



Appendix A

SR-66 Traffic Capacity and Safety Analysis Technical Memorandum

STATE ROUTE

From State Route 34 (US-11E, Andrew Johnson Highway) in Bulls Gap to
Near Speedwell Road/Old Highway 66, Hawkins County, Tennessee

PIN 107579.00, Federal Project #: STP-66(38)

Appendix A: SR-66 Traffic Capacity and Safety Analysis Technical Memorandum

April 2025

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*Please note that copies of the appendices listed above are available for download via the <https://tinyurl.com/SR-66Hawkins> or by scanning the QR code and have not been printed. If you would like to receive a printed version of the appendix material, please call 1-800-546-0949 or email at TDOT.Comments@tn.gov.



1. Introduction

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA), proposes to widen and realign State Route (SR) 66, from the intersection with SR-34 (US-11E, Andrew Johnson Highway) in Bulls Gap to near the intersection with Speedwell Road/Old Highway 66, in Hawkins County.

Because the proposed project involves the use of federal funds, the project is subject to the requirements of the [National Environmental Policy Act \(NEPA\)](#).¹ TDOT and FHWA are preparing an Environmental Assessment (EA) in accordance with the NEPA to identify and evaluate the environmental effects of the proposed project and to identify measures to minimize harm.

2. Alternatives Under Evaluation

A No-Build Alternative and one Build Alternative are being evaluated in the EA. Each alternative is described in the subsequent text below.

2.1. No-Build Alternative

The No-Build Alternative has been retained for detailed study and serves as a benchmark for comparison against the Build Alternative. The No-Build Alternative would retain the existing state route and roadway configuration throughout the SR-66 project area except for those modifications to the roadway network that have been programmed and approved for implementation, as identified in [TDOT's 25-Year Long Range Transportation Policy Plan](#),² [State Transportation Improvement Program \(STIP\)](#),³ and the [TDOT 10-Year Project Plan](#)⁴ and would allow for routine maintenance and safety upgrades.

¹ <https://www.govinfo.gov/content/pkg/COMPS-10352/pdf/COMPS-10352.pdf>

² <https://www.tn.gov/tdot/long-range-planning-home/25-year-transportation-policy-plan.html>

³ <https://www.tn.gov/tdot/program-development-and-administration-home/program-development-and-administration-state-programs.html>

⁴ <https://www.tn.gov/tdot/build-with-us.html>

2.2. Build Alternative

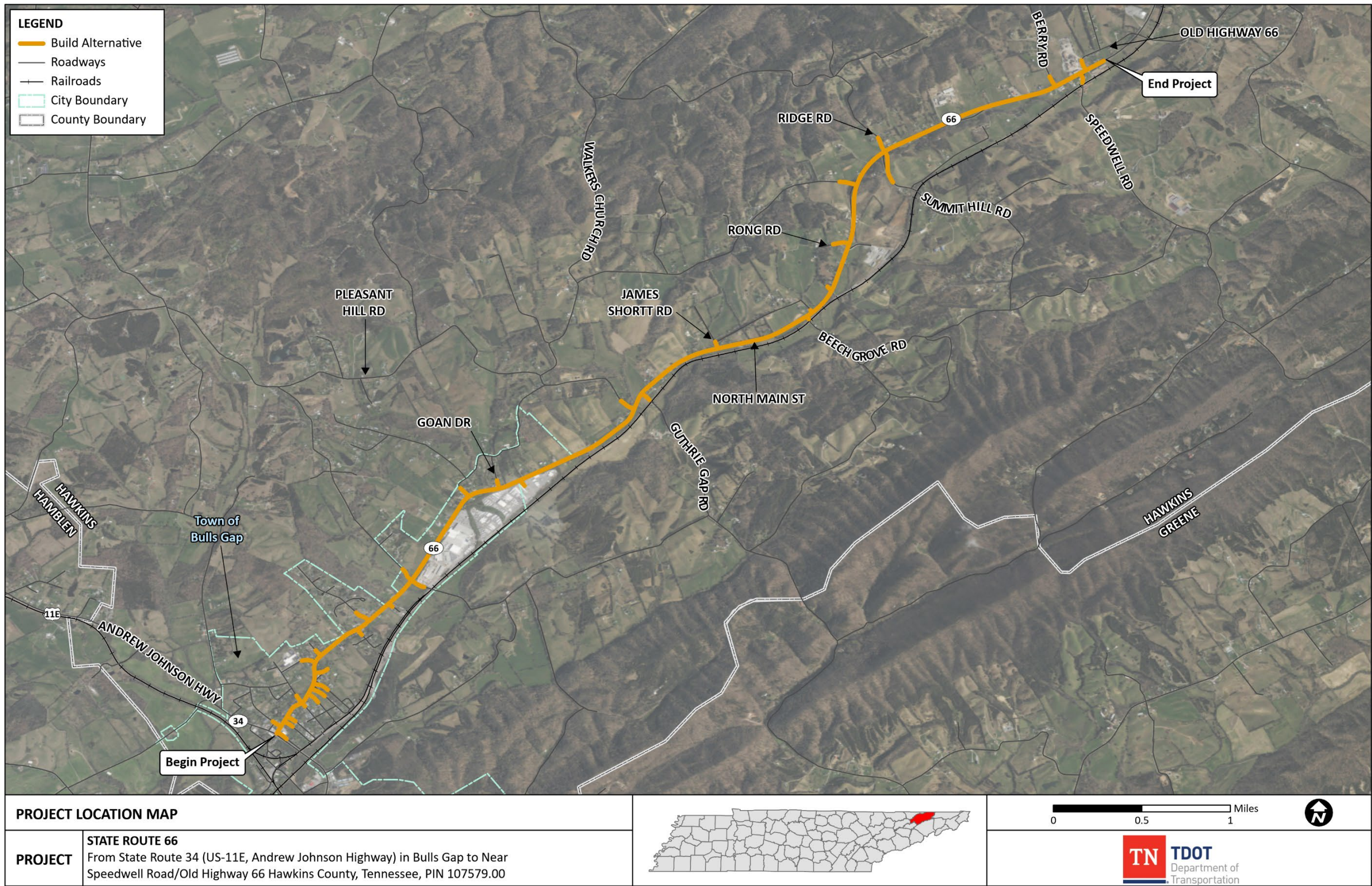
According to the Right-of-Way Plans (dated August 9, 2024),⁵ which serve as the basis of this EA, the Build Alternative would generally follow the existing SR-66 roadway alignment, except in locations where minor alignment shifts are needed to correct roadway geometric deficiencies. The Build Alternative would also widen the existing two-lane roadway configuration (which currently consists of one 10-foot-wide lane in each direction) to include the following (see **Figure 1**):

- Two 12-foot travel lanes (one travel lane in each direction) and paved shoulders four- to ten-feet in width.
- An intermittent 12-foot-wide two-way left-turn lane from SR-34 (US-11E, Andrew Johnson Highway) to north of Goan Drive and from north of Berry Road to near Speedwell Road/Old Highway 66.
- Five-foot wide sidewalks from SR-34 (US-11E, Andrew Johnson Highway) to north of Goan Drive.
- Intermittent curb and gutter.
- Guardrail, as required.

Once completed, the Build Alternative would provide a consistent typical section along SR-66 from SR-34 (US-11E, Andrew Johnson Highway) to the county seat of Rogersville, as well as provide a link from Rogersville to Interstate 81 (I-81). The total proposed project length is approximately 5.70 miles.

⁵ Please see **Appendix C** of the EA for a copy of the Right-of-Way Plans (dated August 9, 2024).

Figure 1: Project Location Map



3. Focus of this Technical Memorandum

This memorandum evaluates the traffic capacity of SR-66 for the Base Year (2028) and Design Year (2048) for both the No-Build (without constructing the project) and Build (after proposed project construction) Alternatives. This memorandum also evaluates safety by reviewing the crash history of existing SR-66 within the project limits.

4. Previous Traffic and Safety Analysis

In 2006, TDOT completed a [Transportation Planning Report \(TPR\)](#)⁶ which analyzed existing and projected traffic data and determined the feasibility of proposed improvements along SR-66 from SR-34 (US-11E, Andrew Johnson Highway) in Bulls Gap to the Otes Community in Hawkins County. The TPR evaluated improving approximately 5.3 miles of the existing two-lane road to an upgraded two-lane facility which would match the roadway lane and shoulder width geometrics (two 12-foot travel lanes with eight- to 12-foot shoulders) of the section of SR-66 from the Otes Community to the Town of Rogersville.

Based on the 2006 TPR, the *TDOT 2007-2009 Multi-Modal Work Program* identified this section of SR-66 as a substandard rural highway and provided the initial funding for the proposed project's planning, environmental, and preliminary engineering studies and processes. Four options (including the No-Build Option) were considered in the 2006 TPR as proposed improvements along SR-66. Option B would shift the alignment west of the existing SR-66 for approximately three miles and Option C would shift the alignment east of the existing SR-66 approximately three miles. Option A proposed all improvements be concentrated along the existing SR-66 corridor. Option A was selected as the Build Alternative to be carried forward for environmental review. Additional information on options reviewed in the 2006 TPR is available in **Chapter 2** of the EA.

The traffic operations analysis completed in support of the 2006 TPR reviewed the above-described options in two horizon year scenarios – the Base Year (2011) and Design Year (2031). The No-Build Alternative was projected to operate at a level of service (LOS) “E” in both the Base Year (2011) and the Design Year (2031). The Build Alternative (Option A) was projected to operate at an LOS “C” in both the Base Year (2011) and the Design Year (2031).

The crash analysis completed in support of the 2006 TPR evaluated historical crash data reported between January 1, 2003, and December 31, 2005. TDOT calculated a crash rate (crashes per one million vehicle miles) for the existing route within the study limits to be 3.08. This was compared to the statewide average rate for these years for a two-lane rural highway (1.70) to determine the critical rate (a quality control measure that defines statistically how the actual rate differs significantly from the statewide average accident rate), which was calculated to be 2.37. The ratio of the actual rate (3.08) to the critical rate (2.37), is 1.30. A ratio of over 1.0 suggests a likely safety deficiency problem.

⁶ <https://www.tn.gov/content/dam/tn/tdot/documents/government-how-do-i-documents/Studies/StatewidePlanning/studies-HawkinsSR66BullsGaptoLM5.3NearOtes-TPR.pdf>

Subsequently, TDOT prepared a D-List Categorical Exclusion (CE), approved by the FHWA on May 6, 2020. The D-List CE reviewed the potential impacts associated with the proposed reconstruction of SR-66 from SR-34 (US-11E, Andrew Johnson Highway) in Bulls Gap to South of Speedwell Road/Old Highway 66 with widened lane and shoulder widths and improved horizontal and vertical alignments along the route. Traffic operations and safety analyses were also prepared as part of the D-List CE using traffic volume projections and historic traffic volume and crash data provided by TDOT.

The traffic operations analysis completed in support of the D-List CE considered two alternatives, the No-Build Alternative and the Build Alternative, in two horizon year scenarios – the Base Year (2023) and Design Year (2043). The design hour volume (DHV) was used to analyze each roadway segment and intersection turning movement DHVs were used to analyze the intersection of SR-34 (US-11E, Andrew Johnson Highway), SR-66 (North Main Street), and South Main Street. The entire corridor was projected to operate between a LOS “A” and LOS “C” in the Base Year (2023) and between an LOS “B” and “C” in the Design Year (2043) for both the No-Build and Build Alternatives. It was noted that *“although the Build Alternative does not increase the capacity of the roadway relative to the No-Build alternative, it does include improvements (including increases in lane and shoulder widths) that improve traffic operations along SR-66 within the study area...the LOS analysis for the Build Alternative does not account for the presence of the TWLTL [two-way left-turn lane], which may provide a typical estimated delay reduction of between 3.5 and 9.4 second per left-turning vehicle through the study period.”*

The crash analysis completed in support of the D-List CE evaluated historical crash data reported between January 1, 2017, and December 31, 2019. The analysis found that 74 percent of crashes occurred along the roadway as compared to only 26 percent occurring at an intersection. Most crashes, 72 percent, consisted of property damage only. There were no fatal crashes reported during the three-year study period, though suspected minor injury crashes (23 percent) and suspected serious injury crashes (5 percent) were reported. The crash rate for the study segments and the study intersection were calculated and compared to the statewide critical crash rate. All of the study period crash rates were found to be below the critical crash rate for both segments and the study intersection. Crashes were most frequently reported to be considered lane departure (40 percent).

5. Evaluation Scenarios

Base Year traffic conditions represent traffic conditions at an estimated date for construction completion. The year 2028 represents the Base Year for anticipated construction completion for the Build Alternative. Typically, roadway projects are designed for traffic conditions 20 years in the future, known as the Design Year. The Design Year is used in planning, environmental studies, and engineering evaluations to represent the proposed project’s service life or full build-out of all project components. The year 2048 represents the Design Year for the Build Alternative, which is 20 years beyond the anticipated date of completion.

The following scenarios were evaluated for this study:

1. Base Year 2028
 - a. No-Build Alternative
 - b. Build Alternative
2. Design Year 2048
 - a. No-Build Alternative
 - b. Build Alternative

Please note, a separate standalone project at the signalized intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway) (PIN 134182.16), as part of the statewide Preventative Maintenance Inspection and Inventory (PMII) program, is proposed to bring the existing infrastructure up to current traffic signal standards.

Improvements under this separate, standalone project (PIN 134182.16) would include Americans with Disabilities Act (ADA) and Public Right-of-Way Accessibility Guidelines (PROWAG) compliance improvements, installation of current signal technologies such as non-intrusive vehicular detection and energy efficient light emitting diode (LED) traffic signal heads, and replacement of the existing signal cabinets and controllers to meet current Advanced Transportation Controller (ATC) industry standards. As these improvements are anticipated for completion in 2027, for the purposes of the intersection capacity analysis completed in this memorandum, the No-Build Alternative assumes optimized signal timing consistent with the signalized intersection project as the project is committed within the State Transportation Improvement Plan.

Additionally, though the proposed improvements associated with the Build Alternative are limited to geometric improvements, changing the lane configuration at an intersection ordinarily necessitates signal timing and/or phasing changes, therefore an optimized signal timing in the Build Alternative scenario was assumed for purposes of the intersection capacity analysis.

6. Traffic Forecasting and Traffic Volumes

TDOT provided projected Base Year 2028 and Design Year 2048 Average Annual Daily Traffic (AADT) volumes along the SR-66 corridor within the project limits, as well as AADT data for each intersecting roadway. TDOT also provided Base Year 2028 and Design Year 2048 AM and PM peak hour turning movement counts at the intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway) at the southern terminus of the proposed project. These volumes are provided in **Appendix A**.

Forecasted volumes for the Base Year 2028 and Design Year 2048 were developed by TDOT. To develop these forecasted volumes, TDOT determined a linear traffic growth rate by conducting a historical trend analysis using TDOT's MS2 Traffic Database. This analysis relies on evaluation of multiple years' worth of existing count station data along the project corridor, for which a linear regression trend analysis was conducted within the MS2 Traffic Database, to determine the linear traffic growth rate. By relying on multiple data points over the past 10 years and a regression analysis methodology, the linear traffic growth rate can be more reflective of long-term trends, taking in to account any outliers or unusual external factors that may have had notable effects on traffic volumes during a given year.

For the subject project, TDOT's MS2 Traffic Database determined that a 1.0 percent per year linear growth factor accurately reflected the historic growth along the subject SR-66 project corridor. This 1.0 percent per year linear growth factor was then applied to the existing traffic volumes along the project corridor to determine the Base Year 2028 and Design Year 2048 forecasted traffic volumes using the following equation:

$$\text{Future Volume [i.e., either Base Year Volume or Design Year Volume]} = \\ \text{Existing Volume} \times (1.0 + \text{Traffic Growth Rate} \times \text{Number of Years from Existing to Future Year})$$

Existing volumes and turning movement counts within the SR-66 project area were not readily available at the same level of granularity as was provided for the Base Year 2028 and Design Year 2048 forecasted volumes. Given the relatively low growth factor determined by TDOT and the relatively short horizon (four years) for the Base Year volume scenarios, it was determined that analysis of the Base Year (2028) and Design Year (2048) volume scenarios would be sufficient for purposes of this analysis.

It was determined that the operational and safety impact of the proposed project would be minimal at intersections with roadways having relatively low AADT (less than 100 vehicles per day). Therefore, only four-leg intersections within the SR-66 project area with AADT volumes greater than 100 vehicles per day were identified for analysis. Based on this criteria, the following five intersections were identified for operational analysis in this memorandum:

- SR-66 and SR-34 (US-11E, Andrew Johnson Highway)
- SR-66 and Wayland Boulevard/Hill Avenue
- SR-66 and Shepherd Road
- SR-66 and Ridge Road/Summit Hill Road
- SR-66 and Old Highway 66/Speedwell Road

These five intersections were used to divide the corridor into four segments to be analyzed as part of this study. The Base Year 2028 and Design Year 2048 AADT volumes provided by TDOT and used as a basis for the analysis of each segment are provided in **Table 1**. These volumes within each horizon year scenario (Base Year 2028 and Design Year 2048) were the same for the No-Build and Build Alternatives, since no changes in capacity, access, or other factors – which may have a notable effect on travel patterns and thereby volumes – are proposed as part of the Build Alternative. In addition to a segment analysis, an intersection level analysis was conducted at the five intersections identified above.

Table 1: Base Year 2028 and Design Year 2048 AADT Volumes by Segment

Identified Segments along SR-66	Base Year 2028 AADT		Design Year 2048 AADT	
	No-Build Alternative	Build Alternative	No-Build Alternative	Build Alternative
Segment 1: SR-34 (US-11E, Andrew Johnson Highway) to Wayland Boulevard/Hill Avenue	4,900		5,880	
Segment 2: Wayland Boulevard/Hill Avenue to Shepherd Road	5,020		6,020	
Segment 3: Shepherd Road to Ridge Road/Summit Hill Road	4,790		5,740	
Segment 4: Ridge Road/Summit Hill Road to Old Highway 66/Speedwell Road	3,890		4,660	

The PM peak hour has higher volumes than the AM peak hour and therefore provides a more conservative, “worst-case” representation of the analysis results for comparison. Therefore, the PM peak hour served as the design hour, the basis for this traffic analysis. While PM peak hour volumes were provided by TDOT for the intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway), PM peak hour volumes had to be developed for the other four intersections and for the four segments. These PM peak hour volumes were calculated using a K-Factor, directional distribution, and heavy vehicle percentage that were calculated based on the available data.

The K-Factor is the proportion of AADT that occurs during the peak hour. The K-Factor for this analysis was calculated by comparing the PM peak hour volumes at the intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway) provided by TDOT with the AADT volumes approaching the intersection, also provided by TDOT. This was calculated with both Base Year 2028 and Design Year 2048 volumes. The K-Factor was determined to be 0.1 in both cases.

The directional distribution is the percentage of AADT traffic along a segment that is traveling in each direction. To calculate the directional distribution along SR-66, the PM peak hour volumes approaching the intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway) from the north were compared to the PM peak hour volumes departing the intersection and heading to the north. The resulting directional distribution of traffic along SR-66 was determined to be approximately 55 percent northbound and 45 percent southbound in the Base Year 2028 and Design Year 2048 PM peak hour.⁷

Based on traffic data provided by TDOT, the percent heavy vehicles (trucks) along the overall length of SR-66 in the project area was three percent during the design hour and five percent over a 24-hour period (the AADT percent heavy vehicles). The percent of heavy vehicles for the various segments and intersections along SR-66 as provided by TDOT was based on a daily average, rather than the PM peak hour. Therefore, the percent heavy vehicles during the PM peak hour was calculated for these segments for use in this analysis. The design hour percent heavy vehicles (three percent) is approximately 60 percent of the AADT percent heavy vehicles (five percent). Therefore, that proportion was applied throughout the corridor to calculate the percent heavy vehicles in the Base Year 2028 and Design Year 2048 PM peak hour for the segments and intersections under study herein. All segments were reported as having a five percent AADT heavy vehicle volume; therefore, a three percent PM peak hour heavy vehicle volume was used on all four segments. The approaches at the five intersections ranged in percent heavy vehicles between three and seven percent heavy vehicles in the PM peak hour, using the 60 percent factor as shown in **Appendix B**.

