



Tenaska Power Traffic Impact Study

**Fluvanna County
Scottsville, VA**

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Revision 1

Prepared For

County Of Fluvanna, VA



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Prepared by

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ACRONYM LIST

AWSC	All Way Stop Control
AADT	Annual Average Daily Traffic
HCM	Highway Capacity Manual
LOS	Level of Service
MPH	Miles per Hour
MUTCD	Manual on Uniform Traffic Control Devices
PHF	Peak Hour Factor
TIS	Traffic Impact Study
TMP	Transportation Management Plan
TWSC	Two-Way Stop-Controlled
VDOT	Virginia Department of Transportation

EXECUTIVE SUMMARY

This Traffic Impact Study (TIS) was prepared to evaluate the impact of construction traffic a proposed natural gas-fired power station project located at 2300 Branch Road, Scottsville, VA (Site). The project, which is scheduled for completion by 2032, will add a new intersection (intersection 7) - Tenaska Operations Driveway at Branch Road (SR 761). This TIS will assess how the new Site will affect local traffic and the surrounding roadway network. In addition to the proposed driveway this TIS evaluates traffic conditions at six (6) existing intersections.

With year 2028 traffic volume SR 53 at SR 619 (intersection 1) operates at LOS F during both AM and PM peak, all other study intersections are LOS C or better.

With the addition of Site traffic (805 peak hour trips) intersections 5 and 6 become LOS F, experiencing high delays.

The proposed intersection Tenaska Operations Driveway at Branch Road (intersection 7) operates at LOS D or better under total traffic in the 2032 Design Year.

Signal warrant analyses show that traffic signals are warranted at Intersections 1 and 5 under both background and total traffic conditions.

To mitigate the traffic impact to existing roadway users at the affected intersections, mitigation measures were developed. These include extending turn lane storage, retiming existing traffic signals, adding new traffic signals, new roundabouts and new turn lanes.

Chapter 1: BACKGROUND

Project Description

Tenaska Power is planning to build a natural gas-fired power station (Project) located at 2300 Branch Road, Scottsville, VA (Site), adjacent to the company's 940-megawatt Tenaska Virginia Generating Station (TVGS), which has been in operation since 2004. The proposed plant will generate 1,540 megawatts of power and will sit on 50 acres within a 425-acre parcel, with a 300-foot vegetative buffer on all sides. Construction groundbreaking is scheduled for the Year 2028, and construction will be completed in the Year 2032.

Project Location

The map below shows the regional location and the proposed Site location. The Site will have a new proposed driveway.

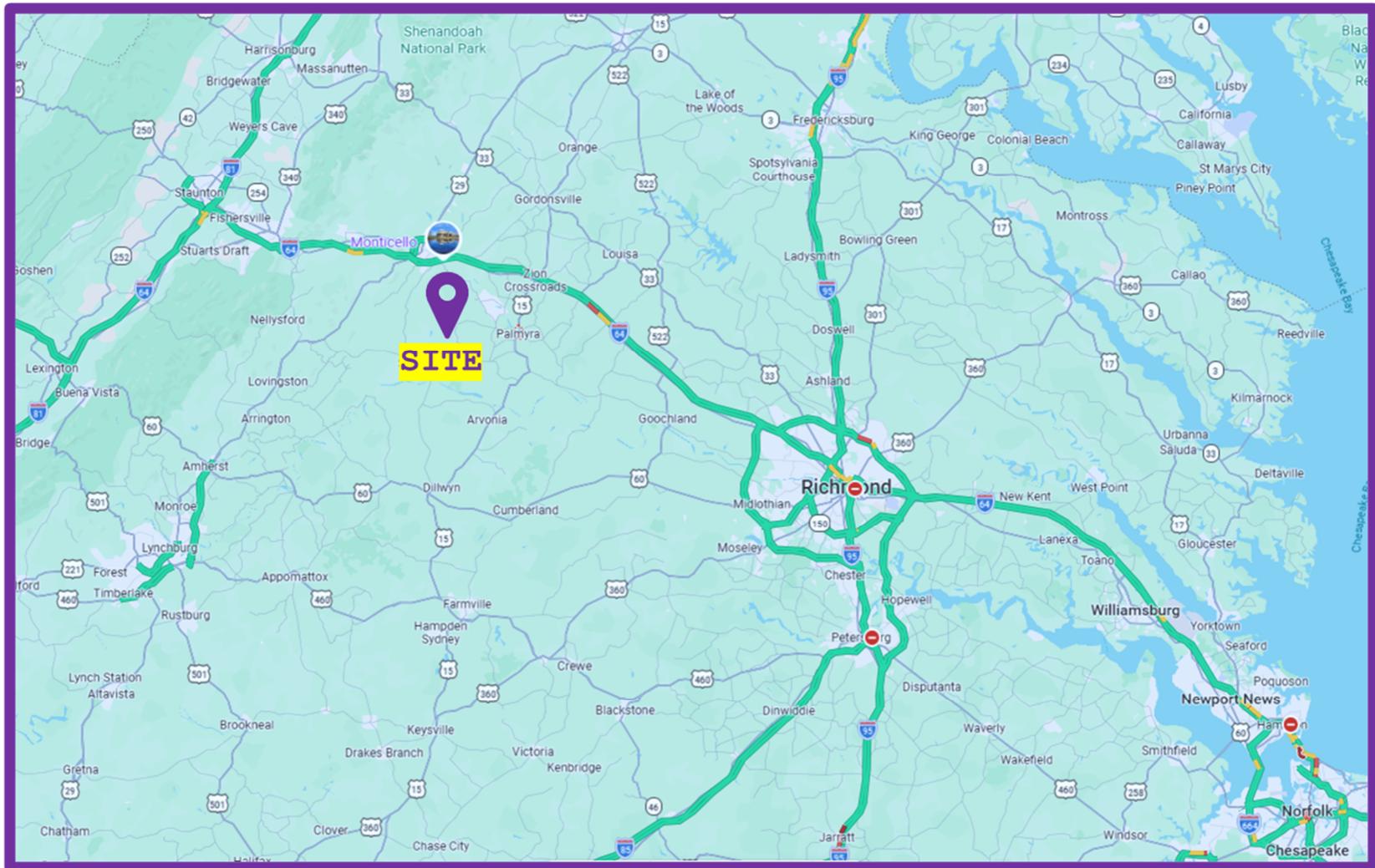


Figure 1: Study Area Showing Proposed Site

Chapter 2: STUDY AREA

Study Intersections

For this study seven (7) intersections are considered:

1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619) (TWSC)
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660) (TWSC)
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761) (TWSC)
4. Branch Road (SR 761) at Rolling Road (SR 620) (TWSC)
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15) (Roundabout)
6. James Madison Highway (US 15) at 3 Notch Road (US 250) (Signalized)
7. Tenaska Operations Driveway at Branch Road (SR 761) (Proposed)

The existing lane configuration and traffic control is shown on **Figure 1** through **Figure 7**.

Road Segments

James Madison Highway (US 15): from 3 Notch Road (US 250) to Thomas Jefferson Parkway (SR 53)

US 15 is designated as *Minor Arterial* by the Virginia Department of Transportation (VDOT). In the study area US 15 runs north-south between 3 Notch Road (US 250) (intersection 6) and Thomas Jefferson Parkway (SR 53), terminating at intersection 5. US 15 is a two-lane road with two 11-foot travel lanes and one-foot paved shoulders. The posted speed limit in the study area is 45 MPH.

Thomas Jefferson Highway (SR 53): from James Madison Highway (US 15) to Ruritan Lake Road (SR 619)

Thomas Jefferson Highway (SR 53) is designated as a *Major Collector* by VDOT. It runs east to west from James Madison Highway (US 15) (intersection 5) to Ruritan Lake Road (SR 619) (intersection 1). Thomas Jefferson Highway (SR 53) is a two-lane road with 11-foot travel lanes and 1-foot paved shoulders. The posted speed limit is 45 MPH.

Ruritan Lake Road (SR 619): from Thomas Jefferson (SR 53) to Branch Road

Ruritan Lake Road (SR 619) is designated as a *Minor Collector* by VDOT. In the study area this road runs east to west from Thomas Jefferson (SR 53) (intersection 1) to Branch Road (intersection 3). This road is a two-lane road with two 11-foot travel lanes and no shoulders. The posted speed limit is 45 MPH.

Branch Road (SR 761): from Ruritan Lake Road (SR 619) to Rollings Road South (SR 620)

Branch Road is designated as a *Rural Local Road* by VDOT. In the study area this road runs from Ruritan Lakes Road (SR 619) (intersection 3) to Rollings Road South (SR 620) (intersection 4). This road will serve as the primary access point for the Site Drive (intersection 7). The posted speed limit is 45 MPH.

Chapter 3: ESTIMATE OF FUTURE CONDITIONS

Background Traffic

Background traffic is all traffic on the roadway that is not related to the Site. Existing peak hour turning movement counts were collected at the study intersections on December 4, 2025. Annual growth rates (g) provided by VDOT Pathways for Planning (P4P) were applied to the 2025 turning movement counts (TMC) to calculate the 2028 Opening Year and 2032 Design Year background traffic volumes.

This methodology was used to determine the background traffic volumes for both the 2028 Opening Year and the 2030 Design Year. The TMC data is included in **Appendix A**.

Traffic Volumes

Turning movement counts data was collected Thursday, December 4, 2025, for all existing study intersections and the Existing Tenaska Driveway at Branch Road (SR 761).

The peak hours and Peak Hour Factors (PHF) shown in **Table 1** were determined based on peak hour traffic movement counts. All the intersections (except intersection 1 and intersection 2) are far from each other (> 0.5 miles away), are not coordinated and function as isolated nodes. Therefore, each intersection was analyzed using its own peak hour and the corresponding PHFs.

For the proposed intersection Tenaska Operations Driveway at Branch Road (SR 761) (intersection 7) the AM and PM peak hours and PHFs are from the TMC at the adjacent intersection which is the Existing Tenaska Driveway at Branch Road (SR 761).

The AM and PM Background Peak Hour volumes are shown on **Figure 8**, through **Figure 21** for each intersection for the 2028 Opening Year and the 2032 Design Year, respectively.

Table 1: Peak Hours and Peak Hour Factors

Intersections	AM Peak Hour	AM PHF	PM Peak Hour	PM PHF
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	7:45 - 8:45	0.94	4:15 - 5:15	0.89
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660)	7:45 - 8:45	0.85	4:15 - 5:15	0.90
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761)	7:45 - 8:45	0.75	4:15 - 5:15	0.90
4. Branch Road (SR 761) at Rolling Road (SR 620)	7:00 - 8:00	0.83	5:00 - 6:00	0.92
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	7:30 - 8:30	0.83	4:00 - 5:00	0.97
6. James Madison Highway (US 15) at 3 Notch Road (US 250)	7:00 - 8:00	0.90	4:30 - 5:30	0.96
7. Tenaska Operations Driveway at Branch Road (SR 761)	8:00 - 9:00	0.86	4:00 - 5:00	0.92

Site Traffic and Site Trip Distribution

The number of Site employees was provided by Tenaska Power. The peak construction traffic will occur during month 31 through month 34. It is expected that during these months, 800 construction employees and 5 Tenaska employees will be commuting daily to/from the Site. However, there will be significant Site traffic during the entire construction period. The number of Site trips was determined by assuming a worst-case scenario that every employee will drive separately, no one is late, no one leaves early, no reduction in trips for sick time or vacation, all workers are on a single shift and arrive and depart during the peak hour of adjacent street.

The trip distribution was derived based on evaluation of route options, existing conditions, existing traffic flow and engineering judgement. The Site distribution is 90% to/from the north (to/from US 250) and 10% to from south (to/from Rolling Road) for

both AM and PM peak hours. The Site trip distribution is shown on **Figure 22** and **Figure 23**.

Total Traffic

The total traffic volume is the sum of background and Site traffic. The total traffic for the 2028 Opening Year and 2032 Design Year were determined by applying annual growth rates obtained from VDOT Pathways for Planning for each respective roadway segment.

The total traffic for the 2028 Opening Year and 2032 Design Year are shown on **Figure 31** through **Figure 44**.

Chapter 4: TURN LANE CRITERIA

The need for right and left turn lanes was determined based on criteria from Section 3 – Turning Lanes from Appendix F “*Access Management Design Standards for Entrances and Intersections*” located in the VDOT Road Design Manual. The length of storage was calculated using the 95% queue length values from capacity analyses and VDOT standard.

Proposed Traffic Control

Due to the anticipated high traffic volumes, dedicated left-turn and right-turn lanes are required for intersections 1, 2, 3, 5 and 7 while some existing tapers at intersections 6 require new lengths (see **Table 2**).

For the 2032 Design Year total traffic the following turn lane lengths are recommended:

1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619) (for the proposed signalized option):
 - Add a new 434-foot (length includes 200-foot taper) eastbound left turn lane
 - Add new 713-foot (length includes 200-foot taper) eastbound right turn lane
 - Add a new 876-foot (length includes 200-foot taper) northbound left turn lane
 - Add a new 300-foot (length includes 200-foot taper) southbound right-turn lane

2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660):
 - Add a new 400-foot (length includes 200-foot taper) westbound left turn lane

3. Ruritan Lake Road (SR 619) at Branch Road (SR 761):
 - Add a new 400-foot (length includes 200-foot taper) westbound left turn lane

5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15):
 - Add new 275-foot (length includes 75-foot taper) westbound right turn lane
 - Add new 275-foot (length includes 75-foot taper) southbound right turn lane

While capacity analysis shows that the recommended length for the westbound right lane is 1064 feet (length includes 200-foot taper) and for the southbound right lane is 1032 feet (length includes 200-foot taper) the bridge and other physical constraints prevent these extensions. The maximum allowable length for these lanes is 275 feet (length includes 75-foot taper).

6. James Madison Highway (US 15) at 3 Notch Road (US 250):
 - Extend existing eastbound left turn lane by 9 feet
 - Extend existing northbound left turn lane by 134 feet

At this intersection based on capacity analysis, the recommended length for the eastbound right lane is 767 feet (length includes 200-foot taper) and for the southbound left lane is 408 feet (length includes 200-foot taper). However, due to geometric constraints, the maximum allowable lengths for these lanes cannot exceed the existing lengths shown in **Table 2**.

7. Tenaska Operations Driveway at Branch Road (SR 761):

- Add a new 400-foot (length includes 200-foot taper) eastbound left turn lane
- Add a new 300-foot (length includes 200-foot taper) westbound right turn lane
- Add a new 525-foot (length includes 200-foot taper) southbound left turn lane (proposed Site driveway).

Table 2: Recommended Storage and Taper Lengths

Intersection	Lane	Storage Length				Taper (ft)	Total Existing (ft)	Total Recommended (ft)
		Q (veh.)	Length (Q*Average Length)	Minimum Length Required (ft)	Recommended Length (ft)			
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	EBL	8.5	234	100	234	200	-	434
	EBR	18.3	513	100	513	200	-	713
	NBL	25.1	676	100	676	200	-	876
	SBR	1.4	52	100	100	200	-	300
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660)	WBL	2.6	75	200	200	200	-	400
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761)	WBL	5.7	150	200	200	200	-	400
4. Branch Road (SR 761) at Rolling Road (SR 620)	NOT REQUIRED							
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	WBR	31.5	864	100	864	200	-	1064*
	SBL	31.7	832	100	832	200	-	1032*
6. James Madison Highway (US 15) at 3 Notch Road (US 250)	EBL	6.6	189	100	189	200	380	389
	EBR	20.4	567	100	567	200	550	767*
	WBL	5.5	168	100	168	200	380	368
	WBR	7.8	208	100	208	200	430	408
	NBL	11.1	324	100	324	200	390	524
	NBR	6.4	189	100	189	200	400	389
	SBL	7.8	208	100	208	200	350	408*
	SBR	6.4	189	100	189	200	400	389
7. Tenaska Operations Driveway at Branch Road (SR 761)	EBL	0	0	200	200	200	-	400
	WBR	0.4	25	100	100	200	-	300
	SBL	12.3	325	100	325	200	-	525

*Existing lengths cannot be extended to meet the recommended lengths due to geometry constraints

Chapter 5: SIGNAL WARRANT

The signal warrant analysis was conducted for two intersections:

1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619) (TWSC)
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)
(Roundabout)

The analyses were performed using HCS (Highway Capacity Software) to evaluate Warrant 1 (8-Hour Volume), Warrant 2 (4-Hour Volume), and Warrant 3 (Peak Hour Volume) under both background and total traffic conditions (see **Table 3**).

For intersection 1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619):

- Warrants 1, 2 and 3 are met under both background and total traffic conditions.

For intersection 5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15):

- Warrants 1, 2 and 3 are met under both background and total traffic conditions.

The results of the Signal Warrant Analyses are attached to **Appendix 3**.

Table 3: Signal Warrants

Intersection	2025 Background			2032 Background			2032 Total Traffic		
	Warrant 1 8 Hour	Warrant 2 4 Hour	Warrant 3 Peak Hour	Warrant 1 8 Hour	Warrant 2 4 Hour	Warrant 3 Peak Hour	Warrant 1 8 Hour	Warrant 2 4 Hour	Warrant 3 Peak Hour
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Chapter 6: ANALYSIS OF TRAFFIC OPERATIONS

Level of Service Criteria

Level of Service (LOS) is the term used to denote different operating conditions that occur on a given road segment under various traffic-volume demands. LOS is a qualitative measure that considers several factors including road geometry, speed, travel delay and freedom to maneuver. LOS designations range from A to F and provide an index of operational qualities of a road segment or an intersection. LOS A represents the best operating conditions; LOS F represents the worst.

LOS designations are reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection.

For unsignalized intersections, the analysis considers the operation of all movements that conflict with other movements, such as main line left turns and traffic exiting a side street. The evaluation criteria used to analyze the study area intersections are based on the *Highway Capacity Manual, 11th Edition*, (HCM), published by the Transportation Research Board (TRB).

Table 4 shows the relationship between delay and LOS for signalized intersections.

Table 4: LOS for Signalized Intersections

LOS	Delay (Seconds/Vehicle)
A	<10
B	<10 and <20
C	>20 and <35
D	>35 and <55
E	>55 and <80
F	>80

Table 5 shows the relationship between delay and LOS for unsignalized intersections. Unsignalized intersections include all way stop control (AWCS) and two-way stop control (TWSC) when only the side street stops.

Table 5: LOS for Unsignalized Intersections

LOS	Delay (Seconds/Vehicle)
A	<10
B	<10 and <15
C	>15 and <25
D	>25 and <35
E	>35 and <50
F	>50

Capacity Analysis

The following intersections were analyzed based on the procedures set in the HCM:

1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619) (TWSC)
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660) (TWSC)
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761) (TWSC)
4. Branch Road (SR 761) at Rolling Road (SR 620) (TWSC)
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15) (Roundabout)
6. James Madison Highway (US 15) at 3 Notch Road (US 250) (Signalized)
7. Tenaska Operations Driveway at Branch Road (SR 761) (Proposed)

HCS analyses were performed for Opening Year 2028 (background and total traffic) and for Design Year 2032 (background and total traffic).

The analyses for 2028 Opening Year Background Traffic show a LOS C or better for the majority of intersections during both AM and PM peak hours (see **Table 6**). However, intersection 1 experiences LOS F during the AM peak hour for the Eastbound Left (EBL)

movement, with a delay of 69.4 seconds. Intersection 6 shows a LOS C or better across all 12 movements, but volume-to-capacity (v/c) ratios reach 0.82 on the Westbound Right movement (WBR), indicating that this movement is approaching its saturation point.

Table 6. Background Traffic LOS for 2028 Opening Year

Intersections	Lane/ Appr.	2028 Background Traffic					
		AM			PM		
		LOS	Delay (sec)	v/c ratio	LOS	Delay (sec)	v/c ratio
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	EBL	F	69.4	0.93	E	47.1	0.77
	NBL	A	8.6	0.04	A	9.0	0.08
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660)	WBL	A	7.7	0.05	A	7.9	0.15
	NBL	B	10.3	0.23	A	9.7	0.14
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761)	WBL	A	7.4	0.02	A	7.4	0.03
	NBL	A	8.9	0.07	A	8.7	0.04
4. Branch Road (SR 761) at Rolling Road (SR 620)	WBL	A	9.5	0.06	A	9.8	0.05
	SBL	A	7.6	0.01	A	7.3	0.01
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	EB	B	13.7	0.7	A	5.8	0.28
	WB	B	10.0	0.47	A	7.0	0.40
	SB	A	7.4	0.37	A	7.6	0.36
6. James Madison Highway (US 15) at 3 Notch Road (US 250)	EBL	B	12.0	0.28	B	13.5	0.45
	EBT	B	13.6	0.07	B	15.7	0.11
	EBR	B	13.6	0.08	B	15.7	0.11
	WBL	B	12.4	0.11	B	16.7	0.15
	WBT	B	15.1	0.11	B	19.6	0.11
	WBR	C	20.3	0.82	C	23.8	0.75
	NBL	B	14.5	0.09	B	16.6	0.09
	NBT	B	19.4	0.68	C	21.1	0.62
	NBR	B	16.9	0.20	B	19	0.18
	SBL	B	13.8	0.39	B	13.6	0.61
	SBT	B	15.4	0.30	B	15.3	0.46
	SBR	B	16.7	0.51	B	15.3	0.45

Table 7. Total Traffic LOS for 2028 Opening Year

Intersections	Lane/ Appr.	2028 Total Traffic					
		AM			PM		
		LOS	Delay (sec)	v/c ratio	LOS	Delay (sec)	v/c ratio
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	EBL	F	147793.8	313.45	F	532.9	2.13
	NBL	C	19.1	0.78	A	9.0	0.08
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660)	WBL	A	7.7	0.05	B	11.8	0.29
	NBL	B	10.7	0.24	C	24.8	0.41
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761)	WBL	B	11.3	0.64	A	7.4	0.03
	NBL	A	8.9	0.07	C	22.7	0.83
4. Branch Road (SR 761) at Rolling Road (SR 620)	WBL	B	10.1	0.07	B	10.0	0.15
	SBL	A	7.9	0.05	A	7.3	0.01
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	EB	B	13.7	0.70	C	20.2	0.61
	WB	F	231.7	1.47	A	7.0	0.40
	SB	A	7.4	0.37	F	87.0	1.12
6. James Madison Highway (US 15) at 3 Notch Road (US 250)	EBL	B	12.9	0.25	C	20.2	0.51
	EBT	B	16.0	0.05	C	22.0	0.12
	EBR	F	63.1	1.00	C	22.0	0.11
	WBL	B	11.4	0.37	C	24.5	0.18
	WBT	B	14.2	0.07	C	27.8	0.11
	WBR	B	18.1	0.53	C	33.8	0.81
	NBL	C	23.1	0.12	D	35.6	0.91
	NBT	C	30.4	0.76	C	22.1	0.45
	NBR	C	26.4	0.22	C	23.2	0.55
	SBL	C	22.3	0.51	B	18.9	0.59
	SBT	C	24.8	0.39	C	29.1	0.71
SBR	C	26.5	0.57	C	29.4	0.69	
7. Tenaska Operations Driveway at Branch Road (SR 761)	EBL	B	10.2	0.12	A	7.3	0.00
	SBL	C	16.3	0.00	D	28.7	0.87
	SBR	-	-	-	A	8.8	0.08

The 2028 Opening Year total traffic analyses results are shown in **Table 7**. Under the total traffic conditions intersection 1 experiences high delays exceeding 147,000 seconds with a v/c ratio of 313.45 during the AM peak hour, signaling that the traffic volumes exceed by far the capacity of the current road. High delays can be observed at

intersection 5, with LOS F and a v/c of 1.47 for the Westbound approach during the AM peak hour and LOS F and a v/c ratio of 1.12 for the Southbound approach during the PM peak hour. Intersection 6 Eastbound right lane (EBR) is LOS F during the AM peak hour. With the addition of Site traffic, the Southbound Left (SBL) at the proposed intersection 7 becomes LOS D.

The analyses results for the 2032 Design Year background traffic are shown in **Table 8**. The results follow the same trend as the 2028 Opening Year background traffic, however the EBL movement at intersection 1 worsens during the AM peak hour, with delays increasing to 137.3 seconds and the v/c ratio climbing to 1.15 (LOS F). This is caused by the traffic growth over a four-year period. Unlike the 2028 background traffic data, the PM peak for this movement also degrades to LOS F in 2032, with delays reaching 86.7 seconds. Intersection 6 shows several movements, such as Westbound through (WBT) drop to LOS C during the PM peak hour.

The 2032 Design Year Total Traffic is shown in **Table 9**. The 2032 Design Year analyses' results show the same trend as the 2028 Opening year total traffic analyses. For intersection 1, the EBL movement remains at LOS F during both AM and PM peak hours with high delays. Similarly, the Eastbound right lane (EBR) at intersection 6 remains LOS F during the AM peak hour, with delays increasing by 25 seconds.

The proposed Site driveway (intersection 7) continues to operate at LOS C or better for all approaches during the AM peak hours. The Southbound Left (SBL) movement stays at LOS D during the PM peak hour, with a slight increase in delays.

Under 2032 Design Year total traffic conditions intersections 2, 3, 4, and 7 don't show major changes and continue to operate at LOS D or better.

Table 8. Background Traffic LOS for 2032 Design Year

Intersections	Lane/ Appr.	2032 Background Traffic					
		AM			PM		
		LOS	Delay (sec)	v/c ratio	LOS	Delay (sec)	v/c ratio
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	EBL	F	137.3	1.15	F	86.7	0.97
	NBL	A	8.7	0.05	A	9.1	0.09
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660)	WBL	A	7.8	0.06	A	9.0	0.17
	NBL	B	10.7	0.27	B	10.0	0.17
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761)	WBL	A	7.4	0.02	A	7.4	0.03
	NBL	A	9.0	0.08	A	8.7	0.04
4. Branch Road (SR 761) at Rolling Road (SR 620)	WBL	A	9.6	0.07	A	9.9	0.07
	SBL	A	7.7	0.01	A	7.3	0.02
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	EB	C	15.6	0.74	A	6.2	0.30
	WB	B	10.8	0.50	A	73.0	0.42
	SB	A	8.1	0.41	A	8.4	0.41
6. James Madison Highway (US 15) at 3 Notch Road (US 250)	EBL	B	13.2	0.29	B	15.1	0.47
	EBT	B	15.0	0.07	B	17.4	0.11
	EBR	B	15.0	0.08	B	17.4	0.11
	WBL	B	13.7	0.12	B	18.7	0.17
	WBT	B	16.7	0.12	C	21.8	0.11
	WBR	C	23.1	0.85	C	26.8	0.79
	NBL	B	15.5	0.11	B	18.3	0.09
	NBT	C	21.7	0.72	C	24.1	0.69
	NBR	B	18.4	0.21	C	21.2	0.21
	SBL	B	15.4	0.49	B	15.6	0.72
	SBT	B	16.9	0.33	B	15.0	0.26
SBR	B	18.6	0.56	B	16.7	0.49	

Table 9. Total Traffic LOS for 2032 Design Year

Intersections	Lane/ Appr.	2032 Total Traffic					
		AM			PM		
		LOS	Delay (sec)	v/c ratio	LOS	Delay (sec)	v/c ratio
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	EBL	-	-	-	F	640.2	2.36
	NBL	C	20.5	0.80	A	2.5	0.09
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660)	WBL	A	7.8	0.06	B	12.4	0.33
	NBL	B	11.2	0.29	D	28.8	0.49
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761)	WBL	B	11.5	0.65	A	7.4	0.03
	NBL	A	9.0	0.08	C	23.5	0.84
4. Branch Road (SR 761) at Rolling Road (SR 620)	WBL	B	10.2	0.08	B	10.2	0.17
	SBL	A	7.9	0.05	A	7.3	0.02
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	EB	C	15.6	0.74	C	22.6	0.66
	WB	F	252.7	1.52	A	7.3	0.42
	SB	A	8.1	0.41	F	108.8	1.18
6. James Madison Highway (US 15) at 3 Notch Road (US 250)	EBL	B	15.1	0.27	C	20.7	0.51
	EBT	B	18.6	0.06	C	22.5	0.12
	EBR	F	89.0	1.07	C	22.5	0.11
	WBL	B	13.3	0.39	C	25.2	0.19
	WBT	B	16.6	0.08	C	28.5	0.12
	WBR	C	22.5	0.61	D	35.3	0.83
	NBL	C	23.0	0.14	C	25.4	0.83
	NBT	C	31.4	0.78	C	25.3	0.55
	NBR	C	26.6	0.23	C	26.1	0.61
	SBL	C	22.7	0.58	C	21.0	0.71
	SBT	C	24.7	0.39	C	27.4	0.41
SBR	C	26.8	0.59	C	31.2	0.76	
7. Tenaska Operations Driveway at Branch Road (SR 761)	EBL	B	10.5	0.12	A	7.4	0.00
	SBL	C	16.7	0.00	D	32.2	0.89
	SBR	-	-	-	A	8.9	0.09

Capacity Analysis with capacity Traffic Improvements

To address the capacity problems, analyses were performed with suggested traffic control conditions. The results in **Table 10** show that these improvements will eliminate the capacity problems generated by the Site traffic and/or existing traffic.

Based on the analyses, the following mitigation measures are needed to maintain LOS C or better:

1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619) (for the proposed signalized option):
 - Add a new 434-foot (length includes 200-foot taper) eastbound left turn lane
 - Add new 713-foot (length includes 200-foot taper) eastbound right turn lane
 - Add a new 876-foot (length includes 200-foot taper) northbound left turn lane
 - Add a new 300-foot (length includes 200-foot taper) southbound right-turn lane
 - Add a traffic signal
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660):
 - Add a new 400-foot (length includes 200-foot taper) westbound left turn lane
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761):
 - Add a new 400-foot (length includes 200-foot taper) westbound left turn lane

5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15):
- Add new 275-foot (length includes 75-foot taper) westbound right turn lane
 - Add new 275-foot (length includes 75-foot taper) southbound right turn lane

While capacity analysis shows that the recommended length for the westbound right lane is 1064 feet (length includes 200-foot taper) and for the southbound left lane is 1032 feet (length includes 200-foot taper) physical constraints prevent these extensions. The maximum allowable length for these lanes is 275 feet (length includes 75-foot taper).

6. James Madison Highway (US 15) at 3 Notch Road (US 250):
- Extend existing eastbound left turn lane by 9 feet
 - Extend existing northbound left turn lane by 134 feet
 - Change existing signal phasing and splits

At this intersection based on capacity analysis, the recommended length for the eastbound right lane is 767 feet (length includes 200-foot taper) and for the southbound left lane is 408 feet (length includes 200-foot taper). However, due to geometric constraints, the maximum allowable lengths for these lanes cannot exceed the existing lengths shown in **Table 2**.

7. Tenaska Operations Driveway at Branch Road (SR 761):
- Add a new 400-foot (length includes 200-foot taper) eastbound left turn lane
 - Add a new 300-foot (length includes 200-foot taper) westbound right turn lane
 - Add a new 525-foot (length includes 200-foot taper) southbound left turn lane (proposed Site driveway).

Table 10. Total Traffic LOS with capacity improvements

Intersections	Lane/ Appr.	2032 Total Traffic				Existing Traffic Control	Proposed Traffic Control
		AM		PM			
		LOS	Delay (sec)	LOS	Delay (sec)		
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	EBL	D	37.6	A	8.4	TWSC	Signalized Add EBL, EBR NBL and SBR lanes
	EBR	A	7.7	C	27.8		
	NBL	D	37.5	B	19.6		
	NBT	A	3.8	B	19.9		
	SBT	C	34.4	C	28.3		
	SBR	B	14.6	A	2.4		
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	EB	A	6.6	C	23.0	Roundabout	Roundabout
	NB	C	16.0	A	5.6		
	SB	C	23.7	A	5.1		
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	EB	C	15.6	C	22.6	Roundabout	Roundabout Add WBR and SBL lanes
	WB	F	86.7	A	4.8		
	SB	A	5.4	D	27.2		
6. James Madison Highway (US 15) at 3 Notch Road (US 250)	EBL	B	15.1	B	19.8	Signalized	Signalized Change existing signal phasing and splits Extend NBL lane by 134 feet Extend EBL by 9 feet
	EBT	B	18.6	C	21.7		
	EBR	D	50.1	A	9.1		
	WBL	B	13.3	C	24.1		
	WBT	B	16.6	C	27.5		
	WBR	B	15.2	B	19.2		
	NBL	C	23.0	C	21.8		
	NBT	C	31.4	C	23.5		
	NBR	B	18.2	C	20.0		
	SBL	C	22.7	B	19.2		
	SBT	C	24.7	C	26.3		
SBR	C	20.2	B	18.4			

Intersection 5 was analyzed with the proposed traffic improvements which include adding a new westbound right lane and a new southbound right lane. The results show that the southbound approach becomes LOS D during the PM peak hour. However, the westbound approach continues to operate at LOS F during the AM peak hour.

Intersection 5 was analyzed as a three-leg signalized intersection. The results (see **Appendix B**) show that adding a traffic signal will improve the capacity to a LOS C or

better. Considering that this is a temporary condition and the peak site traffic will only occur during month 31 through month 34, TRC believes that the signalized option is an impractical mitigation measure. TRC recommends managing the temporary demand by requiring construction traffic to avoid this route during AM and PM peak hours or by having the developer implement staggered shifts.

Chapter 7: Crash Data Analysis

Traffic accident data was obtained from VDOT Crash Map. The data reviewed was from 2017-2024. The data is summarized in **Table 11**.

Regarding **Type of Crash**, the data identifies intersection 6 as the primary crash location with 27 total incidents, where a majority 55.6% are angled collisions. This often indicates causes like inadequate sight triangles or insufficient clearance intervals. Intersections 1 and 5 show a higher prevalence of rear-end collisions (37.5% and 30.8%), which typically suggests "stop-and-go" congestion or inadequate turn-lane storage capacity.

In terms of **Injury Type**, the intersections generally maintain a low-severity profile dominated by Property Damage Only (PDO).

When evaluating **Light Conditions**, the data reveals that most incidents occur during the day, except Intersection 4 with 75% of its crashes occurring in the dark. This may suggest poor street lighting or lack of retroreflective signage.

The **Road** and **Weather Conditions** data shows that the majority (approximately 80%) of all accidents across all intersections occur on dry pavement during clear weather.

Table 11. Crash Data by Intersection

	INTERSECTION					
	1	2	3	4	5	6
Type Of Crash						
Angled collision	25%			50%	15.4%	55.6%
Collision with fixed object	25%			25%	23.1%	
Rear end	37.5%		100%		30.8%	25.9%
Non-contact	12.5%				15.4%	
Side swipe (same direction)				25%	7.7%	7.4%
Side swipe (opposite direction)					7.7%	3.7%
Head on collision						3.7%
Backing collision						3.7%
Injury Type						
K-injury (fatal)						
A-injury						3.7%
B-injury	25%				15.4%	25.9%
C-injury	12.5%				7.7%	3.7%
Property damage	62.5%		100%	100%	76.9%	66.7%
Light Condition						
Dawn	12.5%					11.1%
Day	75%		100%	25%	69.2%	70.4%
Dark	12.5%			75%	30.8%	18.5%
Road Condition						
Dry	87.5%		100%	50%	84.6%	85.2%
Wet	12.5%			50%	15.4%	14.8%
Weather Condition						
Clear	87.5%		100%	100%	76.9%	81.5%
Rain	12.5%				15.4%	11.1%
Fog					7.7%	7.4%
Number of Crashes	8	0	1	4	13	27

Chapter 8: CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on analyses, intersection 1 operates at LOS F with 2028 background traffic. Intersections 2, 3, 4, 5, 6, and 7 operate at LOS C or better during both AM and PM peak hours.

For both years, 2028 and 2032 Total Traffic, intersection 1 operates at LOS F with very high delays, while intersections 5 and 6 become LOS F without improvements. Intersections 2, 3 and 4 experience increase in delay with total traffic, however, continue to operate at LOS D or better. The Southbound Left (SBL) movement at Tenaska Operations Driveway at Branch Road (SR 761) (intersection 7) is LOS D during the PM peak hour.

Capacity improvements at intersections 1, 5, and 6 were identified and recommended in **Table 10**. These include adding dedicated turn lanes, traffic signal (or roundabout) at intersection 1 and adjusting traffic signal phasing and splits at intersection 6. At intersection 5 signal is not recommended since the peak construction traffic occurs only during months 31 through 34. It is recommended that construction traffic avoids this intersection during the AM and PM peak hours by using shift times that do not occur during the peak hours and reducing the Site traffic impact by using staggered shift start times.

For the proposed lanes, the lengths were calculated based on the requirements from Figure 3-1 “*Right and Left Turn Lane Criteria for Single and Dual Lanes*” from Appendix F “*Access Management Design Standards for Entrances and Intersections*” located in the VDOT Road Design Manual and the highest 95th percentile queue length values obtained from capacity analyses.

The crash data identified intersection 6 as the primary crash location with 27 total incidents, where a majority 55.6% are angled collisions. Most accidents at all intersections occurred during the day and dry road conditions and ended with property damage.

Recommendations

Based on the capacity analyses, mitigation measures were developed to address operational deficiencies at the study intersections; these are summarized in **Table 11**. These mitigation measures are shown on **Figure 45A** through **Figure 50**.

Table 12. Recommended mitigation measures

Intersection	Recommendations	Recommended geometric design
1. Thomas Jefferson Parkway (SR 53) at Ruritan Lake Road (SR 619)	Add a new 434-foot eastbound left turn lane	Signalized three-leg intersection or Roundabout
	Add a new 713-foot eastbound right turn lane	
	Add a new 876-foot northbound left turn lane	
	Add a new 300-foot southbound right-turn lane	
2. Ruritan Lake Road (SR 619) at Sclaters Ford Road (SR 660)	Add a new 400-foot westbound left turn lane	Keep existing
3. Ruritan Lake Road (SR 619) at Branch Road (SR 761)	Add a new 400-foot westbound left turn lane	Keep existing
4. Branch Road (SR 761) at Rolling Road (SR 620)	-	Keep existing
5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)	Add a new 275-foot westbound right turn lane	Keep existing
	Add a new 275-foot southbound right-turn lane	
	Avoid this intersection during AM and PM peak hours	
	Staggered shifts	
6. James Madison Highway (US 15) at 3 Notch Road (US 250)	Extend existing northbound left turn lane by 134 feet	Keep existing
	Extend existing eastbound left turn lane by 9 feet	
	Add overlapping phases for the existing signal	
7. Tenaska Operations Driveway at Branch Road (SR 761)	Add a new 400-foot eastbound left turn lane	Keep existing
	Add a new 300-foot westbound right turn lane	
	Add a new 525-foot southbound left turn lane	
	(proposed Site driveway)	

NOTE: Proposed lane lengths include 75-foot tapers for intersection 5 and 200-foot tapers for intersections 1, 2, 3 and 7.

Figures

**EXISTING LANE
CONFIGURATION &
TRAFFIC CONTROL**



FIGURE 1: Existing Lane Configuration & Traffic Control
Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)

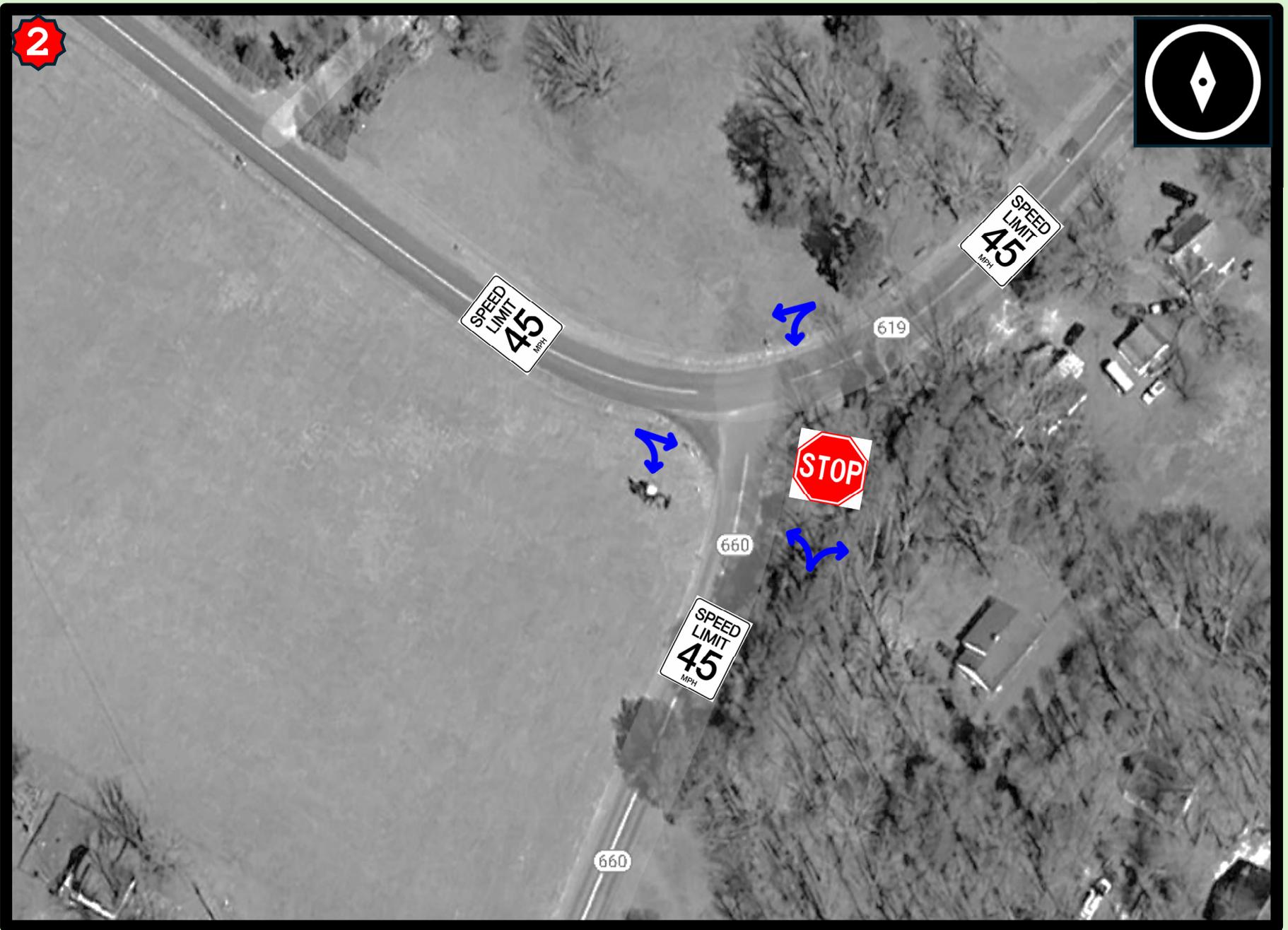


FIGURE 2: Existing Lane Configuration & Traffic Control
Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

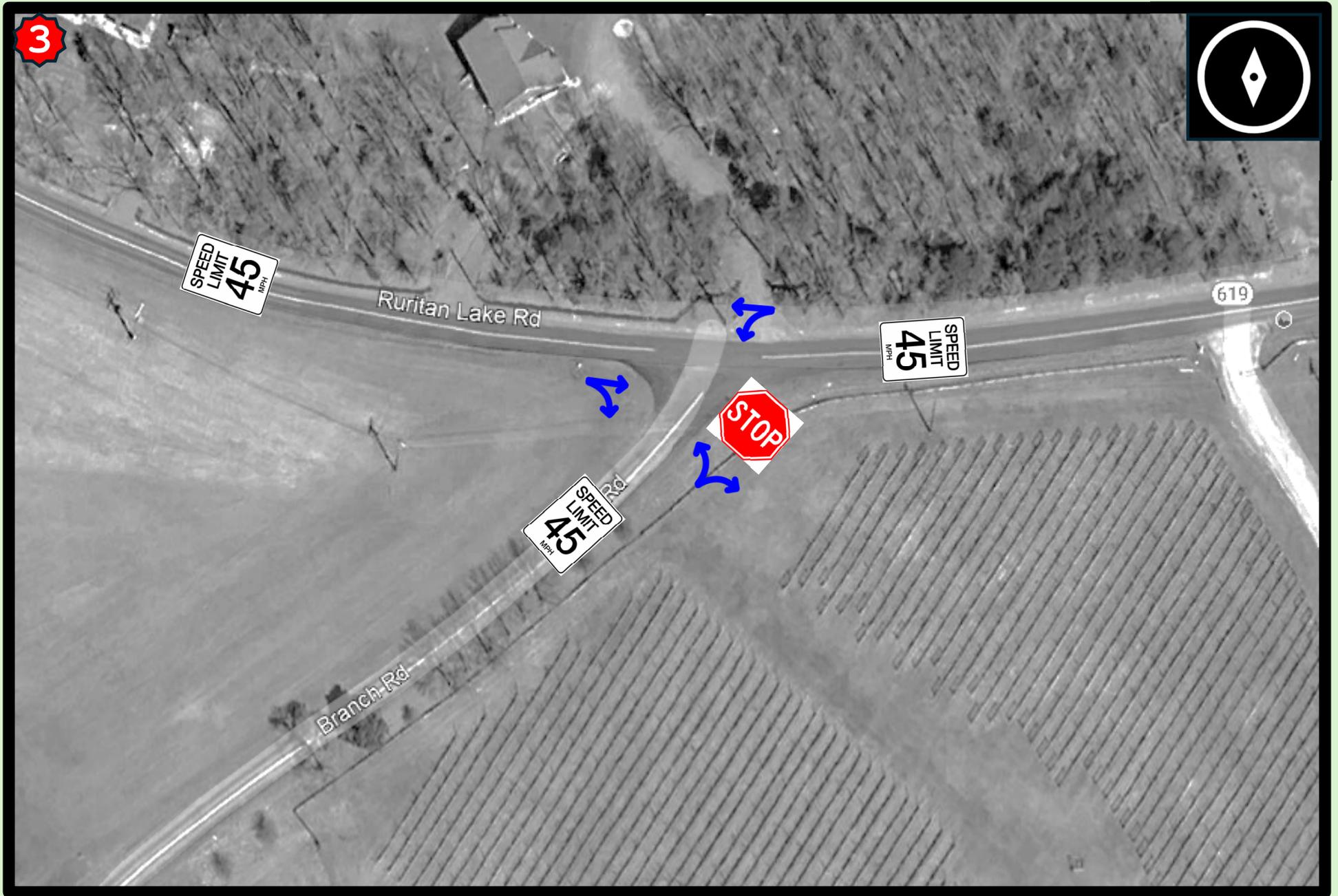


FIGURE 3: Existing Lane Configuration & Traffic Control
Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

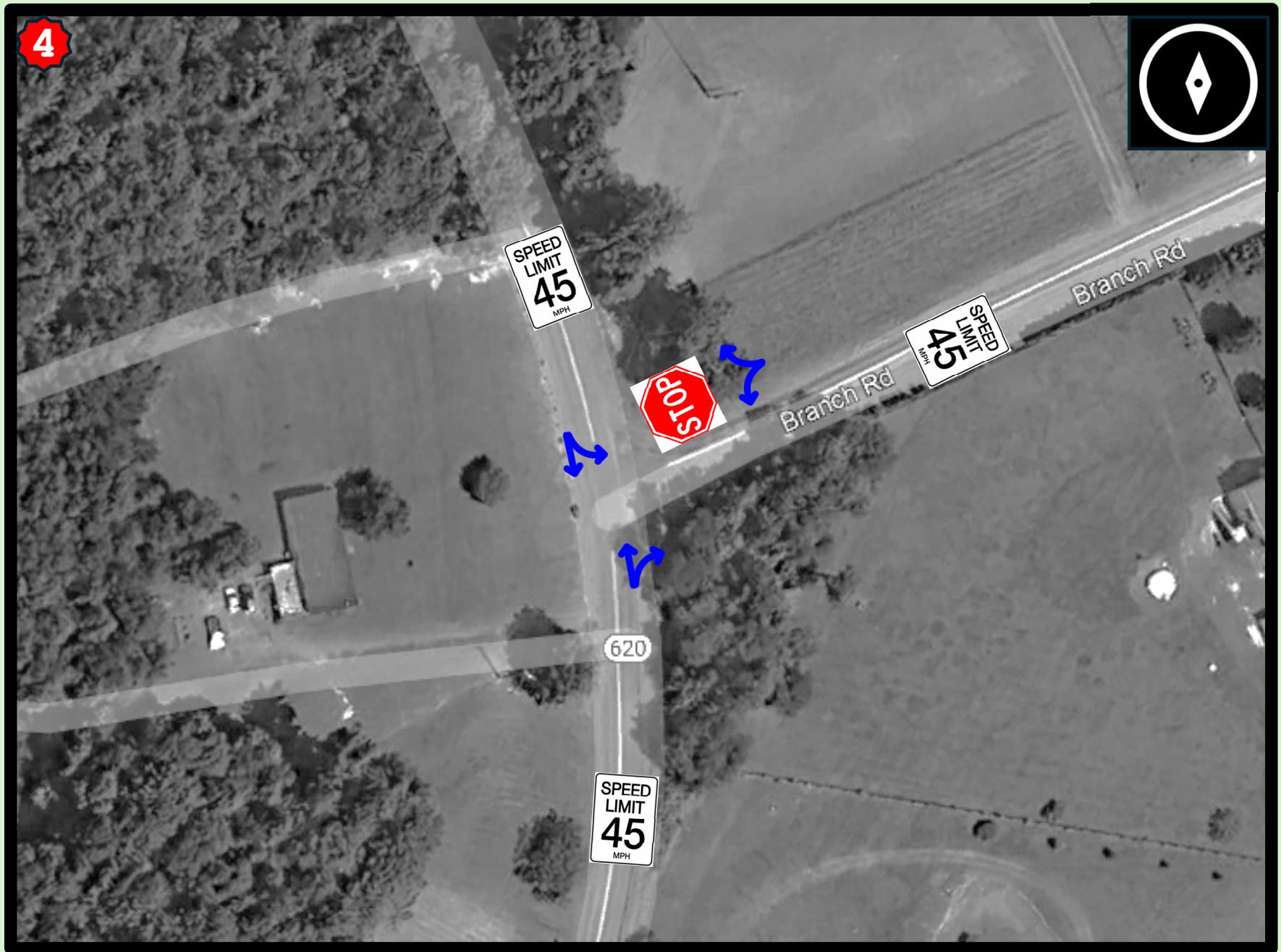


FIGURE 4: Existing Lane Configuration & Traffic Control
Branch Rd (SR 761) at Rolling Rd (SR 620)

