecrest Drive

These 24-hour counts were conducted in order to develop a data adjustment factor to account for atypical traffic conditions due to the COVID-19 public health crisis and to understand the daily traffic in the area.

The traffic counts were evaluated against the historical count data available from IDOT. This historical traffic count data was compared to the December 2020 traffic counts. Based on this comparison, factors of 1.40 and 1.22 were applied to volumes along US 20 and Big Timber Road east of the US 20 intersection, respectively. No additional factors were applied for Big Timber Road west of US 20, Allen Road, and Ridgecrest Drive.

This data indicates that peak traffic volumes occur within the study area on weekdays from 7:00-8:00AM and 4:00-5:00PM.

An additional analysis period was included in the study because an elementary school is being developed at the site. The school district (D300) is anticipating that the school will begin at 8:00AM and dismiss students at 2:15PM. It is assumed that with an 8:00AM start time, the peak of the school

trips will occur between 7:00-8:00AM. With a dismissal time of 2:15PM, it is assumed that the peak of the school trips will occur between 1:45-2:15PM.

The peak periods that were evaluated were labeled as the following:

- AM Peak
- Dismissal Peak
- PM Peak

For purposes of this analysis, the traffic counts were rounded to the nearest multiple of five and balanced between intersections.

The estimated Year 2020 existing peak hour vehicle traffic are presented in **Exhibit 2**.

2.4. Existing Capacity Analyses

Capacity analysis for the existing and future conditions was performed using Synchro Version 10. The capacity of an intersection quantifies its ability to accommodate traffic volumes and is expressed in terms of level of service (LOS), measured in average delay per vehicle. LOS grades range from A to F, with LOS A as the highest (best traffic flow and least delay), LOS E as saturated or at-capacity conditions, and LOS F as the lowest (oversaturated conditions). The lowest LOS grade typically accepted by jurisdictional transportation agencies in Northeastern Illinois is LOS D, and a minimum LOS C is required for through movements on SRA routes such as US 20.

The LOS grades shown below, which are provided in the Transportation Research Board’s Highway Capacity Manual (HCM), quantify and categorize the driver’s discomfort, frustration, fuel consumption, and travel times experienced as a result of intersection control and the resulting traffic queuing. A detailed description of each LOS rating can be found in **Table 2.1**.

Table 2.1. Level of Service Grading Descriptions¹

Level of Service	Description
A	Minimal control delay; traffic operates at primarily free-flow conditions; unimpeded movement within traffic stream.
B	Minor control delay at signalized intersections; traffic operates at a fairly unimpeded level with slightly restricted movement within traffic stream.
C	Moderate control delay; movement within traffic stream more restricted than at LOS B; formation of queues contributes to lower average travel speeds.
D	Considerable control delay that may be substantially increased by small increases in flow; average travel speeds continue to decrease.
E	High control delay; average travel speed no more than 33 percent of free flow speed.
F	Extremely high control delay; extensive queuing and high volumes create exceedingly restricted traffic flow.

The range of control delay for each rating (as detailed in the HCM) is shown in **Table 2.2**. Because signalized intersections are expected to carry a larger volume of vehicles and stopping is required during red time, note that higher delays are tolerated for the corresponding LOS ratings.

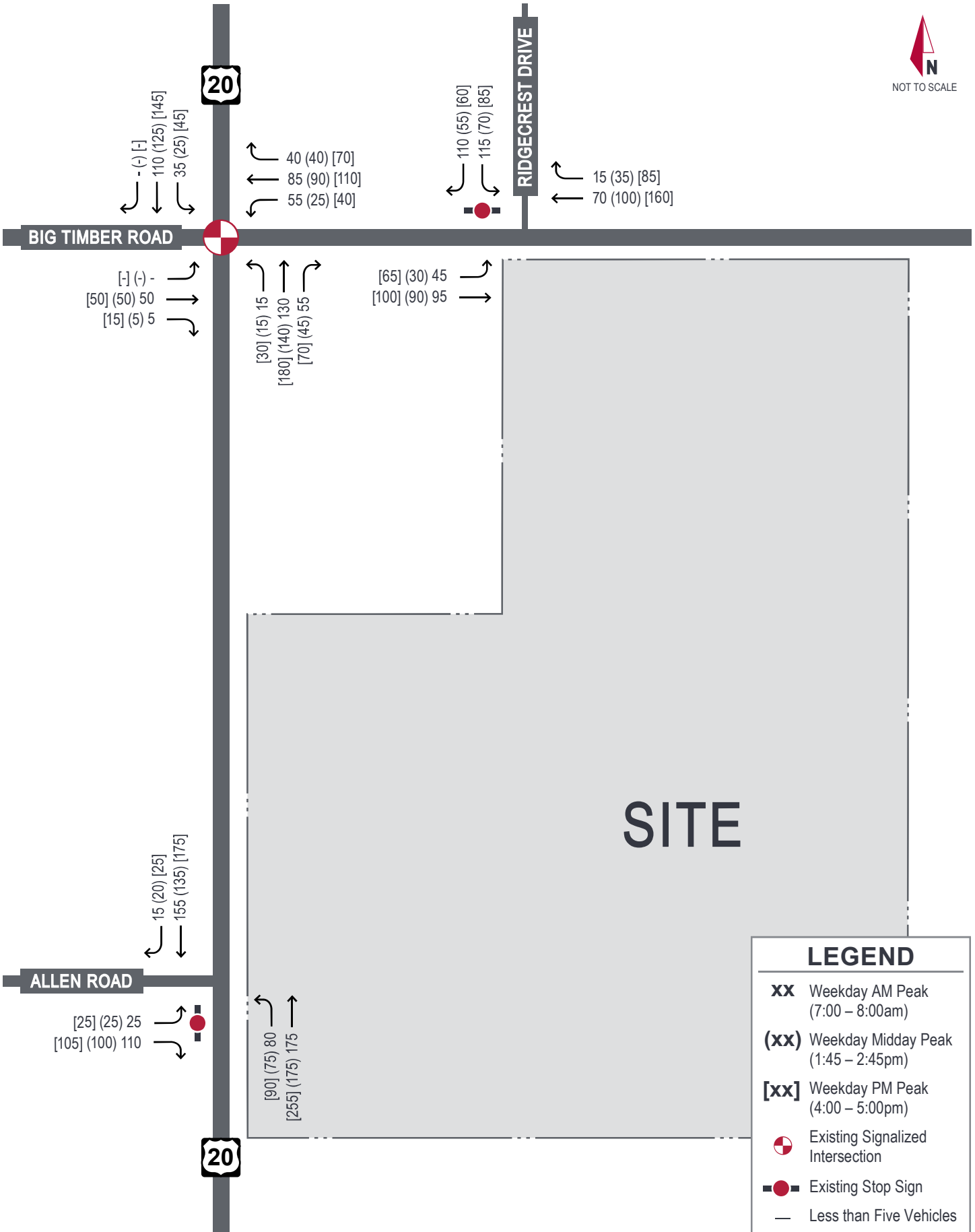


Table 2.2. Level of Service Grading Criteria¹

Level of Service	Average Control Delay (s/veh) at:	
	Unsignalized Intersections	Signalized Intersections
A	0 – 10	0 – 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F ²	> 50	> 80

¹Highway Capacity Manual 2010

²All movements with a Volume to Capacity (v/C) ratio greater than 1 receive a rating of LOS F.

Based on these standards, capacity results were identified for the study intersections under existing conditions. The results of capacity analysis for existing conditions are summarized in **Table 2.3**. In this table, operation on each approach is quantified according to the average delay per vehicle and the corresponding level of service. The results are based on Synchro’s HCM 6th Edition reports.

In order to evaluate existing traffic operations, signal timings for the US 20 / Big Timber Road intersection were obtained from IDOT. It should be noted that right-turn-on-red (RTOR) movements were excluded from the capacity analysis per standard IDOT requirements.

Table 2.3. Existing (Year 2020) Levels of Service

Intersection	Weekday AM Peak		Weekday Dismissal Peak		Weekday PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
US 20 / Big Timber Road *						
Eastbound	17	B	17	B	17	B
Westbound	21	C	20	C	21	C
Northbound	11	B	10	B	14	B
Southbound	9	B	9	A	11	B
<i>Intersection</i>	14	B	14	B	16	B
Big Timber Road / Ridgecrest Drive △						
Eastbound (Left)	8	A	8	A	3	A
Southbound	10	B	10	B	12	B
US 20 / Allen Road △						
Eastbound	11	B	10	B	11	B
Northbound (Left)	8	A	8	A	8	A

* - Signalized Intersection

△ - Minor-Leg Stop-Controlled Intersection

At the signalized intersection of US 20 / Big Timber Road, all approaches currently operate at LOS C or better. The overall intersection currently operates at LOS B during each peak hour analyzed. During each peak hour, the 95th percentile queues are approximately four vehicles (100 feet) or less. The queues are accommodated within the existing storage lanes provided for the northbound and southbound left-turn movements.

The unsignalized intersection of Big Timber Road / Ridgecrest Drive currently operates at LOS B or better for all approaches during each peak hour analyzed. During each peak hour, the 95th percentile queues estimated for each turn lane are approximately one vehicle (25 feet) or less. The queues are accommodated within the existing storage lanes.

The unsignalized intersection of US 20 / Allen Road currently operates at LOS B or better for all approaches during each peak hour analyzed. During each peak hour, the 95th percentile queues estimated for each turn lane are approximately one vehicle (25 feet) or less. The queues are accommodated within the existing storage lanes.

3. FUTURE 2032 CONDITIONS – PHASE A

This section of the report outlines the proposed site plan, summarizes site-specific traffic characteristics, and develops future traffic projections for Phase A of the analysis.

3.1. Development Characteristics & Site Access

Phase A of the proposed development would provide 263 units of mixed residential uses and an 86,260 square-foot elementary school. During Phase A, access to the site would be provided via two newly constructed driveways, Access A and Access B. Access A is proposed to be constructed on US 20 approximately 0.3 miles south of the US 20 / Big Timber Road intersection. Access B is proposed as the fourth leg of the existing intersection of Big Timber Road / Ridgecrest Drive. Both locations would be full-access and minor-leg stop controlled. A site plan is provided in the appendix.

An Intersection Design Study (IDS) was provided for the intersection of US 20 / Big Timber Road. The improvements of the intersection include pavement restriping, signal retiming, and the addition of left-turn lanes for the eastbound and westbound approaches. These improvements are included in the 2032 and 2042 analysis.

3.2. Trip Generation

In order to calculate trips generated by the proposed uses, data was referenced from the Institute of Transportation Engineers (ITE) manual titled Trip Generation, Tenth Edition. Trip generation rates for the ITE Land Use Code (LUC) corresponding to the proposed use are shown in **Table 3.1**. Copies of the ITE data are provided in the appendix.

Table 3.1. ITE Trip Generation Data

ITE Land Use	Unit	Weekday			
		Daily	AM Peak Hour	Dismissal Peak Hour	PM Peak Hour
Single Family Housing (LUC 210)	Per 1 Unit	$\ln(T) = 0.92 \cdot \ln(X) + 2.71$ 50% in/50% out	$T = 0.71 \cdot X + 4.8$ 25% in/75% out	$T = \text{Daily Trips} \cdot 0.062$ 64% in/36% out	$\ln(T) = 0.96 \cdot \ln(X) + 0.2$ 63% in/37% out
Duplex Housing (LUC 220)	Per 1 Unit	$T = 7.56 \cdot X - 40.86$ 50% in/50% out	$\ln(T) = 0.95 \cdot \ln(X) - 0.51$ 25% in/75% out	$T = \text{Daily Trips} \cdot 0.056$ 59% in/41% out	$\ln(T) = 0.89 \cdot \ln(X) - 0.2$ 63% in/37% out
Elementary School (LUC 520)	Students	$T = 20.13 \cdot X - 184.07$ 50% in/50% out	$T = 0.67 \cdot X$ 55% in/46% out	$T = 0.34 \cdot X$ 45% in/55% out	$T = 0.17 \cdot X$ 48% in/52% out

T = trips X = 1 Unit or 1,000 S.F.

The AM and PM Peak periods utilized the Peak Hour of Adjacent Street Traffic to determine the site generated peak hour trips. The Dismissal Peak Hour utilized the PM Peak Hour of the Generator for the Elementary School, while all residential land uses utilized Appendix A of the ITE Trip Generation Manual Daily Distribution percentages for trip generation assumptions from 1:45 PM – 2:45 PM.

Table 3.2 shows the site generated traffic projections based on the calculations for the proposed uses for Phase A.

Table 3.2. 2032 Phase A Site-Generated Traffic Projections¹

Land Use	Size	Daily	Weekday								
			AM Peak Hour			Dismissal Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Single Family Housing (LUC 210)	213 Units	2,270	45	120	165	85	45	130	25	25	50
Duplex Housing (LUC 220)	50 Units	340	5	20	25	10	10	20	15	10	25
Elementary School (LUC 520)	600 Students	1,090	215	190	405	90	115	205	50	55	105
Net New Site Trips		3,700	265	330	595	185	170	355	90	90	180

¹In/Out volumes are rounded to the nearest multiple of five.

Per D300 direction, it is assumed that buses will not be provided for students that live in the neighborhood north of Ridgecrest Drive. It is expected that some of the students will be walking to school, but vehicular traffic was not reduced to take into account the pedestrians that are expected to attend the school.

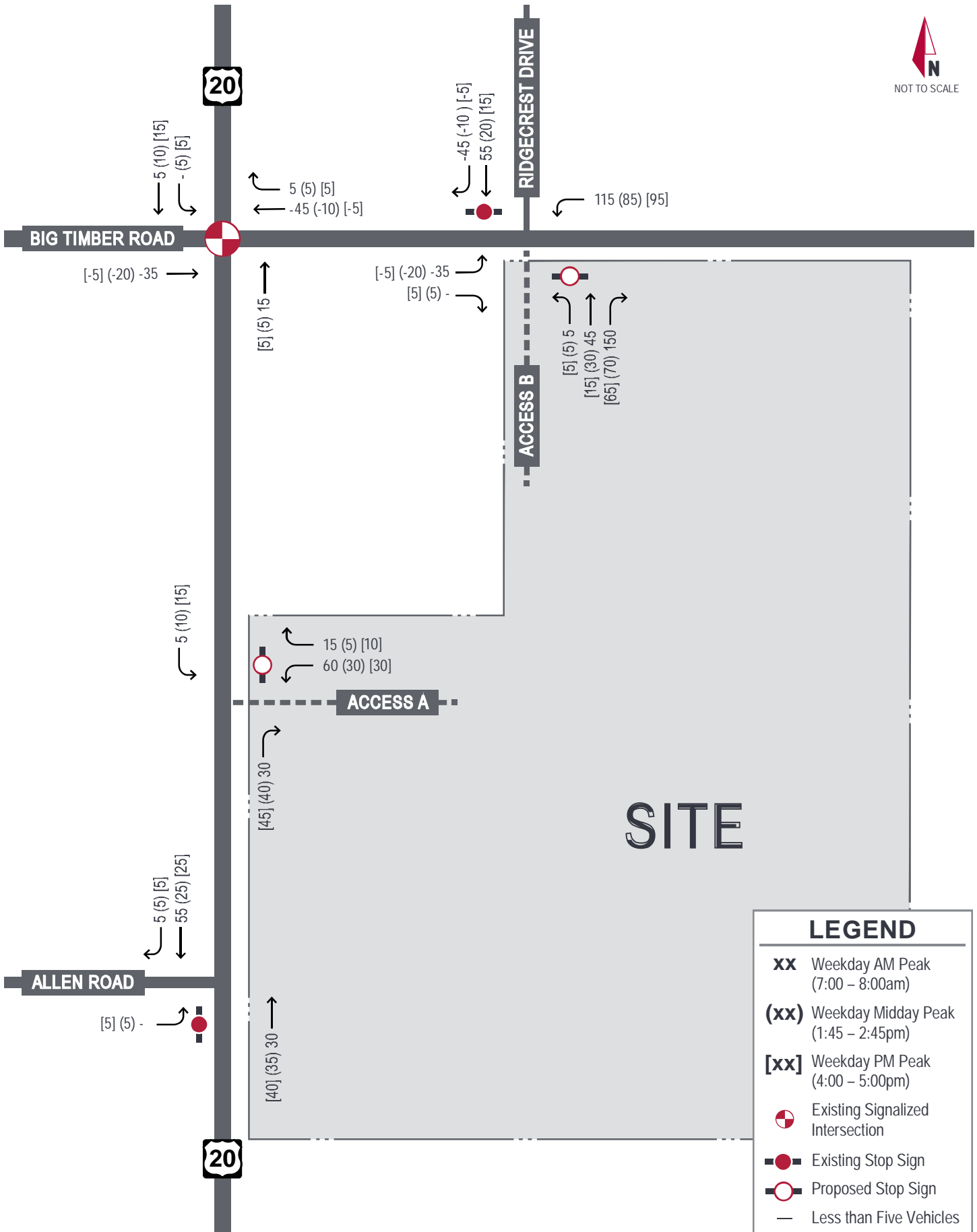
3.3 Directional Distribution

The estimated distribution of site-generated traffic on the surrounding roadway network as it approaches and departs the site is a function of several variables, such as the nature of surrounding land uses, prevailing traffic volumes/patterns, characteristics of the street system, and the ease with which motorists can travel over various sections of that system. The anticipated directional distributions estimated for the primary trips for the 2032 Build year is summarized in **Table 3.3**.

Table 3.3. Phase A Estimated Trip Distribution

Traveling to/from:	Estimated Trip Distribution	
	Residential	School
North via US 20	15%	0%
South via US 20	25%	10%
East via Big Timber Road	55%	40%
West via Allen Road	5%	0%
North via Ridgecrest Drive	-	25%
Internal Site	-	25%
Total	100%	100%

Southbound right traffic from Ridgecrest Drive is associated with the existing elementary school adjacent to the proposed development. This is reflected in the traffic for the elementary school during both Phase A and Phase B of the analysis. Based on these assumptions, the total Phase A site-generated trips are depicted in **Exhibit 3**.



3.5. Future Capacity Analysis

The proposed development for Phase A is expected to be constructed by Year 2032; Kimley-Horn therefore evaluated future traffic conditions for a Year 2032 design horizon. Future background traffic growth was assumed, and site-generated trips were then added in order to analyze the development's impact on the study intersections.

Future Background Traffic Projections

In order to estimate Year 2032 traffic volumes, growth rates were applied to the COVID adjusted existing traffic count data. The growth rates were developed using data received from the Chicago Metropolitan Agency for Planning (CMAP). According to Year 2050 traffic projections, a 2.00 percent annual traffic growth rate was applied to the entire study intersection for twelve (12) years to reflect Year 2032 conditions.

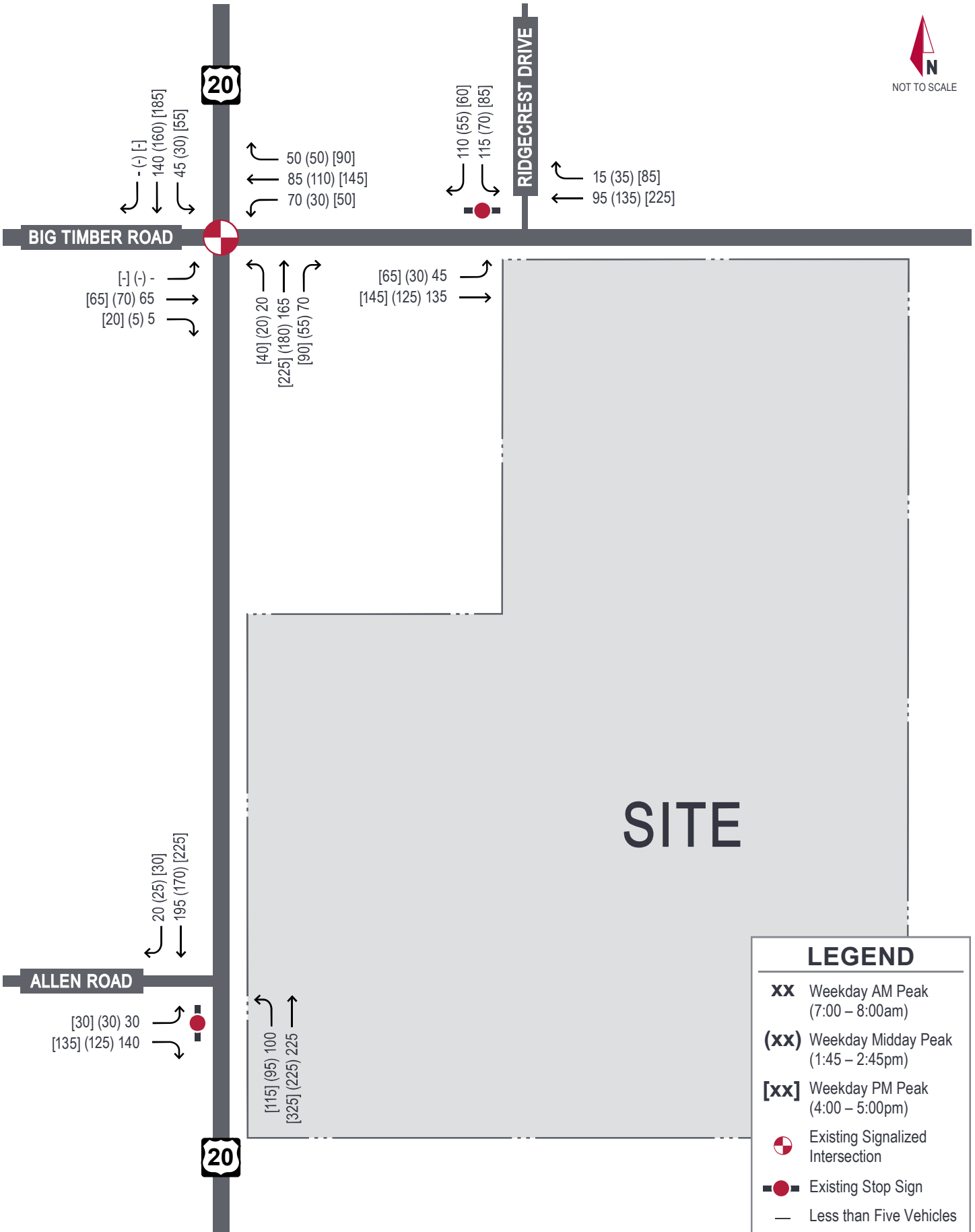
An official letter from CMAP documenting the projected Year 2050 traffic volume on the study roadways is included in the appendix. Traffic projections for the Year 2032 future build scenario are illustrated in **Exhibit 4**.

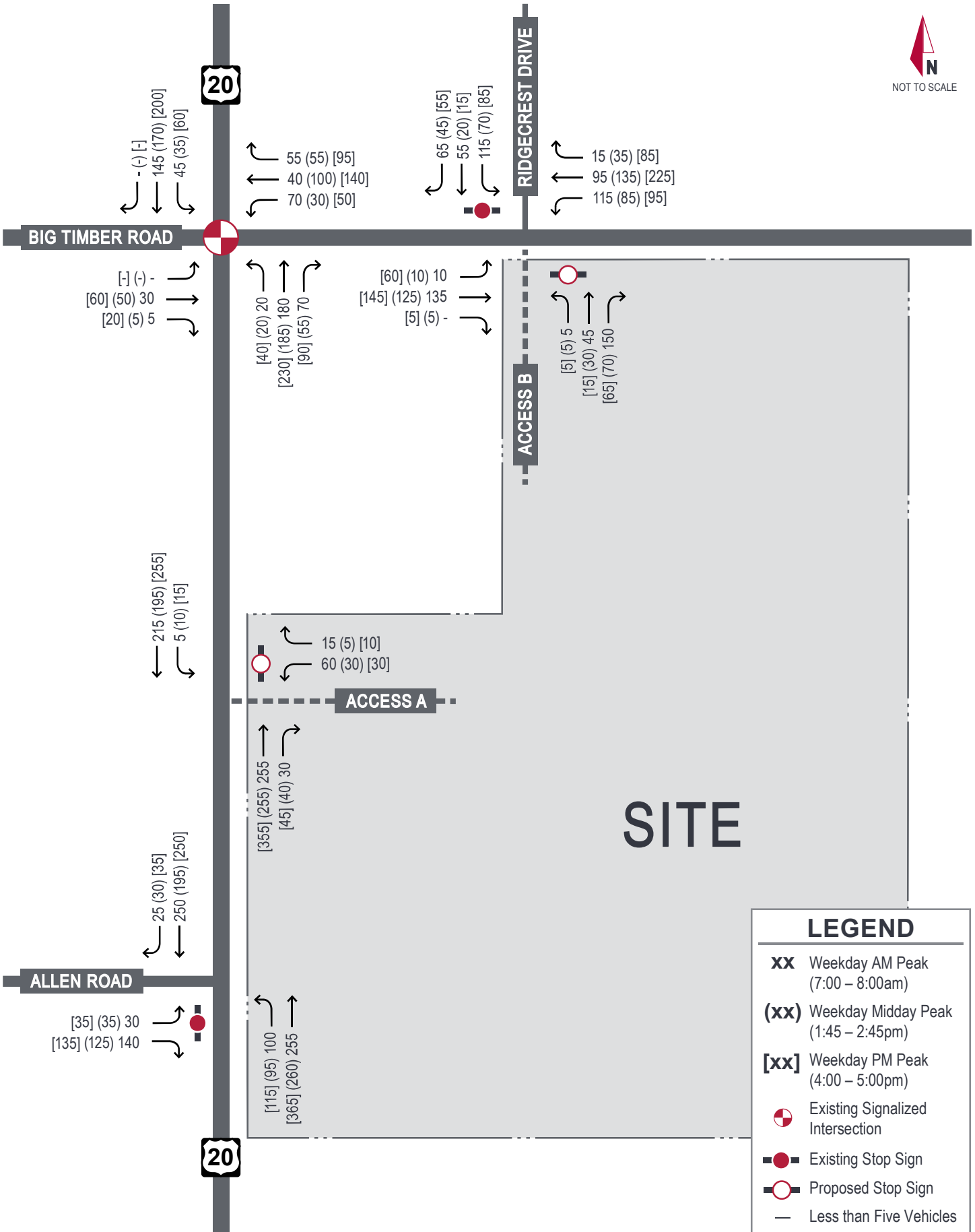
Future Build Traffic Projections

Total traffic projections for Year 2032 were calculated by adding the site-generated trips (Exhibit 3) to future no-build traffic projections (Exhibit 4). Traffic projections for the Year 2032 future build scenario are illustrated in **Exhibit 5**. To account for school-related traffic being generated by the existing Lakewood Crossing Club to the north of Access B, a projection of these trips was created and then redistributed as through traffic between the existing residential area and the new elementary school proposed within the new development. As the proximate elementary school appears to be to the west (Wright Elementary), existing movements to/from the west were reassigned as through traffic heading to/from the new proposed elementary school.

For the analysis of future traffic conditions, the existing intersection geometrics and signal timing was assumed as there are no planned improvements (beyond those detailed in the US 20 / Big Timber Road IDS) in the area. A review of turn lane warrants was completed based on criteria outlined in the IDOT guidelines provided in the IDOT *Bureau of Design and Environment (BDE) Manual and the Kane County Division of Transportation Permit Regulations and Access Control Regulations*. A review of signal warrant analyses was completed based on the *IDOT Signal Warrant Analysis Worksheet*.

Turn lanes were evaluated at the signalized intersection of US 20 / Big Timber Road. According to the IDOT *BDE Manual*, a right-turn lane may be considered where a capacity analysis determines the turn lane is necessary to meet the LOS criteria. The right-turn movements at US 20 / Big Timber Road are projected to operate with limited delay during the peak hours; and therefore, the addition of a right-turn lanes is not expected to improve LOS. Per guidance in the IDOT *BDE Manual*, a right-turn lane is warranted at a signalized intersection where the right-turning volume is greater than 150 vehicles per hour (vph) and there is greater than 300 vehicles per hour per lane (vphpl) on the mainline. The projected future traffic volumes are below the threshold for a right-turn lane at a signalized intersection; and therefore, the geometry shown in the IDS provided was assumed for the analysis of future conditions.





LEGEND	
xx	Weekday AM Peak (7:00 – 8:00am)
(xx)	Weekday Midday Peak (1:45 – 2:45pm)
[xx]	Weekday PM Peak (4:00 – 5:00pm)
	Existing Signalized Intersection
	Existing Stop Sign
	Proposed Stop Sign
—	Less than Five Vehicles

Left and right-turn lanes were evaluated at US 20 / Access A and US 20 / Allen Road utilizing IDOT *BDE Manual* for two-lane highways with a speed limit of 55 miles per hour (mph). Based on the 2032 Build volumes, a southbound left-turn and a northbound right-turn lane is not warranted at US 20 / Access A. A southbound right-turn lane at US 20 / Allen Road is not warranted.

Left and right-turn lanes were evaluated at the intersection of Big Timber Road / Ridgecrest Drive / Access B utilizing the *Kane County Division of Transportation Permit Regulations and Access Control Regulations*. According to the Access Control Regulations, left and right-turn deceleration lanes will be required for all access points to a County freeway and all Major Access to any County highway. A Major Access is defined as the following; *An access for subdivision, public street, commercial development, multi-family development, recreational development, or any other development that is expected to generate 150 or more traffic movements per day.*

Based on this definition of a Major Access, it was determined that Access B is considered a Major Access to Big Timber Road (Kane County Highway 21), and left and right-turn lanes are warranted at Big Timber Road / Ridgecrest Drive / Access B. Pavement to support these turn lanes exists currently and KDOT staff confirmed that turn lanes provided within the existing pavement will be acceptable.

Access A is assumed to provide exclusive left and right-turn lanes for outbound lanes and a single inbound lane. Access B is assumed to provide a shared through/left-turn lane and an exclusive right-turn lane for the outbound lanes and a single inbound lane. Ridgecrest Drive will be modified to include a protect left-turn lane and a shared through/right-lane.

Signal warrant analyses were performed according to criteria set by the Manual on Uniform Traffic Control Devices (MUTCD) for Warrant 1 (Eight-Hour Warrant), Condition A (Minimum Vehicular Volume) and Condition B (Interruption of Continuous Traffic). Warrant 1 can be satisfied by meeting any one of three conditions: Condition A (Minimum Vehicular Volume), Condition B (Interruption of Continuous Traffic), or a combined Condition A & B that has reduced volume thresholds that must be met for both conditions in order to warrant a signal. This warrant is typically evaluated with at least eight hours of traffic count data for an intersection. Because only peak hour projections can be formulated for the proposed development, typical IDOT practice allows a signal warrant to instead be evaluated by reducing evening peak hour volumes to 55 percent of their projected total to represent the minimum volume during a given eight-hour period. Minor-street right-turning volumes were also reduced at the study intersections in accordance with Pagone's Theorem, per IDOT requirements. These reduced volumes were compared to MUTCD criteria for signal warrant analysis. **Table 3.4** reports the signal warrant analyses conducted for Phase A 2032 Build traffic conditions.

Table 3.4. Summary of Signal Warrant Analyses for Future (2032) Build Phase A

Intersection	Major Street	Higher-Volume Minor-Leg Approach	Meets Warrant?
MUTCD Criteria for two-Lane Major Street with two-lane Minor Street			
Warrant 1A	350	105	--
Warrant 1B	525	53	--
Combination ¹			
Warrant 1A	280	84	--
Warrant 1B	420	42	--
US Route 20 / Access A	278	35	No
Big Timber Road / Ridgecrest Drive / Access B	204	115	No
US Route 20 / Allen Road	347	36	No

¹To satisfy warrant criteria for the combined Conditions A & B, the minimum volume thresholds for both conditions must be met.

As shown in **Table 3.4**, a signal warrant is not met at any of the study intersections. Minor-leg stop control is recommended for outbound traffic at Access A and Access B.

As mentioned previously, it is expected that some students from the adjacent neighborhood north of Ridgecrest Drive will be walking to and from school. Because of this assumption, improvements will need to be implemented for pedestrian safety at Big Timber Road / Ridgecrest Drive / Access B. It is proposed that crosswalks will be provided on the north, south, and west legs of the intersection. Additionally, Rectangular Rapid Flashing Beacons (RRFB) could be installed on the west leg of the intersection to improve visibility of the roadway and enhance awareness of pedestrian activity and promote safety for pedestrians crossing Big Timber Road.

The capacity analysis results are provided in **Table 3.5**. Consistent with the existing conditions analysis, the results are based on Synchro’s HCM 6th Edition reports, copies of which are included in the appendix.

Table 3.5. Future (Year 2032) Build Levels of Service

Intersection	Weekday AM Peak		Weekday Dismissal Peak		Weekday PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
US 20 / Big Timber Road *						
Eastbound	25	C	29	C	30	C
Westbound	23	C	30	C	33	C
Northbound	12	B	13	B	15	B
Southbound	10	B	12	B	13	B
<i>Intersection</i>	15	B	18	B	21	C
Big Timber Road / Ridgecrest Drive / Access B △						
Eastbound (Left)	8	A	8	A	8	A
Westbound (Left)	8	A	8	A	8	A
Northbound	11	B	11	B	12	C
Southbound	19	C	14	B	20	C
US 20 / Allen Road △						
Eastbound	12	B	12	C	13	C
Northbound (Left)	8	A	8	A	8	A
US 20 / Access A △						
Westbound	12	B	12	B	14	B
Southbound (Left)	8	A	8	A	8	A

* - Signalized Intersection △ - Minor-Leg Stop-Controlled Intersection

The signalized intersection of US 20 / Big Timber Road is anticipated to operate with similar delay as compared to the existing scenario. With the anticipated change in site-generated traffic and the planned improvements, the approaches at the intersection are expected to operate at LOS C or better during each peak hour.

The unsignalized intersection of Big Timber Road / Ridgecrest Drive / Access B is anticipated to operate at LOS C or better for all approaches during each peak hour. Based on the capacity analysis, an increase in delay is noted for the southbound approach compared to the existing scenario.

The unsignalized intersection of US 20 / Allen Road is anticipated to operate with all approaches at LOS C or better during each peak hour and is expected to operate with similar delay as compared to the existing scenario.

The unsignalized intersection of US 20 / Access A is anticipated to operate at LOS B or better for all approaches during each peak hour.

With the addition of site-generated traffic, the study intersections are expected to operate similar to existing conditions. There are no material changes anticipated for delay and 95th percentile queues. The site access driveways are expected to operate with limited delay at LOS C or better. The 95th percentile queues at the site driveways are expected to be two vehicles (50 feet) or less during each peak hour. Based on the results of the future capacity analysis, the study intersections are expected to support site-generated traffic.

4. FUTURE 2042 CONDITIONS – PHASE B

This section of the report outlines the proposed site plan, summarizes site-specific traffic characteristics, and develops future traffic projections for Phase B of the development.

4.1. Development Characteristics & Site Access

Phase B of the proposed development would provide 731 units of mixed residential uses and an additional 150 students anticipated at the elementary school. During Phase B, access to the site would continue to be provided via Access A and B. An additional two (2) accesses will be constructed for Phase B. Access C is proposed to be constructed at the eastern (fourth) leg of the intersection of US 20 / Allen Road. Access D is proposed to be constructed approximately 0.6 miles east of Big Timber Road / Ridgecrest Drive / Access B. The additional driveways would be full-access and minor-leg stop controlled. A site plan is provided in the appendix.

4.2. Trip Generation

In order to calculate trips generated by the proposed uses, data was referenced from the Institute of Transportation Engineers (ITE) manual titled Trip Generation, Tenth Edition. Trip generation rates for the ITE Land Use Code (LUC) corresponding to the proposed use are shown in **Table 4.1**. Copies of the ITE data are provided in the appendix.