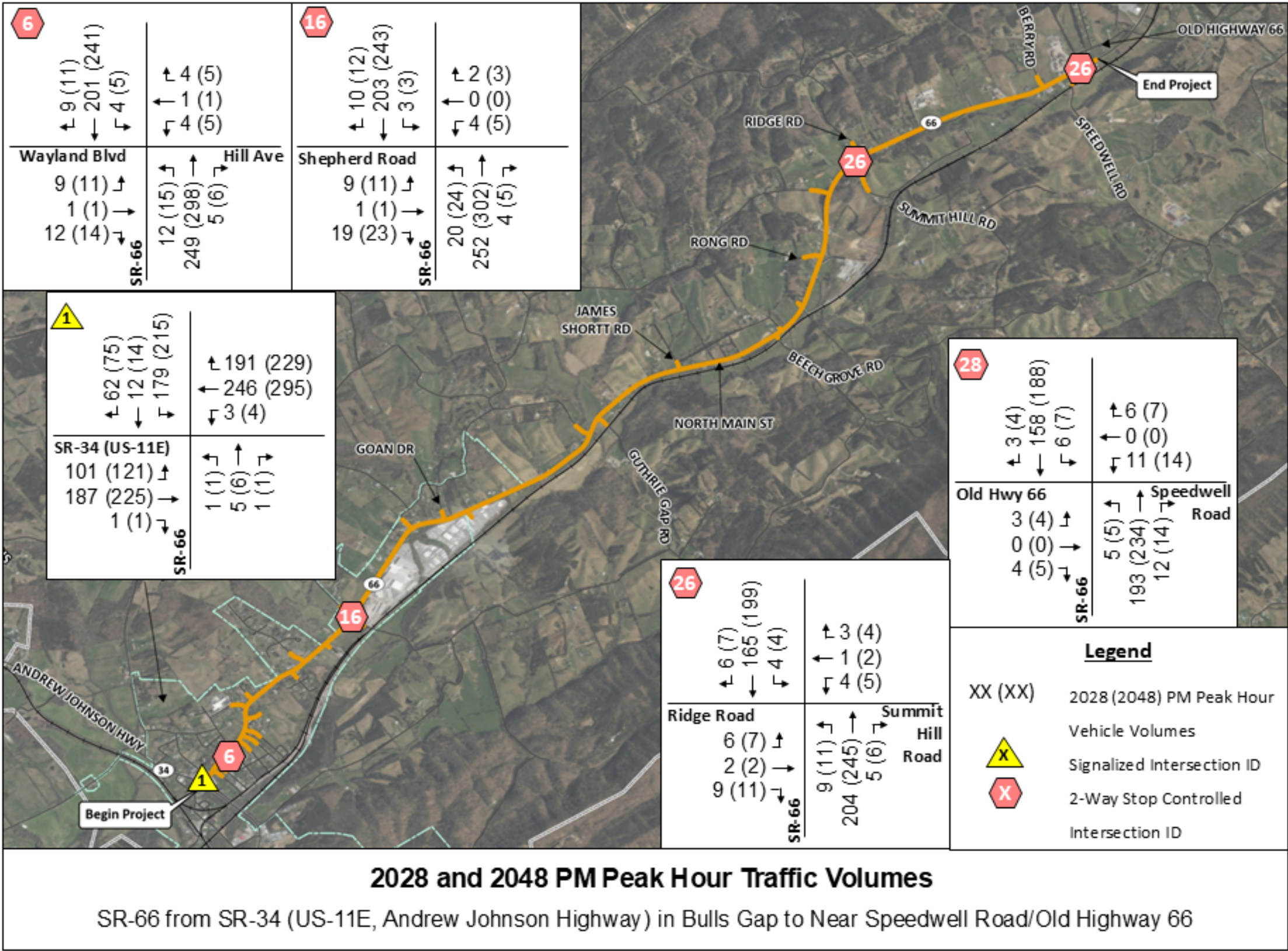
The resulting Base Year 2028 and Design Year 2048 PM peak hour volumes along the four study segments and at the five study intersections are shown **Table 2** and **Figure 2** respectively.

Table 2: Base Year 2028 and Design Year 2048 Design Hour Volumes (PM) by Segment

Identified Segments along SR-66	Base Year 2028 Design Hour Volumes (DHV)		Design Year 2048 DHV	
	Northbound	Southbound	Northbound	Southbound
Segment 1: SR-34 (US-11E, Andrew Johnson Highway) to Wayland Boulevard/Hill Avenue	270	221	323	265
Segment 2: Wayland Boulevard/Hill Avenue to Shepherd Road	276	226	331	271
Segment 3: Shepherd Road to Ridge Road/Summit Hill Road	263	216	316	258
Segment 4: Ridge Road/Summit Hill Road to Old Highway 66/Speedwell Road	214	175	256	210

⁷ Please note that the directional distribution provided by TDOT in **Appendix A** was based on a daily average, rather than the PM peak hour.

Figure 2: 2028 and 2048 PM Peak Hour Volumes



7. Existing and Future Geometrics

The existing SR-66 is a two-lane roadway consisting of 10-foot travel lanes and approximately two-foot shoulders in each direction within the project limits from SR-34 (US-11E, Andrew Johnson Highway) to near Speedwell Road/Old Highway 66, for a total distance of 5.70 miles. The Build Alternative proposes to widen SR-66 to consist of two 12-foot travel lanes and paved shoulders varying from four to 10 feet in width and an intermittent 12-foot TWLTL beginning at SR-34 (US-11E, Andrew Johnson Highway) and ending near the Trinity Pentecostal Church (Sta.211+30.00), approximately 1,720 feet north of Goan Drive. The project also proposes to add five-foot sidewalks along SR-66 within the Town of Bulls Gap and intermittent guardrail, curb and gutter, and minor roadway alignment changes intended to meet current highway design and safety standards.

Once completed, the Build Alternative would provide a consistent typical section along SR-66 from SR-34 (US-11E, Andrew Johnson Highway) to the county seat of Rogersville, while providing a link between Rogersville and I-81.

Geometric data for the existing conditions was obtained from the existing conditions sheets in the Right-of-Way Plans (dated August 9, 2024), which serve as the basis of the EA, or from Google Earth when not available in the design (e.g., as with existing grade profiles). The Right-of-Way Plans (dated August 9, 2024) provided the future geometrics associated with the proposed improvements in the Build Alternative. Refer to **Appendix C** of the EA for a copy of the Right-of-Way Plans (dated August 9, 2024).

8. Traffic Capacity Analysis

8.1. Capacity Analysis Definitions

Table 3 below summarizes the acronyms, terms, and meanings pertaining to capacity analyses that are used within this technical memorandum.

Table 3: Capacity Analysis Acronyms, Terms, and Meanings

Acronym/Term	Meaning
d/c	Demand-to-capacity ratio. Measurement of the vehicle demand (i.e. volume) divided by the capacity of the roadway facility (see also v/c below)
FFS	Free Flow Speed. Measurement of the average speed of traffic on a segment as volume and density approach zero.
followers/mi/ln	Followers per mile per lane. Measurement of density along a roadway facility in terms of the number of following vehicles divided by the length of lane-miles
HCM7	<i>Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis, 2022</i> , published by the Transportation Research Board (TRB)
HCS7	<i>Highway Capacity Software 7</i> . Software developed by the McTrans Center that incorporates the HCM7 methodology.
LOS	Level of Service. A quantitative stratification of a performance measure or measures representing quality of service that facilitates the presentation of results through the use of a familiar A (best) to F (worst) scale.
mi/h	Miles per hour. Measurement of speed along a roadway facility in terms of the number of miles traveled divided by the time duration in hours.
N/A	Not applicable.
pc/mi/ln	Passenger cars per mile per lane. Measurement of density along a roadway facility in terms of the number of passenger cars divided by the length of lane-miles.
TRB	Transportation Research Board.
v/c	Volume-to-capacity ratio. Measurement of the volume (i.e. vehicle demand) divided by the capacity of the roadway (see also d/c above)

8.2. Two-Lane Highway Segment Analysis

This analysis includes an evaluation of traffic operations for the Base Year 2028 and Design Year 2048 for both the No-Build and Build Alternatives. The *Highway Capacity Software, Version 7* (HCS7) was utilized to perform the two-lane highway capacity analyses along segments using methodology prescribed by the *Highway Capacity Manual, 7th Edition* (HCM7) published by the Transportation Research Board (TRB). Specifically, the Two-Lane Highway Module within the HCS7 software was used.

Table 4 summarizes the Motorized Vehicle LOS Criteria for Two-Lane Highways, which is also provided in Exhibit 15-6 within the HCM7.

Table 4: Motorized Vehicle LOS Criteria for Two-Lane Highways

LOS	Follower Density (followers/mile/lane)	
	Higher-Speed Highways Posted Speed Limit \geq 50 mi/h	Lower-Speed Highways Posted Speed Limit $<$ 50 mi/h
A	≤ 2.0	≤ 2.5
B	$> 2.0 - 4.0$	$> 2.5 - 5.0$
C	$> 4.0 - 8.0$	$> 5.0 - 10.0$
D	$> 8.0 - 12.0$	$> 10.0 - 15.0$
E	> 12.0	> 15.0
F	Demand exceeds capacity	

Below is an excerpt from Chapter 15 of the HCM7 that provides additional context for LOS:

“At LOS A, motorists experience operating speeds near the posted speed limit and little difficulty in passing. Platooning is minimal and follower density is very low. At LOS E, speeds may still be reasonable, but platooning is significant, and follower density is high. Passing, if allowed, is essentially impossible. Conditions for LOS B, C, and D represent gradations between the conditions for LOS A and E. LOS F exists whenever demand flow exceeds the capacity of the segment. When demand exceeds capacity, it is expected that there will be a reduction in the capacity at the bottleneck (i.e., the queue discharge rate will be lower than capacity under uncongested conditions).”

As described in **Section 6** above, to analyze the roadway facility, the corridor was separated into four segments between the five four-legged intersections which generally represent points of changing geometric conditions (lane widths, shoulder widths, speed limit changes) and AADT changes along the project corridor. The Base Year 2028 and Design Year 2048 AADT forecasts were used as a basis to determine the DHVs described in **Section 6**.

Inputs for the HCS7 analysis were determined from the Right-of-Way Plans (dated August 9, 2024), herein referred to as “the plans”, that serve as the basis for the EA. Google Earth was used for any additional parameters not depicted in either the plans or in the existing conditions assumed to apply for the No-Build Alternative, as outlined in **Section 6**. The Peak Hour Factor (PHF) was the only required input not provided in these sources, so the HCS default of 0.92 was used. A summary of these inputs and sources is provided in **Table 5** below. Refer to **Appendix C** of the EA for a copy of the Right-of-Way Plans (dated August 9, 2024).

Table 5: Highway Capacity Software, Version 7 (HCS7) Module Inputs

Input	Source of Facility Information/Data
Access Points per Mile	Google Earth
Grade	Right-of-Way Plans (dated 8/9/2024) ¹ (Build) / Google Earth (No-Build)
Heavy Vehicle % (HV%)	TDOT Traffic Volumes ²
Lane Width	Right-of-Way Plans (dated 8/9/2024)
Passing Zones	N/A
Peak Hour Factor (PHF)	HCS7 Default (0.92)
Segment Length	Google Earth
Shoulder Width	Right-of-Way Plans (dated 8/9/2024)
Speed Limit	Google Earth
<i>Notes:</i> ¹ Available in Appendix C of the EA ² Available in Appendix A of this memorandum.	

Table 6 and **Figure 3** show the results of the Base Year 2028 and Design Year 2048 analysis for both the No-Build and Build Alternatives in the northbound and southbound directions of travel during the PM peak hour. LOS and Volume Demand-to-Capacity (v/c) ratio were reported for each segment. The segment capacity analysis reports are included in **Appendix B**.

Table 6: 2028 and 2048 Corridor Traffic Conditions- No-Build and Build Alternatives

Segment	Base Year 2028				Design Year 2048			
	Northbound		Southbound		Northbound		Southbound	
	No-Build LOS ¹ (v/c) ²	Build LOS (v/c)	No-Build LOS (v/c)	Build LOS (v/c)	No-Build LOS (v/c)	Build LOS (v/c)	No-Build LOS (v/c)	Build LOS (v/c)
Segment 1: SR-34 (US-11E, Andrew Johnson Highway) to Wayland Boulevard/Hill Avenue	C (0.17)	C (0.17)	B (0.14)	B (0.14)	C (0.21)	C (0.21)	C (0.17)	C (0.17)
Segment 2: Wayland Boulevard/Hill Avenue to Shepherd Road	C (0.18)	C (0.18)	B (0.14)	A (0.14)	C (0.21)	C (0.21)	C (0.17)	B (0.17)
Segment 3: Shepherd Road to Ridge Road/Summit Hill Road	B (0.17)	B (0.17)	B (0.14)	A (0.14)	B (0.20)	B (0.20)	B (0.16)	B (0.16)
Segment 4: Ridge Road/Summit Hill Road to Old Highway 66/Speedwell Road	A (0.14)	A (0.14)	A (0.14)	A (0.11)	A (0.16)	A (0.16)	A (0.13)	A (0.13)
Notes: ¹ LOS = Level of Service ² v/c = Volume to Capacity Ratio								

The results of the HCS7 analysis of both the Base Year 2028 and the Design Year 2048 show that the projected v/c does not change between the No-Build and Build Alternatives for almost all segments studied, which is not unexpected given the nature of the proposed improvements to be constructed by this project.⁸ The number of through lanes remains the same, and the impact of the new TWLTL does not notably impact capacity results given the low turning volumes and lack of turn lane capacity as a parameter in HCS. Marginal improvements to delay and density, represented by the LOS, are anticipated due to the increase in average speed facilitated by the wider lanes and shoulders. Each segment of the roadway continues to operate at an acceptable LOS of C or better under both the No-Build and Build Alternatives, in both the Base Year 2028 and the Design Year 2048.

8.3. Intersection Capacity Analysis

An intersection capacity analysis was also conducted to measure the impact of the project on the operations of the signalized intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway) as well as at the four unsignalized four-leg intersections identified in **Section 6** as part of this analysis. Synchro 12 software was used to perform intersection operational analyses under the No-Build and Build Alternatives for the Base Year 2028 and Design Year 2048 PM peak hour. Synchro is a macroscopic modeling tool used to evaluate traffic flow and signal operations, including LOS, delay, and v/c ratio based on various versions of the HCM. For purposes of this study, the 2000 HCM was used to process results for the signalized and unsignalized intersections due to the type of signal phasing present today. **Table 7** summarizes the Motorized Vehicle LOS Criteria for signalized and unsignalized (two-way stop controlled) intersections based on delay, measured in seconds per vehicle.

⁸ Please note that the v/c ratio for the Southbound direction of traffic on Segment 4 only slightly decreases from 0.14 to 0.11, but still remains as LOS A. This small decrease was not considered statistically significant, since the LOS stays the same.

Table 7: Motorized Vehicle LOS Criteria for Intersections

LOS	Delay (seconds per vehicle)	
	Signalized Intersection	Unsignalized Two-Way Stop Controlled Intersection
A	≤ 10.0	0 – 10.0
B	> 10.0 – 20.0	> 10.0 – 15.0
C	> 20.0 – 35.0	> 15.0 – 25.0
D	> 35.0 – 55.0	> 25.0 – 35.0
E	> 55.0 – 80.0	> 35.0 – 50.0
F	> 80.0	> 50.0

Volumes used for this analysis were calculated and developed as described in **Section 6**. Existing roadway geometry, lane control (what movements are allowed), intersection control (signal, two-way stop control, or all-way stop control), and speed limit data were collected from Google Maps and Google Streetview. Existing traffic signal timing and phasing information were provided by a representative of the Town of Bulls Gap.

The results of the Synchro analysis for the five study intersections are shown in **Table 8**: Base Year 2028 and Design Year 2048 Intersection Operations and **Figure 3**. Each intersection was analyzed during the PM peak hour to compare operations between the No-Build and Build Alternatives. LOS and delay were calculated for each intersection. Detailed Synchro output reports are provided in **Appendix C**.

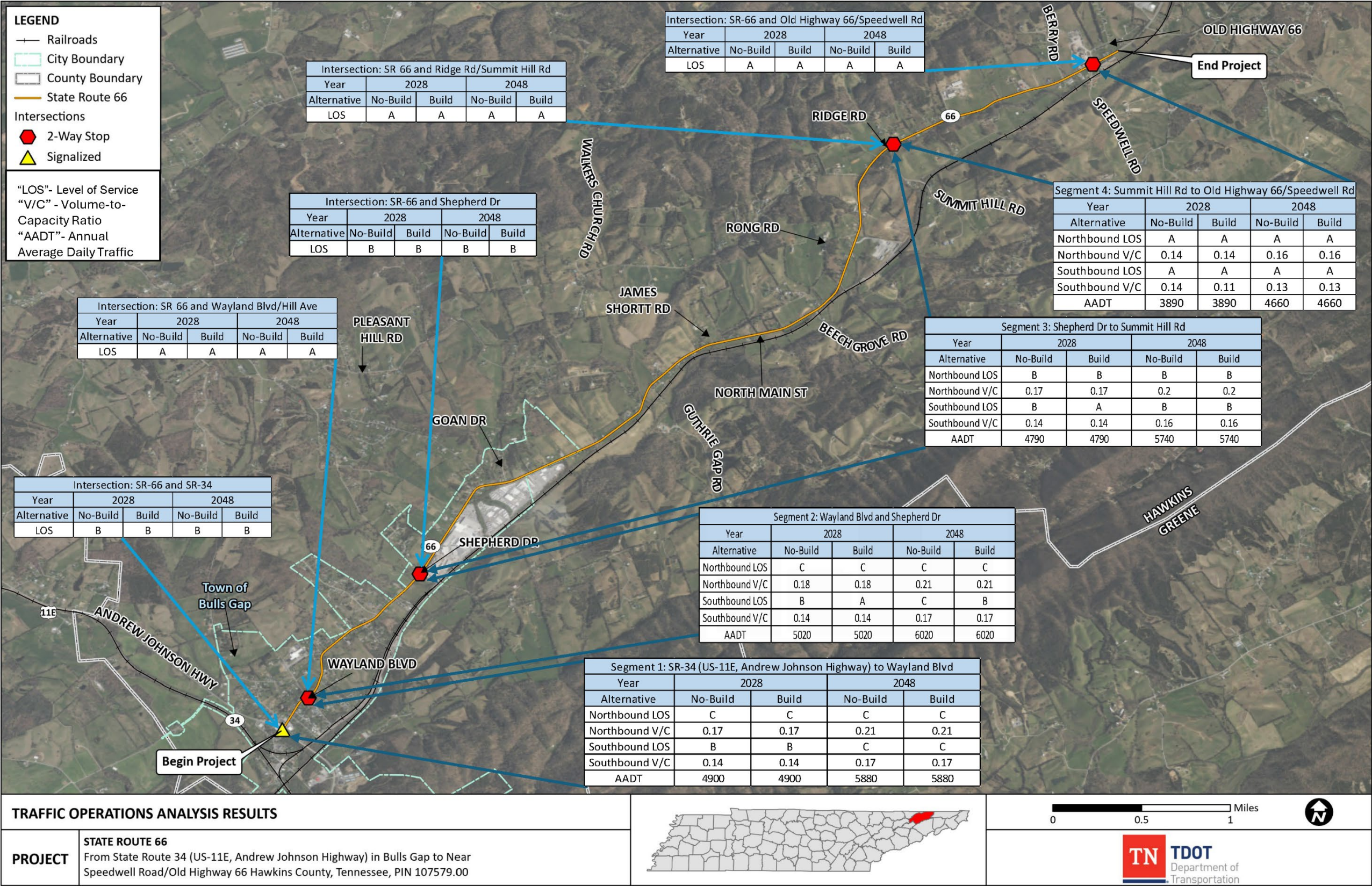
Table 8: Base Year 2028 and Design Year 2048 Intersection Operations- No-Build and Build Alternatives

Intersection	Base Year 2028		Design Year 2048	
	No-Build LOS ¹ (delay ²)	Build LOS (delay)	No-Build LOS (delay)	Build LOS (delay)
SR-66 and SR-34 (US-11E, Andrew Johnson Highway) <i>Signalized</i>	B (12.2)	B (10.4)	B (15.9)	B (12.0)
SR-66 and Wayland Boulevard/Hill Avenue <i>Unsignalized (Two-Way Stop Control)</i>	A (1.0)	A (0.9)	A (1.1)	A (0.9)
SR-66 and Shepherd Road <i>Unsignalized (Two-Way Stop Control)</i>	A (1.2)	A (1.0)	A (1.3)	A (1.1)
SR-66 and Ridge Road/Summit Hill Road <i>Unsignalized (Two-Way Stop Control)</i>	A (0.9)	A (0.9)	A (1.0)	A (1.0)
SR-66 and Old Highway 66/Speedwell Road ³ <i>Unsignalized (Two-Way Stop Control)</i>	A (0.9)	N/A ⁴	A (0.9)	N/A
SR-66 and Speedwell Road ³ <i>Unsignalized (Two-Way Stop Control)</i>	N/A	A (0.6)	N/A	A (0.6)
SR-66 and Old Highway 66 ³ <i>Unsignalized (Two-Way Stop Control)</i>	N/A	A (0.3)	N/A	A (0.3)
Notes: ¹ LOS = Level of Service ² Delay is represented in seconds. ³ The existing intersection of SR-66 and Old Highway 66/Speedwell Road was modeled as a single intersection for the No-Build Alternative and as two separate intersections in the Build Condition based on the proposed configuration of the Build Alternative. ⁴ N/A = Not Applicable. Where a segment would not be present in a given scenario, LOS and delay data would not be available.				

The results of the intersection Synchro analysis show that delay slightly improves at the signalized intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway) under the Build Alternative when compared to the No-Build Alternative for both the Base Year 2028 and Design Year 2048. This reflects the increased efficiency and capacity provided by the Build Alternative's construction of a new southbound left-turn lane at the intersection.

Similarly, for both the Base Year 2028 and the Design Year 2048, the addition of the new TWLTL appears to slightly reduce overall delay at the unsignalized intersections of SR-66 with Wayland Boulevard/Hill Avenue, Shepherd Road, and Old Highway 66/Speedwell Road. The remaining unsignalized intersection of SR-66 and Ridge Road/Summit Hill Road shows no change in delay between the No-Build and Build Alternatives in both the Base Year and the Design Year.