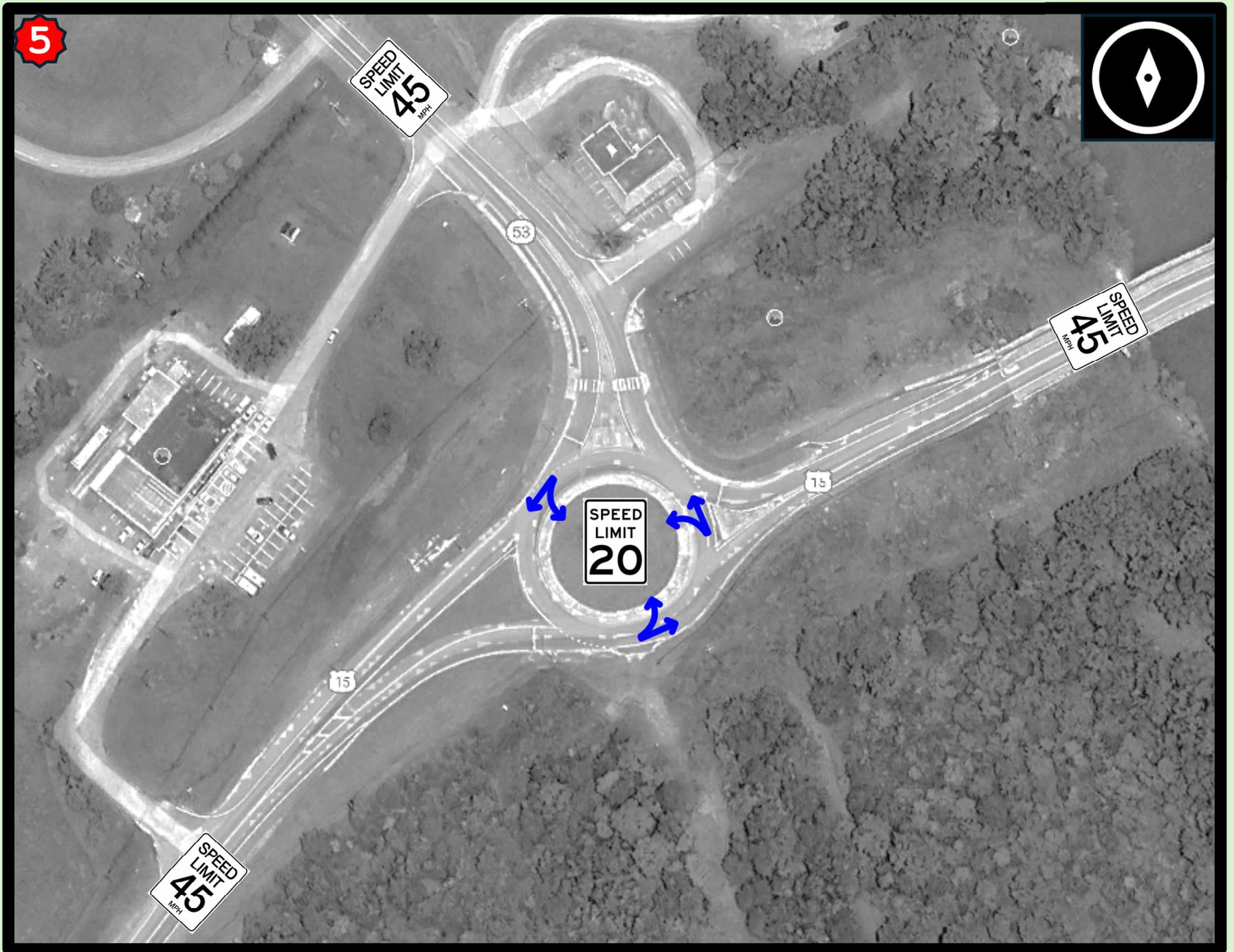


FIGURE 5: Existing Lane Configuration & Traffic Control
Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)



FIGURE 6: Existing Lane Configuration & Traffic Control
James Madison Highway (US 15) at 3 Notch Road (US 250)

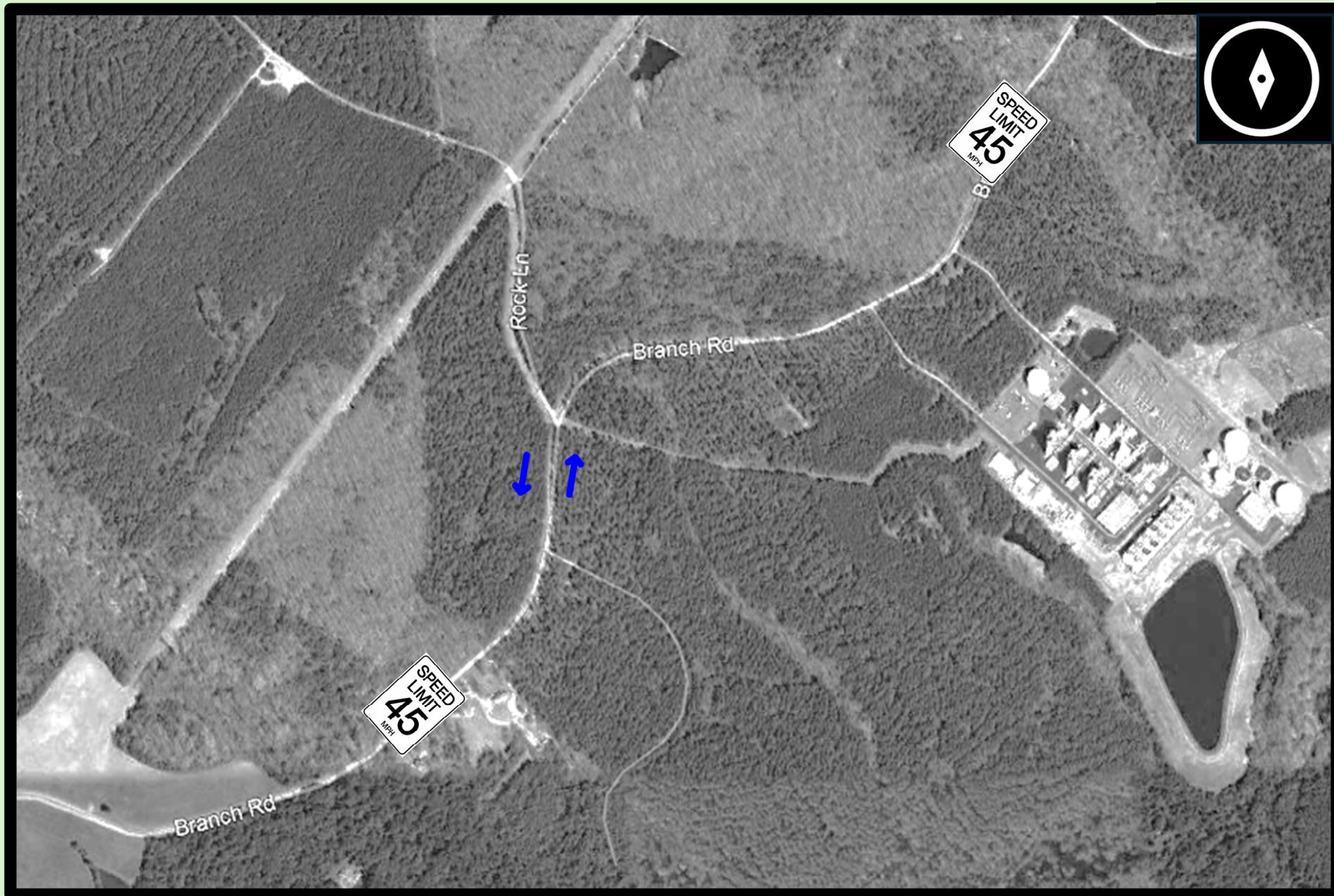


FIGURE 7: Existing Lane Configuration & Traffic Control
Branch Rd (SR 761)

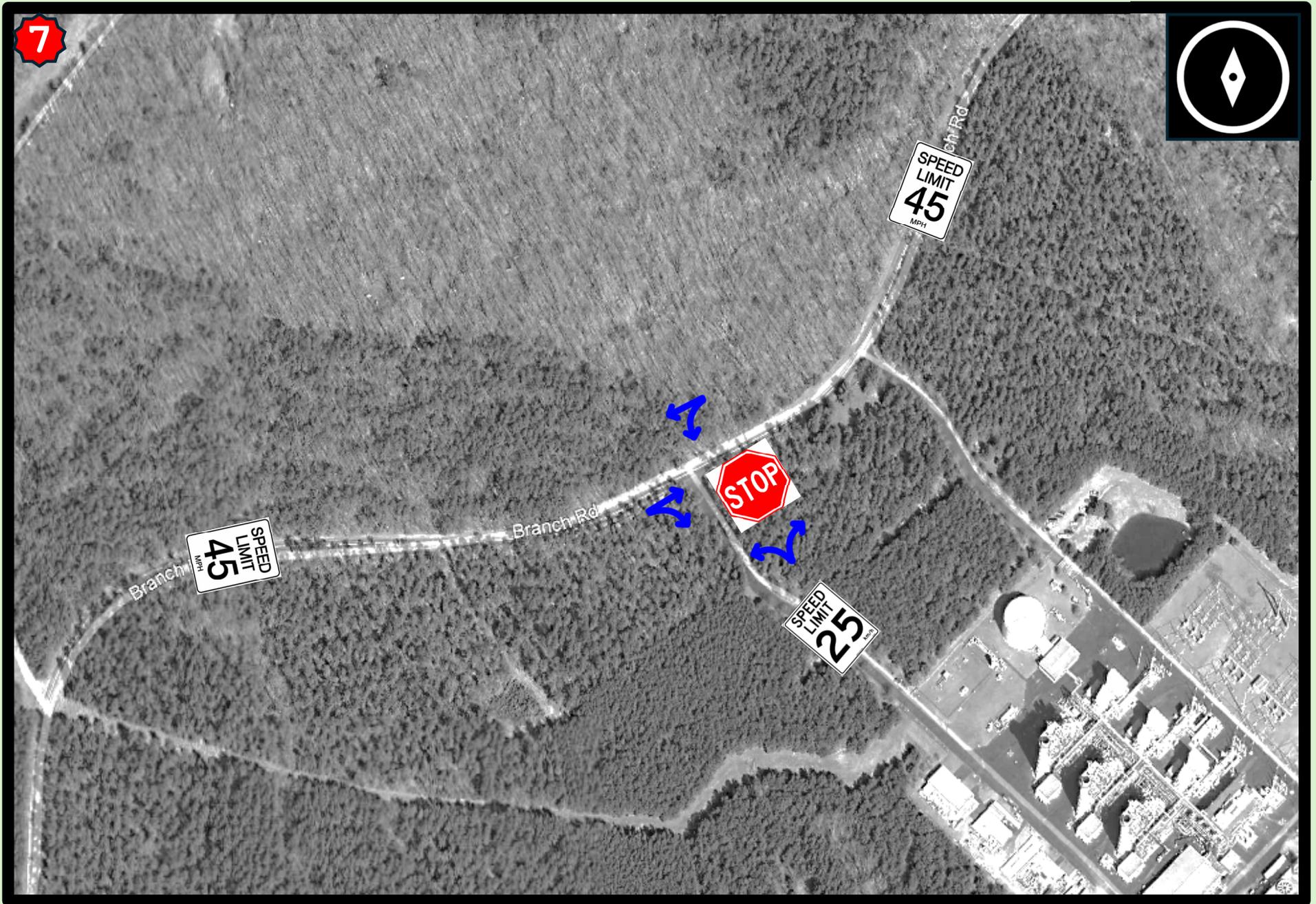


FIGURE 7: Existing Lane Configuration & Traffic Control
Tenaska Operations driveway at Branch Rd (SR 761)

**2028 OPENING YEAR
BACKGROUND TRAFFIC**

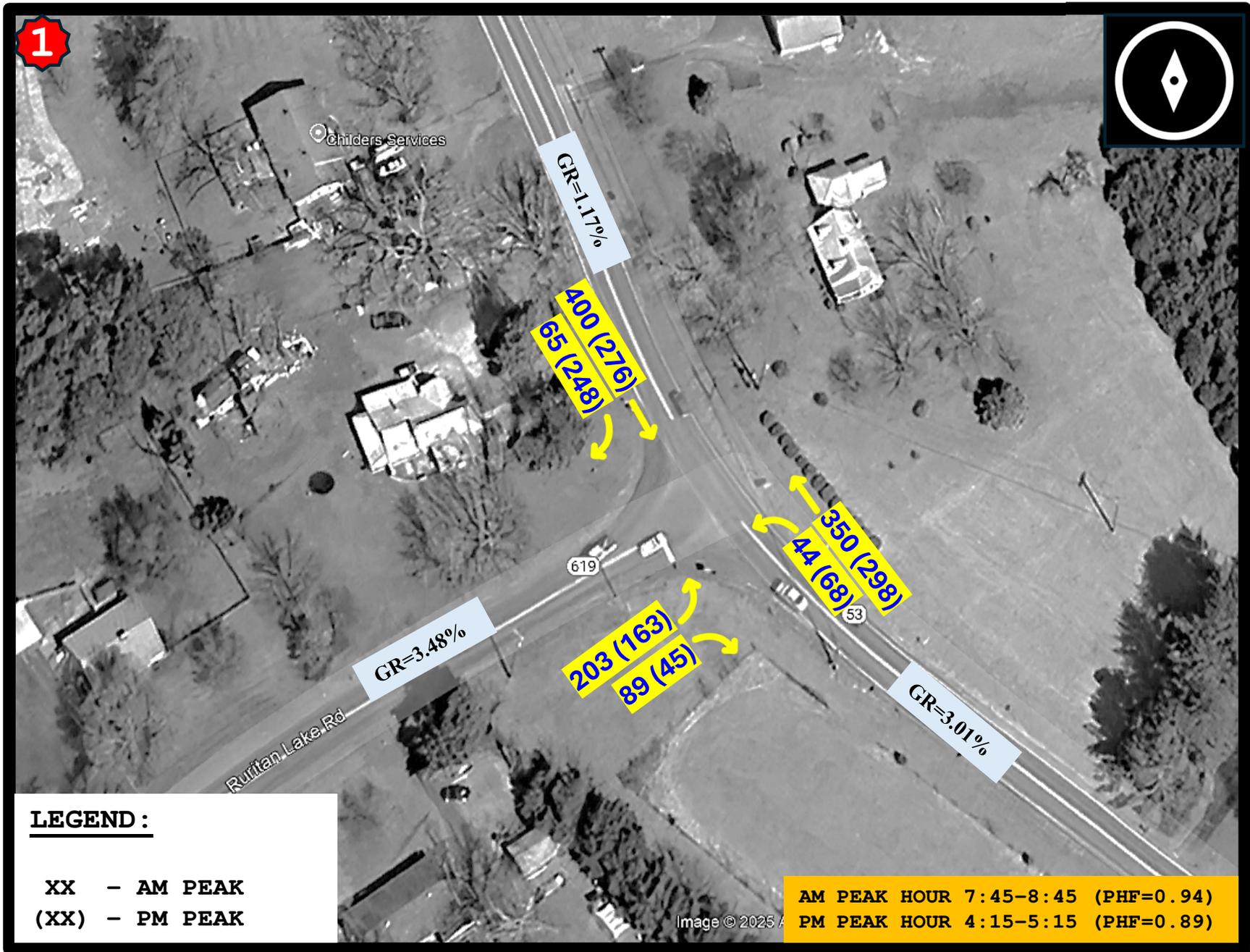


FIGURE 8: 2028 Opening Year Background Traffic
Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)

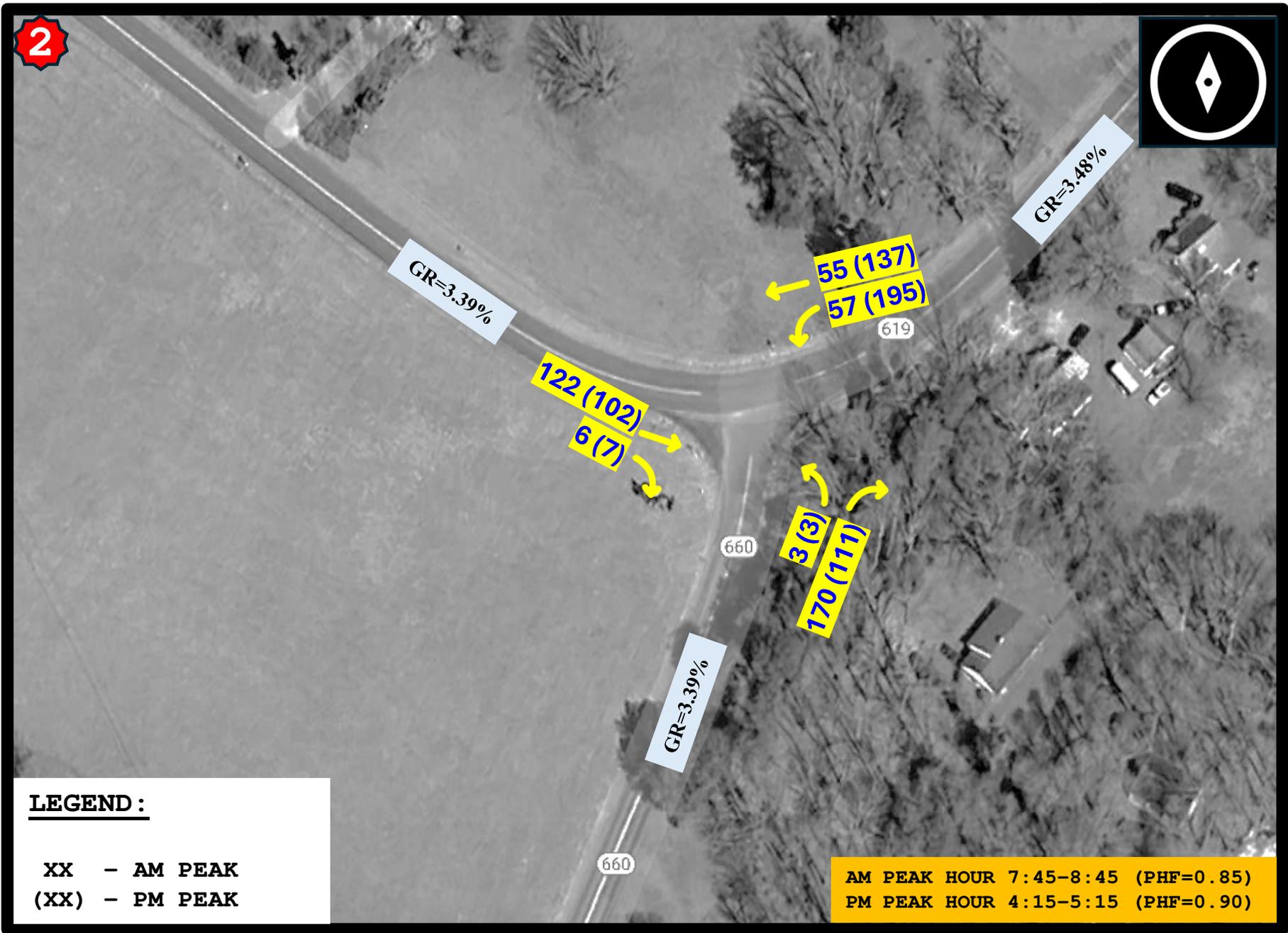


FIGURE 9: 2028 Opening Year Background Traffic
Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

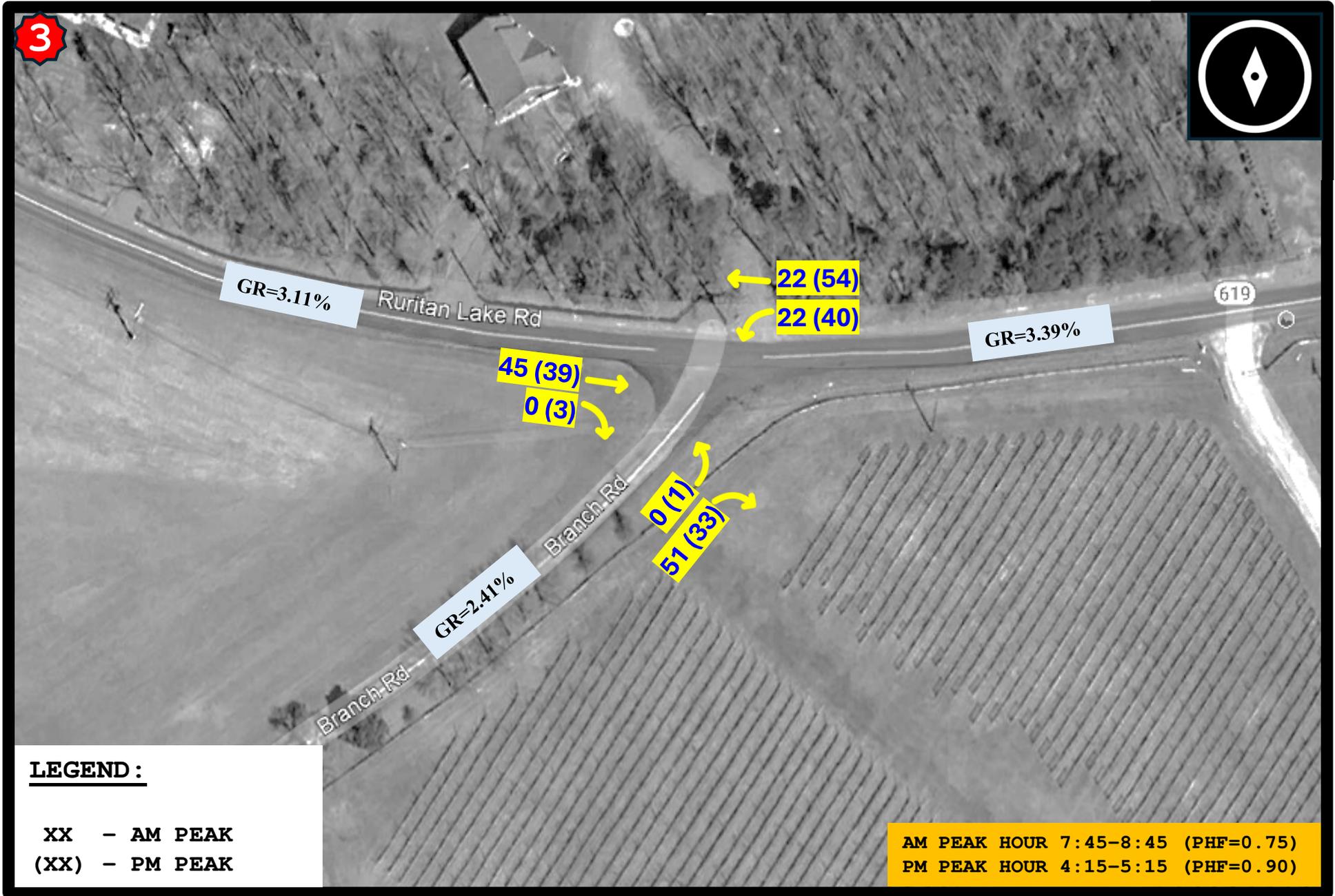


FIGURE 10: 2028 Opening Year Background Traffic
Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

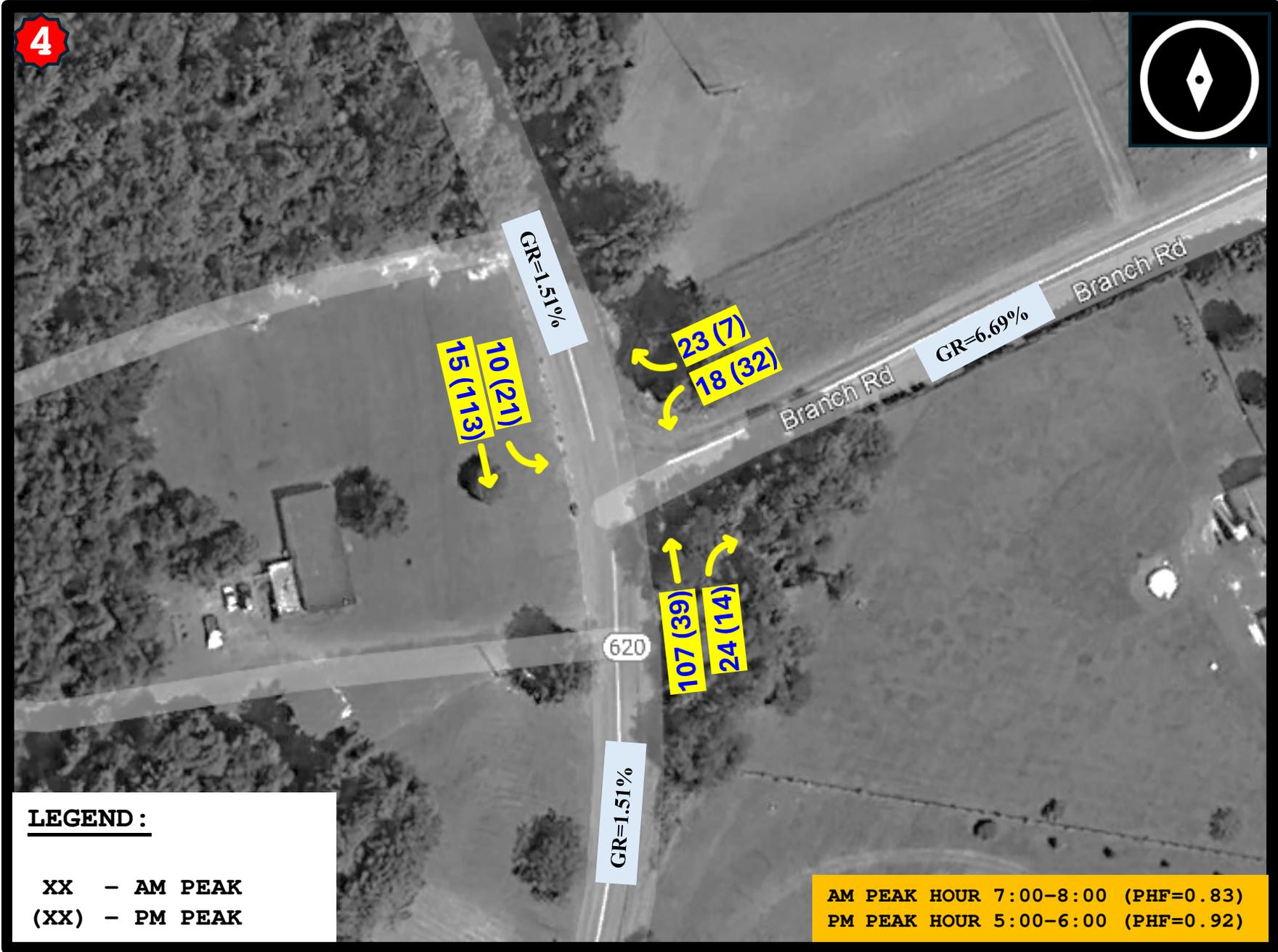


FIGURE 11: 2028 Opening Year Background Traffic
Branch Rd (SR 761) at Rolling Rd (SR 620)

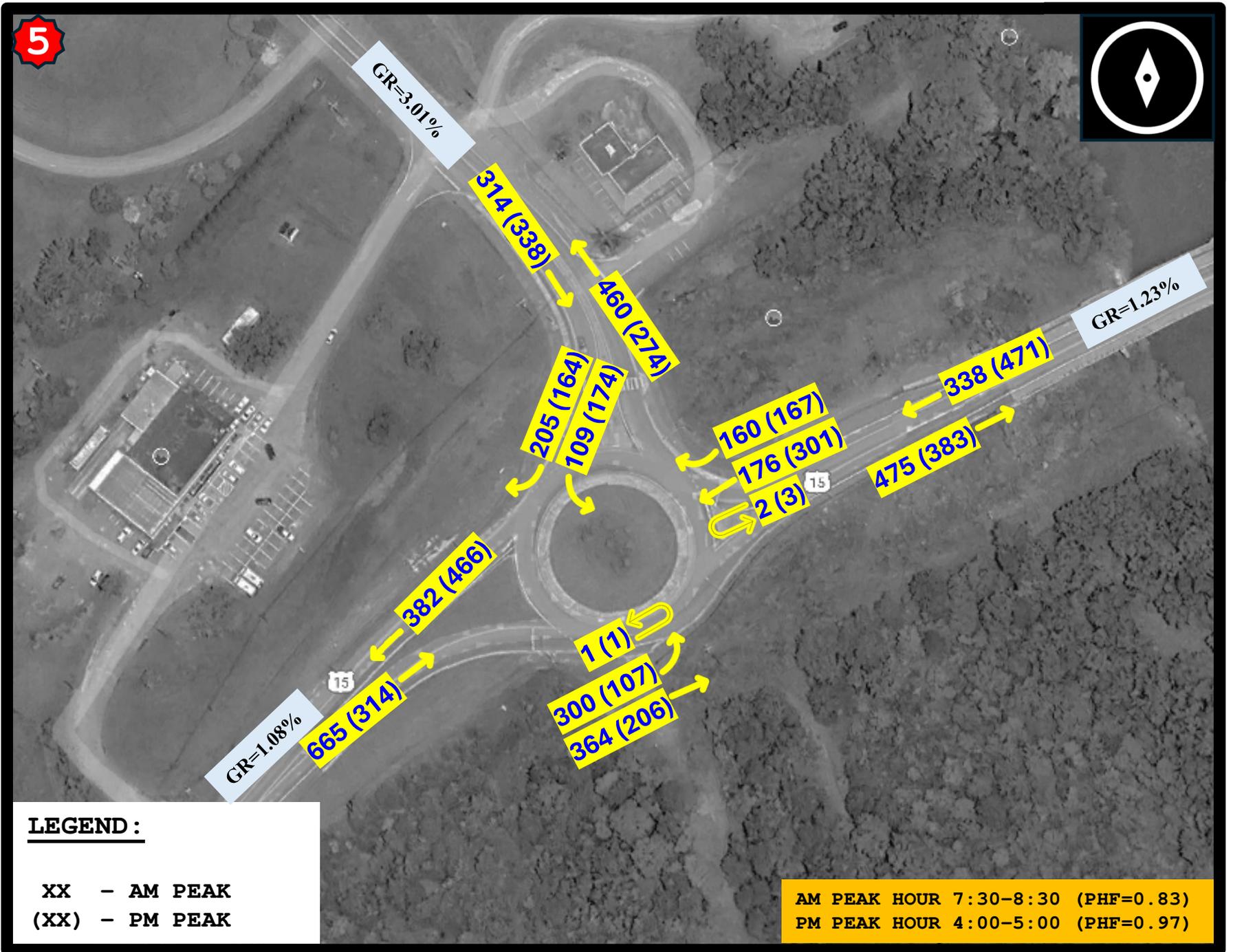


FIGURE 12: 2028 Opening Year Background Traffic
 Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)

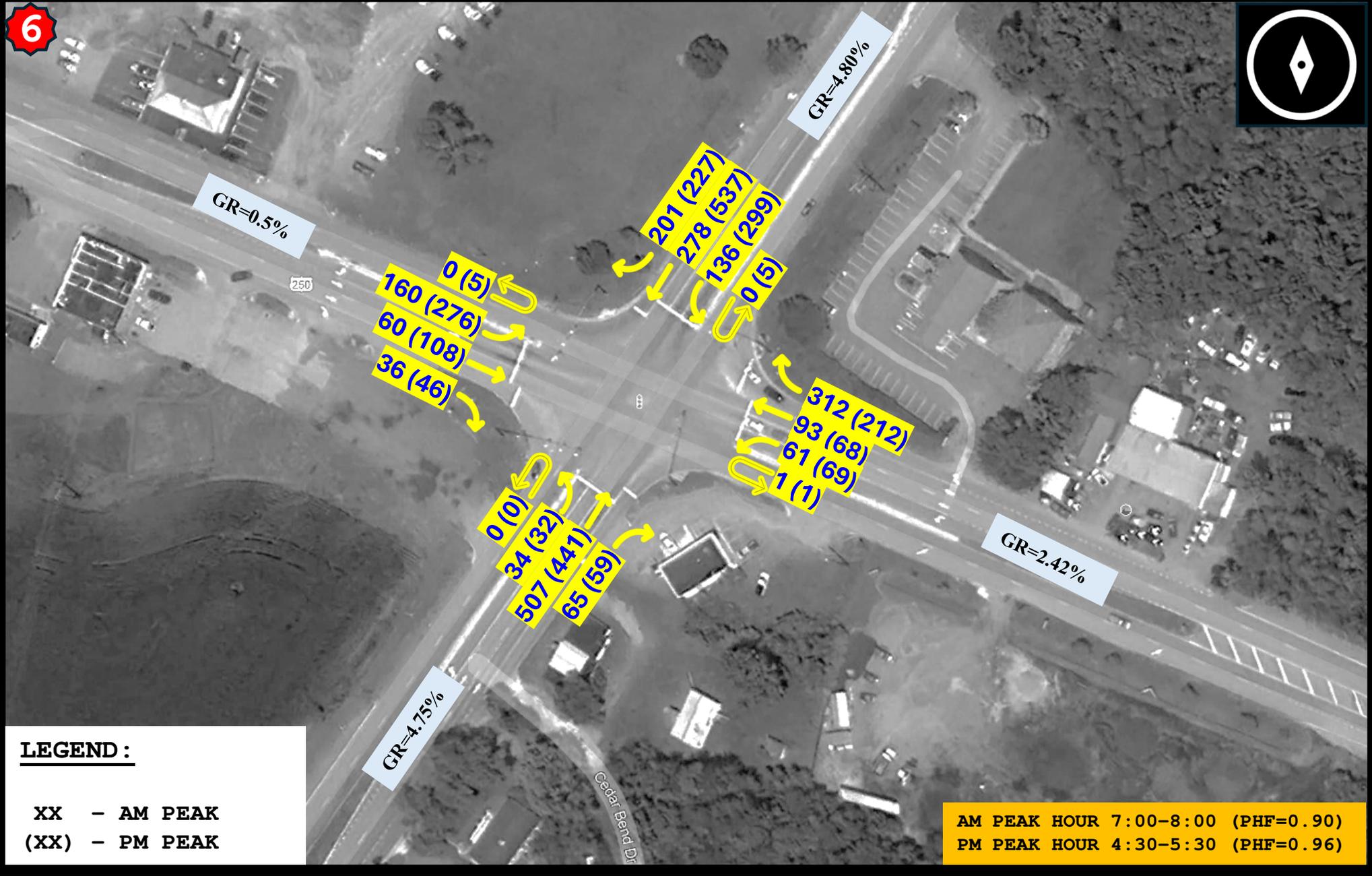


FIGURE 13: 2028 Opening Year Background Traffic
 James Madison Highway (US 15) at 3 Notch Road (US 250)

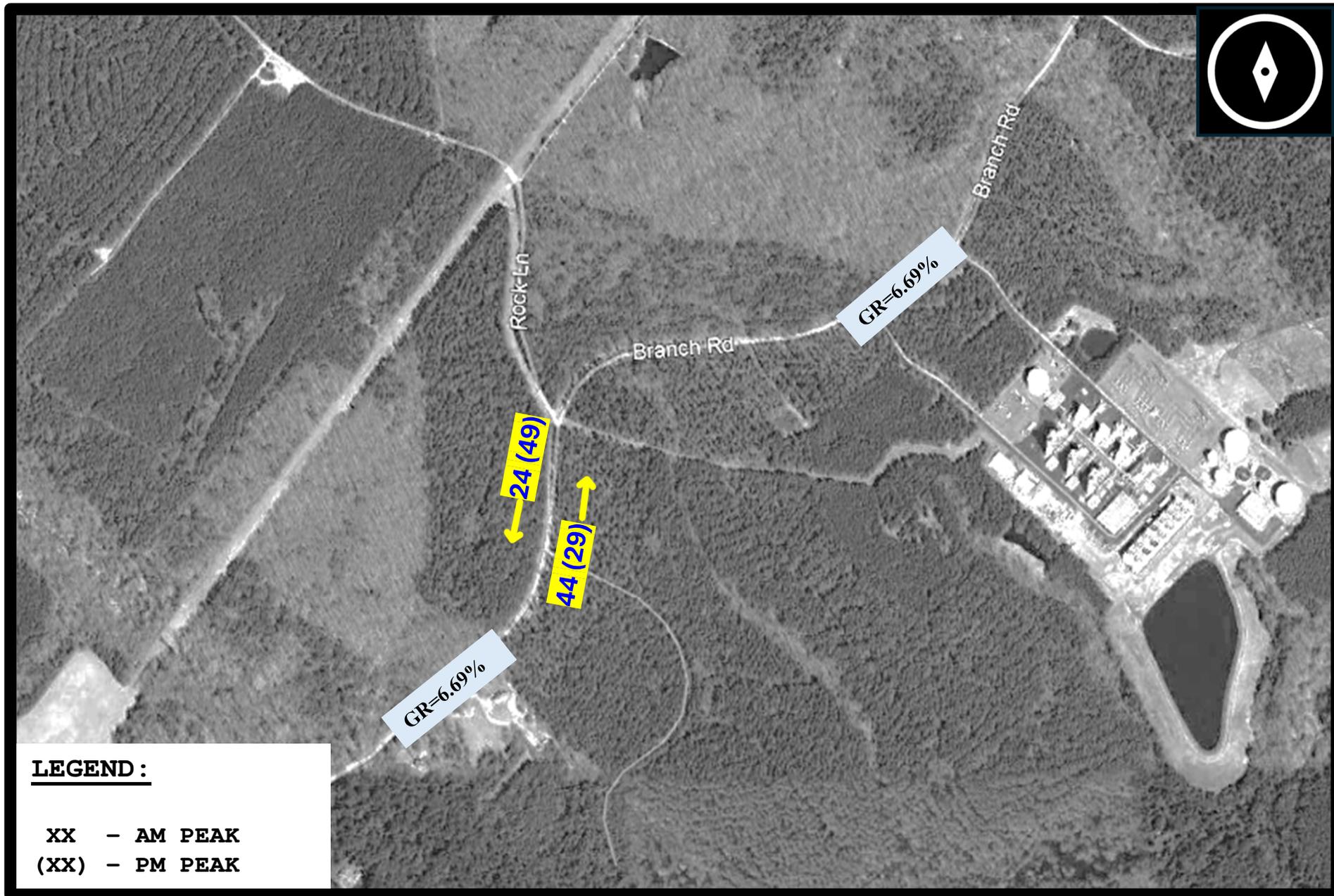


FIGURE 14: 2028 Opening Year Background Traffic
Branch Rd (SR 761)

**2032 DESIGN YEAR
BACKGROUND TRAFFIC**

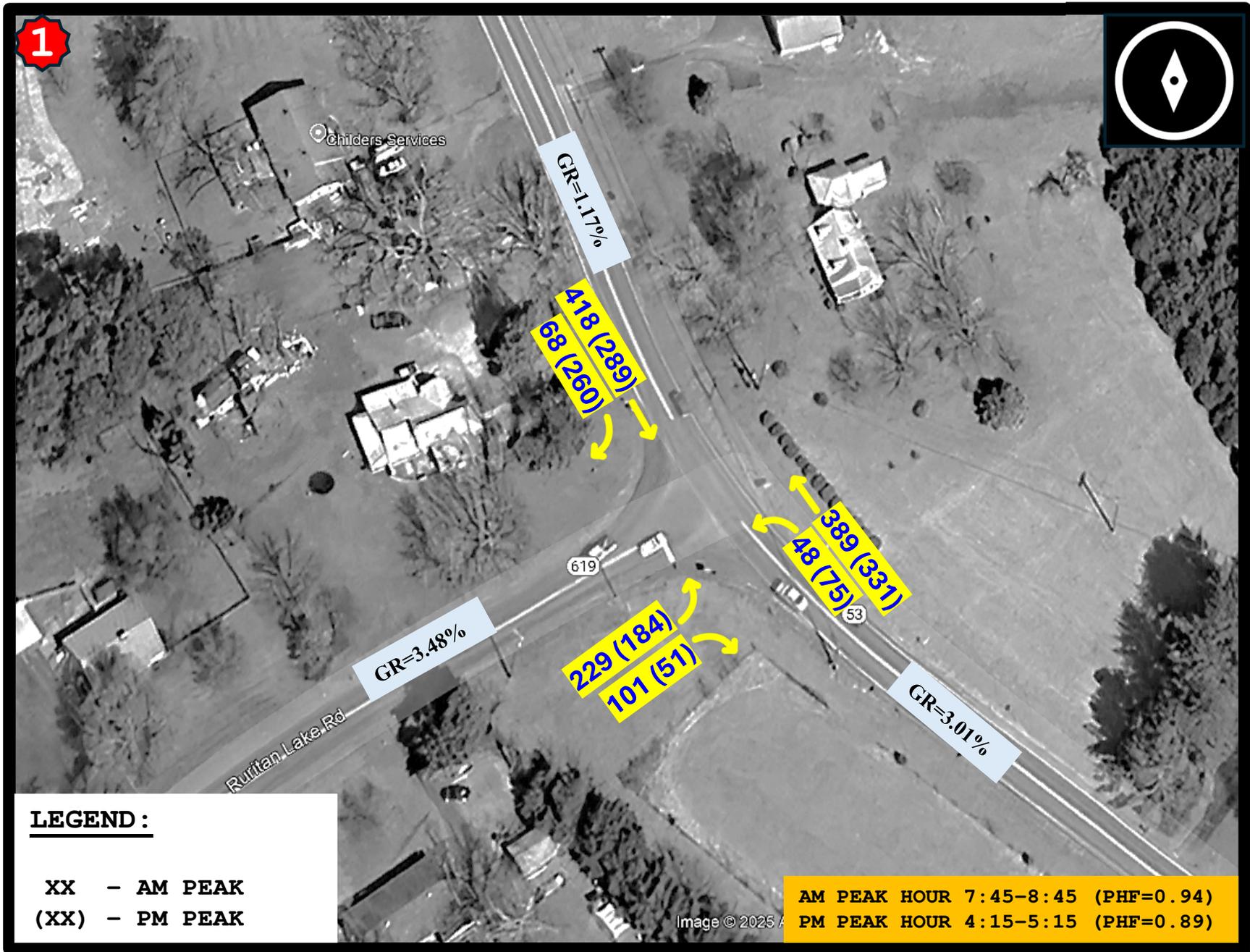


FIGURE 15: 2032 Design Year Background Traffic
 Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)

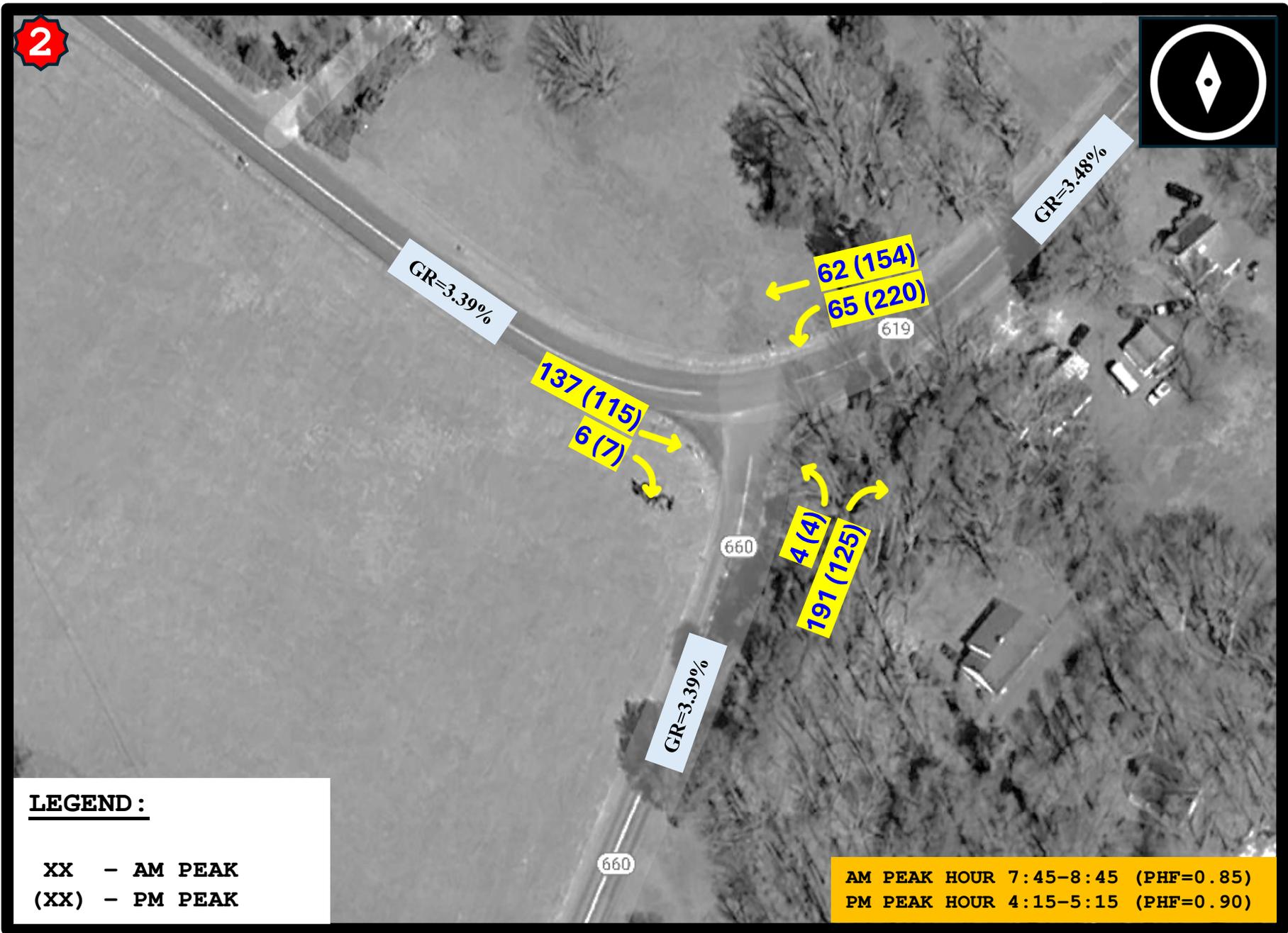


FIGURE 16: 2032 Opening Year Background Traffic
 Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

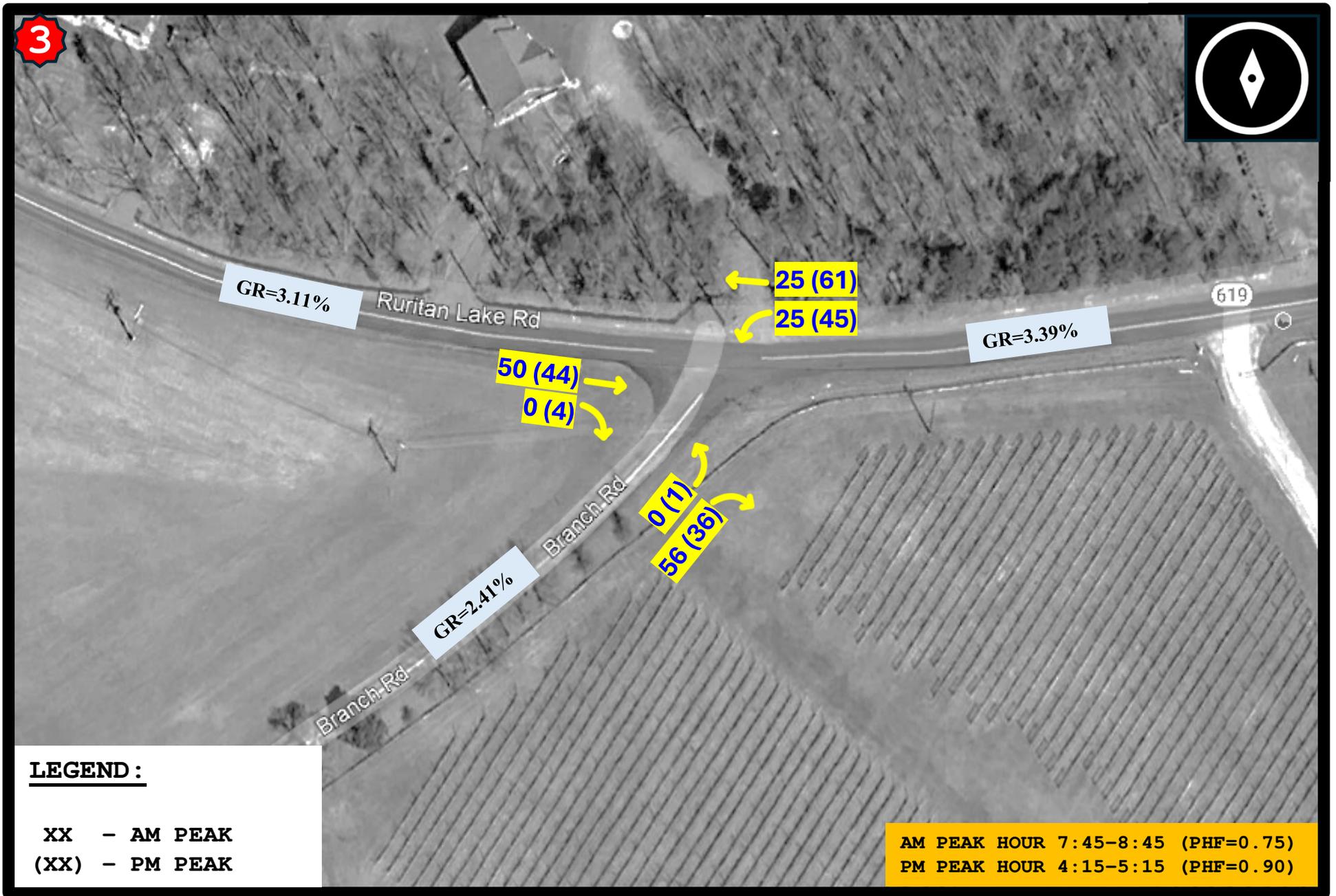


FIGURE 17: 2032 Design Year Background Traffic
Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