Table 4.1. ITE Trip Generation Data

ITE Land Use	Unit	Weekday			
		Daily	AM Peak Hour	Dismissal Peak Hour	PM Peak Hour
Single Family Housing (LUC 210)	Per 1 Unit	$\text{Ln}(T) = 0.92 \cdot \text{LN}(X) + 2.71$ 50% in/50% out	$T = 0.71 \cdot X + 4.8$ 25% in/75% out	$T = \text{Daily Trips} \cdot 0.062$ 64% in/36% out	$\text{Ln}(T) = 0.96 \cdot \text{LN}(X) + 0.2$ 63% in/37% out
Duplex Housing (LUC 220)	Per 1 Unit	$T = 7.56 \cdot X - 40.86$ 50% in/50% out	$\text{Ln}(T) = 0.95 \cdot \text{LN}(X) - 0.51$ 25% in/75% out	$T = \text{Daily Trips} \cdot 0.056$ 59% in/41% out	$\text{Ln}(T) = 0.89 \cdot \text{LN}(X) - 0.2$ 63% in/37% out
Active Adult Single Family Housing (LUC 251)	Per 1 Unit	$\text{Ln}(T) = 0.88 \cdot \text{LN}(X) + 2.28$ 50% in/50% out	$\text{Ln}(T) = 0.76 \cdot \text{LN}(X) + 0.21$ 33% in/67% out	$T = \text{Daily Trips} \cdot 0.07$ 57% in/43% out	$\text{Ln}(T) = 0.78 \cdot \text{LN}(X) + 0.28$ 61% in/39% out
Active Adult Ranch Townhomes (LUC 252)	Per 1 Unit	$T = 4.02 \cdot X - 25.37$ 50% in/50% out	$T = 0.20 \cdot X - 0.18$ 35% in/65% out	$T = \text{Daily Trips} \cdot 0.081$ 53% in/47% out	$T = 0.24 \cdot X + 2.26$ 55% in/45% out
Elementary School (LUC 520)	Students	$T = 20.13 \cdot X - 184.07$ 50% in/50% out	$T = 0.67 \cdot X$ 55% in/46% out	$T = 0.34 \cdot X$ 45% in/55% out	$T = 0.17 \cdot X$ 48% in/52% out

T = trips

X = 1 Unit or 1,000 S.F.

The AM and PM Peak periods utilized the Peak Hour of Adjacent Street Traffic to determine the site generated peak hour trips. The Dismissal Peak Hour utilized the PM Peak Hour of the Generator for the Elementary School, while all residential land uses utilized Appendix A of the ITE Trip Generation Manual Daily Distribution percentages for trip generation assumptions from 1:45 PM – 2:45 PM.

Table 4.2 shows the site generated traffic projections based on the calculations for the proposed uses for Phase B.

Table 4.2. 2042 Phase B Site-Generated Traffic Projections¹

Land Use	Size	Daily	Weekday								
			AM Peak Hour			Dismissal Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Single Family Housing (LUC 210)	425 Units	3,490	75	230	305	155	90	245	255	150	405
Duplex Housing (LUC 220)	90 Units	640	10	35	45	20	15	35	30	15	45
Active Adult Single Family Housing (LUC 251)	162 Units	2,010	20	40	60	80	60	140	45	25	70
Active Adult Ranch Townhomes (LUC 252)	54 Units	190	5	5	10	10	5	15	10	5	15
Elementary School (LUC 520)	150 Students	140	55	45	100	25	30	55	10	15	25
Net New Site Trips		6,920	165	355	520	290	200	490	350	210	560

¹In/Out volumes are rounded to the nearest multiple of five.

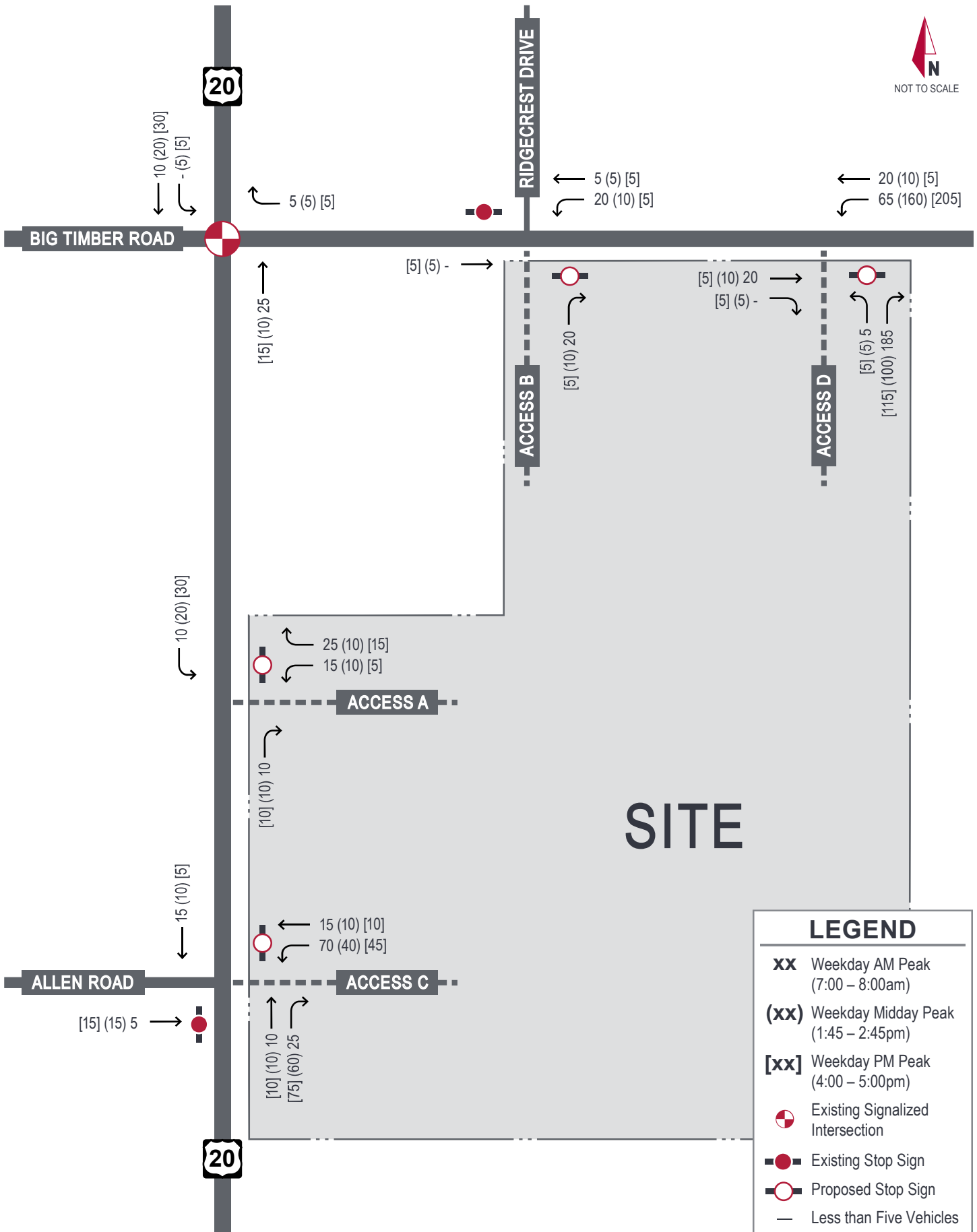
4.3 Directional Distribution

The estimated distribution of site-generated traffic on the surrounding roadway network as it approaches and departs the site is a function of several variables, such as the nature of surrounding land uses, prevailing traffic volumes/patterns, characteristics of the street system, and the ease with which motorists can travel over various sections of that system. The anticipated directional distributions estimated for the primary trips in **Table 4.3**.

Table 4.3. Phase B Estimated Trip Distribution

Traveling to/from:	Estimated Trip Distribution	
	Residential	School
North via US 20	10%	0%
South via US 20	25%	10%
East via Big Timber Road	60%	40%
West via Allen Road	5%	0%
North via Ridgecrest Drive	-	0%
Internal Site	-	50%
Total	100%	100%

Based on these assumptions, the total Phase B site-generated trips are depicted in **Exhibit 6**. A 0% distribution is considered for elementary school traffic from the North via Ridgecrest Drive because it is assumed that traffic from the adjacent neighborhood is already accounted for and generated during Phase A of the development only.



LEGEND	
XX	Weekday AM Peak (7:00 – 8:00am)
(xx)	Weekday Midday Peak (1:45 – 2:45pm)
[xx]	Weekday PM Peak (4:00 – 5:00pm)
	Existing Signalized Intersection
	Existing Stop Sign
	Proposed Stop Sign
	Less than Five Vehicles

4.5. Future Capacity Analysis

The proposed development for Phase B is expected to be constructed by Year 2042; Kimley-Horn therefore evaluated future traffic conditions for a Year 2042 design horizon. Future background traffic growth was assumed, and site-generated trips were then added in order to analyze the development's impact on the study intersections.

Future Background Traffic Projections

In order to estimate Year 2042 traffic volumes, growth rates were applied to the COVID adjusted existing traffic count data. The growth rates were developed using data received from the Chicago Metropolitan Agency for Planning (CMAP). According to Year 2050 traffic projections, a 2.00 percent annual traffic growth rates was applied to the entire study intersection for twenty-two (22) years to reflect Year 2042 conditions.

An official letter from CMAP documenting the projected Year 2050 traffic volume on the study roadways is included in the appendix. For purposes of estimating Year 2042 traffic volumes, it was assumed that Phase A of the development was completed. Traffic projections for the Year 2042 future build scenario are illustrated in **Exhibit 7**.

Future Build Traffic Projections

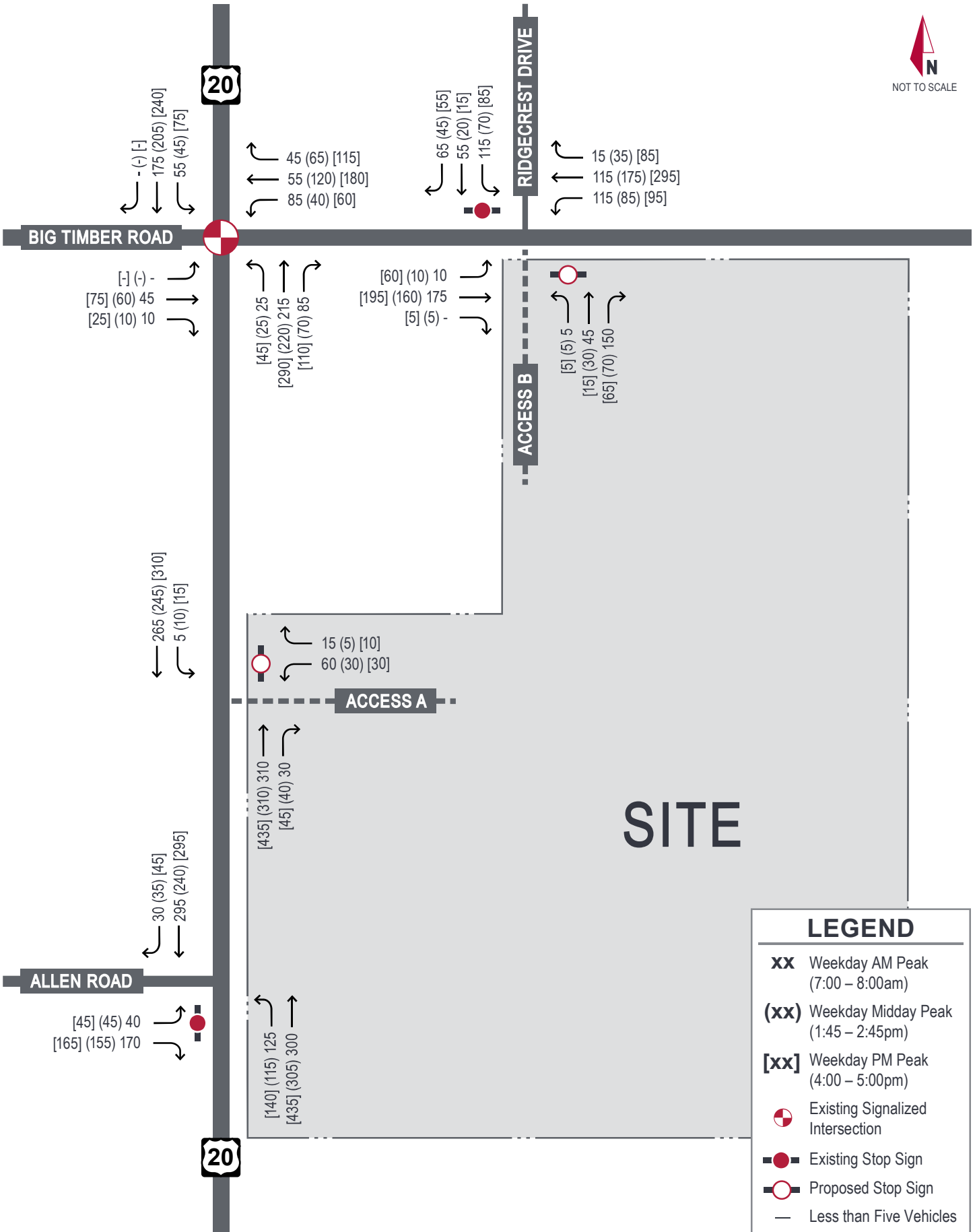
Total traffic projections for Year 2042 were calculated by adding the site-generated trips (Exhibit 6) to future no-build traffic projections (Exhibit 7). Traffic projections for the Year 2042 future build scenario are illustrated in **Exhibit 8**.

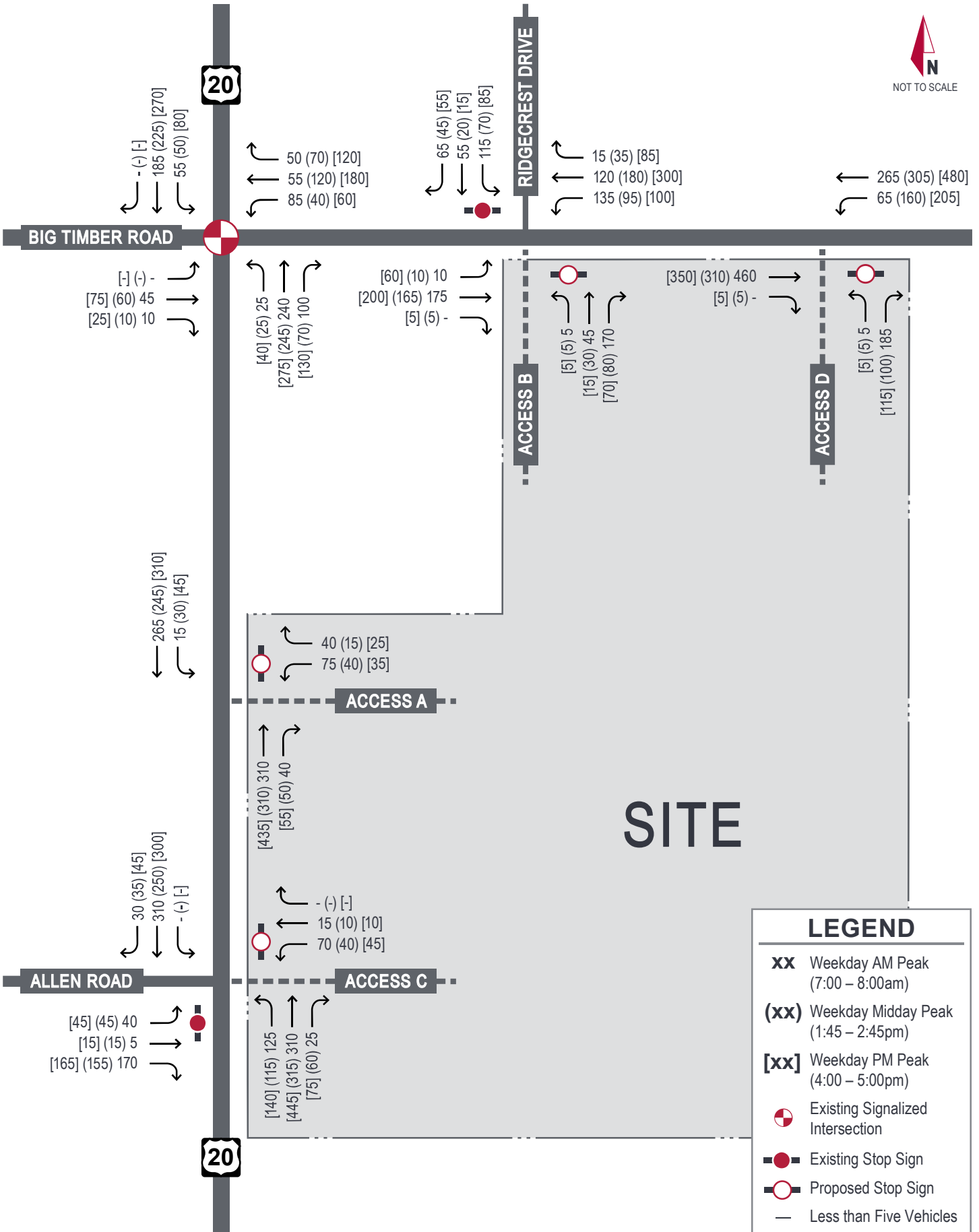
Turn lanes were evaluated at the signalized intersection of US 20 / Big Timber Road. According to the IDOT *BDE Manual*, a right-turn lane may be considered where a capacity analysis determines the turn lane is necessary to meet the LOS criteria. The right-turn movements on US 20 at Big Timber Road are projected to operate with limited delay during the peak hours; and therefore, the addition of a right-turn lanes is not expected to improve LOS. Per guidance in the IDOT *BDE Manual*, a right-turn lane is warranted at a signalized intersection where the right-turning volume is greater than 150 vehicles per hour (vph) and there is greater than 300 vehicles per hour per lane (vphpl) on the mainline. The projected future traffic volumes are below the threshold for a right-turn lane at a signalized intersection; and therefore, the geometry shown in the ISD provided was assumed for the analysis of future conditions.

Left and right-turn lanes were evaluated at US 20 / Access A and US 20 / Allen Road utilizing IDOT *BDE Manual* for two-lane highways with a speed limit of 55 miles per hour (mph). Based on the 2042 Build volumes, a southbound left-turn lane is warranted at Access A. A northbound right-turn lane is warranted at US 20 / Allen Road / Access C. A northbound right-turn lane at US 20 / Access A and a southbound right-turn lane at US 20 / Allen Road / Access C are not warranted.

Based on the existing lane geometry at US 20 / Allen Road / Access C with an existing northbound left-turn lane, a southbound left-turn is recommended at the intersection.

Left and right-turn lanes were evaluated at the intersection of Big Timber Road / Access D utilizing the *Kane County Division of Transportation Permit Regulations and Access Control Regulations*.





Based on the definition of a Major Access discussed previously, it was determined that Access D is considered a Major Access to Big Timber Road (Kane County Highway 21), and left and right-turn lanes are warranted at Big Timber Road / Access D.

The westbound approach at US 20 / Allen Road / Access C is assumed to be reconfigured to provide exclusive left, thru, and right-turn lanes. Access C approach is assumed to provide a protected left-turn lane and a shared through/right lane for the outbound lanes and a single inbound lane. Access D is assumed to provided exclusive left and right-turn lanes for outbound lanes and a single inbound lane.

Utilizing the methodology for the Phase A analysis, signal warrant analyses were performed at all unsignalized intersections in the study area. **Table 4.4** reports the signal warrant analyses conducted for Phase B 2042 Build traffic conditions.

Table 4.4. Summary of Signal Warrant Analyses for Future (2042) Build Phase B

Intersection	Major Street	Higher-Volume Minor-Leg Approach	Meets Warrant?
MUTCD Criteria for two-Lane Major Street with two-lane Minor Street			
Warrant 1A	350	105	--
Warrant 1B	525	53	--
Combination ¹			--
Warrant 1A	280	84	--
Warrant 1B	420	42	--
US Route 20 / Access A	347	47	No
Big Timber Road / Ridgecrest Drive / Access B	250	115	No
US Route 20 / Allen Road / Access C	440	48	No
Big Timber Road / Access D	435	34	No

As shown in **Table 4.4**, a signal warrant is not met at any of the study intersections. Minor-leg stop control is recommended for outbound traffic at all accesses.

The results of the capacity analysis are provided in **Table 4.5**. Consistent with the existing conditions analysis, the results are based on Synchro’s HCM 6th Edition reports, copies of which are included in the appendix.

Table 4.5. Future (Year 2042) Build Levels of Service

Intersection	Weekday AM Peak		Weekday Dismissal Peak		Weekday PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
US 20 / Big Timber Road *						
Eastbound	26	B	30	C	31	C
Westbound	23	C	31	C	40	D
Northbound	14	B	15	B	17	B
Southbound	11	B	13	B	14	B
<i>Intersection</i>	16	<i>B</i>	19	<i>B</i>	24	<i>C</i>
Big Timber Road / Ridgecrest Drive / Access B △						
Eastbound (Left)	8	A	8	A	8	A
Westbound (Left)	8	A	8	A	8	A
Northbound	12	C	12	B	13	B
Southbound	26	D	16	C	26	D
US 20 / Allen Road / Access C △						
Eastbound	16	C	16	C	20	C
Westbound	40	E	27	D	49	E
Northbound (Left)	9	A	8	A	8	A
Southbound (Left)	8	A	8	A	9	A
US 20 / Access A △						
Westbound	14	B	14	B	16	C
Southbound (Left)	8	A	8	A	9	A
Big Timber Road / Access D △						
Westbound (Left)	9	A	8	A	9	A
Northbound	14	B	11	B	12	B

* - Signalized Intersection △ - Minor-Leg Stop-Controlled Intersection

The signalized intersection of US 20 / Big Timber Road is anticipated to operate with similar delay as compared to the existing scenario and the Build 2032 scenario. With the anticipated change in site-generated traffic and the planned improvements, the approaches at the intersection are expected to operate at LOS C or better during each peak hour, with the exception of the westbound approach, that is expected to operate at a LOS D during the PM peak hour.

The unsignalized intersection of Big Timber Road / Ridgecrest Drive / Access B is anticipated to operate at LOS D or better for all approaches during each peak hour. Based on the capacity analysis, an increase in delay is noted for the southbound approach compared to the existing scenario and 2032 Build Scenario.

The unsignalized intersection of US 20 / Allen Road / Access C is anticipated to operate with all approaches at LOS E or better during each peak hour. However, the 95th percentile queue is expected to be 2 vehicles (50 feet) during the PM peak hour.

The unsignalized intersection of US 20 / Access A is anticipated to operate with similar delay as compared to the Build 2032 scenario and is expected to operate at LOS C or better during each peak hour.

The unsignalized intersection of Big Timber Road / Access D is anticipated to operate at LOS B or better during each peak hour.

With the addition of site-generated traffic, the study intersections are expected to operate similar to the 2032 Build scenario. There are no material changes anticipated for delay and 95th percentile queues. The site access driveways are expected to operate with limited delay at LOS D or better, with the exception of Access C. The Access C approach is expected to operate at a LOS E. A signal is not warranted at Access C, but other means of egress at Access C are anticipated for site-generated trips traveling east and south via Big Timber Road.

The 95th percentile queues at the site driveways are expected to be two vehicles (50 feet) or less during each peak hour. Based on the results of the future capacity analysis, the study intersections are expected to support site-generated traffic.

5. RECOMMENDATIONS & CONCLUSIONS

Based on Kimley-Horn's review of the proposed site plan and evaluation of existing and future traffic conditions, the study intersections are expected to adequately accommodate the proposed redevelopment with the following recommendations:

- Construct a southbound left-turn lane at Access A
- Construct an eastbound right-turn lane and a westbound left-turn lane at Access B
- Construct a southbound left-turn lane and a northbound right-turn lane at Access C
- Construct an eastbound right-turn lane and a westbound left-turn lane at Access D
- At all accesses, provide a single inbound and two outbound lanes.
- Reconfigure the Allen Road approach to an exclusive left-turn lane, exclusive thru lane, and an exclusive right-turn lane.
- Install an RRFB on the west leg of Big Timber Road / Ridgecrest Drive / Access B
- Minor-leg stop control should be posted for outbound traffic at all accesses.

Regardless of the final configuration of the intersection geometrics, several additional items should be taken into consideration when preparing site and roadway improvement plans for the subject redevelopment. As the site design progresses, care should be taken with landscaping, signage, and monumentation at the site access locations to ensure that adequate horizontal sight distance is provided from the new stop bars. If alterations to the site plan or land use should occur, changes to the analysis provided within this traffic impact study may be needed.

APPENDIX

Conceptual Site Plan

Traffic Count Data

CMAP Year 2050 Projections

Signal Timings and Intersection Design Study

Existing (2020) Capacity Reports

Data from the ITE Manual Trip Generation, Tenth Edition

Future (2032) Phase A No-Build Capacity Reports

Future (2032) Phase A Build Capacity Reports

Future (2042) Phase B No-Build Capacity Reports

Future (2042) Phase B Build Capacity Reports

CONCEPTUAL SITE PLAN

TRAFFIC COUNT DATA

Study Name 1_Big Timber Road & Brier Hill Road
Start Date Thursday, December 03, 2020 12:00 AM
End Date Friday, December 04, 2020 12:00 AM
Site Code 1

Report Summary

Time Period	Class.	Eastbound					Westbound					Northbound					Southbound					Total
		L	T	R	I	O	L	T	R	I	O	L	T	R	I	O	L	T	R	I	O	
Peak 1	Lights	1	54	7	62	65	39	55	29	123	122	10	74	43	127	115	25	69	0	94	104	406
Specified Period	%	100%	96%	100%	97%	100%	93%	100%	97%	97%	92%	100%	81%	91%	86%	89%	86%	86%	0%	86%	85%	91%
7:00 AM - 8:00 AM	Mediums	0	2	0	2	0	0	0	1	1	6	0	5	1	6	1	3	1	0	4	6	13
One Hour Peak	%	0%	4%	0%	3%	0%	0%	0%	3%	1%	5%	0%	5%	2%	4%	1%	10%	1%	0%	4%	5%	3%
7:00 AM - 8:00 AM	ticated Truc	0	0	0	0	0	3	0	0	3	4	0	12	3	15	13	1	10	0	11	12	29
	%	0%	0%	0%	0%	0%	7%	0%	0%	2%	3%	0%	13%	6%	10%	10%	3%	13%	0%	10%	10%	6%
	Total	1	56	7	64	65	42	55	30	127	132	10	91	47	148	129	29	80	0	109	122	448
	PHF	0.25	1	0.44	0.89	0.81	0.81	0.76	0.62	0.91	0.87	0.62	0.76	0.9	0.82	0.81	0.66	0.8	0	0.76	0.71	0.95
	Approach %	0%	4%	0%	14%	15%	7%	0%	3%	28%	29%	0%	19%	9%	33%	29%	14%	14%	0%	24%	27%	
Peak 2	Lights	2	53	4	59	77	21	69	28	118	101	7	87	29	123	92	19	67	1	87	117	387
Specified Period	%	100%	100%	100%	100%	96%	95%	99%	88%	95%	94%	78%	87%	91%	87%	81%	83%	76%	100%	78%	87%	89%
1:45 PM - 2:45 PM	Mediums	0	0	0	0	3	1	1	0	2	5	2	1	2	5	7	3	6	0	9	1	16
One Hour Peak	%	0%	0%	0%	0%	4%	5%	1%	0%	2%	5%	22%	1%	6%	4%	6%	13%	7%	0%	8%	1%	4%
1:45 PM - 2:45 PM	ticated Truc	0	0	0	0	0	0	0	4	4	2	0	12	1	13	15	1	15	0	16	16	33
	%	0%	0%	0%	0%	0%	0%	0%	13%	3%	2%	0%	12%	3%	9%	13%	4%	17%	0%	14%	12%	8%
	Total	2	53	4	59	80	22	70	32	124	108	9	100	32	141	114	23	88	1	112	134	436
	PHF	0.5	0.78	0.5	0.82	0.83	0.69	0.83	0.8	0.84	0.73	0.56	0.78	0.67	0.8	0.81	0.48	0.88	0.25	0.74	0.78	0.81
	Approach %	0%	0%	0%	14%	18%	5%	1%	13%	28%	25%	22%	13%	9%	32%	26%	17%	24%	0%	26%	31%	
Peak 3	Lights	0	59	14	73	104	33	85	54	172	155	19	113	60	192	147	36	100	0	136	167	573
Specified Period	%	0%	98%	100%	99%	99%	97%	100%	96%	98%	97%	95%	89%	100%	93%	96%	92%	95%	0%	94%	91%	96%
4:00 PM - 5:00 PM	Mediums	0	1	0	1	0	1	0	1	2	3	0	6	0	6	2	2	1	0	3	7	12
One Hour Peak	%	0%	2%	0%	1%	0%	3%	0%	2%	1%	2%	0%	5%	0%	3%	1%	5%	1%	0%	2%	4%	2%
4:00 PM - 5:00 PM	ticated Truc	0	0	0	0	1	0	0	1	1	1	1	8	0	9	4	1	4	0	5	9	15
	%	0%	0%	0%	0%	1%	0%	0%	2%	1%	1%	5%	6%	0%	4%	3%	3%	4%	0%	3%	5%	3%
	Total	0	60	14	74	105	34	85	56	175	159	20	127	60	207	153	39	105	0	144	183	600
	PHF	0	0.79	0.7	0.77	0.8	0.77	0.76	0.82	0.86	0.9	0.62	0.71	0.83	0.88	0.83	0.7	0.88	0	0.86	0.74	0.9
	Approach %	0%	2%	0%	12%	18%	3%	0%	4%	29%	27%	5%	11%	0%	35%	26%	8%	5%	0%	24%	31%	

Study Name 2_Big Timber Road & Ridgecrest Drive
Start Date Thursday, December 03, 2020 12:00 AM
End Date Friday, December 04, 2020 12:00 AM
Site Code 2

Report Summary

Time Period	Class.	Eastbound				Westbound				Northbound		Southbound				Total	
		L	T	I	O	L	T	R	I	O	I	O	L	R	I		O
Peak 1	Lights	29	72	101	107	0	57	14	71	131	0	0	59	50	109	43	281
Specified Period	%	100%	91%	94%	98%	0%	97%	100%	97%	95%	0%	0%	100%	100%	100%	100%	97%
7:00 AM - 8:00 AM	Mediums	0	6	6	2	0	2	0	2	6	0	0	0	0	0	0	8
One Hour Peak	%	0%	8%	6%	2%	0%	3%	0%	3%	4%	0%	0%	0%	0%	0%	0%	3%
7:00 AM - 8:00 AM	ticated Truc	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1
	%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
	Total	29	79	108	109	0	59	14	73	138	0	0	59	50	109	43	290
	PHF	0.72	0.79	0.93	0.88	0	0.87	0.7	0.91	0.77	0	0	0.74	0.89	0.8	0.72	0.9
	Approach %	0%	9%	37%	38%	0%	3%	0%	25%	48%	0%	0%	0%	0%	38%	15%	
Peak 2	Lights	19	68	87	100	0	77	30	107	100	0	0	32	23	55	49	249
Specified Period	%	100%	92%	94%	97%	0%	96%	100%	97%	94%	0%	0%	100%	100%	100%	100%	97%
1:45 PM - 2:45 PM	Mediums	0	5	5	1	0	1	0	1	5	0	0	0	0	0	0	6
One Hour Peak	%	0%	7%	5%	1%	0%	1%	0%	1%	5%	0%	0%	0%	0%	0%	0%	2%
1:45 PM - 2:45 PM	ticated Truc	0	1	1	2	0	2	0	2	1	0	0	0	0	0	0	3
	%	0%	1%	1%	2%	0%	3%	0%	2%	1%	0%	0%	0%	0%	0%	0%	1%
	Total	19	74	93	103	0	80	30	110	106	0	0	32	23	55	49	258
	PHF	0.68	0.92	0.86	0.92	0	0.91	0.83	0.92	0.91	0	0	0.73	0.72	0.92	0.82	0.93
	Approach %	0%	8%	36%	40%	0%	4%	0%	43%	41%	0%	0%	0%	0%	21%	19%	
Peak 3	Lights	46	83	129	160	0	135	68	203	122	0	0	39	25	64	114	396
Specified Period	%	98%	97%	97%	98%	0%	99%	100%	99%	98%	0%	0%	100%	96%	98%	99%	98%
4:00 PM - 5:00 PM	Mediums	1	2	3	2	0	1	0	1	2	0	0	0	1	1	1	5
One Hour Peak	%	2%	2%	2%	1%	0%	1%	0%	0%	2%	0%	0%	0%	4%	2%	1%	1%
4:00 PM - 5:00 PM	ticated Truc	0	1	1	1	0	1	0	1	1	0	0	0	0	0	0	2
	%	0%	1%	1%	1%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
	Total	47	86	133	163	0	137	68	205	125	0	0	39	26	65	115	403
	PHF	0.69	0.9	0.92	0.91	0	0.9	0.85	0.92	0.84	0	0	0.75	0.81	0.77	0.78	0.97
	Approach %	2%	3%	33%	40%	0%	1%	0%	51%	31%	0%	0%	0%	4%	16%	29%	

Study Name 3_Brier Hill Road & Allen Road
Start Date Tuesday, December 08, 2020 12:00 AM
End Date Wednesday, December 09, 2020 12:00 AM
Site Code 3

Report Summary

Time Period	Class.	Eastbound				Westbound		Northbound				Southbound				Total
		L	R	I	O	I	O	L	T	I	O	T	R	I	O	
Peak 1	Lights	21	95	116	84	0	0	71	105	176	179	84	13	97	126	389
Specified Period	%	81%	86%	85%	88%	0%	0%	88%	81%	84%	81%	76%	87%	77%	81%	82%
7:00 AM - 8:00 AM	Mediums	4	4	8	4	0	0	2	13	15	15	11	2	13	17	36
One Hour Peak	%	15%	4%	6%	4%	0%	0%	2%	10%	7%	7%	10%	13%	10%	11%	8%
7:00 AM - 8:00 AM	ticulated Truc	1	11	12	8	0	0	8	11	19	27	16	0	16	12	47
	%	4%	10%	9%	8%	0%	0%	10%	9%	9%	12%	14%	0%	13%	8%	10%
	Total	26	110	136	96	0	0	81	129	210	221	111	15	126	155	472
	PHF	0.59	0.72	0.76	0.83	0	0	0.84	0.83	0.89	0.78	0.82	0.62	0.79	0.84	0.84
	Approach %	19%	14%	29%	20%	0%	0%	12%	19%	44%	47%	24%	13%	27%	33%	
Peak 2	Lights	17	92	109	76	0	0	63	97	160	173	81	13	94	114	363
Specified Period	%	65%	92%	87%	79%	0%	0%	82%	87%	85%	86%	80%	68%	78%	83%	83%
1:45 PM - 2:45 PM	Mediums	5	2	7	9	0	0	7	5	12	9	7	2	9	10	28
One Hour Peak	%	19%	2%	6%	9%	0%	0%	9%	4%	6%	4%	7%	11%	8%	7%	6%
1:45 PM - 2:45 PM	ticulated Truc	4	6	10	11	0	0	7	10	17	19	13	4	17	14	44
	%	15%	6%	8%	11%	0%	0%	9%	9%	9%	9%	13%	21%	14%	10%	10%
	Total	26	100	126	96	0	0	77	112	189	201	101	19	120	138	435
	PHF	0.72	0.69	0.73	0.86	0	0	0.8	0.88	0.89	0.76	0.84	0.53	0.88	0.88	0.88
	Approach %	35%	8%	29%	22%	0%	0%	18%	13%	43%	46%	20%	32%	28%	32%	
Peak 3	Lights	25	106	131	110	0	0	86	148	234	226	120	24	144	173	509
Specified Period	%	96%	100%	99%	95%	0%	0%	96%	91%	93%	94%	90%	92%	90%	92%	94%
4:00 PM - 5:00 PM	Mediums	1	0	1	2	0	0	1	7	8	3	3	1	4	8	13
One Hour Peak	%	4%	0%	1%	2%	0%	0%	1%	4%	3%	1%	2%	4%	3%	4%	2%
4:00 PM - 5:00 PM	ticulated Truc	0	0	0	4	0	0	3	7	10	11	11	1	12	7	22
	%	0%	0%	0%	3%	0%	0%	3%	4%	4%	5%	8%	4%	8%	4%	4%
	Total	26	106	132	116	0	0	90	162	252	240	134	26	160	188	544
	PHF	0.81	0.65	0.75	0.78	0	0	0.78	0.92	0.93	0.75	0.86	0.81	0.85	0.9	0.86
	Approach %	4%	0%	24%	21%	0%	0%	4%	9%	46%	44%	10%	8%	29%	35%	

CMAP YEAR 2050 PROJECTIONS

TRAFFIC FORECAST RECORD

Record Number: ka-19-20

Type of Report: Projection

Year Sought: 2050

Analyst: JAR

Organization requesting forecast: Kimley-Horn

Contact: Morgan Hoxsie P.E.