Figure 3: Traffic Operations Analysis Results- No-Build and Build Alternatives



9. Safety Analysis

A safety analysis was prepared to identify statistically high crash locations and potential trends in contributing factors to crashes along the existing SR-66 corridor within the project limits. Crash data was obtained from TDOT's Enhanced Tennessee Roadway Information Management System (E-TRIMS) database and summaries of crashes by type and severity are provided in **Appendix D**. During the three-year review period from October 2021 to September 2024, 69 total crashes occurred along the SR-66 corridor within the immediate vicinity of the project limits between the intersection of SR-66 with SR-34 (US-11E, Andrew Johnson Highway) and the project terminus near Speedwell Road. A crash map showing the location and relative densities of these crashes is shown in **Figure 4**. A concentration of crashes (12 total crashes) has occurred at the intersection of SR-66 with SR-34 (US-11E, Andrew Johnson Highway). The remainder of the identified crashes (57) were generally distributed evenly along the corridor. Most of the crashes reported during this time period were either categorized as being caused by "lane departure" (25 crashes – 36 percent of total) or "following improperly" (18 crashes – 26 percent of total).

A segment crash rate was calculated for each segment evaluated to determine a relative comparison for crash frequency along SR-66. The facility was subdivided into the same four segments used in the capacity analysis described in **Section 6**. The segment crash rates are based on the number of crashes on a specified roadway segment, the AADT of the roadway, the number of years in the analysis period, and the length of segment. These crash rates are expressed in terms of crashes per one million vehicle miles traveled and are then compared to statewide critical crash rates calculated based on data in the TDOT *Statewide Average Crash Rates for Sections and Spots* (2021-2024) provided in **Appendix E**. The comparison is expressed as a ratio of the section crash rate (A) to the critical crash rate (C) and is referred to as the critical crash rate factor (A/C ratio). The A/C ratio is the threshold above which it is statistically certain (at a 99 percent confidence level) that the section crash rate exceeds the average crash rate and is not mistakenly shown as higher than the average due to randomly occurring crashes. **Table 9** displays the calculated crash rates for each segment and the intersection of SR-66 with SR-34 (US-11E, Andrew Johnson Highway).

A/C ratios of 1.0 or higher indicate the section crash rate for that roadway exceeds the statewide critical crash rate for that roadway type and are likely not due to random occurrence; hence, there may be some unfavorable characteristics of the roadway that contribute to higher crash rates. Roadways qualify for Highway Safety Improvement Program (HSIP) funding if they indicate an A/C ratio of 1.0 or higher.

For the SR-66 roadway corridor analyzed for this study, only the first segment between the intersection of SR-66 with SR-34 (US-11E, Andrew Johnson Highway) and Wayland Boulevard exhibited a Critical Crash Rate Factor (A/C) greater than 1.0, meaning that the crash rate in this segment exceeds the statewide critical crash rate for this roadway type. This also suggests that crashes in this segment are not random and may be caused by some unfavorable characteristics of the roadway within that segment. Upon further inspection, it was noted that a majority of the crashes within this segment occurred at the SR-66 and SR-34 (US-11E, Andrew Johnson Highway) intersection.

Based on the observations that the southernmost section had a Critical Crash Rate Factor of 1.0 and that a notable number of those crashes were occurring at the intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway), further analysis was conducted to determine the intersection crash rate independent of the remainder of the segment. When compared against the statewide critical crash rate, the intersection was found to have an A/C ratio of 0.99. This indicates that the intersection currently experiences a comparable crash rate to that of the statewide average for intersections of similar type. Therefore, it was determined that further safety analysis of Segment 1 was not warranted. If crashes occurring at the intersection were to be excluded from the segment's crash rate, the critical crash rate for Segment 1 would be expected to be below 1.0, meaning the Critical Crash Rate Factor is mostly dependent on the crashes occurring at the intersection, not along the segment itself.

The Build Alternative is not anticipated to result in a notable change in safety at the SR-34 (US-11E, Andrew Johnson Highway) intersection; however, the proposed improvements along SR-66 may improve safety and reduce the frequency of certain types of crashes as noted below:

- The addition of a separate left-turn lane may improve sight distance for turning drivers at the intersection, potentially reducing accidents resulting from failure to yield right of-way.
- The geometric improvements to the horizontal and vertical curves to meet current standards may reduce the probability of a crash.
- The proposed widening of the typical section and other improvements such as wider shoulders and guardrail installation may also serve to reduce lane departure and other fixed object or non-vehicular crashes along the entire corridor. However, the widened typical section could potentially also result in higher average speeds and thereby more severe crashes, if they do occur. As noted above, geometric improvements to the horizontal and vertical curves to meet current standards are included in the proposed project. By bringing the geometry of the roadway up to current design standards associated with the existing posted speed limit, safety can be improved. The proposed design speeds for the corridor are listed below:
 - From SR-34 (US-11E, Andrew Johnson Highway) to Kite Street: 30 mph
 - From Kite Street to approximately 800' north of Guthrie Gap Road: 45 mph
 - From approximately 800' north of Guthrie Gap Road to project terminus: 60 mph

Figure 4: Crash Frequency Heat Map

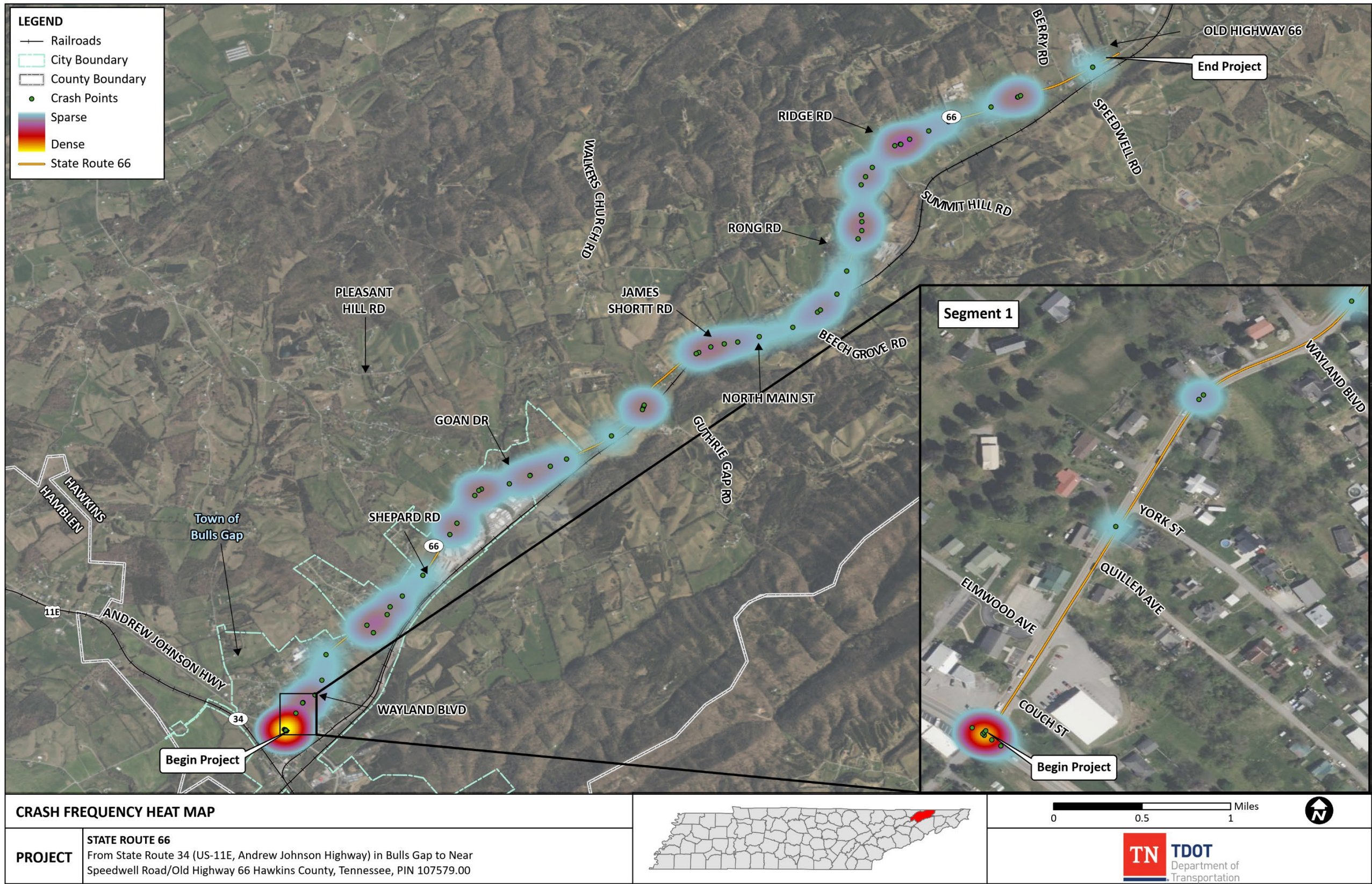


Table 9: SR-66 Intersection/Segment Crash Rate Analysis

Intersection or Segment	Length (miles)	2021-2024 Average AADT	# of Fatal Crashes	# of Injury Crashes	Total Crashes	Exposure "M" (1 MVM or 1 MEV)	Statewide Average Crash Rate	Section Crash Rate (A)	Statewide Critical Crash Rate (C)	Critical Crash Rate Factor (A/C)
Intersection 1: SR-34 (US-11E, Andrew Johnson Highway) and SR-66*	-	9,438	0	0	12	10.33	0.578	1.16	1.18	0.99
Segment 1: SR-34 (US-11E, Andrew Johnson Highway) to Wayland Boulevard/Hill Avenue	0.72	5,272	0	3	15	4.16	1.581	3.61	3.14	1.15 ⁹
Segment 2: Wayland Boulevard/Hill Avenue to Shepherd Road	0.88	5,272	0	1	9	5.08	1.581	1.77	2.98	0.60
Segment 3: Shepherd Road to Ridge Road/Summit Hill Road	3.47	4,024	0	8	34	15.29	1.581	2.22	2.36	0.94
Segment 4: Ridge Road/Summit Hill Road to Old Highway 66/Speedwell Road	1.13	4,024	0	4	11	4.98	1.581	2.21	2.99	0.74
<p>Notes:</p> <p>* Denotes an intersection location instead of a segment</p> <p>Analysis Period: 3 Years (10/01/2021 to 09/30/2024)</p> <p>Crash rates are expressed in crashes per 1 MVM (1 million vehicle miles traveled)</p> <p>Exposure (M) = [(AADT) x 365 x (Time Frame of Analysis (Years)) x (Segment Length)] / 1,000,000</p> <p>Section Crash Rate (A) = Total Crashes / Exposure</p> <p>Statewide Critical Crash Rate (C) = Statewide Average Crash Rate + K (sqrt (Statewide Average Crash Rate/M) + 1/(2M)); Where K = 2.327 which is equal to probability of 0.99.</p> <p>Critical Crash Rate Factor (A/C) = Section Crash Rate (A) / Statewide Critical Crash Rate (C)</p> <p>AADT = Average Annual Daily Traffic, MVM = Million Vehicle Miles, MEV = Million Entering Vehicles</p>										
<p>Sources: Crash data for 10/01/2021 to 09/30/2024 from E-TRIMS</p> <p>Statewide Average Crash Rates Provided from TDOT Data (Statewide Average Rates for Sections and Spots (2021-2024))</p>										

⁹ Though a Critical Crash Rate Factor (A/C) greater than 1.0 indicates that the crash rate exceeds the statewide critical crash rate for a given roadway segment type, within Segment 1, it was noted that a majority of the crashes occurred at the SR-66 and SR-34 (US-11E, Andrew Johnson Highway) intersection. Upon reviewing the SR-66 and SR-34 (US-11E, Andrew Johnson Highway) intersection separately, the intersection A/C ratio does not exceed 1.0. Therefore, it was determined that further safety analysis of Segment 1 was not warranted.

10. Conclusion

The traffic capacity analyses conducted and described in this memorandum compared the operational impacts of the No-Build Alternative to the Build Alternative for both the Base Year 2028 and Design Year 2048. For each of the two years evaluated, the traffic volumes in the No-Build and Build Alternatives remain the same since the proposed project is not expected to impact traffic demand or trip patterns along the corridor.

The safety analysis conducted and described in this memorandum examined the most recent three years of crash data and determined that the segment of SR-66 in the Town of Bulls Gap closest to the intersection with SR-34 (US-11E, Andrew Johnson Highway) exhibits a crash rate higher than the statewide average, with most crashes within this segment occurring at the intersection itself and may be caused by existing unfavorable roadway characteristics. During the three-year period from October 2021 to September 2024, 69 total crashes occurred along the SR-66 corridor within the immediate vicinity of the project limits between the intersection of SR-66 with SR-34 (US-11E, Andrew Johnson Highway) and the project terminus near Speedwell Road. A crash map showing the location and relative densities of these crashes is shown in **Figure 4**. It is evident that a concentration of crashes (12 total crashes) has occurred at the intersection of SR-66 with SR-34 (US-11E, Andrew Johnson Highway). The remainder of crashes (57) were generally distributed evenly along the corridor. Most of the crashes reported during this time period were either categorized as being caused by “lane departure” (25 crashes – 36 percent of total) or “following improperly” (18 crashes – 26 percent of total).

A summary discussion of the results of these analyses is presented for the No-Build Alternative and the Build Alternative below.

10.1. No-Build Alternative

The No-Build Alternative does not incorporate the roadway improvements being considered as part of the proposed project. This alternative assumes the roadway configuration remains the same throughout the SR-66 project area except for pre-approved modifications and other routine maintenance and upgrades. The traffic capacity analyses showed that if the project was not built, corridor and intersection operations would see an overall slight decline from Base Year 2028 to Design Year 2048 due to the forecasted traffic volume growth over time operating within the same unchanged roadway capacity. However, operations are forecasted to still remain at acceptable LOS levels (LOS A to C) in both the Base Year 2028 and Design Year 2048 scenarios.

As the roadway configuration would remain the same under the No-Build, the No-Build Alternative is not anticipated to result in a notable change in safety along SR-66 within the project limits.

10.2. Build Alternative

The Build Alternative represents the conditions which would result from the construction of the proposed project, including addition of a TWLTL, widening of the travel lanes and shoulders, along with other alignment, sidewalk, and guardrail improvements that would not impact the operational analyses described in this memo.

The traffic capacity analyses show that for both the Base Year 2028 and the Design Year 2048, construction of the Build Alternative would maintain or marginally improve capacity and LOS along the corridor compared to the No-Build Alternative. This is not unexpected given the nature of the proposed improvements to be constructed by this project – the number of through lanes remains the same, and the impact of the new TWLTL does not notably impact capacity results given the low turning volumes and lack of turn lane capacity as a parameter in HCS. Marginal improvements to delay and density, represented by the LOS, are anticipated due to the increase in average speed facilitated by the wider lanes and shoulders. Each segment of the roadway continues to operate at an acceptable LOS of C or better under both the No-Build and Build Alternatives, in both the Base Year 2028 and the Design Year 2048.

The results of the intersection Synchro analysis show that delay slightly improves at the signalized intersection of SR-66 and SR-34 (US-11E, Andrew Johnson Highway) under the Build Alternative when compared to the No-Build Alternative for both the Base Year 2028 and Design Year 2048. This reflects the increased efficiency and capacity provided by the Build Alternative's construction of a new southbound left turn lane at the intersection.

Similarly, the addition of the new TWLTL appears to slightly reduce overall delay at the unsignalized intersections of SR-66 with Wayland Boulevard/Hill Avenue, Shepherd Road, and Old Highway 66/Speedwell Road. The remaining unsignalized intersection of SR-66 and Ridge Road/Summit Hill Road shows no change in delay between the No-Build and Build Alternatives in both the Base Year and the Design Year.

The Build Alternative is not anticipated to result in a notable change in safety at the SR-34 (US-11E, Andrew Johnson Highway) intersection; however, the addition of a separate left-turn lane may improve sight distance for turning drivers at the intersection, potentially reducing accidents resulting from failure to yield right-of-way. The Build Alternative's proposed widening of the typical section and other improvements such as wider shoulders and guardrail installation may also serve to reduce lane departure and other fixed object or non-vehicular crashes along the entire corridor. However, the widened typical section may also result in higher average speeds and thereby more severe crashes if they do occur. By bringing the geometry of the roadway up to current design standards associated with the posted speed limit, safety can be improved.



Appendix A

Traffic Volume Data Provided by TDOT

**TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION**

PROJECT NO.: 37005-1237-14 ROUTE: S.R. 66
COUNTY: HAWKINS CITY: BULLS GAP
PROJECT PIN NUMBER: 107579.00
PROJECT DESCRIPTION: FROM S.R. 34 TO SPEEDWELL ROAD / OLD HWY. 66
[1] S.R. 66 AVERAGE TRAFFIC DATA

DIVISION REQUESTING:

MAINTENANCE ☐ PAVEMENT DESIGN ☐
S.T.I.D. ☐ STRUCTURES ☐
PROG. DEVELOPMENT & ADM. ☐ SURVEY & ROADWAY DESIGN ☒
PUBLIC TRANS. & AERO. ☐ TRAFFIC SIGNAL DESIGN ☐
OTHER ☐
YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: 2028
PROJECTED LETTING DATE: DECEMBER 10, 2027

TRAFFIC ASSIGNMENT:

[1]

BASE YEAR		DESIGN YEAR					DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS	
AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
4,330	2028	5,320	532	10	2048	65-35	3	5	136	197

REQUESTED BY: NAME ERIC WILSON DATE 4/18/23
DIVISION REGION I PROJECT DEVELOPMENT
ADDRESS 7345 REGION LANE
KNOXVILLE TN 37914

REVIEWED BY: RANDY BOGUSKIE Randy Boguskie DATE 4/19/2023
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: TONY ARMSTRONG Tony Armstrong DATE 4/19/2023
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

FURNISH THE 2028-2048 TRAFFIC DATA AND ADL's FOR A TWO LANE ROADWAY.

THIS TRAFFIC IS BASED ON 2022 CYCLE COUNTS AND THE PREVIOUS PROJECT PREPARED FOR DESIGN DATED 10/17/2019. DUE TO THE 2022 CYCLE COUNTS BEING LOWER THAN THE 2023 FORECASTED TRAFFIC DATA THIS TRAFFIC IS LOWER THAN THE PREVIOUS PROJECT TRAFFIC. THE DESIGN YEAR TRAFFIC IS BASED ON GROWTH RATE FROM THE TN-TIMES LINEAR REGRESSION TOOL. AADT's, DHV's AND ADL's ARE INCLUDED. THE TRUCK PERCENT WAS LOWERED BASED ON A 2022 CLASSIFICATION COUNT.

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT.

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR ADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.

SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.

(REV. 6/9/21)

**TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION**

PROJECT NO.: 37005-1237-14 ROUTE NO.: S.R. 66
 COUNTY: HAWKINS CITY: BULLS GAP
 PROJECT DESCRIPTION: FROM S.R. 34 TO SPEEDWELL ROAD/OLD HWY. 66

FAP Rural

Pavement Structural Design

Calculation of Equivalent Daily 18 Kip Single Axle Loads

Type Vehicle		ADT (No. Counted)	Flexible		Rigid	
			18-kip Factor	ADL	18-kip Factor	ADL
Pass. cars and motorcycles (1-2)		3,307	0.001	3	0.001	3
Pick-up, Panel, Van (3)		1,277	0.005	6	0.004	5
Sing. Unit	Buses (4)	2	0.300	1	0.300	1
	2-axle, 6-tire (5)	63	0.240	15	0.310	20
	3-axle or more (6-7)	57	1.700	97	2.300	131
	4-axle (8)	38	1.110	42	1.500	57
Comb.	5-axle or more (9-13)	81	1.320	107	2.200	178
Totals (2038 AADT)		4,825		271		395

Suggested Percentages of Trucks in Design Lane

5,000 or less ADT 95%
 5,000 - 10,000 ADT 90%
 10,000 - 15,000 ADT 85%
 15,000 - 20,000 ADT 80%
 20,000 - 30,000 ADT 75%
 30,000 - 40,000 ADT 70%
 40,000 Plus 60%