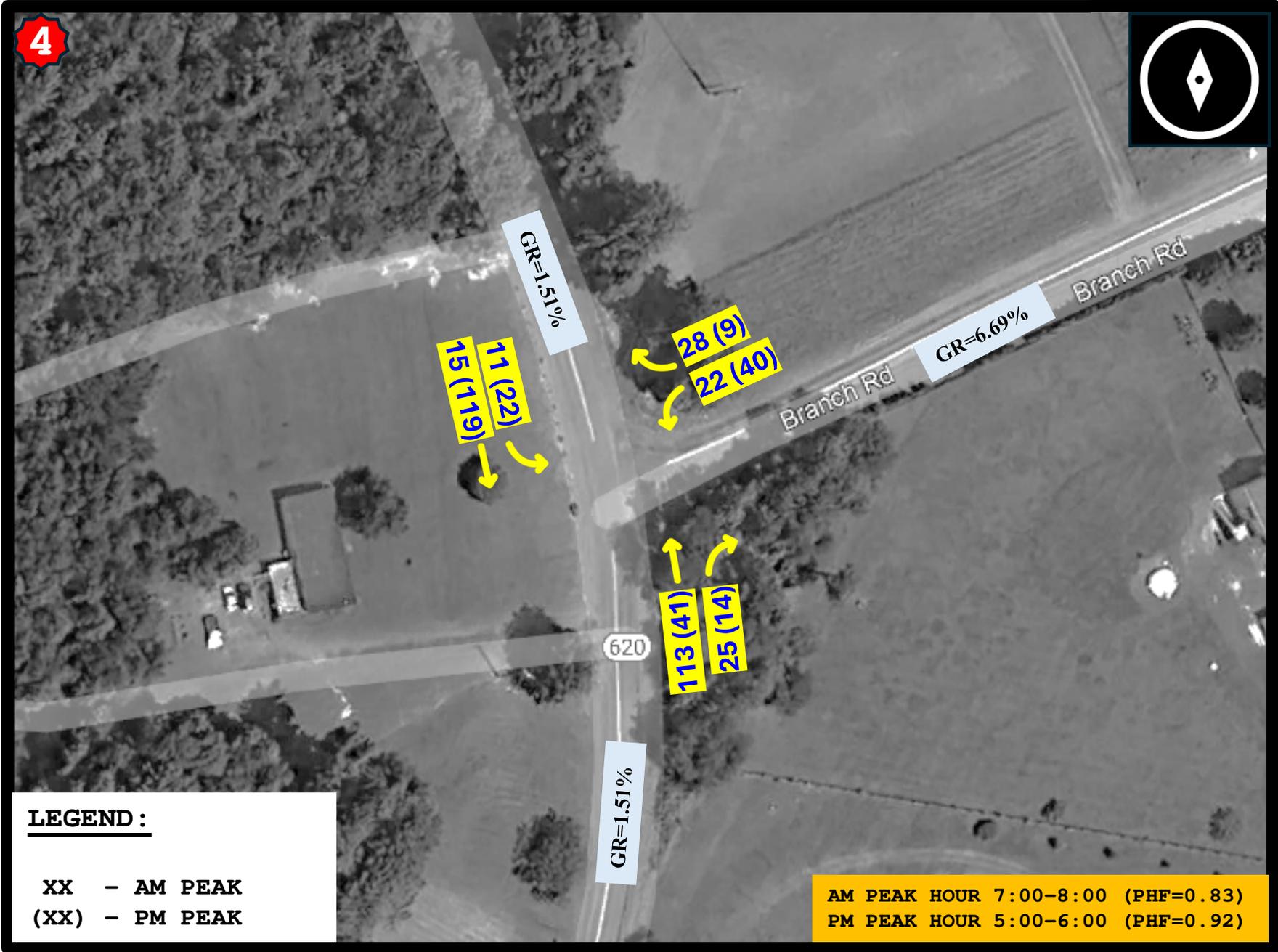


FIGURE 18: 2032 Design Year Background Traffic
Branch Rd (SR 761) at Rolling Rd (SR 620)

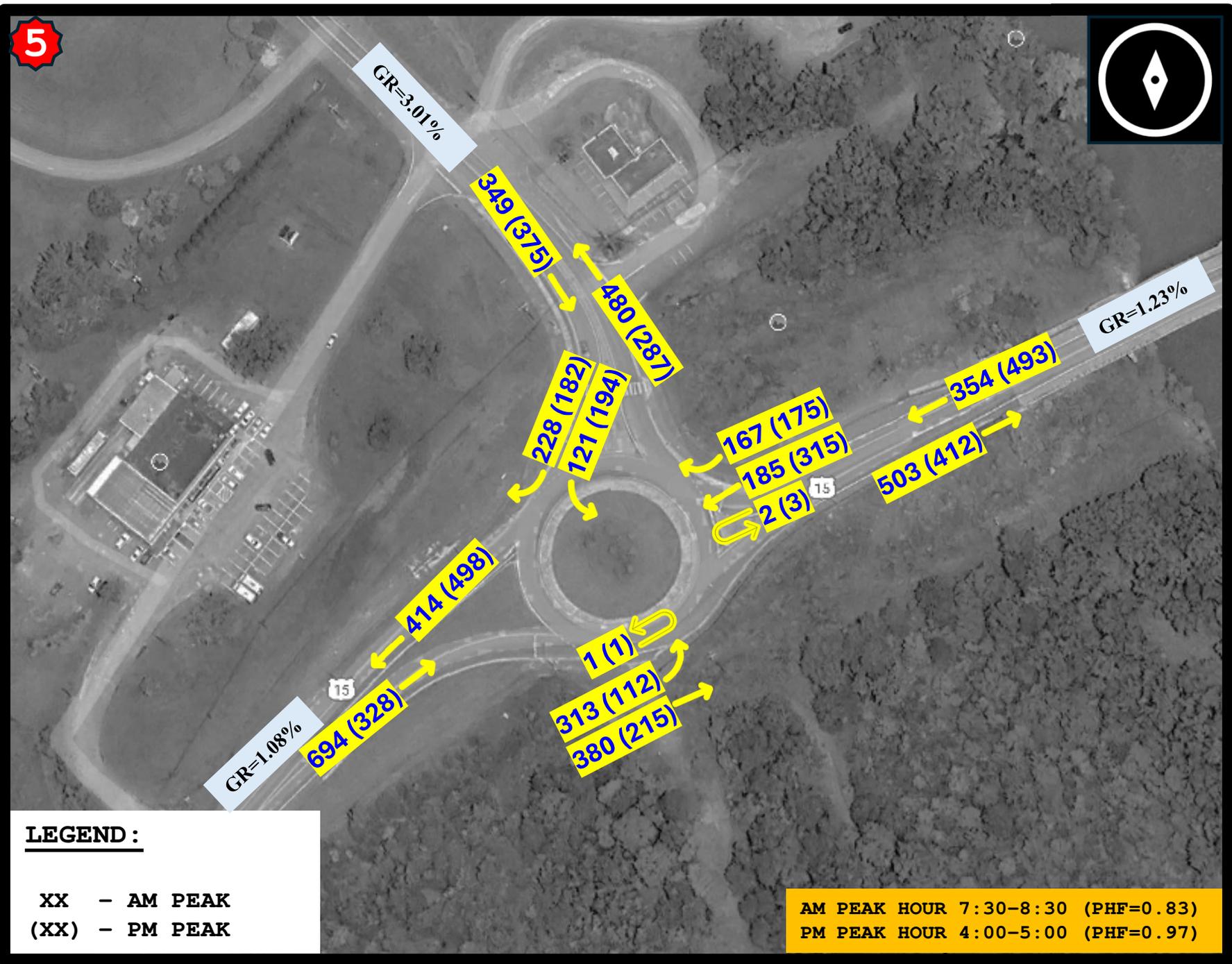


FIGURE 19: 2032 Design Year Background Traffic
 Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)

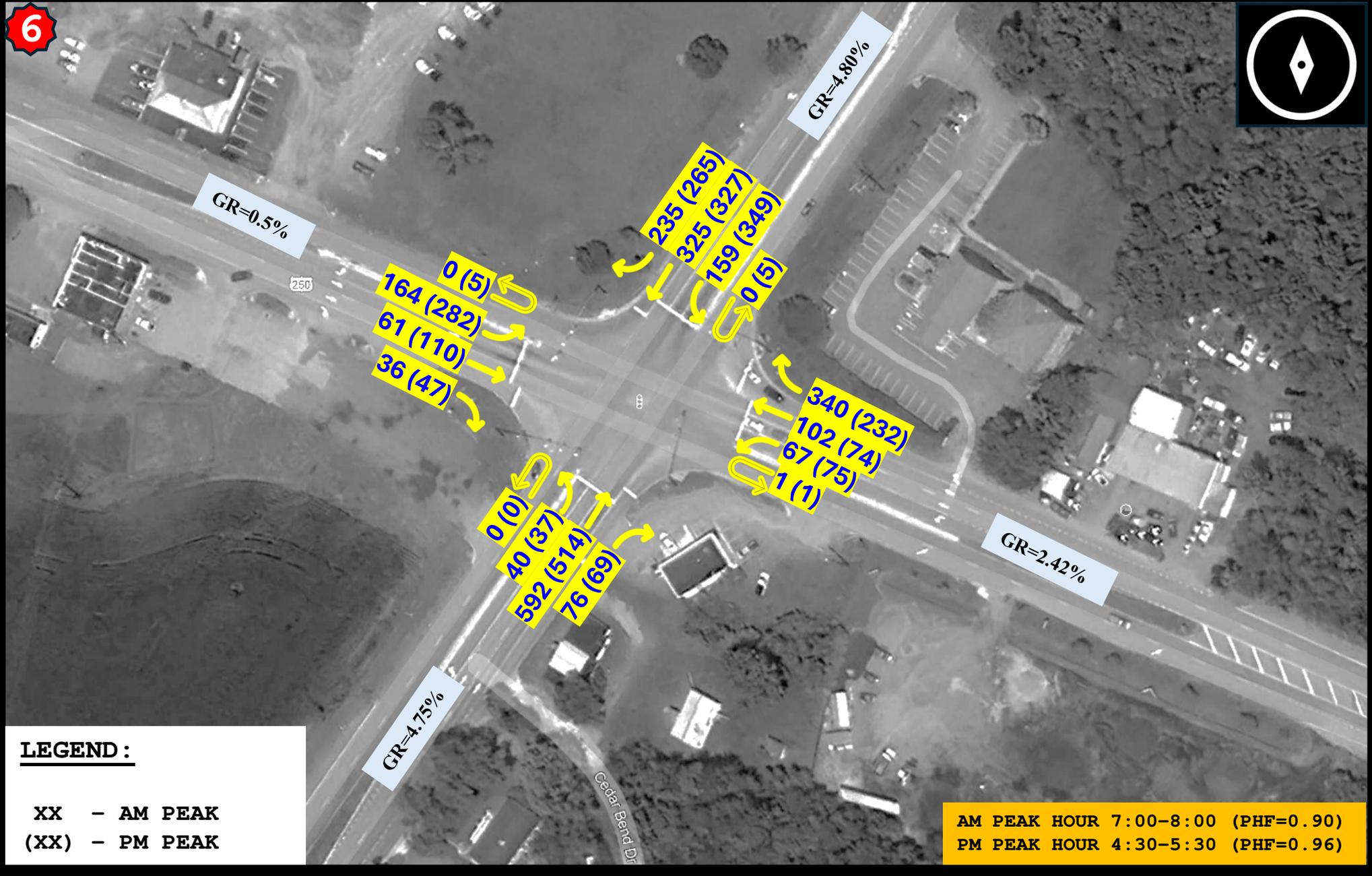


FIGURE 20: 2032 Design Year Background Traffic
 James Madison Highway (US 15) at 3 Notch Road (US 250)

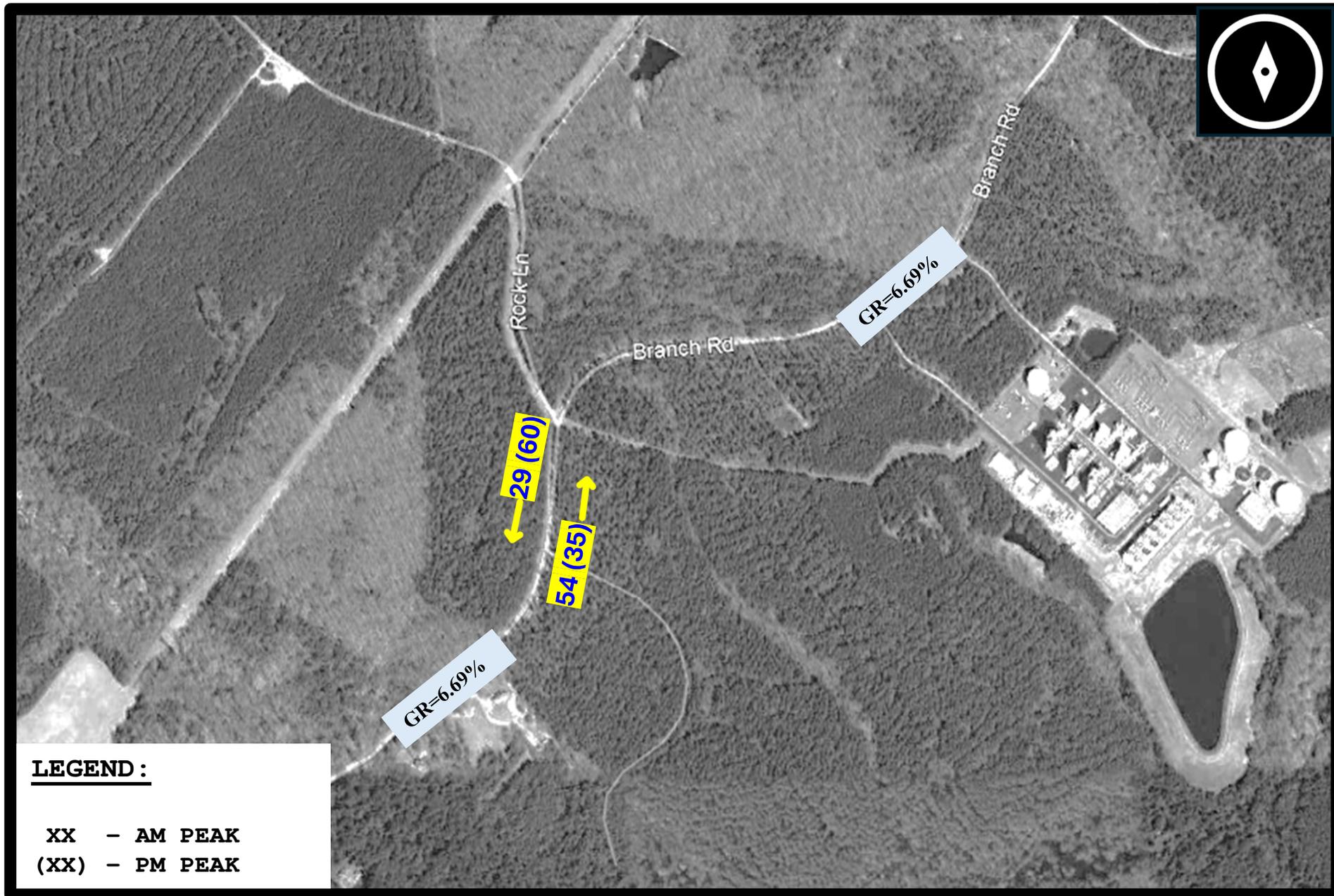


FIGURE 21: 2032 Design Year Background Traffic
Branch Rd (SR 761)

**SITE TRIP DISTRIBUTION
AND
SITE TRIPS**



FIGURE 24: Site Trips

Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)

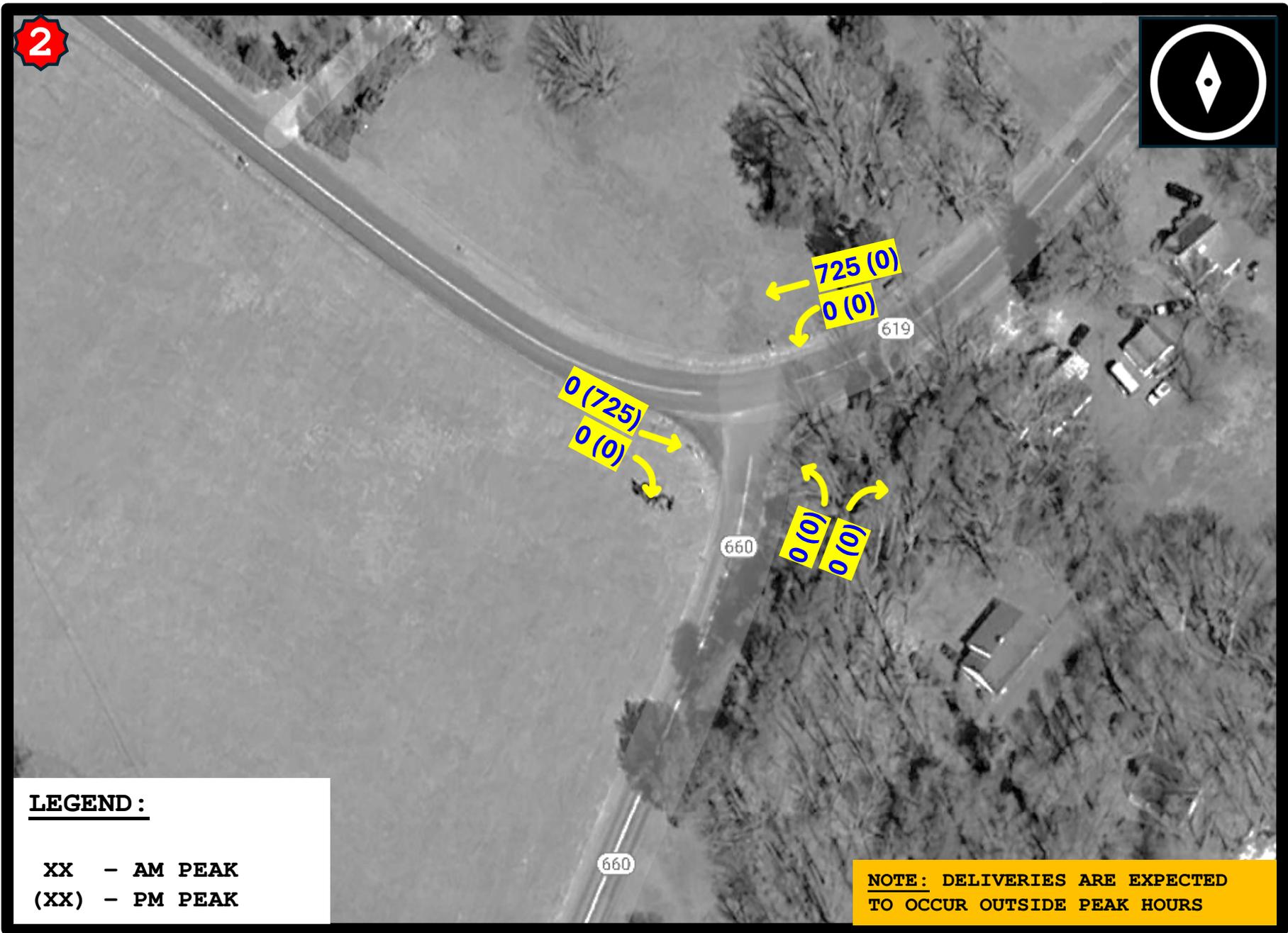


FIGURE 25: Site Trips
 Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

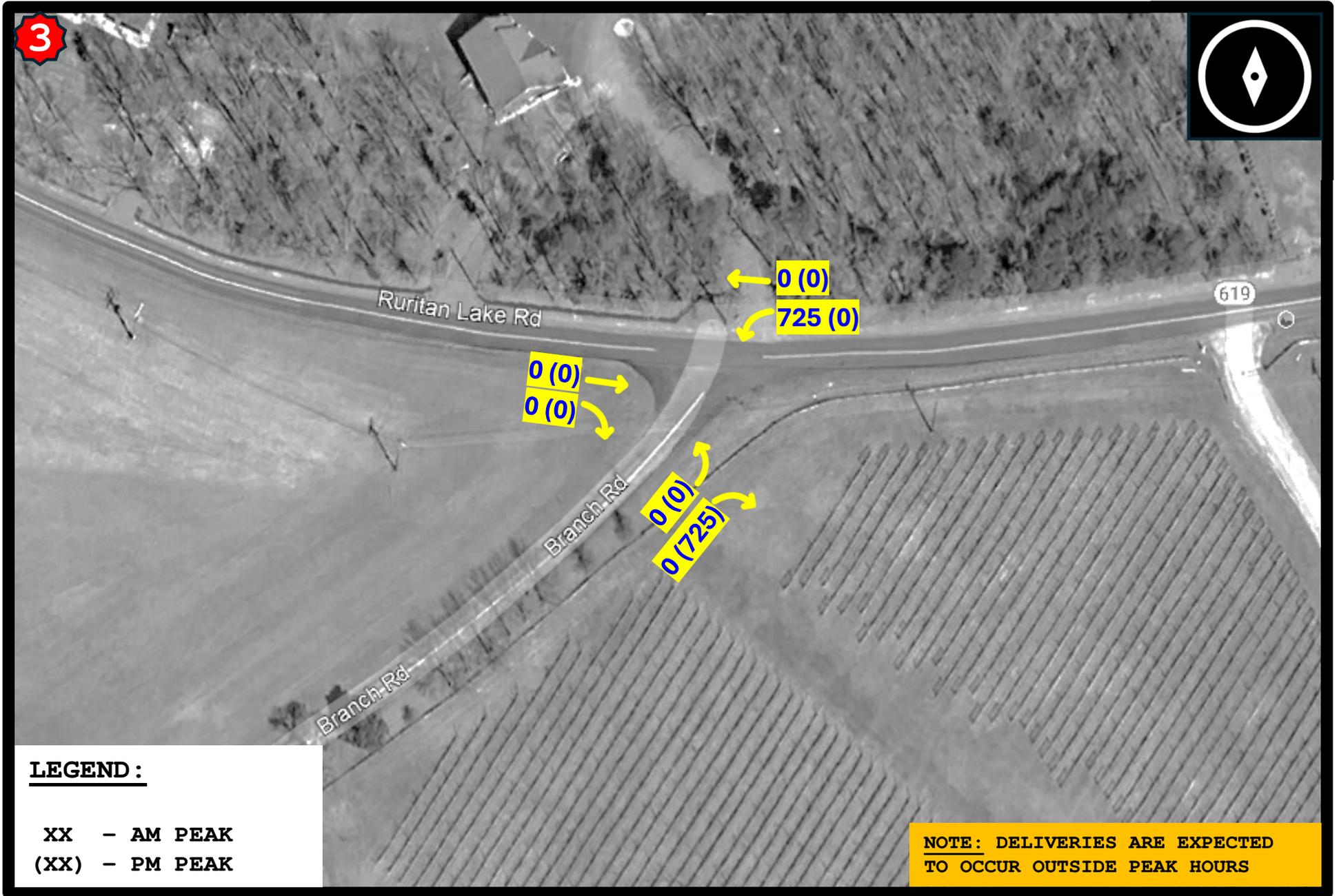


FIGURE 26: Site Trips
 Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

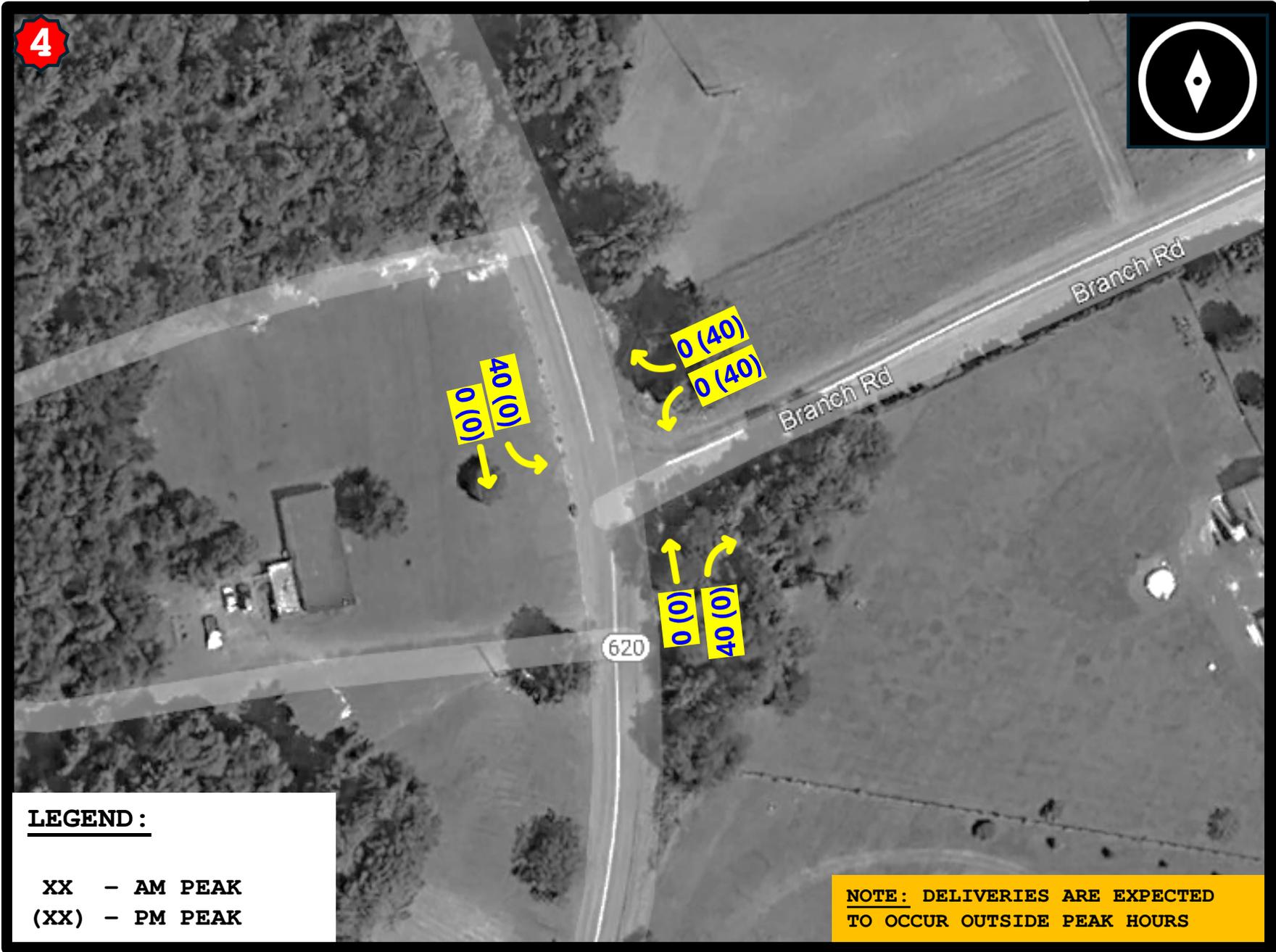


FIGURE 27: Site Trips
Branch Rd (SR 761) at Rolling Rd (SR 620)

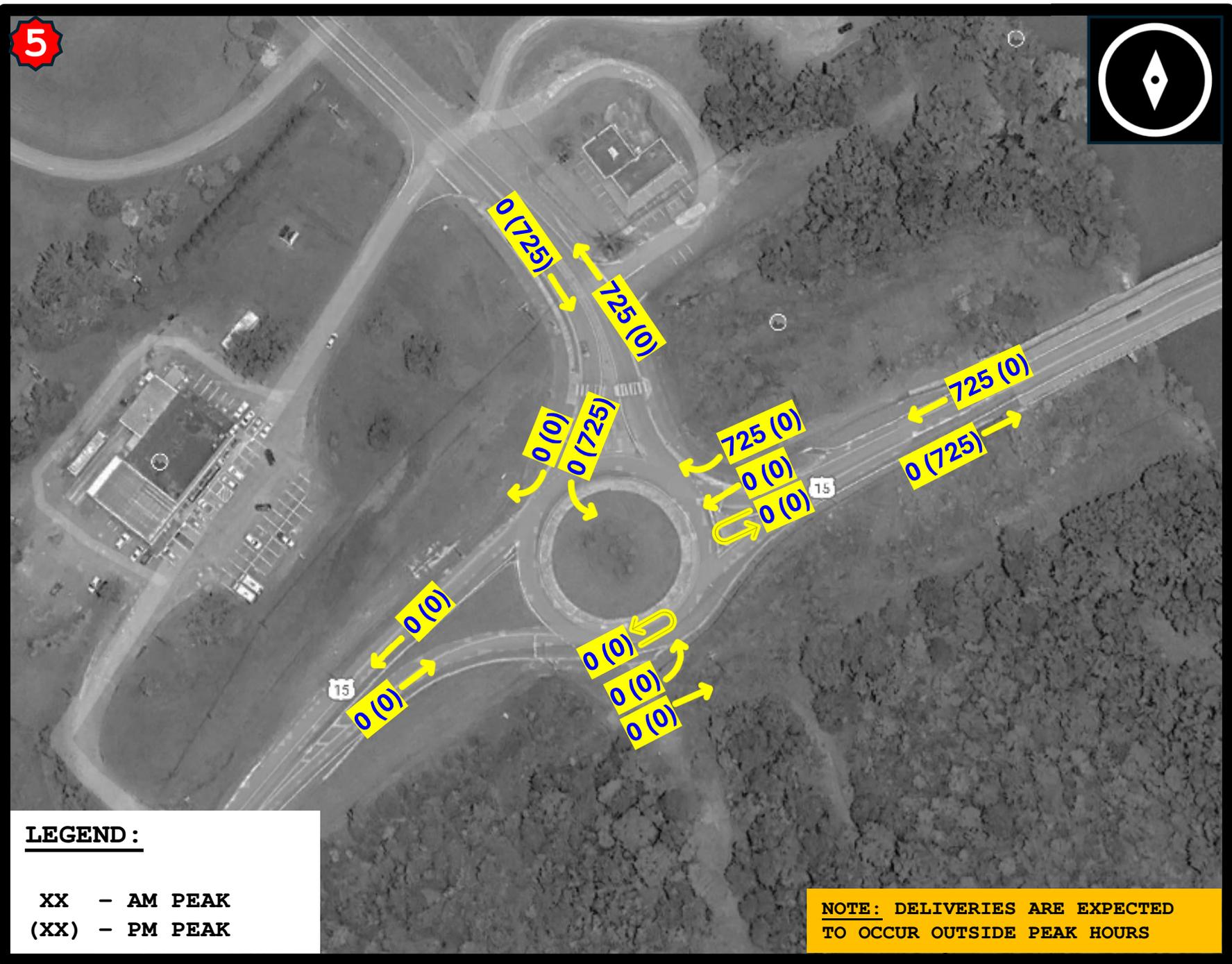


FIGURE 28: Site Trips
 Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)

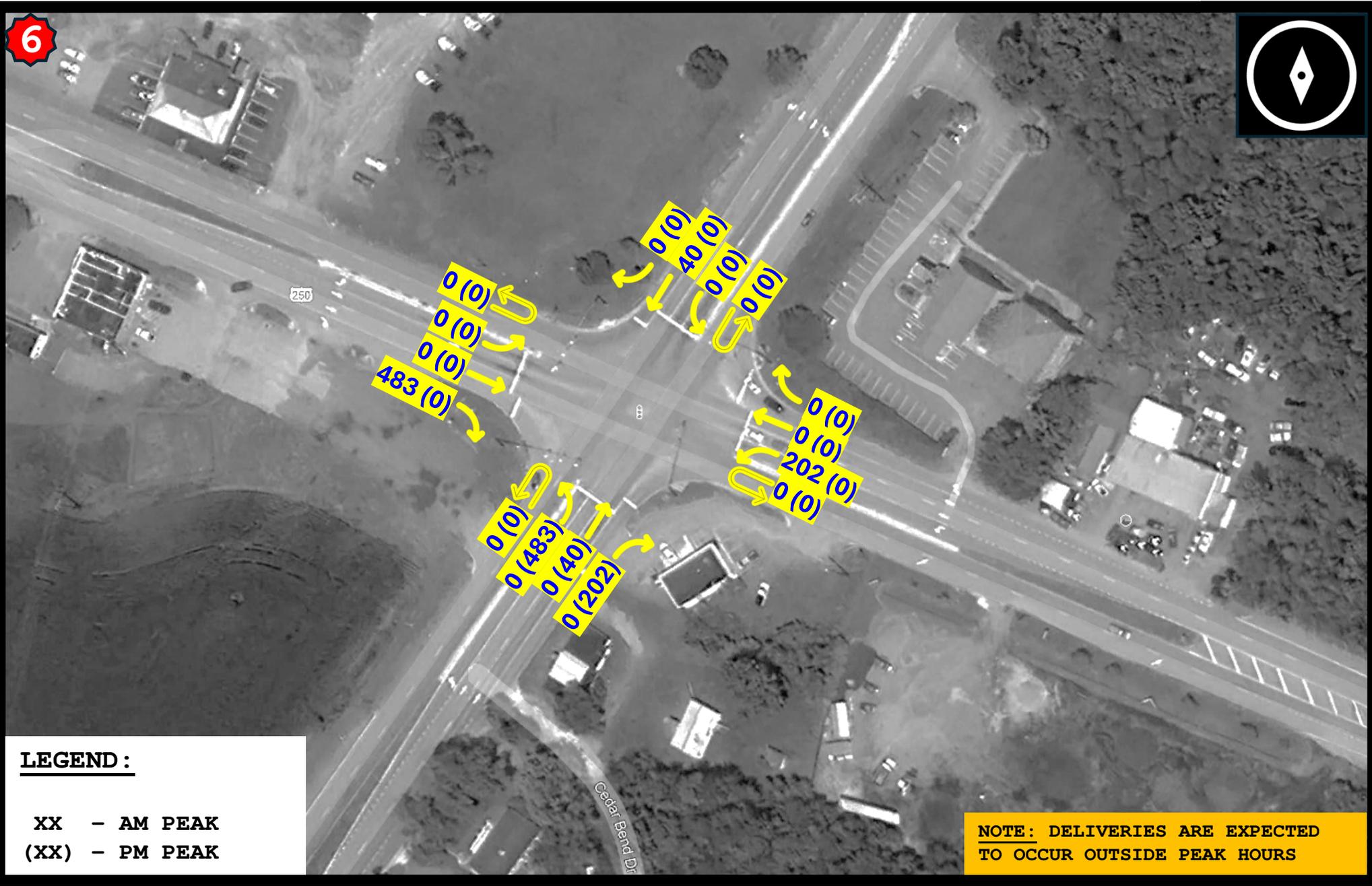


FIGURE 29: Site Trips
 James Madison Highway (US 15) at 3 Notch Road (US 250)

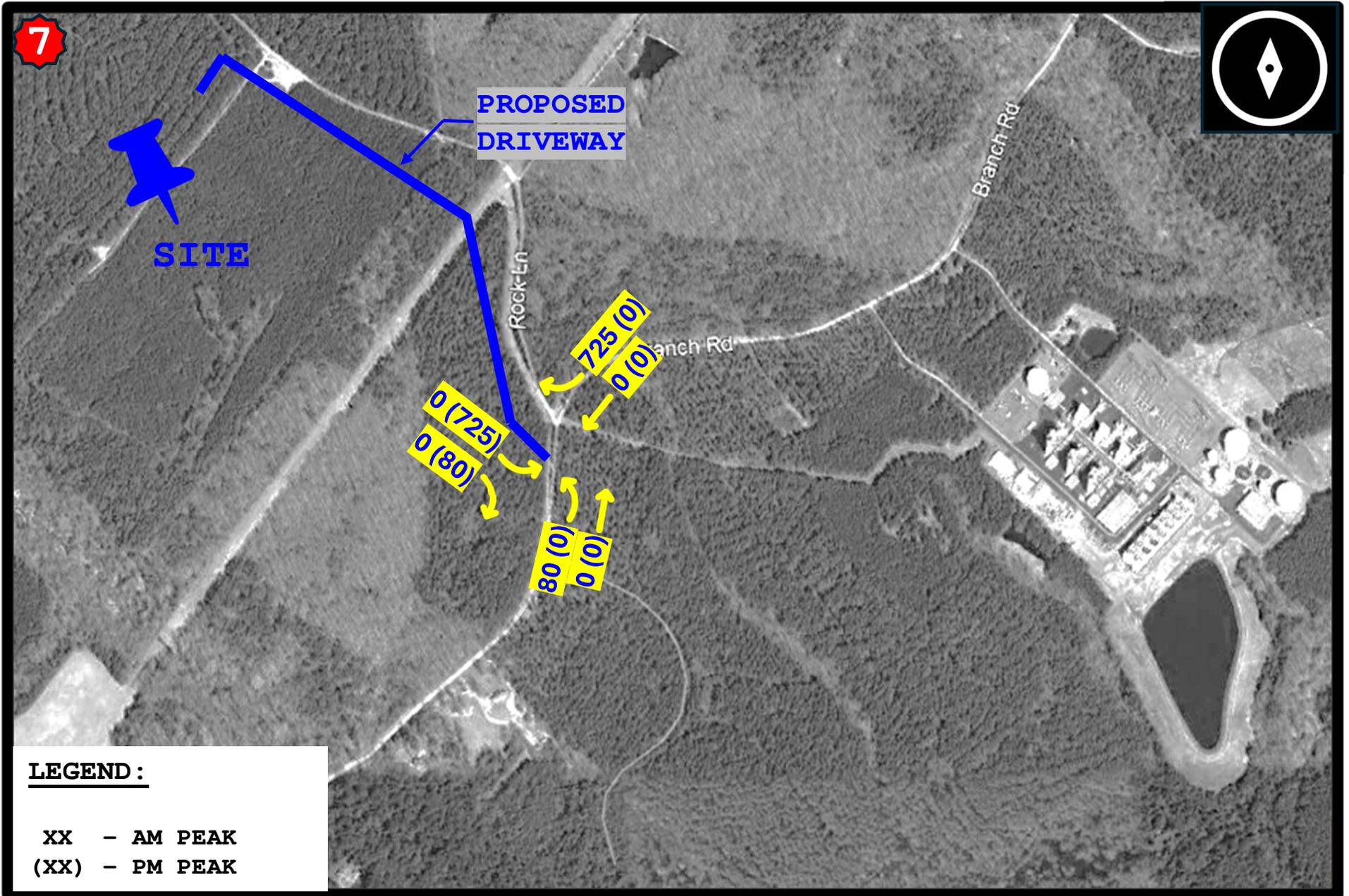


FIGURE 30: Site Trips
 Tenaska Operations driveway at Branch Rd (SR 761)

**2028 OPENING YEAR
TOTAL TRAFFIC**

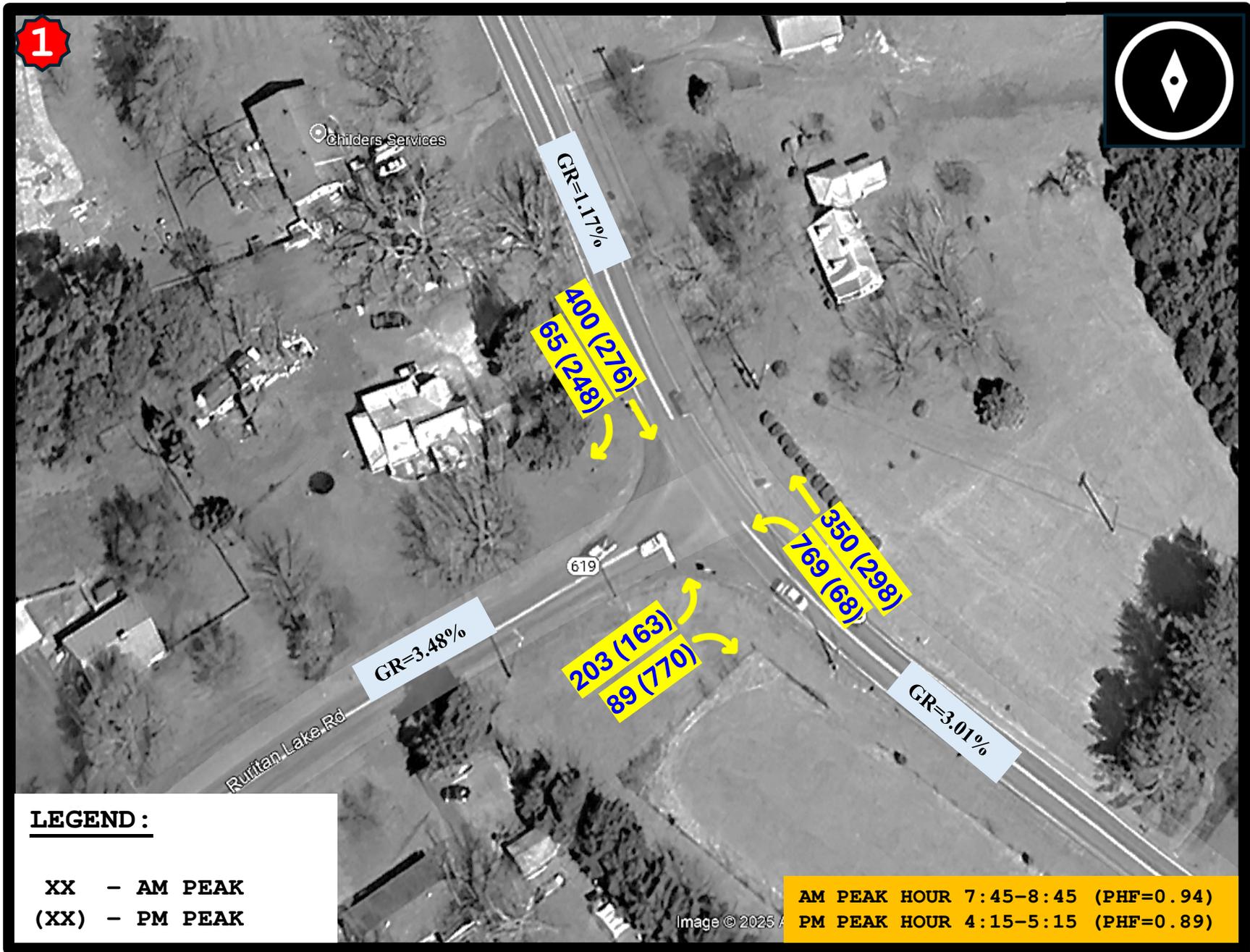


FIGURE 31: 2028 Opening Year Total Traffic
 Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)

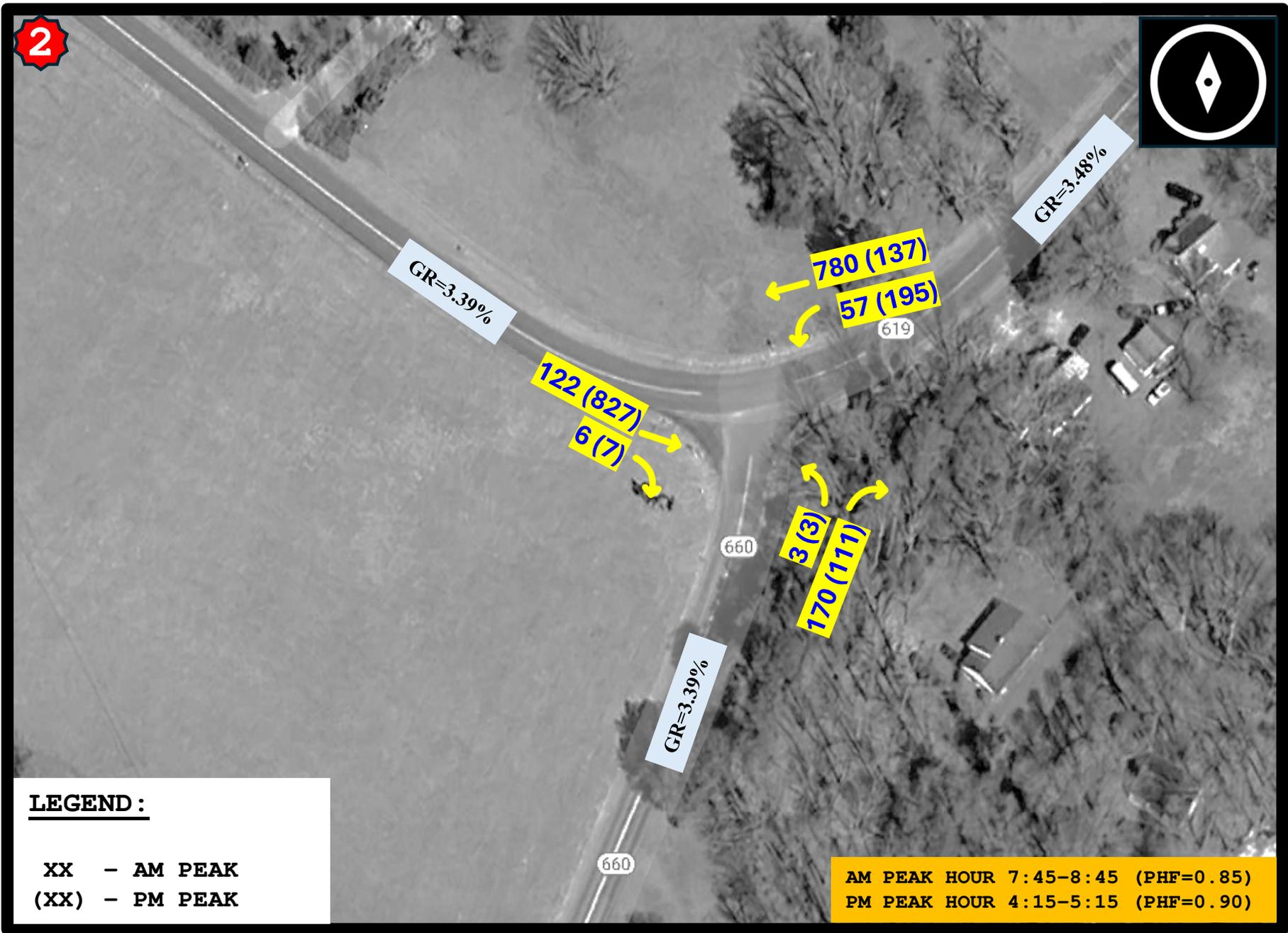


FIGURE 32: 2028 Opening Year Total Traffic
Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

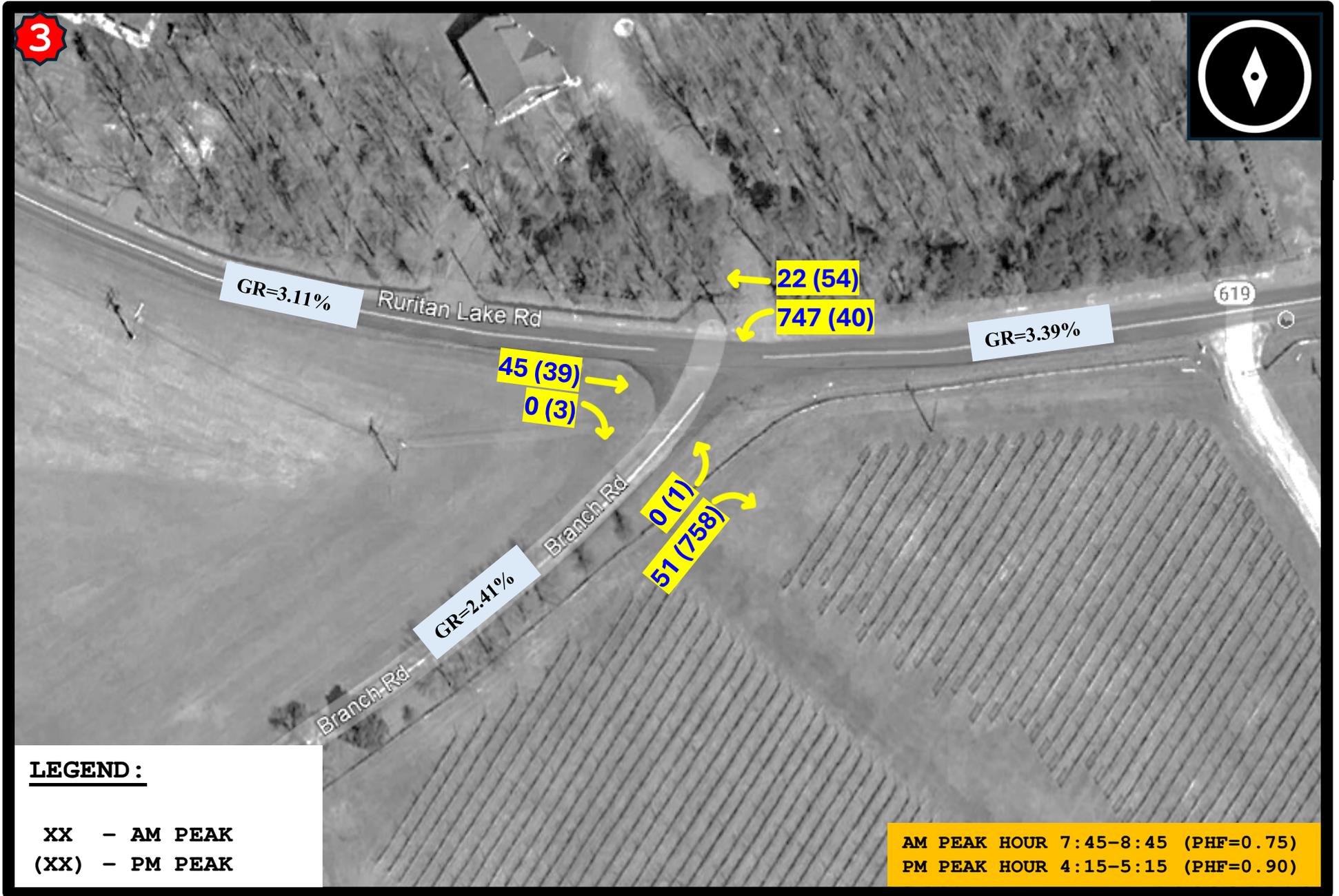


FIGURE 33: 2028 Opening Year Total Traffic
Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