Email or Phone Morgan.Hoxsie@kimley-horn.com

Sponsor:

Date request was received: December 8, 2020

Date that response was emailed: December 11, 2020

Facility Location: Brier Hill Road (IL 20) / Big Timber Road

Municipality: Hampshire



Chicago Metropolitan Agency for Planning

433 West Van Buren Street
Suite 450
Chicago, IL 60607
312-454-0400
cmap.illinois.gov

December 11, 2020

Morgan Hoxsie, P.E. (MN)
Kimley-Horn
4201 Winfield Road
Suite 600
Warrenville, IL 60555

Subject: Brier Hill Road (IL 20) / Big Timber Road

Dear Ms. Hoxsie:

In response to a request made on your behalf and dated December 8, 2020, we have developed year 2050 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current Volumes	Year 2050 ADT
Brier Hill Rd south of Big Timber Rd	5,000	9,300
Brier Hill Rd north of Big Timber Rd	5,650	10,500
Big Timber Rd east of Brier Hill Rd	3,900	7,260
Brier Hill Rd south of Allen Rd	7,600	14,100
Allen Rd	2,750	5,100

Traffic projections are developed using existing ADT data provided in the request letter and the results from the June 2020 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2050 socioeconomic projections and assumes the implementation of the ON TO 2050 Comprehensive Regional Plan for the Northeastern Illinois area. The provision of this data in support of your request does not constitute a CMAP endorsement of the proposed development or any subsequent developments.

If you have any questions, please call me at (312) 386-8806.

Sincerely,

Jose Rodriguez, PTP, AICP
Senior Planner, Research & Analysis

cc: Quigley (IDOT)
2020_TrafficForecast\Hampshire\ka-19-20\ka-19-20.docx

SIGNAL TIMINGS AND INTERSECTION DESIGN STUDY

US 20 @ Big Timber:

	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Min Green	3	20		8	3	20		8
Veh Ext	3.0	7.0		5.0	3.0	7.0		5.0
Max	15	50		35	15	50		35
Dynamic Step				5.0				5.0
Dynamic Max				45				45
Yellow	3.5	4.5		4.5	3.5	4.5		4.5
Red Clr	0.0	3.0		3.0	0.0	3.0		3.0

All times in seconds.

SIGNALIZED CAPACITY DESIGN ANALYSIS

PROGRAM USED: HCS7 VERSION: 7.3 SIGNAL TYPE: UNCOORDINATED AREA TYPE: NON-CBD
 NUMBER OF PHASES: (A.M.) 6 (P.M.) 6 CYCLE LENGTH: (A.M.) 90 SEC. (P.M.) 90 SEC. PEAK HOUR FACTOR: 0.82 / 0.92
 INTERSECTION DELAY/LEVEL-OF-SERVICE A.M. 26.1 SECONDS LOS C P.M. 23.8 SECONDS LOS C

APPROACH	SOUTHBOUND (A)		NORTHBOUND (B)		EASTBOUND (C)		WESTBOUND (D)	
LANE GROUP	L	TR	L	TR	L	TR	L	TR
NUMBER OF LANES	1	1	1	1	1	1	1	1
2018 30TH MAX. HOUR TRAFFIC (veh/h)	A.M. 90 P.M. 70	150 235	40 30	245 295	5 5	210 140	50 45	390 300
BASE SATURATION FLOW RATE (veh/h)	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900
LANE WIDTH (FT)	12	12	12	12	11	11	11	11
VOLUME OF RIGHT TURN ON RED (veh/h)	A.M. 0 P.M. 0	P.M. 0	A.M. 0 P.M. 0	P.M. 0	A.M. 0 P.M. 0	P.M. 0	A.M. 0 P.M. 0	P.M. 0
PEDESTRIANS/HOUR (ped/h)	A.M. 0 P.M. 0	P.M. 0	A.M. 0 P.M. 0	P.M. 0	A.M. 0 P.M. 0	P.M. 0	A.M. 0 P.M. 0	P.M. 0
ARRIVAL TYPE	3		3		3		3	
LANE UTILIZATION ADJ. FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
GREEN TIME (SECONDS)	A.M. 5.8 P.M. 4.2	36.0 45.2	3.8 3.0	34.0 44.0	0.4 0.4	26.0 18.0	3.2 2.9	28.8 20.5
GREEN RATIO (g/C)	A.M. 0.44 P.M. 0.53	0.40 0.50	0.42 0.52	0.38 0.49	0.29 0.20	0.29 0.20	0.33 0.23	0.32 0.23
CAPACITY (c)	A.M. 440 P.M. 521	650 868	462 589	652 798	133 121	499 367	329 294	567 402
v/c RATIO (X)	A.M. 0.249 P.M. 0.146	0.282 0.294	0.106 0.055	0.458 0.402	0.046 0.045	0.513 0.415	0.185 0.166	0.839 0.810
STORAGE QUEUE (FEET)	A.M. 80 P.M. 55	115 150	35 25	195 190	10 10	190 145	55 50	335 290
LANE GROUP DELAY (SECONDS)	A.M. 16.1 P.M. 11.1	19.3 14.0	16.0 10.9	23.4 16.2	25.3 30.0	27.9 32.5	22.1 27.8	33.2 38.5
LANE GROUP LEVEL-OF-SERVICE	A.M. B P.M. B	B	B	C	C	C	C	C
APPROACH DELAY (SECONDS/VEHICLE)	A.M. 18.1 P.M. 13.3		22.3 15.7		27.8 32.4		32.0 37.1	
APPROACH LEVEL-OF-SERVICE	A.M. B P.M. B	B	B	C	C	C	C	D

ELEMENTS CONTROLLING DESIGN

PREFERRED ROUTE:
 F.A. ROUTE NUMBER: FAP 345 MARKED ROUTE NUMBER: US 20
 STREET NAME: US 20 SRA ROUTE ? Y/N Y
 FUNCTIONAL CLASSIFICATION: OTHER PRINCIPAL ARTERIAL OSOW DESIGN ? Y/N Y
 2018 EXISTING ADT: 5,050 VPD. DESIGN YEAR ADT: 5,050 VPD.
 PROPOSED DESIGN SPEED: 55 MPH. PROPOSED POSTED SPEED: 55 MPH.

SECONDARY ROUTE:
 F.A. ROUTE NUMBER: FAU 2261 MARKED ROUTE NUMBER: CH 21
 STREET NAME: BIG TIMBER ROAD SRA ROUTE ? Y/N N
 FUNCTIONAL CLASSIFICATION: MINOR COLLECTOR / MINOR ARTERIAL OSOW DESIGN ? Y/N N
 2018 EXISTING ADT: 3,950 VPD. DESIGN YEAR ADT: 3,950 VPD.
 PROPOSED DESIGN SPEED: 50 MPH. PROPOSED POSTED SPEED: 50 MPH.
 IMPROVEMENT TYPE: 3R ANTICIPATED YEAR OF CONSTRUCTION: 2021
 EXISTING METHOD OF TRAFFIC CONTROL: SIGNALIZED PROPOSED METHOD: SIGNALIZED
 SIGNAL WARRANT: EXISTING SIGNAL
 DESIGN VEHICLE: WB-55 (WEST APPROACH), WB-65 (ALL OTHER APPROACHES)
 DESIGN YEAR: 2021, WHICH IS THE ANTICIPATED YEAR OF CONSTRUCTION.
 TRUCK ROUTE DESIGNATION: PREFERRED ROADWAY: CLASS II
 SECONDARY ROADWAY: N/A
 DESIGN CRITERIA: 3R - BDE CHAPTER 49

GENERAL NOTES
 ARE PROFILES PROVIDED ? (YES/NO). IF NOT, STATE REASON WHY:
 TYPE N/A CURB AND GUTTER ON THE OUTSIDE OF THE ROADWAY/SHOULDERS.
 TYPE N/A CURB AND GUTTER ON THE APPROACH MEDIAN.
 TYPE N/A CURB AND GUTTER ON THE CORNER ISLANDS.
 ALL DIMENSIONS ARE (E-E OR F-F) UNLESS OTHERWISE NOTED
 THE RIGHT-OF-WAY LIMITS ARE PRELIMINARY.
 DESIGN VEHICLE TURNING MOVEMENTS ARE ACCOMMODATED PER AUTOTURN SOFTWARE, VERSION 10.
 THE SCOPE OF WORK: INTERSECTION CHANNELIZATION, PROFILE AND SUPERELEVATION ADJUSTMENTS,
 AND SHOULDER WIDENING TO ACCOMMODATE BICYCLISTS.
 INTERSECTION DESIGN EXCEPTIONS: SEE IDS SHEET 2
 ADDITIONAL NOTES:
 - INTERSECTION WAS NOT INDICATED AS A 5% CRASH LOCATION
 - SIGNAL IS NOT INTERCONNECTED
 - ALL SIDEWALKS AND RAMPS AS SHOWN ARE IN COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT

EDITS
 FILE NAME
 PLOT SCALE
 USER NAME

PHASE	PHASE I	PHASE II	PHASE III	PHASE IV
PERIOD	YELLOW RED	YELLOW RED	YELLOW RED	YELLOW RED
GREEN TIME IN SECONDS	AM 3.8 PM 3.0	3.5 3.5	2.0 1.2	0.0 0.0
	34.0 44.0	4.5 4.5	1.5 1.5	0.4 0.4
	3.5 3.5	1.0 1.0	0.0 0.0	1.0 1.0

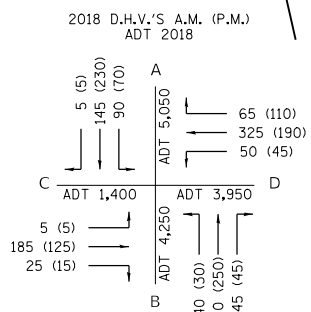
PHASE	PHASE V	PHASE VI	CYCLE LENGTH
PERIOD	YELLOW RED	YELLOW RED	
GREEN TIME IN SECONDS	AM 2.8 PM 2.5	0.0 0.0	26.0 18.0
	0.0 0.0	4.5 4.5	1.5 1.5
	0.0 0.0	18.0 18.0	90 SEC. 90 SEC.

PROP. CURVE PR_CL_BTR_4
 PI STA. = 155+92.52
 $\Delta = 3^\circ 11' 38''$ (LT)
 $D = 0^\circ 47' 17''$
 $R = 7,270.19'$
 $T = 202.69'$
 $L = 405.28'$
 $E = 2.82'$
 $e = 5.20\%$
 $T.R. = 36.00'$
 $S.E. RUN = 125.00'$
 $P.C. STA. = 153+89.84$
 $P.T. STA. = 157+95.22$

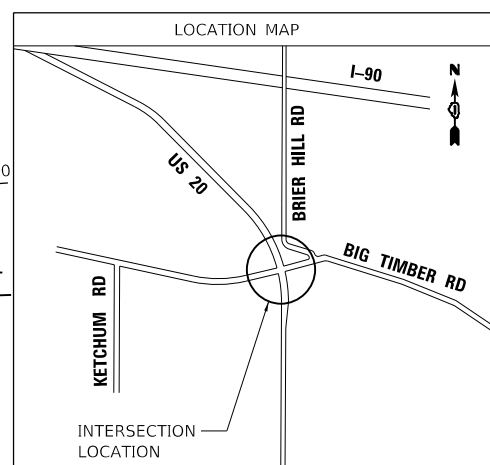
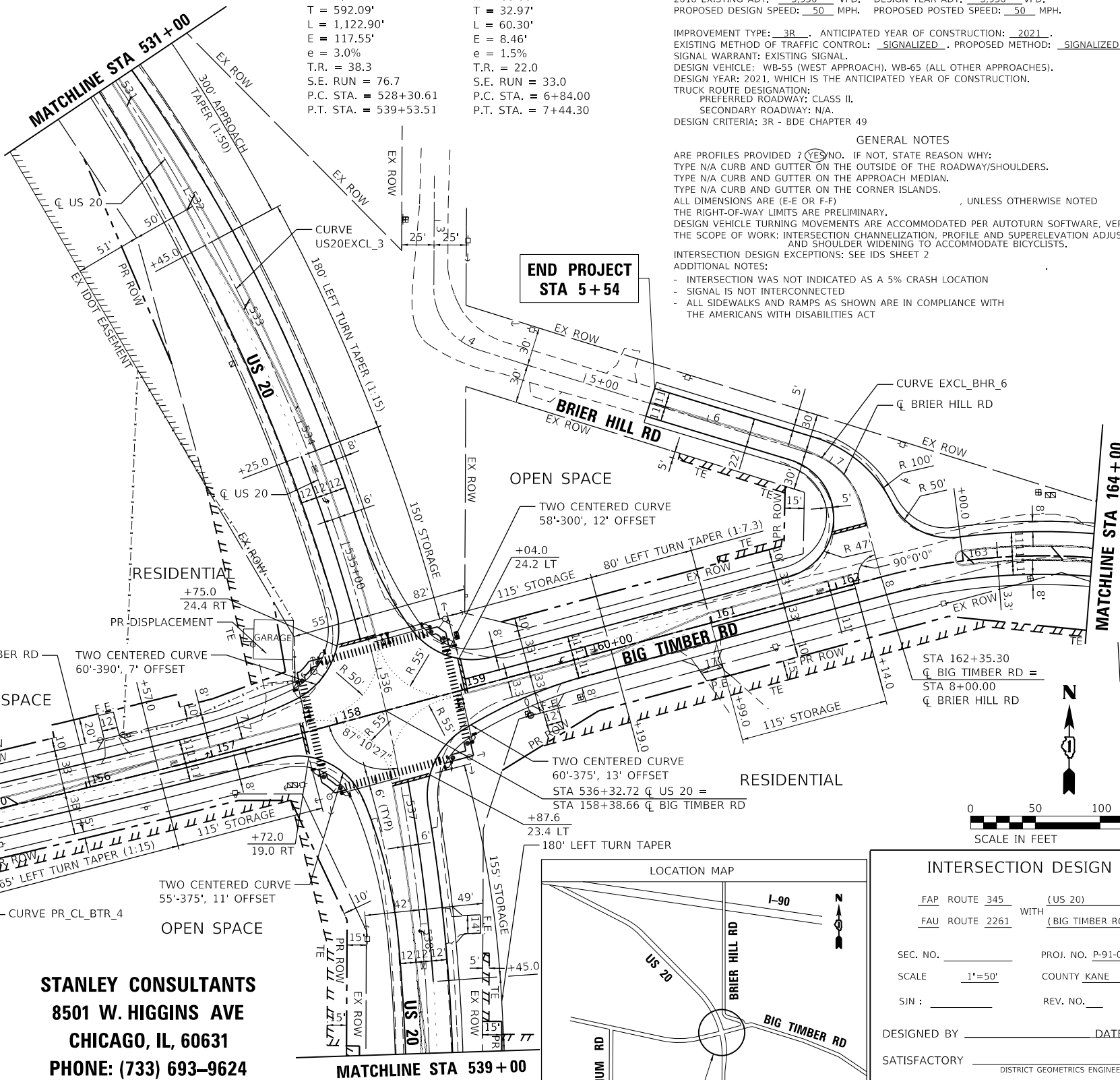
TRAFFIC DATA

MOVEMENT	YEAR 2018 30TH MAXIMUM HOUR TRAFFIC		PERCENT TRUCK TRAFFIC IN 30TH MAX. HOUR		ESTIMATED PERCENT INCREASE BY	YEAR 30TH MAXIMUM HOUR TRAFFIC		ESTIMATED PERCENT INCREASE BY	YEAR 30TH MAXIMUM HOUR TRAFFIC	
	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.
AD (L)	90	70	9%	9%	N/A	N/A	N/A	N/A	N/A	N/A
AB (T)	145	230	19%	11%	N/A	N/A	N/A	N/A	N/A	N/A
AC (R)	5	5	0%	0%	N/A	N/A	N/A	N/A	N/A	N/A
BC (L)	40	30	18%	0%	N/A	N/A	N/A	N/A	N/A	N/A
BA (T)	200	250	9%	17%	N/A	N/A	N/A	N/A	N/A	N/A
BD (R)	45	45	2%	0%	N/A	N/A	N/A	N/A	N/A	N/A
CA (L)	5	5	0%	0%	N/A	N/A	N/A	N/A	N/A	N/A
CD (T)	185	125	5%	2%	N/A	N/A	N/A	N/A	N/A	N/A
CB (R)	25	15	36%	0%	N/A	N/A	N/A	N/A	N/A	N/A
DB (L)	50	45	2%	2%	N/A	N/A	N/A	N/A	N/A	N/A
DC (T)	325	190	4%	1%	N/A	N/A	N/A	N/A	N/A	N/A
DA (R)	65	110	9%	3%	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL A	510	670			N/A	N/A	N/A	N/A	N/A	N/A
TOTAL B	505	615			N/A	N/A	N/A	N/A	N/A	N/A
TOTAL C	585	370			N/A	N/A	N/A	N/A	N/A	N/A
TOTAL D	760	585			N/A	N/A	N/A	N/A	N/A	N/A

T = THROUGH, L = LEFT, R = RIGHT



STANLEY CONSULTANTS
 8501 W. HIGGINS AVE
 CHICAGO, IL, 60631
 PHONE: (733) 693-9624
 FAX: (733) 693-7690
 PM: TYLER GRAU
 PE: CURT GRASS



INTERSECTION DESIGN STUDY

FAP ROUTE 345 WITH (US 20)
 FAU ROUTE 2261 WITH (BIG TIMBER ROAD)

SEC. NO. _____ PROJ. NO. P-91-044-18
 SCALE 1"=50' COUNTY KANE
 SIN : _____ REV. NO. _____

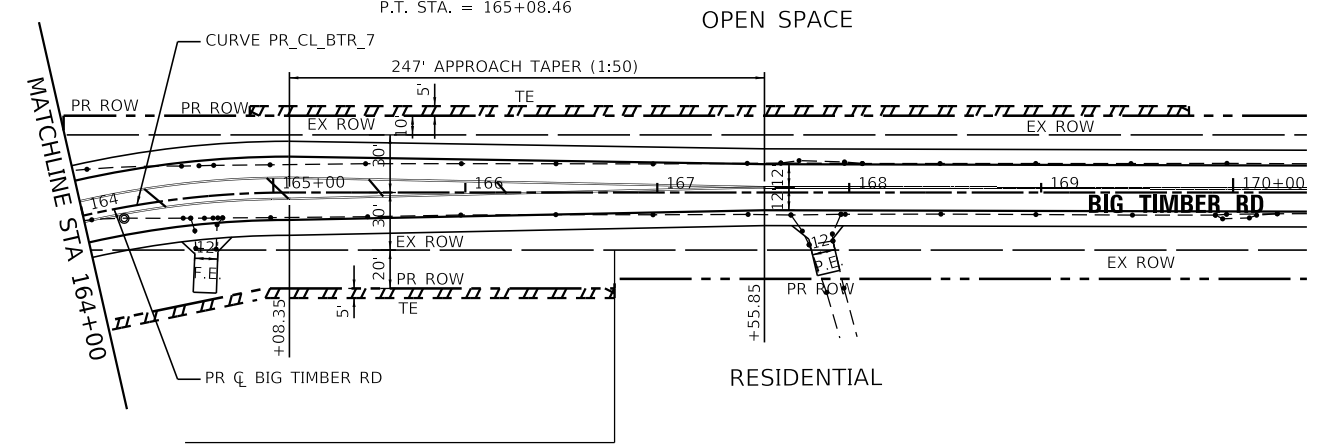
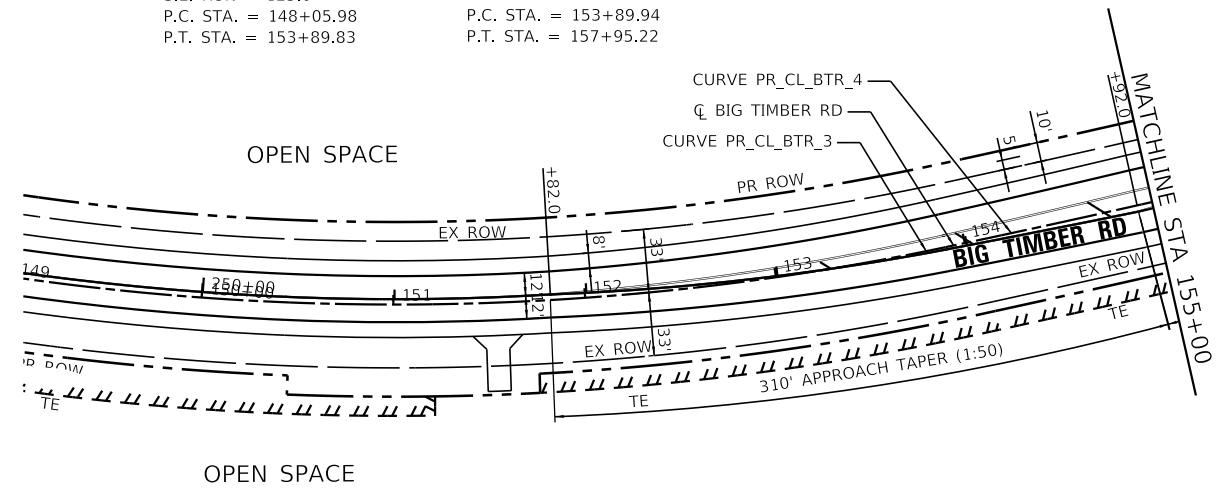
DESIGNED BY _____ DATE _____
 SATISFACTORY _____ DISTRICT GEOMETRICS ENGINEER _____ DATE _____
 SATISFACTORY _____ DISTRICT PROGRAM DEVELOPMENT ENGINEER _____ DATE _____
 SATISFACTORY _____ DISTRICT OPERATIONS ENGINEER _____ DATE _____
 APPROVED _____ REGIONAL ENGINEER _____ DATE _____

CADD FILE NAME : [] I.D.S. SHEET 1 OF 5

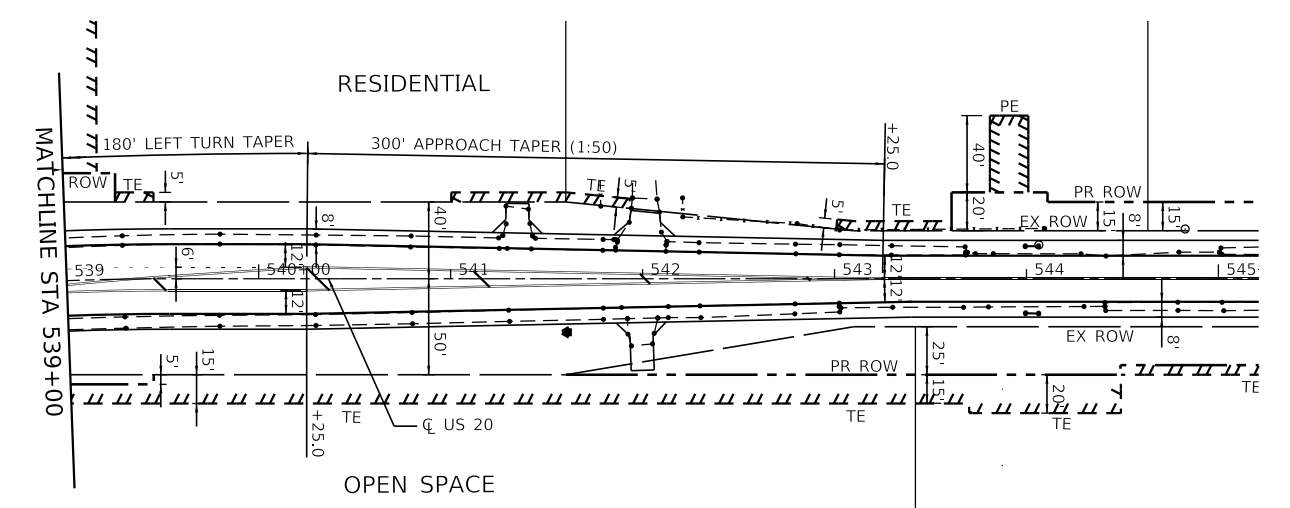
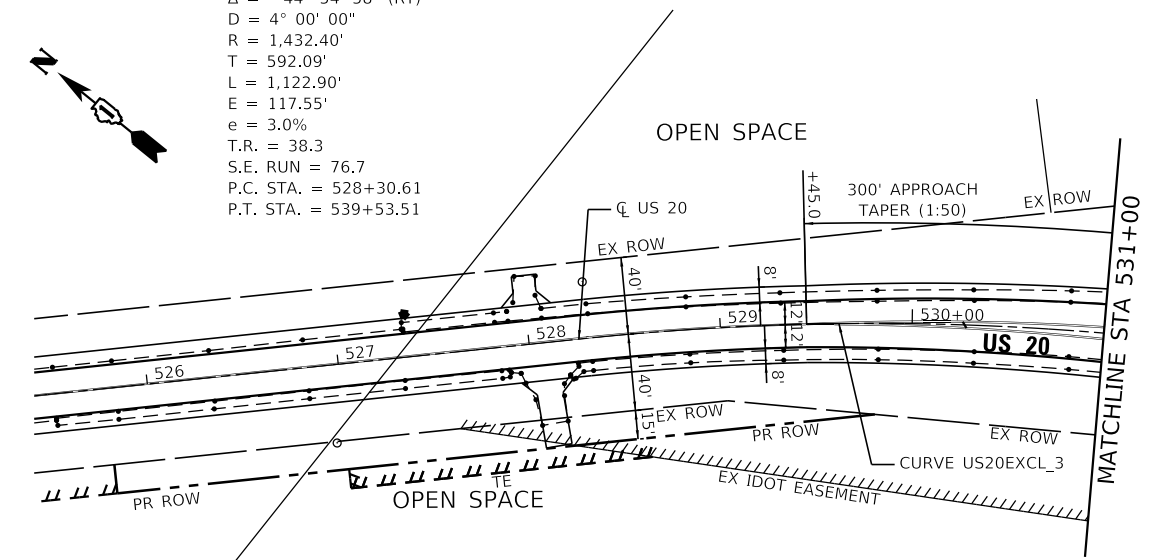
PROP. CURVE PR_CL_BTR_3
 PI STA. = 151+02.27
 $\Delta = 24^\circ 02' 37''$ (LT)
 $D = 4^\circ 07' 05''$
 $R = 1,391.30'$
 $T = 296.28'$
 $L = 583.85'$
 $E = 31.20'$
 $e = 5.20\%$
 $T.R. = 36.0$
 $S.E. RUN = 125.0$
 $P.C. STA. = 148+05.98$
 $P.T. STA. = 153+89.83$

PROP. CURVE PR_CL_BTR_4
 PI STA. = 155+92.63
 $\Delta = 3^\circ 11' 38''$ (LT)
 $D = 0^\circ 47' 17''$
 $R = 7,270.19'$
 $T = 202.69'$
 $L = 405.28'$
 $E = 2.82'$
 $e = 5.20\%$
 $T.R. = 36.0$
 $S.E. RUN = 125.0$
 $P.C. STA. = 153+89.94$
 $P.T. STA. = 157+95.22$

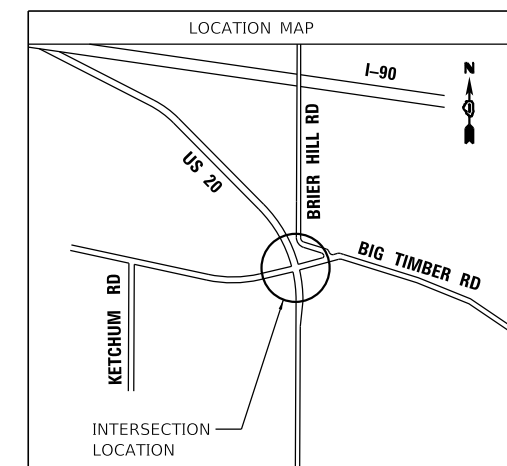
PROP. CURVE PR_CL_BTR_7
 PI STA. = 163+75.02
 $\Delta = 32^\circ 25' 18''$ (RT)
 $D = 11^\circ 48' 49''$
 $R = 485.00'$
 $T = 141.01'$
 $L = 274.45'$
 $E = 20.08'$
 $e = 4.0\%$
 $T.R. = 33.0$
 $S.E. RUN = 88.0$
 $P.C. STA. = 162+34.01$
 $P.T. STA. = 165+08.46$



EXIST. CURVE US20EXCL_3
 PI STA. = 534+22.70
 $\Delta = 44^\circ 54' 58''$ (RT)
 $D = 4^\circ 00' 00''$
 $R = 1,432.40'$
 $T = 592.09'$
 $L = 1,122.90'$
 $E = 117.55'$
 $e = 3.0\%$
 $T.R. = 38.3$
 $S.E. RUN = 76.7$
 $P.C. STA. = 528+30.61$
 $P.T. STA. = 539+53.51$



Level Two Design Exceptions - Big Timber Road					
No.	Location	Element	BDE Policy Value	Proposed Value	Justification
1	BIG TIMBER ROAD STA 160+19 TO STA 160+99	TURN LANE TAPER LENGTH	165' (15:1)	80' (7.2:1)	The turn taper length is restricted due to the proximity of the Brier Hill intersection to the Big Timber Road intersection. In order to provide minimum left-turn storage lengths, for both intersections, the taper length is shortened to 80 feet. Meeting the policy value will require relocating the Brier Hill Rd intersection further east which would impact an archaeological site.
2	BIG TIMBER ROAD STA 157+95.09 TO STA 158+20.09	MINIMUM VERTICAL CURVE LENGTH	150'	25'	Meeting the policy value will reduce the stopping sight distance which is already below policy value. Meeting the policy value would require diverting flow from existing drainage patterns and impacts the US 20 cross slope through the intersection.
3	BIG TIMBER ROAD STA 158+62.95 TO STA 158+92.95	MINIMUM VERTICAL CURVE LENGTH	150'	30'	Meeting the policy value will reduce the stopping sight distance which is already below policy value. Meeting the policy value would require diverting flow from existing drainage patterns and raising the profile grade that impacts adjacent driveways and impacts the US 20 cross slope through the intersection.
4	BIG TIMBER ROAD STA 157+00 TO STA 158+00	MINIMUM STOPPING SIGHT DISTANCE	425'	288'	The stopping sight distance (SSD) has been improved by lowering the super elevation on US 20 to the minimum acceptable rate. Meeting policy value would require realignment of US 20 to reduce super elevation and modifying the Big Timber Road profile to flatten the grades approaching the intersection.
5	BIG TIMBER ROAD STA 160+50 TO STA 162+50	MINIMUM STOPPING SIGHT DISTANCE	425'	227'	The stopping sight distance (SSD) has been improved by lowering the super elevation on US 20 to the minimum acceptable rate. Meeting policy value would require realignment of the US 20 profile or reduce super elevation further and modification of the Big Timber Road profile. The proximity would also require the reprofiling and regrading of Brier Hill Road. These additional impacts might affect the drainage, grading project cost, and create impact to the archaeological site property adjacent to Brier Hill Road.
6	BIG TIMBER ROAD AT BRIER HILL RD (SB RT / EB LT / WB RT)	DESIGN VEHICLE	WB-55 WITHOUT ENCROACHMENT	SINGLE-UNIT TRUCK OR WB-55 WITH ENCROACHMENT	Meeting the policy value would require realignment of Brier Hill Rd that would impact an archaeological site.