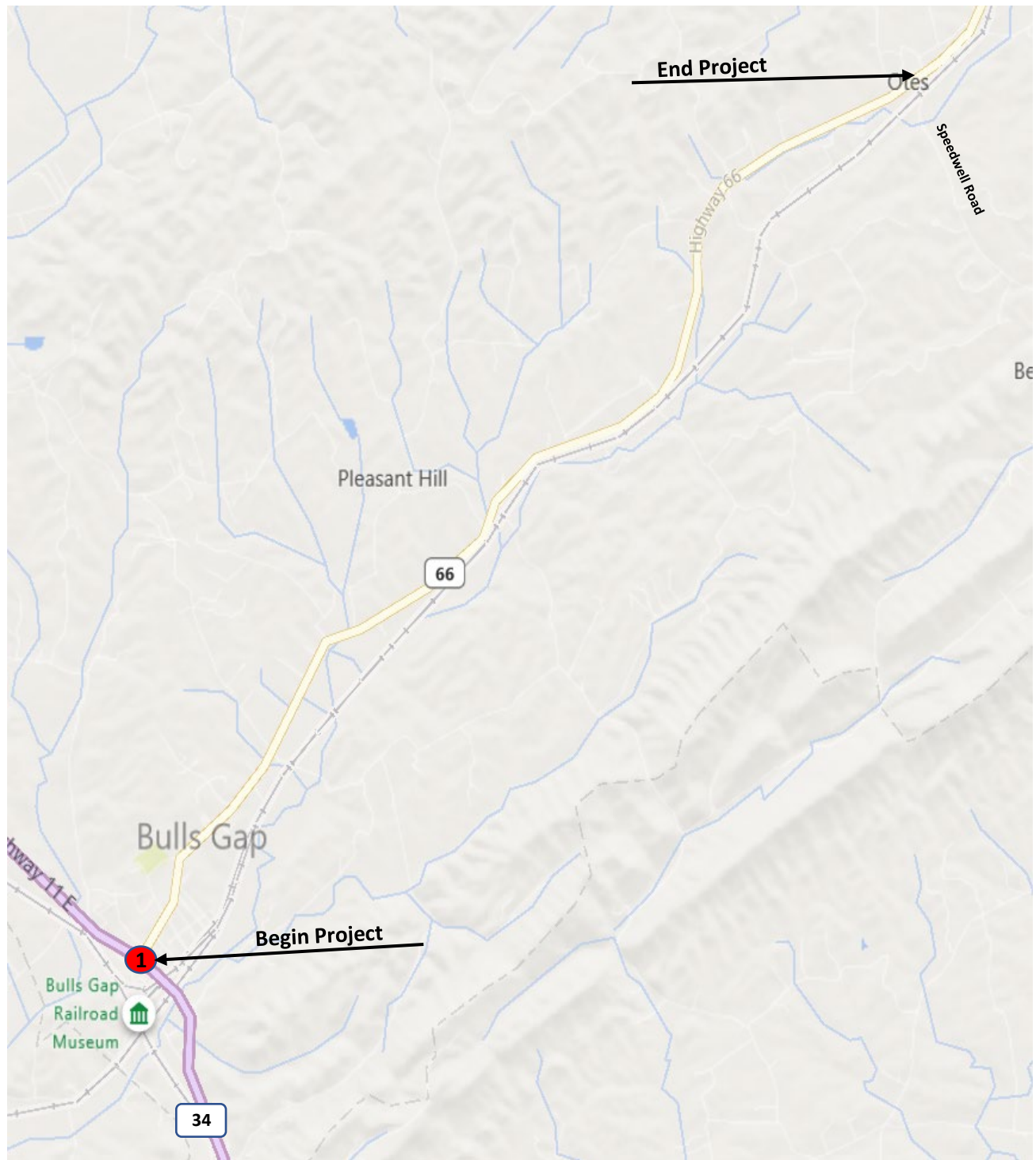
No. of Lanes: 2

% Trucks in Design Lane: 100%

ADL in Design Lane:

FLEX:	0.5	X	1.00	X	271.4	=	136
RIGID:	0.5	X	1.00	X	394.8	=	197

ADL Calculations By: Ashlie Bevan Date: 4/19/2023
 Reviewed By: Randy Boguskie Date: 4/19/2023
 [REV. 7/1/14]

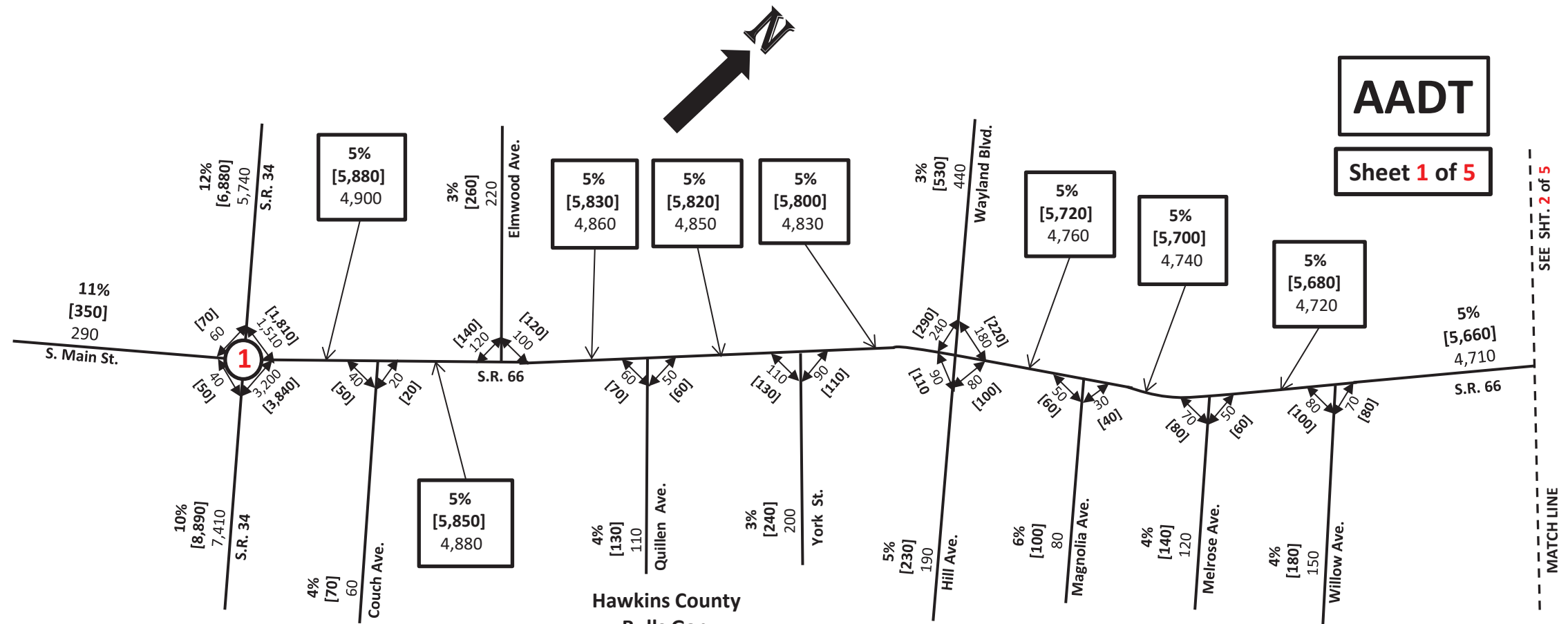


Hawkins County

Bulls Gap

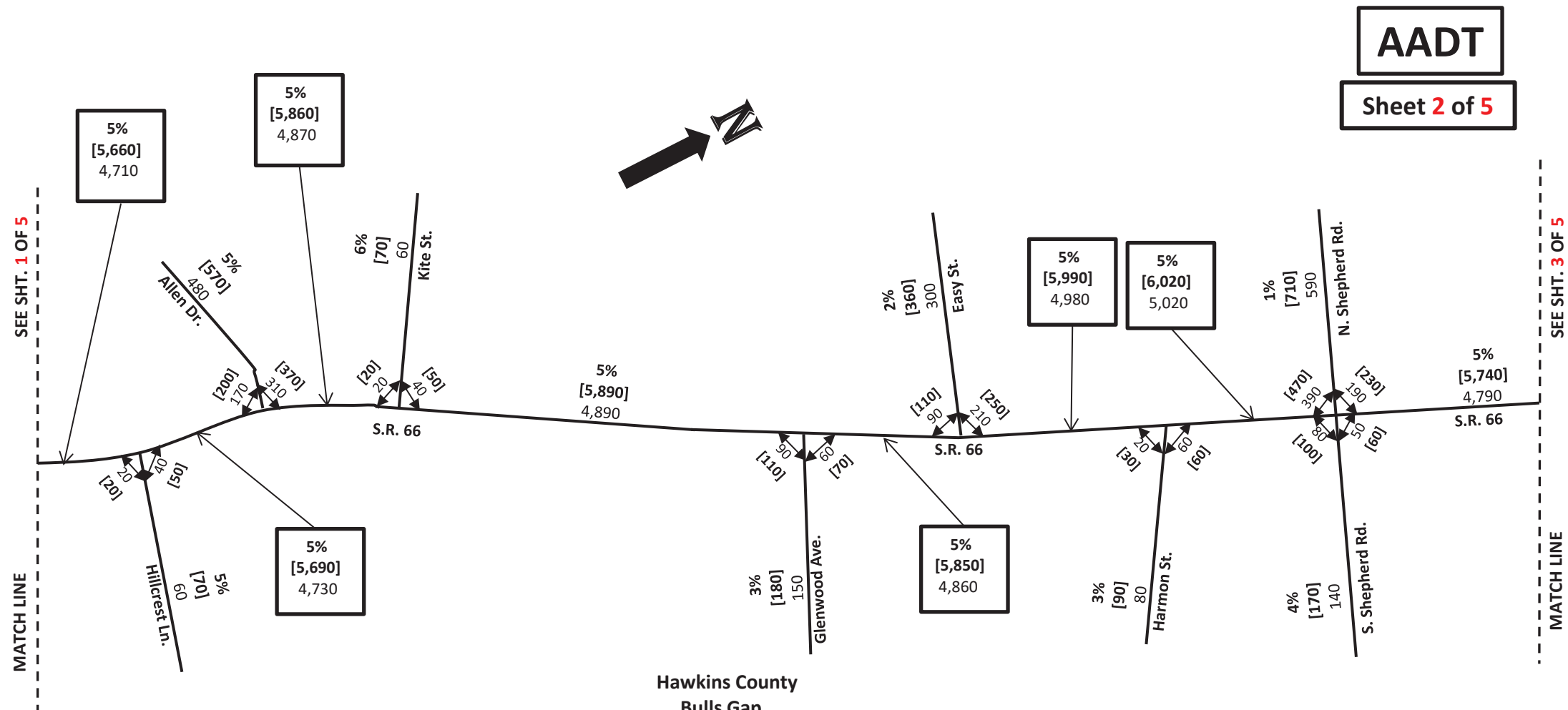
S.R. 66

From S.R. 34 to Speedwell Road / Old Hwy. 66

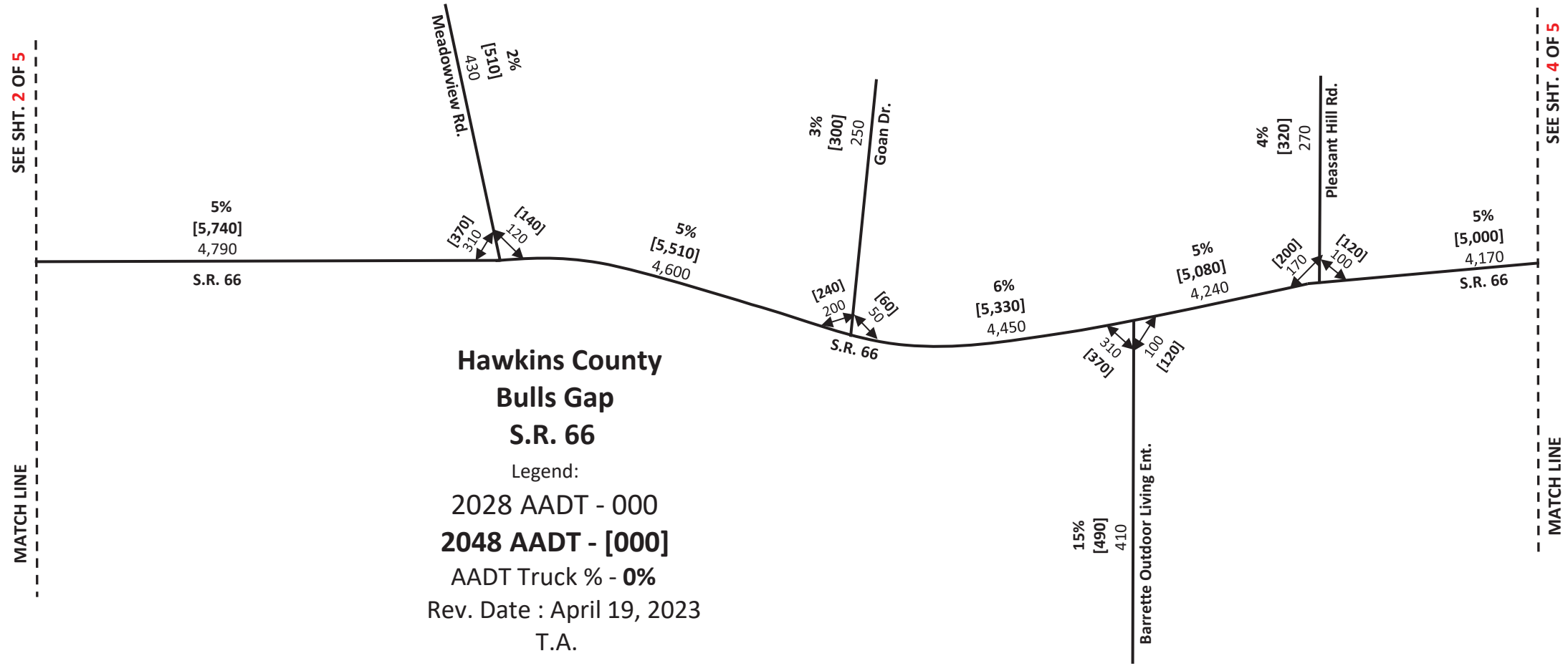


Hawkins County
Bulls Gap
S.R. 66
Legend :
2028 AADT - 000
2048 AADT - [000]
AADT Truck % - 0%
Rev. Date : April 19, 2023
T.A.

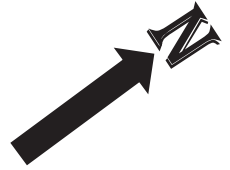
AADT
Sheet 1 of 5

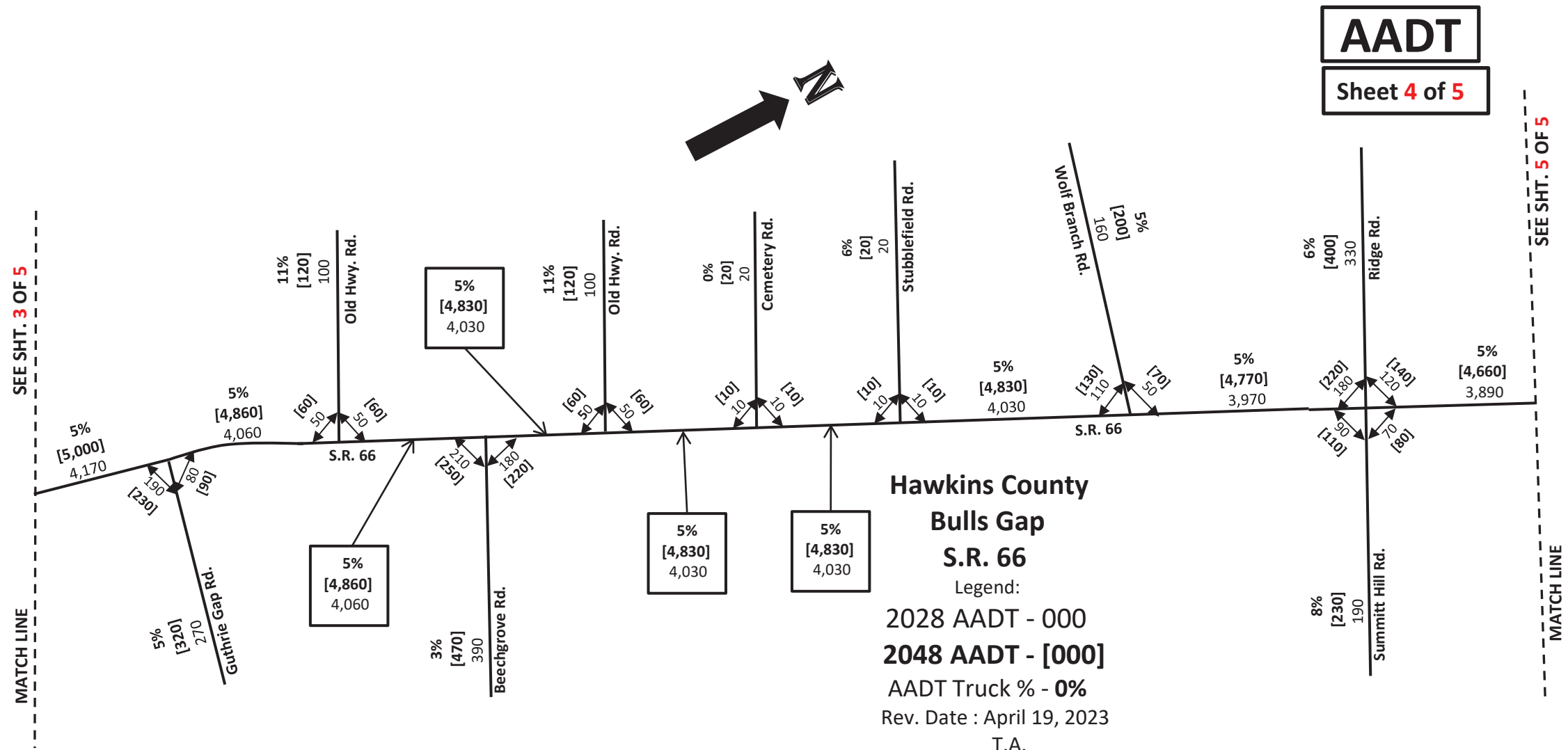


Hawkins County
 Bulls Gap
 S.R. 66
 Legend:
 2028 AADT - 000
2048 AADT - [000]
 AADT Truck % - 0%
 Rev. Date : April 19, 2023
 T.A.



AADT
Sheet **3** of **5**





SEE SHT. 4 OF 5

MATCH LINE



AADT

Sheet 5 of 5

5%
[4,660]
3,890
S.R. 66

6%
[180]
150
Berry Rd.

5%
[4,600]
3,840

5%
[420]
350
Speedwell Rd.

5%
[4,460]
3,730

13%
[180]
150
Old Tn. 66

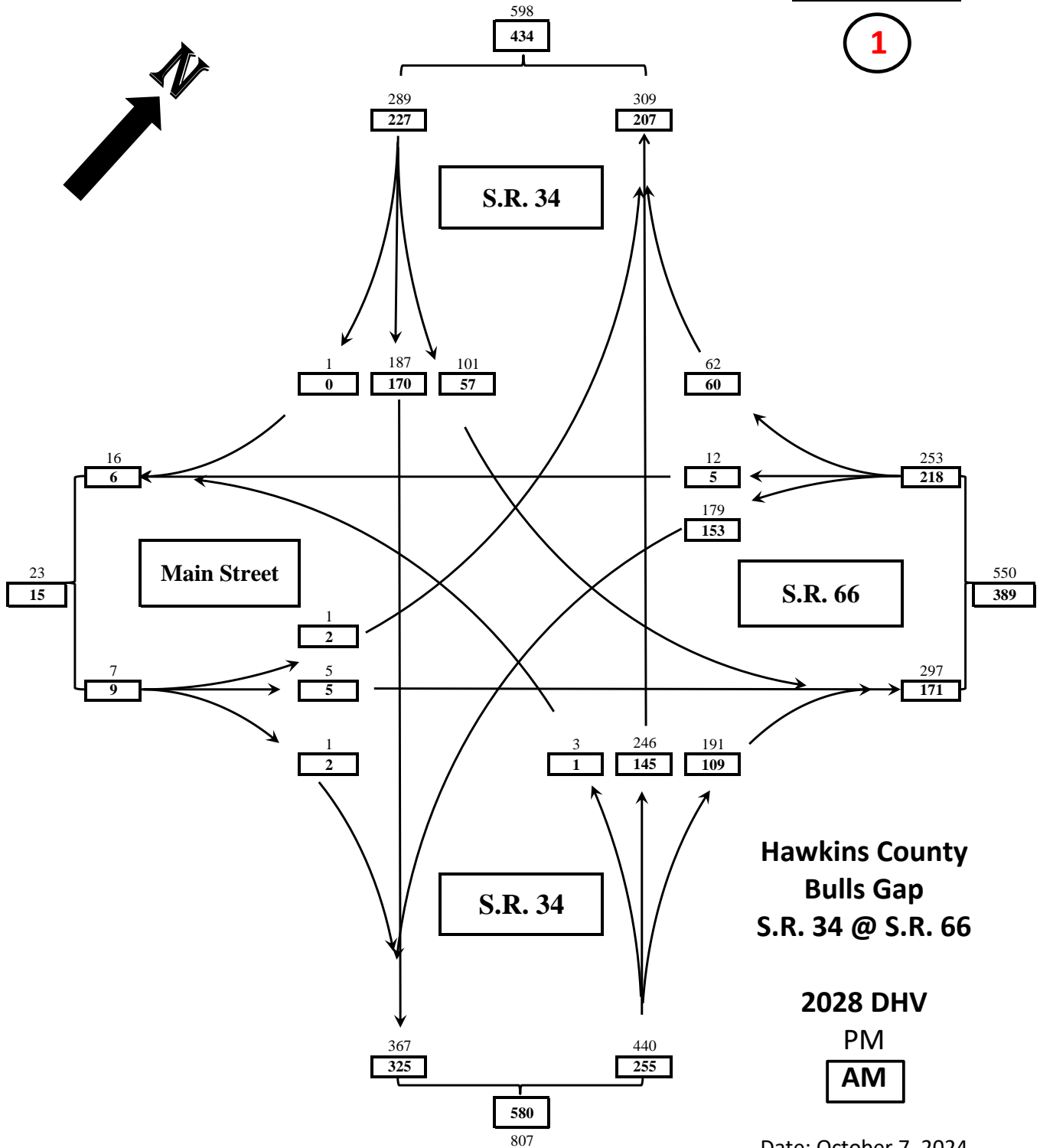
5%
[4,440]
3,700
S.R. 66

Hawkins County
Bulls Gap
S.R. 66

Legend:
2028 AADT - 000
2048 AADT - [000]
AADT Truck % - 0%
Rev. Date : April 19, 2023
T.A.