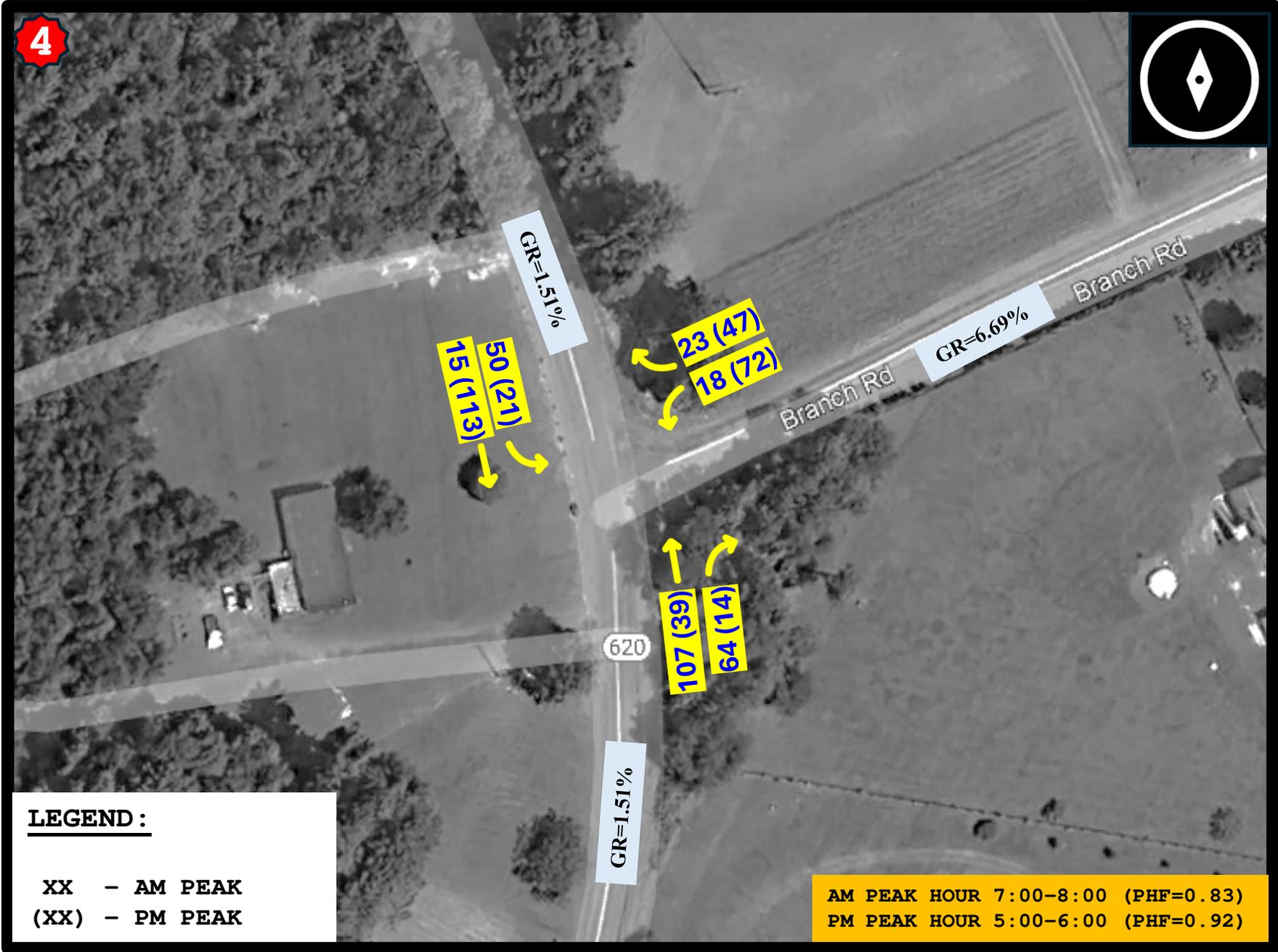


FIGURE 34: 2028 Opening Year Total Traffic
Branch Rd (SR 761) at Rolling Rd (SR 620)

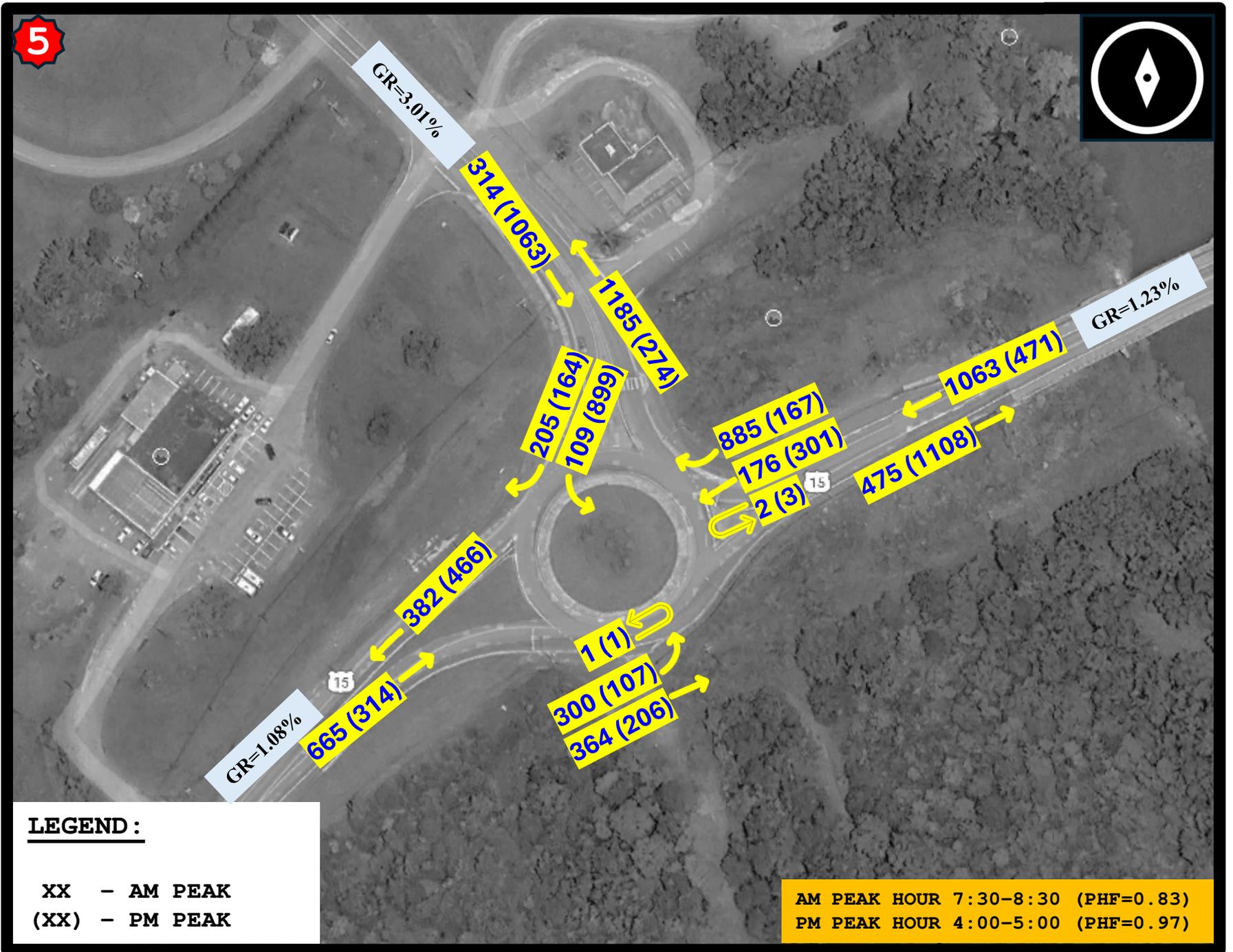


FIGURE 35: 2028 Opening Year Total Traffic
 Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)

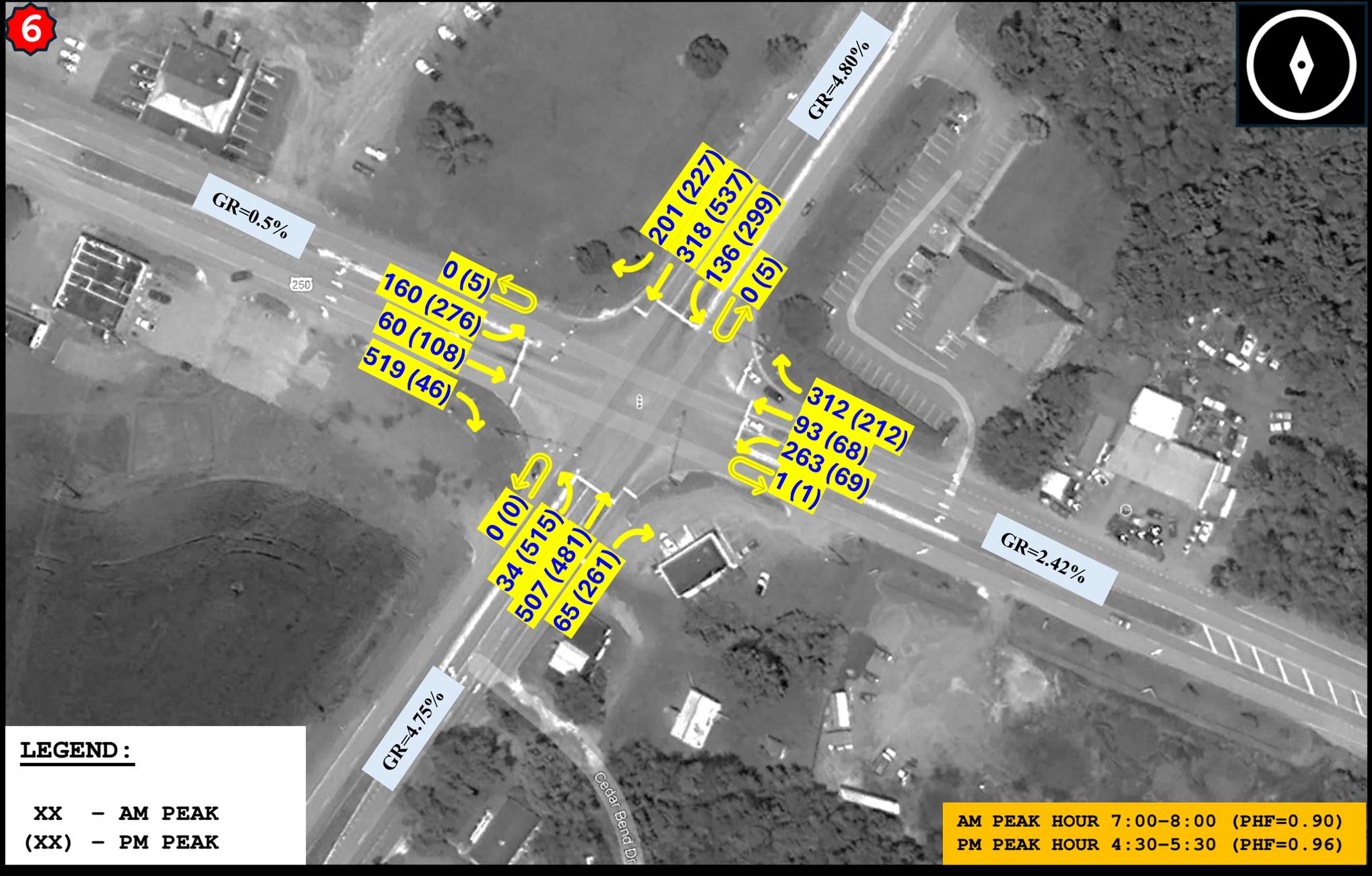


FIGURE 36: 2028 Opening Year Total Traffic
 James Madison Highway (US 15) at 3 Notch Road (US 250)

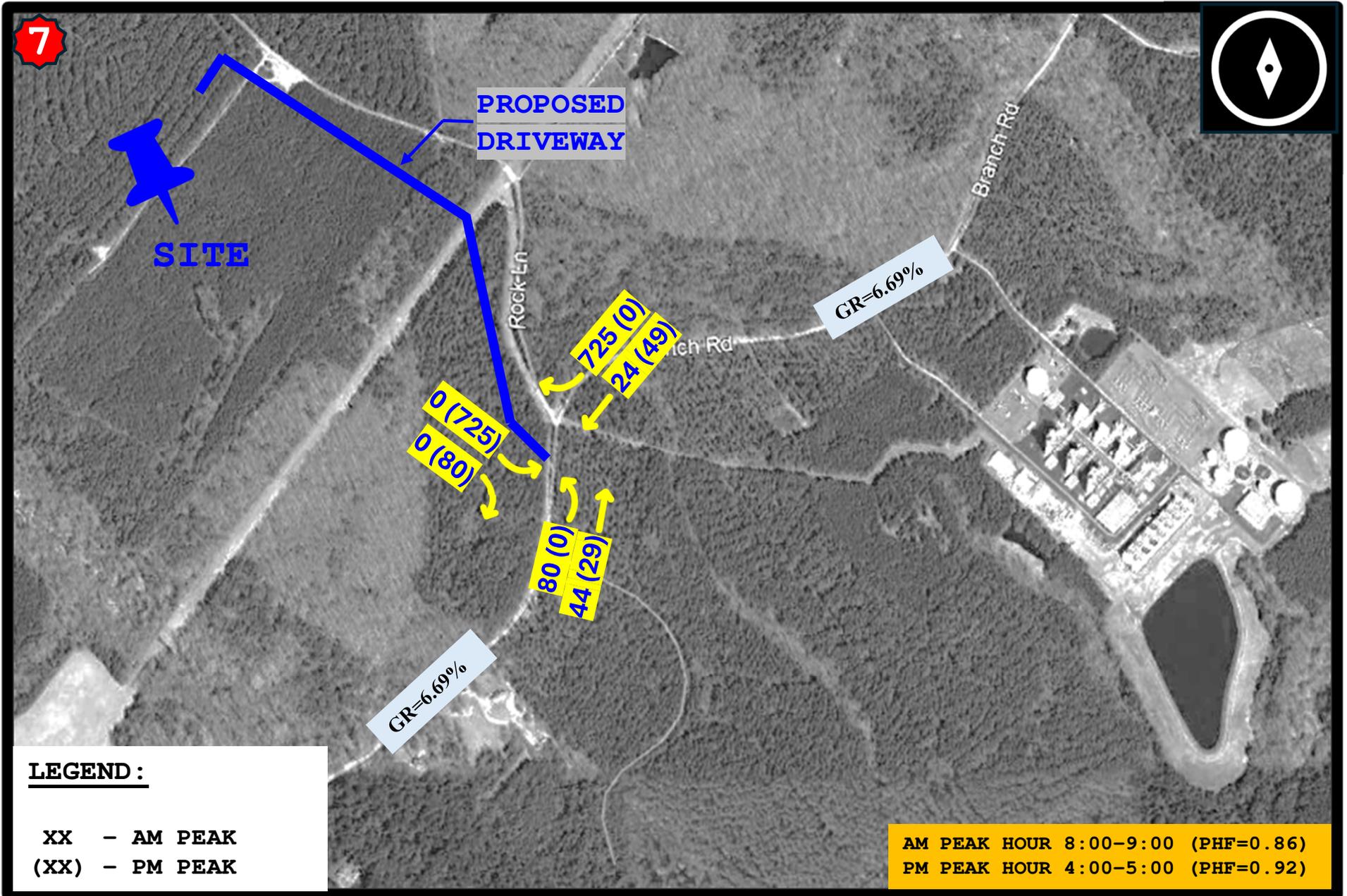


FIGURE 37: 2028 Opening Year Total Traffic
Tenaska Operations driveway at Branch Rd (SR 761)

**2032 DESIGN YEAR
TOTAL TRAFFIC**

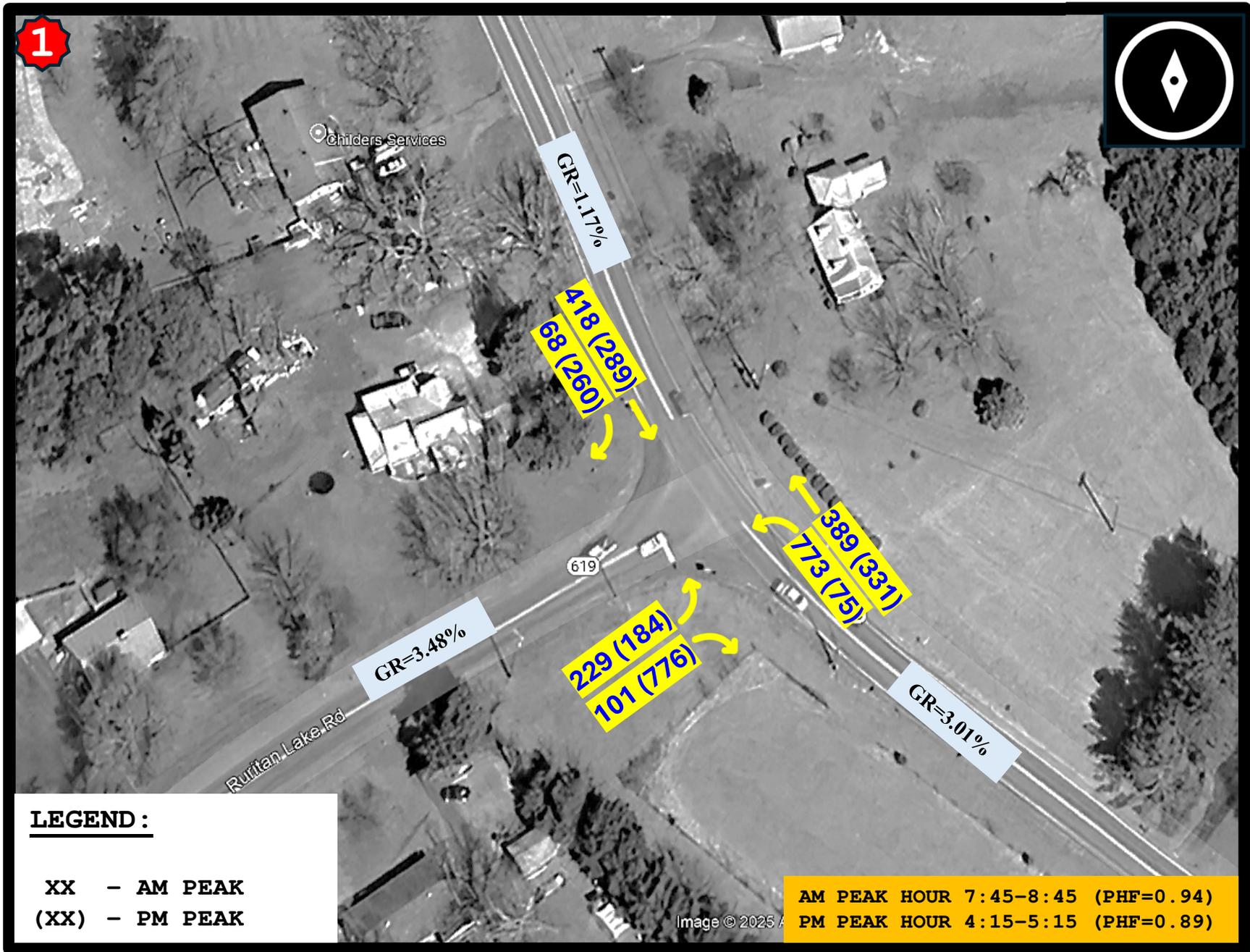


FIGURE 38: 2032 Design Year Total Traffic
Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)

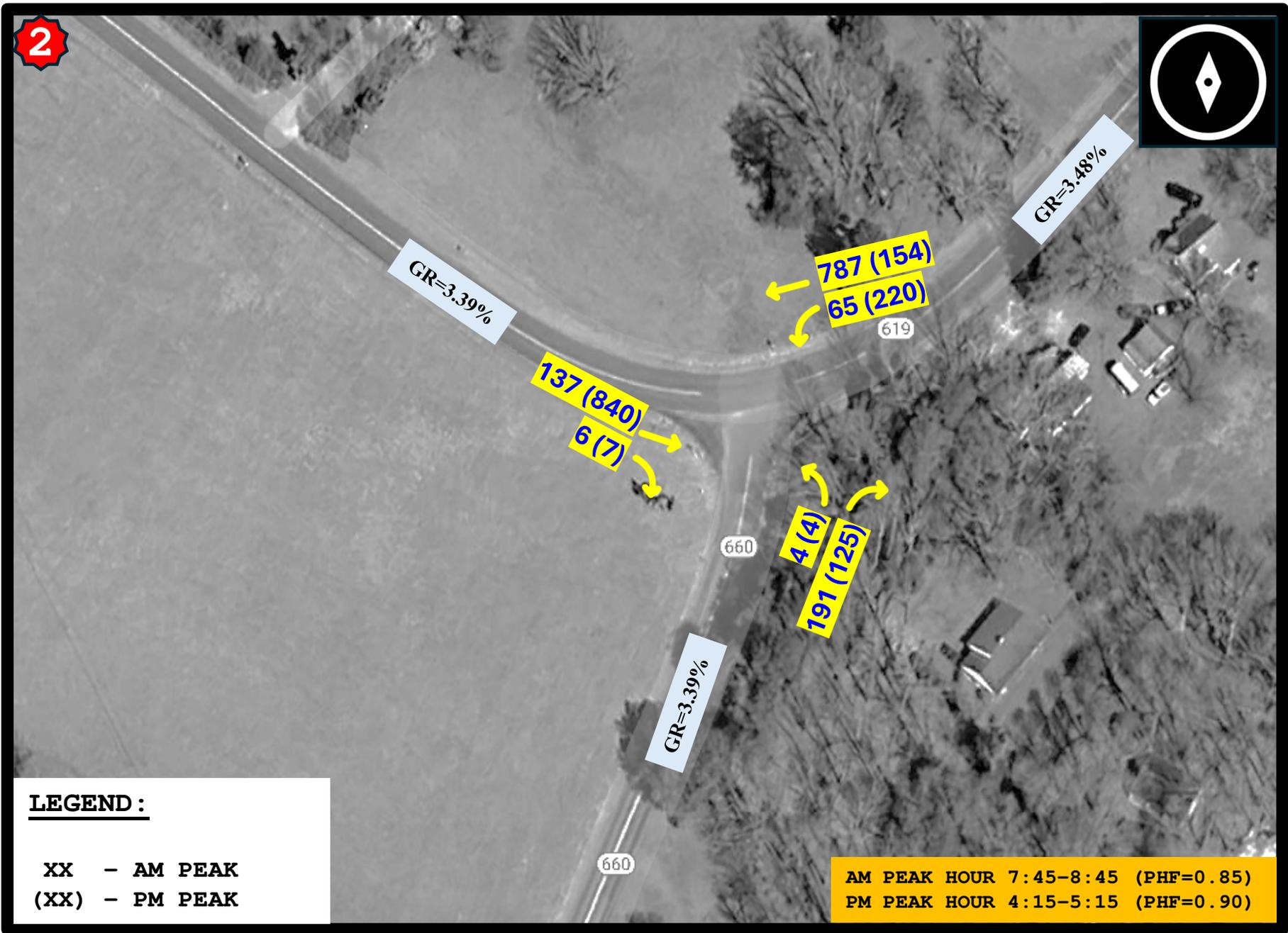


FIGURE 39: 2032 Opening Year Total Traffic
Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

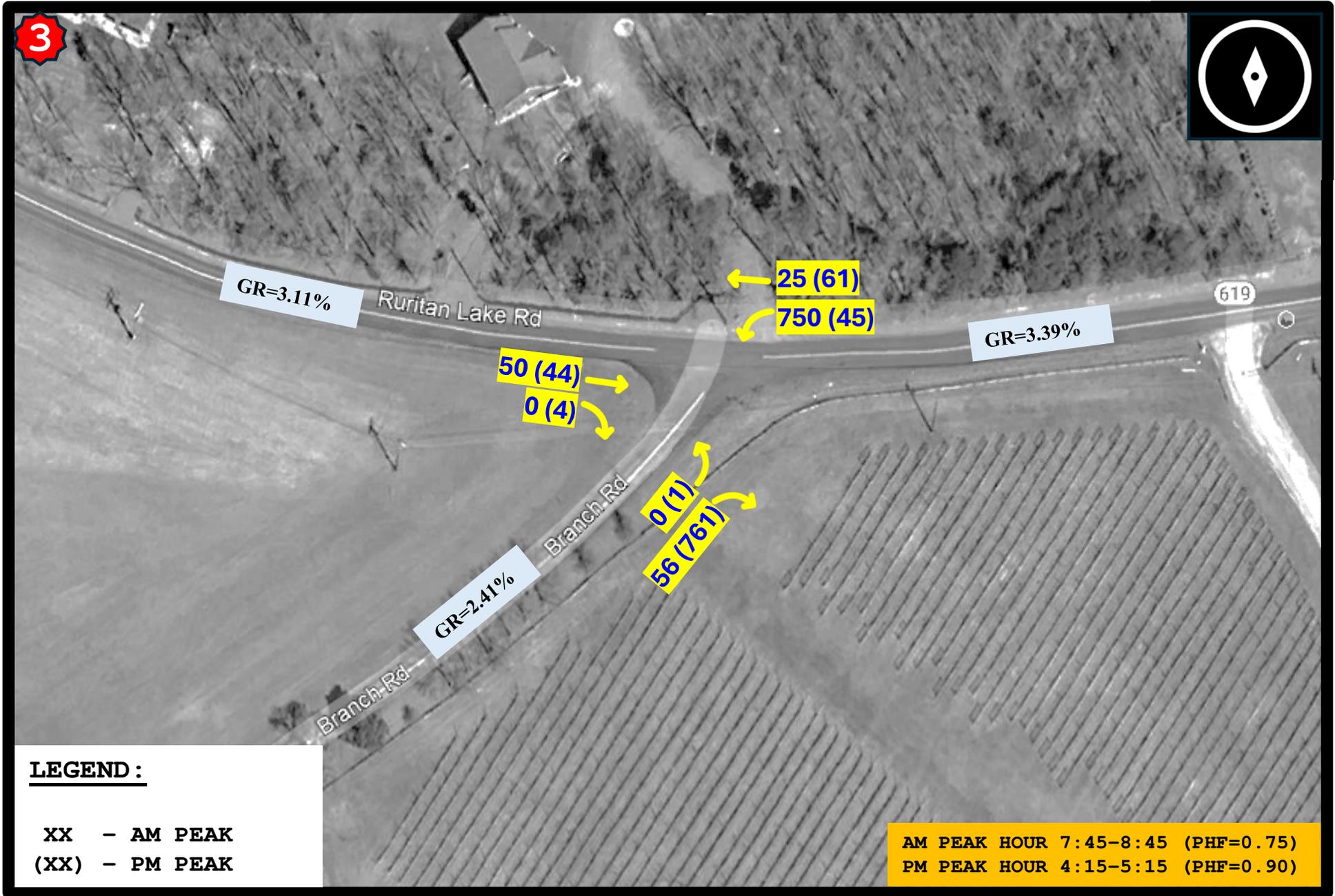


FIGURE 40: 2032 Design Year Total Traffic
Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

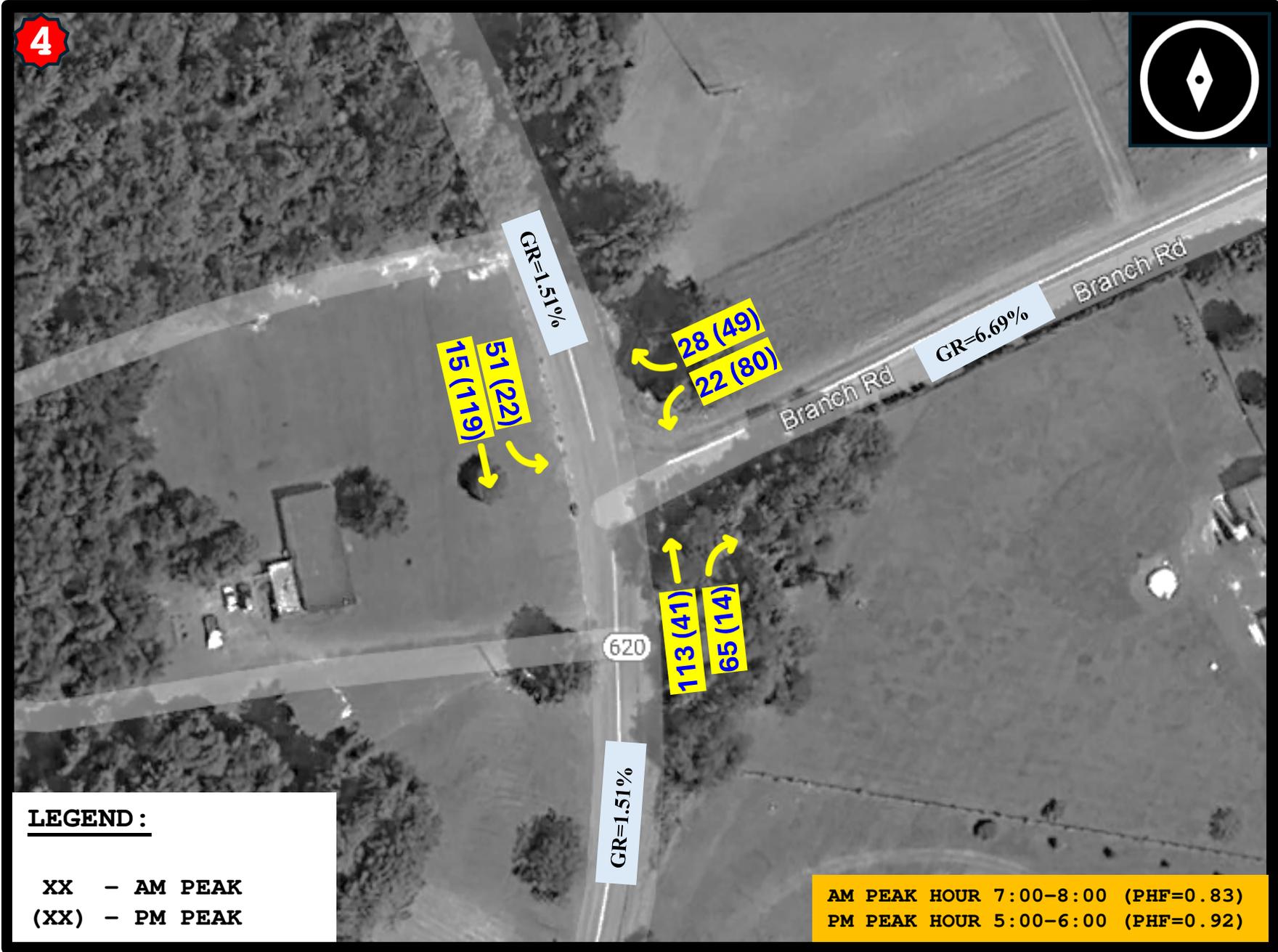


FIGURE 41: 2032 Design Year Total Traffic
Branch Rd (SR 761) at Rolling Rd (SR 620)

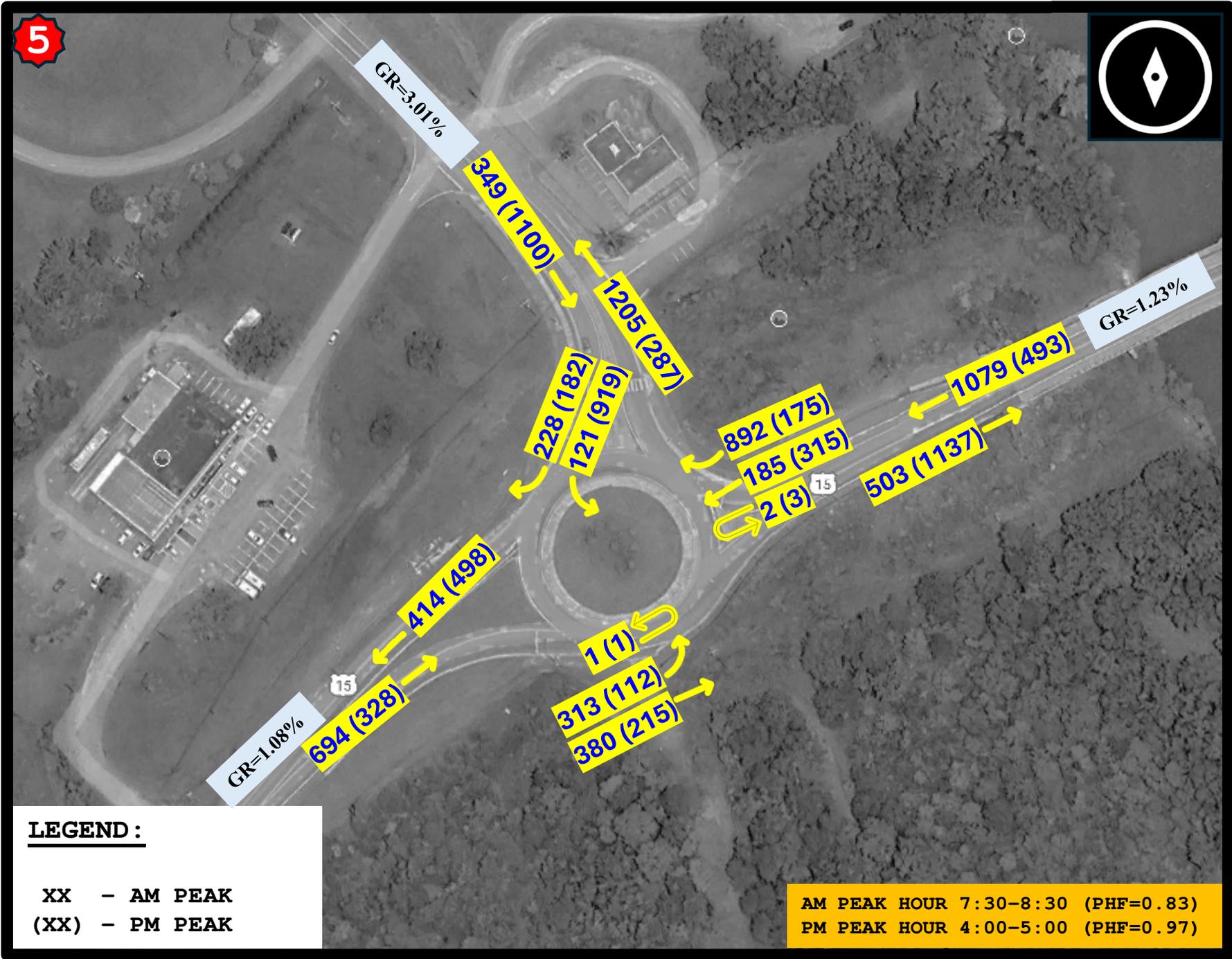


FIGURE 42: 2032 Design Year Total Traffic
 Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)

6

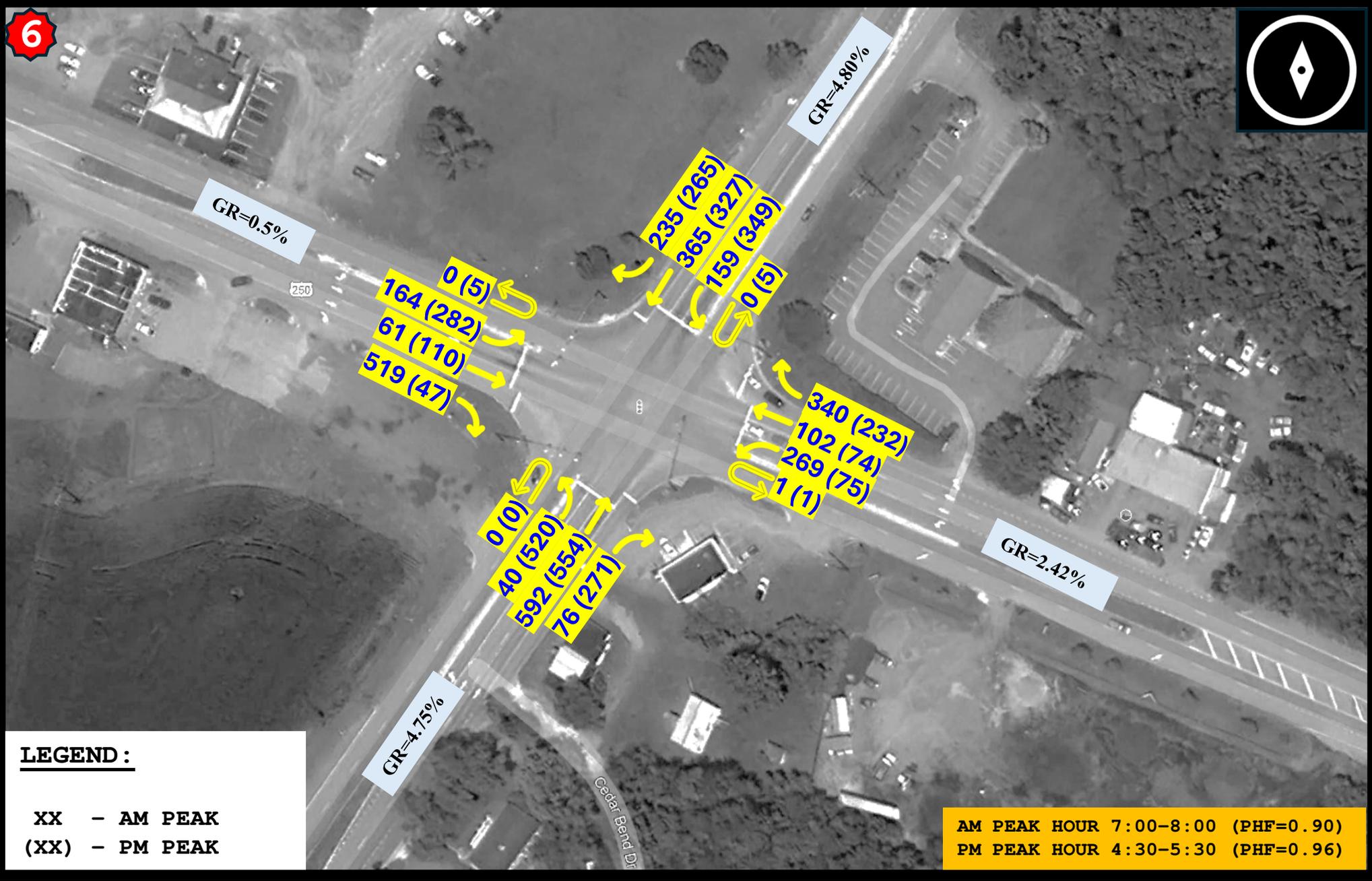


FIGURE 43: 2032 Design Year Total Traffic
 James Madison Highway (US 15) at 3 Notch Road (US 250)

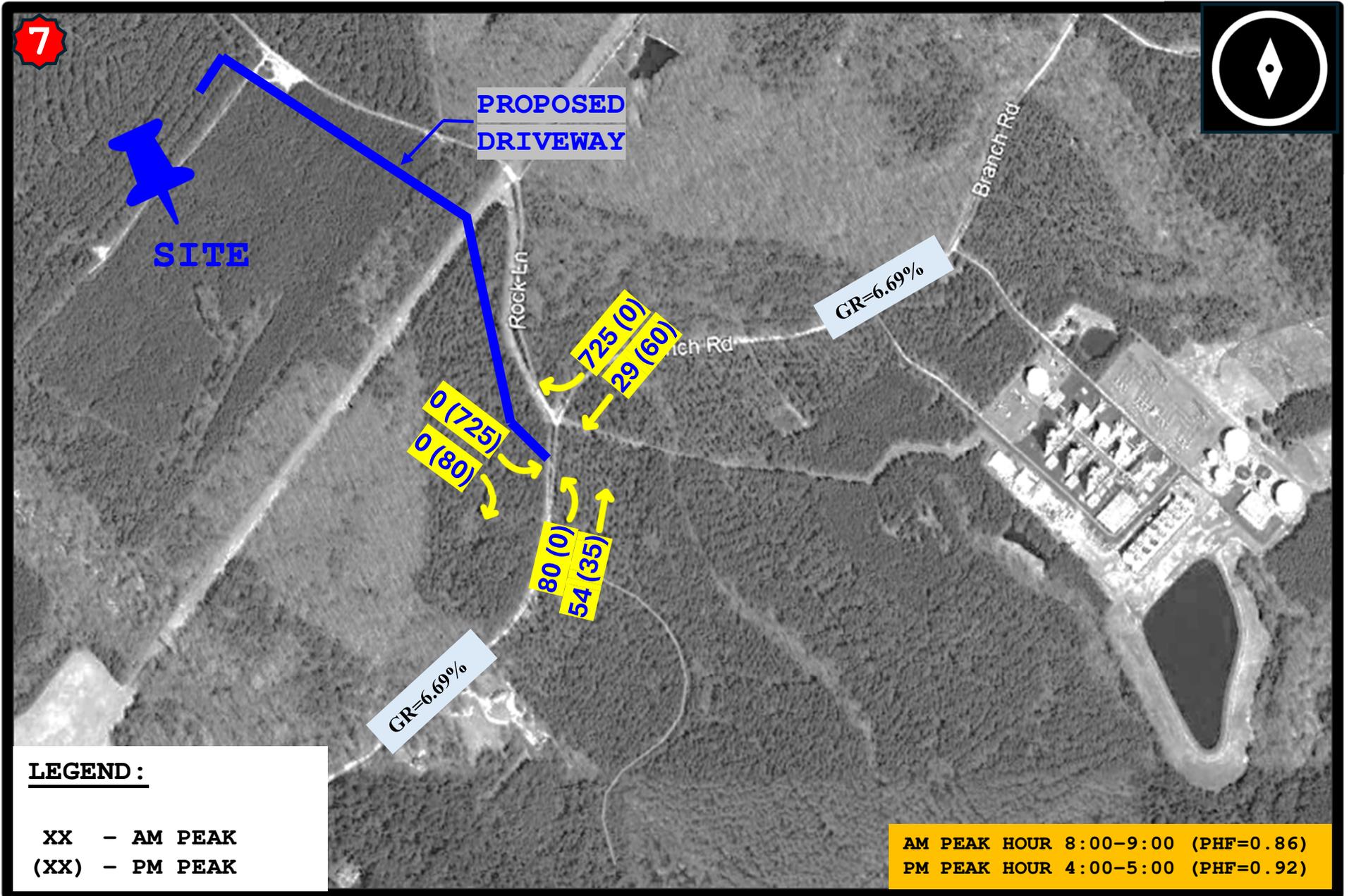


FIGURE 44: 2032 Design Year Total Traffic
Tenaska Operations driveway at Branch Rd (SR 761)

**PROPOSED LANE
CONFIGURATION AND
TRAFFIC CONTROL**

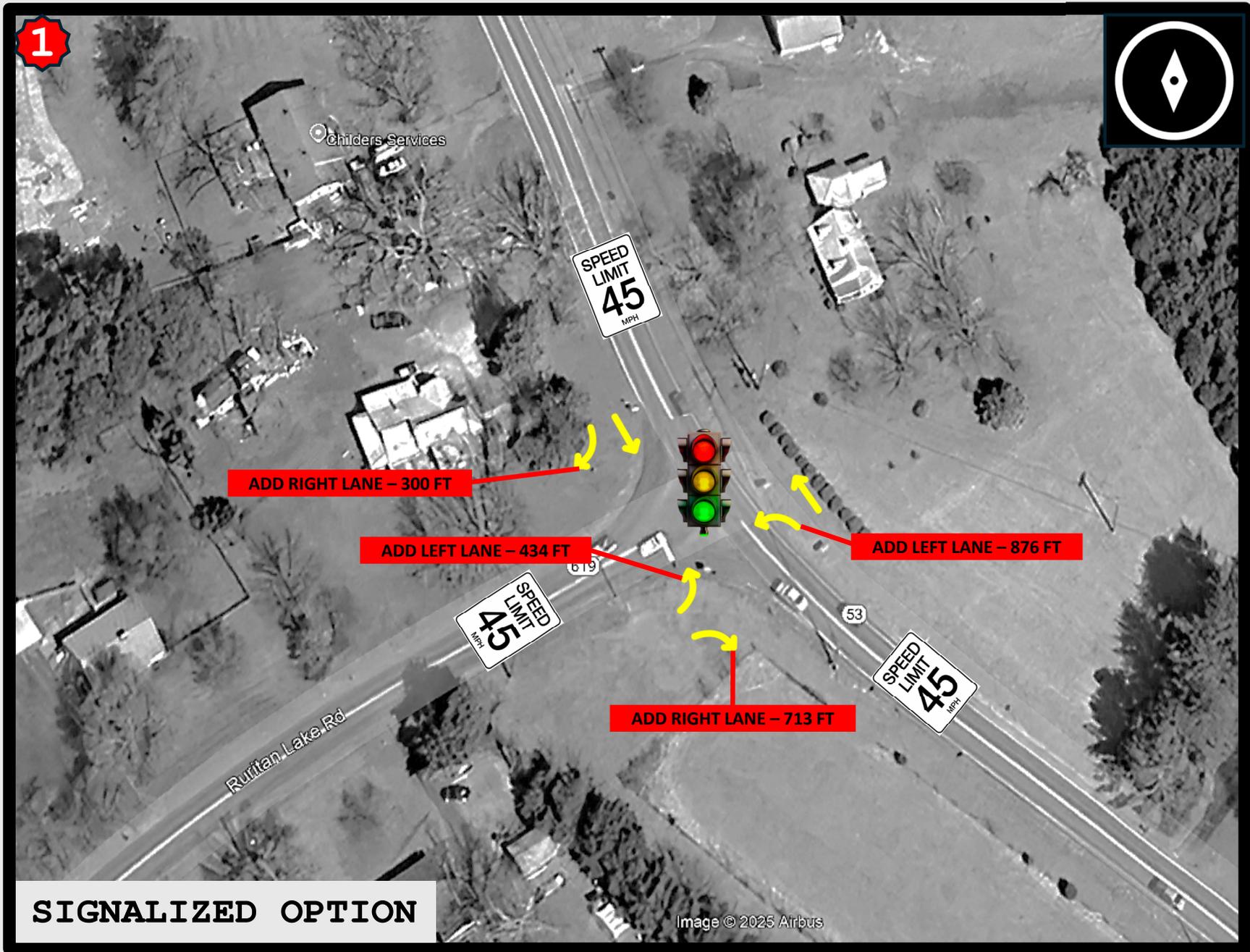


FIGURE 45A: Proposed Lane Configuration & Traffic Control
 Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)



FIGURE 45B: Proposed Lane Configuration & Traffic Control
Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)

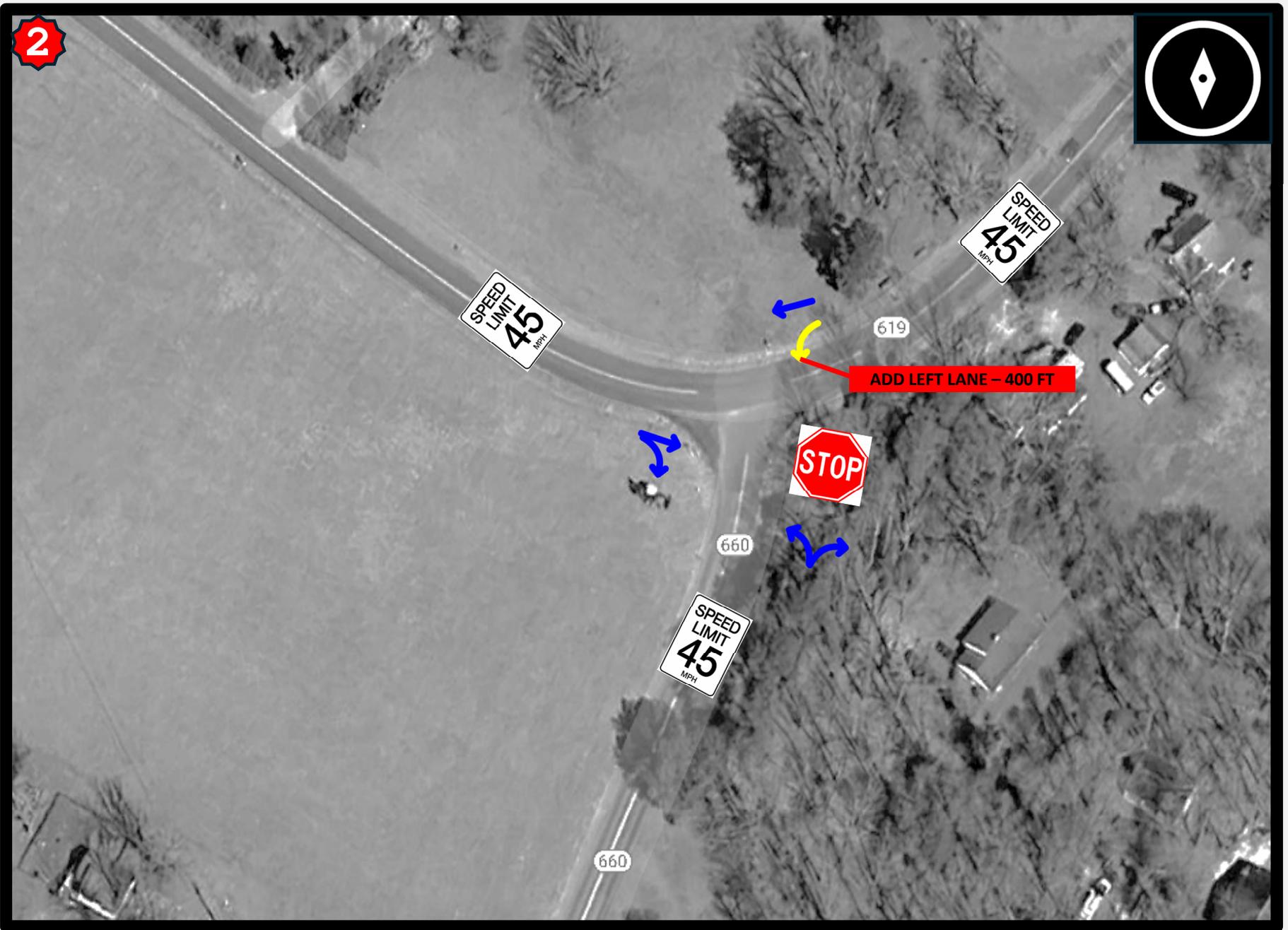


FIGURE 46: Proposed Lane Configuration & Traffic Control
Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