INTERSECTION DESIGN STUDY

FAP ROUTE 345 (US 20)
 FAU ROUTE 2261 WITH (BIG TIMBER ROAD)

SEC. NO. _____ PROJ. NO. P-91-044-18
 SCALE 1"=50' COUNTY KANE
 SIN : _____ REV. NO. _____

DESIGNED BY _____ DATE _____

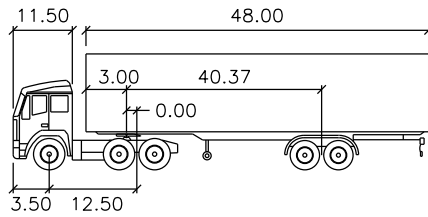
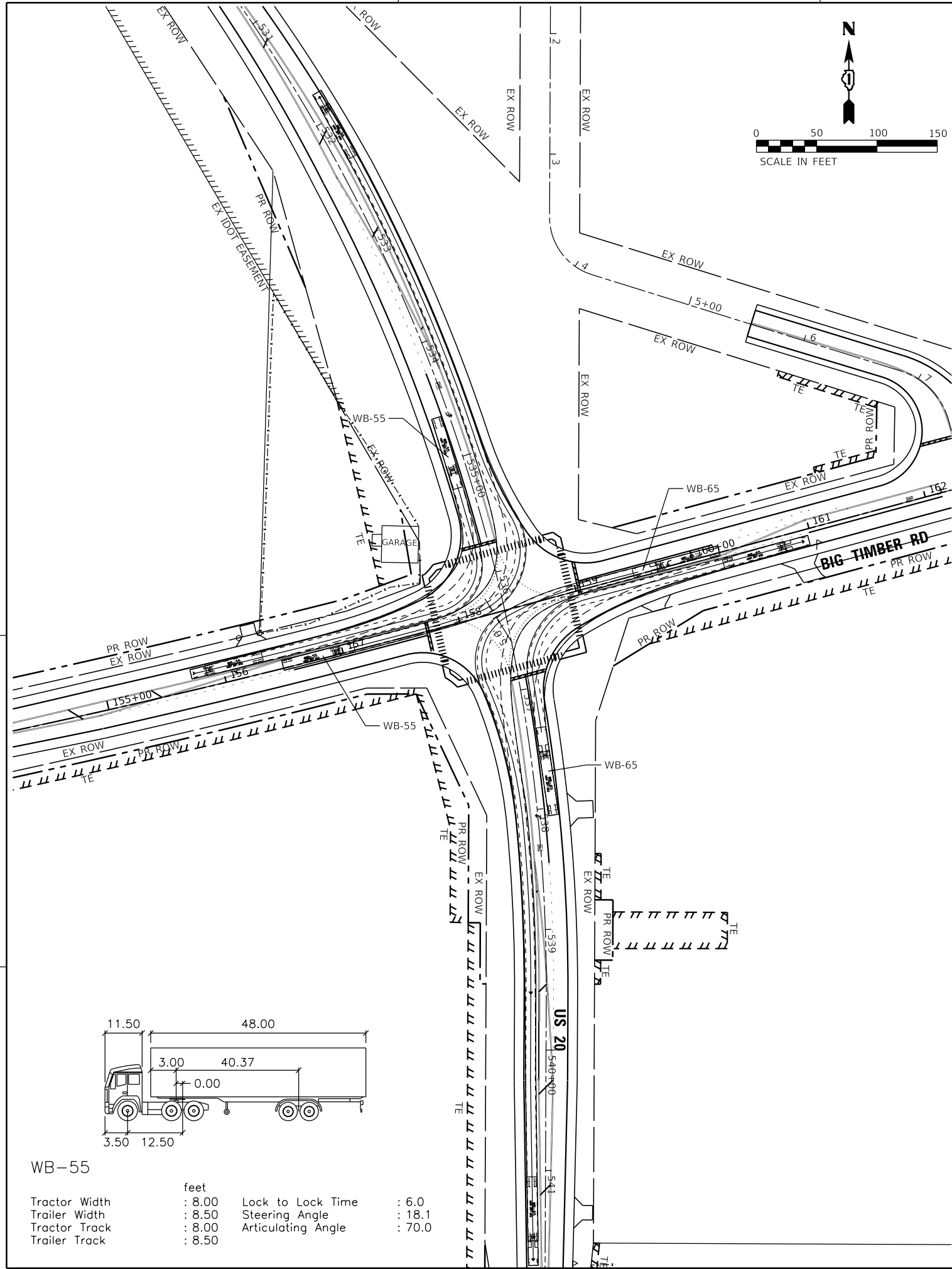
SATISFACTORY _____ DISTRICT GEOMETRICS ENGINEER _____ DATE _____
 SATISFACTORY _____ DISTRICT PROGRAM DEVELOPMENT ENGINEER _____ DATE _____
 SATISFACTORY _____ DISTRICT OPERATIONS ENGINEER _____ DATE _____

APPROVED _____ REGIONAL ENGINEER _____ DATE _____

CADD FILE NAME : [] I.D.S. SHEET 2 OF 5

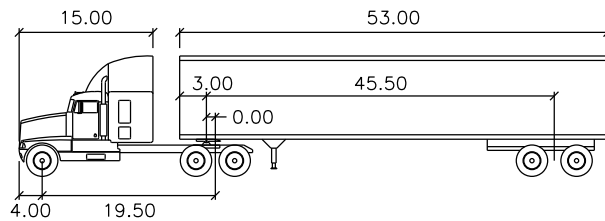
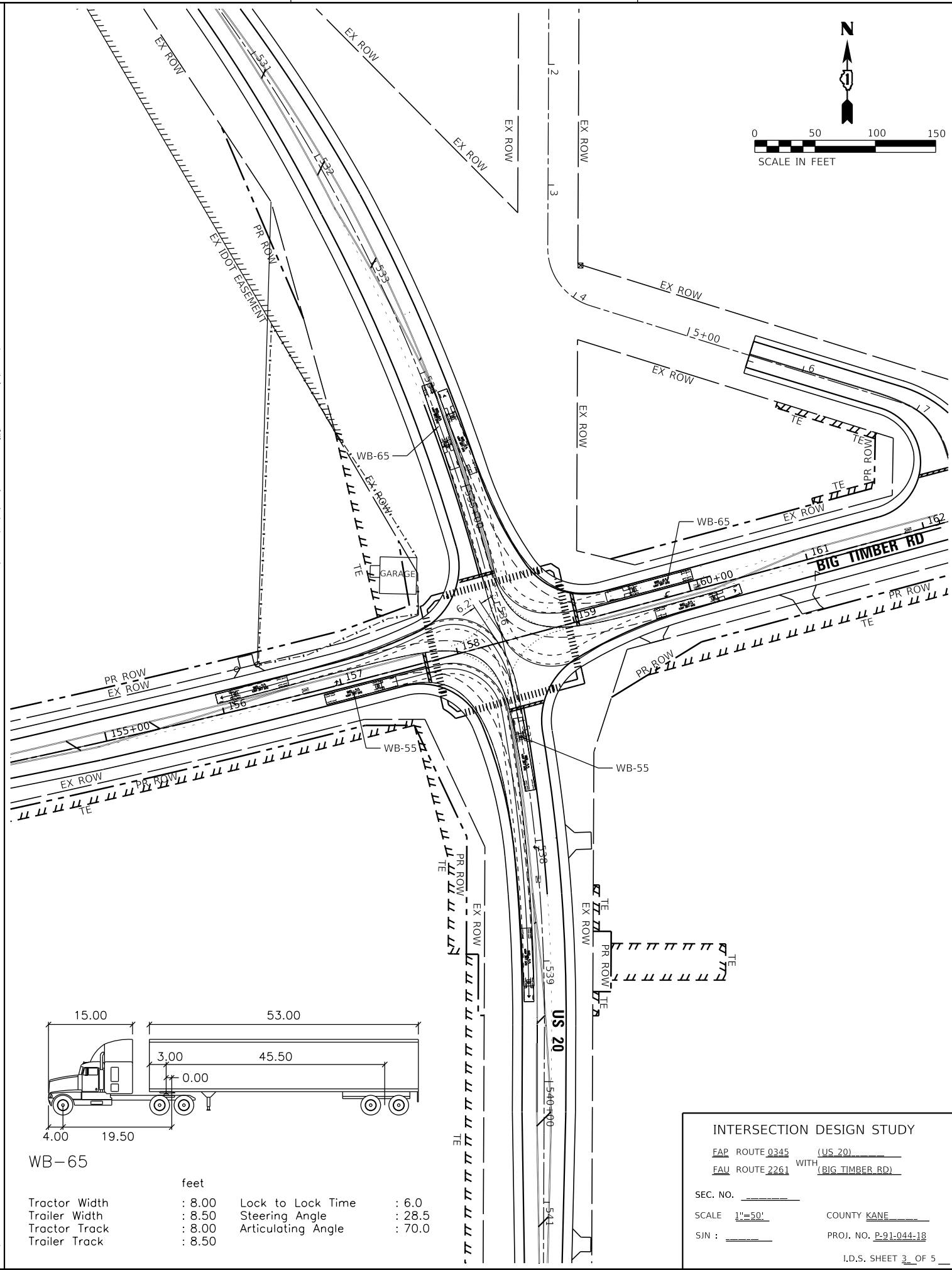
4/20/2020
 N:\chris\2-stanley\group.com\p\w\c\job_1310191044-shh\shh-02.dgn
 100.0000' / in.
 Grau, Tyler

PLOT DATE : 4/16/2020
 FILE NAME : \\s4hpc022-stanfleygroup.com\pww\job_working\462247762173_170101044-shd-hd-03.dgn
 PLOT SCALE : 100.0000' / in.
 USER NAME : Grau, Tyler



WB-55

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 18.1
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		



WB-65

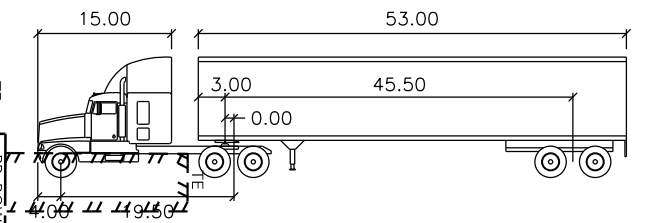
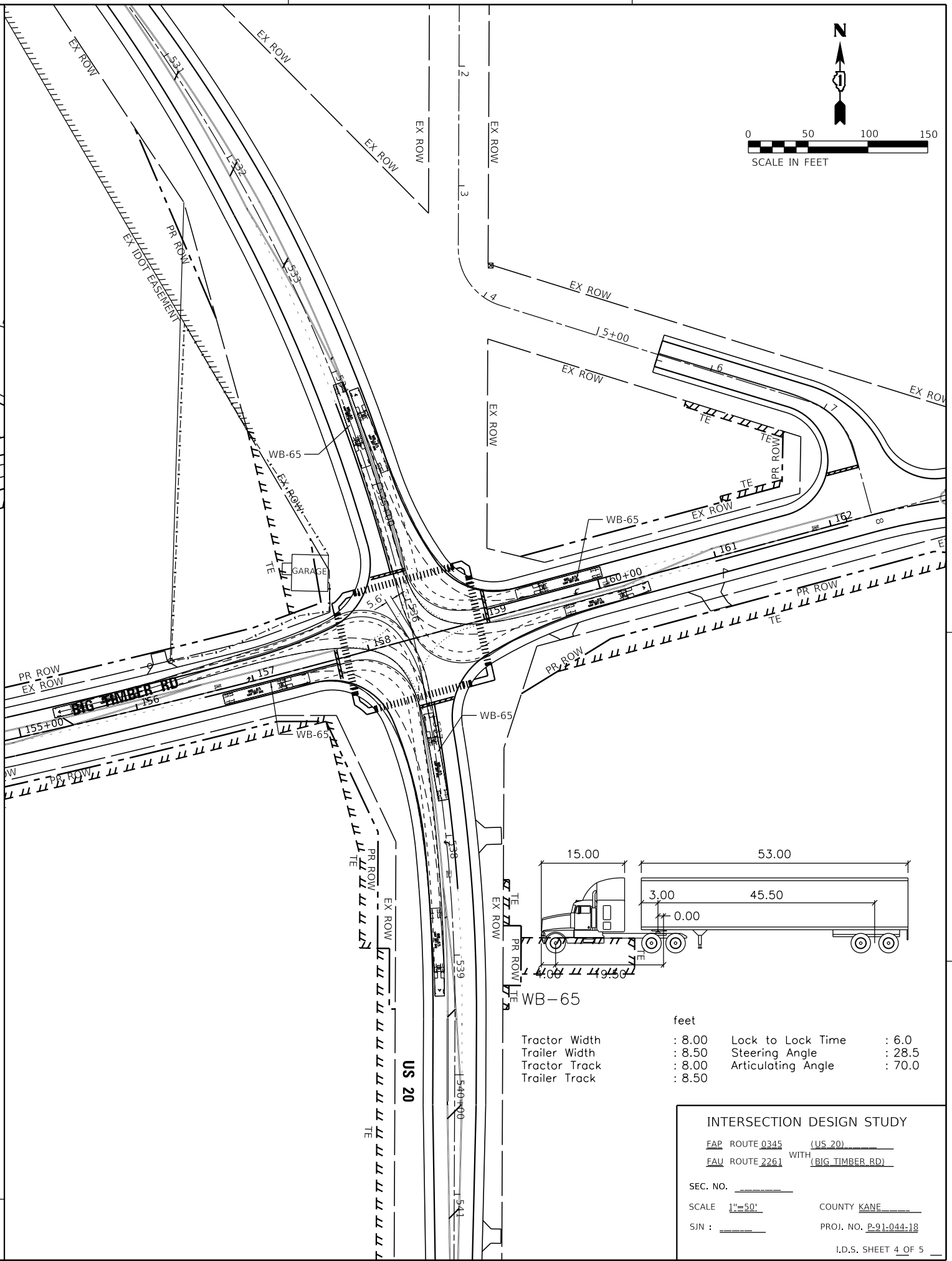
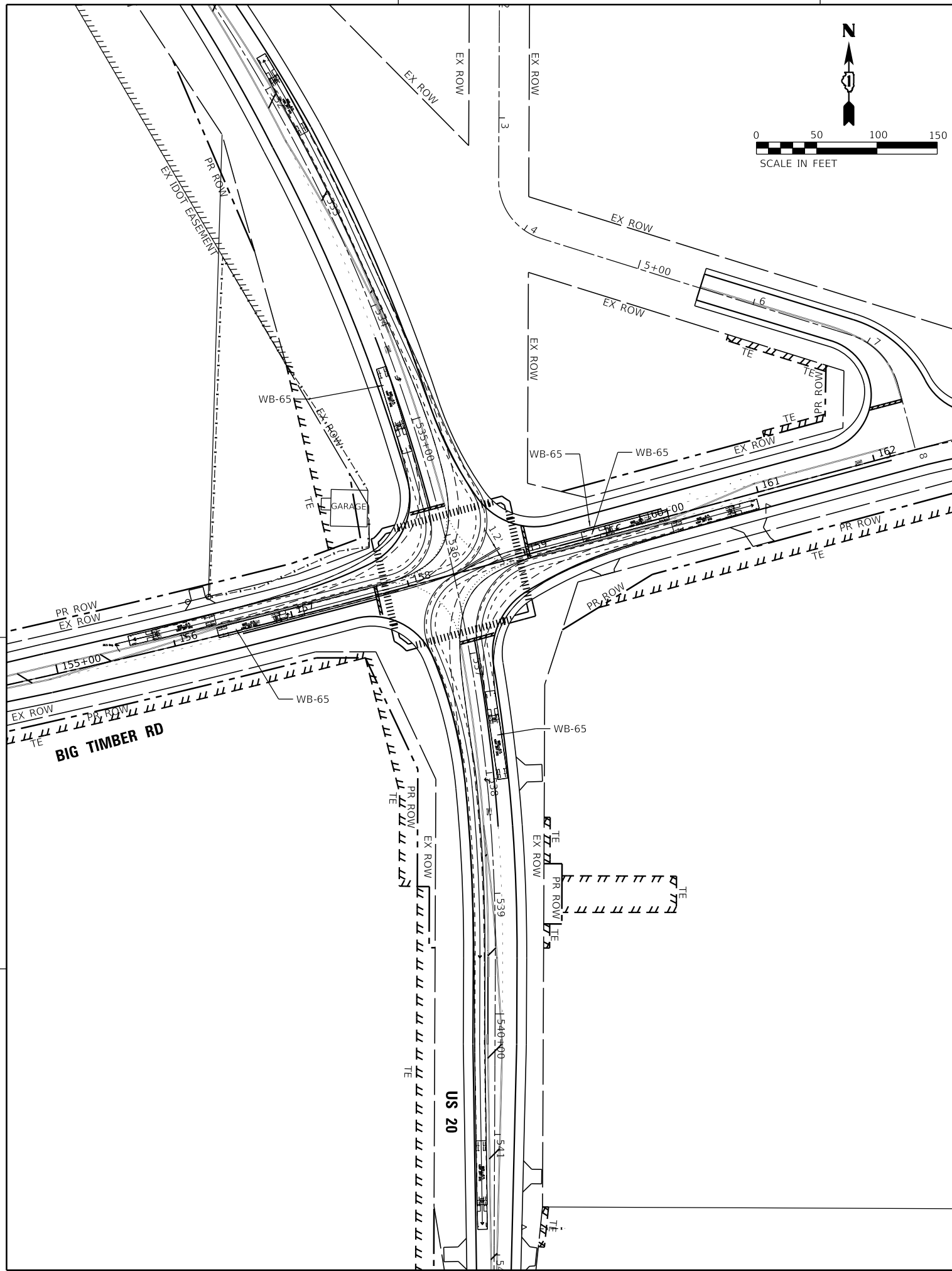
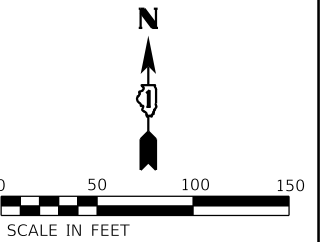
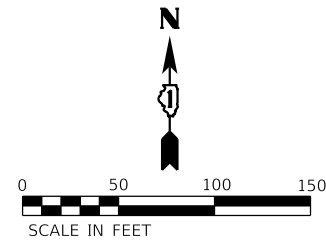
	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.5
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

INTERSECTION DESIGN STUDY

FAP ROUTE 0345 (US 20)
 FAU ROUTE 2261 WITH (BIG TIMBER RD)

SEC. NO. _____ COUNTY KANE
 SCALE 1"=50' PROJ. NO. P-91-044-18
 SIN : _____ I.D.S. SHEET 3 OF 5

PLOT DATE 4/16/2020
 FILE NAME \\s4pawes2-staff\pawes\group\com\pawes\job_working\p91-044\p91-044-shd-04.dgn
 PLOT SCALE 100,0000' / in.
 USER NAME Grau, Tyler



WB-65

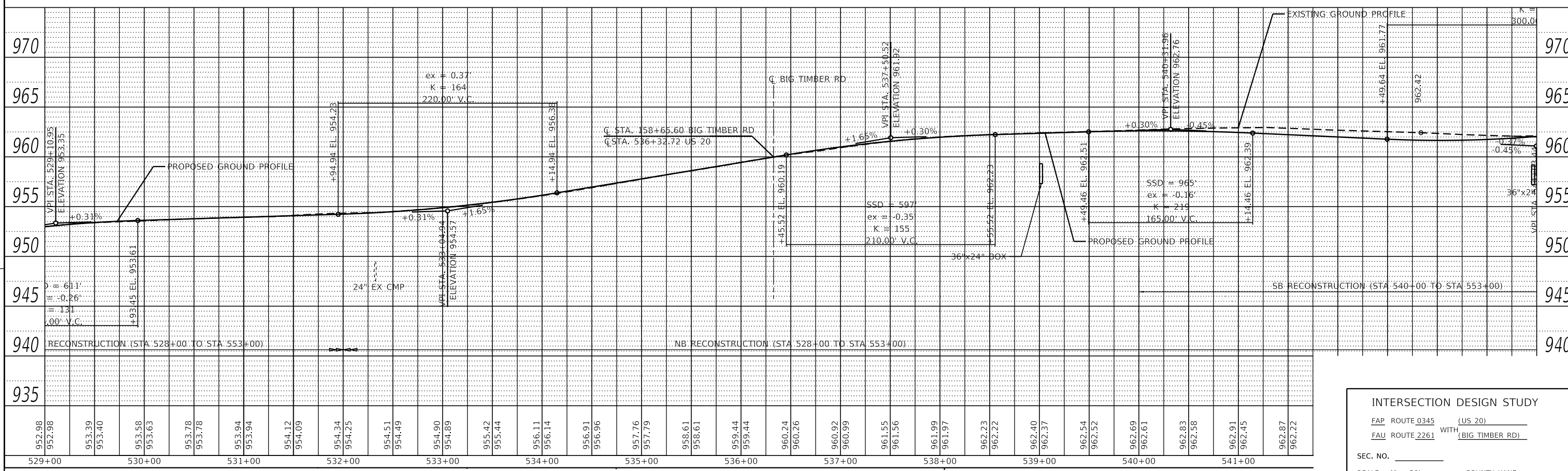
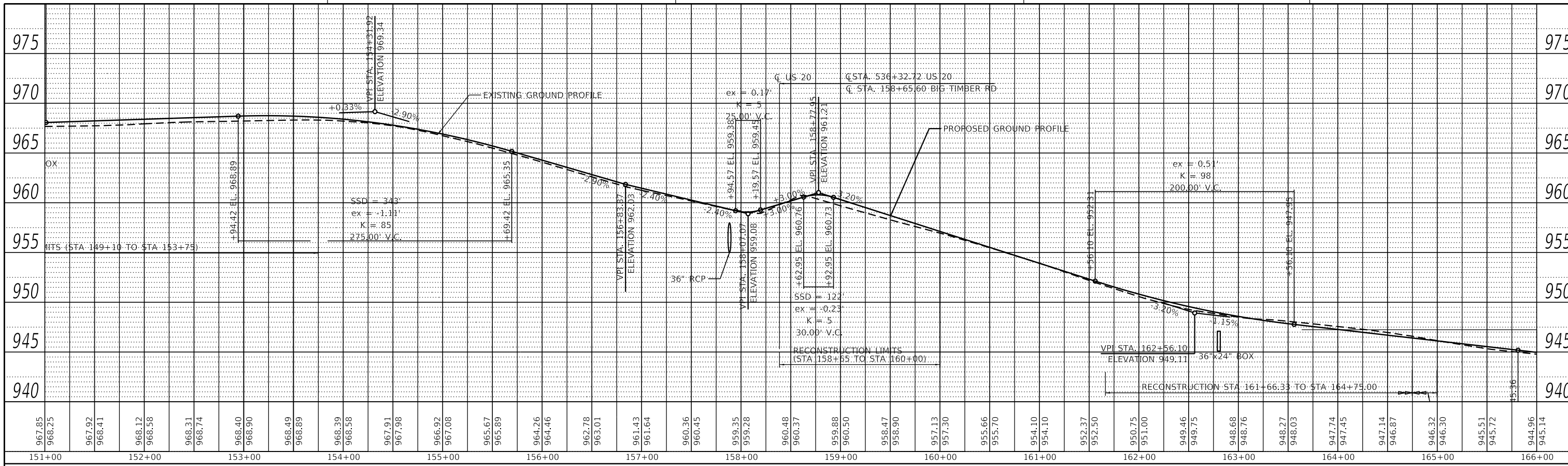
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.5
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

INTERSECTION DESIGN STUDY

FAP ROUTE 0345 (US 20)
 FAU ROUTE 2261 WITH (BIG TIMBER RD)

SEC. NO. _____
 SCALE 1"=50' COUNTY KANE
 SIN : _____ PROJ. NO. P-91-044-18
 I.D.S. SHEET 4 OF 5

PLOT DATE = 4/16/2020
 FILE NAME = \\s01pawcs-2-stanfnygroup.com\pawcsjob_working\6274762173_341019104-shd-05.dgn
 USER NAME = Greg Tyler



INTERSECTION DESIGN STUDY

FAP ROUTE 0345 (US 20)
 FAU ROUTE 2261 WITH (BIG TIMBER RD)

SEC. NO. _____
 SCALE 1" = 50'
 SIN : _____

COUNTY KANE
 PROJ. NO. P-91-044-18
 I.D.S. SHEET 5 OF 5

EXISTING (2020) CAPACITY REPORTS

Weekday Morning Peak Hour

Weekday Dismissal Peak Hour

Weekday Evening Peak Hour

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	1	50	5	55	85	40	15	130	55	35	110	1
Future Volume (veh/h)	1	50	5	55	85	40	15	130	55	35	110	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1945	1870	1870	1870	1870	1870	1707	1707	1856	1707	1707
Adj Flow Rate, veh/h	1	53	5	58	89	42	16	137	58	37	116	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	13	13	3	13	13
Cap, veh/h	78	302	28	163	159	64	665	474	201	590	725	6
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.01	0.42	0.42	0.02	0.43	0.43
Sat Flow, veh/h	10	1740	162	375	914	368	1781	1139	482	1767	1690	15
Grp Volume(v), veh/h	59	0	0	189	0	0	16	0	195	37	0	117
Grp Sat Flow(s),veh/h/ln	1911	0	0	1657	0	0	1781	0	1621	1767	0	1705
Q Serve(g_s), s	0.0	0.0	0.0	3.0	0.0	0.0	0.2	0.0	3.8	0.6	0.0	2.0
Cycle Q Clear(g_c), s	1.3	0.0	0.0	5.0	0.0	0.0	0.2	0.0	3.8	0.6	0.0	2.0
Prop In Lane	0.02		0.08	0.31		0.22	1.00		0.30	1.00		0.01
Lane Grp Cap(c), veh/h	408	0	0	386	0	0	665	0	675	590	0	731
V/C Ratio(X)	0.14	0.00	0.00	0.49	0.00	0.00	0.02	0.00	0.29	0.06	0.00	0.16
Avail Cap(c_a), veh/h	1167	0	0	1029	0	0	1070	0	1434	970	0	1509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	0.0	18.4	0.0	0.0	7.9	0.0	9.3	7.8	0.0	8.4
Incr Delay (d2), s/veh	0.3	0.0	0.0	2.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.0	0.0	3.2	0.0	0.0	0.1	0.0	1.9	0.2	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	0.0	0.0	20.4	0.0	0.0	7.9	0.0	10.4	7.9	0.0	8.9
LnGrp LOS	B	A	A	C	A	A	A	A	B	A	A	A
Approach Vol, veh/h		59			189			211				154
Approach Delay, s/veh		17.3			20.4			10.2				8.6
Approach LOS		B			C			B				A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	27.5		15.8	4.1	28.1		15.8				
Change Period (Y+Rc), s	3.5	7.5		7.5	3.5	7.5		7.5				
Max Green Setting (Gmax), s	11.5	42.5		27.5	11.5	42.5		27.5				
Max Q Clear Time (g_c+I1), s	2.6	5.8		3.3	2.2	4.0		7.0				
Green Ext Time (p_c), s	0.0	3.5		0.4	0.0	1.9		1.7				
Intersection Summary												
HCM 6th Ctrl Delay				13.6								
HCM 6th LOS				B								

HCM 6th TWSC
200: Big Timber Road & Ridgecrest Drive

02/18/2021

Intersection						
Int Delay, s/veh	5.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↗	↖	↖	↖
Traffic Vol, veh/h	45	95	70	15	115	110
Future Vol, veh/h	45	95	70	15	115	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	265	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	100	74	16	121	116

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	90	0	-	0	268 74
Stage 1	-	-	-	-	74 -
Stage 2	-	-	-	-	194 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1505	-	-	-	721 988
Stage 1	-	-	-	-	949 -
Stage 2	-	-	-	-	839 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1505	-	-	-	699 988
Mov Cap-2 Maneuver	-	-	-	-	699 -
Stage 1	-	-	-	-	920 -
Stage 2	-	-	-	-	839 -

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1505	-	-	-	699	988
HCM Lane V/C Ratio	0.031	-	-	-	0.173	0.117
HCM Control Delay (s)	7.5	-	-	-	11.2	9.1
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	0.4

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	110	80	175	155	15
Future Vol, veh/h	25	110	80	175	155	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	10	10	9	14	2
Mvmt Flow	26	116	84	184	163	16

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	523	171	179	0	0
Stage 1	171	-	-	-	-
Stage 2	352	-	-	-	-
Critical Hdwy	6.44	6.3	4.2	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-
Follow-up Hdwy	3.536	3.39	2.29	-	-
Pot Cap-1 Maneuver	511	852	1350	-	-
Stage 1	854	-	-	-	-
Stage 2	707	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	479	852	1350	-	-
Mov Cap-2 Maneuver	479	-	-	-	-
Stage 1	801	-	-	-	-
Stage 2	707	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1350	-	479	852	-	-
HCM Lane V/C Ratio	0.062	-	0.055	0.136	-	-
HCM Control Delay (s)	7.8	-	13	9.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	0.5	-	-

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	1	50	5	25	90	40	15	140	45	25	125	1
Future Volume (veh/h)	1	50	5	25	90	40	15	140	45	25	125	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1945	1870	1870	1870	1870	1870	1722	1722	1841	1648	1648
Adj Flow Rate, veh/h	1	53	5	26	95	42	16	147	47	26	132	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	12	12	4	17	17
Cap, veh/h	80	280	26	116	180	72	656	533	170	595	707	5
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.01	0.43	0.43	0.02	0.43	0.43
Sat Flow, veh/h	10	1739	162	166	1115	445	1781	1250	400	1753	1633	12
Grp Volume(v), veh/h	59	0	0	163	0	0	16	0	194	26	0	133
Grp Sat Flow(s),veh/h/ln	1911	0	0	1725	0	0	1781	0	1650	1753	0	1646
Q Serve(g_s), s	0.0	0.0	0.0	1.1	0.0	0.0	0.2	0.0	3.6	0.4	0.0	2.3
Cycle Q Clear(g_c), s	1.3	0.0	0.0	4.0	0.0	0.0	0.2	0.0	3.6	0.4	0.0	2.3
Prop In Lane	0.02		0.08	0.16		0.26	1.00		0.24	1.00		0.01
Lane Grp Cap(c), veh/h	386	0	0	367	0	0	656	0	703	595	0	712
V/C Ratio(X)	0.15	0.00	0.00	0.44	0.00	0.00	0.02	0.00	0.28	0.04	0.00	0.19
Avail Cap(c_a), veh/h	1194	0	0	1084	0	0	1071	0	1495	992	0	1491
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.0	0.0	0.0	18.2	0.0	0.0	7.5	0.0	8.8	7.5	0.0	8.2
Incr Delay (d2), s/veh	0.4	0.0	0.0	1.8	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.0	0.0	2.6	0.0	0.0	0.1	0.0	1.7	0.2	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	0.0	0.0	20.0	0.0	0.0	7.5	0.0	9.7	7.5	0.0	8.8
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		59			163			210				159
Approach Delay, s/veh		17.4			20.0			9.6				8.6
Approach LOS		B			B			A				A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	27.5		15.1	4.1	27.8		15.1				
Change Period (Y+Rc), s	3.5	7.5		7.5	3.5	7.5		7.5				
Max Green Setting (Gmax), s	11.5	42.5		27.5	11.5	42.5		27.5				
Max Q Clear Time (g_c+I1), s	2.4	5.6		3.3	2.2	4.3		6.0				
Green Ext Time (p_c), s	0.0	3.4		0.4	0.0	2.2		1.4				
Intersection Summary												
HCM 6th Ctrl Delay				13.0								
HCM 6th LOS				B								

HCM 6th TWSC
 200: Big Timber Road & Ridgecrest Drive

02/18/2021

Intersection

Int Delay, s/veh 3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	30	90	100	35	70	55
Future Vol, veh/h	30	90	100	35	70	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	265	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	3	2	2
Mvmt Flow	32	95	105	37	74	58

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	142	0	-	0	264
Stage 1	-	-	-	-	105
Stage 2	-	-	-	-	159
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1441	-	-	-	725
Stage 1	-	-	-	-	919
Stage 2	-	-	-	-	870
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1441	-	-	-	709
Mov Cap-2 Maneuver	-	-	-	-	709
Stage 1	-	-	-	-	899
Stage 2	-	-	-	-	870

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1441	-	-	-	709	949
HCM Lane V/C Ratio	0.022	-	-	-	0.104	0.061
HCM Control Delay (s)	7.6	-	-	-	10.7	9
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0.2

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	100	75	175	135	20
Future Vol, veh/h	25	100	75	175	135	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	15	6	9	9	13	21
Mvmt Flow	26	105	79	184	142	21

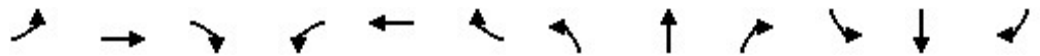
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	495	153	163	0	-	0
Stage 1	153	-	-	-	-	-
Stage 2	342	-	-	-	-	-
Critical Hdwy	6.55	6.26	4.19	-	-	-
Critical Hdwy Stg 1	5.55	-	-	-	-	-
Critical Hdwy Stg 2	5.55	-	-	-	-	-
Follow-up Hdwy	3.635	3.354	2.281	-	-	-
Pot Cap-1 Maneuver	511	883	1374	-	-	-
Stage 1	844	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	482	883	1374	-	-	-
Mov Cap-2 Maneuver	482	-	-	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	691	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1374	-	482	883	-	-
HCM Lane V/C Ratio	0.057	-	0.055	0.119	-	-
HCM Control Delay (s)	7.8	-	12.9	9.6	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	0.4	-	-

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (veh/h)	1	50	15	40	110	70	30	180	70	45	145	1
Future Volume (veh/h)	1	50	15	40	110	70	30	180	70	45	145	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1945	1870	1870	1870	1870	1826	1811	1811	1856	1841	1841
Adj Flow Rate, veh/h	1	53	16	42	116	74	32	189	74	47	153	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	5	6	6	3	4	4
Cap, veh/h	74	290	86	125	194	110	605	495	194	517	742	5
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.02	0.40	0.40	0.03	0.41	0.41
Sat Flow, veh/h	7	1432	426	196	957	540	1739	1239	485	1767	1827	12
Grp Volume(v), veh/h	70	0	0	232	0	0	32	0	263	47	0	154
Grp Sat Flow(s),veh/h/ln	1865	0	0	1694	0	0	1739	0	1724	1767	0	1839
Q Serve(g_s), s	0.0	0.0	0.0	2.7	0.0	0.0	0.5	0.0	5.4	0.8	0.0	2.7
Cycle Q Clear(g_c), s	1.6	0.0	0.0	6.2	0.0	0.0	0.5	0.0	5.4	0.8	0.0	2.7
Prop In Lane	0.01		0.23	0.18		0.32	1.00		0.28	1.00		0.01
Lane Grp Cap(c), veh/h	451	0	0	428	0	0	605	0	688	517	0	747
V/C Ratio(X)	0.16	0.00	0.00	0.54	0.00	0.00	0.05	0.00	0.38	0.09	0.00	0.21
Avail Cap(c_a), veh/h	1093	0	0	1001	0	0	967	0	1462	872	0	1560
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	0.0	18.4	0.0	0.0	8.6	0.0	10.7	8.7	0.0	9.6
Incr Delay (d2), s/veh	0.3	0.0	0.0	2.3	0.0	0.0	0.0	0.0	1.6	0.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	0.0	0.0	4.0	0.0	0.0	0.2	0.0	3.0	0.4	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.9	0.0	0.0	20.6	0.0	0.0	8.7	0.0	12.3	8.8	0.0	10.3
LnGrp LOS	B	A	A	C	A	A	A	A	B	A	A	B
Approach Vol, veh/h		70			232			295				201
Approach Delay, s/veh		16.9			20.6			11.9				9.9
Approach LOS		B			C			B				A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	27.5		17.7	4.6	27.9		17.7				
Change Period (Y+Rc), s	3.5	7.5		7.5	3.5	7.5		7.5				
Max Green Setting (Gmax), s	11.5	42.5		27.5	11.5	42.5		27.5				
Max Q Clear Time (g_c+l1), s	2.8	7.4		3.6	2.5	4.7		8.2				
Green Ext Time (p_c), s	0.0	4.8		0.5	0.0	2.6		2.1				
Intersection Summary												
HCM 6th Ctrl Delay				14.4								
HCM 6th LOS				B								

HCM 6th TWSC
 200: Big Timber Road & Ridgecrest Drive

02/18/2021

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	65	100	160	85	85	60
Future Vol, veh/h	65	100	160	85	85	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	265	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	105	168	89	89	63

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	257	0	-	0	409
Stage 1	-	-	-	-	168
Stage 2	-	-	-	-	241
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1308	-	-	-	599
Stage 1	-	-	-	-	862
Stage 2	-	-	-	-	799
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1308	-	-	-	568
Mov Cap-2 Maneuver	-	-	-	-	568
Stage 1	-	-	-	-	817
Stage 2	-	-	-	-	799

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1308	-	-	-	568	876
HCM Lane V/C Ratio	0.052	-	-	-	0.158	0.072
HCM Control Delay (s)	7.9	-	-	-	12.5	9.4
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6	0.2

Intersection						
Int Delay, s/veh	3.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	105	90	255	175	25
Future Vol, veh/h	25	105	90	255	175	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	4	8	4
Mvmt Flow	26	111	95	268	184	26

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	655	197	210	0	-	0
Stage 1	197	-	-	-	-	-
Stage 2	458	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.227	-	-	-
Pot Cap-1 Maneuver	431	844	1355	-	-	-
Stage 1	836	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	401	844	1355	-	-	-
Mov Cap-2 Maneuver	401	-	-	-	-	-
Stage 1	777	-	-	-	-	-
Stage 2	637	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1355	-	401	844	-	-
HCM Lane V/C Ratio	0.07	-	0.066	0.131	-	-
HCM Control Delay (s)	7.9	-	14.6	9.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	0.5	-	-

DATA FROM THE ITE MANUAL TRIP GENERATION, TENTH EDITION

Land Use: 210

Single-Family Detached Housing

Description

Single-family detached housing includes all single-family detached homes on individual lots. A typical site surveyed is a suburban subdivision.

Additional Data

The number of vehicles and residents had a high correlation with average weekday vehicle trip ends. The use of these variables was limited, however, because the number of vehicles and residents was often difficult to obtain or predict. The number of dwelling units was generally used as the independent variable of choice because it was usually readily available, easy to project, and had a high correlation with average weekday vehicle trip ends.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Single-family detached units had the highest trip generation rate per dwelling unit of all residential uses because they were the largest units in size and had more residents and more vehicles per unit than other residential land uses; they were generally located farther away from shopping centers, employment areas, and other trip attractors than other residential land uses; and they generally had fewer alternative modes of transportation available because they were typically not as concentrated as other residential land uses.