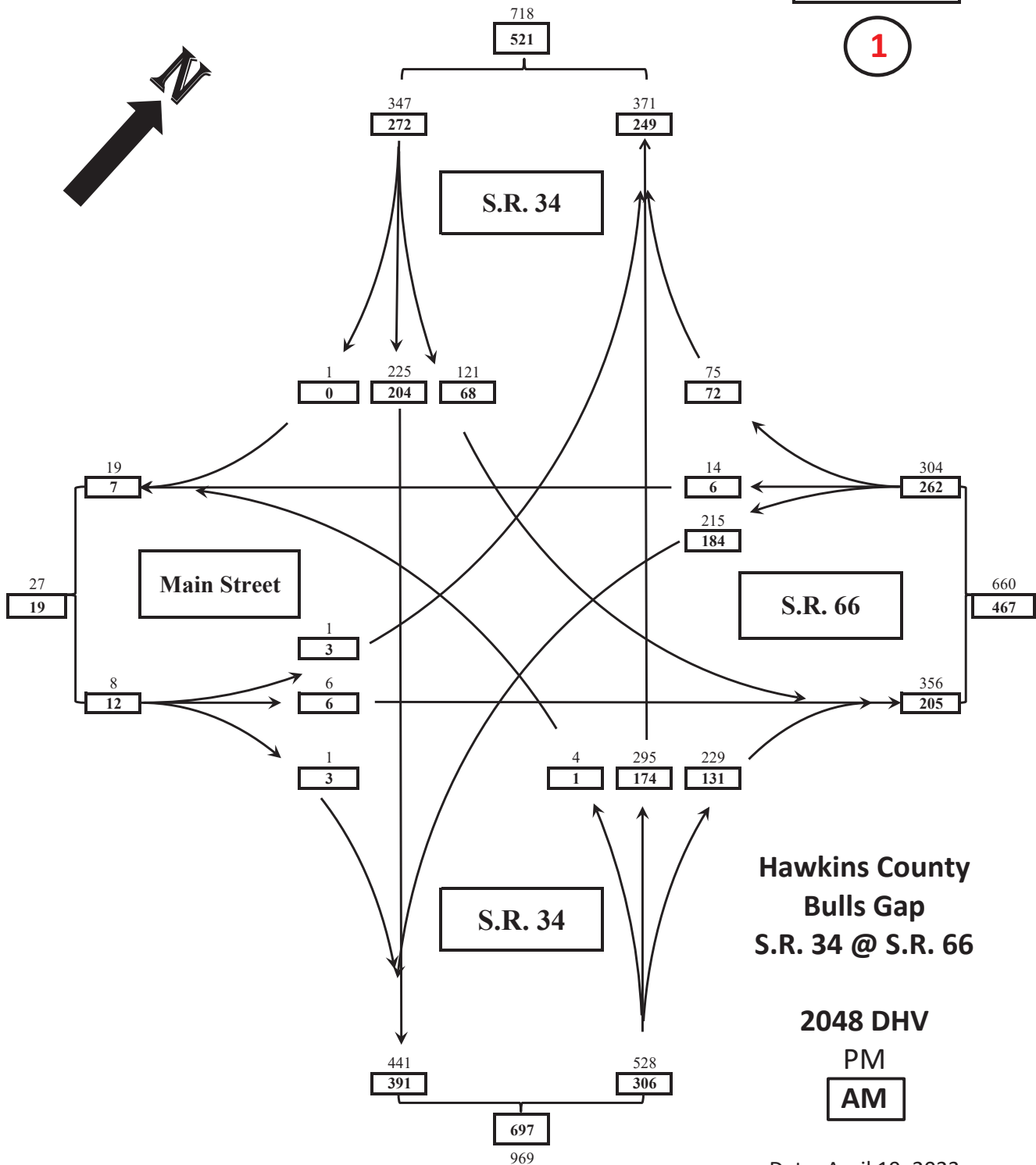
2028 DHV

1



2048 DHV

1



Date: April 19, 2023
TA



Appendix B

HCS7 Reports –
No-Build/Build 2028
No-Build/Build 2048

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment1 No-Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1157
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	30	Access Point Density, pts/mi	18.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	293	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	25.6
Speed Slope Coefficient (m)	1.89381	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.42654	PF Power Coefficient (p)	0.60212
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1157	-	-	24.6

Vehicle Results

Average Speed, mi/h	24.6	Percent Followers, %	49.4
Segment Travel Time, minutes	0.53	Follower Density (FD), followers/mi/ln	5.9
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	15	0.02	5.9	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 4 No-Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5954
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.4

Demand and Capacity

Directional Demand Flow Rate, veh/h	233	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.5
Speed Slope Coefficient (m)	3.68278	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.31376	PF Power Coefficient (p)	0.75291
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5954	-	-	55.9

Vehicle Results

Average Speed, mi/h	55.9	Percent Followers, %	35.5
Segment Travel Time, minutes	1.21	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	60	0.03	1.5	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 2 No-Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	4666
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	30	Access Point Density, pts/mi	10.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	300	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	27.5
Speed Slope Coefficient (m)	4.40660	Speed Power Coefficient (p)	0.41622
PF Slope Coefficient (m)	-1.48292	PF Power Coefficient (p)	0.60897
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4666	-	-	25.3

Vehicle Results

Average Speed, mi/h	25.3	Percent Followers, %	51.0
Segment Travel Time, minutes	2.10	Follower Density (FD), followers/mi/ln	6.0
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	61	0.20	6.0	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 3 No-Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	18334
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	13.6

Demand and Capacity

Directional Demand Flow Rate, veh/h	286	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	49.3
Speed Slope Coefficient (m)	3.11550	Speed Power Coefficient (p)	0.42757
PF Slope Coefficient (m)	-1.55743	PF Power Coefficient (p)	0.65242
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	18334	-	-	47.8

Vehicle Results

Average Speed, mi/h	47.8	Percent Followers, %	49.7
Segment Travel Time, minutes	4.36	Follower Density (FD), followers/mi/ln	3.0
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	228	0.15	3.0	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 1 Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1157
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	30	Access Point Density, pts/mi	18.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	293	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	28.2
Speed Slope Coefficient (m)	2.03473	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.45361	PF Power Coefficient (p)	0.61788
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1157	-	-	27.1

Vehicle Results

Average Speed, mi/h	27.1	Percent Followers, %	49.4
Segment Travel Time, minutes	0.48	Follower Density (FD), followers/mi/ln	5.3
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	15	0.02	5.3	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 2 Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	4666
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	30	Access Point Density, pts/mi	10.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	300	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	30.1
Speed Slope Coefficient (m)	4.19626	Speed Power Coefficient (p)	0.41622
PF Slope Coefficient (m)	-1.48869	PF Power Coefficient (p)	0.62510
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4666	-	-	28.0

Vehicle Results

Average Speed, mi/h	28.0	Percent Followers, %	50.4
Segment Travel Time, minutes	1.89	Follower Density (FD), followers/mi/ln	5.4
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	61	0.16	5.4	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 3 Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	18334
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	45	Access Point Density, pts/mi	13.6

Demand and Capacity

Directional Demand Flow Rate, veh/h	286	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	47.8
Speed Slope Coefficient (m)	3.11550	Speed Power Coefficient (p)	0.41834
PF Slope Coefficient (m)	-1.56799	PF Power Coefficient (p)	0.64752
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	18334	-	-	46.2

Vehicle Results

Average Speed, mi/h	46.2	Percent Followers, %	50.2
Segment Travel Time, minutes	4.50	Follower Density (FD), followers/mi/ln	3.1
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	228	0.16	3.1	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 4 Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5954
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.4

Demand and Capacity

Directional Demand Flow Rate, veh/h	233	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	61.5
Speed Slope Coefficient (m)	3.89958	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28065	PF Power Coefficient (p)	0.76347
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5954	-	-	59.8

Vehicle Results

Average Speed, mi/h	59.8	Percent Followers, %	34.3
Segment Travel Time, minutes	1.13	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	60	0.03	1.3	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment1 No-Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1157
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	30	Access Point Density, pts/mi	18.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	240	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	25.6
Speed Slope Coefficient (m)	1.89381	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.42654	PF Power Coefficient (p)	0.60212
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1157	-	-	24.7

Vehicle Results

Average Speed, mi/h	24.7	Percent Followers, %	45.4
Segment Travel Time, minutes	0.53	Follower Density (FD), followers/mi/ln	4.4
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	12	0.02	4.4	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment2 No-Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	4666
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	30	Access Point Density, pts/mi	10.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	246	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	27.5
Speed Slope Coefficient (m)	2.04681	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.35136	PF Power Coefficient (p)	0.63844
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4666	-	-	26.6

Vehicle Results

Average Speed, mi/h	26.6	Percent Followers, %	42.4
Segment Travel Time, minutes	1.99	Follower Density (FD), followers/mi/ln	3.9
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	50	0.06	3.9	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 3 No-Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	18334
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	13.6

Demand and Capacity

Directional Demand Flow Rate, veh/h	235	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	49.3
Speed Slope Coefficient (m)	3.11550	Speed Power Coefficient (p)	0.42757
PF Slope Coefficient (m)	-1.55743	PF Power Coefficient (p)	0.65242
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	18334	-	-	48.0

Vehicle Results

Average Speed, mi/h	48.0	Percent Followers, %	45.4
Segment Travel Time, minutes	4.34	Follower Density (FD), followers/mi/ln	2.2
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	188	0.10	2.2	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 4 No-Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5954
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.4

Demand and Capacity

Directional Demand Flow Rate, veh/h	190	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.5
Speed Slope Coefficient (m)	3.68278	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.31376	PF Power Coefficient (p)	0.75291
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5954	-	-	56.1

Vehicle Results

Average Speed, mi/h	56.1	Percent Followers, %	31.4
Segment Travel Time, minutes	1.21	Follower Density (FD), followers/mi/ln	1.1
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	49	0.02	1.1	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 1 Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1157
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	30	Access Point Density, pts/mi	18.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	240	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	28.2
Speed Slope Coefficient (m)	2.03473	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.45361	PF Power Coefficient (p)	0.61788
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1157	-	-	27.3

Vehicle Results

Average Speed, mi/h	27.3	Percent Followers, %	45.2
Segment Travel Time, minutes	0.48	Follower Density (FD), followers/mi/ln	4.0
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	12	0.01	4.0	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 2 Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	4666
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	30	Access Point Density, pts/mi	10.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	246	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	30.1
Speed Slope Coefficient (m)	2.18773	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.37147	PF Power Coefficient (p)	0.65245
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4666	-	-	29.2

Vehicle Results

Average Speed, mi/h	29.2	Percent Followers, %	42.2
Segment Travel Time, minutes	1.82	Follower Density (FD), followers/mi/ln	3.6
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	50	0.06	3.6	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 3 Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	18334
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	45	Access Point Density, pts/mi	13.6

Demand and Capacity

Directional Demand Flow Rate, veh/h	235	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	47.8
Speed Slope Coefficient (m)	3.11550	Speed Power Coefficient (p)	0.41834
PF Slope Coefficient (m)	-1.56799	PF Power Coefficient (p)	0.64752
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	18334	-	-	46.4

Vehicle Results

Average Speed, mi/h	46.4	Percent Followers, %	45.9
Segment Travel Time, minutes	4.49	Follower Density (FD), followers/mi/ln	2.3
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	188	0.11	2.3	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	11/24/2024
Agency	Kimley-Horn	Analysis Year	2028
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 4 Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5954
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.4

Demand and Capacity

Directional Demand Flow Rate, veh/h	190	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	61.5
Speed Slope Coefficient (m)	3.89958	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28065	PF Power Coefficient (p)	0.76347
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5954	-	-	60.1

Vehicle Results

Average Speed, mi/h	60.1	Percent Followers, %	30.3
Segment Travel Time, minutes	1.13	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	49	0.02	1.0	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment1 No-Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1157
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	30	Access Point Density, pts/mi	18.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	351	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	25.6
Speed Slope Coefficient (m)	1.89381	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.42654	PF Power Coefficient (p)	0.60212
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1157	-	-	24.5

Vehicle Results

Average Speed, mi/h	24.5	Percent Followers, %	53.2
Segment Travel Time, minutes	0.54	Follower Density (FD), followers/mi/ln	7.6
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	18	0.03	7.6	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 2 No-Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	4666
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	30	Access Point Density, pts/mi	10.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	360	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	27.5
Speed Slope Coefficient (m)	4.40660	Speed Power Coefficient (p)	0.41622
PF Slope Coefficient (m)	-1.48292	PF Power Coefficient (p)	0.60897
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4666	-	-	25.0

Vehicle Results

Average Speed, mi/h	25.0	Percent Followers, %	54.9
Segment Travel Time, minutes	2.12	Follower Density (FD), followers/mi/ln	7.9
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	73	0.27	7.9	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 3 No-Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	18334
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	13.6

Demand and Capacity

Directional Demand Flow Rate, veh/h	343	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	49.3
Speed Slope Coefficient (m)	3.11550	Speed Power Coefficient (p)	0.42757
PF Slope Coefficient (m)	-1.55743	PF Power Coefficient (p)	0.65242
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	18334	-	-	47.6

Vehicle Results

Average Speed, mi/h	47.6	Percent Followers, %	54.0
Segment Travel Time, minutes	4.37	Follower Density (FD), followers/mi/ln	3.9
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	274	0.20	3.9	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 4 No-Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5954
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.4

Demand and Capacity

Directional Demand Flow Rate, veh/h	278	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.5
Speed Slope Coefficient (m)	3.68278	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.31376	PF Power Coefficient (p)	0.75291
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5954	-	-	55.7

Vehicle Results

Average Speed, mi/h	55.7	Percent Followers, %	39.4
Segment Travel Time, minutes	1.21	Follower Density (FD), followers/mi/ln	2.0
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	72	0.04	2.0	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 1 Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1157
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	30	Access Point Density, pts/mi	18.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	351	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	28.2
Speed Slope Coefficient (m)	2.03473	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.45361	PF Power Coefficient (p)	0.61788
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1157	-	-	27.0

Vehicle Results

Average Speed, mi/h	27.0	Percent Followers, %	53.3
Segment Travel Time, minutes	0.49	Follower Density (FD), followers/mi/ln	6.9
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	18	0.03	6.9	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 2 Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	4666
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	30	Access Point Density, pts/mi	10.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	360	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	30.1
Speed Slope Coefficient (m)	4.19626	Speed Power Coefficient (p)	0.41622
PF Slope Coefficient (m)	-1.48869	PF Power Coefficient (p)	0.62510
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4666	-	-	27.7

Vehicle Results

Average Speed, mi/h	27.7	Percent Followers, %	54.4
Segment Travel Time, minutes	1.91	Follower Density (FD), followers/mi/ln	7.1
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	73	0.21	7.1	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 3 Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	18334
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	45	Access Point Density, pts/mi	13.6

Demand and Capacity

Directional Demand Flow Rate, veh/h	343	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	47.8
Speed Slope Coefficient (m)	3.11550	Speed Power Coefficient (p)	0.41834
PF Slope Coefficient (m)	-1.56799	PF Power Coefficient (p)	0.64752
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	18334	-	-	46.1

Vehicle Results

Average Speed, mi/h	46.1	Percent Followers, %	54.4
Segment Travel Time, minutes	4.52	Follower Density (FD), followers/mi/ln	4.1
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	274	0.21	4.1	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 4 Build_NB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5954
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.4

Demand and Capacity

Directional Demand Flow Rate, veh/h	278	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	61.5
Speed Slope Coefficient (m)	3.89958	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28065	PF Power Coefficient (p)	0.76347
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5954	-	-	59.6

Vehicle Results

Average Speed, mi/h	59.6	Percent Followers, %	38.3
Segment Travel Time, minutes	1.14	Follower Density (FD), followers/mi/ln	1.8
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	72	0.04	1.8	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment1 No-Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1157
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	30	Access Point Density, pts/mi	18.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	288	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	25.6
Speed Slope Coefficient (m)	1.89381	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.42654	PF Power Coefficient (p)	0.60212
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1157	-	-	24.6

Vehicle Results

Average Speed, mi/h	24.6	Percent Followers, %	49.0
Segment Travel Time, minutes	0.53	Follower Density (FD), followers/mi/ln	5.7
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	15	0.02	5.7	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment2 No-Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	4666
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	30	Access Point Density, pts/mi	10.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	295	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	27.5
Speed Slope Coefficient (m)	2.04681	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.35136	PF Power Coefficient (p)	0.63844
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4666	-	-	26.5

Vehicle Results

Average Speed, mi/h	26.5	Percent Followers, %	46.2
Segment Travel Time, minutes	2.00	Follower Density (FD), followers/mi/ln	5.1
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	60	0.08	5.1	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 3 No-Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	18334
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	50	Access Point Density, pts/mi	13.6

Demand and Capacity

Directional Demand Flow Rate, veh/h	280	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	49.3
Speed Slope Coefficient (m)	3.11550	Speed Power Coefficient (p)	0.42757
PF Slope Coefficient (m)	-1.55743	PF Power Coefficient (p)	0.65242
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	18334	-	-	47.9

Vehicle Results

Average Speed, mi/h	47.9	Percent Followers, %	49.3
Segment Travel Time, minutes	4.35	Follower Density (FD), followers/mi/ln	2.9
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	224	0.14	2.9	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 4 No-Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5954
Lane Width, ft	10	Shoulder Width, ft	2
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.4

Demand and Capacity

Directional Demand Flow Rate, veh/h	228	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.5
Speed Slope Coefficient (m)	3.68278	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.31376	PF Power Coefficient (p)	0.75291
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5954	-	-	55.9

Vehicle Results

Average Speed, mi/h	55.9	Percent Followers, %	35.1
Segment Travel Time, minutes	1.21	Follower Density (FD), followers/mi/ln	1.4
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	59	0.03	1.4	A

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 1 Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1157
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	30	Access Point Density, pts/mi	18.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	288	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	28.2
Speed Slope Coefficient (m)	2.03473	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.45361	PF Power Coefficient (p)	0.61788
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1157	-	-	27.1

Vehicle Results

Average Speed, mi/h	27.1	Percent Followers, %	49.0
Segment Travel Time, minutes	0.48	Follower Density (FD), followers/mi/ln	5.2
Vehicle LOS	C		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	15	0.02	5.2	C

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 2 Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	4666
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	30	Access Point Density, pts/mi	10.2

Demand and Capacity

Directional Demand Flow Rate, veh/h	295	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	30.1
Speed Slope Coefficient (m)	2.18773	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.37147	PF Power Coefficient (p)	0.65245
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4666	-	-	29.0

Vehicle Results

Average Speed, mi/h	29.0	Percent Followers, %	46.1
Segment Travel Time, minutes	1.83	Follower Density (FD), followers/mi/ln	4.7
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	60	0.08	4.7	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 3 Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	18334
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	45	Access Point Density, pts/mi	13.6

Demand and Capacity

Directional Demand Flow Rate, veh/h	280	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	2	Free-Flow Speed, mi/h	47.8
Speed Slope Coefficient (m)	3.11550	Speed Power Coefficient (p)	0.41834
PF Slope Coefficient (m)	-1.56799	PF Power Coefficient (p)	0.64752
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	18334	-	-	46.3

Vehicle Results

Average Speed, mi/h	46.3	Percent Followers, %	49.8
Segment Travel Time, minutes	4.50	Follower Density (FD), followers/mi/ln	3.0
Vehicle LOS	B		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	224	0.15	3.0	B

HCS Two-Lane Highway Report

Project Information

Analyst	Anahi Aguilon	Date	10/30/2024
Agency	Kimley-Horn	Analysis Year	2048
Jurisdiction	Hawkins County	Time Analyzed	
Project Description	Segment 4 Build_SB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5954
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.4

Demand and Capacity

Directional Demand Flow Rate, veh/h	228	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	61.5
Speed Slope Coefficient (m)	3.89958	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28065	PF Power Coefficient (p)	0.76347
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5954	-	-	59.8

Vehicle Results

Average Speed, mi/h	59.8	Percent Followers, %	33.9
Segment Travel Time, minutes	1.13	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Facility Results

T	VMT veh-mi/AP	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	59	0.03	1.3	A



Appendix C

Synchro Intersection Capacity Analysis
Reports –

No-Build/Build 2028

















No-Build/Build 2048

HCM Signalized Intersection Capacity Analysis

SR-66, PIN 107579.00

1: Main Street/Route 66 & Route 34

2028 No Build

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	2	5	2	153	5	60	57	170	0	1	145	109
Future Volume (vph)	2	5	2	153	5	60	57	170	0	1	145	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	10	10	10
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.96			1.00			0.94	
Flt Protected		0.99			0.97			0.99			1.00	
Satd. Flow (prot)		1590			1716			1637			1576	
Flt Permitted		0.93			0.79			0.86			1.00	
Satd. Flow (perm)		1491			1395			1433			1575	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	5	2	166	5	65	62	185	0	1	158	118
RTOR Reduction (vph)	0	1	0	0	24	0	0	0	0	0	33	0
Lane Group Flow (vph)	0	8	0	0	212	0	0	247	0	0	244	0
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		11.7			11.7			17.0			17.0	
Effective Green, g (s)		11.7			11.7			17.0			17.0	
Actuated g/C Ratio		0.30			0.30			0.44			0.44	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		450			421			629			691	
v/s Ratio Prot												
v/s Ratio Perm		0.01			c0.15			c0.17			0.15	
v/c Ratio		0.02			0.50			0.39			0.35	
Uniform Delay, d1		9.5			11.1			7.4			7.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			1.0			0.4			1.4	
Delay (s)		9.5			12.1			7.8			8.6	
Level of Service		A			B			A			A	
Approach Delay (s/veh)		9.5			12.1			7.8			8.6	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay (s/veh)		9.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		38.7			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		58.0%			ICU Level of Service			B				
Analysis Period (min)		15										
















c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: Hill Avenue/Wayland Drive & Route 66

