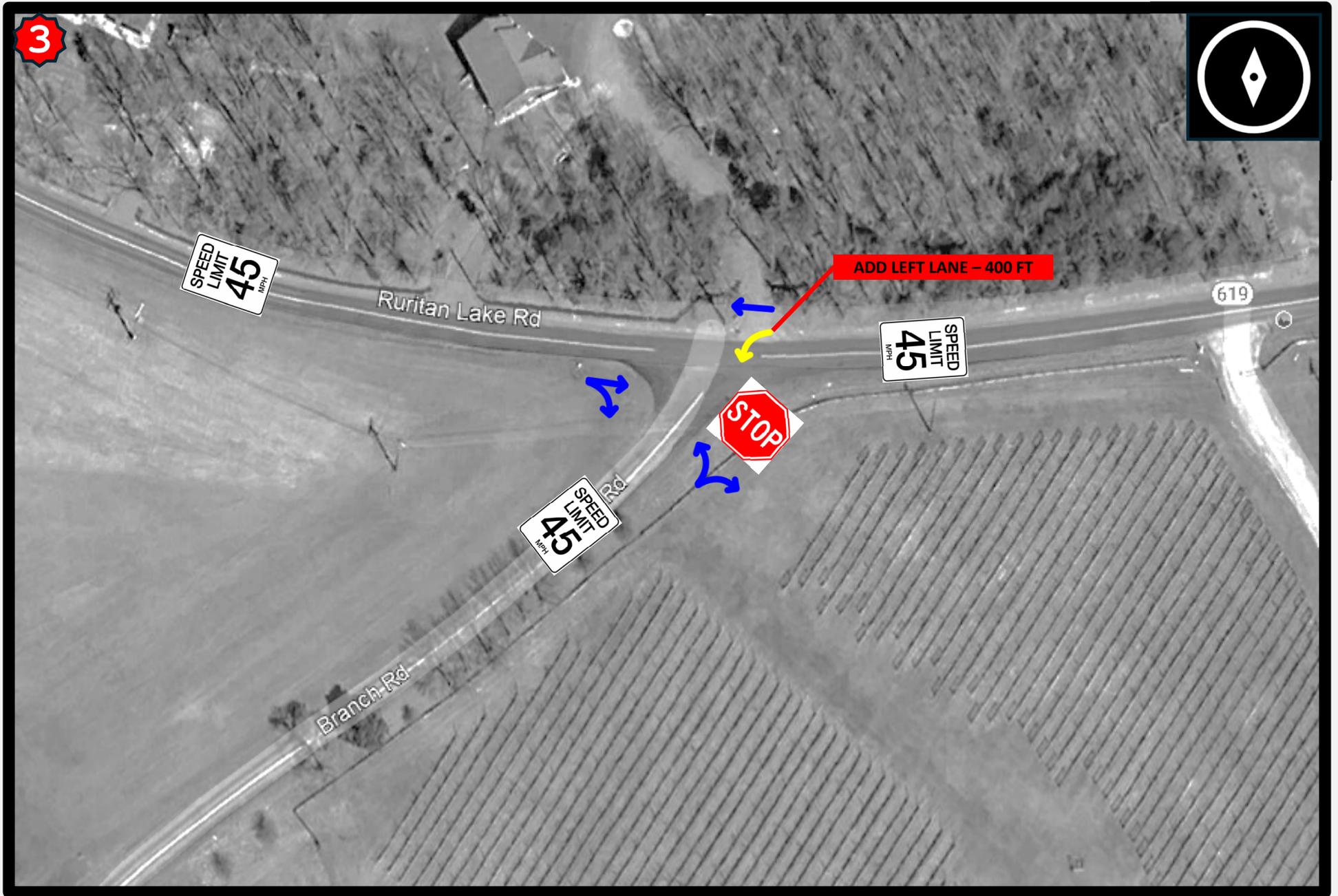


FIGURE 47: Proposed Lane Configuration & Traffic Control
Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

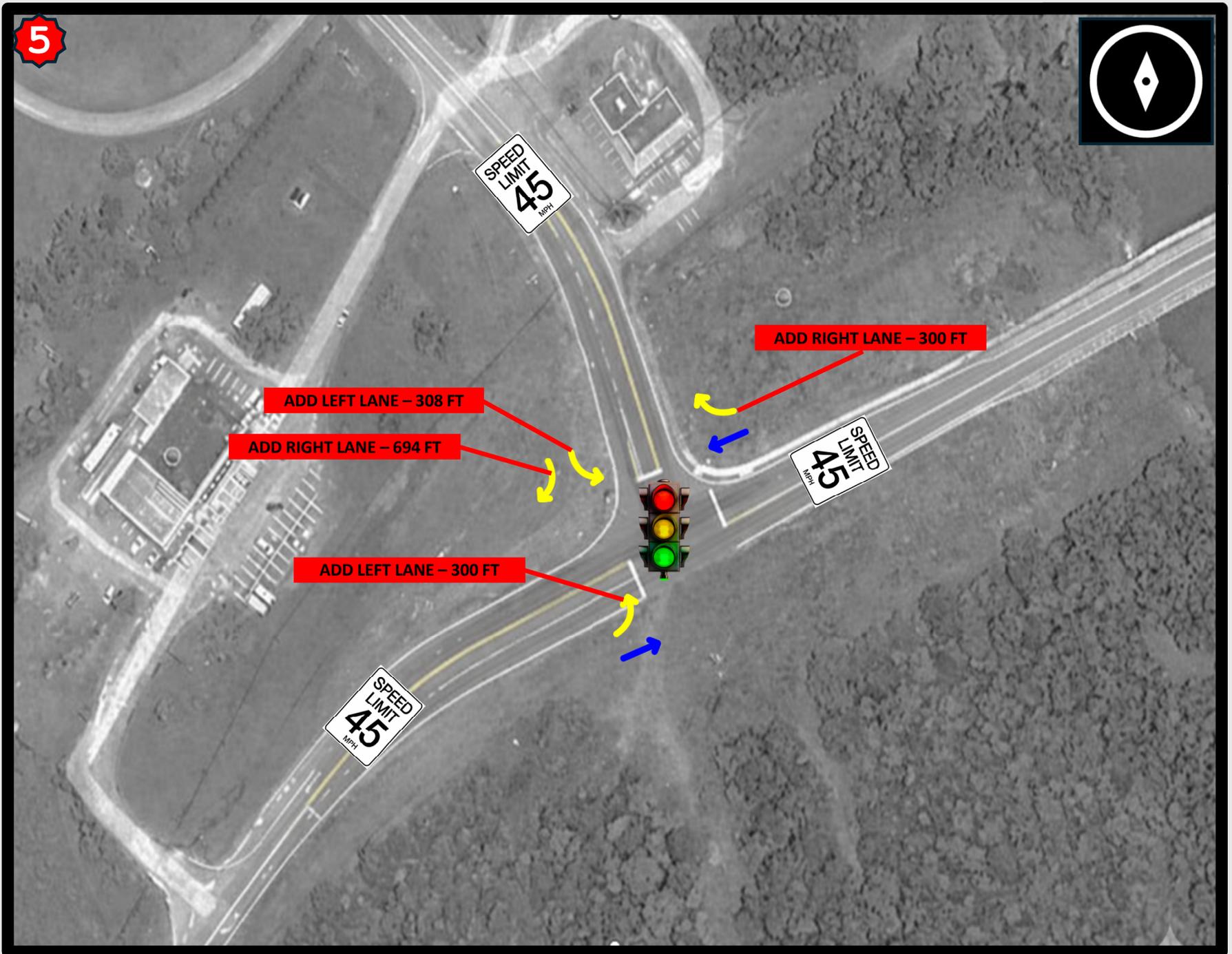


FIGURE 48: Proposed Lane Configuration & Traffic Control
Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)

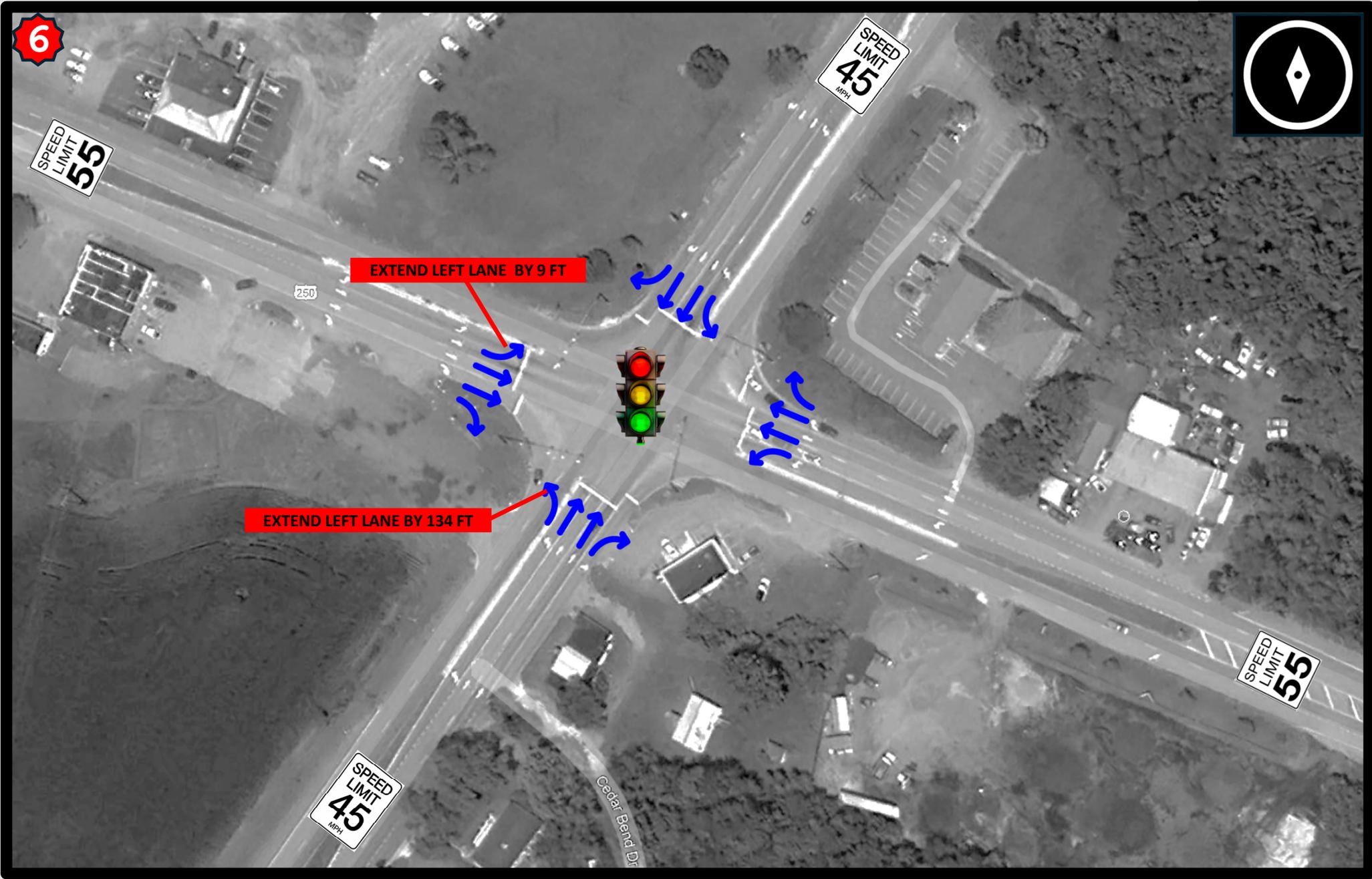


FIGURE 49: Proposed Lane Configuration & Traffic Control
James Madison Highway (US 15) at 3 Notch Road (US 250)

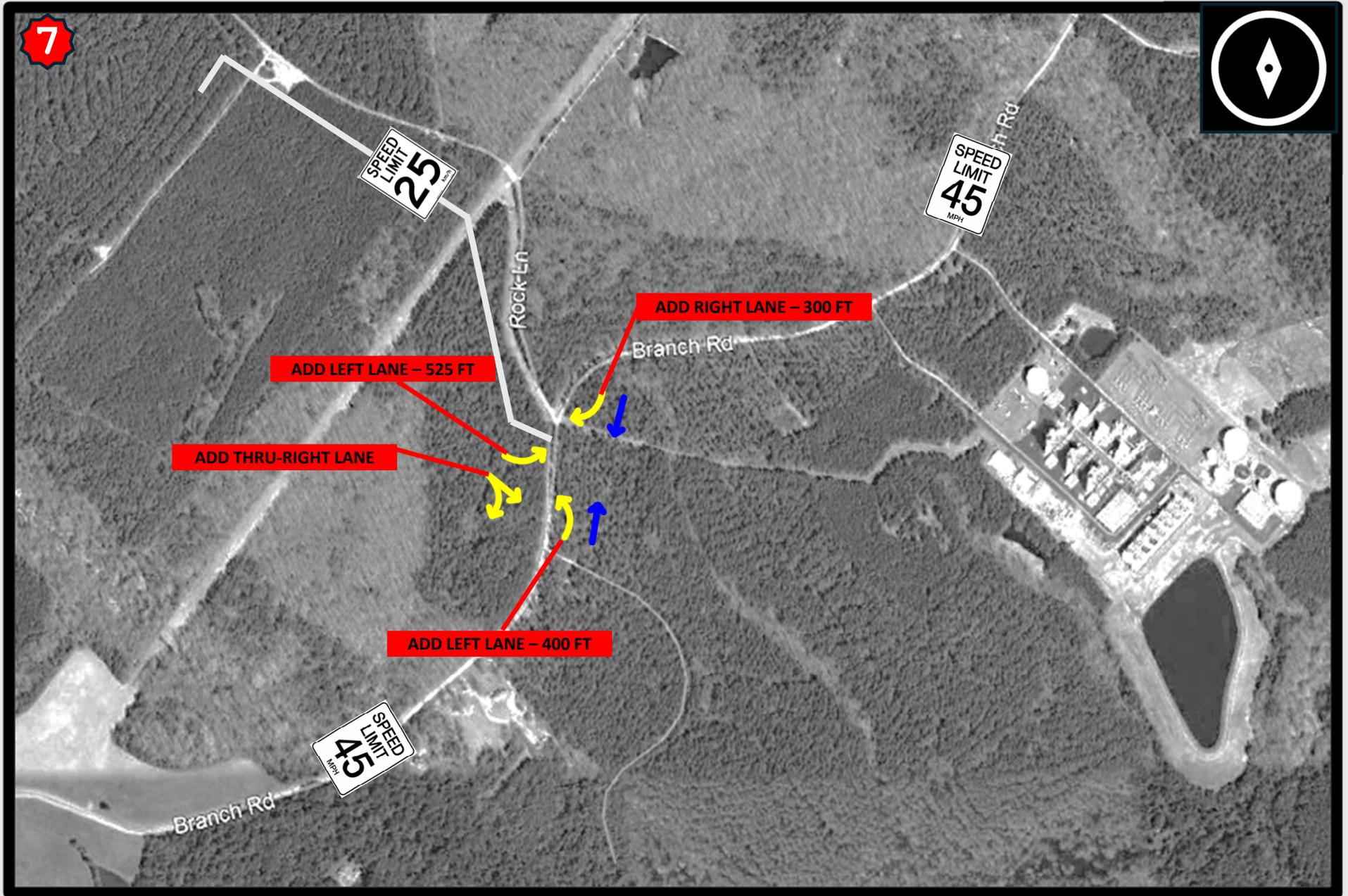


FIGURE 50: Proposed Lane Configuration & Traffic Control
 Tenaska Operations driveway at Branch Rd (SR 761)

APPENDIX A

**TMC
INTERSECTION 1**

**Thomas Jefferson Pkwy (SR 53) at Ruritan Lake
Rd (SR 619)**

1. Thomas Jefferson Pkwy (SR 53) at Ruritan ... - TMC
 Thu Dec 4, 2025
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363610, Location: 37.873935, -78.320255



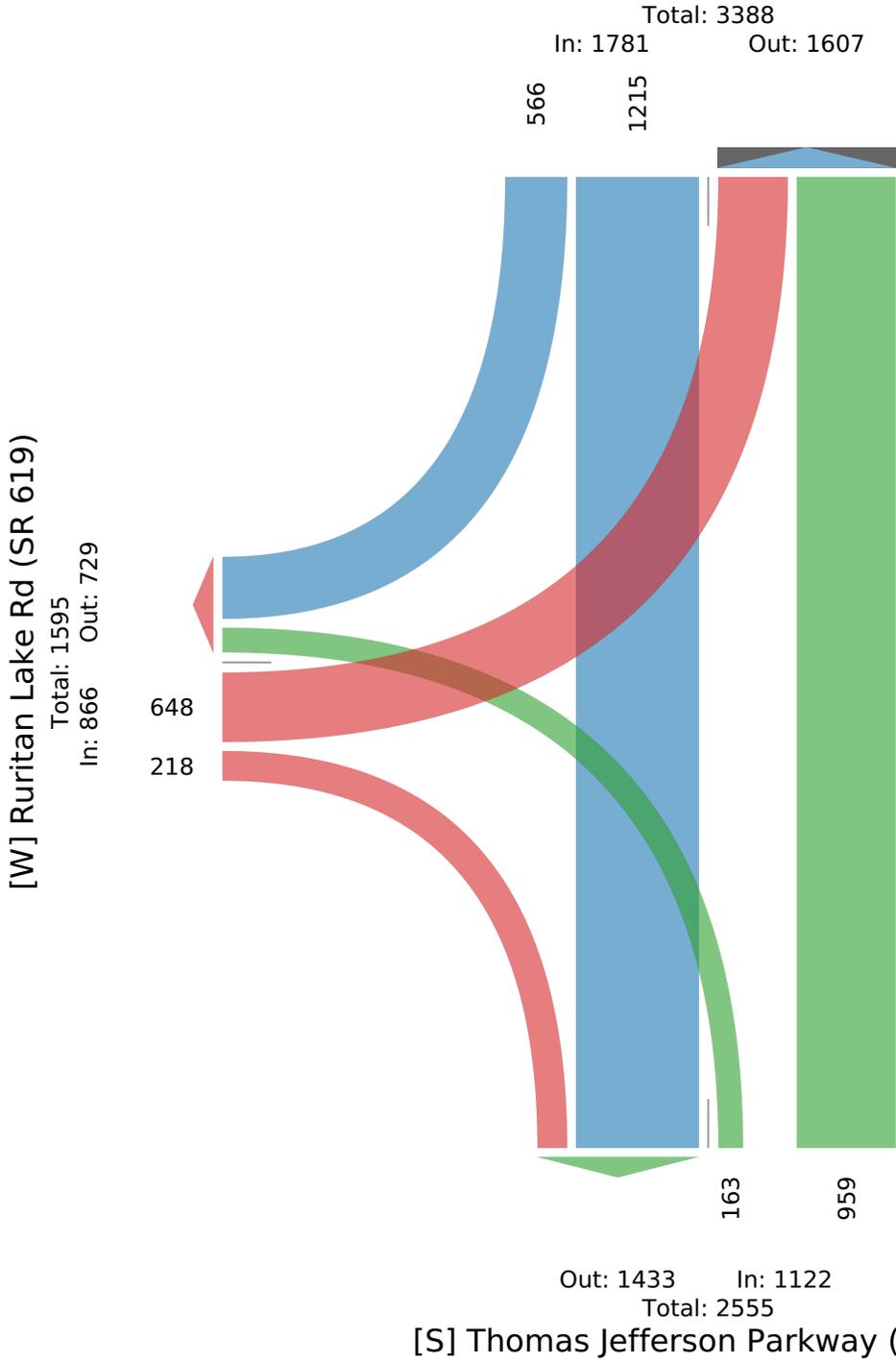
Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Thomas Jefferson Parkway (SR 53) Southbound				Thomas Jefferson Parkway (SR 53) Northbound				Ruritan Lake Rd (SR 619) Eastbound				Int
	R	T	U	App	T	L	U	App	R	L	U	App	
2025-12-04 7:00AM	12	68	0	80	27	1	0	28	17	40	0	57	165
7:15AM	14	77	0	91	30	4	0	34	19	41	0	60	185
7:30AM	11	77	0	88	45	6	0	51	19	52	0	71	210
7:45AM	17	90	0	107	79	9	0	88	8	60	0	68	263
Hourly Total	54	312	0	366	181	20	0	201	63	193	0	256	823
8:00AM	12	95	0	107	96	4	0	100	31	40	0	71	278
8:15AM	18	126	0	144	74	14	0	88	21	33	0	54	286
8:30AM	16	75	0	91	72	13	0	85	21	51	0	72	248
8:45AM	17	46	0	63	48	8	0	56	7	42	0	49	168
Hourly Total	63	342	0	405	290	39	0	329	80	166	0	246	980
4:00PM	50	68	0	118	69	12	0	81	10	41	0	51	250
4:15PM	51	79	0	130	94	14	0	108	9	40	0	49	287
4:30PM	66	55	0	121	60	16	0	76	10	31	0	41	238
4:45PM	62	60	0	122	62	18	0	80	12	34	0	46	248
Hourly Total	229	262	0	491	285	60	0	345	41	146	0	187	1023
5:00PM	61	73	0	134	57	14	0	71	10	43	0	53	258
5:15PM	59	64	0	123	47	10	0	57	10	39	0	49	229
5:30PM	56	73	0	129	59	15	0	74	6	32	0	38	241
5:45PM	44	89	0	133	40	5	0	45	8	29	0	37	215
Hourly Total	220	299	0	519	203	44	0	247	34	143	0	177	943
Total	566	1215	0	1781	959	163	0	1122	218	648	0	866	3769
% Approach	31.8%	68.2%	0%	-	85.5%	14.5%	0%	-	25.2%	74.8%	0%	-	-
% Total	15.0%	32.2%	0%	47.3%	25.4%	4.3%	0%	29.8%	5.8%	17.2%	0%	23.0%	-
Lights	552	1161	0	1713	933	158	0	1091	211	634	0	845	3649
% Lights	97.5%	95.6%	0%	96.2%	97.3%	96.9%	0%	97.2%	96.8%	97.8%	0%	97.6%	96.8%
Articulated Trucks	2	2	0	4	3	0	0	3	0	0	0	0	7
% Articulated Trucks	0.4%	0.2%	0%	0.2%	0.3%	0%	0%	0.3%	0%	0%	0%	0%	0.2%
Buses and Single-Unit Trucks	12	52	0	64	23	5	0	28	7	14	0	21	113
% Buses and Single-Unit Trucks	2.1%	4.3%	0%	3.6%	2.4%	3.1%	0%	2.5%	3.2%	2.2%	0%	2.4%	3.0%

*L: Left, R: Right, T: Thru, U: U-Turn

1. Thomas Jefferson Pkwy (SR 53) at Ruritan ... - TMC
 Thu Dec 4, 2025
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363610, Location: 37.873935, -78.320255

[N] Thomas Jefferson Parkway (SR 53)



1. Thomas Jefferson Pkwy (SR 53) at Ruritan ... - TMC
 Thu Dec 4, 2025
 AM Peak (7:45 AM - 8:45 AM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363610, Location: 37.873935, -78.320255



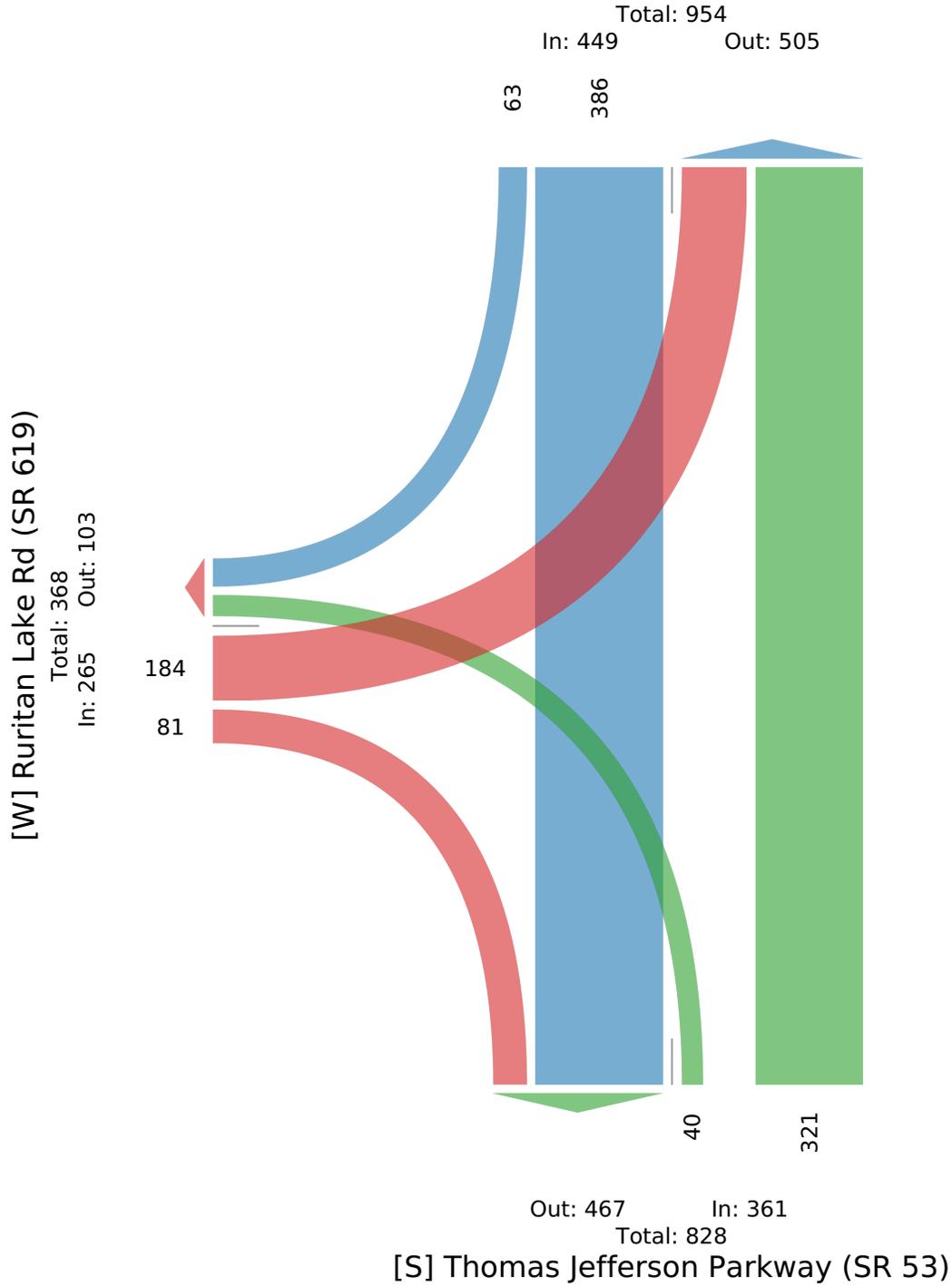
Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Thomas Jefferson Parkway (SR 53) Southbound				Thomas Jefferson Parkway (SR 53) Northbound				Ruritan Lake Rd (SR 619) Eastbound				Int
	R	T	U	App	T	L	U	App	R	L	U	App	
2025-12-04 7:45AM	17	90	0	107	79	9	0	88	8	60	0	68	263
8:00AM	12	95	0	107	96	4	0	100	31	40	0	71	278
8:15AM	18	126	0	144	74	14	0	88	21	33	0	54	286
8:30AM	16	75	0	91	72	13	0	85	21	51	0	72	248
Total	63	386	0	449	321	40	0	361	81	184	0	265	1075
% Approach	14.0%	86.0%	0%	-	88.9%	11.1%	0%	-	30.6%	69.4%	0%	-	-
% Total	5.9%	35.9%	0%	41.8%	29.9%	3.7%	0%	33.6%	7.5%	17.1%	0%	24.7%	-
PHF	0.875	0.766	-	0.780	0.836	0.714	-	0.903	0.653	0.767	-	0.920	0.940
Lights	60	370	0	430	307	38	0	345	79	176	0	255	1030
% Lights	95.2%	95.9%	0%	95.8%	95.6%	95.0%	0%	95.6%	97.5%	95.7%	0%	96.2%	95.8%
Articulated Trucks	0	1	0	1	2	0	0	2	0	0	0	0	3
% Articulated Trucks	0%	0.3%	0%	0.2%	0.6%	0%	0%	0.6%	0%	0%	0%	0%	0.3%
Buses and Single-Unit Trucks	3	15	0	18	12	2	0	14	2	8	0	10	42
% Buses and Single-Unit Trucks	4.8%	3.9%	0%	4.0%	3.7%	5.0%	0%	3.9%	2.5%	4.3%	0%	3.8%	3.9%

* L: Left, R: Right, T: Thru, U: U-Turn

1. Thomas Jefferson Pkwy (SR 53) at Ruritan ... - TMC
 Thu Dec 4, 2025
 AM Peak (7:45 AM - 8:45 AM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363610, Location: 37.873935, -78.320255

[N] Thomas Jefferson Parkway (SR 53)



1. Thomas Jefferson Pkwy (SR 53) at Ruritan ... - TMC
 Thu Dec 4, 2025
 PM Peak (4:15 PM - 5:15 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363610, Location: 37.873935, -78.320255



Leg Direction	Thomas Jefferson Parkway (SR 53) Southbound				Thomas Jefferson Parkway (SR 53) Northbound				Ruritan Lake Rd (SR 619) Eastbound				
Time	R	T	U	App	T	L	U	App	R	L	U	App	Int
2025-12-04 4:15PM	51	79	0	130	94	14	0	108	9	40	0	49	287
4:30PM	66	55	0	121	60	16	0	76	10	31	0	41	238
4:45PM	62	60	0	122	62	18	0	80	12	34	0	46	248
5:00PM	61	73	0	134	57	14	0	71	10	43	0	53	258
Total	240	267	0	507	273	62	0	335	41	148	0	189	1031
% Approach	47.3%	52.7%	0%	-	81.5%	18.5%	0%	-	21.7%	78.3%	0%	-	-
% Total	23.3%	25.9%	0%	49.2%	26.5%	6.0%	0%	32.5%	4.0%	14.4%	0%	18.3%	-
PHF	0.909	0.845	-	0.946	0.726	0.861	-	0.775	0.854	0.860	-	0.892	0.898
Lights	237	257	0	494	270	61	0	331	38	148	0	186	1011
% Lights	98.8%	96.3%	0%	97.4%	98.9%	98.4%	0%	98.8%	92.7%	100%	0%	98.4%	98.1%
Articulated Trucks	1	0	0	1	1	0	0	1	0	0	0	0	2
% Articulated Trucks	0.4%	0%	0%	0.2%	0.4%	0%	0%	0.3%	0%	0%	0%	0%	0.2%
Buses and Single-Unit Trucks	2	10	0	12	2	1	0	3	3	0	0	3	18
% Buses and Single-Unit Trucks	0.8%	3.7%	0%	2.4%	0.7%	1.6%	0%	0.9%	7.3%	0%	0%	1.6%	1.7%

* L: Left, R: Right, T: Thru, U: U-Turn

1. Thomas Jefferson Pkwy (SR 53) at Ruritan ... - TMC
 Thu Dec 4, 2025
 PM Peak (4:15 PM - 5:15 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363610, Location: 37.873935, -78.320255

[N] Thomas Jefferson Parkway (SR 53)

Total: 928
 In: 507 Out: 421

240

267

[W] Ruritan Lake Rd (SR 619)

Total: 491
 In: 189 Out: 302

148
 41

62

273

Out: 308 In: 335
 Total: 643

[S] Thomas Jefferson Parkway (SR 53)

**TMC
INTERSECTION 2**

**Ruritan Lake Rd (SR 619) at Sclaters Ford Rd
(SR 660)**

2 . Ruritan Lake Rd (SR 619) at Sclaters For... - TMC

Thu Dec 4, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363611, Location: 37.872583, -78.32251



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ruritan Lake Rd (SR 619) Westbound				Ruritan Lake Rd (SR 619) Northbound				Sclaters Ford Rd (SR 660) Eastbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2025-12-04 7:00AM	5	8	0	13	37	2	0	39	2	22	0	24	76
7:15AM	8	11	0	19	29	1	0	30	2	28	0	30	79
7:30AM	12	5	0	17	47	1	0	48	1	19	0	20	85
7:45AM	8	17	0	25	51	1	0	52	1	32	0	33	110
Hourly Total	33	41	0	74	164	5	0	169	6	101	0	107	350
8:00AM	6	11	0	17	39	1	0	40	1	24	0	25	82
8:15AM	15	13	0	28	31	1	0	32	2	27	0	29	89
8:30AM	21	11	0	32	33	0	0	33	1	28	0	29	94
8:45AM	13	12	0	25	28	1	0	29	1	20	0	21	75
Hourly Total	55	47	0	102	131	3	0	134	5	99	0	104	340
4:00PM	29	35	0	64	12	0	0	12	0	22	0	22	98
4:15PM	25	40	0	65	21	0	0	21	2	33	0	35	121
4:30PM	37	44	0	81	21	0	0	21	0	16	0	16	118
4:45PM	31	49	0	80	24	0	0	24	2	20	0	22	126
Hourly Total	122	168	0	290	78	0	0	78	4	91	0	95	463
5:00PM	31	44	0	75	35	3	0	38	2	24	0	26	139
5:15PM	23	45	0	68	29	2	0	31	0	17	0	17	116
5:30PM	32	40	0	72	20	0	0	20	2	16	0	18	110
5:45PM	16	33	0	49	19	0	0	19	0	20	0	20	88
Hourly Total	102	162	0	264	103	5	0	108	4	77	0	81	453
Total	312	418	0	730	476	13	0	489	19	368	0	387	1606
% Approach	42.7%	57.3%	0%	-	97.3%	2.7%	0%	-	4.9%	95.1%	0%	-	-
% Total	19.4%	26.0%	0%	45.5%	29.6%	0.8%	0%	30.4%	1.2%	22.9%	0%	24.1%	-
Lights	305	408	0	713	461	13	0	474	18	359	0	377	1564
% Lights	97.8%	97.6%	0%	97.7%	96.8%	100%	0%	96.9%	94.7%	97.6%	0%	97.4%	97.4%
Articulated Trucks	0	2	0	2	0	0	0	0	0	0	0	0	2
% Articulated Trucks	0%	0.5%	0%	0.3%	0%	0%	0%	0%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks	7	8	0	15	15	0	0	15	1	9	0	10	40
% Buses and Single-Unit Trucks	2.2%	1.9%	0%	2.1%	3.2%	0%	0%	3.1%	5.3%	2.4%	0%	2.6%	2.5%

*L: Left, R: Right, T: Thru, U: U-Turn

2 . Ruritan Lake Rd (SR 619) at Sclaters For... - TMC

Thu Dec 4, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

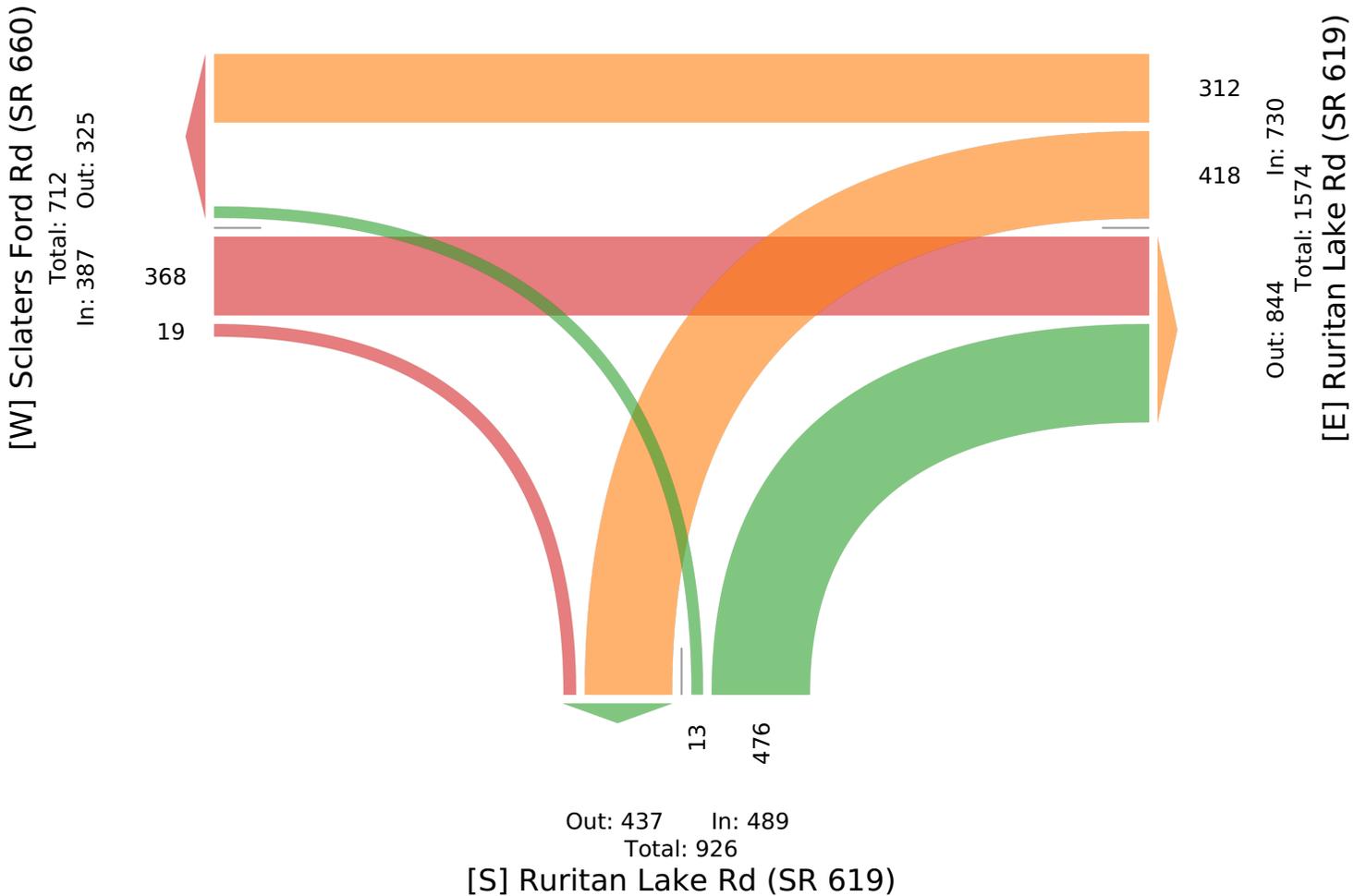
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363611, Location: 37.872583, -78.32251



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



2 . Ruritan Lake Rd (SR 619) at Sclaters For... - TMC
 Thu Dec 4, 2025
 AM Peak (7:45 AM - 8:45 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363611, Location: 37.872583, -78.32251

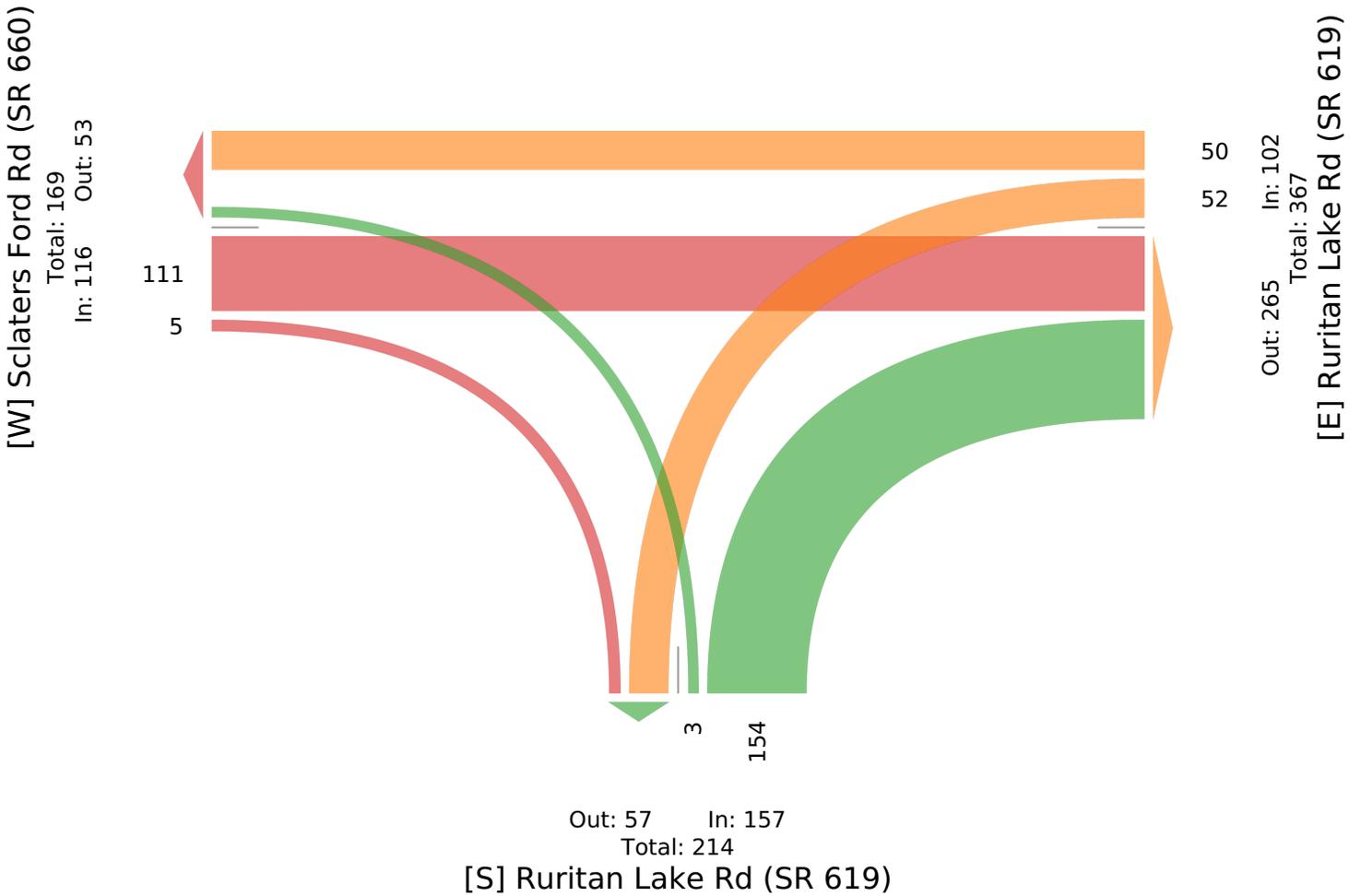


Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ruritan Lake Rd (SR 619) Westbound				Ruritan Lake Rd (SR 619) Northbound				Sclaters Ford Rd (SR 660) Eastbound				
Time	T	L	U	App	R	L	U	App	R	T	U	App	Int
2025-12-04 7:45AM	8	17	0	25	51	1	0	52	1	32	0	33	110
8:00AM	6	11	0	17	39	1	0	40	1	24	0	25	82
8:15AM	15	13	0	28	31	1	0	32	2	27	0	29	89
8:30AM	21	11	0	32	33	0	0	33	1	28	0	29	94
Total	50	52	0	102	154	3	0	157	5	111	0	116	375
% Approach	49.0%	51.0%	0%	-	98.1%	1.9%	0%	-	4.3%	95.7%	0%	-	-
% Total	13.3%	13.9%	0%	27.2%	41.1%	0.8%	0%	41.9%	1.3%	29.6%	0%	30.9%	-
PHF	0.595	0.765	-	0.797	0.755	0.750	-	0.755	0.625	0.867	-	0.879	0.852
Lights	49	48	0	97	147	3	0	150	5	108	0	113	360
% Lights	98.0%	92.3%	0%	95.1%	95.5%	100%	0%	95.5%	100%	97.3%	0%	97.4%	96.0%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	1	4	0	5	7	0	0	7	0	3	0	3	15
% Buses and Single-Unit Trucks	2.0%	7.7%	0%	4.9%	4.5%	0%	0%	4.5%	0%	2.7%	0%	2.6%	4.0%

* L: Left, R: Right, T: Thru, U: U-Turn

2 . Ruritan Lake Rd (SR 619) at Sclaters For... - TMC
 Thu Dec 4, 2025
 AM Peak (7:45 AM - 8:45 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363611, Location: 37.872583, -78.32251



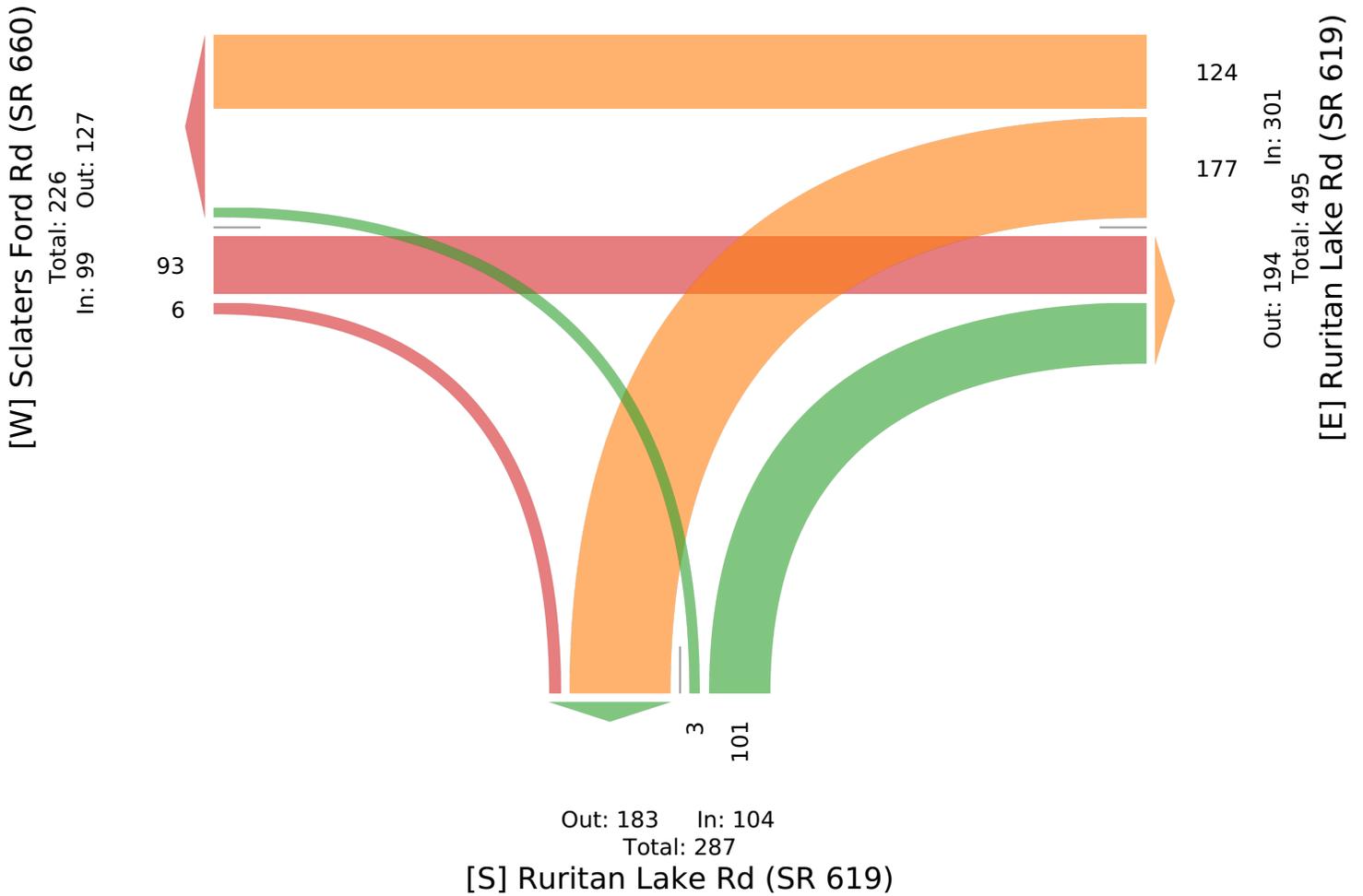
2 . Ruritan Lake Rd (SR 619) at Sclaters For... - TMC
 Thu Dec 4, 2025
 PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363611, Location: 37.872583, -78.32251



Leg Direction	Ruritan Lake Rd (SR 619) Westbound				Ruritan Lake Rd (SR 619) Northbound				Sclaters Ford Rd (SR 660) Eastbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2025-12-04 4:15PM	25	40	0	65	21	0	0	21	2	33	0	35	121
4:30PM	37	44	0	81	21	0	0	21	0	16	0	16	118
4:45PM	31	49	0	80	24	0	0	24	2	20	0	22	126
5:00PM	31	44	0	75	35	3	0	38	2	24	0	26	139
Total	124	177	0	301	101	3	0	104	6	93	0	99	504
% Approach	41.2%	58.8%	0%	-	97.1%	2.9%	0%	-	6.1%	93.9%	0%	-	-
% Total	24.6%	35.1%	0%	59.7%	20.0%	0.6%	0%	20.6%	1.2%	18.5%	0%	19.6%	-
PHF	0.838	0.903	-	0.929	0.721	0.250	-	0.684	0.750	0.705	-	0.707	0.906
Lights	122	175	0	297	99	3	0	102	6	91	0	97	496
% Lights	98.4%	98.9%	0%	98.7%	98.0%	100%	0%	98.1%	100%	97.8%	0%	98.0%	98.4%
Articulated Trucks	0	1	0	1	0	0	0	0	0	0	0	0	1
% Articulated Trucks	0%	0.6%	0%	0.3%	0%	0%	0%	0%	0%	0%	0%	0%	0.2%
Buses and Single-Unit Trucks	2	1	0	3	2	0	0	2	0	2	0	2	7
% Buses and Single-Unit Trucks	1.6%	0.6%	0%	1.0%	2.0%	0%	0%	1.9%	0%	2.2%	0%	2.0%	1.4%

* L: Left, R: Right, T: Thru, U: U-Turn

2 . Ruritan Lake Rd (SR 619) at Sclaters For... - TMC
 Thu Dec 4, 2025
 PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363611, Location: 37.872583, -78.32251



TMC
INTERSECTION 3

**Ruritan Lake Rd (SR 619) at Branch Rd (SR
761)**

3. Ruritan Lake Rd (SR 619) at Branch Rd (SR... - TMC

Thu Dec 4, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363612, Location: 37.879428, -78.358551