Time-of-day distribution data for this land use are presented in Appendix A. For the six general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:00 and 5:00 p.m., respectively. For the two sites with Saturday data, the overall highest vehicle volume was counted between 3:00 and 4:00 p.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 10:15 and 11:15 a.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Delaware, Illinois, Indiana, Maryland, Minnesota, Montana, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, and Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 903, 925, 936

Single-Family Detached Housing (210)

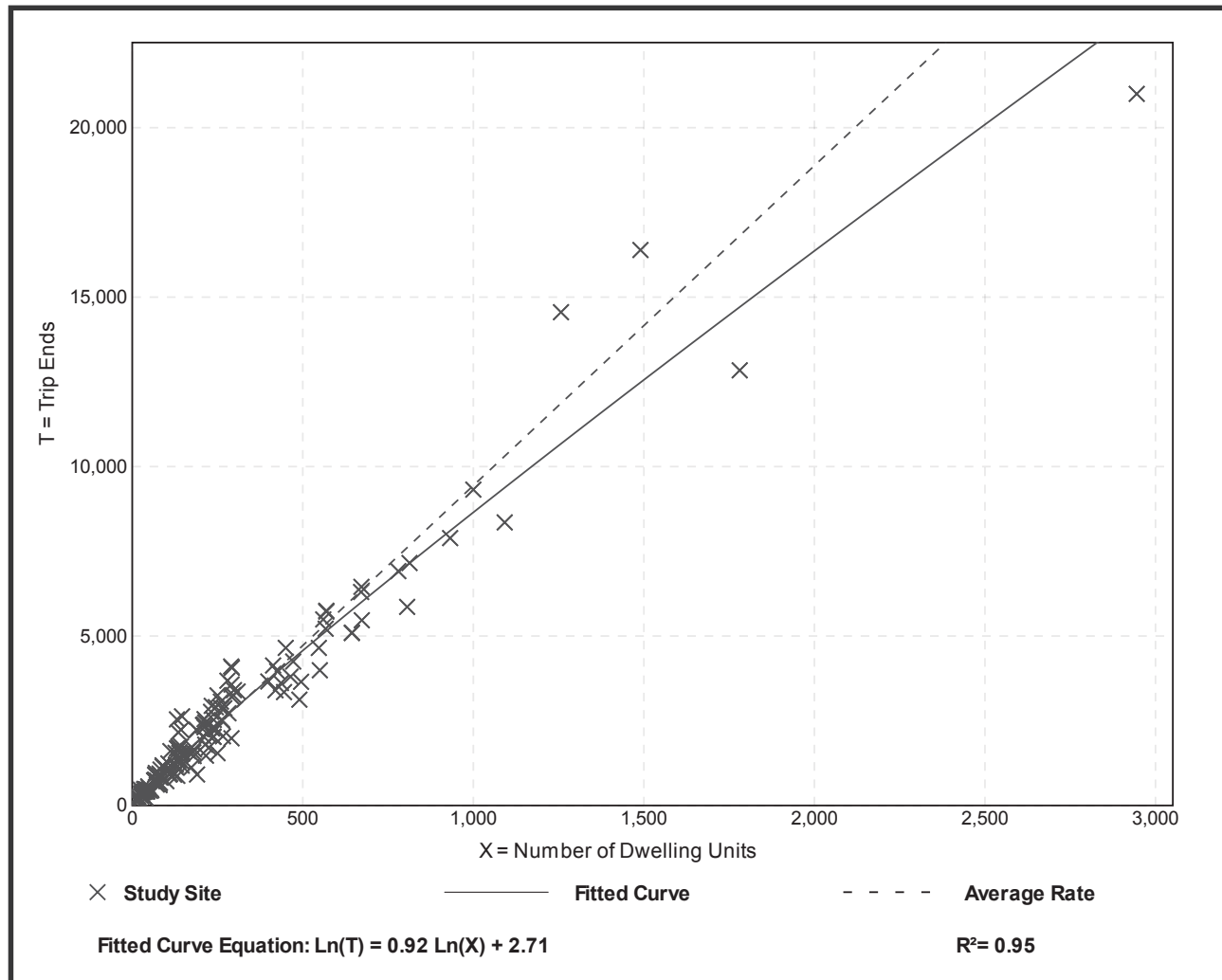
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

**On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.**

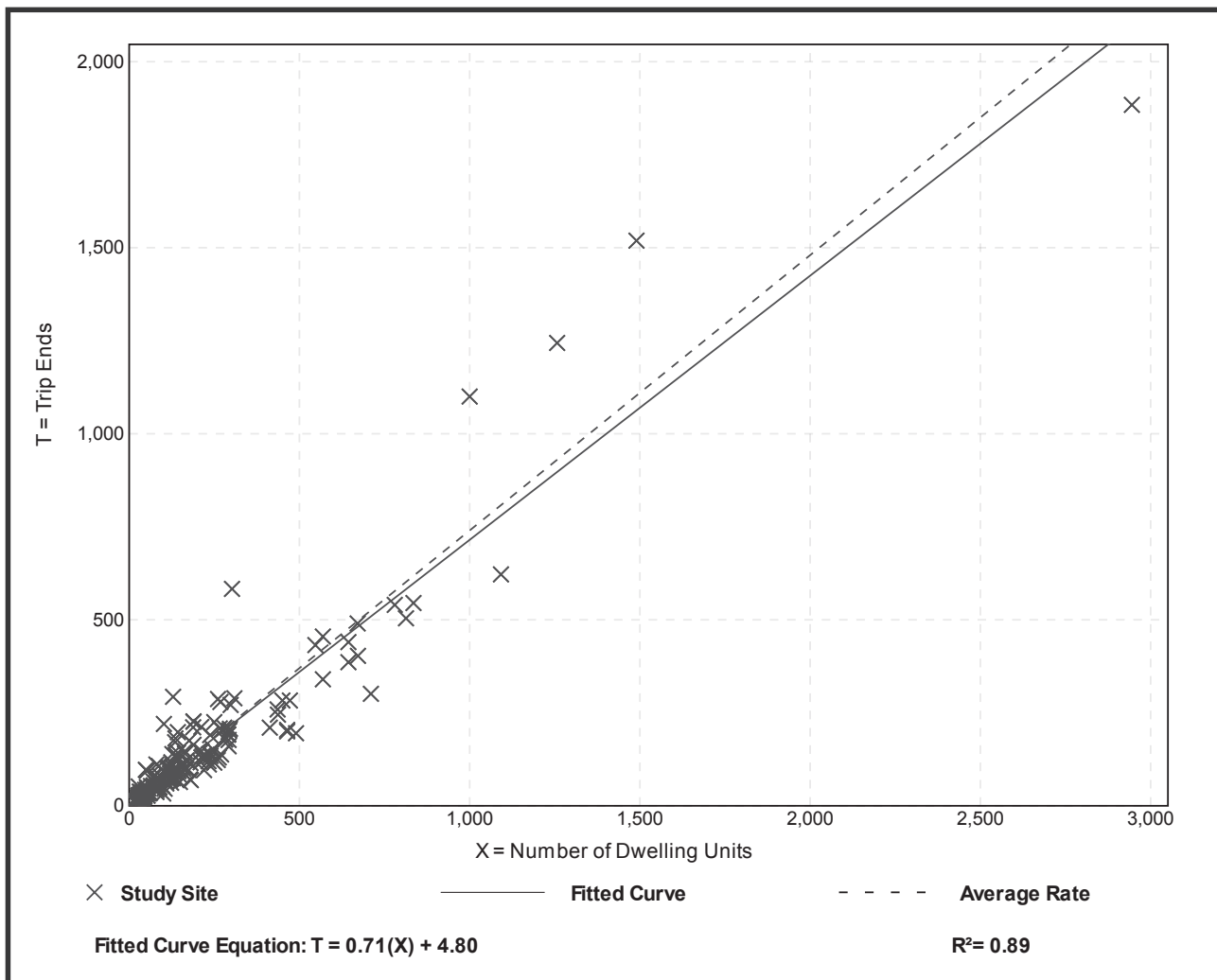
Setting/Location: General Urban/Suburban

Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



Single-Family Detached Housing (210)

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

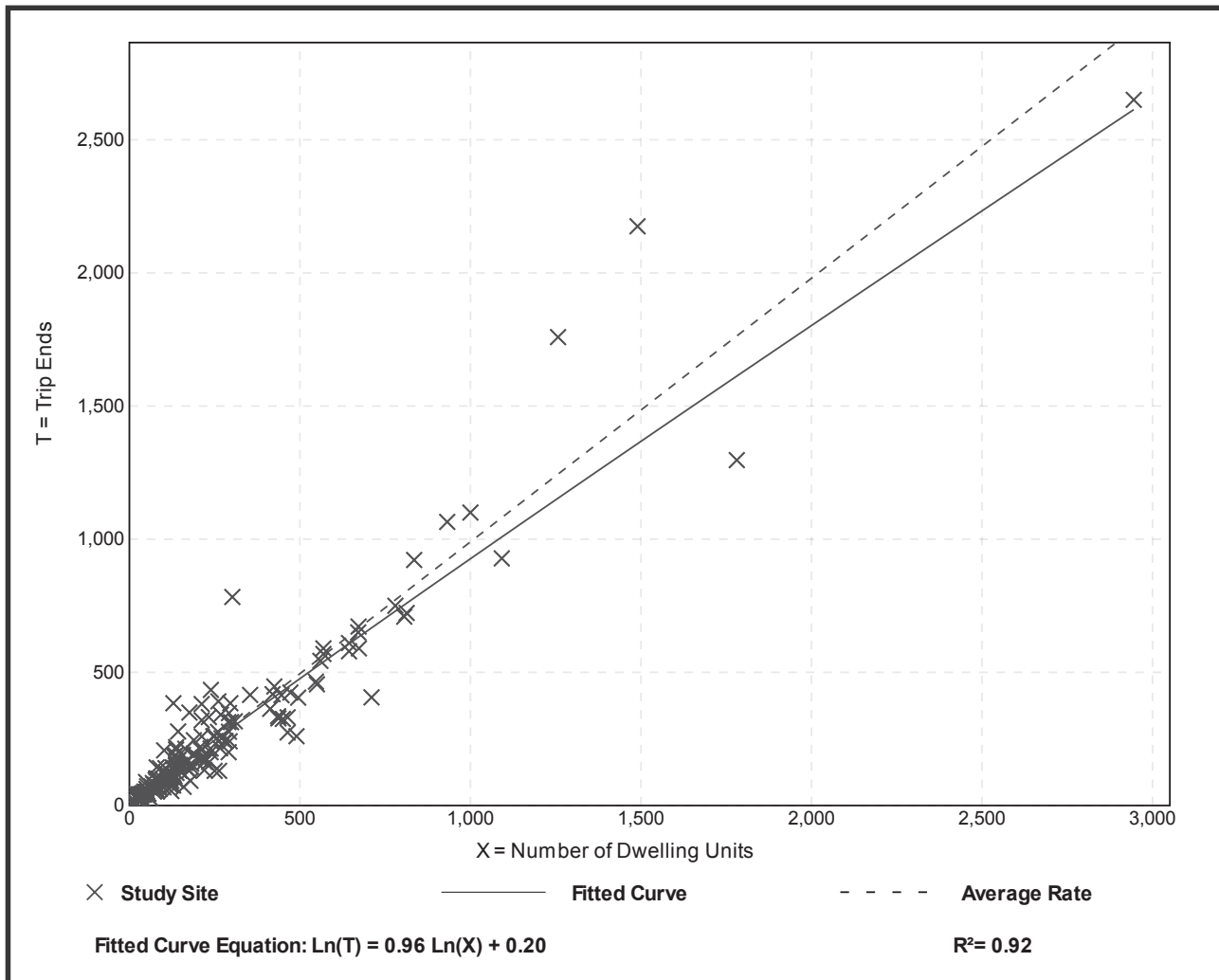
Setting/Location: General Urban/Suburban

Number of Studies: 190
 Avg. Num. of Dwelling Units: 242
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Land Use: 220

Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), and off-campus student apartment (Land Use 225) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the low-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:45 and 5:45 p.m., respectively. For the one site with Saturday data, the overall highest vehicle volume was counted between 9:45 and 10:45 a.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 11:45 a.m. and 12:45 p.m.

For the one dense multi-use urban site with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 6:15 and 7:15 p.m., respectively.

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

The average numbers of person trips per vehicle trip at the five general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.13 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.21 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, District of Columbia, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Minnesota, New Jersey, New York, Ontario, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, and Washington.

It is expected that the number of bedrooms and number of residents are likely correlated to the number of trips generated by a residential site. Many of the studies included in this land use did not indicate the total number of bedrooms. To assist in the future analysis of this land use, it is important that this information be collected and included in trip generation data submissions.

Source Numbers

168, 187, 188, 204, 211, 300, 305, 306, 319, 320, 321, 357, 390, 412, 418, 525, 530, 571, 579, 583, 864, 868, 869, 870, 896, 903, 918, 946, 947, 948, 951

Multifamily Housing (Low-Rise) (220)

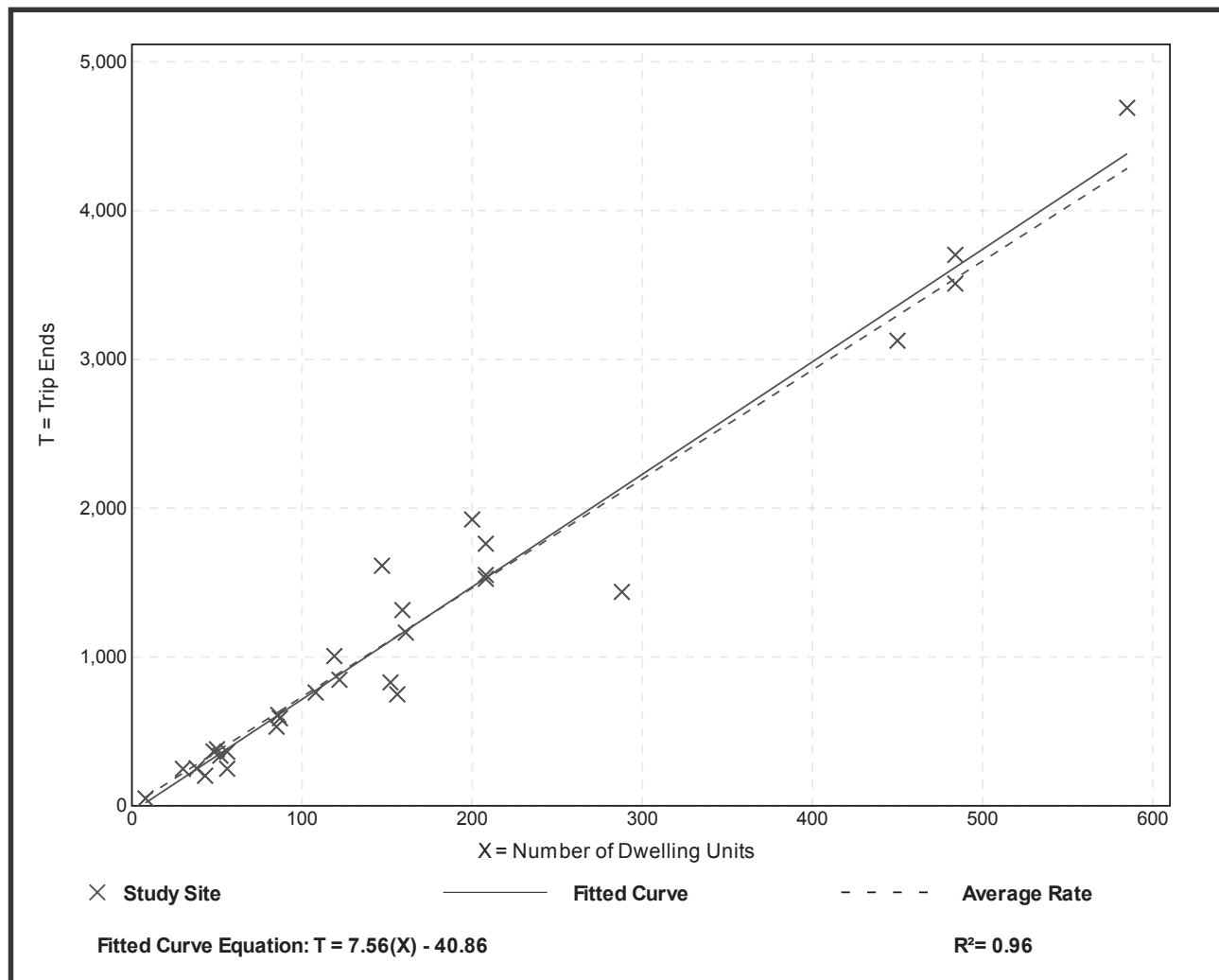
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units

**On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.**

Setting/Location: General Urban/Suburban

Number of Studies: 42

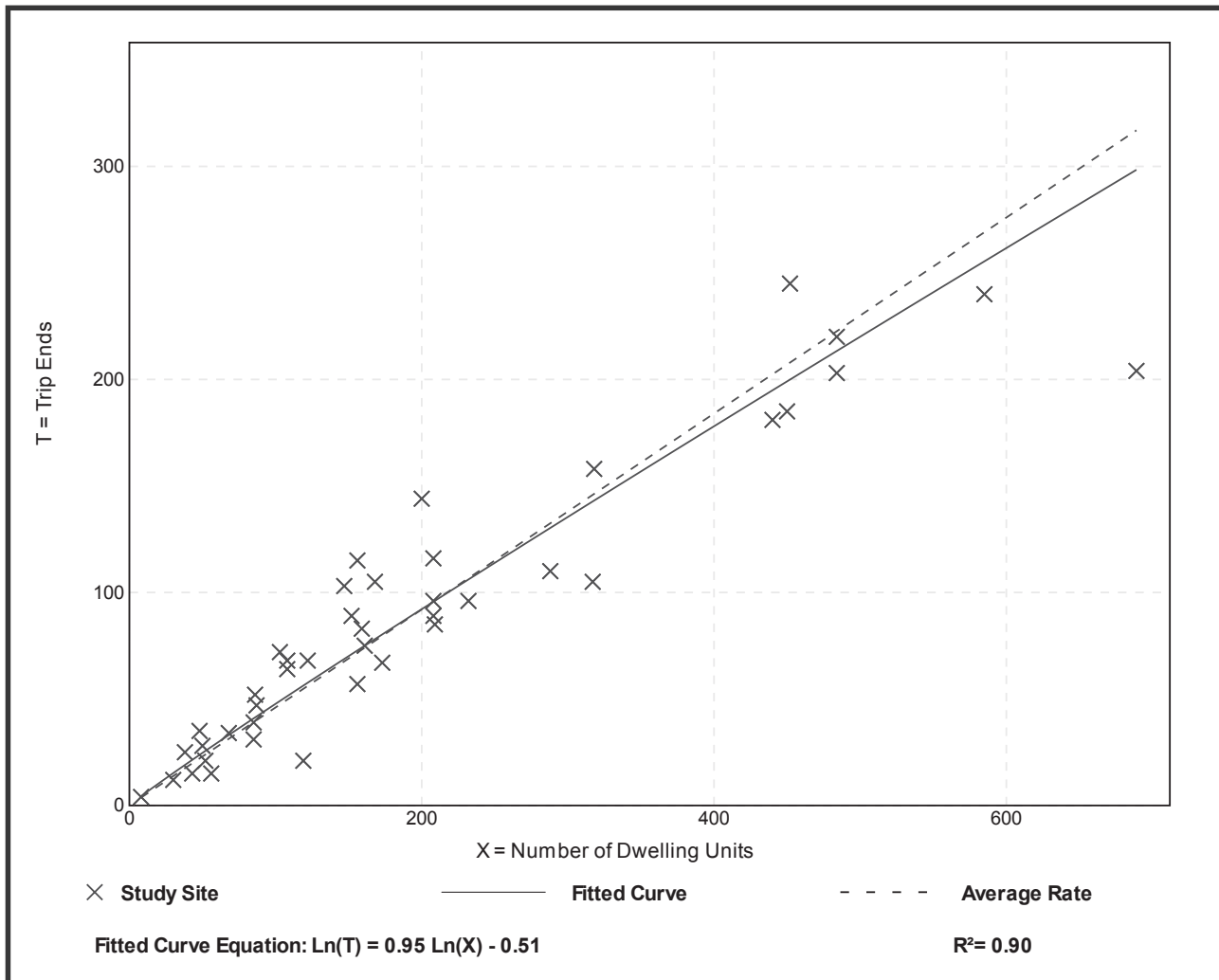
Avg. Num. of Dwelling Units: 199

Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 50

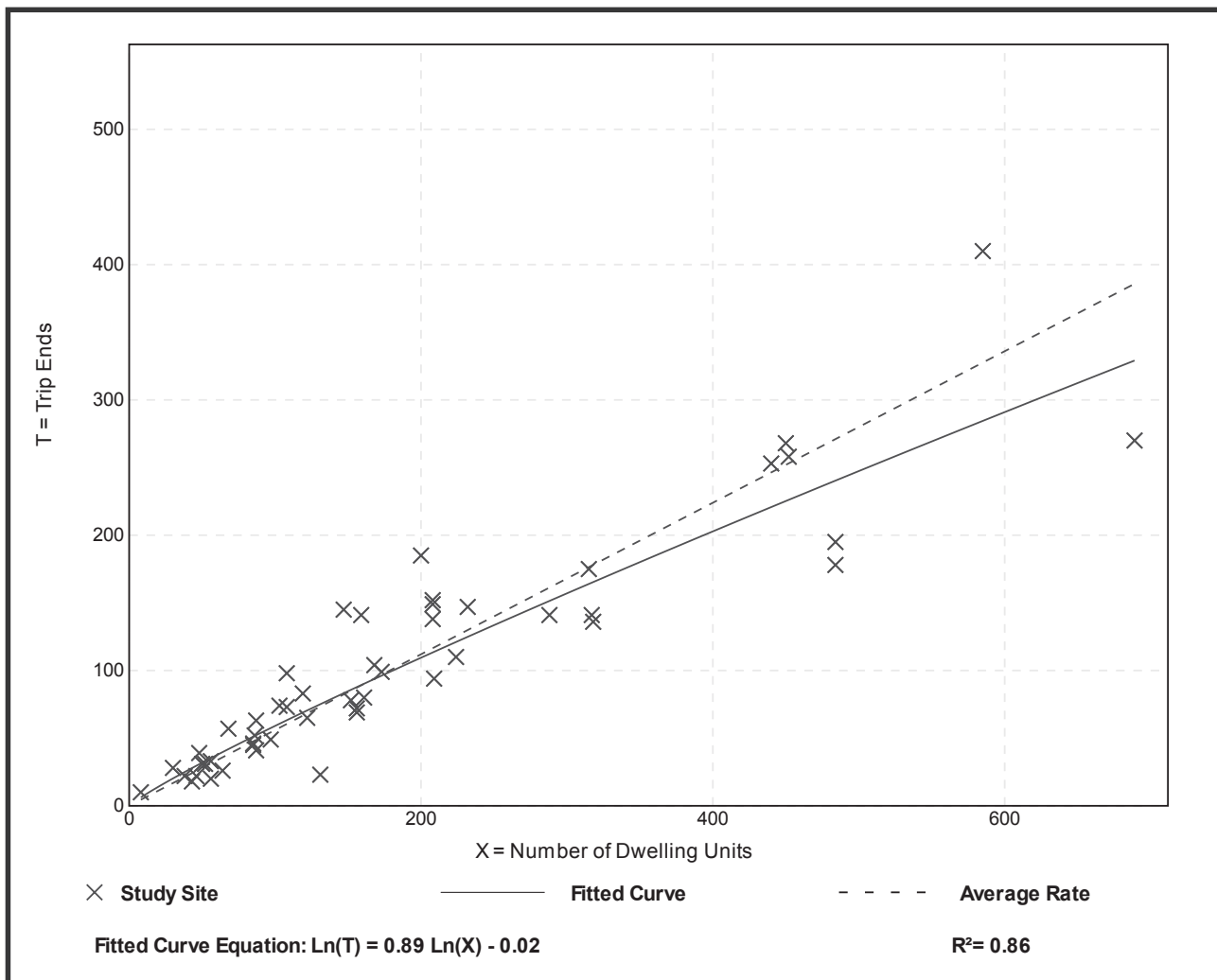
Avg. Num. of Dwelling Units: 187

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



Land Use: 251

Senior Adult Housing—Detached

Description

Senior adult housing consists of detached independent living developments, including retirement communities, age-restricted housing, and active adult communities. These developments may include amenities such as golf courses, swimming pools, 24-hour security, transportation, and common recreational facilities. However, they generally lack centralized dining and on-site health facilities. Detached senior adult housing communities may or may not be gated. Residents in these communities are typically active (requiring little to no medical supervision). The percentage of retired residents varies by development. Senior adult housing—attached (Land Use 252), congregate care facility (Land Use 253), assisted living (Land Use 254), and continuing care retirement community (Land Use 255) are related land uses.

Additional Data

Caution should be used when applying trip rates for this land use as it may contain a wide variety of studies ranging from communities with very active, working residents to communities with older, retired residents. As more data becomes available, consideration will be given to future stratification of this land use.

Many factors affected the trip rates for detached senior adult housing. Factors such as the average age of residents, development location and size, affluence of residents, employment status, and vehicular access should be taken into consideration when conducting an analysis. Some developments were located within close proximity to medical facilities, restaurants, shopping centers, banks, and recreational activities.

For the six sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 98.5 percent of the total dwelling units were occupied.

Time-of-day distribution data for this land use are presented in Appendix A. For the six general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 5:00 and 6:00 p.m., respectively.

For the six sites for which data were provided for both occupied dwelling units and total dwelling units, an average of 98.5 percent of the units were occupied.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Delaware, Florida, New Hampshire, New Jersey, and Pennsylvania.

Source Numbers

221, 289, 398, 421, 500, 550, 598, 601, 629, 734, 930

Senior Adult Housing - Detached (251)

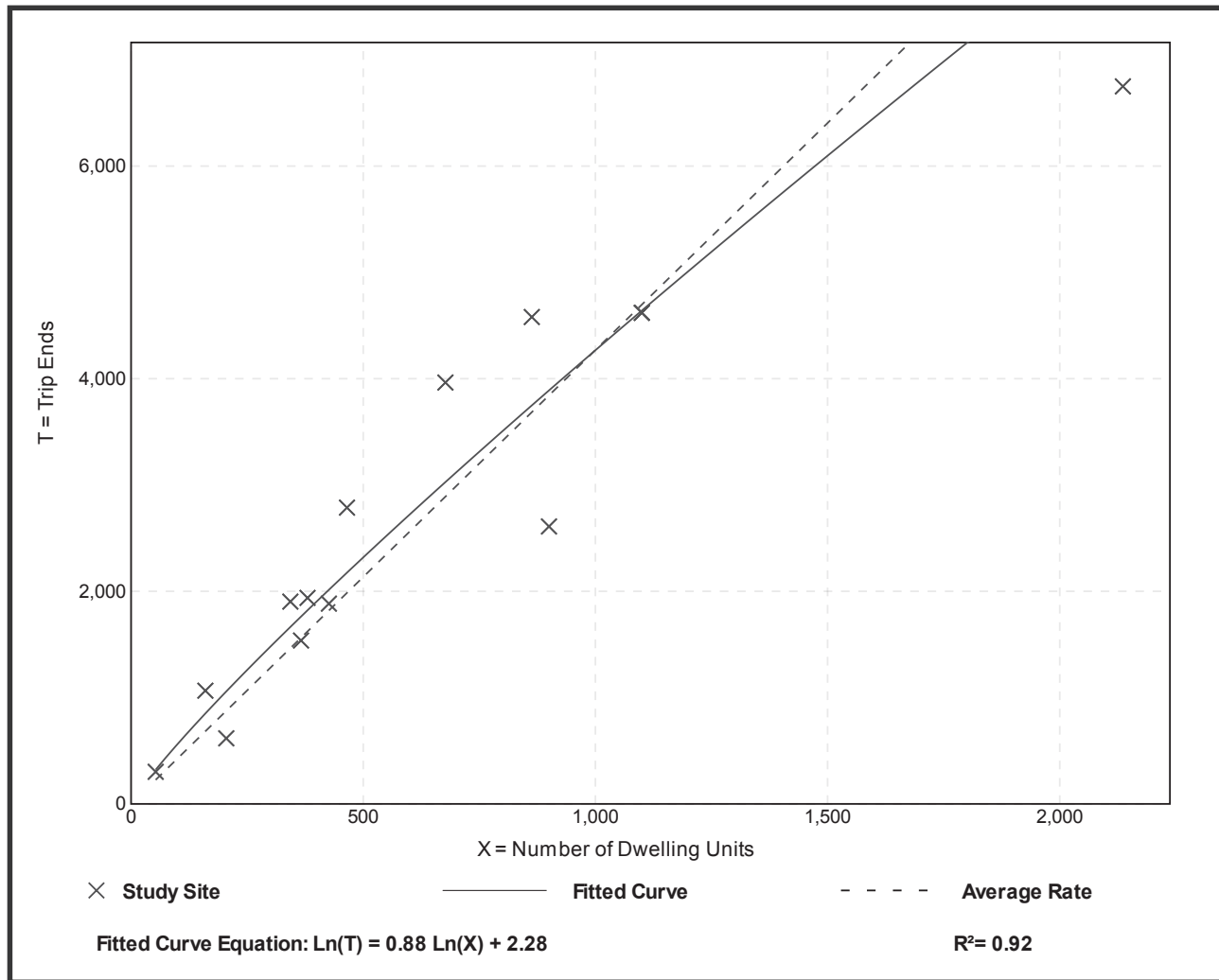
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 14
Avg. Num. of Dwelling Units: 655
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.27	2.90 - 6.66	1.11

Data Plot and Equation



Senior Adult Housing - Detached (251)

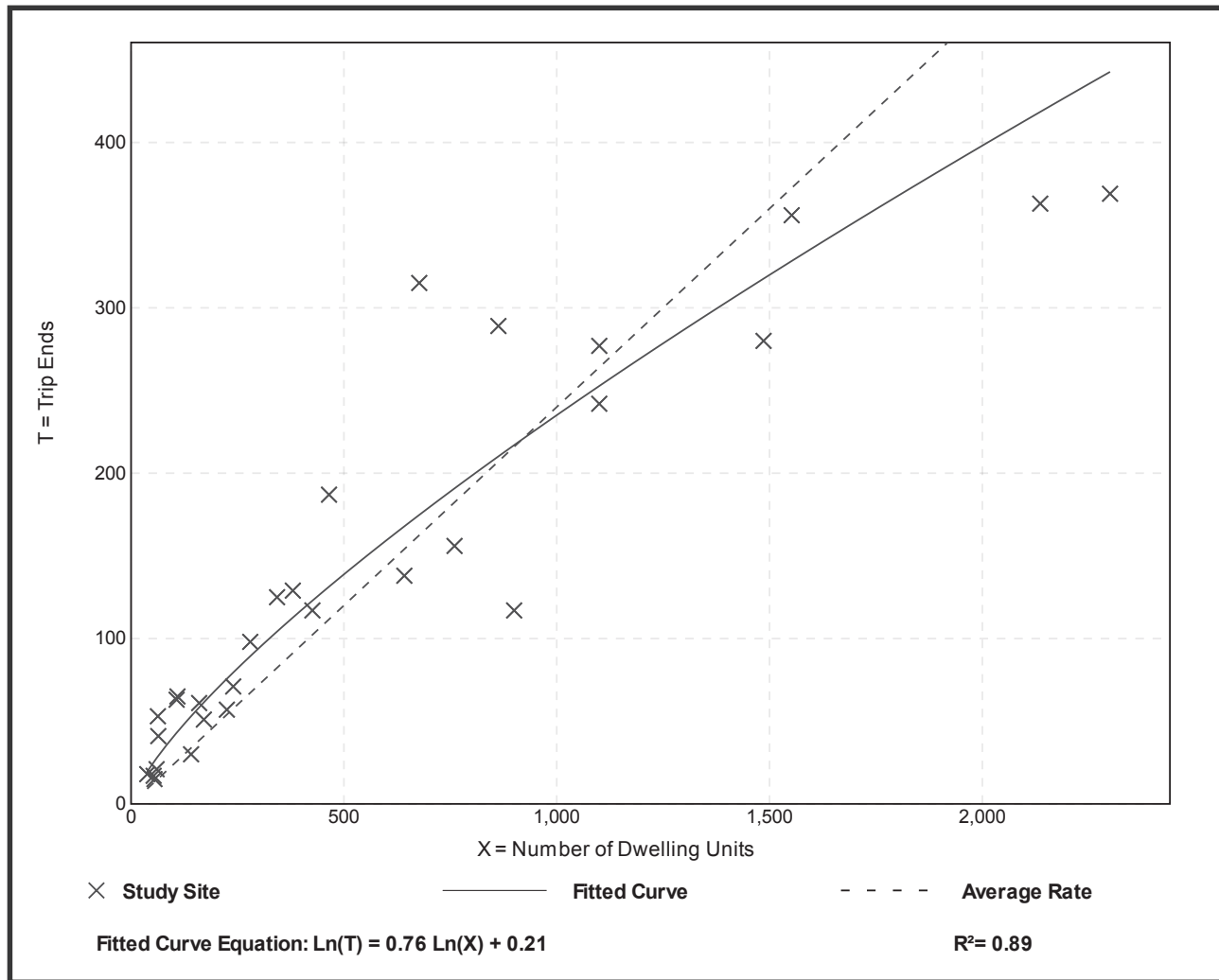
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban
 Number of Studies: 29
 Avg. Num. of Dwelling Units: 583
 Directional Distribution: 33% entering, 67% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.24	0.13 - 0.84	0.10

Data Plot and Equation



Senior Adult Housing - Detached (251)

Vehicle Trip Ends vs: Dwelling Units

**On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.**

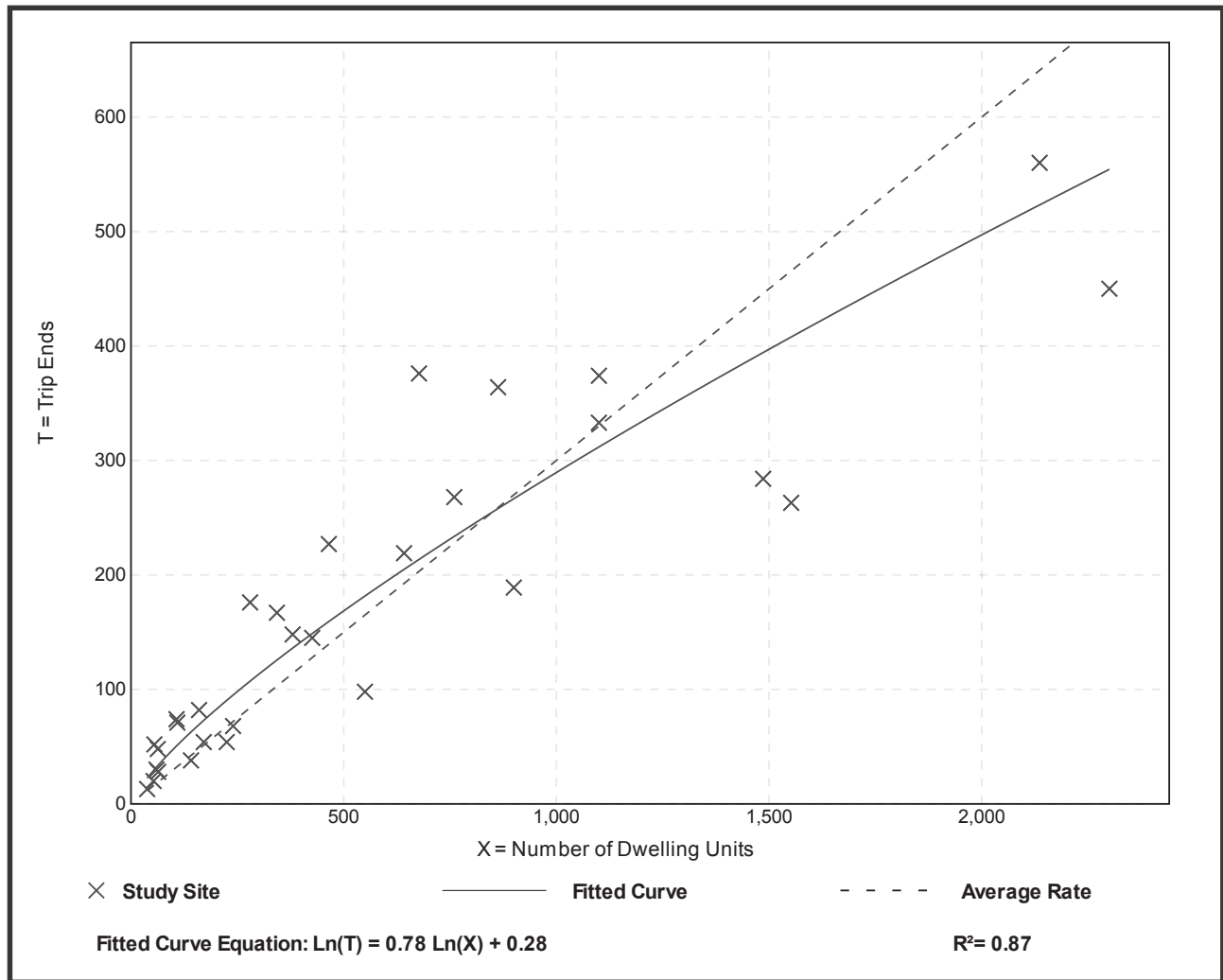
Setting/Location: General Urban/Suburban

Number of Studies: 30
Avg. Num. of Dwelling Units: 582
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.17 - 0.95	0.13

Data Plot and Equation



Land Use: 252

Senior Adult Housing—Attached

Description

Senior adult housing consists of attached independent living developments, including retirement communities, age-restricted housing, and active adult communities. These developments may include limited social or recreational services. However, they generally lack centralized dining and onsite medical facilities. Residents in these communities live independently, are typically active (requiring little to no medical supervision) and may or may not be retired. Senior adult housing—detached (Land Use 251), congregate care facility (Land Use 253), assisted living (Land Use 254), and continuing care retirement community (Land Use 255) are related uses.

Additional Data

Time-of-day distribution data for this land use are presented in Appendix A. For the one general urban/suburban site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 11:45 a.m. and 12:45 p.m. and 12:00 and 1:00 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, and the 2000s in Alberta (CAN), California, Illinois, New Hampshire, New Jersey, New York, and Pennsylvania.