SR-66, PIN 107579.00

2028 No Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	149	5	4	200	9	4	1	4	9	1	12
Future Volume (Veh/h)	12	149	5	4	200	9	4	1	4	9	1	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	162	5	4	217	10	4	1	4	10	1	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	1175											
pX, platoon unblocked												
vC, conflicting volume	227			167			434	426	165	425	423	222
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			167			434	426	165	425	423	222
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	98	100	98
cM capacity (veh/h)	1335			1405			516	513	877	531	516	818
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	180	231	9	24								
Volume Left	13	4	4	10								
Volume Right	5	10	4	13								
cSH	1335	1405	631	655								
Volume to Capacity	0.01	0.00	0.01	0.04								
Queue Length 95th (ft)	1	0	1	3								
Control Delay (s/veh)	0.6	0.2	10.8	10.7								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.6	0.2	10.8	10.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			24.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 16: Route 66 & S. Shephard Drive/N. Shephard Drive

SR-66, PIN 107579.00
2028 No Build
















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	20	146	4	3	208	10	9	1	19	4	0	2
Future Volume (Veh/h)	20	146	4	3	208	10	9	1	19	4	0	2
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	159	4	3	226	11	10	1	21	4	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			163			445	445	232	464	448	161
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			163			445	445	232	464	448	161
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	97	99	100	100
cM capacity (veh/h)	1324			1410			515	499	808	489	498	887
Direction, Lane #	NB 1	SB 1	SE 1	NW 1								
Volume Total	185	240	32	6								
Volume Left	22	3	10	4								
Volume Right	4	11	21	2								
cSH	1324	1410	675	575								
Volume to Capacity	0.02	0.00	0.05	0.01								
Queue Length 95th (ft)	1	0	4	1								
Control Delay (s/veh)	1.0	0.1	10.6	11.3								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	1.0	0.1	10.6	11.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			30.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

26: Summit Hill Road/Ridge Road & Route 66

SR-66, PIN 107579.00


















2028 No Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	96	5	4	173	6	4	1	3	6	2	9
Future Volume (Veh/h)	9	96	5	4	173	6	4	1	3	6	2	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	104	5	4	188	7	4	1	3	7	2	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	195			109			337	330	107	330	329	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	195			109			337	330	107	330	329	192
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	99	100	99
cM capacity (veh/h)	1372			1475			598	579	940	612	581	845
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	119	199	8	19								
Volume Left	10	4	4	7								
Volume Right	5	7	3	10								
cSH	1372	1475	689	712								
Volume to Capacity	0.01	0.00	0.01	0.03								
Queue Length 95th (ft)	1	0	1	2								
Control Delay (s/veh)	0.7	0.2	10.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.7	0.2	10.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			20.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 28: Speedwell Road/Old Highway 66 & Route 66

SR-66, PIN 107579.00

2028 No Build


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	85	12	6	166	3	11	0	6	3	0	4
Future Volume (Veh/h)	5	85	12	6	166	3	11	0	6	3	0	4
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	92	13	7	180	3	12	0	7	3	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	183			105			307	306	99	305	311	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	183			105			307	306	99	305	311	182
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1374			1468			633	598	949	639	599	861
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	5	105	7	183	19	7						
Volume Left	5	0	7	0	12	3						
Volume Right	0	13	0	3	7	4						
cSH	1374	1700	1468	1700	722	749						
Volume to Capacity	0.00	0.06	0.00	0.11	0.03	0.01						
Queue Length 95th (ft)	0	0	0	0	2	1						
Control Delay (s/veh)	7.6	0.0	7.5	0.0	10.1	9.8						
Lane LOS	A		A		B	A						
Approach Delay (s/veh)	0.3		0.3		10.1	9.8						
Approach LOS					B	A						
Intersection Summary												
Average Delay				1.1								
Intersection Capacity Utilization				18.9%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

SR-66, PIN 107579.00

1: Main Street/Route 66 & Route 34

2028 Build



















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	2	5	2	153	5	60	57	170	0	1	145	109
Future Volume (vph)	2	5	2	153	5	60	57	170	0	1	145	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.97		1.00	0.86			1.00			0.94	
Flt Protected		0.99		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		1704		1752	1588			1754			1689	
Flt Permitted		0.94		0.75	1.00			0.87			1.00	
Satd. Flow (perm)		1615		1387	1588			1546			1688	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	5	2	166	5	65	62	185	0	1	158	118
RTOR Reduction (vph)	0	2	0	0	50	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	7	0	166	20	0	0	247	0	0	238	0
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		8.7		8.7	8.7			19.1			19.1	
Effective Green, g (s)		8.7		8.7	8.7			19.1			19.1	
Actuated g/C Ratio		0.23		0.23	0.23			0.51			0.51	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		371		319	365			781			852	
v/s Ratio Prot					0.01							
v/s Ratio Perm		0.00		c0.12				c0.16			0.14	
v/c Ratio		0.02		0.52	0.05			0.32			0.28	
Uniform Delay, d1		11.3		12.7	11.3			5.5			5.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.0		1.5	0.1			0.2			0.8	
Delay (s)		11.3		14.3	11.4			5.7			6.2	
Level of Service		B		B	B			A			A	
Approach Delay (s/veh)		11.3			13.4			5.7			6.2	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay (s/veh)			8.3			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			37.8			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			54.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

6: Route 66 & Hill Avenue/Wayland Drive

SR-66, PIN 107579.00

2028 Build



















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	4	1	4	9	1	12	12	149	5	4	200	9
Future Volume (Veh/h)	4	1	4	9	1	12	12	149	5	4	200	9
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	1	4	10	1	13	13	162	5	4	217	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage veh							2			2		
Upstream signal (ft)							1173					
pX, platoon unblocked												
vC, conflicting volume	429	426	165	423	423	222	227				167	
vC1, stage 1 conf vol	191	191		230	230							
vC2, stage 2 conf vol	239	235		193	193							
vCu, unblocked vol	429	426	165	423	423	222	227				167	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	100	100	99	100	98	99				100	
cM capacity (veh/h)	665	630	877	682	637	818	1335				1405	
Direction, Lane #	NB 1	SB 1	NE 1	NE 2	SW 1	SW 2						
Volume Total	9	24	13	167	4	227						
Volume Left	4	10	13	0	4	0						
Volume Right	4	13	0	5	0	10						
cSH	740	747	1335	1700	1405	1700						
Volume to Capacity	0.01	0.03	0.01	0.10	0.00	0.13						
Queue Length 95th (ft)	1	2	1	0	0	0						
Control Delay (s/veh)	9.9	10.0	7.7	0.0	7.6	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s/veh)	9.9	10.0	0.6		0.1							
Approach LOS	A	A										
Intersection Summary												
Average Delay				1.0								
Intersection Capacity Utilization				21.1%	ICU Level of Service					A		
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

16: Route 66 & S. Shephard Drive/N. Shephard Drive

SR-66, PIN 107579.00

2028 Build
















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	20	146	4	3	208	10	9	1	19	4	0	2
Future Volume (Veh/h)	20	146	4	3	208	10	9	1	19	4	0	2
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	159	4	3	226	11	10	1	21	4	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			163			443	445	232	459	448	161
vC1, stage 1 conf vol							238	238			205	205
vC2, stage 2 conf vol							205	207			254	243
vCu, unblocked vol	237			163			443	445	232	459	448	161
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5			6.1	5.5
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	97	99	100	100
cM capacity (veh/h)	1324			1410			672	627	810	640	616	884
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SE 1	NW 1						
Volume Total	22	163	3	237	32	6						
Volume Left	22	0	3	0	10	4						
Volume Right	0	4	0	11	21	2						
cSH	1324	1700	1410	1700	755	705						
Volume to Capacity	0.02	0.10	0.00	0.14	0.04	0.01						
Queue Length 95th (ft)	1	0	0	0	3	1						
Control Delay (s/veh)	7.8	0.0	7.6	0.0	10.0	10.2						
Lane LOS	A			A			A			B		
Approach Delay (s/veh)	0.9			0.1			10.0			10.2		
Approach LOS							A			B		
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			26.6%		ICU Level of Service		A					
Analysis Period (min)			15									











HCM Unsignalized Intersection Capacity Analysis

26: Summit Hill Road/Ridge Road & Route 66

SR-66, PIN 107579.00

2028 Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	96	5	4	173	6	4	1	3	6	2	9
Future Volume (Veh/h)	9	96	5	4	173	6	4	1	3	6	2	9
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	104	5	4	188	7	4	1	3	7	2	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	195			109			337	330	107	330	329	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	195			109			337	330	107	330	329	192
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	99	100	99
cM capacity (veh/h)	1372			1475			598	579	940	612	581	845
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	119	199	8	19								
Volume Left	10	4	4	7								
Volume Right	5	7	3	10								
cSH	1372	1475	689	712								
Volume to Capacity	0.01	0.00	0.01	0.03								
Queue Length 95th (ft)	1	0	1	2								
Control Delay (s/veh)	0.7	0.2	10.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.7	0.2	10.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay				1.1								
Intersection Capacity Utilization				20.4%	ICU Level of Service				A			
Analysis Period (min)				15								

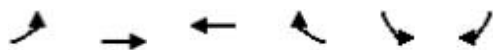
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	90	12	6	166	11	6
Future Volume (Veh/h)	90	12	6	166	11	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	13	7	180	12	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		TWLTL			
Median storage veh			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			111		299	105
vC1, stage 1 conf vol					105	
vC2, stage 2 conf vol					194	
vCu, unblocked vol			111		299	105
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1460		780	942
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	111	7	180	19		
Volume Left	0	7	0	12		
Volume Right	13	0	0	7		
cSH	1700	1460	1700	833		
Volume to Capacity	0.07	0.00	0.11	0.02		
Queue Length 95th (ft)	0	0	0	2		
Control Delay (s/veh)	0.0	7.5	0.0	9.4		
Lane LOS		A		A		
Approach Delay (s/veh)	0.0	0.3		9.4		
Approach LOS				A		
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			18.7%	ICU Level of Service	A	
Analysis Period (min)			15			





HCM Unsignalized Intersection Capacity Analysis

29: Route 66 & Old Highway 66

SR-66, PIN 107579.00

2028 Build



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	85	172	3	3	4
Future Volume (Veh/h)	5	85	172	3	3	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	92	187	3	3	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	None			
Median storage veh		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	190				291	189
vC1, stage 1 conf vol					189	
vC2, stage 2 conf vol					102	
vCu, unblocked vol	190				291	189
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1384				794	853
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	5	92	190	7		
Volume Left	5	0	0	3		
Volume Right	0	0	3	4		
cSH	1384	1700	1700	827		
Volume to Capacity	0.00	0.05	0.11	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s/veh)	7.6	0.0	0.0	9.4		
Lane LOS	A			A		
Approach Delay (s/veh)	0.4		0.0	9.4		
Approach LOS				A		
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			19.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

SR-66, PIN 107579.00

1: Main Street/Route 66 & Route 34

2028 No Build
















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	1	5	1	179	12	62	101	187	1	3	246	191
Future Volume (vph)	1	5	1	179	12	62	101	187	1	3	246	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	10	10	10
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.97			1.00			0.94	
Flt Protected		0.99			0.97			0.98			1.00	
Satd. Flow (prot)		1614			1723			1628			1574	
Flt Permitted		0.96			0.79			0.76			1.00	
Satd. Flow (perm)		1555			1401			1256			1572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	5	1	195	13	67	110	203	1	3	267	208
RTOR Reduction (vph)	0	1	0	0	20	0	0	0	0	0	32	0
Lane Group Flow (vph)	0	6	0	0	255	0	0	314	0	0	446	0
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		14.2			14.2			22.5			22.5	
Effective Green, g (s)		14.2			14.2			22.5			22.5	
Actuated g/C Ratio		0.30			0.30			0.48			0.48	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		472			426			605			757	
v/s Ratio Prot												
v/s Ratio Perm		0.00			c0.18			0.25			c0.28	
v/c Ratio		0.01			0.60			0.52			0.59	
Uniform Delay, d1		11.4			13.8			8.4			8.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			2.3			0.8			3.3	
Delay (s)		11.4			16.1			9.1			12.1	
Level of Service		B			B			A			B	
Approach Delay (s/veh)		11.4			16.1			9.1			12.1	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay (s/veh)		12.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		46.7			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		73.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

6: Hill Avenue/Wayland Drive & Route 66

SR-66, PIN 107579.00

















2028 No Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	249	5	4	201	9	4	1	4	9	1	12
Future Volume (Veh/h)	12	249	5	4	201	9	4	1	4	9	1	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	271	5	4	218	10	4	1	4	10	1	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	1175											
pX, platoon unblocked												
vC, conflicting volume	228			276			544	536	274	535	533	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228			276			544	536	274	535	533	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	99	98	100	98
cM capacity (veh/h)	1334			1281			436	444	763	449	447	817
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	289	232	9	24								
Volume Left	13	4	4	10								
Volume Right	5	10	4	13								
cSH	1334	1281	540	593								
Volume to Capacity	0.01	0.00	0.02	0.04								
Queue Length 95th (ft)	1	0	1	3								
Control Delay (s/veh)	0.4	0.2	11.8	11.3								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.4	0.2	11.8	11.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			29.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
16: Route 66 & S. Shephard Drive/N. Shephard Drive

SR-66, PIN 107579.00

2028 No Build

















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	20	252	4	3	203	10	9	1	19	4	0	2
Future Volume (Veh/h)	20	252	4	3	203	10	9	1	19	4	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	274	4	3	221	11	10	1	21	4	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	232			278			555	555	227	574	558	276
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232			278			555	555	227	574	558	276
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	97	99	100	100
cM capacity (veh/h)	1330			1279			435	432	813	413	431	765
Direction, Lane #	NB 1	SB 1	SE 1	NW 1								
Volume Total	300	235	32	6								
Volume Left	22	3	10	4								
Volume Right	4	11	21	2								
cSH	1330	1279	626	488								
Volume to Capacity	0.02	0.00	0.05	0.01								
Queue Length 95th (ft)	1	0	4	1								
Control Delay (s/veh)	0.7	0.1	11.1	12.5								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.7	0.1	11.1	12.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			35.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

26: Summit Hill Road/Ridge Road & Route 66

SR-66, PIN 107579.00

2028 No Build




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	204	5	4	165	6	4	1	3	6	2	9
Future Volume (Veh/h)	9	204	5	4	165	6	4	1	3	6	2	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	222	5	4	179	7	4	1	3	7	2	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	186			227			446	439	225	439	438	183
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	186			227			446	439	225	439	438	183
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	99	100	99
cM capacity (veh/h)	1382			1335			506	502	808	518	505	855
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	237	190	8	19								
Volume Left	10	4	4	7								
Volume Right	5	7	3	10								
cSH	1382	1335	588	651								
Volume to Capacity	0.01	0.00	0.01	0.03								
Queue Length 95th (ft)	1	0	1	2								
Control Delay (s/veh)	0.4	0.2	11.2	10.7								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.4	0.2	11.2	10.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			25.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

28: Speedwell Road/Old Highway 66 & Route 66

SR-66, PIN 107579.00

2028 No Build


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	193	12	6	158	3	11	0	6	3	0	4
Future Volume (Veh/h)	5	193	12	6	158	3	11	0	6	3	0	4
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	210	13	7	172	3	12	0	7	3	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	175			223			417	416	217	415	421	174
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	175			223			417	416	217	415	421	174
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	99	99	100	100
cM capacity (veh/h)	1383			1328			535	518	816	540	520	870
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	5	223	7	175	19	7						
Volume Left	5	0	7	0	12	3						
Volume Right	0	13	0	3	7	4						
cSH	1383	1700	1328	1700	613	689						
Volume to Capacity	0.00	0.13	0.01	0.10	0.03	0.01						
Queue Length 95th (ft)	0	0	0	0	2	1						
Control Delay (s/veh)	7.6	0.0	7.7	0.0	11.1	10.3						
Lane LOS	A		A		B	B						
Approach Delay (s/veh)	0.2		0.3		11.1	10.3						
Approach LOS					B	B						
Intersection Summary												
Average Delay				0.9								
Intersection Capacity Utilization				20.9%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

SR-66, PIN 107579.00

1: Main Street/Route 66 & Route 34

2028 Build



















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	1	5	1	179	12	62	101	187	1	3	246	191
Future Volume (vph)	1	5	1	179	12	62	101	187	1	3	246	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.87			1.00			0.94	
Flt Protected		0.99		0.95	1.00			0.98			1.00	
Satd. Flow (prot)		1729		1752	1613			1744			1687	
Flt Permitted		0.97		0.75	1.00			0.74			1.00	
Satd. Flow (perm)		1687		1389	1613			1313			1684	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	5	1	195	13	67	110	203	1	3	267	208
RTOR Reduction (vph)	0	1	0	0	51	0	0	0	0	0	35	0
Lane Group Flow (vph)	0	6	0	195	29	0	0	314	0	0	443	0
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		12.1		12.1	12.1			27.5			27.5	
Effective Green, g (s)		12.1		12.1	12.1			27.5			27.5	
Actuated g/C Ratio		0.24		0.24	0.24			0.55			0.55	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		411		338	393			727			933	
v/s Ratio Prot					0.02							
v/s Ratio Perm		0.00		c0.14				0.24			c0.26	
v/c Ratio		0.02		0.58	0.07			0.43			0.47	
Uniform Delay, d1		14.2		16.5	14.4			6.5			6.7	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.0		2.4	0.1			0.4			1.7	
Delay (s)		14.2		18.9	14.5			6.9			8.4	
Level of Service		B		B	B			A			A	
Approach Delay (s/veh)		14.2			17.6			6.9			8.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay (s/veh)			10.4									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			49.6							15.0		
Intersection Capacity Utilization			69.4%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

6: Route 66 & Hill Avenue/Wayland Drive

SR-66, PIN 107579.00

2028 Build



















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	4	1	4	9	1	12	12	249	5	4	201	9
Future Volume (Veh/h)	4	1	4	9	1	12	12	249	5	4	201	9
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	1	4	10	1	13	13	271	5	4	218	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage (veh)							2			2		
Upstream signal (ft)							1173					
pX, platoon unblocked												
vC, conflicting volume	539	536	274	533	533	223	228			276		
vC1, stage 1 conf vol	300	300		231	231							
vC2, stage 2 conf vol	240	236		302	302							
vCu, unblocked vol	539	536	274	533	533	223	228			276		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	98	100	98	99			100		
cM capacity (veh/h)	609	583	763	618	587	817	1334			1281		
Direction, Lane #	NB 1	SB 1	NE 1	NE 2	SW 1	SW 2						
Volume Total	9	24	13	276	4	228						
Volume Left	4	10	13	0	4	0						
Volume Right	4	13	0	5	0	10						
cSH	665	710	1334	1700	1281	1700						
Volume to Capacity	0.01	0.03	0.01	0.16	0.00	0.13						
Queue Length 95th (ft)	1	3	1	0	0	0						
Control Delay (s/veh)	10.5	10.3	7.7	0.0	7.8	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s/veh)	10.5	10.3	0.3		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay	0.9											
Intersection Capacity Utilization	23.4%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

16: Route 66 & S. Shephard Drive/N. Shephard Drive

SR-66, PIN 107579.00

2028 Build

















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	20	252	4	3	203	10	9	1	19	4	0	2
Future Volume (Veh/h)	20	252	4	3	203	10	9	1	19	4	0	2
Sign Control	Free				Free				Stop			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	274	4	3	221	11	10	1	21	4	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	232			278			553	555	227	569	558	276
vC1, stage 1 conf vol							233	233		320	320	
vC2, stage 2 conf vol							320	322		249	238	
vCu, unblocked vol	232			278			553	555	227	569	558	276
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	97	99	100	100
cM capacity (veh/h)	1330			1279			607	576	815	587	570	763
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SE 1	NW 1						
Volume Total	22	278	3	232	32	6						
Volume Left	22	0	3	0	10	4						
Volume Right	0	4	0	11	21	2						
cSH	1330	1700	1279	1700	728	636						
Volume to Capacity	0.02	0.16	0.00	0.14	0.04	0.01						
Queue Length 95th (ft)	1	0	0	0	3	1						
Control Delay (s/veh)	7.8	0.0	7.8	0.0	10.2	10.7						
Lane LOS	A		A		B	B						
Approach Delay (s/veh)	0.6		0.1		10.2	10.7						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			26.6%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

26: Summit Hill Road/Ridge Road & Route 66

SR-66, PIN 107579.00

2028 Build











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	204	5	4	165	6	4	1	3	6	2	9
Future Volume (Veh/h)	9	204	5	4	165	6	4	1	3	6	2	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	222	5	4	179	7	4	1	3	7	2	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	186			227			446	439	225	439	438	183
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	186			227			446	439	225	439	438	183
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	99	100	99
cM capacity (veh/h)	1382			1335			506	502	808	518	505	855
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	237	190	8	19								
Volume Left	10	4	4	7								
Volume Right	5	7	3	10								
cSH	1382	1335	588	651								
Volume to Capacity	0.01	0.00	0.01	0.03								
Queue Length 95th (ft)	1	0	1	2								
Control Delay (s/veh)	0.4	0.2	11.2	10.7								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.4	0.2	11.2	10.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			25.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

28: Speedwell Road & Route 66

SR-66, PIN 107579.00

2028 Build

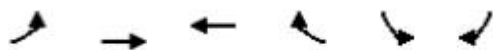
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	198	12	6	158	11	6
Future Volume (Veh/h)	198	12	6	158	11	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	215	13	7	172	12	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		TWLTL			
Median storage veh	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			228		408	222
vC1, stage 1 conf vol					222	
vC2, stage 2 conf vol					186	
vCu, unblocked vol			228		408	222
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1323		726	811
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	228	7	172	19		
Volume Left	0	7	0	12		
Volume Right	13	0	0	7		
cSH	1700	1323	1700	755		
Volume to Capacity	0.13	0.01	0.10	0.03		
Queue Length 95th (ft)	0	0	0	2		
Control Delay (s/veh)	0.0	7.7	0.0	9.9		
Lane LOS	A		A			
Approach Delay (s/veh)	0.0	0.3	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			21.1%	ICU Level of Service		A
Analysis Period (min)			15			