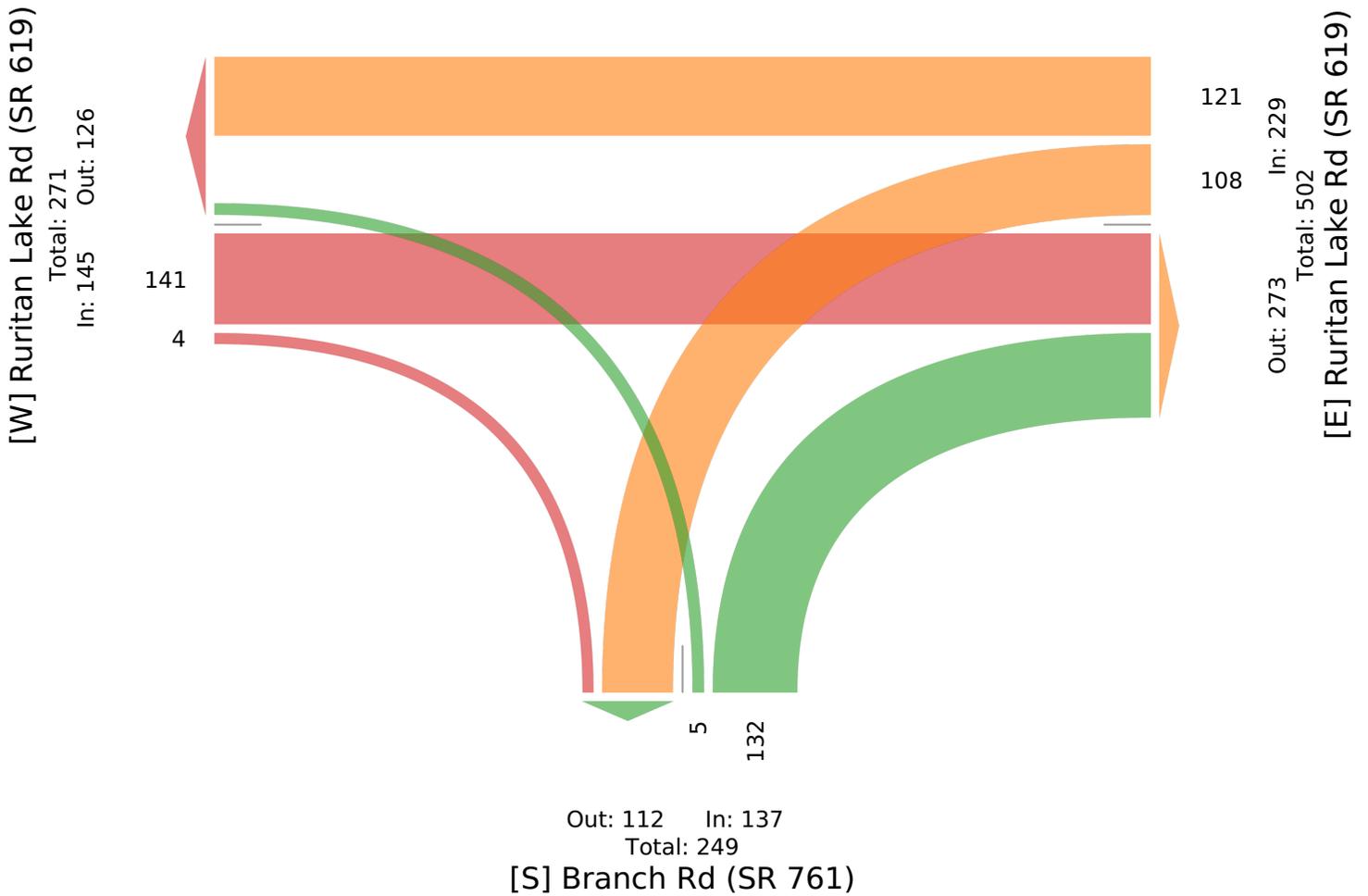
Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ruritan Lake Rd (SR 619) Westbound				Branch Rd (SR 761) Northbound				Ruritan Lake Rd (SR 619) Eastbound				
Time	T	L	U	App	R	L	U	App	R	T	U	App	Int
2025-12-04 7:00AM	1	2	0	3	10	0	0	10	0	9	0	9	22
7:15AM	1	4	0	5	8	1	0	9	0	10	0	10	24
7:30AM	5	0	0	5	10	1	0	11	0	4	0	4	20
7:45AM	2	3	0	5	9	0	0	9	0	13	0	13	27
Hourly Total	9	9	0	18	37	2	0	39	0	36	0	36	93
8:00AM	3	2	0	5	14	0	0	14	0	8	0	8	27
8:15AM	4	6	0	10	14	0	0	14	0	8	0	8	32
8:30AM	11	9	0	20	11	0	0	11	0	12	0	12	43
8:45AM	6	7	0	13	3	0	0	3	0	5	0	5	21
Hourly Total	24	24	0	48	42	0	0	42	0	33	0	33	123
4:00PM	7	10	0	17	7	2	0	9	0	10	0	10	36
4:15PM	10	7	0	17	10	1	0	11	1	14	0	15	43
4:30PM	13	11	0	24	7	0	0	7	1	4	0	5	36
4:45PM	13	9	0	22	10	0	0	10	0	7	0	7	39
Hourly Total	43	37	0	80	34	3	0	37	2	35	0	37	154
5:00PM	13	9	0	22	4	0	0	4	1	11	0	12	38
5:15PM	10	11	0	21	5	0	0	5	1	8	0	9	35
5:30PM	14	10	0	24	6	0	0	6	0	10	0	10	40
5:45PM	8	8	0	16	4	0	0	4	0	8	0	8	28
Hourly Total	45	38	0	83	19	0	0	19	2	37	0	39	141
Total	121	108	0	229	132	5	0	137	4	141	0	145	511
% Approach	52.8%	47.2%	0%	-	96.4%	3.6%	0%	-	2.8%	97.2%	0%	-	-
% Total	23.7%	21.1%	0%	44.8%	25.8%	1.0%	0%	26.8%	0.8%	27.6%	0%	28.4%	-
Lights	117	105	0	222	126	4	0	130	4	137	0	141	493
% Lights	96.7%	97.2%	0%	96.9%	95.5%	80.0%	0%	94.9%	100%	97.2%	0%	97.2%	96.5%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	4	3	0	7	6	1	0	7	0	4	0	4	18
% Buses and Single-Unit Trucks	3.3%	2.8%	0%	3.1%	4.5%	20.0%	0%	5.1%	0%	2.8%	0%	2.8%	3.5%

*L: Left, R: Right, T: Thru, U: U-Turn

3. Ruritan Lake Rd (SR 619) at Branch Rd (SR... - TMC
 Thu Dec 4, 2025
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363612, Location: 37.879428, -78.358551



3. Ruritan Lake Rd (SR 619) at Branch Rd (SR... - TMC

Thu Dec 4, 2025

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363612, Location: 37.879428, -78.358551

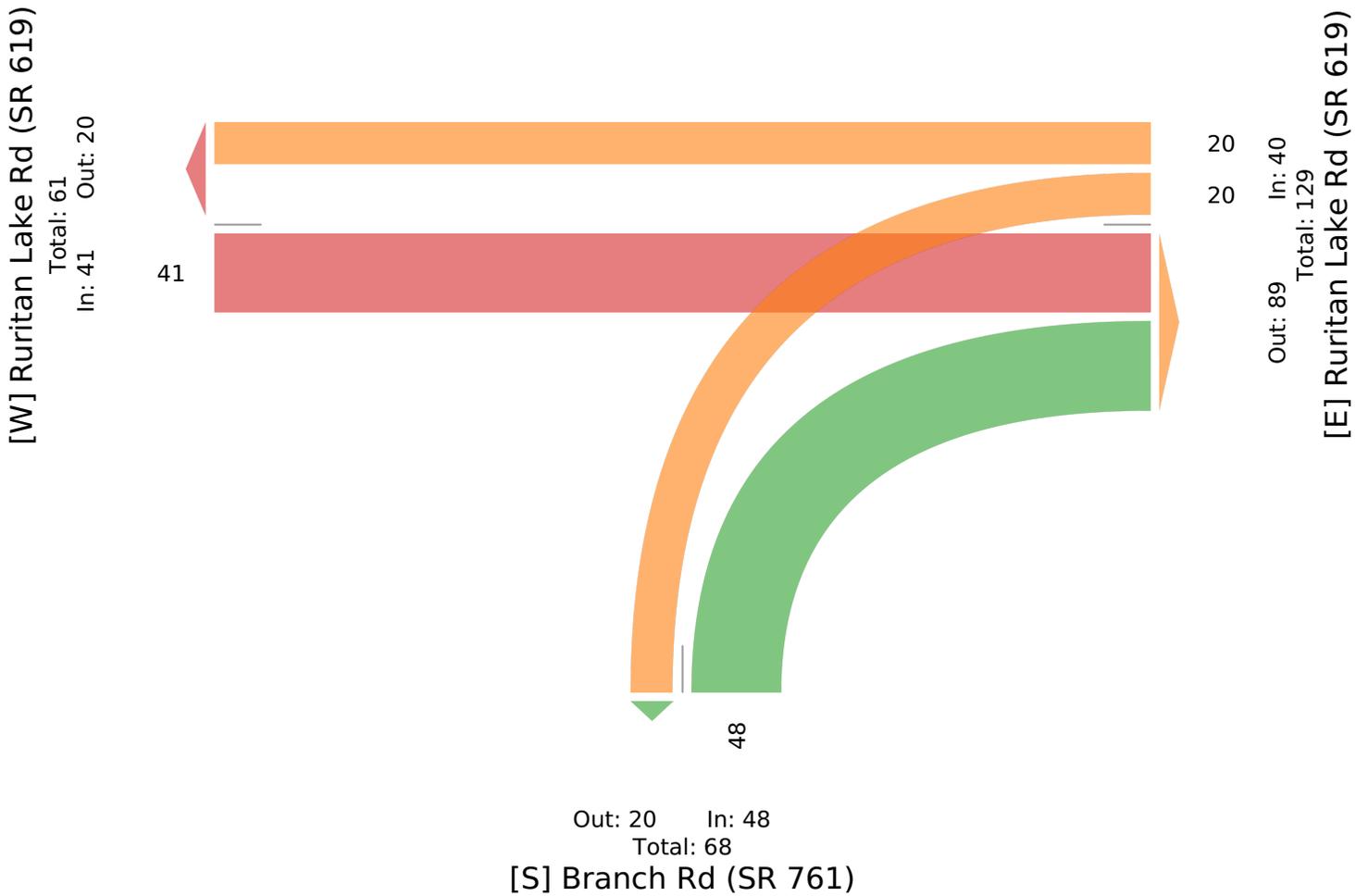


Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ruritan Lake Rd (SR 619) Westbound				Branch Rd (SR 761) Northbound				Ruritan Lake Rd (SR 619) Eastbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2025-12-04 7:45AM	2	3	0	5	9	0	0	9	0	13	0	13	27
8:00AM	3	2	0	5	14	0	0	14	0	8	0	8	27
8:15AM	4	6	0	10	14	0	0	14	0	8	0	8	32
8:30AM	11	9	0	20	11	0	0	11	0	12	0	12	43
Total	20	20	0	40	48	0	0	48	0	41	0	41	129
% Approach	50.0%	50.0%	0%	-	100%	0%	0%	-	0%	100%	0%	-	-
% Total	15.5%	15.5%	0%	31.0%	37.2%	0%	0%	37.2%	0%	31.8%	0%	31.8%	-
PHF	0.455	0.556	-	0.500	0.857	-	-	0.857	-	0.788	-	0.788	0.750
Lights	18	20	0	38	45	0	0	45	0	40	0	40	123
% Lights	90.0%	100%	0%	95.0%	93.8%	0%	0%	93.8%	0%	97.6%	0%	97.6%	95.3%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	2	0	0	2	3	0	0	3	0	1	0	1	6
% Buses and Single-Unit Trucks	10.0%	0%	0%	5.0%	6.3%	0%	0%	6.3%	0%	2.4%	0%	2.4%	4.7%

* L: Left, R: Right, T: Thru, U: U-Turn

3. Ruritan Lake Rd (SR 619) at Branch Rd (SR... - TMC
 Thu Dec 4, 2025
 AM Peak (7:45 AM - 8:45 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363612, Location: 37.879428, -78.358551



3. Ruritan Lake Rd (SR 619) at Branch Rd (SR... - TMC
 Thu Dec 4, 2025
 PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363612, Location: 37.879428, -78.358551

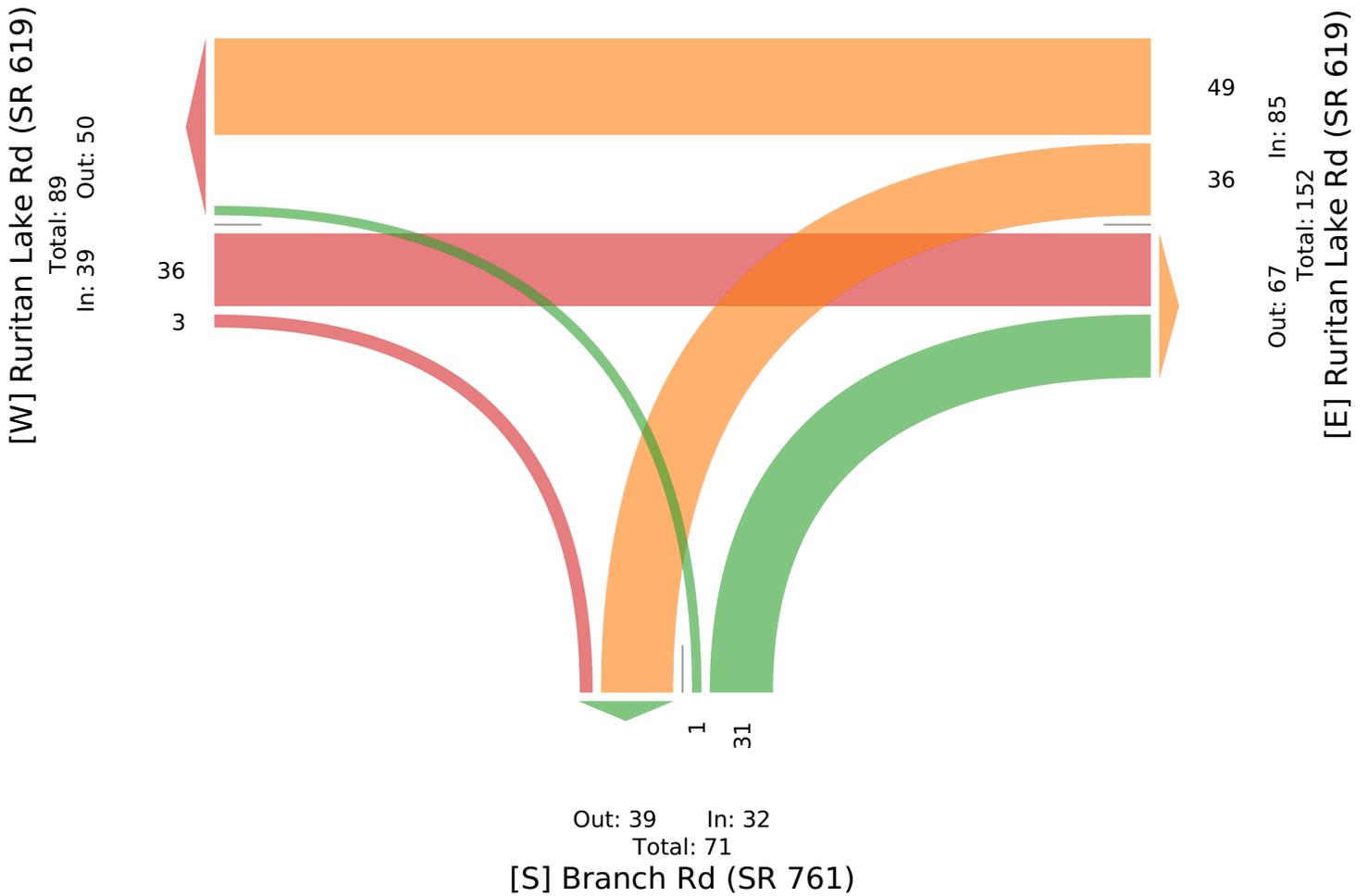


Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ruritan Lake Rd (SR 619) Westbound				Branch Rd (SR 761) Northbound				Ruritan Lake Rd (SR 619) Eastbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2025-12-04 4:15PM	10	7	0	17	10	1	0	11	1	14	0	15	43
4:30PM	13	11	0	24	7	0	0	7	1	4	0	5	36
4:45PM	13	9	0	22	10	0	0	10	0	7	0	7	39
5:00PM	13	9	0	22	4	0	0	4	1	11	0	12	38
Total	49	36	0	85	31	1	0	32	3	36	0	39	156
% Approach	57.6%	42.4%	0%	-	96.9%	3.1%	0%	-	7.7%	92.3%	0%	-	-
% Total	31.4%	23.1%	0%	54.5%	19.9%	0.6%	0%	20.5%	1.9%	23.1%	0%	25.0%	-
PHF	0.942	0.818	-	0.885	0.775	0.250	-	0.727	0.750	0.643	-	0.650	0.907
Lights	47	36	0	83	30	1	0	31	3	35	0	38	152
% Lights	95.9%	100%	0%	97.6%	96.8%	100%	0%	96.9%	100%	97.2%	0%	97.4%	97.4%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	2	0	0	2	1	0	0	1	0	1	0	1	4
% Buses and Single-Unit Trucks	4.1%	0%	0%	2.4%	3.2%	0%	0%	3.1%	0%	2.8%	0%	2.6%	2.6%

* L: Left, R: Right, T: Thru, U: U-Turn

3. Ruritan Lake Rd (SR 619) at Branch Rd (SR... - TMC
 Thu Dec 4, 2025
 PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363612, Location: 37.879428, -78.358551



**TMC
INTERSECTION 4**

Branch Rd (SR 761) at Rolling Rd (SR 620)

4. Branch Rd (SR 761) at Rolling Rd (SR 620) - TMC

Thu Dec 4, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363613, Location: 37.854647, -78.418687



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Rolling Rd (SR 620) Southbound				Branch Rd (SR 761) Westbound				Rolling Rd (SR 620) Northbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2025-12-04 7:00AM	1	0	0	1	5	3	0	8	4	32	0	36	45
7:15AM	5	4	0	9	8	5	0	13	5	28	0	33	55
7:30AM	4	4	0	8	1	5	0	6	3	20	0	23	37
7:45AM	4	2	0	6	5	2	0	7	11	22	0	33	46
Hourly Total	14	10	0	24	19	15	0	34	23	102	0	125	183
8:00AM	7	2	0	9	7	1	0	8	3	20	0	23	40
8:15AM	7	3	0	10	3	1	0	4	9	18	0	27	41
8:30AM	5	1	0	6	3	6	0	9	2	16	0	18	33
8:45AM	6	3	0	9	1	8	0	9	5	12	0	17	35
Hourly Total	25	9	0	34	14	16	0	30	19	66	0	85	149
4:00PM	20	7	0	27	3	6	0	9	4	8	0	12	48
4:15PM	11	6	0	17	1	5	0	6	6	9	0	15	38
4:30PM	14	8	0	22	4	9	0	13	7	10	0	17	52
4:45PM	15	4	0	19	3	9	0	12	3	7	0	10	41
Hourly Total	60	25	0	85	11	29	0	40	20	34	0	54	179
5:00PM	24	1	0	25	3	10	0	13	6	12	0	18	56
5:15PM	27	6	0	33	1	7	0	8	2	6	0	8	49
5:30PM	31	5	0	36	0	6	0	6	4	11	0	15	57
5:45PM	26	8	0	34	2	4	0	6	1	8	0	9	49
Hourly Total	108	20	0	128	6	27	0	33	13	37	0	50	211
Total	207	64	0	271	50	87	0	137	75	239	0	314	722
% Approach	76.4%	23.6%	0%	-	36.5%	63.5%	0%	-	23.9%	76.1%	0%	-	-
% Total	28.7%	8.9%	0%	37.5%	6.9%	12.0%	0%	19.0%	10.4%	33.1%	0%	43.5%	-
Lights	205	62	0	267	50	83	0	133	71	234	0	305	705
% Lights	99.0%	96.9%	0%	98.5%	100%	95.4%	0%	97.1%	94.7%	97.9%	0%	97.1%	97.6%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	2	2	0	4	0	4	0	4	4	5	0	9	17
% Buses and Single-Unit Trucks	1.0%	3.1%	0%	1.5%	0%	4.6%	0%	2.9%	5.3%	2.1%	0%	2.9%	2.4%

*L: Left, R: Right, T: Thru, U: U-Turn

4. Branch Rd (SR 761) at Rolling Rd (SR 620) - TMC

Thu Dec 4, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363613, Location: 37.854647, -78.418687



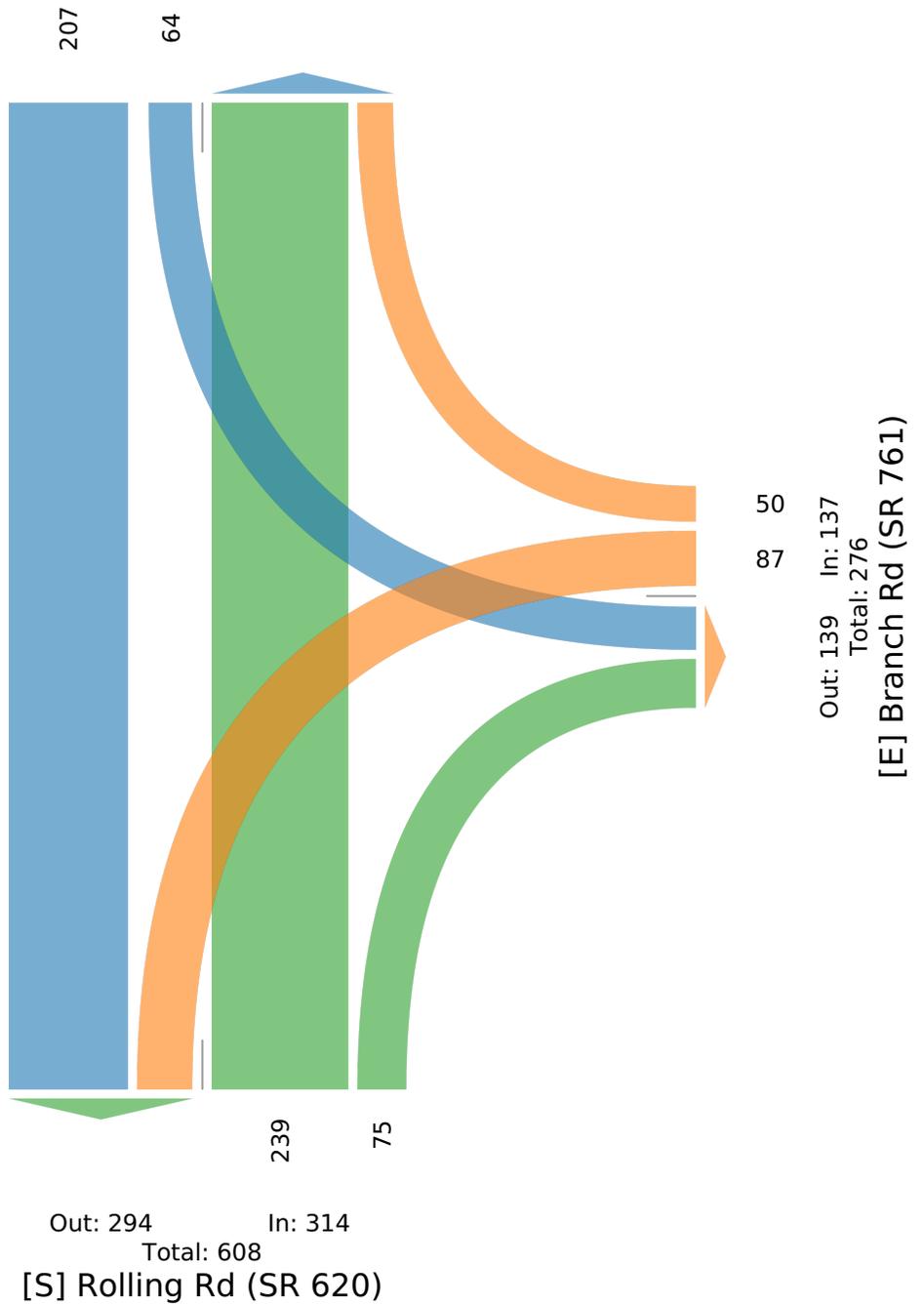
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Rolling Rd (SR 620)

Total: 560

In: 271

Out: 289



4. Branch Rd (SR 761) at Rolling Rd (SR 620) - TMC

Thu Dec 4, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363613, Location: 37.854647, -78.418687



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Rolling Rd (SR 620) Southbound				Branch Rd (SR 761) Westbound				Rolling Rd (SR 620) Northbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2025-12-04 7:00AM	1	0	0	1	5	3	0	8	4	32	0	36	45
7:15AM	5	4	0	9	8	5	0	13	5	28	0	33	55
7:30AM	4	4	0	8	1	5	0	6	3	20	0	23	37
7:45AM	4	2	0	6	5	2	0	7	11	22	0	33	46
Total	14	10	0	24	19	15	0	34	23	102	0	125	183
% Approach	58.3%	41.7%	0%	-	55.9%	44.1%	0%	-	18.4%	81.6%	0%	-	-
% Total	7.7%	5.5%	0%	13.1%	10.4%	8.2%	0%	18.6%	12.6%	55.7%	0%	68.3%	-
PHF	0.700	0.625	-	0.667	0.594	0.750	-	0.654	0.523	0.797	-	0.868	0.832
Lights	14	9	0	23	19	14	0	33	22	101	0	123	179
% Lights	100%	90.0%	0%	95.8%	100%	93.3%	0%	97.1%	95.7%	99.0%	0%	98.4%	97.8%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	0	1	0	1	0	1	0	1	1	1	0	2	4
% Buses and Single-Unit Trucks	0%	10.0%	0%	4.2%	0%	6.7%	0%	2.9%	4.3%	1.0%	0%	1.6%	2.2%

* L: Left, R: Right, T: Thru, U: U-Turn

4. Branch Rd (SR 761) at Rolling Rd (SR 620) - TMC

Thu Dec 4, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363613, Location: 37.854647, -78.418687

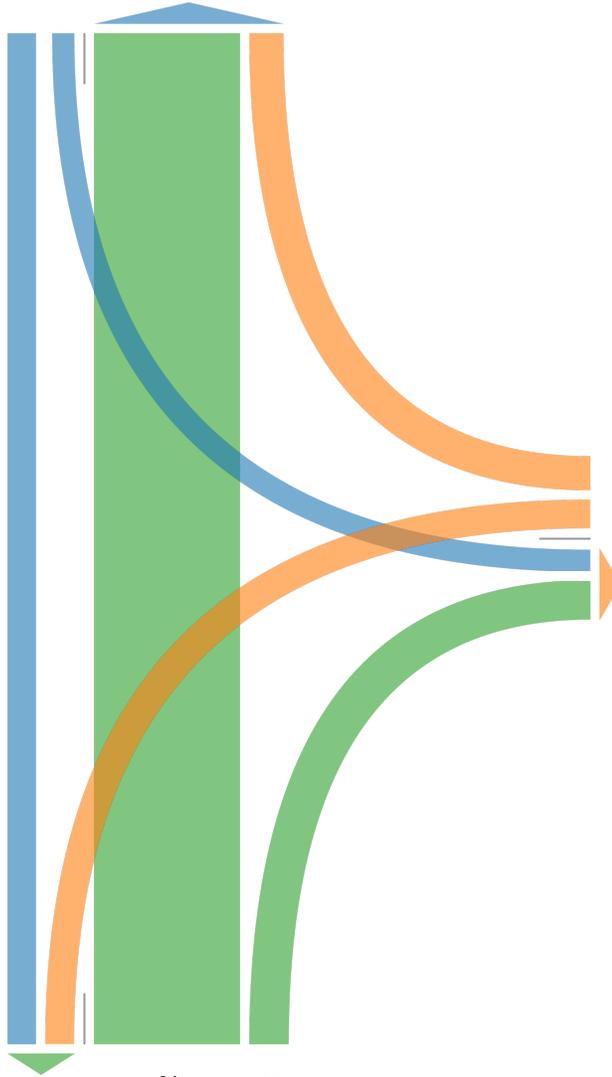


Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Rolling Rd (SR 620)

Total: 145
In: 24 Out: 121

14
10



19
15
Out: 33 In: 34
Total: 67

[E] Branch Rd (SR 761)

Out: 29 In: 125
Total: 154
[S] Rolling Rd (SR 620)

4. Branch Rd (SR 761) at Rolling Rd (SR 620) - TMC

Thu Dec 4, 2025

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363613, Location: 37.854647, -78.418687



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Rolling Rd (SR 620) Southbound				Branch Rd (SR 761) Westbound				Rolling Rd (SR 620) Northbound				Int
	T	L	U	App	R	L	U	App	R	T	U	App	
2025-12-04 5:00PM	24	1	0	25	3	10	0	13	6	12	0	18	56
5:15PM	27	6	0	33	1	7	0	8	2	6	0	8	49
5:30PM	31	5	0	36	0	6	0	6	4	11	0	15	57
5:45PM	26	8	0	34	2	4	0	6	1	8	0	9	49
Total	108	20	0	128	6	27	0	33	13	37	0	50	211
% Approach	84.4%	15.6%	0%	-	18.2%	81.8%	0%	-	26.0%	74.0%	0%	-	-
% Total	51.2%	9.5%	0%	60.7%	2.8%	12.8%	0%	15.6%	6.2%	17.5%	0%	23.7%	-
PHF	0.871	0.625	-	0.889	0.500	0.675	-	0.635	0.542	0.771	-	0.694	0.925
Lights	107	20	0	127	6	27	0	33	13	36	0	49	209
% Lights	99.1%	100%	0%	99.2%	100%	100%	0%	100%	100%	97.3%	0%	98.0%	99.1%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	1	0	0	1	0	0	0	0	0	1	0	1	2
% Buses and Single-Unit Trucks	0.9%	0%	0%	0.8%	0%	0%	0%	0%	0%	2.7%	0%	2.0%	0.9%

* L: Left, R: Right, T: Thru, U: U-Turn

4. Branch Rd (SR 761) at Rolling Rd (SR 620) - TMC

Thu Dec 4, 2025

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363613, Location: 37.854647, -78.418687



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Rolling Rd (SR 620)

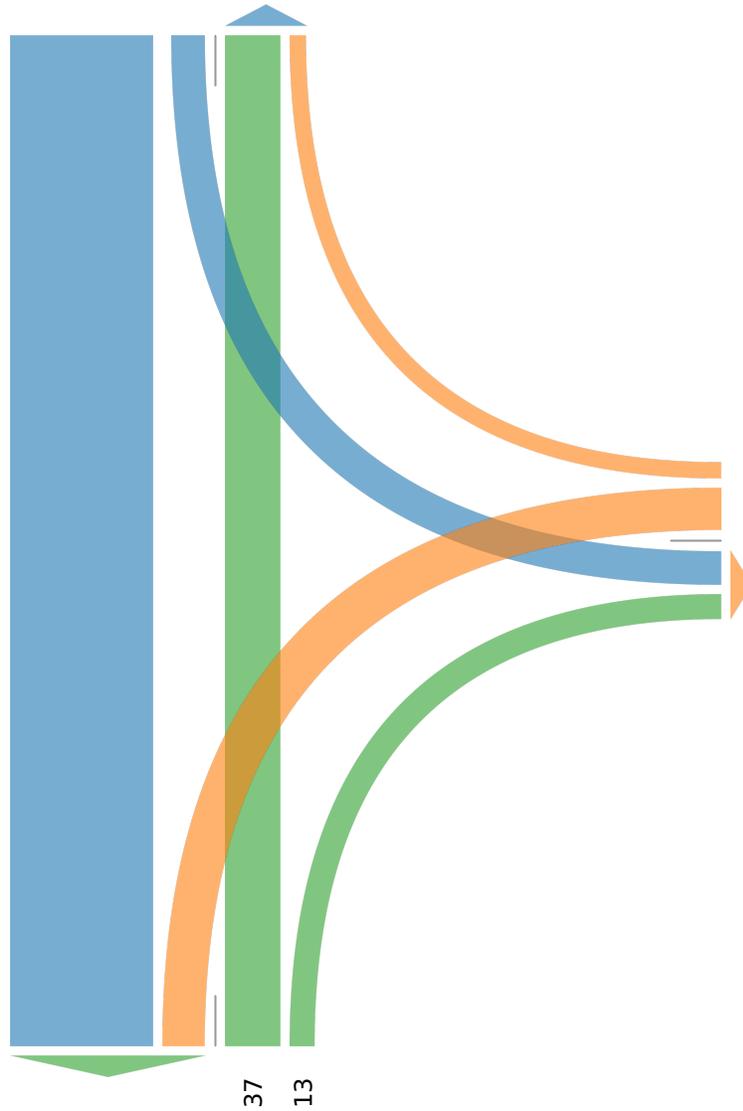
Total: 171

In: 128

Out: 43

108

20



6
27
Out: 33 In: 33
Total: 66

[E] Branch Rd (SR 761)

Out: 135 In: 50
Total: 185
[S] Rolling Rd (SR 620)

TMC
INTERSECTION 5

**Thomas Jefferson Parkway (SR 53) at James
Madison Highway (US 15)**

5. Thomas Jefferson Parkway (SR 53) at James... - TMC

Thu Dec 4, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363609, Location: 37.856158, -78.267821



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Thomas Jefferson Parkway (SR 53)					James Madison Highway (US 15)					South Northbound					James Madison Highway (US 15) Eastbound					Int
	Southbound					Westbound															
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2025-12-04 7:00AM	40	0	11	0	51	16	53	0	1	70	0	0	0	0	0	0	43	10	0	53	174
7:15AM	80	0	16	0	96	21	56	0	0	77	0	0	0	0	0	0	56	13	1	70	243
7:30AM	91	0	20	0	111	23	70	0	0	93	0	0	0	0	0	0	102	69	0	171	375
7:45AM	45	0	16	0	61	40	44	0	2	86	0	0	0	0	0	0	103	95	0	198	345
Hourly Total	256	0	63	0	319	100	223	0	3	326	0	0	0	0	0	0	304	187	1	492	1137
8:00AM	20	0	22	0	42	35	26	0	0	61	0	0	0	0	0	0	85	76	1	162	265
8:15AM	32	0	42	0	74	56	30	0	0	86	0	0	0	0	0	0	63	51	0	114	274
8:30AM	41	0	32	0	73	37	27	0	0	64	0	0	0	0	0	0	52	34	1	87	224
8:45AM	9	0	25	0	34	23	29	0	0	52	0	0	0	0	0	0	54	26	0	80	166
Hourly Total	102	0	121	0	223	151	112	0	0	263	0	0	0	0	0	0	254	187	2	443	929
4:00PM	33	0	46	0	79	40	75	0	2	117	0	0	0	0	0	0	57	21	0	78	274
4:15PM	35	0	43	0	78	40	62	0	0	102	0	0	0	0	0	0	46	36	0	82	262
4:30PM	42	0	34	0	76	44	75	0	1	120	0	0	0	0	0	0	53	26	0	79	275
4:45PM	40	0	37	0	77	37	78	0	0	115	0	0	0	0	0	0	44	21	1	66	258
Hourly Total	150	0	160	0	310	161	290	0	3	454	0	0	0	0	0	0	200	104	1	305	1069
5:00PM	32	0	31	0	63	46	62	0	0	108	0	0	0	0	0	0	43	27	0	70	241
5:15PM	35	0	34	0	69	36	84	0	0	120	0	0	0	0	0	0	46	13	1	60	249
5:30PM	41	0	28	0	69	28	62	0	0	90	0	0	0	0	0	0	44	16	0	60	219
5:45PM	28	0	31	0	59	24	63	0	0	87	0	0	0	0	0	0	35	20	1	56	202
Hourly Total	136	0	124	0	260	134	271	0	0	405	0	0	0	0	0	0	168	76	2	246	911
Total	644	0	468	0	1112	546	896	0	6	1448	0	0	0	0	0	0	926	554	6	1486	4046
% Approach	57.9%	0%	42.1%	0%	-	37.7%	61.9%	0%	0.4%	-	0%	0%	0%	0%	-	0%	62.3%	37.3%	0.4%	-	-
% Total	15.9%	0%	11.6%	0%	27.5%	13.5%	22.1%	0%	0.1%	35.8%	0%	0%	0%	0%	0%	0%	22.9%	13.7%	0.1%	36.7%	-
Lights	606	0	455	0	1061	531	830	0	5	1366	0	0	0	0	0	0	886	528	6	1420	3847
% Lights	94.1%	0%	97.2%	0%	95.4%	97.3%	92.6%	0%	83.3%	94.3%	0%	0%	0%	0%	-	0%	95.7%	95.3%	100%	95.6%	95.1%
Articulated Trucks	2	0	2	0	4	3	35	0	0	38	0	0	0	0	0	0	28	2	0	30	72
% Articulated Trucks	0.3%	0%	0.4%	0%	0.4%	0.5%	3.9%	0%	0%	2.6%	0%	0%	0%	0%	-	0%	3.0%	0.4%	0%	2.0%	1.8%
Buses and Single-Unit Trucks	36	0	11	0	47	12	31	0	1	44	0	0	0	0	0	0	12	24	0	36	127
% Buses and Single-Unit Trucks	5.6%	0%	2.4%	0%	4.2%	2.2%	3.5%	0%	16.7%	3.0%	0%	0%	0%	0%	-	0%	1.3%	4.3%	0%	2.4%	3.1%

*L: Left, R: Right, T: Thru, U: U-Turn

5. Thomas Jefferson Parkway (SR 53) at James... - TMC
 Thu Dec 4, 2025
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363609, Location: 37.856158, -78.267821

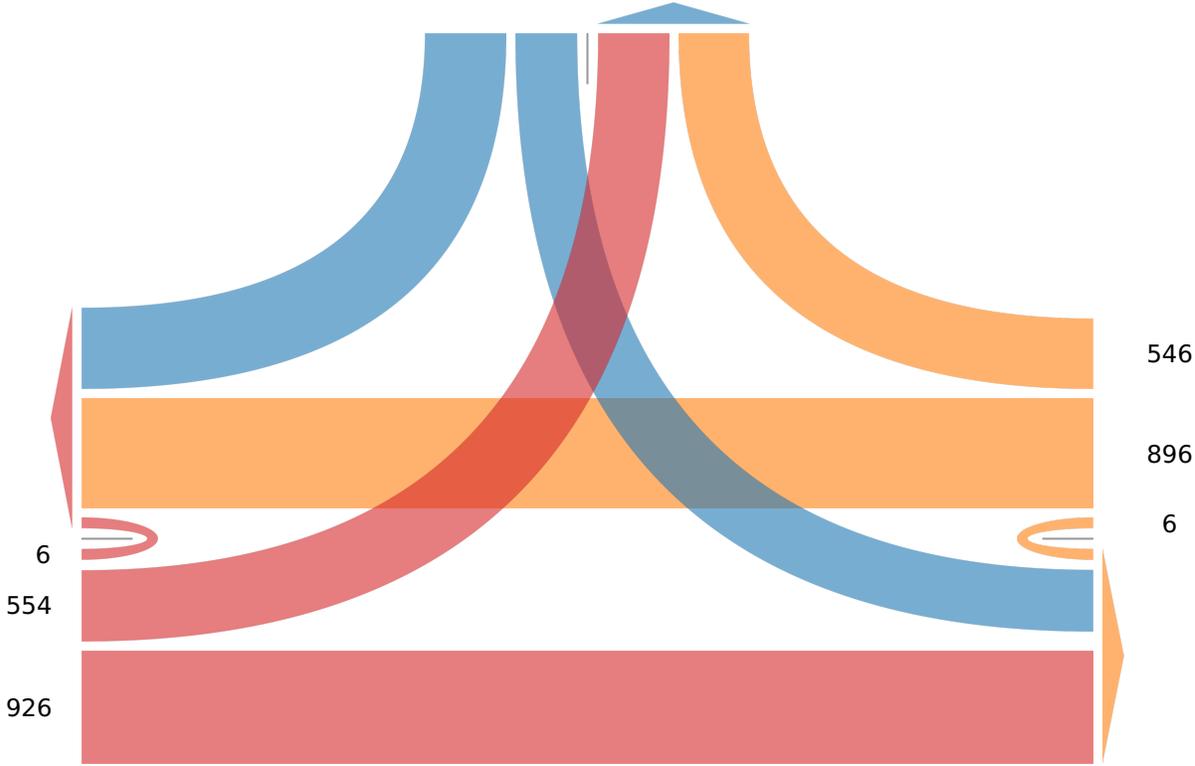
[N] Thomas Jefferson Parkway (SR 53)

Total: 2212
 In: 1112 Out: 1100

644 468

[W] James Madison Highway (US 15)

Total: 3032
 In: 1486 Out: 1546



[E] James Madison Highway (US 15)

Total: 2848
 In: 1448 Out: 1400

5. Thomas Jefferson Parkway (SR 53) at James... - TMC
 Thu Dec 4, 2025
 AM Peak (7:30 AM - 8:30 AM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363609, Location: 37.856158, -78.267821



Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Thomas Jefferson Parkway (SR 53) Southbound					James Madison Highway (US 15) Westbound					South Northbound					James Madison Highway (US 15) Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2025-12-04 7:30AM	91	0	20	0	111	23	70	0	0	93	0	0	0	0	0	0	102	69	0	171	375
7:45AM	45	0	16	0	61	40	44	0	2	86	0	0	0	0	0	0	103	95	0	198	345
8:00AM	20	0	22	0	42	35	26	0	0	61	0	0	0	0	0	0	85	76	1	162	265
8:15AM	32	0	42	0	74	56	30	0	0	86	0	0	0	0	0	0	63	51	0	114	274
Total	188	0	100	0	288	154	170	0	2	326	0	0	0	0	0	0	353	291	1	645	1259
% Approach	65.3%	0%	34.7%	0%	-	47.2%	52.1%	0%	0.6%	-	0%	0%	0%	0%	-	0%	54.7%	45.1%	0.2%	-	-
% Total	14.9%	0%	7.9%	0%	22.9%	12.2%	13.5%	0%	0.2%	25.9%	0%	0%	0%	0%	0%	0%	28.0%	23.1%	0.1%	51.2%	-
PHF	0.516	-	0.595	-	0.649	0.688	0.607	-	0.250	0.876	-	-	-	-	-	-	0.857	0.766	0.250	0.814	0.839
Lights	175	0	94	0	269	144	148	0	1	293	0	0	0	0	0	0	334	267	1	602	1164
% Lights	93.1%	0%	94.0%	0%	93.4%	93.5%	87.1%	0%	50.0%	89.9%	0%	0%	0%	0%	-	0%	94.6%	91.8%	100%	93.3%	92.5%
Articulated Trucks	0	0	1	0	1	1	12	0	0	13	0	0	0	0	0	0	13	1	0	14	28
% Articulated Trucks	0%	0%	1.0%	0%	0.3%	0.6%	7.1%	0%	0%	4.0%	0%	0%	0%	0%	-	0%	3.7%	0.3%	0%	2.2%	2.2%
Buses and Single-Unit Trucks	13	0	5	0	18	9	10	0	1	20	0	0	0	0	0	0	6	23	0	29	67
% Buses and Single-Unit Trucks	6.9%	0%	5.0%	0%	6.3%	5.8%	5.9%	0%	50.0%	6.1%	0%	0%	0%	0%	-	0%	1.7%	7.9%	0%	4.5%	5.3%

* L: Left, R: Right, T: Thru, U: U-Turn

5. Thomas Jefferson Parkway (SR 53) at James... - TMC
 Thu Dec 4, 2025
 AM Peak (7:30 AM - 8:30 AM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363609, Location: 37.856158, -78.267821

[N] Thomas Jefferson Parkway (SR 53)

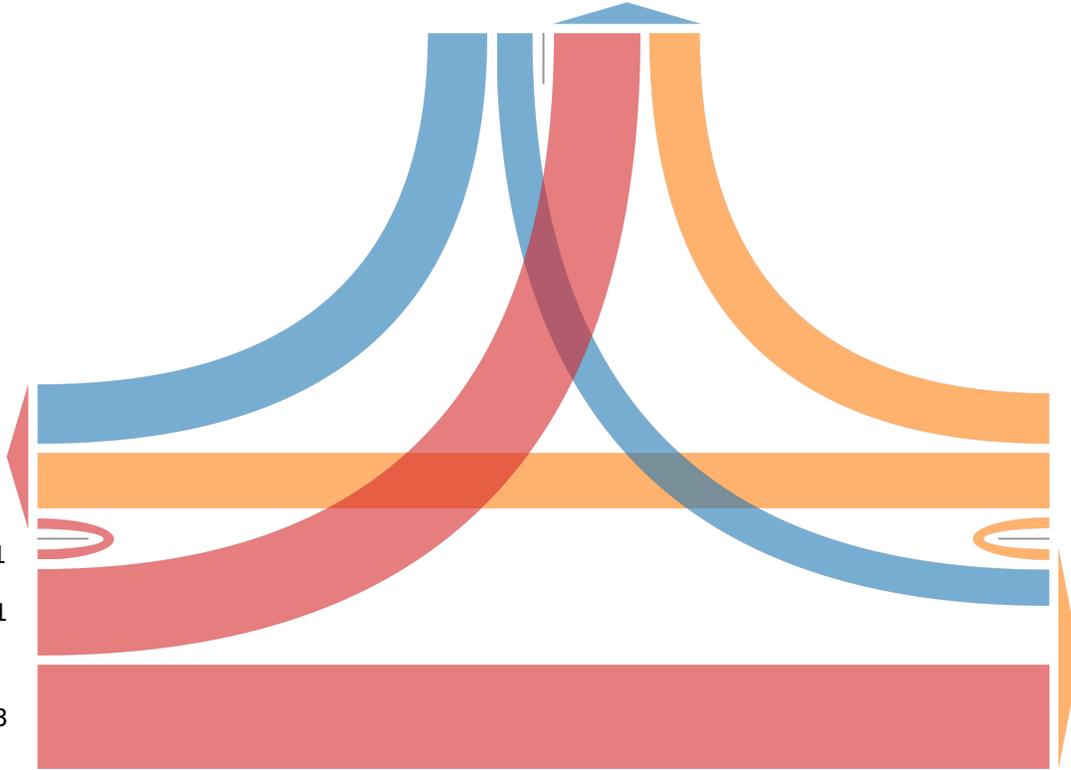
Total: 733
 In: 288 Out: 445

188 100

[W] James Madison Highway (US 15)

Total: 1004
 In: 645 Out: 359

1
 291
 353



154
 170
 2
 Out: 455 In: 326
 Total: 781

[E] James Madison Highway (US 15)

5. Thomas Jefferson Parkway (SR 53) at James... - TMC

Thu Dec 4, 2025

PM Peak (4 PM - 5 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363609, Location: 37.856158, -78.267821



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Thomas Jefferson Parkway (SR 53)					James Madison Highway (US 15)					South Northbound					James Madison Highway (US 15) Eastbound					Int
	Southbound					Westbound															
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2025-12-04 4:00PM	33	0	46	0	79	40	75	0	2	117	0	0	0	0	0	0	57	21	0	78	274
4:15PM	35	0	43	0	78	40	62	0	0	102	0	0	0	0	0	0	46	36	0	82	262
4:30PM	42	0	34	0	76	44	75	0	1	120	0	0	0	0	0	0	53	26	0	79	275
4:45PM	40	0	37	0	77	37	78	0	0	115	0	0	0	0	0	0	44	21	1	66	258
Total	150	0	160	0	310	161	290	0	3	454	0	0	0	0	0	0	200	104	1	305	1069
% Approach	48.4%	0%	51.6%	0%	-	35.5%	63.9%	0%	0.7%	-	0%	0%	0%	0%	-	0%	65.6%	34.1%	0.3%	-	-
% Total	14.0%	0%	15.0%	0%	29.0%	15.1%	27.1%	0%	0.3%	42.5%	0%	0%	0%	0%	0%	0%	18.7%	9.7%	0.1%	28.5%	-
PHF	0.893	-	0.870	-	0.981	0.915	0.929	-	0.375	0.946	-	-	-	-	-	-	0.877	0.722	0.250	0.930	0.972
Lights	143	0	158	0	301	158	272	0	3	433	0	0	0	0	0	0	193	103	1	297	1031
% Lights	95.3%	0%	98.8%	0%	97.1%	98.1%	93.8%	0%	100%	95.4%	0%	0%	0%	0%	-	0%	96.5%	99.0%	100%	97.4%	96.4%
Articulated Trucks	1	0	0	0	1	1	9	0	0	10	0	0	0	0	0	0	5	1	0	6	17
% Articulated Trucks	0.7%	0%	0%	0%	0.3%	0.6%	3.1%	0%	0%	2.2%	0%	0%	0%	0%	-	0%	2.5%	1.0%	0%	2.0%	1.6%
Buses and Single-Unit Trucks	6	0	2	0	8	2	9	0	0	11	0	0	0	0	0	0	2	0	0	2	21
% Buses and Single-Unit Trucks	4.0%	0%	1.3%	0%	2.6%	1.2%	3.1%	0%	0%	2.4%	0%	0%	0%	0%	-	0%	1.0%	0%	0%	0.7%	2.0%

* L: Left, R: Right, T: Thru, U: U-Turn

5. Thomas Jefferson Parkway (SR 53) at James... - TMC

Thu Dec 4, 2025

PM Peak (4 PM - 5 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363609, Location: 37.856158, -78.267821



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Thomas Jefferson Parkway (SR 53)

Total: 575

In: 310

Out: 265

150

160

[W] James Madison Highway (US 15)

Total: 746

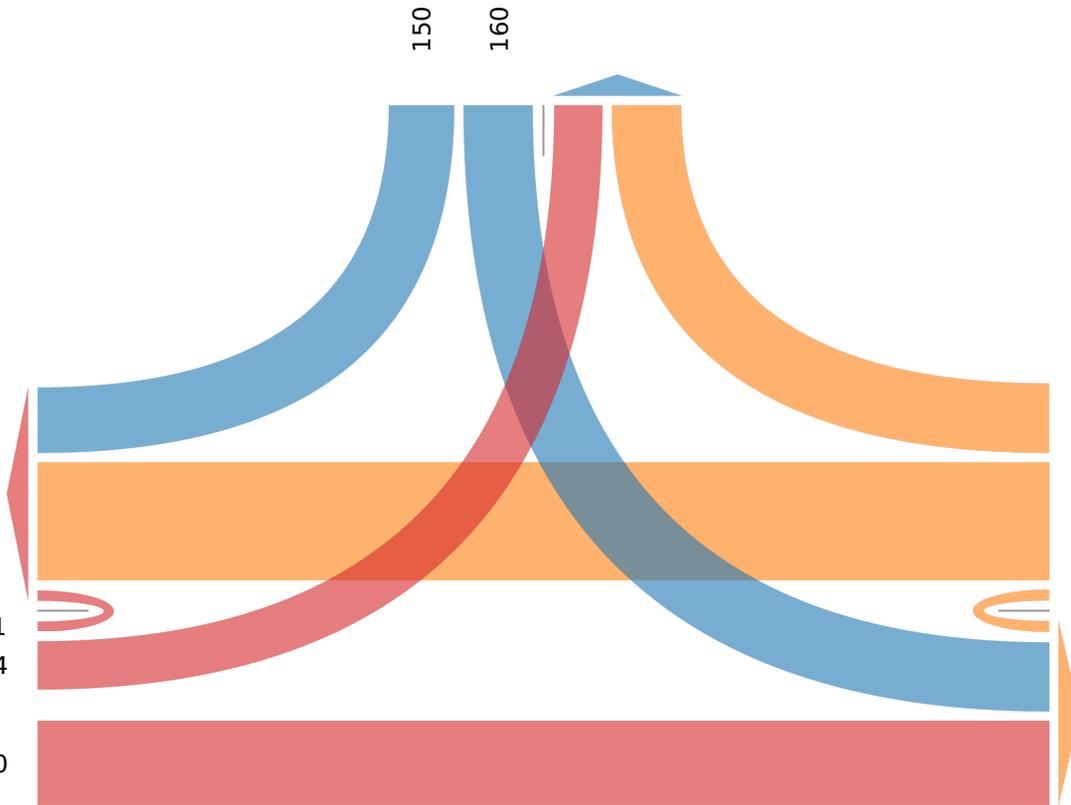
In: 305

Out: 441

104

200

1



161

290

3

In: 454

Out: 363

Total: 817

[E] James Madison Highway (US 15)

**TMC
INTERSECTION 6**

**James Madison Highway (US 15) at 3 Notch Road
(US 250)**

6. James Madison Highway (US 15) at 3 Notch ... - TMC

Thu Dec 4, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363614, Location: 37.970721, -78.219441



Provided by: Gewalt Hamilton Associates Inc.