Source Numbers

272, 501, 576, 602, 703, 734, 741, 902, 970

Senior Adult Housing - Attached (252)

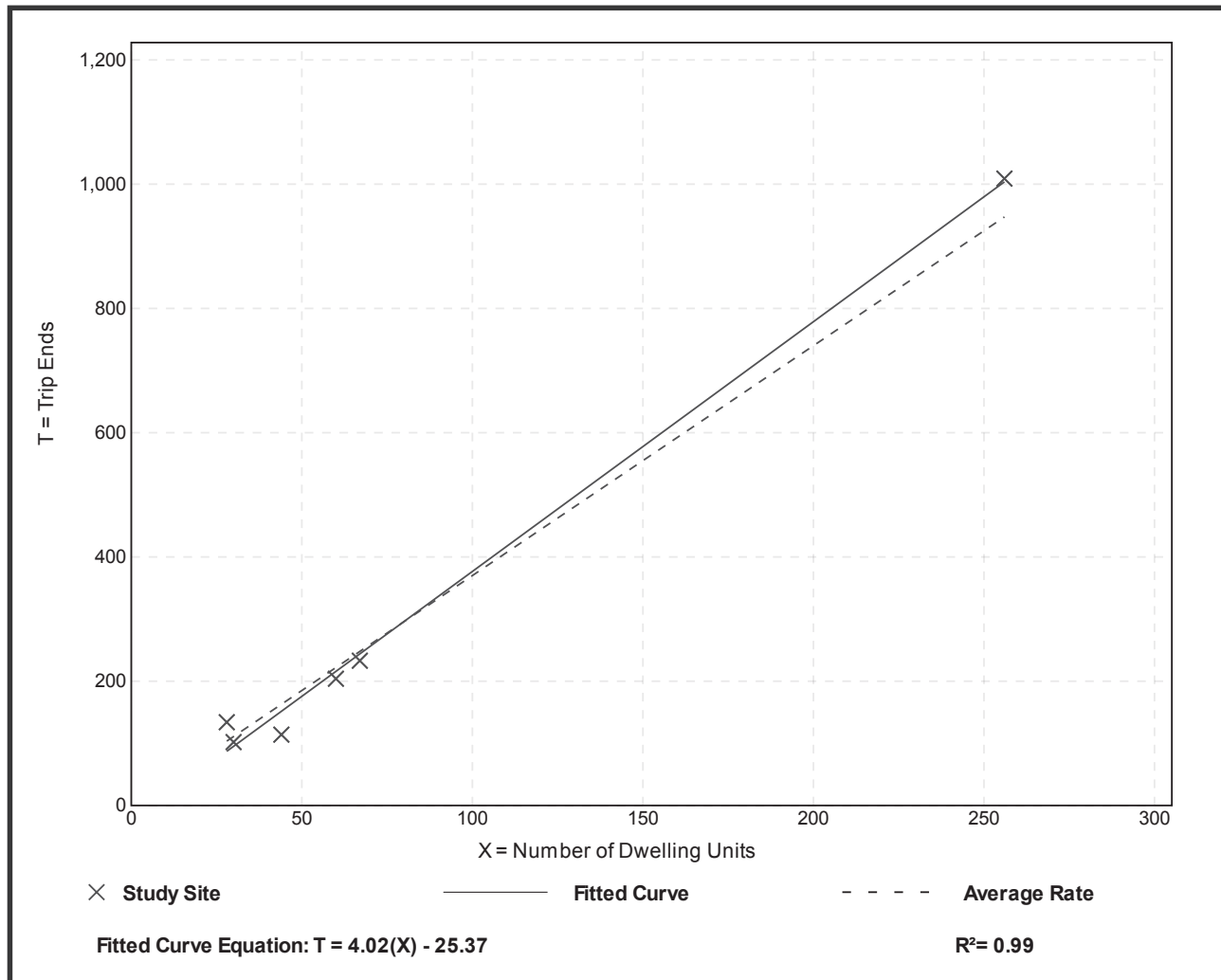
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. Num. of Dwelling Units: 81
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.70	2.59 - 4.79	0.53

Data Plot and Equation



Senior Adult Housing - Attached (252)

Vehicle Trip Ends vs: Dwelling Units

**On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.**

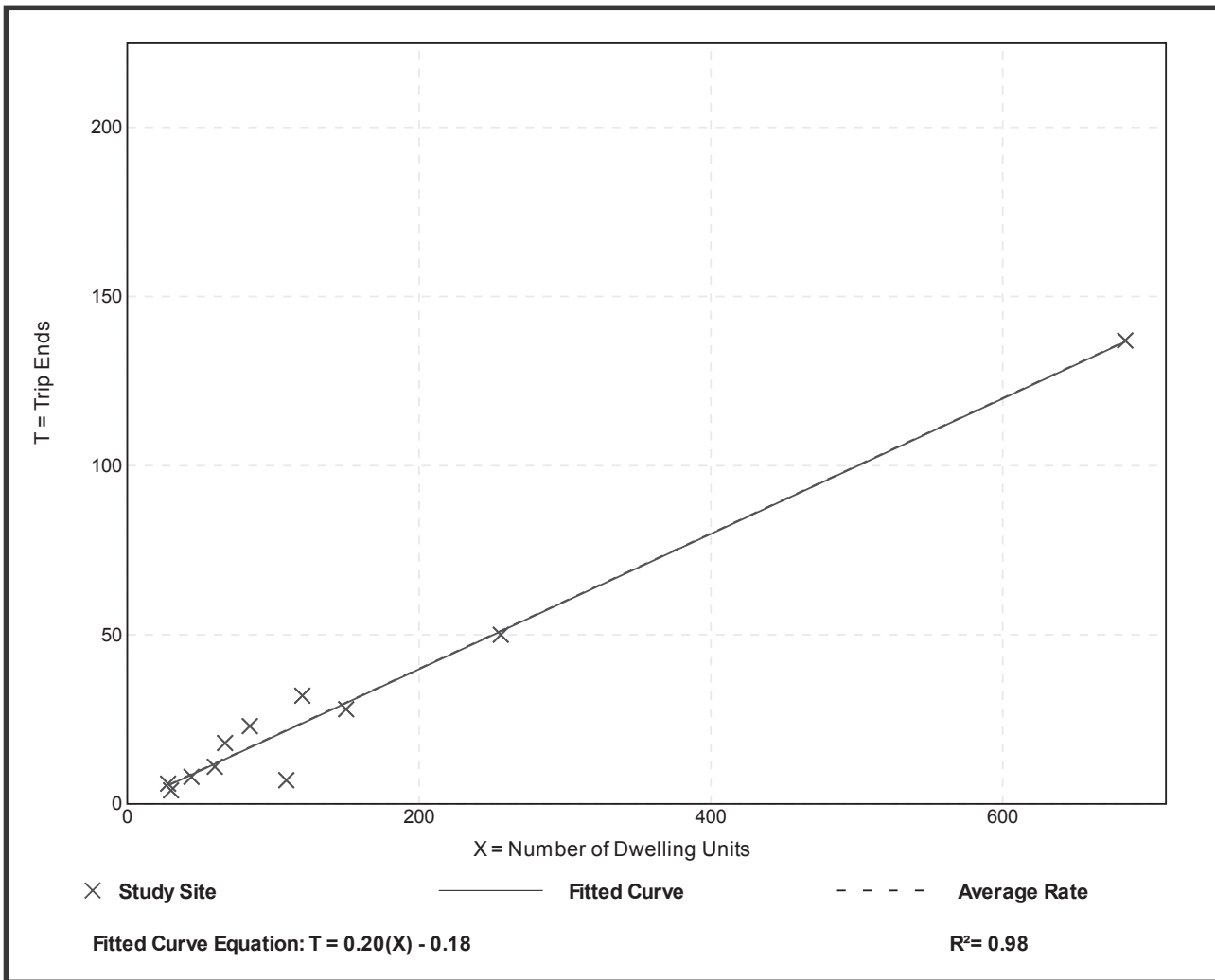
Setting/Location: General Urban/Suburban

Number of Studies: 11
Avg. Num. of Dwelling Units: 148
Directional Distribution: 35% entering, 65% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.20	0.06 - 0.27	0.05

Data Plot and Equation



Senior Adult Housing - Attached (252)

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

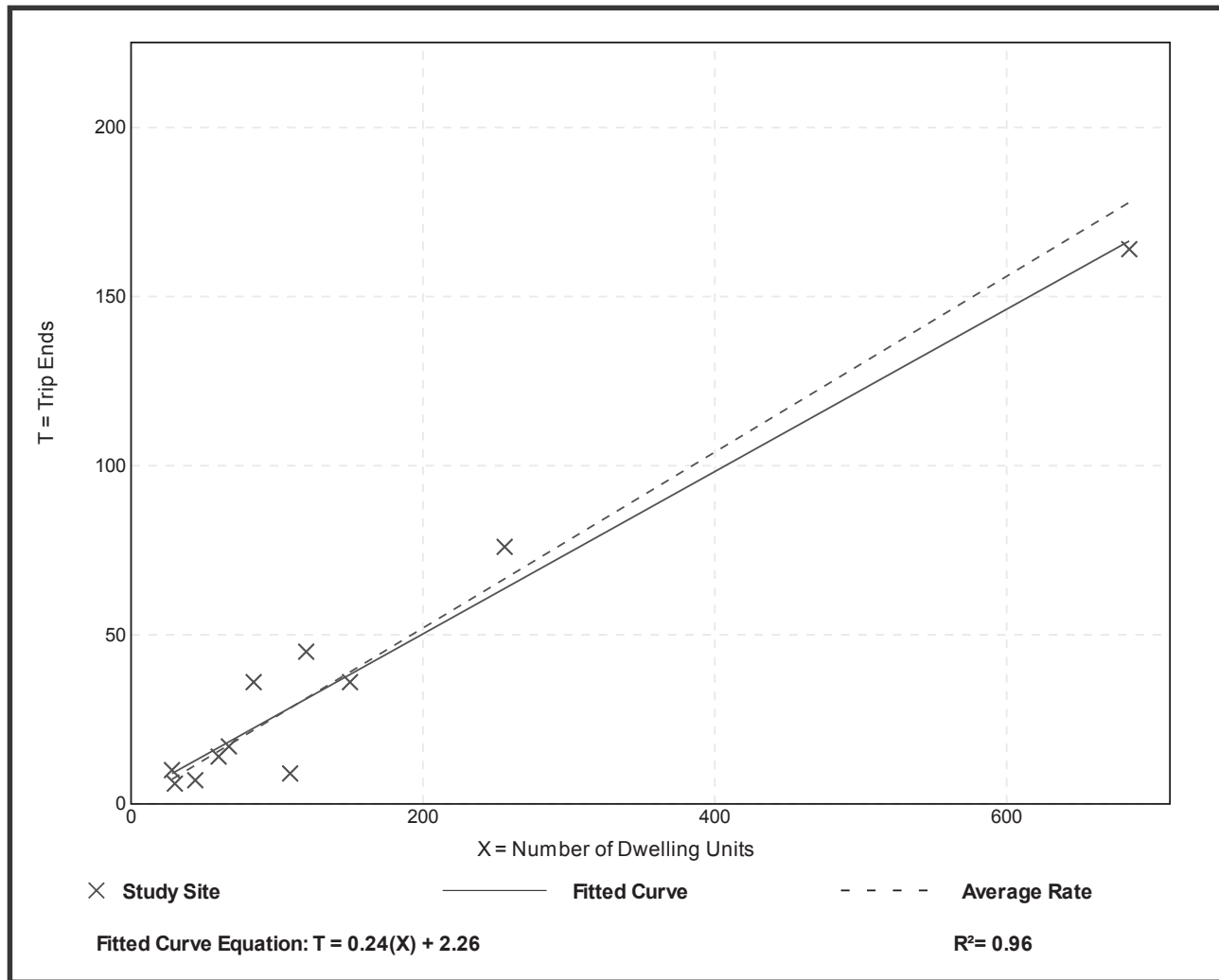
Setting/Location: General Urban/Suburban

Number of Studies: 11
 Avg. Num. of Dwelling Units: 148
 Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.26	0.08 - 0.43	0.08

Data Plot and Equation



Appendix A

Residential (Land Uses 200–299)

Land Use	210 Single-Family Detached Housing						220 Multifamily Housing (Low-Rise)							
	General Urban/Suburban						General Urban/Suburban						Dense Multi-Use Urban	
Setting	Weekday		Saturday		Sunday		Weekday		Saturday		Sunday		Weekday	
Time Period	Vehicle		Vehicle		Vehicle		Vehicle		Vehicle		Vehicle		Vehicle	
Trip Type	6		2		1		10		1		1		1	
# Data Sites	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	0.3	5.5	0.9	7.6	1.0	6.8	0.7	5.4	0.0	8.0	0.0	12.3	0.0	5.0
12:15	0.3	5.6	0.7	8.8	1.0	9.4	0.7	5.3	0.0	10.6	0.0	12.3	0.0	4.6
12:30	0.2	5.8	0.6	9.3	0.5	9.9	0.6	5.2	0.0	11.7	0.0	12.3	0.0	4.2
12:45	0.2	6.1	0.7	8.5	1.0	7.3	0.5	4.9	0.0	9.6	0.0	10.3	0.0	3.8
1:00	0.2	6.0	0.5	8.2	1.0	7.8	0.4	4.6	0.0	7.4	0.0	12.3	0.0	5.0
1:15	0.2	6.1	0.5	7.7	1.0	4.7	0.3	4.9	0.0	3.2	0.0	8.9	0.0	7.3
1:30	0.2	6.2	0.4	6.8	0.5	5.2	0.3	5.0	0.0	2.1	0.0	8.2	0.0	8.0
1:45	0.1	6.2	0.4	8.2	0.0	6.3	0.3	5.6	0.0	3.7	0.0	8.2	0.0	8.8
2:00	0.1	6.6	0.4	8.6	0.0	4.2	0.3	5.7	0.0	5.3	0.0	8.2	0.0	8.0
2:15	0.1	6.8	0.4	9.2	0.0	4.2	0.4	5.7	0.0	5.9	0.0	8.2	0.0	7.6
2:30	0.1	6.7	0.4	9.4	0.0	3.6	0.4	6.3	0.0	5.3	0.0	6.2	0.0	7.6
2:45	0.1	7.1	0.4	9.3	0.0	2.6	0.3	5.9	0.0	5.9	0.0	6.2	0.0	6.5
3:00	0.2	7.2	0.6	10.0	0.5	5.2	0.4	6.2	0.0	5.9	0.0	3.4	0.4	7.3
3:15	0.2	7.7	0.9	8.2	0.5	7.3	0.3	6.5	0.0	6.9	0.0	5.5	0.4	6.1
3:30	0.3	8.5	0.8	8.6	0.5	8.9	0.4	6.4	0.0	5.9	0.0	6.8	0.4	6.9
3:45	0.5	8.9	0.8	7.2	0.5	11.5	0.6	7.0	0.0	5.3	0.0	6.2	0.4	7.3
4:00	0.6	9.0	0.6	6.2	0.0	9.9	0.6	7.6	0.0	5.9	0.0	6.2	0.4	6.9
4:15	0.7	8.9	0.2	7.0	1.0	9.9	0.7	8.1	0.0	6.4	0.0	2.7	0.4	6.5
4:30	1.0	8.9	0.5	7.3	1.6	9.9	0.8	8.8	0.5	9.0	0.7	4.1	0.4	6.1
4:45	1.0	8.9	0.6	7.7	2.1	10.4	1.0	9.2	1.1	8.5	1.4	6.2	1.1	5.7
5:00	1.2	8.8	0.9	8.0	2.1	11.5	1.3	9.1	1.1	10.1	1.4	7.5	0.8	6.1
5:15	1.6	8.6	1.1	7.4	1.6	10.4	1.6	9.2	1.1	10.1	1.4	8.9	2.3	6.9
5:30	2.0	8.3	0.9	6.5	1.0	9.4	1.9	9.0	0.5	9.6	0.7	8.9	3.1	7.3
5:45	2.9	7.9	0.9	5.9	1.0	6.8	2.4	8.2	0.0	11.2	0.7	6.2	4.6	8.4
6:00	3.8	7.2	0.9	5.4	1.6	7.3	2.9	7.9	1.1	8.5	1.4	4.8	5.0	9.2
6:15	4.5	6.7	1.2	5.6	1.0	6.8	3.8	7.2	2.1	6.4	2.7	4.8	5.0	9.5
6:30	5.4	6.0	1.5	5.3	1.6	7.3	4.9	6.6	2.1	4.8	2.7	3.4	6.9	8.4
6:45	6.2	5.6	1.9	5.9	2.1	8.9	6.3	6.4	2.1	3.7	2.1	3.4	8.0	6.9
7:00	6.7	5.2	1.9	5.6	2.1	6.8	7.4	5.7	2.7	2.7	1.4	3.4	11.1	5.0
7:15	7.3	5.0	2.5	5.8	3.1	6.3	7.7	5.4	1.6	4.3	2.7	4.1	9.9	4.6
7:30	7.1	4.8	3.5	5.8	3.6	5.7	7.7	5.4	1.6	4.8	4.1	2.7	8.8	3.8
7:45	6.6	4.7	3.8	5.4	3.6	4.2	6.9	4.9	2.7	4.3	6.2	2.7	7.3	3.8
8:00	6.2	4.7	4.3	5.0	3.1	5.2	6.3	5.1	1.6	3.7	6.8	2.7	4.6	5.7
8:15	5.7	4.5	4.7	3.6	2.6	4.2	6.0	4.8	2.7	4.8	6.2	0.7	5.0	3.8
8:30	5.1	4.3	4.0	3.2	3.1	2.6	5.6	4.1	4.3	4.3	6.2	1.4	3.8	6.9
8:45	4.9	3.7	4.8	2.8	2.1	1.6	5.5	4.1	4.3	3.2	4.8	1.4	3.1	8.8
9:00	4.3	3.4	5.2	2.1	3.6	0.0	5.3	3.6	6.9	3.7	6.2	0.7	2.7	6.9
9:15	4.1	2.8	5.4	2.2	5.2	0.0	5.1	3.6	9.0	2.7	5.5	2.1	2.7	8.0
9:30	4.4	2.3	6.0	2.1	6.3	0.0	4.6	3.6	10.1	3.2	5.5	1.4	3.4	5.0
9:45	4.4	2.0	7.3	1.5	10.9	0.5	4.1	3.3	12.2	4.3	8.9	2.1	4.2	3.1
10:00	4.8	1.6	7.9	1.3	12.5	0.5	4.0	2.9	9.6	3.7	10.3	2.7	4.6	2.3
10:15	5.0	1.3	8.1	0.9	13.0	0.5	4.3	2.2	7.4	2.1	11.6	1.4	4.2	1.5
10:30	5.0	1.2	7.7	0.9	11.5	0.5	4.7	1.8	6.4	2.7	11.6	1.4	3.1	1.1
10:45	5.2	1.2	6.2	0.8	9.4	0.0	5.2	1.4	5.9	1.6	8.9	0.7	1.9	0.8
11:00	5.2	1.0	6.5	1.4	7.3	0.0	5.3	1.2	10.6	1.6	8.2	0.0	1.9	1.5
11:15	5.3	0.8	6.5	1.4	6.3	0.0	5.3	1.0	11.2	1.6	10.3	0.0	3.1	0.8
11:30	5.4	0.7	7.2	1.5	5.7	1.0	5.2	0.8	11.2	0.0	11.6	0.0	4.2	0.8
11:45	5.4	0.4	7.9	1.3	6.3	1.0	5.4	0.7	10.6	0.0	13.7	0.0	5.0	0.8

Land Use	225 Off-Campus Student Apartment				231 Mid-Rise Residential with 1st-Floor Commercial		251 Senior Adult Housing—Detached		252 Senior Adult Housing—Attached		254 Assisted Living	
	Setting		Time Period		Trip Type		# Data Sites					
	1/2-Mile from Campus	Adjacent to Campus	Weekday		Vehicle		17		Weekday		Weekday	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	2.7	5.3	2.7	5.1	0.7	5.9	0.2	7.6	0.3	8.8	0.0	10.4
12:15	2.4	5.3	2.4	5.0	0.3	4.9	0.2	7.6	0.4	8.7	0.0	10.1
12:30	2.1	5.2	2.2	4.9	0.1	4.7	0.2	7.4	0.4	8.2	0.0	10.8
12:45	1.8	5.4	1.9	5.1	0.1	4.3	0.2	7.3	0.4	7.7	0.0	10.5
1:00	1.6	5.6	1.7	5.3	0.1	4.1	0.1	7.1	0.4	7.8	0.0	9.1
1:15	1.5	5.8	1.6	5.5	0.1	4.5	0.1	7.0	0.3	7.8	0.0	9.3
1:30	1.3	5.8	1.4	5.6	0.1	4.6	0.1	6.9	0.2	8.2	0.0	7.7
1:45	1.2	5.9	1.2	5.4	0.1	4.7	0.1	7.0	0.1	8.1	0.0	8.2
2:00	1.0	5.8	1.1	5.3	0.1	5.2	0.1	7.2	0.0	8.0	0.0	8.0
2:15	0.9	5.9	0.9	5.4	0.1	5.1	0.1	7.5	0.1	7.7	0.0	6.6
2:30	0.8	6.0	0.8	5.5	0.1	5.1	0.1	7.7	0.1	7.5	0.0	8.8
2:45	0.6	6.2	0.7	5.7	0.3	5.2	0.1	7.7	0.1	7.4	0.0	8.6
3:00	0.6	6.4	0.6	5.9	0.2	4.9	0.1	7.8	0.2	7.3	0.0	7.9
3:15	0.5	6.4	0.6	5.9	0.3	5.1	0.1	7.8	0.2	7.4	0.0	9.6
3:30	0.4	6.6	0.5	6.1	0.5	5.3	0.1	7.9	0.2	7.5	0.0	7.4
3:45	0.4	6.7	0.4	6.2	0.3	5.6	0.1	7.9	0.2	7.5	0.0	8.2
4:00	0.4	6.8	0.4	6.4	0.5	5.8	0.2	7.9	0.3	7.3	0.0	8.8
4:15	0.4	7.0	0.4	6.8	0.6	6.1	0.2	8.0	0.5	7.5	0.8	7.7
4:30	0.5	7.2	0.4	7.1	0.4	7.0	0.3	8.2	0.9	7.2	1.4	8.2
4:45	0.6	7.4	0.5	7.4	0.6	7.6	0.5	8.2	1.1	6.9	1.6	7.2
5:00	0.6	7.5	0.6	7.6	0.8	8.8	0.6	8.2	1.5	6.6	2.7	7.1
5:15	0.6	7.6	0.6	7.8	1.1	10.4	0.8	8.1	1.9	6.0	3.1	6.4
5:30	0.7	7.5	0.8	7.7	1.6	10.5	1.1	7.7	1.8	5.8	2.5	6.0
5:45	0.8	7.4	0.9	7.6	3.2	10.1	1.7	7.1	2.0	5.7	4.1	4.4
6:00	1.1	7.2	1.1	7.6	4.0	9.4	2.3	6.5	2.1	5.8	3.5	3.6
6:15	1.4	7.1	1.5	7.2	5.6	8.3	3.1	5.8	2.2	6.1	6.8	2.5
6:30	1.9	6.9	1.8	7.2	6.5	7.2	3.9	5.2	2.5	5.9	8.3	1.1
6:45	2.5	6.8	2.3	7.0	7.2	6.7	4.7	4.4	3.0	5.6	8.0	1.3
7:00	3.1	6.5	2.8	6.8	7.7	6.8	5.5	3.9	3.5	5.5	9.3	0.8
7:15	3.4	6.4	3.1	6.8	7.6	6.3	5.9	3.6	3.9	5.1	6.3	0.9
7:30	3.6	6.3	3.2	6.8	7.9	5.9	6.4	3.3	4.5	5.0	6.1	0.8
7:45	3.7	6.1	3.3	6.9	6.7	5.4	6.6	3.1	4.7	4.9	5.3	0.3
8:00	3.9	6.1	3.4	7.0	6.8	4.5	6.5	3.0	5.0	4.4	5.2	0.2
8:15	4.1	6.1	3.6	7.1	6.4	4.1	6.6	2.8	5.2	3.9	5.8	0.2
8:30	4.3	6.1	3.9	6.9	6.5	3.8	6.7	2.6	5.4	3.4	5.8	0.2
8:45	4.3	6.1	3.8	6.9	5.9	4.7	6.8	2.4	5.7	3.0	7.1	0.2
9:00	4.1	6.1	3.8	6.7	5.4	4.7	6.8	2.2	5.6	2.7	6.8	0.2
9:15	4.0	6.0	3.7	6.5	4.7	4.5	6.9	1.9	6.0	2.5	6.4	0.3
9:30	3.9	5.8	3.7	6.5	4.1	4.3	6.9	1.7	6.1	2.5	6.3	0.5
9:45	4.0	5.5	3.8	6.1	4.1	2.8	6.7	1.5	6.4	2.2	6.0	0.6
10:00	4.1	5.1	3.8	5.8	3.9	2.1	6.9	1.3	6.9	2.2	6.0	0.8
10:15	4.1	4.7	3.8	5.3	4.5	1.8	7.1	1.1	6.9	2.0	6.0	1.4
10:30	4.4	4.5	3.9	4.8	4.8	1.6	7.3	0.9	7.2	1.5	6.1	1.4
10:45	4.5	4.1	4.3	4.4	5.6	1.4	7.4	0.7	6.8	1.4	7.1	1.6
11:00	4.5	3.9	4.4	4.0	6.2	1.4	7.4	0.6	6.7	1.0	8.3	1.6
11:15	4.7	3.6	4.8	3.6	6.4	1.2	7.2	0.5	7.2	0.7	9.1	0.6
11:30	5.0	3.3	5.0	3.3	6.3	1.2	7.3	0.3	7.6	0.5	10.1	0.5
11:45	5.1	3.0	5.0	3.0	6.3	1.0	7.4	0.3	8.7	0.3	9.6	0.2

Land Use: 520

Elementary School

Description

An elementary school typically serves students attending kindergarten through the fifth or sixth grade. Elementary schools are usually centrally located in residential communities in order to facilitate student access and have no student drivers. This land use consists of schools where bus service is usually provided to students living beyond a specified distance from the school. Both public and private elementary schools are included in this land use. Middle school/junior high school (Land Use 522), high school (Land Use 530), private school (K-8) (Land Use 534), private school (K-12) (Land Use 536), and charter elementary school (Land Use 537) are related uses.

Additional Data

Elementary school students generally used school buses more than regular transit and were dropped off and picked up more than high school students, who were apt to walk longer distances, ride bicycles, or, in some cases, drive to school. The percentage of students at the sites who were transported to school via bus varied considerably. Some sites experienced higher than average trip rates because many students did not utilize the available school bus service. Due to the varied transit and school bus usage at these sites, it is desirable that future studies report additional detail on the percentage of students who were bused to school and the percentage that were dropped off and picked up.

The elementary schools surveyed exhibited significant variations in terms of facilities provided. Because the ratio of floor space to student population varied widely among the schools surveyed, the number of students may be a more reliable independent variable on which to establish trip generation rates.

Time-of-day distribution data for this land use are presented in Appendix A. For the 11 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 2:15 and 3:15 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alabama, Arizona, British Columbia (CAN), California, Connecticut, Florida, Hawaii, Minnesota, Montana, New York, Oregon, Texas, and Utah.

Source Numbers

186, 383, 390, 395, 533, 536, 572, 579, 583, 609, 611, 612, 613, 632, 707, 852, 856, 858, 866, 877, 878, 896, 940

Elementary School (520)

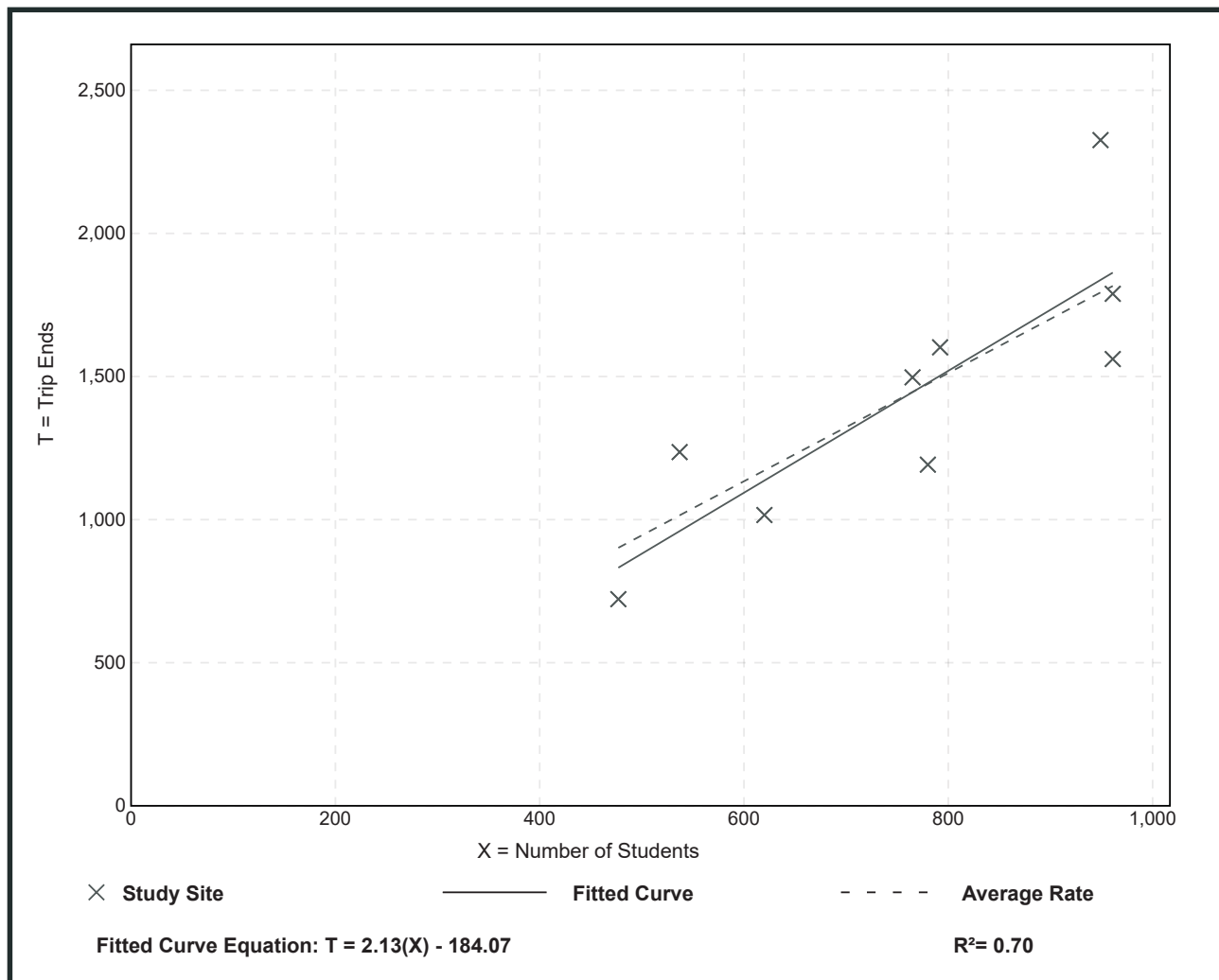
Vehicle Trip Ends vs: Students
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 9
Avg. Num. of Students: 760
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
1.89	1.51 - 2.45	0.34

Data Plot and Equation



Elementary School (520)

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

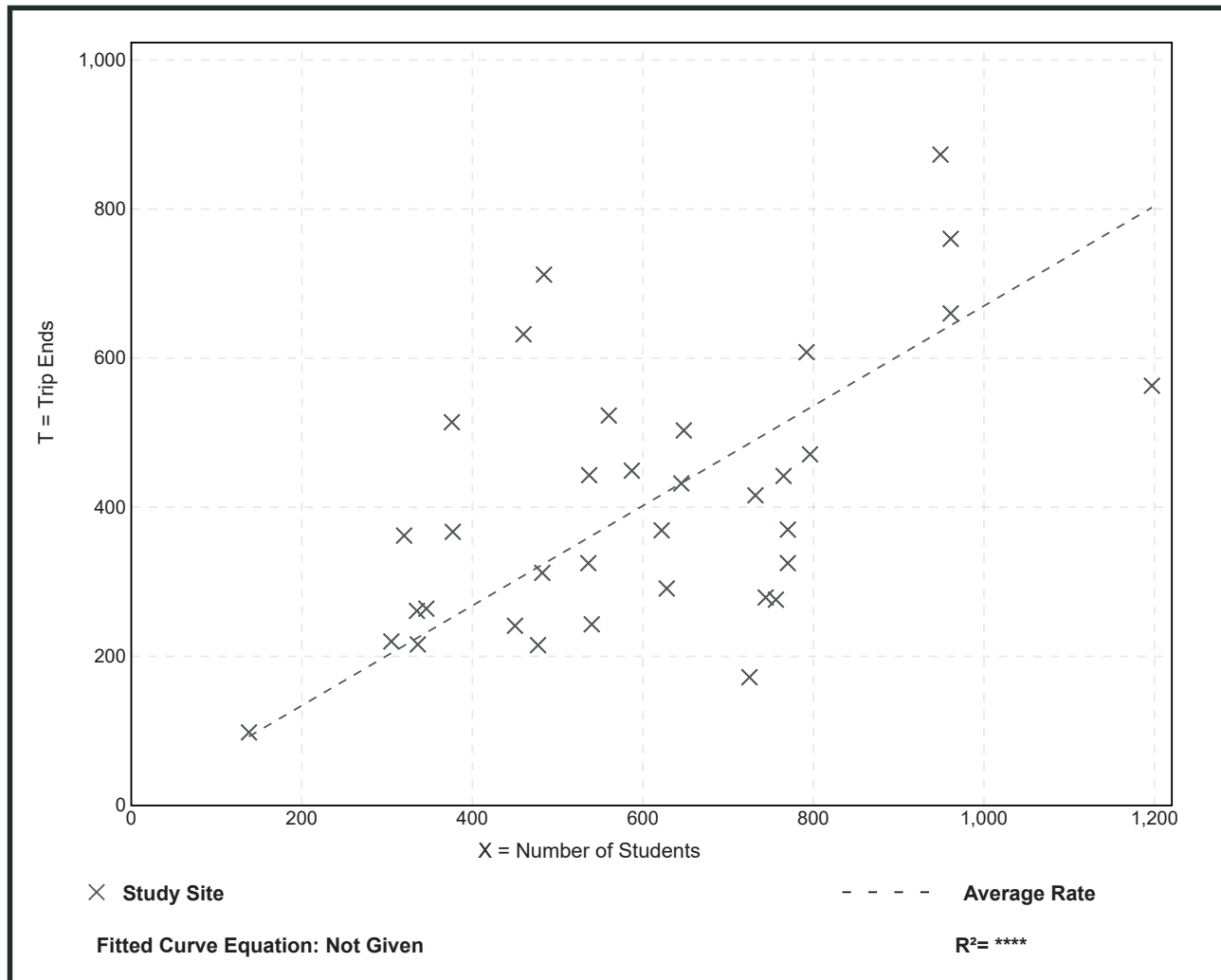
Setting/Location: General Urban/Suburban

Number of Studies: 35
 Avg. Num. of Students: 603
 Directional Distribution: 54% entering, 46% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.67	0.24 - 1.47	0.27

Data Plot and Equation



Elementary School (520)