HCM Unsignalized Intersection Capacity Analysis

29: Route 66 & Old Highway 66

SR-66, PIN 107579.00

2028 Build



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	193	164	3	3	4
Future Volume (Veh/h)	5	193	164	3	3	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	210	178	3	3	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	None			
Median storage veh		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	181				400	180
vC1, stage 1 conf vol					180	
vC2, stage 2 conf vol					220	
vCu, unblocked vol	181				400	180
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1394				737	863
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	5	210	181	7		
Volume Left	5	0	0	3		
Volume Right	0	0	3	4		
cSH	1394	1700	1700	804		
Volume to Capacity	0.00	0.12	0.11	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s/veh)	7.6	0.0	0.0	9.5		
Lane LOS	A			A		
Approach Delay (s/veh)	0.2		0.0	9.5		
Approach LOS				A		
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			20.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

SR-66, PIN 107579.00

1: Main Street/Route 66 & Route 34

2048 No Build

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	3	6	3	184	6	72	68	204	0	1	174	131
Future Volume (vph)	3	6	3	184	6	72	68	204	0	1	174	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	10	10	10
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.96			1.00			0.94	
Flt Protected		0.99			0.97			0.99			1.00	
Satd. Flow (prot)		1587			1716			1637			1576	
Flt Permitted		0.92			0.78			0.84			1.00	
Satd. Flow (perm)		1479			1391			1396			1575	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	7	3	200	7	78	74	222	0	1	189	142
RTOR Reduction (vph)	0	2	0	0	23	0	0	0	0	0	34	0
Lane Group Flow (vph)	0	11	0	0	262	0	0	296	0	0	298	0
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		13.1			13.1			17.1			17.1	
Effective Green, g (s)		13.1			13.1			17.1			17.1	
Actuated g/C Ratio		0.33			0.33			0.43			0.43	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		481			453			593			669	
v/s Ratio Prot												
v/s Ratio Perm		0.01			c0.19			c0.21			0.19	
v/c Ratio		0.02			0.58			0.50			0.44	
Uniform Delay, d1		9.2			11.3			8.4			8.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			1.8			0.7			2.1	
Delay (s)		9.2			13.1			9.1			10.3	
Level of Service		A			B			A			B	
Approach Delay (s/veh)		9.2			13.1			9.1			10.3	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM 2000 Control Delay (s/veh)		10.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		40.2			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		65.8%			ICU Level of Service			C				
Analysis Period (min)		15										

















c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

6: Hill Avenue/Wayland Drive & Route 66

















SR-66, PIN 107579.00

2048 No Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	178	6	5	241	11	5	1	5	11	1	14
Future Volume (Veh/h)	15	178	6	5	241	11	5	1	5	11	1	14
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	193	7	5	262	12	5	1	5	12	1	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	1175											
pX, platoon unblocked												
vC, conflicting volume	274			200			522	513	197	512	510	268
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	274			200			522	513	197	512	510	268
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	99	97	100	98
cM capacity (veh/h)	1283			1366			448	456	842	463	459	771
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	216	279	11	28								
Volume Left	16	5	5	12								
Volume Right	7	12	5	15								
cSH	1283	1366	570	589								
Volume to Capacity	0.01	0.00	0.02	0.05								
Queue Length 95th (ft)	1	0	1	4								
Control Delay (s/veh)	0.7	0.2	11.4	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.7	0.2	11.4	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay				1.2								
Intersection Capacity Utilization				27.8%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 16: Route 66 & S. Shephard Drive/N. Shephard Drive

SR-66, PIN 107579.00
2048 No Build
















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	24	176	5	3	248	12	11	1	23	5	0	3
Future Volume (Veh/h)	24	176	5	3	248	12	11	1	23	5	0	3
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	191	5	3	270	13	12	1	25	5	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	283			196			531	531	277	554	535	194
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	283			196			531	531	277	554	535	194
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			97	100	97	99	100	100
cM capacity (veh/h)	1274			1371			449	444	762	422	443	851
Direction, Lane #	NB 1	SB 1	SE 1	NW 1								
Volume Total	222	286	38	8								
Volume Left	26	3	12	5								
Volume Right	5	13	25	3								
cSH	1274	1371	615	520								
Volume to Capacity	0.02	0.00	0.06	0.02								
Queue Length 95th (ft)	2	0	5	1								
Control Delay (s/veh)	1.1	0.1	11.2	12.0								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	1.1	0.1	11.2	12.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			35.1%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

26: Summit Hill Road/Ridge Road & Route 66



















SR-66, PIN 107579.00

2048 No Build

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	11	121	6	4	202	7	5	2	4	7	2	11	
Future Volume (Veh/h)	11	121	6	4	202	7	5	2	4	7	2	11	
Sign Control	Free				Free				Stop		Stop		
Grade	0%				0%				0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	12	132	7	4	220	8	5	2	4	8	2	12	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None						None						
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	228			139				405	396	136	397	395	224
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	228			139				405	396	136	397	395	224
tC, single (s)	4.1			4.1				7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100				99	100	100	99	100	99
cM capacity (veh/h)	1334			1438				537	530	905	551	532	810
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	151	232	11	22									
Volume Left	12	4	5	8									
Volume Right	7	8	4	12									
cSH	1334	1438	628	665									
Volume to Capacity	0.01	0.00	0.02	0.03									
Queue Length 95th (ft)	1	0	1	3									
Control Delay (s/veh)	0.7	0.2	10.8	10.6									
Lane LOS	A	A	B	B									
Approach Delay (s/veh)	0.7	0.2	10.8	10.6									
Approach LOS			B	B									
Intersection Summary													
Average Delay			1.2										
Intersection Capacity Utilization			22.8%		ICU Level of Service			A					
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis 28: Speedwell Road/Old Highway 66 & Route 66

SR-66, PIN 107579.00
2048 No Build


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	110	14	7	191	4	14	0	7	4	0	5
Future Volume (Veh/h)	5	110	14	7	191	4	14	0	7	4	0	5
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	120	15	8	208	4	15	0	8	4	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	212			135			367	366	128	364	371	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			135			367	366	128	364	371	210
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	99	99	100	99
cM capacity (veh/h)	1341			1431			577	553	915	583	554	830
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	5	135	8	212	23	9						
Volume Left	5	0	8	0	15	4						
Volume Right	0	15	0	4	8	5						
cSH	1341	1700	1431	1700	662	698						
Volume to Capacity	0.00	0.08	0.01	0.12	0.03	0.01						
Queue Length 95th (ft)	0	0	0	0	3	1						
Control Delay (s/veh)	7.7	0.0	7.5	0.0	10.6	10.2						
Lane LOS	A		A		B	B						
Approach Delay (s/veh)	0.3		0.3		10.6	10.2						
Approach LOS					B	B						
Intersection Summary												
Average Delay				1.1								
Intersection Capacity Utilization				20.3%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

SR-66, PIN 107579.00

1: Main Street/Route 66 & Route 34

2048 Build



















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	3	6	3	184	6	72	68	204	0	1	174	131
Future Volume (vph)	3	6	3	184	6	72	68	204	0	1	174	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.97		1.00	0.86			1.00			0.94	
Flt Protected		0.99		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		1701		1752	1591			1754			1689	
Flt Permitted		0.93		0.75	1.00			0.85			1.00	
Satd. Flow (perm)		1604		1382	1591			1511			1688	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	7	3	200	7	78	74	222	0	1	189	142
RTOR Reduction (vph)	0	2	0	0	60	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	11	0	200	25	0	0	296	0	0	293	0
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		9.0		9.0	9.0			19.6			19.6	
Effective Green, g (s)		9.0		9.0	9.0			19.6			19.6	
Actuated g/C Ratio		0.23		0.23	0.23			0.51			0.51	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		373		322	370			767			857	
v/s Ratio Prot					0.02							
v/s Ratio Perm		0.01		c0.14				c0.20			0.17	
v/c Ratio		0.03		0.62	0.07			0.39			0.34	
Uniform Delay, d1		11.4		13.3	11.5			5.8			5.7	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.0		3.7	0.1			0.3			1.1	
Delay (s)		11.5		17.0	11.6			6.1			6.7	
Level of Service		B		B	B			A			A	
Approach Delay (s/veh)		11.5			15.4			6.1			6.7	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay (s/veh)			9.3			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			38.6			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			61.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

6: Route 66 & Hill Avenue/Wayland Drive

SR-66, PIN 107579.00



















2048 Build

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	5	1	5	11	1	14	15	178	6	5	241	11
Future Volume (Veh/h)	5	1	5	11	1	14	15	178	6	5	241	11
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	5	12	1	15	16	193	7	5	262	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage (veh)							2			2		
Upstream signal (ft)							1173					
pX, platoon unblocked												
vC, conflicting volume	516	513	197	509	510	268	274				200	
vC1, stage 1 conf vol	229	229		278	278							
vC2, stage 2 conf vol	288	284		231	232							
vCu, unblocked vol	516	513	197	509	510	268	274				200	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	100	99	98	100	98	99				100	
cM capacity (veh/h)	613	589	842	632	597	771	1283				1366	
Direction, Lane #	NB 1	SB 1	NE 1	NE 2	SW 1	SW 2						
Volume Total	11	28	16	200	5	274						
Volume Left	5	12	16	0	5	0						
Volume Right	5	15	0	7	0	12						
cSH	697	698	1283	1700	1366	1700						
Volume to Capacity	0.02	0.04	0.01	0.12	0.00	0.16						
Queue Length 95th (ft)	1	3	1	0	0	0						
Control Delay (s/veh)	10.3	10.4	7.8	0.0	7.6	0.0						
Lane LOS	B	B	A	A								
Approach Delay (s/veh)	10.3	10.4	0.6	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			23.4%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
16: Route 66 & S. Shephard Drive/N. Shephard Drive

SR-66, PIN 107579.00
















2048 Build

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	24	176	5	3	248	12	11	1	23	5	0	3
Future Volume (Veh/h)	24	176	5	3	248	12	11	1	23	5	0	3
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	191	5	3	270	13	12	1	25	5	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	283			196			529	531	277	547	535	194
vC1, stage 1 conf vol							283	283		246	246	
vC2, stage 2 conf vol							246	248		302	289	
vCu, unblocked vol	283			196			529	531	277	547	535	194
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	97	99	100	100
cM capacity (veh/h)	1274			1371			624	589	765	588	576	848
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SE 1	NW 1						
Volume Total	26	196	3	283	38	8						
Volume Left	26	0	3	0	12	5						
Volume Right	0	5	0	13	25	3						
cSH	1274	1700	1371	1700	708	664						
Volume to Capacity	0.02	0.12	0.00	0.17	0.05	0.01						
Queue Length 95th (ft)	2	0	0	0	4	1						
Control Delay (s/veh)	7.9	0.0	7.6	0.0	10.4	10.5						
Lane LOS	A		A		B	B						
Approach Delay (s/veh)	0.9		0.1		10.4	10.5						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			29.9%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 26: Summit Hill Road/Ridge Road & Route 66

SR-66, PIN 107579.00

2048 Build











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	121	6	4	202	7	5	2	4	7	2	11
Future Volume (Veh/h)	11	121	6	4	202	7	5	2	4	7	2	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	132	7	4	220	8	5	2	4	8	2	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	228			139			405	396	136	397	395	224
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228			139			405	396	136	397	395	224
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	99	100	99
cM capacity (veh/h)	1334			1438			537	530	905	551	532	810
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	232	11	22								
Volume Left	12	4	5	8								
Volume Right	7	8	4	12								
cSH	1334	1438	628	665								
Volume to Capacity	0.01	0.00	0.02	0.03								
Queue Length 95th (ft)	1	0	1	3								
Control Delay (s/veh)	0.7	0.2	10.8	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.7	0.2	10.8	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			22.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

28: Speedwell Road & Route 66

SR-66, PIN 107579.00

2048 Build

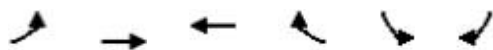
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	115	14	7	191	14	7
Future Volume (Veh/h)	115	14	7	191	14	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	15	8	208	15	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		TWLTL			
Median storage veh			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			140		357	133
vC1, stage 1 conf vol					133	
vC2, stage 2 conf vol					224	
vCu, unblocked vol			140		357	133
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1425		748	909
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	140	8	208	23		
Volume Left	0	8	0	15		
Volume Right	15	0	0	8		
cSH	1700	1425	1700	797		
Volume to Capacity	0.08	0.01	0.12	0.03		
Queue Length 95th (ft)	0	0	0	2		
Control Delay (s/veh)	0.0	7.5	0.0	9.7		
Lane LOS		A		A		
Approach Delay (s/veh)	0.0	0.3		9.7		
Approach LOS				A		
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			20.1%	ICU Level of Service	A	
Analysis Period (min)			15			





HCM Unsignalized Intersection Capacity Analysis

29: Route 66 & Old Highway 66

SR-66, PIN 107579.00

2048 Build



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	110	198	4	4	5
Future Volume (Veh/h)	5	110	198	4	4	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	120	215	4	4	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	None			
Median storage veh		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	219				347	217
vC1, stage 1 conf vol					217	
vC2, stage 2 conf vol					130	
vCu, unblocked vol	219				347	217
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1350				762	823
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	5	120	219	9		
Volume Left	5	0	0	4		
Volume Right	0	0	4	5		
cSH	1350	1700	1700	795		
Volume to Capacity	0.00	0.07	0.13	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s/veh)	7.7	0.0	0.0	9.6		
Lane LOS	A			A		
Approach Delay (s/veh)	0.3		0.0	9.6		
Approach LOS				A		
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			20.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

SR-66, PIN 107579.00

1: Main Street/Route 66 & Route 34
















2048 No Build

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	1	6	1	215	14	75	121	225	1	4	295	229
Future Volume (vph)	1	6	1	215	14	75	121	225	1	4	295	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	10	10	10
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			1.00			0.94	
Flt Protected		0.99			0.97			0.98			1.00	
Satd. Flow (prot)		1623			1722			1628			1574	
Flt Permitted		0.97			0.78			0.70			1.00	
Satd. Flow (perm)		1576			1399			1155			1571	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	7	1	234	15	82	132	245	1	4	321	249
RTOR Reduction (vph)	0	1	0	0	21	0	0	0	0	0	29	0
Lane Group Flow (vph)	0	8	0	0	310	0	0	378	0	0	545	0
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		16.2			16.2			28.0			28.0	
Effective Green, g (s)		16.2			16.2			28.0			28.0	
Actuated g/C Ratio		0.30			0.30			0.52			0.52	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		471			418			596			811	
v/s Ratio Prot												
v/s Ratio Perm		0.01			c0.22			0.33			c0.35	
v/c Ratio		0.02			0.74			0.63			0.67	
Uniform Delay, d1		13.4			17.1			9.4			9.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			6.9			2.2			4.4	
Delay (s)		13.4			24.1			11.6			14.1	
Level of Service		B			C			B			B	
Approach Delay (s/veh)		13.4			24.1			11.6			14.1	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay (s/veh)		15.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		54.2			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		84.7%			ICU Level of Service			E				
Analysis Period (min)		15										

c Critical Lane Group

















HCM Unsignalized Intersection Capacity Analysis 6: Hill Avenue/Wayland Drive & Route 66

SR-66, PIN 107579.00
2048 No Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	298	6	5	241	11	5	1	5	11	1	14
Future Volume (Veh/h)	15	298	6	5	241	11	5	1	5	11	1	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	324	7	5	262	12	5	1	5	12	1	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1175										
pX, platoon unblocked												
vC, conflicting volume	274			331			653	644	328	643	641	268
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	274			331			653	644	328	643	641	268
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	99	97	100	98
cM capacity (veh/h)	1283			1223			366	384	712	378	386	771
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	347	279	11	28								
Volume Left	16	5	5	12								
Volume Right	7	12	5	15								
cSH	1283	1223	472	521								
Volume to Capacity	0.01	0.00	0.02	0.05								
Queue Length 95th (ft)	1	0	2	4								
Control Delay (s/veh)	0.5	0.2	12.8	12.3								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.5	0.2	12.8	12.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			33.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 16: Route 66 & S. Shephard Drive/N. Shephard Drive

SR-66, PIN 107579.00
2048 No Build
















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	24	302	5	3	243	12	11	1	23	5	0	3
Future Volume (Veh/h)	24	302	5	3	243	12	11	1	23	5	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	328	5	3	264	13	12	1	25	5	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	277			333			662	662	271	685	666	331
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			333			662	662	271	685	666	331
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			97	100	97	99	100	100
cM capacity (veh/h)	1280			1221			367	374	768	345	373	713
Direction, Lane #	NB 1	SB 1	SE 1	NW 1								
Volume Total	359	280	38	8								
Volume Left	26	3	12	5								
Volume Right	5	13	25	3								
cSH	1280	1221	560	428								
Volume to Capacity	0.02	0.00	0.07	0.02								
Queue Length 95th (ft)	2	0	5	1								
Control Delay (s/veh)	0.8	0.1	11.9	13.6								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.8	0.1	11.9	13.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			41.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

26: Summit Hill Road/Ridge Road & Route 66


















SR-66, PIN 107579.00

2048 No Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	245	6	4	199	7	5	2	4	7	2	11
Future Volume (Veh/h)	11	245	6	4	199	7	5	2	4	7	2	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	266	7	4	216	8	5	2	4	8	2	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	224			273			535	526	270	527	525	220
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	224			273			535	526	270	527	525	220
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	99	98	100	99
cM capacity (veh/h)	1339			1284			440	448	762	451	449	815
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	285	228	11	22								
Volume Left	12	4	5	8								
Volume Right	7	8	4	12								
cSH	1339	1284	521	596								
Volume to Capacity	0.01	0.00	0.02	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s/veh)	0.4	0.2	12.1	11.3								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.4	0.2	12.1	11.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			29.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 28: Speedwell Road/Old Highway 66 & Route 66

SR-66, PIN 107579.00
2048 No Build


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	234	14	7	188	4	14	0	7	4	0	5
Future Volume (Veh/h)	5	234	14	7	188	4	14	0	7	4	0	5
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	254	15	8	204	4	15	0	8	4	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	208			269			497	496	262	494	501	206
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	208			269			497	496	262	494	501	206
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	99	99	100	99
cM capacity (veh/h)	1345			1277			472	466	770	477	467	835
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	5	269	8	208	23	9						
Volume Left	5	0	8	0	15	4						
Volume Right	0	15	0	4	8	5						
cSH	1345	1700	1277	1700	546	626						
Volume to Capacity	0.00	0.16	0.01	0.12	0.04	0.01						
Queue Length 95th (ft)	0	0	0	0	3	1						
Control Delay (s/veh)	7.7	0.0	7.8	0.0	11.9	10.8						
Lane LOS	A		A		B	B						
Approach Delay (s/veh)	0.1		0.3		11.9	10.8						
Approach LOS					B	B						
Intersection Summary												
Average Delay				0.9								
Intersection Capacity Utilization				23.2%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

SR-66, PIN 107579.00

1: Main Street/Route 66 & Route 34

2048 Build



















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	1	6	1	215	14	75	121	225	1	4	295	229
Future Volume (vph)	1	6	1	215	14	75	121	225	1	4	295	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.99		1.00	0.87			1.00			0.94	
Flt Protected		0.99		0.95	1.00			0.98			1.00	
Satd. Flow (prot)		1739		1752	1611			1745			1687	
Flt Permitted		0.98		0.75	1.00			0.72			1.00	
Satd. Flow (perm)		1706		1387	1611			1274			1684	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	7	1	234	15	82	132	245	1	4	321	249
RTOR Reduction (vph)	0	1	0	0	61	0	0	0	0	0	36	0
Lane Group Flow (vph)	0	8	0	234	36	0	0	378	0	0	538	0
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	7%	7%	7%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		12.7		12.7	12.7			27.3			27.3	
Effective Green, g (s)		12.7		12.7	12.7			27.3			27.3	
Actuated g/C Ratio		0.25		0.25	0.25			0.55			0.55	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		433		352	409			695			919	
v/s Ratio Prot					0.02							
v/s Ratio Perm		0.00		c0.17				0.30			c0.32	
v/c Ratio		0.02		0.66	0.09			0.54			0.59	
Uniform Delay, d1		14.0		16.7	14.2			7.3			7.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.0		4.7	0.1			0.9			2.7	
Delay (s)		14.0		21.4	14.3			8.2			10.3	
Level of Service		B		C	B			A			B	
Approach Delay (s/veh)		14.0			19.3			8.2			10.3	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay (s/veh)			12.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			79.4%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

6: Route 66 & Hill Avenue/Wayland Drive

SR-66, PIN 107579.00



















2048 Build

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	5	1	5	11	1	14	15	298	6	5	241	11
Future Volume (Veh/h)	5	1	5	11	1	14	15	298	6	5	241	11
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	5	12	1	15	16	324	7	5	262	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage (veh)							2			2		
Upstream signal (ft)							1173					
pX, platoon unblocked												
vC, conflicting volume	647	644	328	640	641	268	274				331	
vC1, stage 1 conf vol	360	360		278	278							
vC2, stage 2 conf vol	288	284		362	363							
vCu, unblocked vol	647	644	328	640	641	268	274				331	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	100	99	98	100	98	99				100	
cM capacity (veh/h)	553	538	712	562	542	771	1283				1223	
Direction, Lane #	NB 1	SB 1	NE 1	NE 2	SW 1	SW 2						
Volume Total	11	28	16	331	5	274						
Volume Left	5	12	16	0	5	0						
Volume Right	5	15	0	7	0	12						
cSH	614	656	1283	1700	1223	1700						
Volume to Capacity	0.02	0.04	0.01	0.19	0.00	0.16						
Queue Length 95th (ft)	1	3	1	0	0	0						
Control Delay (s/veh)	11.0	10.7	7.8	0.0	8.0	0.0						
Lane LOS	B	B	A	A								
Approach Delay (s/veh)	11.0	10.7	0.4	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay	0.9											
Intersection Capacity Utilization	26.0%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 16: Route 66 & S. Shephard Drive/N. Shephard Drive