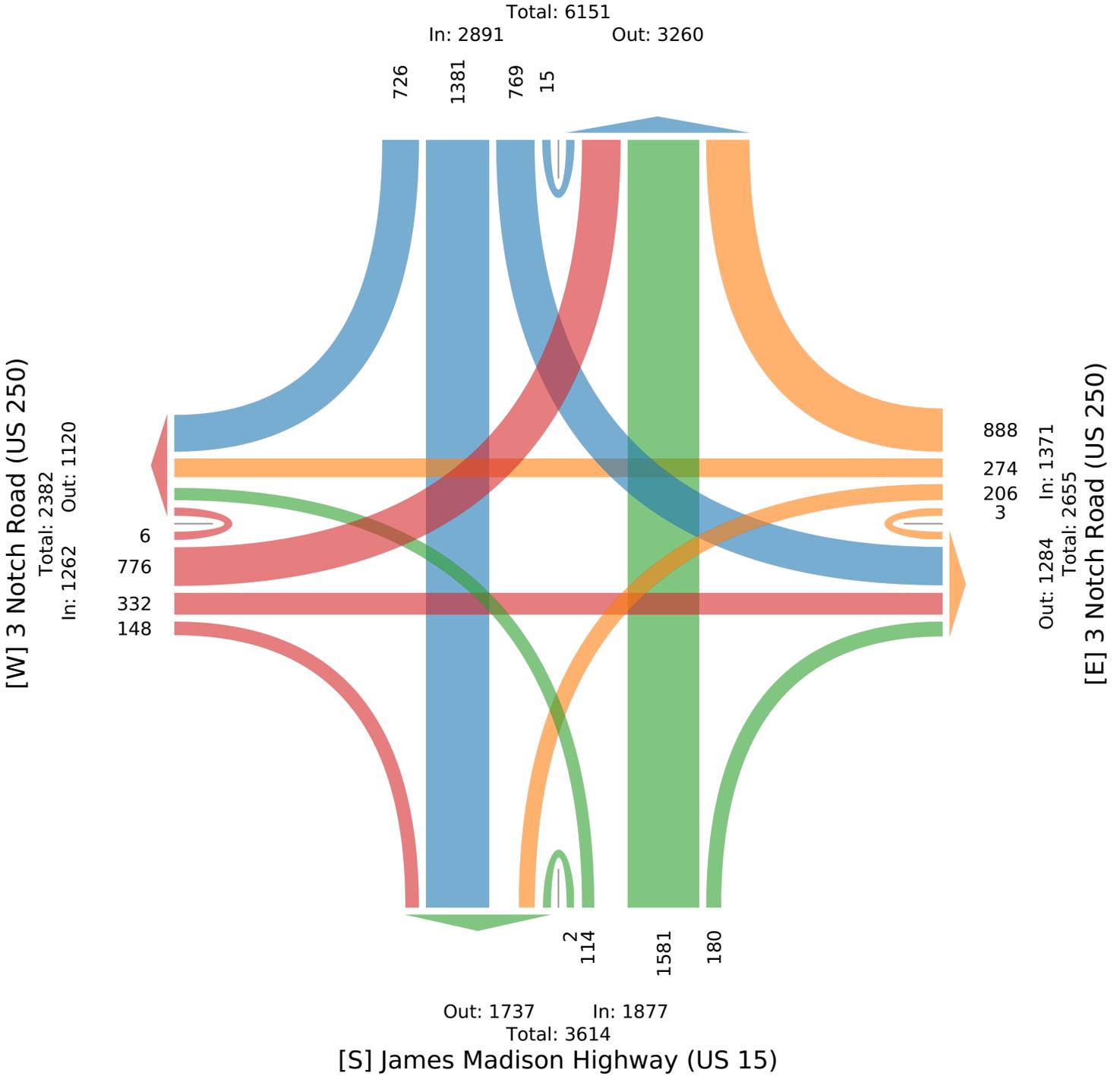
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	James Madison Highway (US 15) Southbound					3 Notch Road (US 250) Westbound					James Madison Highway (US 15) Northbound					3 Notch Road (US 250) Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2025-12-04 7:00AM	40	47	21	0	108	84	30	16	0	130	12	103	6	0	121	9	10	39	0	58	417
7:15AM	43	65	32	0	140	63	15	8	1	87	9	99	4	0	112	8	18	38	0	64	403
7:30AM	42	68	29	0	139	75	18	18	0	111	16	104	9	0	129	7	17	46	0	70	449
7:45AM	51	63	37	0	151	69	24	15	0	108	20	138	11	0	169	11	14	35	0	60	488
Hourly Total	176	243	119	0	538	291	87	57	1	436	57	444	30	0	531	35	59	158	0	252	1757
8:00AM	39	64	19	1	123	52	17	8	0	77	16	101	11	1	129	7	22	41	0	70	399
8:15AM	33	57	32	1	123	61	19	12	0	92	9	107	7	0	123	8	11	45	0	64	402
8:30AM	35	47	27	0	109	64	19	4	0	87	2	107	0	0	109	4	17	31	0	52	357
8:45AM	43	59	23	0	125	52	24	9	0	85	10	99	5	0	114	5	21	39	0	65	389
Hourly Total	150	227	101	2	480	229	79	33	0	341	37	414	23	1	475	24	71	156	0	251	1547
4:00PM	52	113	75	4	244	58	8	16	0	82	17	86	12	1	116	11	24	47	0	82	524
4:15PM	39	116	75	1	231	30	18	14	0	62	6	85	9	0	100	12	23	43	1	79	472
4:30PM	46	100	75	3	224	59	18	26	0	103	20	86	9	0	115	14	28	57	2	101	543
4:45PM	41	117	56	0	214	45	13	13	0	71	13	118	6	0	137	10	28	70	0	108	530
Hourly Total	178	446	281	8	913	192	57	69	0	318	56	375	36	1	468	47	103	217	3	370	2069
5:00PM	57	130	63	1	251	42	15	14	1	72	12	94	8	0	114	11	27	81	3	122	559
5:15PM	54	122	67	0	243	52	17	11	0	80	7	88	5	0	100	10	23	64	0	97	520
5:30PM	54	102	71	3	230	42	13	9	0	64	2	74	9	0	85	13	28	53	0	94	473
5:45PM	57	111	67	1	236	40	6	13	1	60	9	92	3	0	104	8	21	47	0	76	476
Hourly Total	222	465	268	5	960	176	51	47	2	276	30	348	25	0	403	42	99	245	3	389	2028
Total	726	1381	769	15	2891	888	274	206	3	1371	180	1581	114	2	1877	148	332	776	6	1262	7401
% Approach	25.1%	47.8%	26.6%	0.5%	-	64.8%	20.0%	15.0%	0.2%	-	9.6%	84.2%	6.1%	0.1%	-	11.7%	26.3%	61.5%	0.5%	-	-
% Total	9.8%	18.7%	10.4%	0.2%	39.1%	12.0%	3.7%	2.8%	0%	18.5%	2.4%	21.4%	1.5%	0%	25.4%	2.0%	4.5%	10.5%	0.1%	17.1%	-
Lights	675	1328	728	15	2746	845	242	175	3	1265	161	1521	107	2	1791	135	286	737	6	1164	6966
% Lights	93.0%	96.2%	94.7%	100%	95.0%	95.2%	88.3%	85.0%	100%	92.3%	89.4%	96.2%	93.9%	100%	95.4%	91.2%	86.1%	95.0%	100%	92.2%	94.1%
Articulated Trucks	18	23	19	0	60	18	6	17	0	41	9	24	1	0	34	5	11	13	0	29	164
% Articulated Trucks	2.5%	1.7%	2.5%	0%	2.1%	2.0%	2.2%	8.3%	0%	3.0%	5.0%	1.5%	0.9%	0%	1.8%	3.4%	3.3%	1.7%	0%	2.3%	2.2%
Buses and Single-Unit Trucks	33	30	22	0	85	25	26	14	0	65	10	36	6	0	52	8	35	26	0	69	271
% Buses and Single-Unit Trucks	4.5%	2.2%	2.9%	0%	2.9%	2.8%	9.5%	6.8%	0%	4.7%	5.6%	2.3%	5.3%	0%	2.8%	5.4%	10.5%	3.4%	0%	5.5%	3.7%

*L: Left, R: Right, T: Thru, U: U-Turn

6. James Madison Highway (US 15) at 3 Notch ... - TMC
 Thu Dec 4, 2025
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363614, Location: 37.970721, -78.219441

[N] James Madison Highway (US 15)



6. James Madison Highway (US 15) at 3 Notch ... - TMC

Thu Dec 4, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363614, Location: 37.970721, -78.219441



Provided by: Gewalt Hamilton Associates Inc.

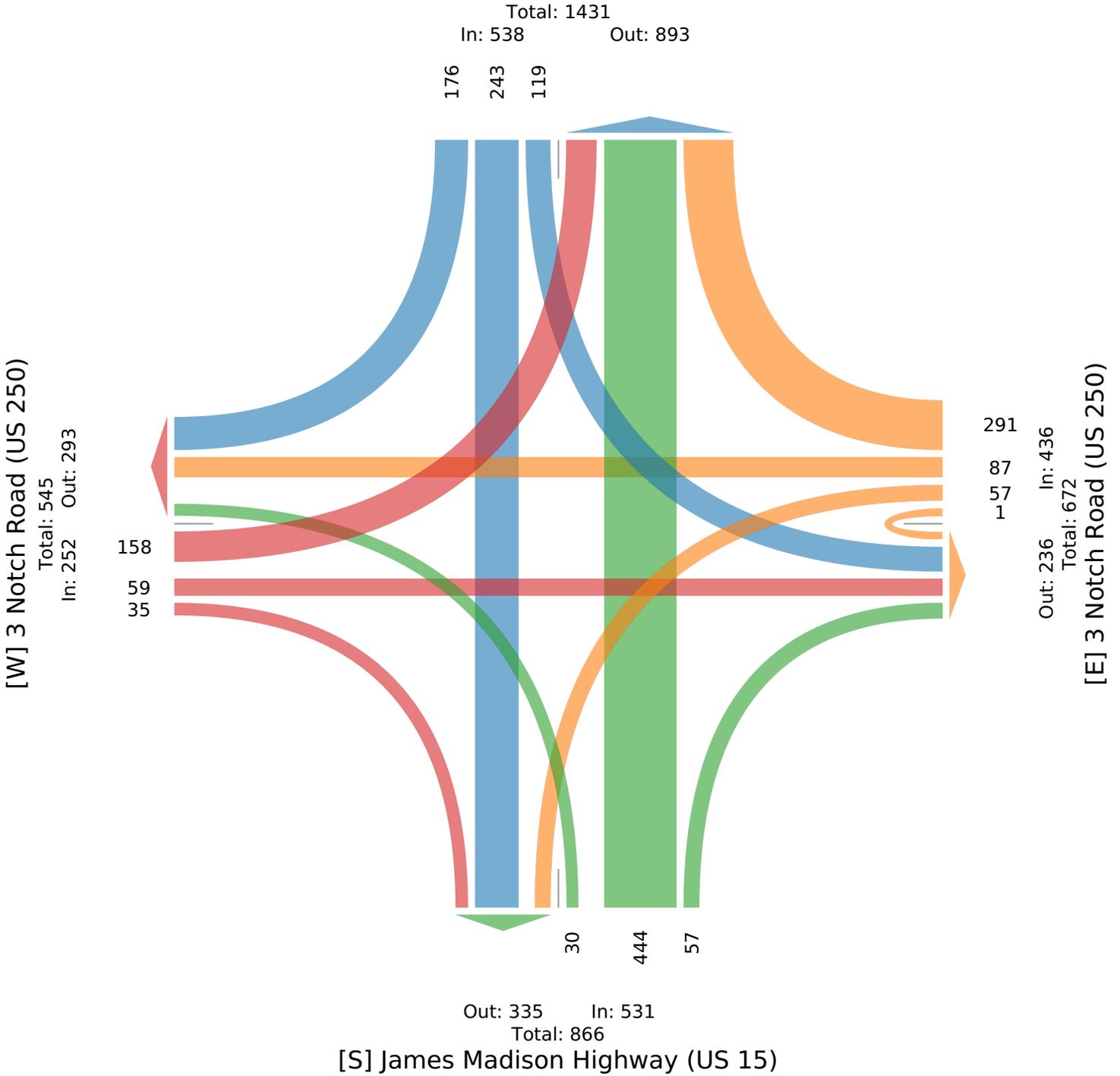
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	James Madison Highway (US 15) Southbound						3 Notch Road (US 250) Westbound						James Madison Highway (US 15) Northbound						3 Notch Road (US 250) Eastbound						Int						
	R	T	L	U	App		R	T	L	U	App		R	T	L	U	App		R	T	L	U	App								
Time																															
2025-12-04 7:00AM	40	47	21	0	108		84	30	16	0	130		12	103	6	0	121		9	10	39	0	58		417						
7:15AM	43	65	32	0	140		63	15	8	1	87		9	99	4	0	112		8	18	38	0	64		403						
7:30AM	42	68	29	0	139		75	18	18	0	111		16	104	9	0	129		7	17	46	0	70		449						
7:45AM	51	63	37	0	151		69	24	15	0	108		20	138	11	0	169		11	14	35	0	60		488						
Total	176	243	119	0	538		291	87	57	1	436		57	444	30	0	531		35	59	158	0	252		1757						
% Approach	32.7%	45.2%	22.1%	0%	-		66.7%	20.0%	13.1%	0.2%	-		10.7%	83.6%	5.6%	0%	-		13.9%	23.4%	62.7%	0%	-		-						
% Total	10.0%	13.8%	6.8%	0%	30.6%		16.6%	5.0%	3.2%	0.1%	24.8%		3.2%	25.3%	1.7%	0%	30.2%		2.0%	3.4%	9.0%	0%	14.3%		-						
PHF	0.863	0.893	0.804	-	0.891		0.866	0.725	0.792	0.250	0.838		0.713	0.804	0.682	-	0.786		0.795	0.819	0.859	-	0.900		0.900						
Lights	149	227	108	0	484		275	76	48	1	400		51	419	27	0	497		32	45	142	0	219		1600						
% Lights	84.7%	93.4%	90.8%	0%	90.0%		94.5%	87.4%	84.2%	100%	91.7%		89.5%	94.4%	90.0%	0%	93.6%		91.4%	76.3%	89.9%	0%	86.9%		91.1%						
Articulated Trucks	15	10	6	0	31		8	2	7	0	17		2	11	0	0	13		1	2	5	0	8		69						
% Articulated Trucks	8.5%	4.1%	5.0%	0%	5.8%		2.7%	2.3%	12.3%	0%	3.9%		3.5%	2.5%	0%	0%	2.4%		2.9%	3.4%	3.2%	0%	3.2%		3.9%						
Buses and Single-Unit Trucks	12	6	5	0	23		8	9	2	0	19		4	14	3	0	21		2	12	11	0	25		88						
% Buses and Single-Unit Trucks	6.8%	2.5%	4.2%	0%	4.3%		2.7%	10.3%	3.5%	0%	4.4%		7.0%	3.2%	10.0%	0%	4.0%		5.7%	20.3%	7.0%	0%	9.9%		5.0%						

*L: Left, R: Right, T: Thru, U: U-Turn

6. James Madison Highway (US 15) at 3 Notch ... - TMC
 Thu Dec 4, 2025
 AM Peak (7 AM - 8 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363614, Location: 37.970721, -78.219441

[N] James Madison Highway (US 15)



6. James Madison Highway (US 15) at 3 Notch ... - TMC

Thu Dec 4, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1363614, Location: 37.970721, -78.219441



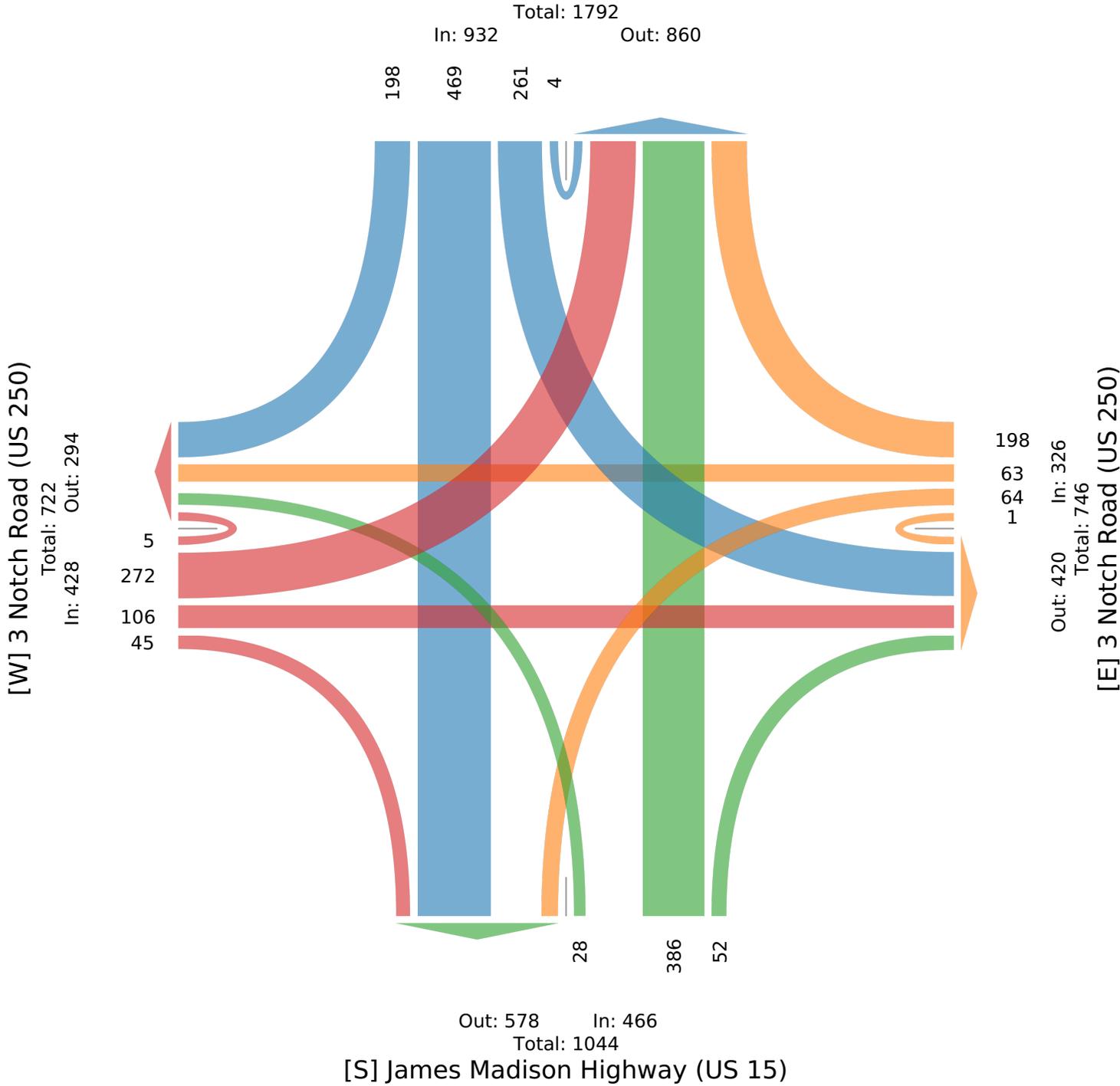
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	James Madison Highway (US 15) Southbound					3 Notch Road (US 250) Westbound					James Madison Highway (US 15) Northbound					3 Notch Road (US 250) Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2025-12-04 4:30PM	46	100	75	3	224	59	18	26	0	103	20	86	9	0	115	14	28	57	2	101	543
4:45PM	41	117	56	0	214	45	13	13	0	71	13	118	6	0	137	10	28	70	0	108	530
5:00PM	57	130	63	1	251	42	15	14	1	72	12	94	8	0	114	11	27	81	3	122	559
5:15PM	54	122	67	0	243	52	17	11	0	80	7	88	5	0	100	10	23	64	0	97	520
Total	198	469	261	4	932	198	63	64	1	326	52	386	28	0	466	45	106	272	5	428	2152
% Approach	21.2%	50.3%	28.0%	0.4%	-	60.7%	19.3%	19.6%	0.3%	-	11.2%	82.8%	6.0%	0%	-	10.5%	24.8%	63.6%	1.2%	-	-
% Total	9.2%	21.8%	12.1%	0.2%	43.3%	9.2%	2.9%	3.0%	0%	15.1%	2.4%	17.9%	1.3%	0%	21.7%	2.1%	4.9%	12.6%	0.2%	19.9%	-
PHF	0.868	0.902	0.870	0.333	0.928	0.839	0.875	0.615	0.250	0.791	0.650	0.818	0.778	-	0.850	0.804	0.946	0.840	0.417	0.877	0.962
Lights	191	461	256	4	912	194	61	56	1	312	51	377	26	0	454	43	99	268	5	415	2093
% Lights	96.5%	98.3%	98.1%	100%	97.9%	98.0%	96.8%	87.5%	100%	95.7%	98.1%	97.7%	92.9%	0%	97.4%	95.6%	93.4%	98.5%	100%	97.0%	97.3%
Articulated Trucks	1	3	1	0	5	2	0	1	0	3	0	4	0	0	4	0	1	1	0	2	14
% Articulated Trucks	0.5%	0.6%	0.4%	0%	0.5%	1.0%	0%	1.6%	0%	0.9%	0%	1.0%	0%	0%	0.9%	0%	0.9%	0.4%	0%	0.5%	0.7%
Buses and Single-Unit Trucks	6	5	4	0	15	2	2	7	0	11	1	5	2	0	8	2	6	3	0	11	45
% Buses and Single-Unit Trucks	3.0%	1.1%	1.5%	0%	1.6%	1.0%	3.2%	10.9%	0%	3.4%	1.9%	1.3%	7.1%	0%	1.7%	4.4%	5.7%	1.1%	0%	2.6%	2.1%

*L: Left, R: Right, T: Thru, U: U-Turn

6. James Madison Highway (US 15) at 3 Notch ... - TMC
 Thu Dec 4, 2025
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 1363614, Location: 37.970721, -78.219441

[N] James Madison Highway (US 15)



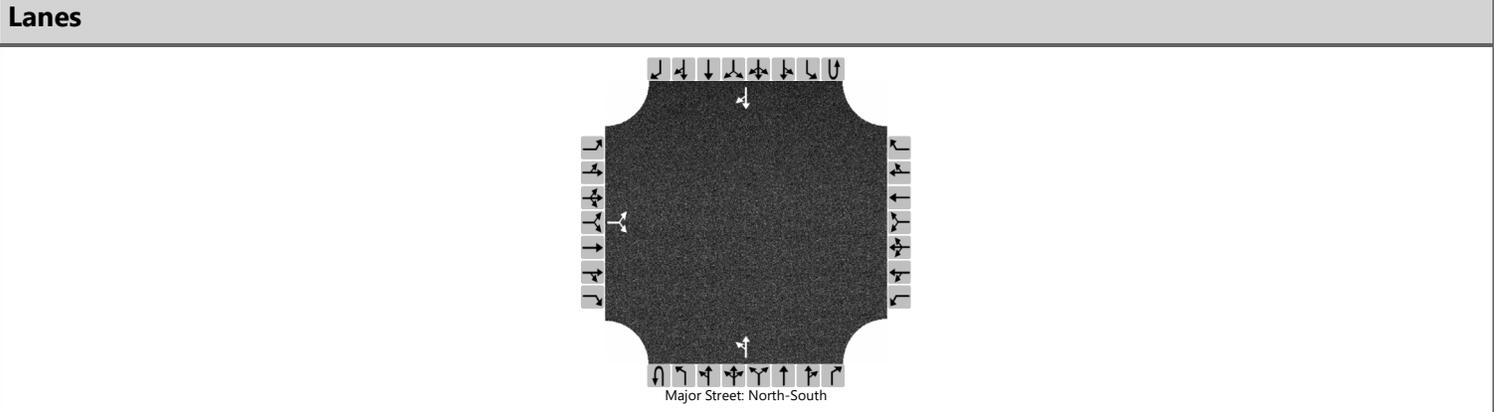
APPENDIX B

2028 Background Traffic Analyses

2028 Background Traffic AM

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	1. Thomas Jefferson Pkwy (SR 53) at Ruritan...				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Ruritan Lake Rd (SR 619)				
Analysis Year	2028	North/South Street	Thomas Jefferson Pkwy (SR 53)				
Time Analyzed	2028 Background AM	Peak Hour Factor	0.94				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2028 Background AM						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		203		89						44	350				400	65
Percent Heavy Vehicles (%)		4		3						5						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.44		6.23						4.15						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.54		3.33						2.25						

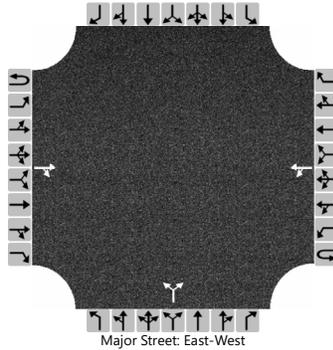
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			311							47						
Capacity, c (veh/h)			333							1054						
v/c Ratio			0.93							0.04						
95% Queue Length, Q ₉₅ (veh)			9.5							0.1						
95% Queue Length, Q ₉₅ (ft)			244.5							2.6						
Control Delay (s/veh)			69.4							8.6	0.5					
Level of Service (LOS)			F							A	A					
Approach Delay (s/veh)	69.4								1.4							
Approach LOS	F								A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	2. Ruritan Lake Rd (SR 619) at Sclaters Ford R...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2028			North/South Street	Sclaters Ford Rd (SR 660)		
Time Analyzed	2028 Background AM			Peak Hour Factor	0.85		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2028 Background AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			122	6		57	55			3		170				
Percent Heavy Vehicles (%)						8				0		5				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.18					6.40		6.25			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.27					3.50		3.35			

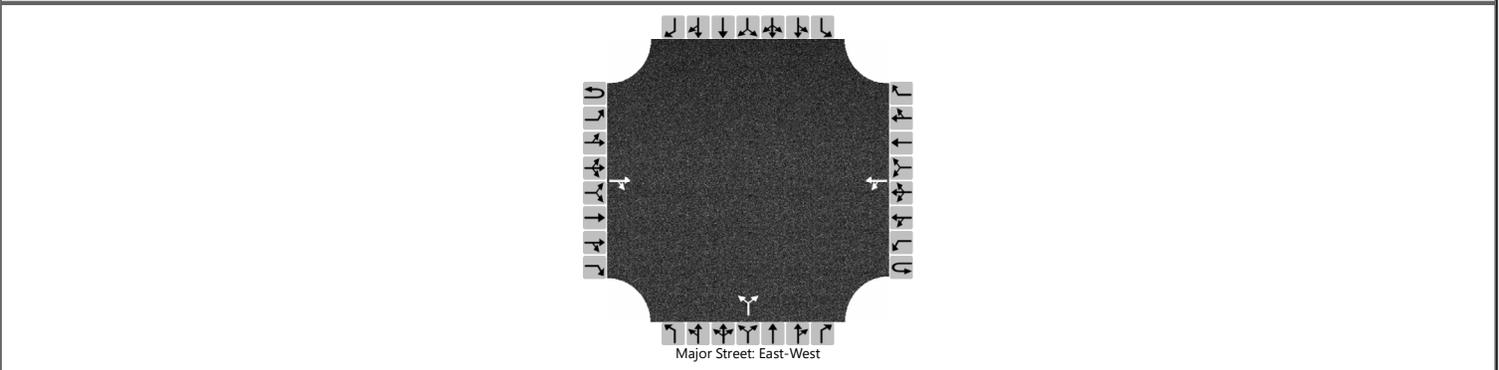
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						67						204				
Capacity, c (veh/h)						1395						885				
v/c Ratio						0.05						0.23				
95% Queue Length, Q ₉₅ (veh)						0.2						0.9				
95% Queue Length, Q ₉₅ (ft)						5.3						23.4				
Control Delay (s/veh)						7.7	0.4					10.3				
Level of Service (LOS)						A	A					B				
Approach Delay (s/veh)						4.1					10.3					
Approach LOS						A					B					

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	3. Ruritan Lake Rd (SR 619) at Branch Rd (SR...				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Ruritan Lake Rd (SR 619)				
Analysis Year	2028	North/South Street	Branch Rd (SR 761)				
Time Analyzed	2028 Background AM	Peak Hour Factor	0.75				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	2028 Background AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			45	0		22	22			0		51				
Percent Heavy Vehicles (%)						0				0		6				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.10					6.40		6.26			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.20					3.50		3.35			

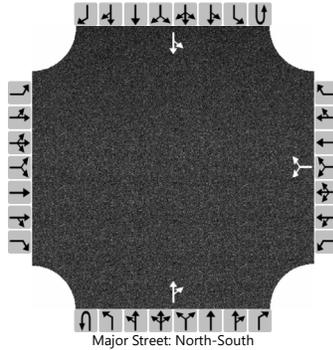
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						29						68				
Capacity, c (veh/h)						1556						994				
v/c Ratio						0.02						0.07				
95% Queue Length, Q ₉₅ (veh)						0.1						0.2				
95% Queue Length, Q ₉₅ (ft)						2.5						5.2				
Control Delay (s/veh)						7.4	0.1					8.9				
Level of Service (LOS)						A	A					A				
Approach Delay (s/veh)					3.7				8.9							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	4. Branch Rd (SR 761) at Rolling Rd (SR 620)		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Rolling Rd (SR 620)		
Analysis Year	2028			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2028 Background AM			Peak Hour Factor	0.83		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	2028 Background AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						18		23			107	24		10	15	
Percent Heavy Vehicles (%)						7		0						10		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

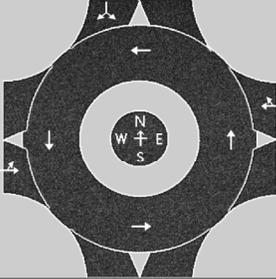
Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.47		6.20							4.20		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.56		3.30							2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						49									12		
Capacity, c (veh/h)						850									1374		
v/c Ratio						0.06									0.01		
95% Queue Length, Q ₉₅ (veh)						0.2									0.0		
95% Queue Length, Q ₉₅ (ft)						5.1									0.0		
Control Delay (s/veh)						9.5									7.6	0.1	
Level of Service (LOS)						A									A	A	
Approach Delay (s/veh)					9.5								3.1				
Approach LOS					A								A				

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2028				Analysis Time Period, hrs	0.25		
Time Analyzed	2028 Background AM				Peak Hour Factor	0.83		
Project Description	2028 Background AM				Jurisdiction	VDOT		

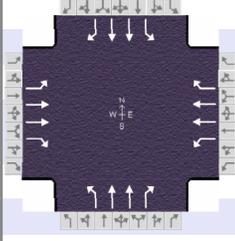
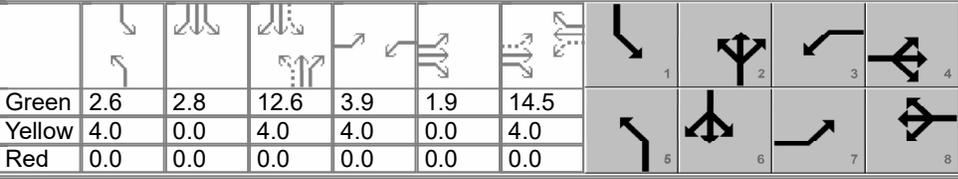
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT				TR								LR			
Volume (V), veh/h	1	300	364		2		176	160					0	109		205
Percent Heavy Vehicles, %	0	8	2		50		6	6					0	5		7
Flow Rate (v _{PCE}), pc/h	1	390	447		4		225	204					0	138		264
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763						4.9763	
Follow-Up Headway, s		2.6087			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h		838			433						402	
Entry Volume, veh/h		800			407						378	
Circulating Flow (v _c), pc/h	142			391			980			230		
Exiting Flow (v _{ex}), pc/h	589			490			594			0		
Capacity (c _{PCE}), pc/h		1194			926						1091	
Capacity (c), veh/h		1140			871						1027	
v/c Ratio (x)		0.70			0.47						0.37	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Lane Control Delay (d), s/veh		13.7			10.0						7.4	
Lane LOS		B			B						A	
95% Queue Length, Q ₉₅ (veh)		6.2			2.5						1.7	
95% Queue Length, Q ₉₅ (ft)		155.0			65.5						44.6	
Approach Delay, s/veh LOS	13.7		B	10.0		B				7.4		A
Intersection Delay, s/veh LOS	11.3						B					

HCS Signalized Intersection Results Summary

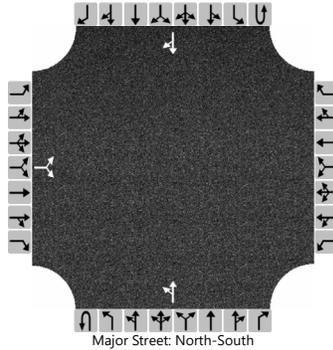
General Information					Intersection Information										
Agency	TRC				Duration, h	0.250									
Analyst	Dorin Papuc		Analysis Date	12/29/2025		Area Type	Other								
Jurisdiction	VDOT		Time Period	2028 Background AM		PHF	0.90								
Urban Street	James Madison Highwa...		Analysis Year	2028		Analysis Period	1 > 7:00								
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...											
Project Description	2028 Background AM														
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				160	60	36	62	93	312	34	507	65	136	278	201
Signal Information															
Cycle, s	54.2	Reference Phase	2	Green	2.6	2.8	12.6	3.9	1.9	14.5					
Offset, s	0	Reference Point	End	Yellow	4.0	0.0	4.0	4.0	0.0	4.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Red	0.0	0.0	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On												
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				7	4	3	8	5	2	1	6				
Case Number				1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0				
Phase Duration, s				9.8	20.3	7.9	18.5	6.6	16.6	9.4	19.4				
Change Period, (Y+R _c), s				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Allow Headway (MAH), s				3.0	3.2	3.0	3.2	3.0	3.0	3.0	3.0				
Queue Clearance Time (g _s), s				5.9	3.0	3.5	13.3	2.9	9.9	5.4	8.7				
Green Extension Time (g _e), s				0.2	1.2	0.1	1.1	0.0	2.6	0.2	2.6				
Phase Call Probability				0.93	1.00	0.65	1.00	1.00	1.00	0.90	1.00				
Max Out Probability				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h				178	67	40	69	103	347	38	563	72	151	309	223
Adjusted Saturation Flow Rate (s), veh/h/ln				1711	1527	1535	1753	1668	1572	1668	1766	1522	1753	1766	1522
Queue Service Time (g _s), s				3.9	0.8	1.0	1.5	1.3	11.3	0.9	7.9	2.1	3.4	3.7	6.7
Cycle Queue Clearance Time (g _c), s				3.9	0.8	1.0	1.5	1.3	11.3	0.9	7.9	2.1	3.4	3.7	6.7
Green Ratio (g/C)				0.37	0.30	0.30	0.34	0.27	0.27	0.28	0.23	0.23	0.35	0.28	0.28
Capacity (c), veh/h				621	922	463	591	890	420	393	821	354	380	1001	431
Volume-to-Capacity Ratio (X)				0.286	0.072	0.086	0.117	0.116	0.826	0.096	0.686	0.204	0.398	0.308	0.518
Back of Queue (Q), ft/ln (95 th percentile)				56	12	14	22	20	162	14	126	29	49	57	92
Back of Queue (Q), veh/ln (95 th percentile)				2.1	0.4	0.5	0.8	0.7	6.3	0.5	4.9	1.1	1.9	2.2	3.5
Queue Storage Ratio (RQ) (95 th percentile)				0.31	0.00	0.02	0.12	0.00	0.86	0.07	0.00	0.15	0.25	0.00	0.44
Uniform Delay (d ₁), s/veh				11.9	13.5	13.6	12.4	15.1	18.7	14.5	19.1	16.8	13.6	15.3	16.4
Incremental Delay (d ₂), s/veh				0.1	0.0	0.0	0.0	0.0	1.6	0.0	0.4	0.1	0.3	0.1	0.4
Initial Queue Delay (d ₃), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh				12.0	13.6	13.6	12.4	15.1	20.3	14.5	19.4	16.9	13.8	15.4	16.7
Level of Service (LOS)				B	B	B	B	B	C	B	B	B	B	B	B
Approach Delay, s/veh / LOS				12.6	B		18.2	B		18.9	B		15.5	B	
Intersection Delay, s/veh / LOS				16.8						B					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.41	B		2.42	B		2.42	B		2.42	B	
Bicycle LOS Score / LOS				0.72	A		0.92	A		1.04	A		1.05	A	

2028 Background Traffic PM

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	1. Thomas Jefferson Pkwy (SR 53) at Ruritan...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2028			North/South Street	Thomas Jefferson Pkwy (SR 53)		
Time Analyzed	2028 Background PM			Peak Hour Factor	0.89		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	2028 Background PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		163		45						68	298				276	248
Percent Heavy Vehicles (%)		0		7						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.27						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.36						2.22						

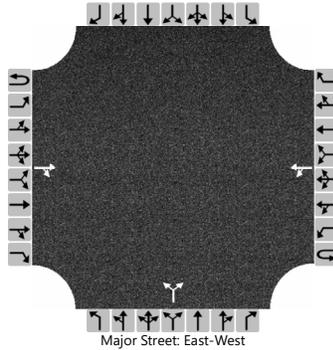
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			234							76						
Capacity, c (veh/h)			304							987						
v/c Ratio			0.77							0.08						
95% Queue Length, Q ₉₅ (veh)			5.9							0.3						
95% Queue Length, Q ₉₅ (ft)			149.3							7.6						
Control Delay (s/veh)			47.1							9.0	0.9					
Level of Service (LOS)			E							A	A					
Approach Delay (s/veh)		47.1								2.4						
Approach LOS		E								A						

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	2. Ruritan Lake Rd (SR 619) at Sclaters Ford R...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2028			North/South Street	Sclaters Ford Rd (SR 660)		
Time Analyzed	2028 Background PM			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2028 Background PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			102	7		195	137			3		111				
Percent Heavy Vehicles (%)						1				0		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.11					6.40		6.22			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.21					3.50		3.32			

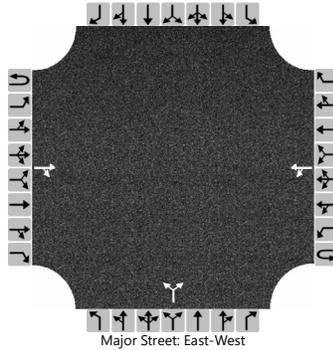
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						217						127				
Capacity, c (veh/h)						1473						894				
v/c Ratio						0.15						0.14				
95% Queue Length, Q ₉₅ (veh)						0.5						0.5				
95% Queue Length, Q ₉₅ (ft)						12.6						12.7				
Control Delay (s/veh)						7.9	1.3					9.7				
Level of Service (LOS)						A	A					A				
Approach Delay (s/veh)					5.1				9.7							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	3. Ruritan Lake Rd (SR 619) at Branch Rd (SR...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2028			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2028 Background PM			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2028 Background PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			39	3		40	54			1		33				
Percent Heavy Vehicles (%)						0				0		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.10					6.40		6.23			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.20					3.50		3.33			

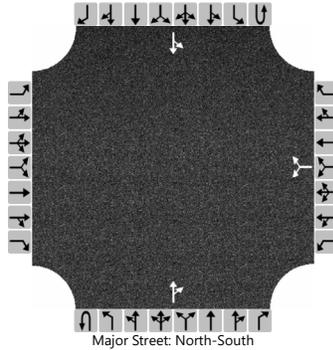
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						44						38				
Capacity, c (veh/h)						1574						1013				
v/c Ratio						0.03						0.04				
95% Queue Length, Q ₉₅ (veh)						0.1						0.1				
95% Queue Length, Q ₉₅ (ft)						2.5						2.6				
Control Delay (s/veh)						7.4	0.2					8.7				
Level of Service (LOS)						A	A					A				
Approach Delay (s/veh)					3.3				8.7							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	4. Branch Rd (SR 761) at Rolling Rd (SR 620)		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Rolling Rd (SR 620)		
Analysis Year	2028			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2028 Background PM			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	2028 Background PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						32		7			39	14		21	113	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

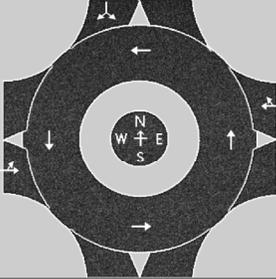
Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						42									23		
Capacity, c (veh/h)						799									1560		
v/c Ratio						0.05									0.01		
95% Queue Length, Q ₉₅ (veh)						0.2									0.0		
95% Queue Length, Q ₉₅ (ft)						5.0									0.0		
Control Delay (s/veh)						9.8									7.3	0.1	
Level of Service (LOS)						A									A	A	
Approach Delay (s/veh)						9.8								1.2			
Approach LOS						A								A			

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2028				Analysis Time Period, hrs	0.25		
Time Analyzed	2028 Background PM				Peak Hour Factor	0.97		
Project Description	2028 Background PM				Jurisdiction	VDOT		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT				TR								LR			
Volume (V), veh/h	1	107	206		3		301	167					0	174		164
Percent Heavy Vehicles, %	0	0	1		0		3	1					0	1		4
Flow Rate (v _{PCE}), pc/h	1	110	214		3		320	174					0	181		176
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763						4.9763	
Follow-Up Headway, s		2.6087			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h		325			497						357	
Entry Volume, veh/h		323			486						348	
Circulating Flow (v _c), pc/h	184			111			509			324		
Exiting Flow (v _{ex}), pc/h	398			497			284			0		
Capacity (C _{PCE}), pc/h		1144			1232						992	
Capacity (c), veh/h		1136			1205						968	
v/c Ratio (x)		0.28			0.40						0.36	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Lane Control Delay (d), s/veh		5.8			7.0						7.6	
Lane LOS		A			A						A	
95% Queue Length, Q ₉₅ (veh)		1.2			2.0						1.7	
95% Queue Length, Q ₉₅ (ft)		30.0			50.9						43.3	
Approach Delay, s/veh LOS	5.8		A	7.0		A				7.6		A
Intersection Delay, s/veh LOS	6.9						A					

HCS Signalized Intersection Results Summary

General Information					Intersection Information													
Agency	TRC				Duration, h	0.250												
Analyst	Dorin Papuc		Analysis Date	12/29/2025	Area Type	Other												
Jurisdiction	VDOT		Time Period	2028 Background PM	PHF	0.96												
Urban Street	James Madison Highwa...		Analysis Year	2028	Analysis Period	1 > 4:30												
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...														
Project Description	2028 Background PM																	
Demand Information				EB			WB			NB			SB					
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R			
Demand (v), veh/h				281	108	46	70	68	212	32	441	59	304	537	227			
Signal Information																		
Cycle, s	57.3	Reference Phase	2															
Offset, s	0	Reference Point	End															
Uncoordinated	Yes	Simult. Gap E/W	On	Green	2.5	3.3	11.8	4.1	1.2	10.5								
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	4.0								
				Red	0.0	0.0	0.0	0.0	0.0	0.0								
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT							
Assigned Phase				7	4	3	8	5	2	1	6							
Case Number				1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0							
Phase Duration, s				13.3	19.6	8.1	14.5	6.5	15.8	13.8	23.0							
Change Period, (Y+R _c), s				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0							
Max Allow Headway (MAH), s				3.0	3.1	3.0	3.1	3.0	3.0	3.0	3.0							
Queue Clearance Time (g _s), s				8.9	3.4	4.0	9.5	2.9	8.7	9.3	9.1							
Green Extension Time (g _e), s				0.4	0.9	0.1	0.9	0.0	3.0	0.4	3.0							
Phase Call Probability				0.99	1.00	0.69	1.00	1.00	1.00	0.99	1.00							
Max Out Probability				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
Movement Group Results				EB			WB			NB			SB					
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R			
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16			
Adjusted Flow Rate (v), veh/h				293	113	48	73	71	221	33	459	61	317	559	236			
Adjusted Saturation Flow Rate (s), veh/h/ln				1795	1724	1560	1654	1766	1598	1711	1795	1585	1781	1795	1572			
Queue Service Time (g _s), s				6.9	1.4	1.3	2.0	1.0	7.5	0.9	6.7	1.8	7.3	7.1	6.8			
Cycle Queue Clearance Time (g _c), s				6.9	1.4	1.3	2.0	1.0	7.5	0.9	6.7	1.8	7.3	7.1	6.8			
Green Ratio (g/C)				0.38	0.27	0.27	0.26	0.18	0.18	0.25	0.21	0.21	0.41	0.33	0.33			
Capacity (c), veh/h				643	943	426	463	647	293	344	739	326	512	1194	523			
Volume-to-Capacity Ratio (X)				0.456	0.119	0.112	0.158	0.109	0.755	0.097	0.622	0.188	0.618	0.469	0.452			
Back of Queue (Q), ft/ln (95 th percentile)				102	22	19	31	16	115	14	110	27	106	107	92			
Back of Queue (Q), veh/ln (95 th percentile)				4.0	0.8	0.7	1.2	0.6	4.6	0.5	4.4	1.1	4.2	4.3	3.6			
Queue Storage Ratio (RQ) (95 th percentile)				0.56	0.00	0.03	0.17	0.00	0.61	0.07	0.00	0.14	0.53	0.00	0.44			
Uniform Delay (d ₁), s/veh				13.3	15.7	15.7	16.7	19.6	22.3	16.6	20.8	18.9	13.1	15.2	15.1			
Incremental Delay (d ₂), s/veh				0.2	0.0	0.0	0.1	0.0	1.5	0.0	0.3	0.1	0.5	0.1	0.2			
Initial Queue Delay (d ₃), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Control Delay (d), s/veh				13.5	15.7	15.7	16.7	19.6	23.8	16.6	21.1	19.0	13.6	15.3	15.3			
Level of Service (LOS)				B	B	B	B	B	C	B	C	B	B	B	B			
Approach Delay, s/veh / LOS				14.3	B		21.6	C		20.6	C		14.8	B				
Intersection Delay, s/veh / LOS				17.0						B								
Multimodal Results				EB			WB			NB			SB					
Pedestrian LOS Score / LOS				2.42	B		2.43	B		2.43	B		2.41	B				
Bicycle LOS Score / LOS				0.86	A		0.79	A		0.94	A		1.41	A				

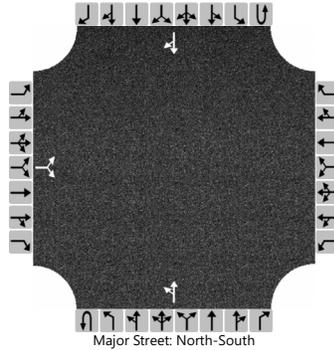
2032 Background Traffic Analyses

2032 Background Traffic AM

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	1. Thomas Jefferson Pkwy (SR 53) at Ruritan...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Thomas Jefferson Pkwy (SR 53)		
Time Analyzed	2032 Background AM			Peak Hour Factor	0.94		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	2032 Background AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		229		101						48	389				418	68
Percent Heavy Vehicles (%)		4		3						5						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.44		6.23						4.15						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.54		3.33						2.25						

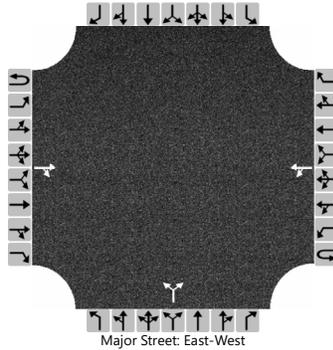
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			351							51						
Capacity, c (veh/h)			304							1034						
v/c Ratio			1.15							0.05						
95% Queue Length, Q ₉₅ (veh)			14.8							0.2						
95% Queue Length, Q ₉₅ (ft)			380.9							5.2						
Control Delay (s/veh)			137.3							8.7	0.6					
Level of Service (LOS)			F							A	A					
Approach Delay (s/veh)	137.3								1.4							
Approach LOS	F								A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	2. Ruritan Lake Rd (SR 619) at Sclaters Ford R...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Sclaters Ford Rd (SR 660)		
Time Analyzed	2032 Background AM			Peak Hour Factor	0.85		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Background AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			137	6		65	62			4		191				
Percent Heavy Vehicles (%)						8				0		5				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.18					6.40		6.25			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.27					3.50		3.35			