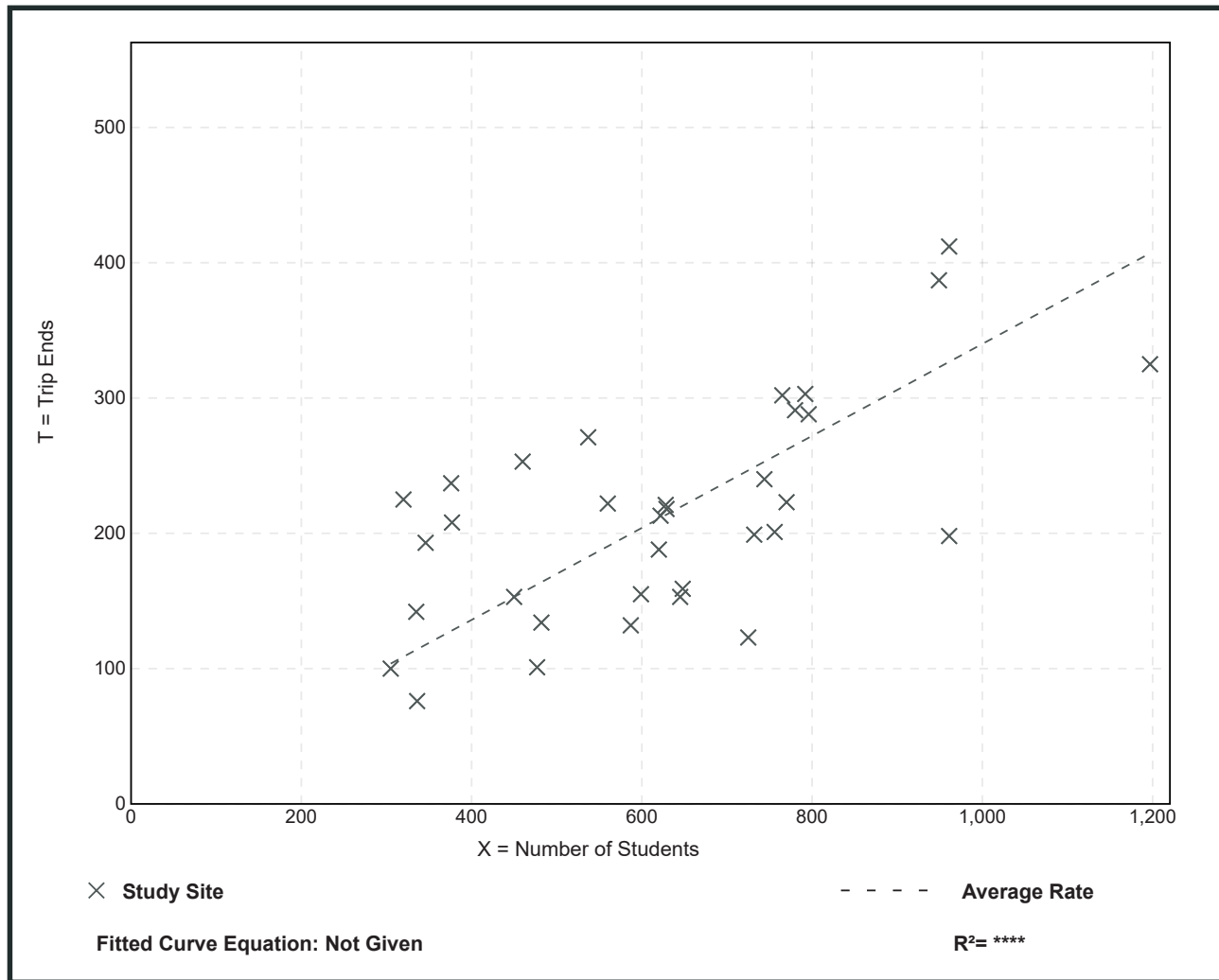
Vehicle Trip Ends vs: Students
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
 Number of Studies: 34
 Avg. Num. of Students: 626
 Directional Distribution: 45% entering, 55% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.34	0.17 - 0.70	0.11

Data Plot and Equation



FUTURE (2032) PHASE A NO-BUILD CAPACITY REPORTS

Weekday Morning Peak Hour

Weekday Dismissal Peak Hour

Weekday Evening Peak Hour

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	65	5	70	85	50	20	165	70	45	140	1
Future Volume (veh/h)	1	65	5	70	85	50	20	165	70	45	140	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1796	1870	1870	1870	1707	1707	1856	1707	1707
Adj Flow Rate, veh/h	1	68	5	74	89	53	21	174	74	47	147	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	2	2	2	13	13	3	13	13
Cap, veh/h	247	217	16	316	193	115	665	513	218	572	791	5
Arrive On Green	0.00	0.13	0.13	0.05	0.18	0.18	0.02	0.45	0.45	0.03	0.47	0.47
Sat Flow, veh/h	1781	1721	127	1711	1098	654	1781	1137	483	1767	1694	12
Grp Volume(v), veh/h	1	0	73	74	0	142	21	0	248	47	0	148
Grp Sat Flow(s),veh/h/ln	1781	0	1848	1711	0	1753	1781	0	1620	1767	0	1705
Q Serve(g_s), s	0.0	0.0	2.2	2.3	0.0	4.5	0.4	0.0	6.1	0.9	0.0	3.1
Cycle Q Clear(g_c), s	0.0	0.0	2.2	2.3	0.0	4.5	0.4	0.0	6.1	0.9	0.0	3.1
Prop In Lane	1.00		0.07	1.00		0.37	1.00		0.30	1.00		0.01
Lane Grp Cap(c), veh/h	247	0	233	316	0	307	665	0	731	572	0	796
V/C Ratio(X)	0.00	0.00	0.31	0.23	0.00	0.46	0.03	0.00	0.34	0.08	0.00	0.19
Avail Cap(c_a), veh/h	344	0	626	437	0	706	761	0	940	640	0	990
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	24.7	21.6	0.0	23.0	8.9	0.0	11.0	8.8	0.0	9.7
Incr Delay (d2), s/veh	0.0	0.0	1.6	0.4	0.0	2.3	0.0	0.0	1.3	0.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	1.7	1.5	0.0	3.3	0.2	0.0	3.3	0.4	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.7	0.0	26.3	22.0	0.0	25.3	8.9	0.0	12.3	8.8	0.0	10.2
LnGrp LOS	C	A	C	C	A	C	A	A	B	A	A	B
Approach Vol, veh/h		74			216			269				195
Approach Delay, s/veh		26.3			24.1			12.0				9.8
Approach LOS		C			C			B				A
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.6	34.0	7.6	13.8	5.7	35.0	4.5	16.9				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	4.5	36.0	7.5	21.0	4.5	36.0	3.5	25.0				
Max Q Clear Time (g_c+l1), s	2.9	8.1	4.3	4.2	2.4	5.1	2.0	6.5				
Green Ext Time (p_c), s	0.0	4.1	0.0	0.4	0.0	2.3	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay				16.3								
HCM 6th LOS				B								

Intersection						
Int Delay, s/veh	5.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	45	135	95	15	115	110
Future Vol, veh/h	45	135	95	15	115	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	265	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	142	100	16	121	116

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	116	0	-	0	336
Stage 1	-	-	-	-	100
Stage 2	-	-	-	-	236
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1473	-	-	-	659
Stage 1	-	-	-	-	924
Stage 2	-	-	-	-	803
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1473	-	-	-	638
Mov Cap-2 Maneuver	-	-	-	-	638
Stage 1	-	-	-	-	894
Stage 2	-	-	-	-	803

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1473	-	-	-	638	956
HCM Lane V/C Ratio	0.032	-	-	-	0.19	0.121
HCM Control Delay (s)	7.5	-	-	-	12	9.3
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7	0.4

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	140	100	225	195	20
Future Vol, veh/h	30	140	100	225	195	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	10	10	9	14	2
Mvmt Flow	32	147	105	237	205	21

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	663	216	226	0	0
Stage 1	216	-	-	-	-
Stage 2	447	-	-	-	-
Critical Hdwy	6.44	6.3	4.2	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-
Follow-up Hdwy	3.536	3.39	2.29	-	-
Pot Cap-1 Maneuver	423	804	1297	-	-
Stage 1	815	-	-	-	-
Stage 2	640	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	389	804	1297	-	-
Mov Cap-2 Maneuver	389	-	-	-	-
Stage 1	749	-	-	-	-
Stage 2	640	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1297	-	389	804	-	-
HCM Lane V/C Ratio	0.081	-	0.081	0.183	-	-
HCM Control Delay (s)	8	-	15.1	10.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	0.7	-	-

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	70	5	30	110	50	20	180	55	30	160	1
Future Volume (veh/h)	1	70	5	30	110	50	20	180	55	30	160	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1722	1722	1841	1648	1648
Adj Flow Rate, veh/h	1	74	5	32	116	53	21	189	58	32	168	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	12	12	4	17	17
Cap, veh/h	261	359	24	345	275	126	671	641	197	593	840	5
Arrive On Green	0.00	0.21	0.21	0.02	0.23	0.23	0.02	0.51	0.51	0.02	0.51	0.51
Sat Flow, veh/h	1781	1732	117	1781	1215	555	1781	1264	388	1753	1637	10
Grp Volume(v), veh/h	1	0	79	32	0	169	21	0	247	32	0	169
Grp Sat Flow(s),veh/h/ln	1781	0	1849	1781	0	1770	1781	0	1652	1753	0	1646
Q Serve(g_s), s	0.0	0.0	3.1	1.2	0.0	7.1	0.5	0.0	7.5	0.8	0.0	4.8
Cycle Q Clear(g_c), s	0.0	0.0	3.1	1.2	0.0	7.1	0.5	0.0	7.5	0.8	0.0	4.8
Prop In Lane	1.00		0.06	1.00		0.31	1.00		0.23	1.00		0.01
Lane Grp Cap(c), veh/h	261	0	383	345	0	401	671	0	838	593	0	845
V/C Ratio(X)	0.00	0.00	0.21	0.09	0.00	0.42	0.03	0.00	0.29	0.05	0.00	0.20
Avail Cap(c_a), veh/h	318	0	384	369	0	401	718	0	840	629	0	845
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	28.5	26.4	0.0	28.7	10.0	0.0	12.4	10.1	0.0	11.4
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.1	0.0	1.5	0.0	0.0	0.9	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	2.4	0.9	0.0	5.3	0.3	0.0	4.5	0.4	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	0.0	29.1	26.6	0.0	30.2	10.0	0.0	13.3	10.1	0.0	12.0
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	B
Approach Vol, veh/h		80			201			268			201	
Approach Delay, s/veh		29.0			29.6			13.0			11.7	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	50.0	6.2	24.0	6.0	50.5	4.6	25.6				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	3.8	44.1	2.9	18.0	3.8	44.1	2.9	18.2				
Max Q Clear Time (g_c+I1), s	2.8	9.5	3.2	5.1	2.5	6.8	2.0	9.1				
Green Ext Time (p_c), s	0.0	4.4	0.0	0.4	0.0	2.9	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay				18.8								
HCM 6th LOS				B								

HCM 6th TWSC
 200: Big Timber Road & Ridgecrest Drive

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Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	30	125	135	35	70	55
Future Vol, veh/h	30	125	135	35	70	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	265	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	2	2	2
Mvmt Flow	32	132	142	37	74	58

Major/Minor

	Major1	Major2	Minor2		
Conflicting Flow All	179	0	0	338	142
Stage 1	-	-	-	142	-
Stage 2	-	-	-	196	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1397	-	-	658	906
Stage 1	-	-	-	885	-
Stage 2	-	-	-	837	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1397	-	-	643	906
Mov Cap-2 Maneuver	-	-	-	643	-
Stage 1	-	-	-	865	-
Stage 2	-	-	-	837	-

Approach

	EB	WB	SB
HCM Control Delay, s	1.5	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt

	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1397	-	-	-	643	906
HCM Lane V/C Ratio	0.023	-	-	-	0.115	0.064
HCM Control Delay (s)	7.6	-	-	-	11.3	9.2
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4	0.2

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	125	95	225	170	25
Future Vol, veh/h	30	125	95	225	170	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	15	6	9	9	13	21
Mvmt Flow	32	132	100	237	179	26

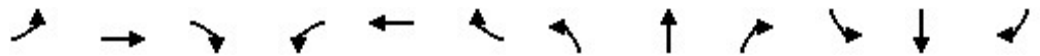
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	629	192	205	0	-	0
Stage 1	192	-	-	-	-	-
Stage 2	437	-	-	-	-	-
Critical Hdwy	6.55	6.26	4.19	-	-	-
Critical Hdwy Stg 1	5.55	-	-	-	-	-
Critical Hdwy Stg 2	5.55	-	-	-	-	-
Follow-up Hdwy	3.635	3.354	2.281	-	-	-
Pot Cap-1 Maneuver	426	839	1326	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	394	839	1326	-	-	-
Mov Cap-2 Maneuver	394	-	-	-	-	-
Stage 1	749	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	2.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1326	-	394	839	-	-
HCM Lane V/C Ratio	0.075	-	0.08	0.157	-	-
HCM Control Delay (s)	7.9	-	14.9	10.1	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	0.6	-	-

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	65	20	50	145	90	40	225	90	55	185	1
Future Volume (veh/h)	1	65	20	50	145	90	40	225	90	55	185	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1826	1811	1811	1856	1841	1841
Adj Flow Rate, veh/h	1	68	21	53	153	95	42	237	95	58	195	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	5	6	6	3	4	4
Cap, veh/h	207	279	86	352	255	158	635	611	245	525	922	5
Arrive On Green	0.00	0.20	0.20	0.03	0.24	0.24	0.02	0.50	0.50	0.03	0.50	0.50
Sat Flow, veh/h	1781	1371	423	1781	1079	670	1739	1230	493	1767	1830	9
Grp Volume(v), veh/h	1	0	89	53	0	248	42	0	332	58	0	196
Grp Sat Flow(s),veh/h/ln	1781	0	1794	1781	0	1750	1739	0	1722	1767	0	1839
Q Serve(g_s), s	0.0	0.0	3.7	2.1	0.0	11.2	1.1	0.0	10.6	1.4	0.0	5.2
Cycle Q Clear(g_c), s	0.0	0.0	3.7	2.1	0.0	11.2	1.1	0.0	10.6	1.4	0.0	5.2
Prop In Lane	1.00		0.24	1.00		0.38	1.00		0.29	1.00		0.01
Lane Grp Cap(c), veh/h	207	0	365	352	0	413	635	0	856	525	0	927
V/C Ratio(X)	0.00	0.00	0.24	0.15	0.00	0.60	0.07	0.00	0.39	0.11	0.00	0.21
Avail Cap(c_a), veh/h	264	0	365	353	0	413	658	0	873	535	0	932
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	29.6	26.4	0.0	30.1	10.6	0.0	13.9	11.0	0.0	12.2
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.2	0.0	3.7	0.0	0.0	1.3	0.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	2.8	1.5	0.0	8.3	0.6	0.0	6.8	0.8	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.5	0.0	30.3	26.6	0.0	33.8	10.7	0.0	15.2	11.0	0.0	12.7
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	B
Approach Vol, veh/h		90			301			374				254
Approach Delay, s/veh		30.3			32.5			14.7				12.3
Approach LOS		C			C			B				B
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	50.0	7.5	24.0	6.5	50.6	4.6	26.9				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	3.1	44.9	3.0	18.0	3.1	44.9	2.9	18.1				
Max Q Clear Time (g_c+I1), s	3.4	12.6	4.1	5.7	3.1	7.2	2.0	13.2				
Green Ext Time (p_c), s	0.0	6.2	0.0	0.4	0.0	3.4	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay				20.8								
HCM 6th LOS				C								

HCM 6th TWSC
 200: Big Timber Road & Ridgecrest Drive

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Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	65	145	225	85	85	60
Future Vol, veh/h	65	145	225	85	85	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	265	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	153	237	89	89	63

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	326	0	-	0	526 237
Stage 1	-	-	-	-	237 -
Stage 2	-	-	-	-	289 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1234	-	-	-	512 802
Stage 1	-	-	-	-	802 -
Stage 2	-	-	-	-	760 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1234	-	-	-	484 802
Mov Cap-2 Maneuver	-	-	-	-	484 -
Stage 1	-	-	-	-	758 -
Stage 2	-	-	-	-	760 -

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1234	-	-	-	484	802
HCM Lane V/C Ratio	0.055	-	-	-	0.185	0.079
HCM Control Delay (s)	8.1	-	-	-	14.1	9.9
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7	0.3

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	135	115	325	225	30
Future Vol, veh/h	30	135	115	325	225	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	4	8	4
Mvmt Flow	32	142	121	342	237	32

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	837	253	269	0	-	0
Stage 1	253	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.227	-	-	-
Pot Cap-1 Maneuver	337	786	1289	-	-	-
Stage 1	789	-	-	-	-	-
Stage 2	557	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	305	786	1289	-	-	-
Mov Cap-2 Maneuver	305	-	-	-	-	-
Stage 1	715	-	-	-	-	-
Stage 2	557	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1289	-	305	786	-	-
HCM Lane V/C Ratio	0.094	-	0.104	0.181	-	-
HCM Control Delay (s)	8.1	-	18.2	10.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	0.7	-	-

FUTURE (2032) PHASE A BUILD CAPACITY REPORTS

Weekday Morning Peak Hour

Weekday Dismissal Peak Hour

Weekday Evening Peak Hour

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	30	5	70	40	55	20	180	70	45	145	1
Future Volume (veh/h)	1	30	5	70	40	55	20	180	70	45	145	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1796	1870	1870	1870	1707	1707	1856	1707	1707
Adj Flow Rate, veh/h	1	32	5	74	42	58	21	189	74	47	153	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	2	2	2	13	13	3	13	13
Cap, veh/h	269	186	29	335	119	165	667	532	208	566	798	5
Arrive On Green	0.00	0.12	0.12	0.05	0.17	0.17	0.02	0.46	0.46	0.03	0.47	0.47
Sat Flow, veh/h	1781	1579	247	1711	711	982	1781	1168	457	1767	1694	11
Grp Volume(v), veh/h	1	0	37	74	0	100	21	0	263	47	0	154
Grp Sat Flow(s),veh/h/ln	1781	0	1826	1711	0	1694	1781	0	1625	1767	0	1705
Q Serve(g_s), s	0.0	0.0	1.1	2.3	0.0	3.2	0.4	0.0	6.5	0.9	0.0	3.2
Cycle Q Clear(g_c), s	0.0	0.0	1.1	2.3	0.0	3.2	0.4	0.0	6.5	0.9	0.0	3.2
Prop In Lane	1.00		0.14	1.00		0.58	1.00		0.28	1.00		0.01
Lane Grp Cap(c), veh/h	269	0	215	335	0	284	667	0	741	566	0	804
V/C Ratio(X)	0.00	0.00	0.17	0.22	0.00	0.35	0.03	0.00	0.36	0.08	0.00	0.19
Avail Cap(c_a), veh/h	368	0	624	457	0	689	764	0	952	635	0	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	24.4	21.8	0.0	22.6	8.6	0.0	10.9	8.6	0.0	9.4
Incr Delay (d2), s/veh	0.0	0.0	0.8	0.3	0.0	1.6	0.0	0.0	1.3	0.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	0.9	1.5	0.0	2.2	0.2	0.0	3.5	0.4	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	0.0	25.2	22.1	0.0	24.2	8.6	0.0	12.2	8.6	0.0	10.0
LnGrp LOS	C	A	C	C	A	C	A	A	B	A	A	A
Approach Vol, veh/h		38			174			284			201	
Approach Delay, s/veh		25.2			23.3			11.9			9.7	
Approach LOS		C			C			B			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.6	34.0	7.6	13.2	5.6	35.0	4.5	16.3				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	4.5	36.0	7.5	21.0	4.5	36.0	3.5	25.0				
Max Q Clear Time (g_c+I1), s	2.9	8.5	4.3	3.1	2.4	5.2	2.0	5.2				
Green Ext Time (p_c), s	0.0	4.4	0.0	0.2	0.0	2.4	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

HCM 6th TWSC
 200: Access B/Ridgecrest Drive & Big Timber Road

02/18/2021

Intersection												
Int Delay, s/veh	9.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗		↖	↗	↖	↗	
Traffic Vol, veh/h	10	135	1	115	95	15	5	45	150	115	55	65
Future Vol, veh/h	10	135	1	115	95	15	5	45	150	115	55	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	142	1	121	100	16	5	47	158	121	58	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	116	0	0	143	0	0	577	522	142	609	507	100
Stage 1	-	-	-	-	-	-	164	164	-	342	342	-
Stage 2	-	-	-	-	-	-	413	358	-	267	165	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1473	-	-	1440	-	-	428	459	906	407	468	956
Stage 1	-	-	-	-	-	-	838	762	-	673	638	-
Stage 2	-	-	-	-	-	-	616	628	-	738	762	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1473	-	-	1440	-	-	332	418	906	286	426	956
Mov Cap-2 Maneuver	-	-	-	-	-	-	332	418	-	286	426	-
Stage 1	-	-	-	-	-	-	832	757	-	668	584	-
Stage 2	-	-	-	-	-	-	472	575	-	567	757	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			4			11.2			19.4		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	407	906	1473	-	-	1440	-	-	286	609
HCM Lane V/C Ratio	0.129	0.174	0.007	-	-	0.084	-	-	0.423	0.207
HCM Control Delay (s)	15.2	9.8	7.5	-	-	7.7	-	-	26.5	12.5
HCM Lane LOS	C	A	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.4	0.6	0	-	-	0.3	-	-	2	0.8

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	140	100	255	250	25
Future Vol, veh/h	30	140	100	255	250	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	10	10	9	14	2
Mvmt Flow	32	147	105	268	263	26

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	754	276	289	0	-	0
Stage 1	276	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Critical Hdwy	6.44	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	374	744	1228	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	342	744	1228	-	-	-
Mov Cap-2 Maneuver	342	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	620	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1228	-	342	744	-	-
HCM Lane V/C Ratio	0.086	-	0.092	0.198	-	-
HCM Control Delay (s)	8.2	-	16.6	11	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	0.7	-	-

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	60	15	255	30	5	215
Future Vol, veh/h	60	15	255	30	5	215
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	16	268	32	5	226

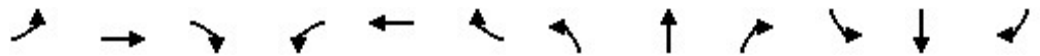
Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	520	284	0	0	300
Stage 1	284	-	-	-	-
Stage 2	236	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	516	755	-	-	1261
Stage 1	764	-	-	-	-
Stage 2	803	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	514	755	-	-	1261
Mov Cap-2 Maneuver	514	-	-	-	-
Stage 1	764	-	-	-	-
Stage 2	800	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	514	755	1261
HCM Lane V/C Ratio	-	-	0.123	0.021	0.004
HCM Control Delay (s)	-	-	13	9.9	7.9
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	0

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	50	5	30	100	55	20	185	55	35	170	1
Future Volume (veh/h)	1	50	5	30	100	55	20	185	55	35	170	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1722	1722	1841	1648	1648
Adj Flow Rate, veh/h	1	53	5	32	105	58	21	195	58	37	179	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	12	12	4	17	17
Cap, veh/h	264	347	33	361	255	141	662	645	192	591	843	5
Arrive On Green	0.00	0.21	0.21	0.02	0.23	0.23	0.02	0.51	0.51	0.03	0.51	0.51
Sat Flow, veh/h	1781	1683	159	1781	1132	625	1781	1275	379	1753	1637	9
Grp Volume(v), veh/h	1	0	58	32	0	163	21	0	253	37	0	180
Grp Sat Flow(s),veh/h/ln	1781	0	1842	1781	0	1758	1781	0	1654	1753	0	1646
Q Serve(g_s), s	0.0	0.0	2.2	1.2	0.0	6.9	0.5	0.0	7.7	0.9	0.0	5.2
Cycle Q Clear(g_c), s	0.0	0.0	2.2	1.2	0.0	6.9	0.5	0.0	7.7	0.9	0.0	5.2
Prop In Lane	1.00		0.09	1.00		0.36	1.00		0.23	1.00		0.01
Lane Grp Cap(c), veh/h	264	0	380	361	0	396	662	0	837	591	0	848
V/C Ratio(X)	0.00	0.00	0.15	0.09	0.00	0.41	0.03	0.00	0.30	0.06	0.00	0.21
Avail Cap(c_a), veh/h	321	0	382	389	0	396	709	0	839	622	0	848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	0.0	28.3	26.5	0.0	28.7	10.1	0.0	12.5	10.1	0.0	11.5
Incr Delay (d2), s/veh	0.0	0.0	0.4	0.1	0.0	1.5	0.0	0.0	0.9	0.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	1.7	0.9	0.0	5.1	0.3	0.0	4.6	0.5	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	0.0	28.7	26.6	0.0	30.2	10.1	0.0	13.4	10.1	0.0	12.1
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	B
Approach Vol, veh/h		59			195			274			217	
Approach Delay, s/veh		28.6			29.6			13.2			11.7	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	50.0	6.2	23.9	6.0	50.7	4.6	25.6				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	3.8	44.1	3.1	18.0	3.8	44.1	2.9	18.2				
Max Q Clear Time (g_c+I1), s	2.9	9.7	3.2	4.2	2.5	7.2	2.0	8.9				
Green Ext Time (p_c), s	0.0	4.6	0.0	0.3	0.0	3.1	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay				18.3								
HCM 6th LOS				B								

HCM 6th TWSC
 200: Access B/Ridgecrest Drive & Big Timber Road

02/18/2021

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗		↖	↗	↖	↗	
Traffic Vol, veh/h	10	125	5	85	135	35	5	30	70	70	20	45
Future Vol, veh/h	10	125	5	85	135	35	5	30	70	70	20	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	3	2	2	2	2	2	2	2
Mvmt Flow	11	132	5	89	142	37	5	32	74	74	21	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	179	0	0	137	0	0	527	511	132	530	479	142
Stage 1	-	-	-	-	-	-	154	154	-	320	320	-
Stage 2	-	-	-	-	-	-	373	357	-	210	159	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1397	-	-	1447	-	-	462	466	917	460	486	906
Stage 1	-	-	-	-	-	-	848	770	-	692	652	-
Stage 2	-	-	-	-	-	-	648	628	-	792	766	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1397	-	-	1447	-	-	400	433	917	379	452	906
Mov Cap-2 Maneuver	-	-	-	-	-	-	400	433	-	379	452	-
Stage 1	-	-	-	-	-	-	841	764	-	686	612	-
Stage 2	-	-	-	-	-	-	557	589	-	693	760	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			2.6			10.9			13.9		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	428	917	1397	-	-	1447	-	-	379	692
HCM Lane V/C Ratio	0.086	0.08	0.008	-	-	0.062	-	-	0.194	0.099
HCM Control Delay (s)	14.2	9.3	7.6	-	-	7.7	-	-	16.8	10.8
HCM Lane LOS	B	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	0.3	0	-	-	0.2	-	-	0.7	0.3

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	125	95	260	195	30
Future Vol, veh/h	35	125	95	260	195	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	15	6	9	9	13	21
Mvmt Flow	37	132	100	274	205	32

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	695	221	237	0	-	0
Stage 1	221	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Critical Hdwy	6.55	6.26	4.19	-	-	-
Critical Hdwy Stg 1	5.55	-	-	-	-	-
Critical Hdwy Stg 2	5.55	-	-	-	-	-
Follow-up Hdwy	3.635	3.354	2.281	-	-	-
Pot Cap-1 Maneuver	389	809	1290	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	359	809	1290	-	-	-
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	600	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1290	-	359	809	-	-
HCM Lane V/C Ratio	0.078	-	0.103	0.163	-	-
HCM Control Delay (s)	8	-	16.2	10.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	0.6	-	-

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔		↔	↔
Traffic Vol, veh/h	30	5	255	40	10	195
Future Vol, veh/h	30	5	255	40	10	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	5	268	42	11	205

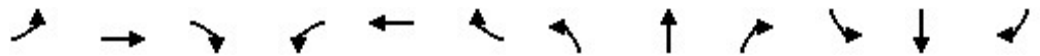
Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	516	289	0	0	310
Stage 1	289	-	-	-	-
Stage 2	227	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	519	750	-	-	1250
Stage 1	760	-	-	-	-
Stage 2	811	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	514	750	-	-	1250
Mov Cap-2 Maneuver	514	-	-	-	-
Stage 1	760	-	-	-	-
Stage 2	804	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	514	750	1250
HCM Lane V/C Ratio	-	-	0.061	0.007	0.008
HCM Control Delay (s)	-	-	12.5	9.8	7.9
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	0

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	60	20	50	140	95	40	230	90	60	200	1
Future Volume (veh/h)	1	60	20	50	140	95	40	230	90	60	200	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1826	1811	1811	1856	1841	1841
Adj Flow Rate, veh/h	1	63	21	53	147	100	42	242	95	63	211	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	5	6	6	3	4	4
Cap, veh/h	206	272	91	355	244	166	626	612	240	525	916	4
Arrive On Green	0.00	0.20	0.20	0.03	0.23	0.23	0.03	0.49	0.49	0.03	0.50	0.50
Sat Flow, veh/h	1781	1342	447	1781	1038	706	1739	1238	486	1767	1830	9
Grp Volume(v), veh/h	1	0	84	53	0	247	42	0	337	63	0	212
Grp Sat Flow(s),veh/h/ln	1781	0	1790	1781	0	1743	1739	0	1724	1767	0	1839
Q Serve(g_s), s	0.0	0.0	3.5	2.1	0.0	11.2	1.1	0.0	10.9	1.6	0.0	5.8
Cycle Q Clear(g_c), s	0.0	0.0	3.5	2.1	0.0	11.2	1.1	0.0	10.9	1.6	0.0	5.8
Prop In Lane	1.00		0.25	1.00		0.40	1.00		0.28	1.00		0.00
Lane Grp Cap(c), veh/h	206	0	362	355	0	409	626	0	852	525	0	921
V/C Ratio(X)	0.00	0.00	0.23	0.15	0.00	0.60	0.07	0.00	0.40	0.12	0.00	0.23
Avail Cap(c_a), veh/h	262	0	362	357	0	409	653	0	854	541	0	921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.6	0.0	29.7	26.6	0.0	30.3	10.6	0.0	14.1	11.0	0.0	12.5
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.2	0.0	3.8	0.0	0.0	1.4	0.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	2.6	1.5	0.0	8.4	0.6	0.0	7.0	0.9	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.7	0.0	30.4	26.7	0.0	34.1	10.6	0.0	15.5	11.1	0.0	13.1
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	B
Approach Vol, veh/h		85			300			379				275
Approach Delay, s/veh		30.4			32.8			15.0				12.7
Approach LOS		C			C			B				B
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	50.0	7.5	24.0	7.0	50.5	4.6	26.9				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	3.8	44.1	3.1	18.0	3.8	44.1	2.9	18.2				
Max Q Clear Time (g_c+I1), s	3.6	12.9	4.1	5.5	3.1	7.8	2.0	13.2				
Green Ext Time (p_c), s	0.0	6.2	0.0	0.4	0.0	3.7	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay				20.8								
HCM 6th LOS				C								

HCM 6th TWSC
 200: Access B/Ridgecrest Drive & Big Timber Road

02/18/2021

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↖	↗	↖		↖	↖	↖	↗	↗
Traffic Vol, veh/h	60	145	5	95	225	85	5	15	65	85	15	55
Future Vol, veh/h	60	145	5	95	225	85	5	15	65	85	15	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	153	5	100	237	89	5	16	68	89	16	58

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	326	0	0	158	0	0	798	805	153	761	721	237
Stage 1	-	-	-	-	-	-	279	279	-	437	437	-
Stage 2	-	-	-	-	-	-	519	526	-	324	284	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1234	-	-	1422	-	-	304	316	893	322	353	802
Stage 1	-	-	-	-	-	-	728	680	-	598	579	-
Stage 2	-	-	-	-	-	-	540	529	-	688	676	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1234	-	-	1422	-	-	247	279	893	259	312	802
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	279	-	259	312	-
Stage 1	-	-	-	-	-	-	691	645	-	568	538	-
Stage 2	-	-	-	-	-	-	452	492	-	588	642	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	2.3		1.8		11.8		19.6	
HCM LOS					B		C	

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	270	893	1234	-	-	1422	-	-	259	600
HCM Lane V/C Ratio	0.078	0.077	0.051	-	-	0.07	-	-	0.345	0.123
HCM Control Delay (s)	19.5	9.4	8.1	-	-	7.7	-	-	26.1	11.8
HCM Lane LOS	C	A	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.3	0.2	0.2	-	-	0.2	-	-	1.5	0.4

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	135	115	365	250	35
Future Vol, veh/h	35	135	115	365	250	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	4	8	4
Mvmt Flow	37	142	121	384	263	37

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	908	282	300	0	-	0
Stage 1	282	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.227	-	-	-
Pot Cap-1 Maneuver	306	757	1255	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	533	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	277	757	1255	-	-	-
Mov Cap-2 Maneuver	277	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	533	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1255	-	277	757	-	-
HCM Lane V/C Ratio	0.096	-	0.133	0.188	-	-
HCM Control Delay (s)	8.2	-	20	10.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.5	0.7	-	-

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖		↖	↗
Traffic Vol, veh/h	30	10	355	45	15	255
Future Vol, veh/h	30	10	355	45	15	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	11	374	47	16	268

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	698	398	0	0	421
Stage 1	398	-	-	-	-
Stage 2	300	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	407	652	-	-	1138
Stage 1	678	-	-	-	-
Stage 2	752	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	401	652	-	-	1138
Mov Cap-2 Maneuver	401	-	-	-	-
Stage 1	678	-	-	-	-
Stage 2	741	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	401	652	1138
HCM Lane V/C Ratio	-	-	0.079	0.016	0.014
HCM Control Delay (s)	-	-	14.7	10.6	8.2
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0	0

FUTURE (2042) PHASE B NO-BUILD CAPACITY REPORTS

Weekday Morning Peak Hour

Weekday Dismissal Peak Hour

Weekday Evening Peak Hour

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	80	10	85	100	45	25	215	85	55	175	0
Future Volume (veh/h)	1	80	10	85	100	45	25	215	85	55	175	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1796	1870	1870	1870	1707	1707	1856	1707	1707
Adj Flow Rate, veh/h	1	84	11	89	105	47	26	226	89	58	184	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	2	2	2	13	13	3	13	13
Cap, veh/h	250	203	27	313	226	101	627	517	204	509	786	0
Arrive On Green	0.00	0.13	0.13	0.06	0.18	0.18	0.02	0.44	0.44	0.04	0.46	0.00
Sat Flow, veh/h	1781	1620	212	1711	1224	548	1781	1166	459	1767	1707	0
Grp Volume(v), veh/h	1	0	95	89	0	152	26	0	315	58	184	0
Grp Sat Flow(s),veh/h/ln	1781	0	1832	1711	0	1772	1781	0	1625	1767	1707	0
Q Serve(g_s), s	0.0	0.0	3.0	2.8	0.0	4.8	0.5	0.0	8.4	1.1	4.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	3.0	2.8	0.0	4.8	0.5	0.0	8.4	1.1	4.1	0.0
Prop In Lane	1.00		0.12	1.00		0.31	1.00		0.28	1.00		0.00
Lane Grp Cap(c), veh/h	250	0	229	313	0	327	627	0	721	509	786	0
V/C Ratio(X)	0.00	0.00	0.41	0.28	0.00	0.47	0.04	0.00	0.44	0.11	0.23	0.00
Avail Cap(c_a), veh/h	346	0	610	414	0	702	715	0	927	567	974	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.1	0.0	25.5	21.2	0.0	23.0	9.2	0.0	12.1	9.3	10.3	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.5	0.5	0.0	2.2	0.0	0.0	1.9	0.1	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	2.4	1.8	0.0	3.5	0.3	0.0	4.7	0.6	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	0.0	28.0	21.7	0.0	25.2	9.2	0.0	14.0	9.4	11.0	0.0
LnGrp LOS	C	A	C	C	A	C	A	A	B	A	B	A
Approach Vol, veh/h		96			241			341			242	
Approach Delay, s/veh		28.0			23.9			13.7			10.6	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	34.0	8.3	13.9	5.9	35.0	4.5	17.6				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	4.5	36.0	7.5	21.0	4.5	36.0	3.5	25.0				
Max Q Clear Time (g_c+I1), s	3.1	10.4	4.8	5.0	2.5	6.1	2.0	6.8				
Green Ext Time (p_c), s	0.0	5.3	0.0	0.6	0.0	2.9	0.0	1.2				

Intersection Summary

HCM 6th Ctrl Delay	17.0
HCM 6th LOS	B

HCM 6th TWSC
 200: Access B/Ridgecrest Drive & Big Timber Road

02/18/2021

Intersection												
Int Delay, s/veh	11.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	175	1	115	115	15	5	45	150	115	55	110
Future Vol, veh/h	45	175	1	115	115	15	5	45	150	115	55	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	184	1	121	121	16	5	47	158	121	58	116

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	137	0	0	185	0	0	736	657	184	744	642	121
Stage 1	-	-	-	-	-	-	278	278	-	363	363	-
Stage 2	-	-	-	-	-	-	458	379	-	381	279	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1447	-	-	1390	-	-	335	385	858	331	392	930
Stage 1	-	-	-	-	-	-	728	680	-	656	625	-
Stage 2	-	-	-	-	-	-	583	615	-	641	680	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1447	-	-	1390	-	-	233	340	858	220	347	930
Mov Cap-2 Maneuver	-	-	-	-	-	-	233	340	-	220	347	-
Stage 1	-	-	-	-	-	-	705	658	-	635	571	-
Stage 2	-	-	-	-	-	-	419	561	-	470	658	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	1.5		3.7		12.1		24.3	
HCM LOS					B		C	

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	325	858	1447	-	-	1390	-	-	220	596
HCM Lane V/C Ratio	0.162	0.184	0.033	-	-	0.087	-	-	0.55	0.291
HCM Control Delay (s)	18.2	10.1	7.6	-	-	7.8	-	-	39.7	13.5
HCM Lane LOS	C	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.6	0.7	0.1	-	-	0.3	-	-	3	1.2