SR-66, PIN 107579.00

2048 Build

















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	24	302	5	3	243	12	11	1	23	5	0	3
Future Volume (Veh/h)	24	302	5	3	243	12	11	1	23	5	0	3
Sign Control	Free				Free				Stop			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	328	5	3	264	13	12	1	25	5	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	277			333			660	662	271	678	666	331
vC1, stage 1 conf vol							277	277		383	383	
vC2, stage 2 conf vol							383	385		296	283	
vCu, unblocked vol	277			333			660	662	271	678	666	331
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	97	99	100	100
cM capacity (veh/h)	1280			1221			553	532	771	531	525	711
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SE 1	NW 1						
Volume Total	26	333	3	277	38	8						
Volume Left	26	0	3	0	12	5						
Volume Right	0	5	0	13	25	3						
cSH	1280	1700	1221	1700	678	587						
Volume to Capacity	0.02	0.20	0.00	0.16	0.06	0.01						
Queue Length 95th (ft)	2	0	0	0	4	1						
Control Delay (s/veh)	7.9	0.0	8.0	0.0	10.6	11.2						
Lane LOS	A		A		B	B						
Approach Delay (s/veh)	0.6		0.1		10.6	11.2						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			29.9%	ICU Level of Service					A			
Analysis Period (min)			15									











HCM Unsignalized Intersection Capacity Analysis

26: Summit Hill Road/Ridge Road & Route 66

SR-66, PIN 107579.00

2048 Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	245	6	4	199	7	5	2	4	7	2	11
Future Volume (Veh/h)	11	245	6	4	199	7	5	2	4	7	2	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	266	7	4	216	8	5	2	4	8	2	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	224			273			535	526	270	527	525	220
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	224			273			535	526	270	527	525	220
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	99	98	100	99
cM capacity (veh/h)	1339			1284			440	448	762	451	449	815
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	285	228	11	22								
Volume Left	12	4	5	8								
Volume Right	7	8	4	12								
cSH	1339	1284	521	596								
Volume to Capacity	0.01	0.00	0.02	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s/veh)	0.4	0.2	12.1	11.3								
Lane LOS	A	A	B	B								
Approach Delay (s/veh)	0.4	0.2	12.1	11.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			29.1%		ICU Level of Service				A			
Analysis Period (min)			15									

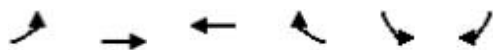
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	239	14	7	188	14	7
Future Volume (Veh/h)	239	14	7	188	14	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	260	15	8	204	15	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		TWLTL			
Median storage veh)	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			275		488	268
vC1, stage 1 conf vol					268	
vC2, stage 2 conf vol					220	
vCu, unblocked vol			275		488	268
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1271		684	764
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	275	8	204	23		
Volume Left	0	8	0	15		
Volume Right	15	0	0	8		
cSH	1700	1271	1700	710		
Volume to Capacity	0.16	0.01	0.12	0.03		
Queue Length 95th (ft)	0	0	0	3		
Control Delay (s/veh)	0.0	7.9	0.0	10.2		
Lane LOS	A		B			
Approach Delay (s/veh)	0.0	0.3	10.2			
Approach LOS	B					
Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	23.4%		ICU Level of Service		A	
Analysis Period (min)	15					





HCM Unsignalized Intersection Capacity Analysis

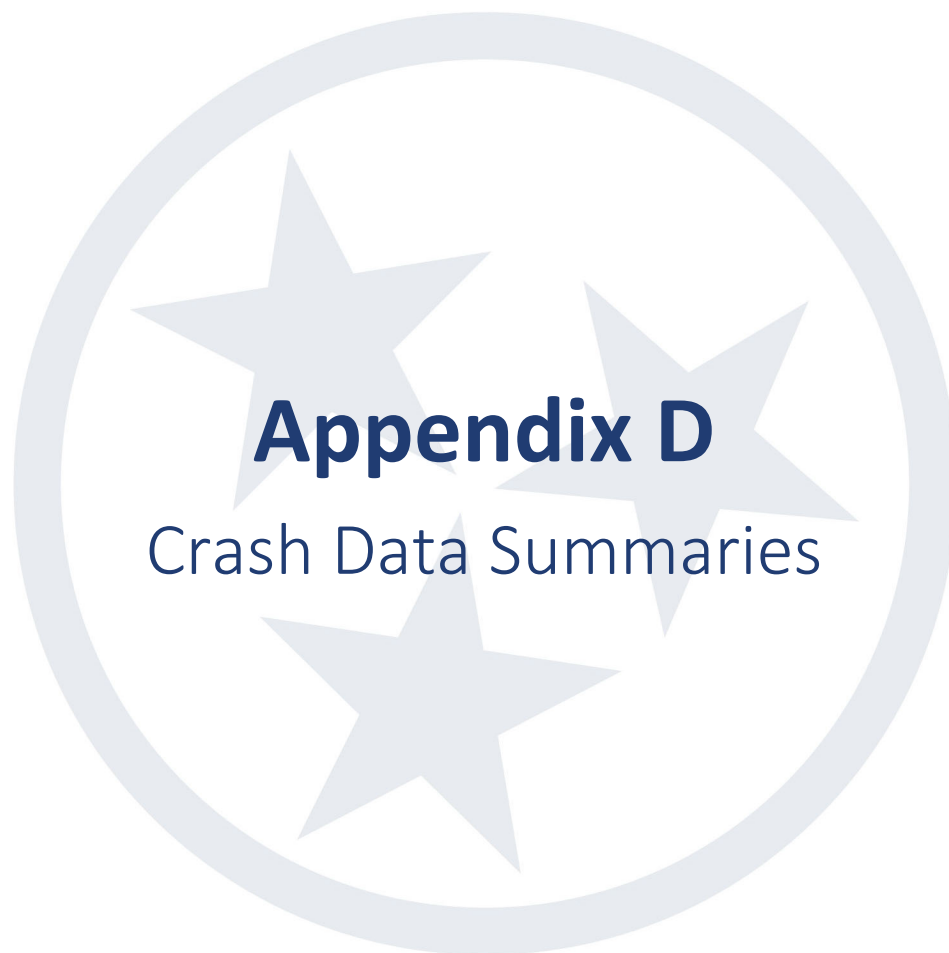
29: Route 66 & Old Highway 66

SR-66, PIN 107579.00

2048 Build



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	234	195	4	4	5
Future Volume (Veh/h)	5	234	195	4	4	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	254	212	4	4	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	None			
Median storage veh)		2				
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	216				478	214
vC1, stage 1 conf vol					214	
vC2, stage 2 conf vol					264	
vCu, unblocked vol	216				478	214
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1354				696	826
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	5	254	216	9		
Volume Left	5	0	0	4		
Volume Right	0	0	4	5		
cSH	1354	1700	1700	763		
Volume to Capacity	0.00	0.15	0.13	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s/veh)	7.7	0.0	0.0	9.8		
Lane LOS	A			A		
Approach Delay (s/veh)	0.1		0.0	9.8		
Approach LOS				A		
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			22.3%	ICU Level of Service		A
Analysis Period (min)			15			



Appendix D

Crash Data Summaries

YEAR	TOTAL CRASHES	YEAR	SEVERITY				
			Fatal (K)	Serious Injury (A)	Minor Injury (B)	Possible Injury (C)	PDO (O)
2021	7	2021	0	0	0	0	7
2022	21	2022	0	1	2	1	17
2023	28	2023	0	1	6	1	20
2024	13	2024	0	0	2	2	9
TOTAL	69(100%)	TOTAL	0(0%)	2(3%)	10(14%)	4(6%)	53(77%)
Total	69	Total	0	2	10	4	53

YEAR	TYPE OF COLLISION							
	Head On	Rear End	Angle	Sideswipe, Same Direction	Sideswipe, Opposite Direction	No Collision with Other Vehicle	Pedestrian Involved	Other/ Unknown
1	0	2	2	0	0	3	0	0
2	0	5	1	1	1	13	0	0
3	0	9	3	1	2	11	0	2
4	0	3	4	1	0	5	0	0
TOTAL	0(0%)	19(28%)	10(14%)	3(4%)	3(4%)	32(46%)	0(0%)	2(3%)
al	0	19	10	3	3	32	0	2

YEAR	DRIVER ACTIONS										
	"Exceeding Posted Speed Limit"	"Failure to Yield Right of Way"	"Following Improperly"	"Improper Passing"	"Improper Backing"	"Driving Left of Center"	"Lane Departure"	"Swerved or Avoided"	"Inattentive (Eating, Reading, Talking, Etc.)"	"No Contributing Actions from other Vehicle"	"Other (Unknown)"
2021	0	0	2	0	1	0	2	0	0	1	1
2022	0	0	4	0	0	0	10	0	0	5	2
2023	0	4	8	1	0	0	9	1	1	3	1
2024	2	2	4	0	0	0	4	0	0	1	0
TOTAL	2(3%)	6(9%)	18(26%)	1(1%)	1(1%)	0(0%)	25(36%)	1(1%)	1(1%)	10(14%)	4(6%)
Total	2	6	18	1	1	0	25	1	1	10	4

YEAR	LIGHT CONDITION			WEATHER CONDITION					LOCATION	
	Daylight	Dark-Lighted	Dark-Not Lighted	Clear	Rain	Cloudy	Snow	Fog	At Intersection	Along Roadway
2021	4	1	2	1	0	5	0	1	2	5
2022	10	3	8	18	0	3	0	0	2	19
2023	20	2	6	20	1	7	0	0	8	20
2024	11	0	2	12	1	0	0	0	6	7
TOTAL	45(65%)	6(9%)	18(26%)	51(74%)	2(3%)	15(22%)	0(0%)	1(1%)	18(26%)	51(74%)
Total	45	6	18	51	2	15	0	1	18	51



Appendix E

TDOT Statewide Average Crash Rates –
2021 to 2024

Study: OFFICIAL HSIP STUDY 2021-2023

Begin Date: 1/1/2021 End Date: 12/31/2023

Note: Severe crash rates are the sum of rates for fatal and incapacitating injury crashes.

Tennessee Department of Transportation
Statewide Average Crash Rates for Sections and Spots

Study: OFFICIAL HSIP STUDY 2021-2023

Begin Date: 1/1/2021 End Date: 12/31/2023

Route Type	Rural / Urban	Location Type	Highway Type	Fatal Rate	Incap. Rate	Other Inj. Rate	Pd. Rate	Total Rate	Severe Crash Rate	Total Veh. Miles (in millions)
Functionally Classified Local Roads										
FUNCT.	Rural	Section	2 OR 3 LN	0.030	0.127	0.335	1.822	2.467	0.156	7,591
FUNCT.	Rural	Section	2 OR 3 LN W/TL	0.022	0.022	0.087	1.443	1.661	0.044	46
FUNCT.	Rural	Section	4 OR MORE UNDIV	0.000	0.268	0.000	4.292	4.560	0.268	4
FUNCT.	Rural	Section	4 OR MORE DIV	0.000	0.000	0.000	0.000	0.000	0.000	0
FUNCT.	Rural	Section	4 OR MORE W TL	0.000	0.000	0.000	0.000	0.000	0.000	0
FUNCT.	Rural	Section	FREEWAY	0.000	1.120	1.120	14.563	17.924	1.120	1
FUNCT.	Rural	Spot	2 OR 3 LN	0.014	0.058	0.154	0.839	1.135	0.072	16,574
FUNCT.	Rural	Spot	2 OR 3 LN W/TL	0.004	0.004	0.022	0.276	0.320	0.007	275
FUNCT.	Rural	Spot	4 OR MORE UNDIV	0.000	0.053	0.026	0.500	0.580	0.053	38
FUNCT.	Rural	Spot	FREEWAY	0.000	0.078	0.078	1.320	1.553	0.078	13
FUNCT.	Urban	Section	2 OR 3 LN	0.016	0.070	0.289	2.446	3.137	0.086	16,233
FUNCT.	Urban	Section	2 OR 3 LN W/TL	0.015	0.042	0.236	2.232	2.925	0.057	1,807
FUNCT.	Urban	Section	4 OR MORE UNDIV	0.032	0.081	0.272	3.293	4.145	0.114	2,775
FUNCT.	Urban	Section	4 OR MORE DIV	0.012	0.047	0.185	2.351	3.008	0.059	3,733
FUNCT.	Urban	Section	4 OR MORE W TL	0.028	0.064	0.178	2.941	3.633	0.091	4,783
FUNCT.	Urban	Section	FREEWAY	0.025	0.045	0.101	1.755	2.124	0.069	447
FUNCT.	Urban	Spot	2 OR 3 LN	0.003	0.012	0.052	0.445	0.572	0.015	96,231
FUNCT.	Urban	Spot	2 OR 3 LN W/TL	0.002	0.006	0.034	0.328	0.428	0.008	13,221
FUNCT.	Urban	Spot	4 OR MORE UNDIV	0.004	0.010	0.035	0.417	0.527	0.013	27,219
FUNCT.	Urban	Spot	4 OR MORE DIV	0.002	0.006	0.025	0.316	0.405	0.008	32,547
FUNCT.	Urban	Spot	4 OR MORE W TL	0.003	0.008	0.022	0.356	0.440	0.011	41,840
FUNCT.	Urban	Spot	FREEWAY	0.003	0.005	0.015	0.219	0.267	0.008	3,883

Tennessee Department of Transportation
Statewide Average Crash Rates for Sections and Spots

Study: OFFICIAL HSIP STUDY 2021-2023

Begin Date: 1/1/2021 End Date: 12/31/2023

Route Type	Rural / Urban	Location Type	Highway Type	Fatal Rate	Incap. Rate	Other Inj. Rate	Pd. Rate	Total Rate	Severe Crash Rate	Total Veh. Miles (in millions)
High Risk Rural Roads										
MAJOR COL.	Rural	Section	2 OR 3 LN	0.032	0.130	0.313	1.470	2.052	0.162	8,100
MAJOR COL.	Rural	Section	2 OR 3 LN W/TL	0.016	0.024	0.180	1.646	1.944	0.039	128
MAJOR COL.	Rural	Section	4 OR MORE UNDIV	0.069	0.277	0.416	1.247	2.147	0.346	14
MAJOR COL.	Rural	Section	4 OR MORE DIV	0.000	0.000	0.083	2.152	2.400	0.000	24
MAJOR COL.	Rural	Section	4 OR MORE W TL	0.000	0.016	0.095	1.527	1.654	0.016	63
MAJOR COL.	Rural	Section	FREEWAY	0.000	0.000	0.000	2.491	2.768	0.000	4
MAJOR COL.	Rural	Spot	2 OR 3 LN	0.011	0.045	0.108	0.513	0.715	0.056	23,542
MAJOR COL.	Rural	Spot	2 OR 3 LN W/TL	0.003	0.006	0.040	0.329	0.394	0.009	668
MAJOR COL.	Rural	Spot	4 OR MORE UNDIV	0.008	0.032	0.048	0.191	0.295	0.040	125
MAJOR COL.	Rural	Spot	4 OR MORE DIV	0.000	0.000	0.014	0.450	0.506	0.000	142
MAJOR COL.	Rural	Spot	4 OR MORE W TL	0.003	0.003	0.015	0.249	0.274	0.005	398
MAJOR COL.	Rural	Spot	FREEWAY	0.000	0.000	0.000	0.578	0.630	0.000	19
MIN COL.	Rural	Section	2 OR 3 LN	0.031	0.129	0.323	1.779	2.413	0.161	6,859
MIN COL.	Rural	Section	2 OR 3 LN W/TL	0.025	0.025	0.101	1.031	1.258	0.050	40
MIN COL.	Rural	Section	4 OR MORE UNDIV	0.000	0.268	0.000	4.292	4.560	0.268	4
MIN COL.	Rural	Section	4 OR MORE DIV	0.000	0.000	0.000	0.000	0.000	0.000	0
MIN COL.	Rural	Section	4 OR MORE W TL	0.000	0.000	0.000	0.000	0.000	0.000	0
MIN COL.	Rural	Section	FREEWAY	0.000	1.904	1.904	17.136	20.944	1.904	1
MIN COL.	Rural	Spot	2 OR 3 LN	0.016	0.065	0.161	0.888	1.205	0.080	13,784
MIN COL.	Rural	Spot	2 OR 3 LN W/TL	0.004	0.004	0.017	0.214	0.252	0.009	234
MIN COL.	Rural	Spot	4 OR MORE UNDIV	0.000	0.053	0.026	0.500	0.580	0.053	38
MIN COL.	Rural	Spot	FREEWAY	0.000	0.192	0.192	2.107	2.490	0.192	5

Tennessee Department of Transportation
Statewide Intersection Crash Rates

Study: OFFICIAL HSIP STUDY 2021-2023

Begin Date: 1/1/2021

End Date: 12/31/2023

		Rural						Urban				
				Multi-Lane					Multi-Lane			
		2 Lane	2 Ln w/Turn	Univided	Divided	Turn Lane		2 Lane	2 Ln w/Turn	Univided	Divided	Turn Lane
Signalized Intersections												
	Non-injury	0.460	0.395	0.564	0.442	0.399		0.507	0.455	0.550	0.506	0.472
	Injury	0.056	0.046	0.068	0.082	0.063		0.059	0.043	0.072	0.062	0.056
	Incap Inj	0.011	0.012	0.017	0.024	0.021		0.012	0.008	0.011	0.013	0.011
	Fatal	0.005	0.000	0.002	0.013	0.003		0.002	0.000	0.002	0.002	0.003
	Total	0.578	0.495	0.741	0.595	0.537		0.677	0.609	0.731	0.671	0.620
Full Stop Intersections												
	Non-injury	0.418	0.000	0.000	0.474	0.000		0.540	0.630	0.766	0.363	0.000
	Injury	0.052	0.000	0.000	0.066	0.000		0.042	0.084	0.128	0.000	0.000
	Incap Inj	0.005	0.000	0.000	0.033	0.000		0.004	0.042	0.000	0.007	0.000
	Fatal	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	Total	0.506	0.000	0.000	0.595	0.000		0.673	0.839	1.021	0.399	0.000
Other Intersections												
	Non-injury	0.081	0.074	0.080	0.054	0.052		0.104	0.084	0.108	0.085	0.083
	Injury	0.018	0.011	0.015	0.015	0.009		0.014	0.009	0.012	0.010	0.009
	Incap Inj	0.006	0.004	0.006	0.007	0.003		0.003	0.002	0.002	0.003	0.002
	Fatal	0.001	0.001	0.001	0.002	0.001		0.001	0.001	0.001	0.001	0.001
	Total	0.112	0.099	0.108	0.082	0.069		0.134	0.107	0.139	0.110	0.108
Intersection Rates: Crashes / Million Entering Vehicles												

Intersection Rates: Crashes / Million Entering Vehicles



Appendix F

TDOT Approval of Traffic and Safety
Analysis (Dated February 5, 2025)

From: Gregory Dyer <Greg.Dyer@tn.gov>
Sent: Wednesday, February 5, 2025 1:50 PM
To: Krebs, Meridith <Meridith.Krebs@kimley-horn.com>
Subject: RE: R1, Hawkins Co, PIN 107579.00, SR-66 - Traffic and Safety Analysis

Hi Meredith,
No additional comments from HQ Traffic Design. Thanks!



Greg Dyer, P.E. | Traffic Modeling Manager
Traffic Design Division
James K. Polk Bldg, 18th Floor
505 Deaderick St., Nashville, TN 37243
p. 615-253-0046
Greg.Dyer@tn.gov
tn.gov/tdot

From: Krebs, Meridith <Meridith.Krebs@kimley-horn.com>
Sent: Wednesday, February 5, 2025 1:42 PM
To: Gregory Dyer <Greg.Dyer@tn.gov>
Cc: David A. Duncan <David.A.Duncan@tn.gov>; Andrew Barlow <Andrew.Barlow@tn.gov>; Erick Hunt-Hawkins <Erick.Hunt-Hawkins@tn.gov>; Tammy Sellers <Tammy.Sellers@tn.gov>; Rachel Head <Rachel.Head@tn.gov>; Cantrell, Holly <Holly.Cantrell@kimley-horn.com>; Prunty, Rob <Rob.Prunty@kimley-horn.com>; Frosch, Colin <Colin.Frosch@kimley-horn.com>; Dexter Justis <Dexter.Justis@tn.gov>; John Barrett <John.Barrett@tn.gov>; Michelle Nickerson <Michelle.Nickerson@tn.gov>
Subject: [EXTERNAL] RE: R1, Hawkins Co, PIN 107579.00, SR-66 - Traffic and Safety Analysis

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Good afternoon. Hope everyone is doing well. I wanted to follow-up on the SR-66 Traffic and Safety Analysis to see if there were any additional comments.

Thank you.

-Meridith

Meridith Krebs | Senior Project Manager
Kimley-Horn | 10 Lea Avenue, Suite 400, Nashville, TN 37210
Direct: 615.564.2874



TDOT
Department of
Transportation