Intersection						
Int Delay, s/veh	4.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	170	125	300	295	30
Future Vol, veh/h	40	170	125	300	295	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	10	10	9	14	2
Mvmt Flow	42	179	132	316	311	32
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	907	327	343	0	-	0
Stage 1	327	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Critical Hdwy	6.44	6.3	4.2	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.39	2.29	-	-	-
Pot Cap-1 Maneuver	304	696	1173	-	-	-
Stage 1	726	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	270	696	1173	-	-	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	644	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	13.7		2.5		0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1173	-	270	696	-	-
HCM Lane V/C Ratio	0.112	-	0.156	0.257	-	-
HCM Control Delay (s)	8.5	-	20.8	12	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.5	1	-	-

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	60	15	310	30	5	265
Future Vol, veh/h	60	15	310	30	5	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	16	326	32	5	279

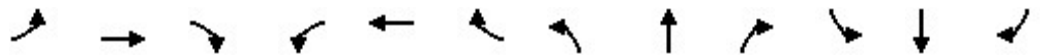
Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	631	342	0	0	358
Stage 1	342	-	-	-	-
Stage 2	289	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	445	701	-	-	1201
Stage 1	719	-	-	-	-
Stage 2	760	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	443	701	-	-	1201
Mov Cap-2 Maneuver	443	-	-	-	-
Stage 1	719	-	-	-	-
Stage 2	757	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	443	701	1201
HCM Lane V/C Ratio	-	-	0.143	0.023	0.004
HCM Control Delay (s)	-	-	14.5	10.3	8
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	0

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	80	10	40	130	65	25	220	70	45	205	1
Future Volume (veh/h)	1	80	10	40	130	65	25	220	70	45	205	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1722	1722	1841	1648	1648
Adj Flow Rate, veh/h	1	84	11	42	137	68	26	232	74	47	216	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	12	12	4	17	17
Cap, veh/h	236	331	43	339	272	135	625	626	200	542	835	4
Arrive On Green	0.00	0.20	0.20	0.03	0.23	0.23	0.02	0.50	0.50	0.03	0.51	0.51
Sat Flow, veh/h	1781	1620	212	1781	1180	585	1781	1251	399	1753	1639	8
Grp Volume(v), veh/h	1	0	95	42	0	205	26	0	306	47	0	217
Grp Sat Flow(s),veh/h/ln	1781	0	1832	1781	0	1765	1781	0	1650	1753	0	1647
Q Serve(g_s), s	0.0	0.0	3.8	1.6	0.0	8.9	0.6	0.0	10.0	1.1	0.0	6.5
Cycle Q Clear(g_c), s	0.0	0.0	3.8	1.6	0.0	8.9	0.6	0.0	10.0	1.1	0.0	6.5
Prop In Lane	1.00		0.12	1.00		0.33	1.00		0.24	1.00		0.00
Lane Grp Cap(c), veh/h	236	0	375	339	0	407	625	0	826	542	0	839
V/C Ratio(X)	0.00	0.00	0.25	0.12	0.00	0.50	0.04	0.00	0.37	0.09	0.00	0.26
Avail Cap(c_a), veh/h	293	0	375	354	0	407	666	0	828	566	0	839
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	29.3	26.7	0.0	29.5	10.4	0.0	13.5	10.6	0.0	12.2
Incr Delay (d2), s/veh	0.0	0.0	0.8	0.2	0.0	2.1	0.0	0.0	1.3	0.1	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	3.0	1.2	0.0	6.7	0.4	0.0	6.1	0.7	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	30.1	26.9	0.0	31.5	10.5	0.0	14.7	10.6	0.0	12.9
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	B
Approach Vol, veh/h		96			247			332				264
Approach Delay, s/veh		30.1			30.7			14.4				12.5
Approach LOS		C			C			B				B
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	50.0	6.8	24.0	6.3	50.8	4.6	26.2				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	3.8	44.1	3.1	18.0	3.8	44.1	2.9	18.2				
Max Q Clear Time (g_c+I1), s	3.1	12.0	3.6	5.8	2.6	8.5	2.0	10.9				
Green Ext Time (p_c), s	0.0	5.6	0.0	0.5	0.0	3.8	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay				19.8								
HCM 6th LOS				B								

HCM 6th TWSC
 200: Access B/Ridgecrest Drive & Big Timber Road

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Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↑	↔		↔	↔	↔	↔	↔
Traffic Vol, veh/h	30	160	5	85	175	35	5	30	70	70	20	55
Future Vol, veh/h	30	160	5	85	175	35	5	30	70	70	20	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	3	2	2	2	2	2	2	2
Mvmt Flow	32	168	5	89	184	37	5	32	74	74	21	58

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	221	0	0	173	0	0	652	631	168	650	599	184
Stage 1	-	-	-	-	-	-	232	232	-	362	362	-
Stage 2	-	-	-	-	-	-	420	399	-	288	237	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1348	-	-	1404	-	-	381	398	876	382	415	858
Stage 1	-	-	-	-	-	-	771	713	-	657	625	-
Stage 2	-	-	-	-	-	-	611	602	-	720	709	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1348	-	-	1404	-	-	318	364	876	306	380	858
Mov Cap-2 Maneuver	-	-	-	-	-	-	318	364	-	306	380	-
Stage 1	-	-	-	-	-	-	752	696	-	641	586	-
Stage 2	-	-	-	-	-	-	514	564	-	615	692	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	1.2		2.2		11.7		15.8	
HCM LOS					B		C	

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	357	876	1348	-	-	1404	-	-	306	642
HCM Lane V/C Ratio	0.103	0.084	0.023	-	-	0.064	-	-	0.241	0.123
HCM Control Delay (s)	16.2	9.5	7.7	-	-	7.7	-	-	20.5	11.4
HCM Lane LOS	C	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	0.3	0.1	-	-	0.2	-	-	0.9	0.4

Intersection						
Int Delay, s/veh	4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	155	115	305	240	35
Future Vol, veh/h	45	155	115	305	240	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	15	6	9	9	13	21
Mvmt Flow	47	163	121	321	253	37

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	835	272	290	0	-	0
Stage 1	272	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Critical Hdwy	6.55	6.26	4.19	-	-	-
Critical Hdwy Stg 1	5.55	-	-	-	-	-
Critical Hdwy Stg 2	5.55	-	-	-	-	-
Follow-up Hdwy	3.635	3.354	2.281	-	-	-
Pot Cap-1 Maneuver	321	757	1233	-	-	-
Stage 1	745	-	-	-	-	-
Stage 2	545	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	290	757	1233	-	-	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	545	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1233	-	290	757	-	-
HCM Lane V/C Ratio	0.098	-	0.163	0.216	-	-
HCM Control Delay (s)	8.2	-	19.8	11.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.6	0.8	-	-

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	30	5	310	40	10	245
Future Vol, veh/h	30	5	310	40	10	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	5	326	42	11	258

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	627	347	0	0	368
Stage 1	347	-	-	-	-
Stage 2	280	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	447	696	-	-	1191
Stage 1	716	-	-	-	-
Stage 2	767	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	443	696	-	-	1191
Mov Cap-2 Maneuver	443	-	-	-	-
Stage 1	716	-	-	-	-
Stage 2	760	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	443	696	1191
HCM Lane V/C Ratio	-	-	0.071	0.008	0.009
HCM Control Delay (s)	-	-	13.7	10.2	8.1
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0	0

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	80	25	60	185	115	45	290	110	75	240	1
Future Volume (veh/h)	1	80	25	60	185	115	45	290	110	75	240	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1826	1811	1811	1856	1841	1841
Adj Flow Rate, veh/h	1	84	26	63	195	121	47	305	116	79	253	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	5	6	6	3	4	4
Cap, veh/h	153	275	85	333	254	157	593	614	234	462	917	4
Arrive On Green	0.00	0.20	0.20	0.03	0.23	0.23	0.03	0.49	0.49	0.04	0.50	0.50
Sat Flow, veh/h	1781	1370	424	1781	1080	670	1739	1250	475	1767	1832	7
Grp Volume(v), veh/h	1	0	110	63	0	316	47	0	421	79	0	254
Grp Sat Flow(s),veh/h/ln	1781	0	1794	1781	0	1750	1739	0	1726	1767	0	1839
Q Serve(g_s), s	0.0	0.0	4.7	2.5	0.0	15.1	1.2	0.0	14.7	2.0	0.0	7.2
Cycle Q Clear(g_c), s	0.0	0.0	4.7	2.5	0.0	15.1	1.2	0.0	14.7	2.0	0.0	7.2
Prop In Lane	1.00		0.24	1.00		0.38	1.00		0.28	1.00		0.00
Lane Grp Cap(c), veh/h	153	0	361	333	0	411	593	0	848	462	0	920
V/C Ratio(X)	0.01	0.00	0.30	0.19	0.00	0.77	0.08	0.00	0.50	0.17	0.00	0.28
Avail Cap(c_a), veh/h	209	0	361	333	0	411	616	0	850	469	0	920
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	30.4	26.8	0.0	32.0	10.8	0.0	15.3	11.7	0.0	13.0
Incr Delay (d2), s/veh	0.0	0.0	1.0	0.3	0.0	10.0	0.1	0.0	2.1	0.2	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	3.6	1.8	0.0	11.4	0.7	0.0	9.1	1.2	0.0	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	0.0	31.4	27.1	0.0	42.0	10.9	0.0	17.4	11.9	0.0	13.7
LnGrp LOS	C	A	C	C	A	D	B	A	B	B	A	B
Approach Vol, veh/h		111			379			468			333	
Approach Delay, s/veh		31.4			39.5			16.7			13.3	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	50.0	7.6	24.0	7.1	50.8	4.6	27.0				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	3.8	44.1	3.1	18.0	3.8	44.1	2.9	18.2				
Max Q Clear Time (g_c+I1), s	4.0	16.7	4.5	6.7	3.2	9.2	2.0	17.1				
Green Ext Time (p_c), s	0.0	7.6	0.0	0.6	0.0	4.5	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay				23.8								
HCM 6th LOS				C								

HCM 6th TWSC
200: Access B/Ridgecrest Drive & Big Timber Road

02/18/2021

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↖	↗	↖		↖	↖	↖	↗	↖
Traffic Vol, veh/h	65	195	5	95	295	85	5	15	65	85	15	60
Future Vol, veh/h	65	195	5	95	295	85	5	15	65	85	15	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	205	5	100	311	89	5	16	68	89	16	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	400	0	0	210	0	0	936	941	205	897	857	311
Stage 1	-	-	-	-	-	-	341	341	-	511	511	-
Stage 2	-	-	-	-	-	-	595	600	-	386	346	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1159	-	-	1361	-	-	245	263	836	261	295	729
Stage 1	-	-	-	-	-	-	674	639	-	545	537	-
Stage 2	-	-	-	-	-	-	491	490	-	637	635	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1159	-	-	1361	-	-	193	229	836	205	257	729
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	229	-	205	257	-
Stage 1	-	-	-	-	-	-	634	601	-	513	498	-
Stage 2	-	-	-	-	-	-	402	454	-	536	598	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2			1.6			12.9			24.9		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	219	836	1159	-	-	1361	-	-	205	533
HCM Lane V/C Ratio	0.096	0.082	0.059	-	-	0.073	-	-	0.436	0.148
HCM Control Delay (s)	23.2	9.7	8.3	-	-	7.9	-	-	35.5	12.9
HCM Lane LOS	C	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.3	0.3	0.2	-	-	0.2	-	-	2	0.5

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	165	140	435	295	45
Future Vol, veh/h	45	165	140	435	295	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	135	0	270	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	4	8	4
Mvmt Flow	47	174	147	458	311	47

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1087	335	358	0	-	0
Stage 1	335	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.13	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.227	-	-	-
Pot Cap-1 Maneuver	239	707	1195	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	210	707	1195	-	-	-
Mov Cap-2 Maneuver	210	-	-	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	466	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15	2.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1195	-	210	707	-	-
HCM Lane V/C Ratio	0.123	-	0.226	0.246	-	-
HCM Control Delay (s)	8.4	-	27.1	11.7	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.8	1	-	-

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↖		↘	↗
Traffic Vol, veh/h	30	10	435	45	15	310
Future Vol, veh/h	30	10	435	45	15	310
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	11	458	47	16	326

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	840	482	0	0	505	0
Stage 1	482	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	335	584	-	-	1060	-
Stage 1	621	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	330	584	-	-	1060	-
Mov Cap-2 Maneuver	330	-	-	-	-	-
Stage 1	621	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	330	584	1060
HCM Lane V/C Ratio	-	-	0.096	0.018	0.015
HCM Control Delay (s)	-	-	17.1	11.3	8.4
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	0

FUTURE (2042) PHASE B BUILD CAPACITY REPORTS

Weekday Morning Peak Hour

Weekday Dismissal Peak Hour

Weekday Evening Peak Hour

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	45	10	85	55	50	25	240	85	55	185	1
Future Volume (veh/h)	1	45	10	85	55	50	25	240	85	55	185	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1796	1870	1870	1870	1707	1707	1856	1707	1707
Adj Flow Rate, veh/h	1	47	11	89	58	53	26	253	89	58	195	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	7	2	2	2	13	13	3	13	13
Cap, veh/h	272	177	41	336	162	148	620	538	189	491	785	4
Arrive On Green	0.00	0.12	0.12	0.06	0.18	0.18	0.02	0.45	0.45	0.04	0.46	0.46
Sat Flow, veh/h	1781	1466	343	1711	900	822	1781	1207	424	1767	1697	9
Grp Volume(v), veh/h	1	0	58	89	0	111	26	0	342	58	0	196
Grp Sat Flow(s),veh/h/ln	1781	0	1809	1711	0	1722	1781	0	1631	1767	0	1706
Q Serve(g_s), s	0.0	0.0	1.8	2.8	0.0	3.5	0.5	0.0	9.2	1.1	0.0	4.4
Cycle Q Clear(g_c), s	0.0	0.0	1.8	2.8	0.0	3.5	0.5	0.0	9.2	1.1	0.0	4.4
Prop In Lane	1.00		0.19	1.00		0.48	1.00		0.26	1.00		0.01
Lane Grp Cap(c), veh/h	272	0	219	336	0	310	620	0	727	491	0	789
V/C Ratio(X)	0.00	0.00	0.27	0.26	0.00	0.36	0.04	0.00	0.47	0.12	0.00	0.25
Avail Cap(c_a), veh/h	369	0	605	438	0	686	708	0	935	549	0	978
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.2	0.0	25.1	21.2	0.0	22.5	9.1	0.0	12.2	9.3	0.0	10.2
Incr Delay (d2), s/veh	0.0	0.0	1.4	0.4	0.0	1.5	0.0	0.0	2.2	0.1	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	1.4	1.8	0.0	2.5	0.3	0.0	5.2	0.6	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	0.0	26.4	21.7	0.0	24.0	9.1	0.0	14.4	9.5	0.0	11.0
LnGrp LOS	C	A	C	C	A	C	A	A	B	A	A	B
Approach Vol, veh/h		59			200			368			254	
Approach Delay, s/veh		26.4			23.0			14.0			10.6	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	34.0	8.3	13.6	5.9	35.0	4.5	17.3				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	4.5	36.0	7.5	21.0	4.5	36.0	3.5	25.0				
Max Q Clear Time (g_c+I1), s	3.1	11.2	4.8	3.8	2.5	6.4	2.0	5.5				
Green Ext Time (p_c), s	0.0	5.7	0.0	0.3	0.0	3.2	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay				15.9								
HCM 6th LOS				B								

HCM 6th TWSC
 200: Access B/Ridgecrest Drive & Big Timber Road

02/18/2021

Intersection												
Int Delay, s/veh	10.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↑	↔		↔	↔	↔	↔	↔
Traffic Vol, veh/h	10	175	1	135	120	15	5	45	170	115	55	65
Future Vol, veh/h	10	175	1	135	120	15	5	45	170	115	55	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	184	1	142	126	16	5	47	179	121	58	68

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	142	0	0	185	0	0	687	632	184	730	617	126
Stage 1	-	-	-	-	-	-	206	206	-	410	410	-
Stage 2	-	-	-	-	-	-	481	426	-	320	207	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1441	-	-	1390	-	-	361	398	858	338	405	924
Stage 1	-	-	-	-	-	-	796	731	-	619	595	-
Stage 2	-	-	-	-	-	-	566	586	-	692	731	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1441	-	-	1390	-	-	269	355	858	220	361	924
Mov Cap-2 Maneuver	-	-	-	-	-	-	269	355	-	220	361	-
Stage 1	-	-	-	-	-	-	790	725	-	614	534	-
Stage 2	-	-	-	-	-	-	420	526	-	508	725	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.4		3.9		11.9		26.4	
HCM LOS					B		D	

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	344	858	1441	-	-	1390	-	-	220	539
HCM Lane V/C Ratio	0.153	0.209	0.007	-	-	0.102	-	-	0.55	0.234
HCM Control Delay (s)	17.3	10.3	7.5	-	-	7.9	-	-	39.7	13.7
HCM Lane LOS	C	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.5	0.8	0	-	-	0.3	-	-	3	0.9

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↗	↖	↗	↖	↗
Traffic Vol, veh/h	40	5	170	70	15	1	125	310	25	1	310	30
Future Vol, veh/h	40	5	170	70	15	1	125	310	25	1	310	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	None
Storage Length	-	-	135	0	-	-	270	-	265	265	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	4	2	10	2	2	2	10	9	2	2	14	2
Mvmt Flow	42	5	179	74	16	1	132	326	26	1	326	32

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	956	960	342	937	950	326	358	0	0	352	0	0
Stage 1	344	344	-	590	590	-	-	-	-	-	-	-
Stage 2	612	616	-	347	360	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.52	6.3	7.12	6.52	6.22	4.2	-	-	4.12	-	-
Critical Hdwy Stg 1	6.14	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.018	3.39	3.518	4.018	3.318	2.29	-	-	2.218	-	-
Pot Cap-1 Maneuver	236	257	683	245	260	715	1158	-	-	1207	-	-
Stage 1	667	637	-	494	495	-	-	-	-	-	-	-
Stage 2	477	482	-	669	626	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	204	227	683	162	230	715	1158	-	-	1207	-	-
Mov Cap-2 Maneuver	204	227	-	162	230	-	-	-	-	-	-	-
Stage 1	591	636	-	438	439	-	-	-	-	-	-	-
Stage 2	407	427	-	489	625	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	15.3		40.1		2.3		0			
HCM LOS	C		E							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1158	-	-	206	683	162	240	1207	-	-
HCM Lane V/C Ratio	0.114	-	-	0.23	0.262	0.455	0.07	0.001	-	-
HCM Control Delay (s)	8.5	-	-	27.6	12.1	44.5	21.1	8	-	-
HCM Lane LOS	A	-	-	D	B	E	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.9	1	2.1	0.2	0	-	-

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	75	40	310	40	15	265
Future Vol, veh/h	75	40	310	40	15	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	79	42	326	42	16	279

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	658	347	0	0	368	0
Stage 1	347	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	429	696	-	-	1191	-
Stage 1	716	-	-	-	-	-
Stage 2	743	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	423	696	-	-	1191	-
Mov Cap-2 Maneuver	423	-	-	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	733	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	423	696	1191
HCM Lane V/C Ratio	-	-	0.187	0.06	0.013
HCM Control Delay (s)	-	-	15.5	10.5	8.1
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.2	0

Intersection						
Int Delay, s/veh	3.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘	↗
Traffic Vol, veh/h	460	1	65	265	5	185
Future Vol, veh/h	460	1	65	265	5	185
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	240	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	484	1	68	279	5	195

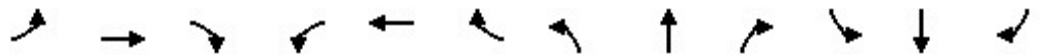
Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	485	0	899
Stage 1	-	-	-	-	484
Stage 2	-	-	-	-	415
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1078	-	309
Stage 1	-	-	-	-	620
Stage 2	-	-	-	-	666
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1078	-	290
Mov Cap-2 Maneuver	-	-	-	-	290
Stage 1	-	-	-	-	620
Stage 2	-	-	-	-	624

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	290	583	-	-	1078	-
HCM Lane V/C Ratio	0.018	0.334	-	-	0.063	-
HCM Control Delay (s)	17.6	14.2	-	-	8.6	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	1.5	-	-	0.2	-

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	60	10	40	120	70	25	230	70	50	225	1
Future Volume (veh/h)	1	60	10	40	120	70	25	230	70	50	225	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1722	1722	1841	1648	1648
Adj Flow Rate, veh/h	1	63	11	42	126	74	26	242	74	53	237	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	12	12	4	17	17
Cap, veh/h	238	317	55	355	254	149	607	632	193	536	837	4
Arrive On Green	0.00	0.20	0.20	0.03	0.23	0.23	0.02	0.50	0.50	0.03	0.51	0.51
Sat Flow, veh/h	1781	1551	271	1781	1105	649	1781	1266	387	1753	1640	7
Grp Volume(v), veh/h	1	0	74	42	0	200	26	0	316	53	0	238
Grp Sat Flow(s),veh/h/ln	1781	0	1822	1781	0	1754	1781	0	1653	1753	0	1647
Q Serve(g_s), s	0.0	0.0	3.0	1.6	0.0	8.7	0.6	0.0	10.4	1.3	0.0	7.3
Cycle Q Clear(g_c), s	0.0	0.0	3.0	1.6	0.0	8.7	0.6	0.0	10.4	1.3	0.0	7.3
Prop In Lane	1.00		0.15	1.00		0.37	1.00		0.23	1.00		0.00
Lane Grp Cap(c), veh/h	238	0	372	355	0	403	607	0	826	536	0	841
V/C Ratio(X)	0.00	0.00	0.20	0.12	0.00	0.50	0.04	0.00	0.38	0.10	0.00	0.28
Avail Cap(c_a), veh/h	295	0	372	370	0	403	647	0	827	556	0	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	29.1	26.7	0.0	29.5	10.5	0.0	13.6	10.6	0.0	12.3
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.1	0.0	2.0	0.0	0.0	1.3	0.1	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	2.3	1.2	0.0	6.5	0.4	0.0	6.3	0.8	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	0.0	29.6	26.9	0.0	31.5	10.6	0.0	15.0	10.7	0.0	13.2
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	A	B
Approach Vol, veh/h		75			242			342				291
Approach Delay, s/veh		29.6			30.7			14.6				12.7
Approach LOS		C			C			B				B
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.3	50.0	6.8	24.0	6.3	51.0	4.6	26.2				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	3.8	44.1	3.1	18.0	3.8	44.1	2.9	18.2				
Max Q Clear Time (g_c+I1), s	3.3	12.4	3.6	5.0	2.6	9.3	2.0	10.7				
Green Ext Time (p_c), s	0.0	5.8	0.0	0.4	0.0	4.2	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay				19.3								
HCM 6th LOS				B								

HCM 6th TWSC
 200: Access B/Ridgecrest Drive & Big Timber Road

02/18/2021

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↖	↗	↖		↖	↖	↖	↗	↖
Traffic Vol, veh/h	10	165	5	95	180	35	5	30	80	70	20	45
Future Vol, veh/h	10	165	5	95	180	35	5	30	80	70	20	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	3	2	2	2	2	2	2	2
Mvmt Flow	11	174	5	100	189	37	5	32	84	74	21	47

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	226	0	0	179	0	0	638	622	174	646	590	189
Stage 1	-	-	-	-	-	-	196	196	-	389	389	-
Stage 2	-	-	-	-	-	-	442	426	-	257	201	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1342	-	-	1397	-	-	389	403	869	385	420	853
Stage 1	-	-	-	-	-	-	806	739	-	635	608	-
Stage 2	-	-	-	-	-	-	594	586	-	748	735	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1342	-	-	1397	-	-	331	371	869	306	387	853
Mov Cap-2 Maneuver	-	-	-	-	-	-	331	371	-	306	387	-
Stage 1	-	-	-	-	-	-	800	733	-	630	564	-
Stage 2	-	-	-	-	-	-	501	544	-	641	729	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	2.4	11.5	16.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	365	869	1342	-	-	1397	-	-	306	622
HCM Lane V/C Ratio	0.101	0.097	0.008	-	-	0.072	-	-	0.241	0.11
HCM Control Delay (s)	16	9.6	7.7	-	-	7.8	-	-	20.5	11.5
HCM Lane LOS	C	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	0.3	0	-	-	0.2	-	-	0.9	0.4

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↗	↖	↗	↖	↗
Traffic Vol, veh/h	45	15	155	40	10	1	115	315	60	1	250	35
Future Vol, veh/h	45	15	155	40	10	1	115	315	60	1	250	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	None
Storage Length	-	-	135	0	-	-	270	-	265	265	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	15	2	6	2	2	2	9	9	2	2	13	21
Mvmt Flow	47	16	163	42	11	1	121	332	63	1	263	37

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	896	921	282	866	876	332	300	0	0	395	0	0
Stage 1	284	284	-	574	574	-	-	-	-	-	-	-
Stage 2	612	637	-	292	302	-	-	-	-	-	-	-
Critical Hdwy	7.25	6.52	6.26	7.12	6.52	6.22	4.19	-	-	4.12	-	-
Critical Hdwy Stg 1	6.25	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.25	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.635	4.018	3.354	3.518	4.018	3.318	2.281	-	-	2.218	-	-
Pot Cap-1 Maneuver	248	270	747	274	287	710	1222	-	-	1164	-	-
Stage 1	696	676	-	504	503	-	-	-	-	-	-	-
Stage 2	459	471	-	716	664	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	222	243	747	188	258	710	1222	-	-	1164	-	-
Mov Cap-2 Maneuver	222	243	-	188	258	-	-	-	-	-	-	-
Stage 1	627	675	-	454	453	-	-	-	-	-	-	-
Stage 2	403	424	-	546	663	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.6		27.2		1.9		0	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1222	-	-	227	747	188	274	1164	-	-
HCM Lane V/C Ratio	0.099	-	-	0.278	0.218	0.224	0.042	0.001	-	-
HCM Control Delay (s)	8.3	-	-	26.9	11.2	29.6	18.7	8.1	-	-
HCM Lane LOS	A	-	-	D	B	D	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.1	0.8	0.8	0.1	0	-	-

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	40	15	310	50	30	245
Future Vol, veh/h	40	15	310	50	30	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	16	326	53	32	258

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	675	353	0	0	379	0
Stage 1	353	-	-	-	-	-
Stage 2	322	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	419	691	-	-	1179	-
Stage 1	711	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	408	691	-	-	1179	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	715	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	408	691	1179
HCM Lane V/C Ratio	-	-	0.103	0.023	0.027
HCM Control Delay (s)	-	-	14.8	10.3	8.1
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	0.1

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘	↗
Traffic Vol, veh/h	310	5	160	305	5	100
Future Vol, veh/h	310	5	160	305	5	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	240	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	326	5	168	321	5	105

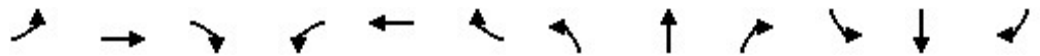
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	331	0	983	326
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	657	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1228	-	276	715
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	516	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1228	-	238	715
Mov Cap-2 Maneuver	-	-	-	-	238	-
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	445	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	238	715	-	-	1228	-
HCM Lane V/C Ratio	0.022	0.147	-	-	0.137	-
HCM Control Delay (s)	20.5	10.9	-	-	8.4	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0.5	-	-	0.5	-

HCM 6th Signalized Intersection Summary
 100: U.S. Route 20 & Big Timber Road

02/18/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	75	25	60	180	120	45	305	110	80	270	1
Future Volume (veh/h)	1	75	25	60	180	120	45	305	110	80	270	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1826	1811	1811	1856	1841	1841
Adj Flow Rate, veh/h	1	79	26	63	189	126	47	321	116	84	284	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	5	6	6	3	4	4
Cap, veh/h	152	270	89	336	245	164	569	623	225	452	919	3
Arrive On Green	0.00	0.20	0.20	0.03	0.23	0.23	0.03	0.49	0.49	0.04	0.50	0.50
Sat Flow, veh/h	1781	1347	443	1781	1047	698	1739	1270	459	1767	1833	6
Grp Volume(v), veh/h	1	0	105	63	0	315	47	0	437	84	0	285
Grp Sat Flow(s),veh/h/ln	1781	0	1791	1781	0	1745	1739	0	1728	1767	0	1840
Q Serve(g_s), s	0.0	0.0	4.5	2.5	0.0	15.1	1.2	0.0	15.5	2.1	0.0	8.2
Cycle Q Clear(g_c), s	0.0	0.0	4.5	2.5	0.0	15.1	1.2	0.0	15.5	2.1	0.0	8.2
Prop In Lane	1.00		0.25	1.00		0.40	1.00		0.27	1.00		0.00
Lane Grp Cap(c), veh/h	152	0	359	336	0	409	569	0	848	452	0	922
V/C Ratio(X)	0.01	0.00	0.29	0.19	0.00	0.77	0.08	0.00	0.52	0.19	0.00	0.31
Avail Cap(c_a), veh/h	208	0	359	336	0	409	592	0	850	456	0	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.4	0.0	30.4	26.9	0.0	32.1	10.9	0.0	15.6	11.8	0.0	13.2
Incr Delay (d2), s/veh	0.0	0.0	1.0	0.3	0.0	10.1	0.1	0.0	2.2	0.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	3.4	1.8	0.0	11.4	0.7	0.0	9.5	1.3	0.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	0.0	31.4	27.2	0.0	42.2	11.0	0.0	17.8	12.0	0.0	14.1
LnGrp LOS	C	A	C	C	A	D	B	A	B	B	A	B
Approach Vol, veh/h		106			378			484			369	
Approach Delay, s/veh		31.4			39.7			17.2			13.6	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	50.0	7.6	24.0	7.1	51.0	4.6	27.0				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	3.8	44.1	3.1	18.0	3.8	44.1	2.9	18.2				
Max Q Clear Time (g_c+I1), s	4.1	17.5	4.5	6.5	3.2	10.2	2.0	17.1				
Green Ext Time (p_c), s	0.0	7.9	0.0	0.5	0.0	5.1	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay				23.7								
HCM 6th LOS				C								

HCM 6th TWSC
 200: Access B/Ridgecrest Drive & Big Timber Road

02/18/2021

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↖	↗	↖		↖	↖	↖	↗	↖
Traffic Vol, veh/h	60	200	5	100	300	85	5	15	70	85	15	55
Future Vol, veh/h	60	200	5	100	300	85	5	15	70	85	15	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	240	240	-	265	-	-	0	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	211	5	105	316	89	5	16	74	89	16	58

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	405	0	0	216	0	0	945	952	211	911	868	316
Stage 1	-	-	-	-	-	-	337	337	-	526	526	-
Stage 2	-	-	-	-	-	-	608	615	-	385	342	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1154	-	-	1354	-	-	242	259	829	255	290	724
Stage 1	-	-	-	-	-	-	677	641	-	535	529	-
Stage 2	-	-	-	-	-	-	483	482	-	638	638	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1154	-	-	1354	-	-	191	226	829	199	253	724
Mov Cap-2 Maneuver	-	-	-	-	-	-	191	226	-	199	253	-
Stage 1	-	-	-	-	-	-	640	606	-	506	488	-
Stage 2	-	-	-	-	-	-	397	444	-	535	603	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	1.9		1.6		12.8			26.3		
HCM LOS					B			D		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	216	829	1154	-	-	1354	-	-	199	518
HCM Lane V/C Ratio	0.097	0.089	0.055	-	-	0.078	-	-	0.45	0.142
HCM Control Delay (s)	23.5	9.8	8.3	-	-	7.9	-	-	37.1	13.1
HCM Lane LOS	C	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.3	0.3	0.2	-	-	0.3	-	-	2.1	0.5

HCM 6th TWSC
300: U.S. Route 20 & Allen Road

02/18/2021

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Vol, veh/h	45	15	165	45	10	1	140	445	75	1	300	45
Future Vol, veh/h	45	15	165	45	10	1	140	445	75	1	300	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	None
Storage Length	135	-	135	0	-	-	270	-	265	265	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	3	4	2	2	8	4
Mvmt Flow	47	16	174	47	11	1	147	468	79	1	316	47

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1150	1183	340	1112	1127	468	363	0	0	547	0	0
Stage 1	342	342	-	762	762	-	-	-	-	-	-	-
Stage 2	808	841	-	350	365	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.13	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.227	-	-	2.218	-	-
Pot Cap-1 Maneuver	175	189	702	186	205	595	1190	-	-	1022	-	-
Stage 1	673	638	-	397	414	-	-	-	-	-	-	-
Stage 2	375	380	-	666	623	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	151	165	702	118	179	595	1190	-	-	1022	-	-
Mov Cap-2 Maneuver	151	165	-	118	179	-	-	-	-	-	-	-
Stage 1	590	637	-	348	363	-	-	-	-	-	-	-
Stage 2	319	333	-	488	622	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	18.5		48.8		1.8		0	
HCM LOS	C		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1190	-	-	151	165	702	118	191	1022	-	-
HCM Lane V/C Ratio	0.124	-	-	0.314	0.096	0.247	0.401	0.061	0.001	-	-
HCM Control Delay (s)	8.5	-	-	39.4	29.1	11.8	54.6	25.1	8.5	-	-
HCM Lane LOS	A	-	-	E	D	B	F	D	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	1.3	0.3	1	1.7	0.2	0	-	-

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	35	25	435	55	45	310
Future Vol, veh/h	35	25	435	55	45	310
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	265	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	26	458	58	47	326

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	907	487	0	0	516	0
Stage 1	487	-	-	-	-	-
Stage 2	420	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	306	581	-	-	1050	-
Stage 1	618	-	-	-	-	-
Stage 2	663	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	292	581	-	-	1050	-
Mov Cap-2 Maneuver	292	-	-	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	633	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.9	0	1.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	292	581	1050
HCM Lane V/C Ratio	-	-	0.126	0.045	0.045
HCM Control Delay (s)	-	-	19.1	11.5	8.6
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	0.1

Intersection

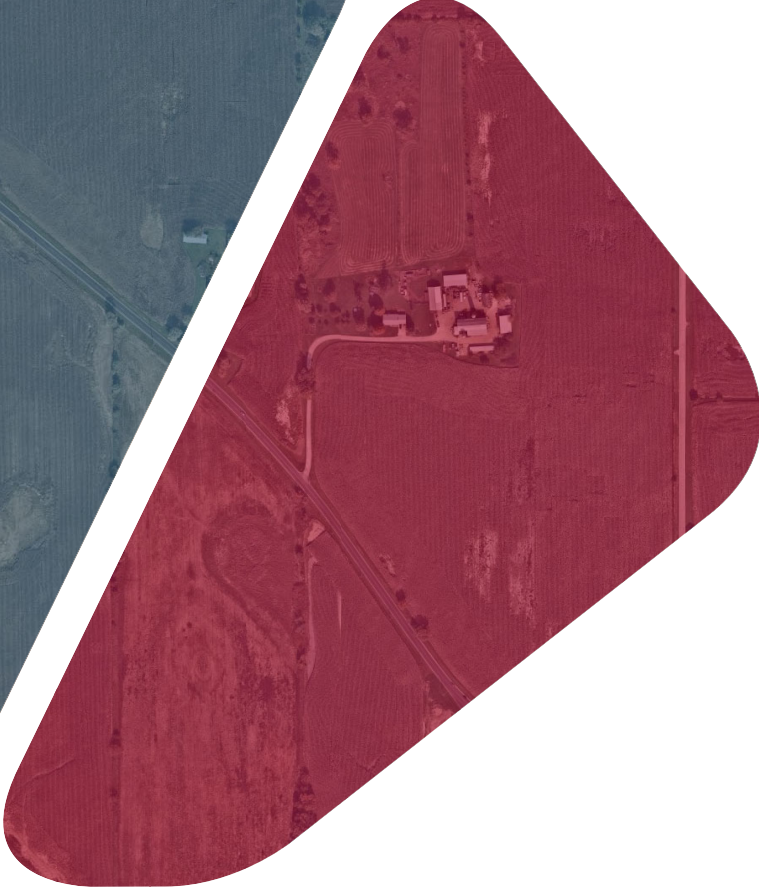
Int Delay, s/veh 2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘	↗
Traffic Vol, veh/h	350	5	205	480	5	115
Future Vol, veh/h	350	5	205	480	5	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	240	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	368	5	216	505	5	121

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	373
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1185
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1185
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	145	677	-	-	1185	-
HCM Lane V/C Ratio	0.036	0.179	-	-	0.182	-
HCM Control Delay (s)	30.8	11.5	-	-	8.7	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0.6	-	-	0.7	-



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