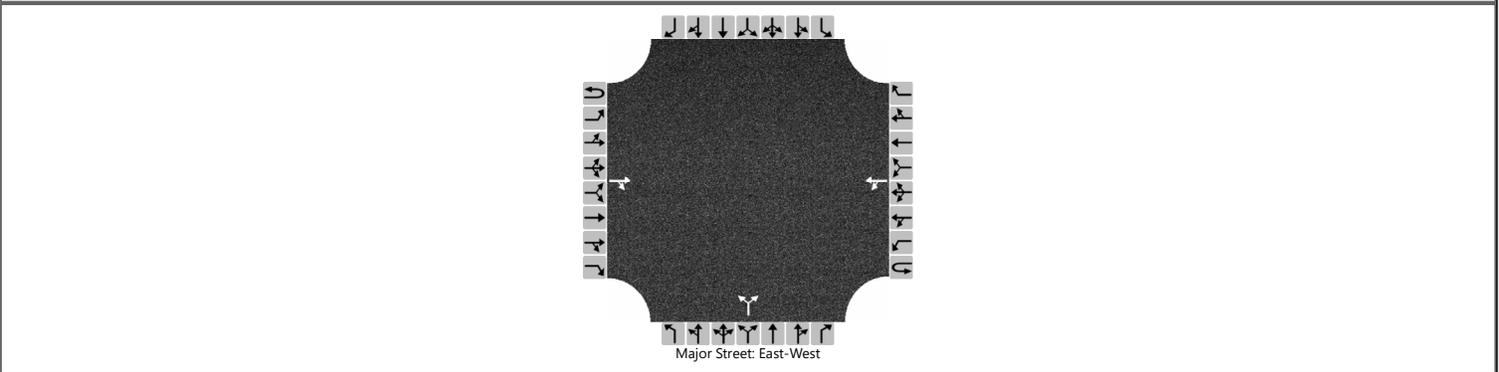
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						76						229				
Capacity, c (veh/h)						1374						863				
v/c Ratio						0.06						0.27				
95% Queue Length, Q ₉₅ (veh)						0.2						1.1				
95% Queue Length, Q ₉₅ (ft)						5.3						28.6				
Control Delay (s/veh)						7.8	0.5					10.7				
Level of Service (LOS)						A	A					B				
Approach Delay (s/veh)					4.2				10.7							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	3. Ruritan Lake Rd (SR 619) at Branch Rd (SR...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2032 Background AM			Peak Hour Factor	0.75		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Background AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			50	0		25	25			0		56				
Percent Heavy Vehicles (%)						0				0		6				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.10					6.40		6.26			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.20					3.50		3.35			

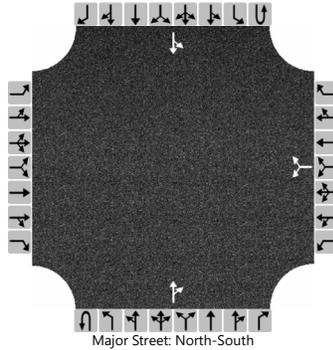
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						33						75				
Capacity, c (veh/h)						1548						986				
v/c Ratio						0.02						0.08				
95% Queue Length, Q ₉₅ (veh)						0.1						0.2				
95% Queue Length, Q ₉₅ (ft)						2.5						5.2				
Control Delay (s/veh)						7.4	0.2					9.0				
Level of Service (LOS)						A	A					A				
Approach Delay (s/veh)					3.8				9.0							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	4. Branch Rd (SR 761) at Rolling Rd (SR 620)				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Rolling Rd (SR 620)				
Analysis Year	2032	North/South Street	Branch Rd (SR 761)				
Time Analyzed	2032 Background AM	Peak Hour Factor	0.83				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2032 Background AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	1	0		0	1	0
Configuration							LR					TR			LT	
Volume (veh/h)						22		28			113	25			11	15
Percent Heavy Vehicles (%)						7		0							10	
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

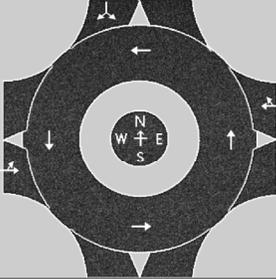
Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.47		6.20							4.20	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.56		3.30							2.29	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						60									13	
Capacity, c (veh/h)						840									1365	
v/c Ratio						0.07									0.01	
95% Queue Length, Q ₉₅ (veh)						0.2									0.0	
95% Queue Length, Q ₉₅ (ft)						5.1									0.0	
Control Delay (s/veh)						9.6									7.7	0.1
Level of Service (LOS)						A									A	A
Approach Delay (s/veh)					9.6								3.3			
Approach LOS					A								A			

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2032				Analysis Time Period, hrs	0.25		
Time Analyzed	2032 Background AM				Peak Hour Factor	0.83		
Project Description	2032 Background AM				Jurisdiction	VDOT		

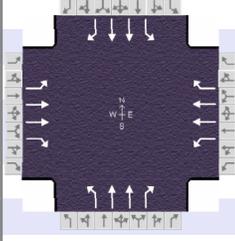
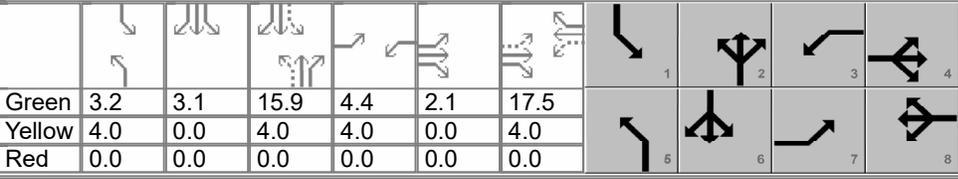
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT				TR				LR							
Volume (V), veh/h	1	313	380		2		185	167					0	121		228
Percent Heavy Vehicles, %	0	8	2		50		6	6					0	5		7
Flow Rate (v _{PCE}), pc/h	1	407	467		4		236	213					0	153		294
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763						4.9763	
Follow-Up Headway, s		2.6087			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass									
Entry Flow (v _e), pc/h		875			453						447	
Entry Volume, veh/h		836			426						420	
Circulating Flow (v _c), pc/h	157			408			1032			241		
Exiting Flow (v _{ex}), pc/h	624			531			620			0		
Capacity (c _{PCE}), pc/h		1176			910						1079	
Capacity (c), veh/h		1123			856						1015	
v/c Ratio (x)		0.74			0.50						0.41	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass									
Lane Control Delay (d), s/veh		15.6			10.8						8.1	
Lane LOS		C			B						A	
95% Queue Length, Q ₉₅ (veh)		7.3			2.8						2.1	
95% Queue Length, Q ₉₅ (ft)		182.5			73.4						55.1	
Approach Delay, s/veh LOS	15.6		C	10.8		B				8.1		A
Intersection Delay, s/veh LOS	12.5						B					

HCS Signalized Intersection Results Summary

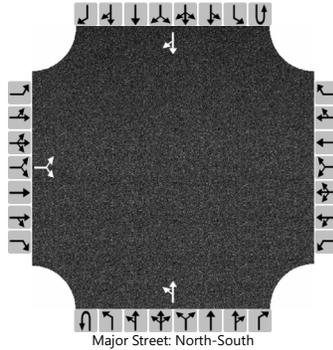
General Information					Intersection Information											
Agency	TRC				Duration, h	0.250										
Analyst	Dorin Papuc		Analysis Date	12/29/2025	Area Type	Other										
Jurisdiction	VDOT		Time Period	2032 Background AM	PHF	0.90										
Urban Street	James Madison Highwa...		Analysis Year	2032	Analysis Period	1 > 7:00										
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...												
Project Description	2032 Background AM															
Demand Information					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					164	61	36	68	102	340	40	592	76	159	325	235
Signal Information																
Cycle, s	62.2	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	Yes	Simult. Gap E/W	On													
Force Mode	Fixed	Simult. Gap N/S	On													
		Green	3.2	3.1	15.9	4.4	2.1	17.5								
		Yellow	4.0	0.0	4.0	4.0	0.0	4.0								
		Red	0.0	0.0	0.0	0.0	0.0	0.0								
Timer Results					EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					7	4	3	8	5	2	1	6				
Case Number					1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0				
Phase Duration, s					10.5	23.6	8.4	21.5	7.2	19.9	10.3	23.0				
Change Period, (Y+R _c), s					4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Allow Headway (MAH), s					3.0	3.2	3.0	3.2	3.0	3.0	3.0	3.0				
Queue Clearance Time (g _s), s					6.6	3.1	3.8	16.2	3.2	12.6	6.4	11.0				
Green Extension Time (g _e), s					0.2	1.3	0.1	1.2	0.0	3.2	0.2	3.2				
Phase Call Probability					0.96	1.00	0.73	1.00	1.00	1.00	0.95	1.00				
Max Out Probability					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Movement Group Results					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h					182	68	40	76	113	378	44	658	84	177	361	261
Adjusted Saturation Flow Rate (s), veh/h/ln					1711	1527	1535	1753	1668	1572	1668	1766	1522	1753	1766	1522
Queue Service Time (g _s), s					4.6	1.0	1.1	1.8	1.6	14.2	1.2	10.6	2.7	4.4	4.9	9.0
Cycle Queue Clearance Time (g _c), s					4.6	1.0	1.1	1.8	1.6	14.2	1.2	10.6	2.7	4.4	4.9	9.0
Green Ratio (g/C)					0.39	0.31	0.31	0.35	0.28	0.28	0.31	0.26	0.26	0.38	0.31	0.31
Capacity (c), veh/h					613	963	484	596	938	442	390	903	389	359	1079	465
Volume-to-Capacity Ratio (X)					0.297	0.070	0.083	0.127	0.121	0.855	0.114	0.728	0.217	0.492	0.335	0.562
Back of Queue (Q), ft/ln (95 th percentile)					69	15	16	28	26	210	19	176	40	68	79	129
Back of Queue (Q), veh/ln (95 th percentile)					2.6	0.5	0.6	1.1	0.9	8.2	0.7	6.9	1.5	2.6	3.1	4.9
Queue Storage Ratio (RQ) (95 th percentile)					0.38	0.00	0.03	0.16	0.00	1.10	0.10	0.00	0.20	0.34	0.00	0.62
Uniform Delay (d ₁), s/veh					13.1	15.0	15.0	13.7	16.7	21.2	15.5	21.3	18.3	15.0	16.8	18.2
Incremental Delay (d ₂), s/veh					0.1	0.0	0.0	0.0	0.0	1.9	0.0	0.4	0.1	0.4	0.1	0.4
Initial Queue Delay (d ₃), s/veh					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh					13.2	15.0	15.0	13.7	16.7	23.1	15.5	21.7	18.4	15.4	16.9	18.6
Level of Service (LOS)					B	B	B	B	B	C	B	C	B	B	B	B
Approach Delay, s/veh / LOS					13.9	B		20.6	C		21.0	C		17.1	B	
Intersection Delay, s/veh / LOS					18.8						B					
Multimodal Results					EB			WB			NB			SB		
Pedestrian LOS Score / LOS					2.42	B		2.42	B		2.42	B		2.42	B	
Bicycle LOS Score / LOS					0.73	A		0.96	A		1.14	A		1.15	A	

2032 Background Traffic PM

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	1. Thomas Jefferson Pkwy (SR 53) at Ruritan...				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Ruritan Lake Rd (SR 619)				
Analysis Year	2032	North/South Street	Thomas Jefferson Pkwy (SR 53)				
Time Analyzed	2032 Background PM	Peak Hour Factor	0.89				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2032 Background PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound					
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		
Movement																		
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6		
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0		
Configuration			LR							LT						TR		
Volume (veh/h)		184		51						75	331					289	260	
Percent Heavy Vehicles (%)		0		7						2								
Proportion Time Blocked																		
Percent Grade (%)	0																	
Right Turn Channelized																		
Median Type Storage	Undivided																	

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1							
Critical Headway (sec)		6.40		6.27						4.12							
Base Follow-Up Headway (sec)		3.5		3.3						2.2							
Follow-Up Headway (sec)		3.50		3.36						2.22							

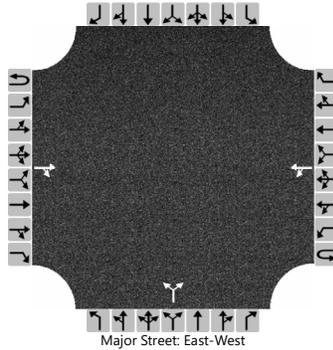
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			264							84							
Capacity, c (veh/h)			273							963							
v/c Ratio			0.97							0.09							
95% Queue Length, Q ₉₅ (veh)			9.4							0.3							
95% Queue Length, Q ₉₅ (ft)			237.9							7.6							
Control Delay (s/veh)			86.7							9.1	1.0						
Level of Service (LOS)			F							A	A						
Approach Delay (s/veh)	86.7								2.5								
Approach LOS	F								A								

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	2. Ruritan Lake Rd (SR 619) at Sclaters Ford R...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Sclaters Ford Rd (SR 660)		
Time Analyzed	2032 Background PM			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Background PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			115	7		220	154			4		125				
Percent Heavy Vehicles (%)						1				0		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.11					6.40		6.22			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.21					3.50		3.32			

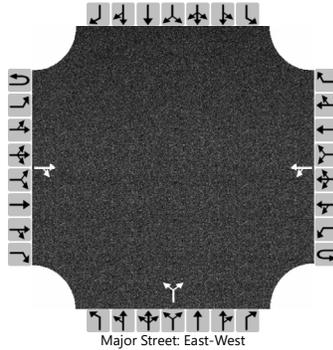
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						244						143				
Capacity, c (veh/h)						1455						861				
v/c Ratio						0.17						0.17				
95% Queue Length, Q ₉₅ (veh)						0.6						0.6				
95% Queue Length, Q ₉₅ (ft)						15.1						15.2				
Control Delay (s/veh)						8.0	1.5					10.0				
Level of Service (LOS)						A	A					B				
Approach Delay (s/veh)					5.3				10.0							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	3. Ruritan Lake Rd (SR 619) at Branch Rd (SR...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2032 Background PM			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Background PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration				TR		LT					LR					
Volume (veh/h)			44	4		45	61			1		36				
Percent Heavy Vehicles (%)						0				0		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.33				

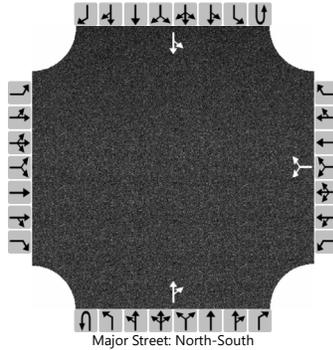
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						50					41					
Capacity, c (veh/h)						1565					1004					
v/c Ratio						0.03					0.04					
95% Queue Length, Q ₉₅ (veh)						0.1					0.1					
95% Queue Length, Q ₉₅ (ft)						2.5					2.6					
Control Delay (s/veh)						7.4	0.2				8.7					
Level of Service (LOS)						A	A				A					
Approach Delay (s/veh)					3.3				8.7							
Approach LOS					A				A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Dorin Papuc	Intersection	4. Branch Rd (SR 761) at Rolling Rd (SR 620)
Agency/Co.	TRC	Jurisdiction	VDOT
Date Performed	12/29/2025	East/West Street	Rolling Rd (SR 620)
Analysis Year	2032	North/South Street	Branch Rd (SR 761)
Time Analyzed	2032 Background PM	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	2032 Background PM		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						40		9			41	14		22	119	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

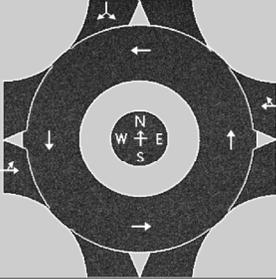
Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						53									24		
Capacity, c (veh/h)						789									1557		
v/c Ratio						0.07									0.02		
95% Queue Length, Q ₉₅ (veh)						0.2									0.0		
95% Queue Length, Q ₉₅ (ft)						5.0									0.0		
Control Delay (s/veh)						9.9									7.3	0.1	
Level of Service (LOS)						A									A	A	
Approach Delay (s/veh)					9.9								1.2				
Approach LOS					A								A				

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2032				Analysis Time Period, hrs	0.25		
Time Analyzed	2032 Background PM				Peak Hour Factor	0.97		
Project Description	2032 Background PM				Jurisdiction	VDOT		

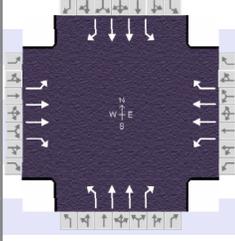
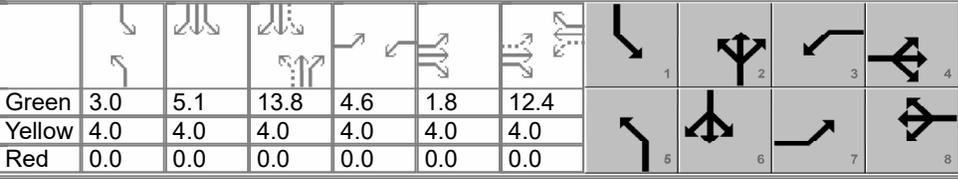
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT				TR								LR			
Volume (V), veh/h	1	112	215		3		315	175					0	194		182
Percent Heavy Vehicles, %	0	0	1		0		3	1					0	1		4
Flow Rate (v _{PCE}), pc/h	1	115	224		3		334	182					0	202		195
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763						4.9763	
Follow-Up Headway, s		2.6087			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h		340			519						397	
Entry Volume, veh/h		338			507						388	
Circulating Flow (v _c), pc/h	205			116			545			338		
Exiting Flow (v _{ex}), pc/h	429			530			297			0		
Capacity (C _{PCE}), pc/h		1120			1226						978	
Capacity (c), veh/h		1112			1199						954	
v/c Ratio (x)		0.30			0.42						0.41	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Lane Control Delay (d), s/veh		6.2			7.3						8.4	
Lane LOS		A			A						A	
95% Queue Length, Q ₉₅ (veh)		1.3			2.1						2.0	
95% Queue Length, Q ₉₅ (ft)		32.5			53.5						51.0	
Approach Delay, s/veh LOS	6.2	A		7.3	A					8.4	A	
Intersection Delay, s/veh LOS	7.3						A					

HCS Signalized Intersection Results Summary

General Information					Intersection Information										
Agency	TRC				Duration, h	0.250									
Analyst	Dorin Papuc		Analysis Date	12/29/2025		Area Type	Other								
Jurisdiction	VDOT		Time Period	2032 Background PM		PHF	0.96								
Urban Street	James Madison Highwa...		Analysis Year	2032		Analysis Period	1 > 4:30								
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...											
Project Description	2032 Background PM														
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				287	110	47	76	74	232	37	514	69	354	327	265
Signal Information															
Cycle, s	64.8	Reference Phase	2	Green	3.0	5.1	13.8	4.6	1.8	12.4					
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	4.0	4.0	4.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Red	0.0	0.0	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On												
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				7	4	3	8	5	2	1	6				
Case Number				1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0				
Phase Duration, s				14.4	22.2	8.6	16.4	7.0	17.8	16.2	27.0				
Change Period, (Y+R _c), s				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Allow Headway (MAH), s				3.0	3.1	3.0	3.1	3.0	3.0	3.0	3.0				
Queue Clearance Time (g _s), s				10.0	3.6	4.4	11.4	3.1	11.0	11.6	10.9				
Green Extension Time (g _e), s				0.4	1.0	0.1	0.9	0.0	2.8	0.5	2.8				
Phase Call Probability				1.00	1.00	0.76	1.00	1.00	1.00	1.00	1.00				
Max Out Probability				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00			
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h				299	115	49	79	77	242	39	535	72	369	341	276
Adjusted Saturation Flow Rate (s), veh/h/ln				1795	1724	1560	1654	1766	1598	1711	1795	1585	1781	1795	1572
Queue Service Time (g _s), s				8.0	1.6	1.5	2.4	1.2	9.4	1.1	9.0	2.4	9.6	4.4	8.9
Cycle Queue Clearance Time (g _c), s				8.0	1.6	1.5	2.4	1.2	9.4	1.1	9.0	2.4	9.6	4.4	8.9
Green Ratio (g/C)				0.38	0.28	0.28	0.26	0.19	0.19	0.26	0.21	0.21	0.43	0.35	0.35
Capacity (c), veh/h				634	972	440	455	677	306	404	766	338	511	1273	558
Volume-to-Capacity Ratio (X)				0.472	0.118	0.111	0.174	0.114	0.790	0.095	0.699	0.213	0.721	0.268	0.495
Back of Queue (Q), ft/ln (95 th percentile)				124	26	22	40	20	149	19	154	37	148	69	126
Back of Queue (Q), veh/ln (95 th percentile)				4.9	1.0	0.9	1.5	0.8	5.9	0.7	6.1	1.5	5.8	2.7	4.9
Queue Storage Ratio (RQ) (95 th percentile)				0.69	0.00	0.04	0.22	0.00	0.78	0.10	0.00	0.19	0.74	0.00	0.60
Uniform Delay (d ₁), s/veh				14.9	17.3	17.3	18.6	21.7	25.0	18.2	23.7	21.1	14.7	15.0	16.4
Incremental Delay (d ₂), s/veh				0.2	0.0	0.0	0.1	0.0	1.7	0.0	0.4	0.1	0.9	0.0	0.3
Initial Queue Delay (d ₃), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh				15.1	17.4	17.4	18.7	21.8	26.8	18.3	24.1	21.2	15.6	15.0	16.7
Level of Service (LOS)				B	B	B	B	C	C	B	C	C	B	B	B
Approach Delay, s/veh / LOS				15.9	B		24.2	C		23.4	C		15.7	B	
Intersection Delay, s/veh / LOS				19.1						B					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.42	B		2.43	B		2.43	B		2.41	B	
Bicycle LOS Score / LOS				0.87	A		0.82	A		1.02	A		1.30	A	

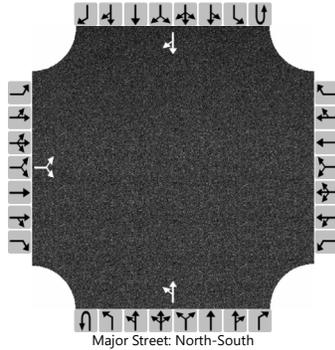
2028 Total Traffic Analyses

2028 Total Traffic AM

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	1. Thomas Jefferson Pkwy (SR 53) at Ruritan...				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Ruritan Lake Rd (SR 619)				
Analysis Year	2028	North/South Street	Thomas Jefferson Pkwy (SR 53)				
Time Analyzed	2028 Total AM	Peak Hour Factor	0.94				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2028 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0		0	1	0		0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		203		89						769	350				400	65
Percent Heavy Vehicles (%)		4		3						5						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.44		6.23						4.15						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.54		3.33						2.25						

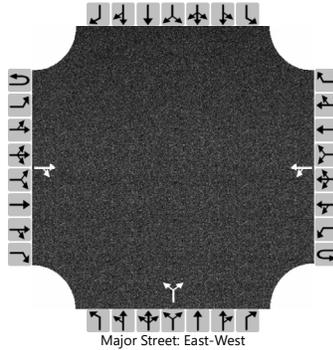
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			311							818						
Capacity, c (veh/h)			1							1054						
v/c Ratio			313.45							0.78						
95% Queue Length, Q ₉₅ (veh)			41.5							8.2						
95% Queue Length, Q ₉₅ (ft)			1068.2							213.2						
Control Delay (s/veh)			147793.8							19.1	18.7					
Level of Service (LOS)			F							C	C					
Approach Delay (s/veh)	147793.8								19.0							
Approach LOS	F								C							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	2. Ruritan Lake Rd (SR 619) at Sclaters Ford R...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2028			North/South Street	Sclaters Ford Rd (SR 660)		
Time Analyzed	2028 Total AM			Peak Hour Factor	0.85		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2028 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			122	6		57	780			3		170				
Percent Heavy Vehicles (%)						8				0		5				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.18					6.40		6.25			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.27					3.50		3.35			

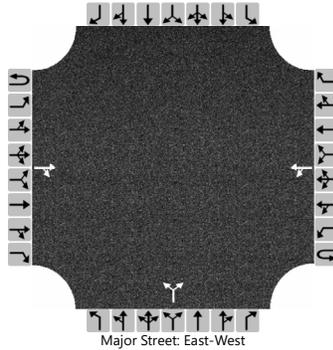
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						67						204				
Capacity, c (veh/h)						1395						837				
v/c Ratio						0.05						0.24				
95% Queue Length, Q ₉₅ (veh)						0.2						1.0				
95% Queue Length, Q ₉₅ (ft)						5.3						26.0				
Control Delay (s/veh)						7.7	0.8					10.7				
Level of Service (LOS)						A	A					B				
Approach Delay (s/veh)					1.2				10.7							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	3. Ruritan Lake Rd (SR 619) at Branch Rd (SR...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2028			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2028 Total AM			Peak Hour Factor	0.75		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2028 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0	
Configuration				TR		LT					LR						
Volume (veh/h)			45	0		747	22			0		51					
Percent Heavy Vehicles (%)						0				0		6					
Proportion Time Blocked																	
Percent Grade (%)										0							
Right Turn Channelized																	
Median Type Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.10					6.40		6.26			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.20					3.50		3.35			

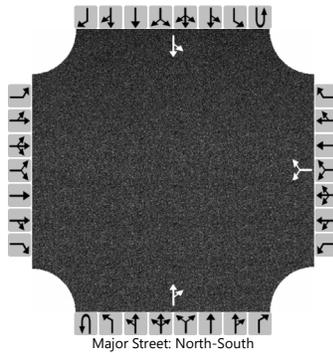
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					996						68					
Capacity, c (veh/h)					1556						994					
v/c Ratio					0.64						0.07					
95% Queue Length, Q ₉₅ (veh)					5.0						0.2					
95% Queue Length, Q ₉₅ (ft)					125.0						5.2					
Control Delay (s/veh)					11.3	7.4					8.9					
Level of Service (LOS)					B	A					A					
Approach Delay (s/veh)					11.2				8.9							
Approach LOS					B				A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	4. Branch Rd (SR 761) at Rolling Rd (SR 620)				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Rolling Rd (SR 620)				
Analysis Year	2028	North/South Street	Branch Rd (SR 761)				
Time Analyzed	2028 Total AM	Peak Hour Factor	0.83				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2028 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	1	0		0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						18		23			107	64		50	15	
Percent Heavy Vehicles (%)						7		0						10		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

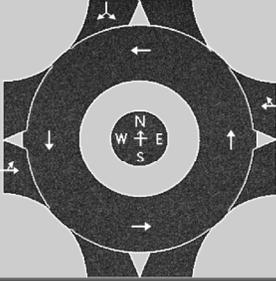
Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.47		6.20						4.20		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.56		3.30						2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						49								60		
Capacity, c (veh/h)						759								1319		
v/c Ratio						0.07								0.05		
95% Queue Length, Q ₉₅ (veh)						0.2								0.1		
95% Queue Length, Q ₉₅ (ft)						5.1								2.7		
Control Delay (s/veh)						10.1								7.9	0.4	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					10.1								6.1			
Approach LOS					B								A			

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2028				Analysis Time Period, hrs	0.25		
Time Analyzed	2028 Total AM				Peak Hour Factor	0.83		
Project Description	2028 Total AM				Jurisdiction	VDOT		

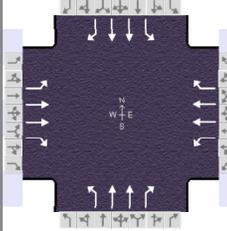
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT				TR				LR							
Volume (V), veh/h	1	300	364		2		176	885					0	109		205
Percent Heavy Vehicles, %	0	8	2		50		6	6					0	5		7
Flow Rate (v _{PCE}), pc/h	1	390	447		4		225	1130					0	138		264
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763						4.9763	
Follow-Up Headway, s		2.6087			2.6087						2.6087	

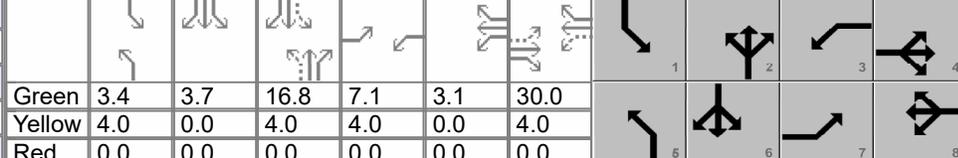
Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h		838			1359						402	
Entry Volume, veh/h		800			1281						378	
Circulating Flow (v _c), pc/h	142			391			980			230		
Exiting Flow (v _{ex}), pc/h	589			490			1520			0		
Capacity (c _{PCE}), pc/h		1194			926						1091	
Capacity (c), veh/h		1140			873						1027	
v/c Ratio (x)		0.70			1.47						0.37	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		13.7			231.7						7.4	
Lane LOS		B			F						A	
95% Queue Length, Q ₉₅ (veh)		6.2			59.1						1.7	
95% Queue Length, Q ₉₅ (ft)		155.0			1548.4						44.6	
Approach Delay, s/veh LOS	13.7		B	231.7		F				7.4		A
Intersection Delay, s/veh LOS	126.3						F					

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	TRC			Duration, h	0.250	
Analyst	Dorin Papuc	Analysis Date	12/29/2025	Area Type	Other	
Jurisdiction	VDOT	Time Period	2028 Total AM	PHF	0.90	
Urban Street	James Madison Highwa...	Analysis Year	2028	Analysis Period	1 > 7:00	
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...		
Project Description	2028 Total AM					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	160	60	519	264	93	312	34	507	65	136	318	201

Signal Information																
Cycle, s	80.0	Reference Phase	2	Green	3.4	3.7	16.8	7.1	3.1	30.0	Yellow	4.0	0.0	4.0	4.0	4.0
Offset, s	0	Reference Point	End	Red	0.0	0.0	0.0	0.0	0.0	0.0						
Uncoordinated	Yes	Simult. Gap E/W	On													
Force Mode	Fixed	Simult. Gap N/S	On													

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	11.1	34.0	14.2	37.1	7.4	20.8	11.1	24.4
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	3.0	3.2	3.0	3.2	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s	7.0	32.0	9.8	15.3	3.4	14.0	7.1	12.2
Green Extension Time (g_e), s	0.2	0.0	0.4	2.4	0.0	2.7	0.2	2.7
Phase Call Probability	0.98	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Max Out Probability	0.00	1.00	0.00	0.03	0.00	0.00	0.00	0.00

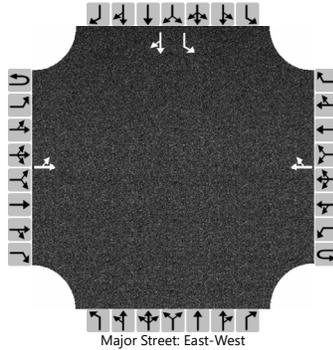
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	178	67	577	293	103	347	38	563	72	151	353	223
Adjusted Saturation Flow Rate (s), veh/h/ln	1711	1527	1535	1753	1668	1572	1668	1766	1522	1753	1766	1522
Queue Service Time (g_s), s	5.0	1.1	30.0	7.8	1.5	13.3	1.4	12.0	3.2	5.1	6.6	10.2
Cycle Queue Clearance Time (g_c), s	5.0	1.1	30.0	7.8	1.5	13.3	1.4	12.0	3.2	5.1	6.6	10.2
Green Ratio (g/C)	0.46	0.38	0.38	0.52	0.41	0.41	0.25	0.21	0.21	0.32	0.26	0.26
Capacity (c), veh/h	700	1145	575	787	1379	650	304	740	319	295	902	389
Volume-to-Capacity Ratio (X)	0.254	0.058	1.002	0.373	0.075	0.533	0.124	0.761	0.226	0.512	0.392	0.575
Back of Queue (Q), ft/ln (95 th percentile)	79	18	579	119	25	197	25	213	51	91	118	164
Back of Queue (Q), veh/ln (95 th percentile)	3.0	0.6	22.1	4.6	0.9	7.7	0.9	8.3	1.9	3.5	4.6	6.2
Queue Storage Ratio (RQ) (95 th percentile)	0.44	0.00	1.05	0.66	0.00	1.04	0.13	0.00	0.25	0.45	0.00	0.78
Uniform Delay (d_1), s/veh	12.9	16.0	25.0	11.3	14.2	17.7	23.1	29.8	26.3	21.7	24.7	26.0
Incremental Delay (d_2), s/veh	0.1	0.0	38.1	0.1	0.0	0.4	0.1	0.6	0.1	0.5	0.1	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	12.9	16.0	63.1	11.4	14.2	18.1	23.1	30.4	26.4	22.3	24.8	26.5
Level of Service (LOS)	B	B	F	B	B	B	C	C	C	C	C	C
Approach Delay, s/veh / LOS	48.4		D	14.9		B	29.5		C	24.8		C
Intersection Delay, s/veh / LOS	29.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.42	B	2.42	B	2.44	B	2.43	B
Bicycle LOS Score / LOS	1.17	A	1.10	A	1.04	A	1.09	A

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	7. Tenaska Operations driveway at Branch Rd...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Branch Rd (SR 761)		
Analysis Year	2028			North/South Street	Tenaska Operations driveway		
Time Analyzed	2028 Background AM			Peak Hour Factor	0.86		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2028 Background AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound						
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R			
Movement	1U	1	2	3	4U	4	5	6					7	8	9		10	11	12
Priority																			
Number of Lanes	0	0	1	0	0	0	1	0			0	0			0		1	1	0
Configuration		LT						TR									L		TR
Volume (veh/h)		80	44				24	725									0	0	0
Percent Heavy Vehicles (%)		0															0	0	0
Proportion Time Blocked																			
Percent Grade (%)																	0		
Right Turn Channelized																			
Median Type Storage	Undivided																		

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1															7.1	6.5	6.2
Critical Headway (sec)		4.10															7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2															3.5	4.0	3.3
Follow-Up Headway (sec)		2.20															3.50	4.00	3.30

Delay, Queue Length, and Level of Service

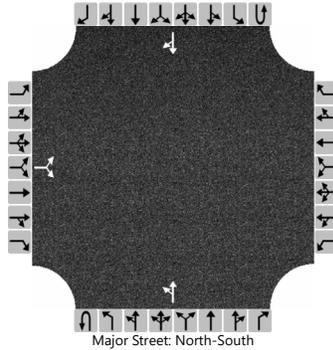
Flow Rate, v (veh/h)		93															0		0
Capacity, c (veh/h)		783															319		0
v/c Ratio		0.12															0.00		
95% Queue Length, Q ₉₅ (veh)		0.4															0.0		
95% Queue Length, Q ₉₅ (ft)		10.0															0.0		
Control Delay (s/veh)		10.2	1.3														16.3		
Level of Service (LOS)		B	A														C		
Approach Delay (s/veh)		7.0																	
Approach LOS		A																	

2028 Total Traffic PM

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	1. Thomas Jefferson Pkwy (SR 53) at Ruritan...				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Ruritan Lake Rd (SR 619)				
Analysis Year	2028	North/South Street	Thomas Jefferson Pkwy (SR 53)				
Time Analyzed	2028 Total PM	Peak Hour Factor	0.89				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2028 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0		0	1	0		0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		163		770						68	298				276	248
Percent Heavy Vehicles (%)		0		7						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.27						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.36						2.22						

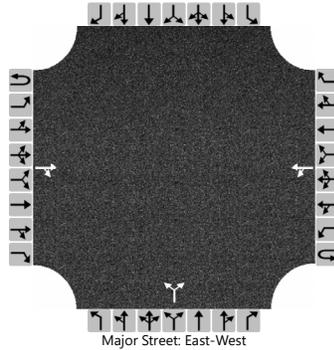
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			1048							76						
Capacity, c (veh/h)			493							987						
v/c Ratio			2.13							0.08						
95% Queue Length, Q ₉₅ (veh)			74.7							0.3						
95% Queue Length, Q ₉₅ (ft)			1953.8							7.6						
Control Delay (s/veh)			532.9							9.0	0.9					
Level of Service (LOS)			F							A	A					
Approach Delay (s/veh)	532.9								2.4							
Approach LOS	F								A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	2. Ruritan Lake Rd (SR 619) at Sclaters Ford R...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2028			North/South Street	Sclaters Ford Rd (SR 660)		
Time Analyzed	2028 Total PM			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2028 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			827	7		195	137			3		111				
Percent Heavy Vehicles (%)						1				0		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.11					6.40		6.22			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.21					3.50		3.32			

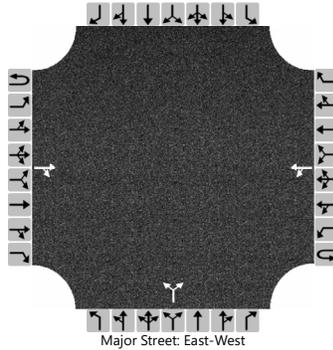
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						217						127				
Capacity, c (veh/h)						742						306				
v/c Ratio						0.29						0.41				
95% Queue Length, Q ₉₅ (veh)						1.2						1.9				
95% Queue Length, Q ₉₅ (ft)						30.2						48.2				
Control Delay (s/veh)						11.8	3.8					24.8				
Level of Service (LOS)						B	A					C				
Approach Delay (s/veh)					8.5				24.8							
Approach LOS					A				C							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	3. Ruritan Lake Rd (SR 619) at Branch Rd (SR...				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Ruritan Lake Rd (SR 619)				
Analysis Year	2028	North/South Street	Branch Rd (SR 761)				
Time Analyzed	2028 Total PM	Peak Hour Factor	0.90				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	2028 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration				TR	LT						LR					
Volume (veh/h)			39	3	40	54			1		758					
Percent Heavy Vehicles (%)					0				0		3					
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)					4.1				7.1		6.2					
Critical Headway (sec)					4.10				6.40		6.23					
Base Follow-Up Headway (sec)					2.2				3.5		3.3					
Follow-Up Headway (sec)					2.20				3.50		3.33					

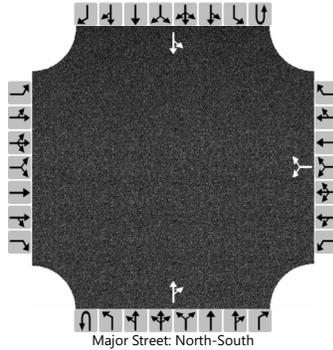
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					44				843							
Capacity, c (veh/h)					1574				1022							
v/c Ratio					0.03				0.83							
95% Queue Length, Q ₉₅ (veh)					0.1				9.8							
95% Queue Length, Q ₉₅ (ft)					2.5				250.9							
Control Delay (s/veh)					7.4	0.2			22.7							
Level of Service (LOS)					A	A			C							
Approach Delay (s/veh)					3.3				22.7							
Approach LOS					A				C							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	4. Branch Rd (SR 761) at Rolling Rd (SR 620)				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Rolling Rd (SR 620)				
Analysis Year	2028	North/South Street	Branch Rd (SR 761)				
Time Analyzed	2028 Total PM	Peak Hour Factor	0.92				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2028 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	1	0		0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						72		47			39	14		21	113	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

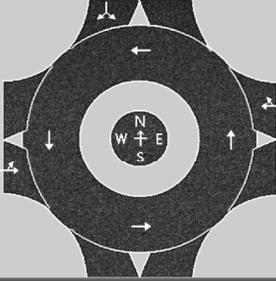
Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						129								23		
Capacity, c (veh/h)						848								1560		
v/c Ratio						0.15								0.01		
95% Queue Length, Q ₉₅ (veh)						0.5								0.0		
95% Queue Length, Q ₉₅ (ft)						12.5								0.0		
Control Delay (s/veh)						10.0								7.3	0.1	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					10.0								1.2			
Approach LOS					B								A			

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2028				Analysis Time Period, hrs	0.25		
Time Analyzed	2028 Total PM				Peak Hour Factor	0.97		
Project Description	2028 Total PM				Jurisdiction	VDOT		

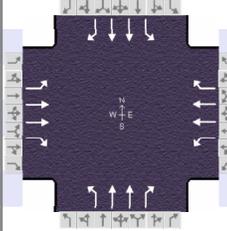
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT				TR				LR							
Volume (V), veh/h	1	107	206		3		301	167					0	899		164
Percent Heavy Vehicles, %	0	0	1		0		3	1					0	1		4
Flow Rate (v _{PCE}), pc/h	1	110	214		3		320	174					0	936		176
Right-Turn Bypass	None				None				None							
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763						4.9763	
Follow-Up Headway, s		2.6087			2.6087						2.6087	

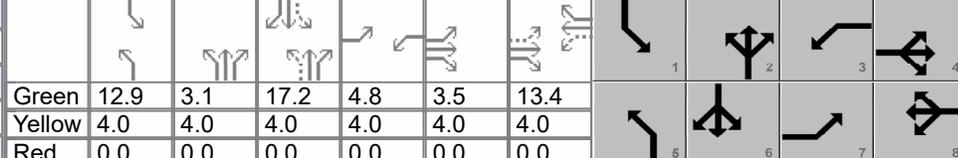
Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h		325			497						1112	
Entry Volume, veh/h		323			486						1096	
Circulating Flow (v _c), pc/h	939			111			1264			324		
Exiting Flow (v _{ex}), pc/h	1153			497			284			0		
Capacity (C _{PCE}), pc/h		530			1232						992	
Capacity (c), veh/h		526			1205						977	
v/c Ratio (x)		0.61			0.40						1.12	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Lane Control Delay (d), s/veh		20.2			7.0						87.0	
Lane LOS		C			A						F	
95% Queue Length, Q ₉₅ (veh)		4.1			2.0						29.0	
95% Queue Length, Q ₉₅ (ft)		102.5			50.9						733.5	
Approach Delay, s/veh LOS	20.2	C		7.0	A					87.0	F	
Intersection Delay, s/veh LOS	55.3						F					

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	TRC			Duration, h	0.250	
Analyst	Dorin Papuc	Analysis Date	12/29/2025	Area Type	Other	
Jurisdiction	VDOT	Time Period	2028 Total PM	PHF	0.96	
Urban Street	James Madison Highwa...	Analysis Year	2028	Analysis Period	1 > 4:30	
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...		
Project Description	2028 Total PM					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	281	108	46	70	68	212	515	481	261	304	537	227

Signal Information														
Cycle, s	78.9	Reference Phase	2	Green	12.9	3.1	17.2	4.8	3.5	13.4				
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	4.0	4.0	4.0				
Uncoordinated	Yes	Simult. Gap E/W	On	Red	0.0	0.0	0.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	16.3	24.9	8.8	17.4	24.0	28.2	16.9	21.2
Change Period, (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	3.0	3.1	3.0	3.1	3.0	3.0	3.0	3.0
Queue Clearance Time (g _s), s	12.0	4.0	4.8	12.5	20.1	13.3	12.6	13.4
Green Extension Time (g _e), s	0.3	0.9	0.1	0.9	0.0	3.7	0.4	3.7
Phase Call Probability	1.00	1.00	0.80	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.01	0.00	0.00	0.00	1.00	0.00	0.03	0.00

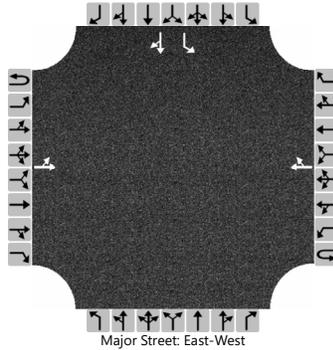
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	293	113	48	73	71	221	536	501	272	317	559	236
Adjusted Saturation Flow Rate (s), veh/h/ln	1795	1724	1560	1654	1766	1598	1711	1795	1585	1781	1795	1572
Queue Service Time (g _s), s	10.0	2.0	1.8	2.8	1.3	10.5	18.1	8.9	11.3	10.6	11.4	10.9
Cycle Queue Clearance Time (g _c), s	10.0	2.0	1.8	2.8	1.3	10.5	18.1	8.9	11.3	10.6	11.4	10.9
Green Ratio (g/C)	0.35	0.27	0.27	0.23	0.17	0.17	0.50	0.31	0.31	0.38	0.22	0.22
Capacity (c), veh/h	577	915	414	394	600	272	585	1103	487	535	781	342
Volume-to-Capacity Ratio (X)	0.507	0.123	0.116	0.185	0.118	0.813	0.917	0.454	0.558	0.592	0.716	0.691
Back of Queue (Q), ft/ln (95 th percentile)	170	34	29	50	24	178	364	154	176	178	203	178
Back of Queue (Q), veh/ln (95 th percentile)	6.7	1.3	1.1	1.8	1.0	7.1	13.8	6.1	6.9	7.0	8.1	7.0
Queue Storage Ratio (RQ) (95 th percentile)	0.94	0.00	0.05	0.28	0.00	0.94	1.92	0.00	0.88	0.89	0.00	0.85
Uniform Delay (d ₁), s/veh	19.9	22.0	22.0	24.4	27.7	31.5	16.6	22.0	22.8	18.5	28.6	28.4
Incremental Delay (d ₂), s/veh	0.3	0.0	0.0	0.1	0.0	2.3	19.1	0.1	0.4	0.4	0.5	0.9
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	20.2	22.0	22.0	24.5	27.8	33.8	35.6	22.1	23.2	18.9	29.1	29.4
Level of Service (LOS)	C	C	C	C	C	C	D	C	C	B	C	C
Approach Delay, s/veh / LOS	20.8	C		30.8	C		27.9	C		26.2	C	
Intersection Delay, s/veh / LOS	26.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.43	B	2.44	B	2.43	B	2.44	B
Bicycle LOS Score / LOS	0.86	A	0.79	A	1.57	B	1.41	A

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	7. Tenaska Operations driveway at Branch Rd...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Branch Rd (SR 761)		
Analysis Year	2028			North/South Street	Tenaska Operations driveway		
Time Analyzed	2028 Total PM			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2028 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		1	1	0
Configuration		LT						TR						L		TR
Volume (veh/h)		0	29				49	0						725	0	80
Percent Heavy Vehicles (%)		4												0	0	0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1	6.5	6.2
Critical Headway (sec)		4.14												7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2												3.5	4.0	3.3
Follow-Up Headway (sec)		2.24												3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0												788		87
Capacity, c (veh/h)		1540												907		1020
v/c Ratio		0.00												0.87		0.09
95% Queue Length, Q ₉₅ (veh)		0.0												11.3		0.3
95% Queue Length, Q ₉₅ (ft)		0.0												282.5		7.5
Control Delay (s/veh)		7.3	0.0											28.7		8.9
Level of Service (LOS)		A	A											D		A
Approach Delay (s/veh)		0.0												26.8		
Approach LOS		A												D		

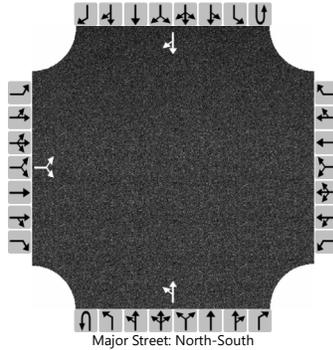
2032 Total Traffic Analyses

2032 Total Traffic AM

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	1. Thomas Jefferson Pkwy (SR 53) at Ruritan...				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Ruritan Lake Rd (SR 619)				
Analysis Year	2032	North/South Street	Thomas Jefferson Pkwy (SR 53)				
Time Analyzed	2032 Total AM	Peak Hour Factor	0.94				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2032 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0		0	1	0		0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		229		101						773	389				418	68
Percent Heavy Vehicles (%)		4		3						5						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.44		6.23						4.15						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.54		3.33						2.25						

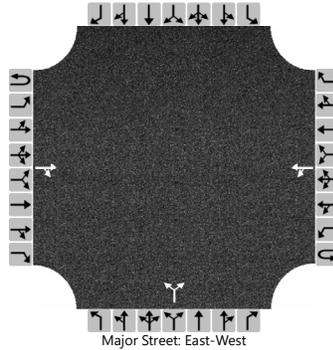
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			351							822						
Capacity, c (veh/h)			0							1034						
v/c Ratio										0.80						
95% Queue Length, Q ₉₅ (veh)										8.8						
95% Queue Length, Q ₉₅ (ft)										228.8						
Control Delay (s/veh)										20.5	20.5					
Level of Service (LOS)										C	C					
Approach Delay (s/veh)									20.5							
Approach LOS									C							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	2. Ruritan Lake Rd (SR 619) at Sclaters Ford R...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Sclaters Ford Rd (SR 660)		
Time Analyzed	2032 Total AM			Peak Hour Factor	0.85		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			137	6		65	787			4		191				
Percent Heavy Vehicles (%)						8				0		5				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.18					6.40		6.25			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.27					3.50		3.35			

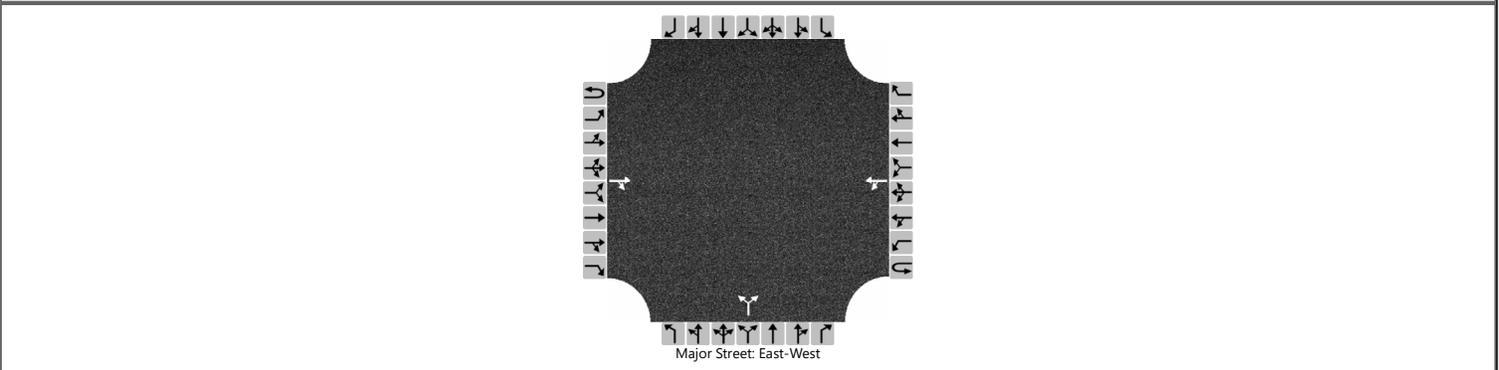
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						76						229				
Capacity, c (veh/h)						1374						805				
v/c Ratio						0.06						0.29				
95% Queue Length, Q ₉₅ (veh)						0.2						1.2				
95% Queue Length, Q ₉₅ (ft)						5.3						31.2				
Control Delay (s/veh)						7.8	0.9					11.2				
Level of Service (LOS)						A	A					B				
Approach Delay (s/veh)					1.4				11.2							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	3. Ruritan Lake Rd (SR 619) at Branch Rd (SR...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2032 Total AM			Peak Hour Factor	0.75		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			50	0		750	25			0		56				
Percent Heavy Vehicles (%)						0				0		6				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.10					6.40		6.26			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.20					3.50		3.35			

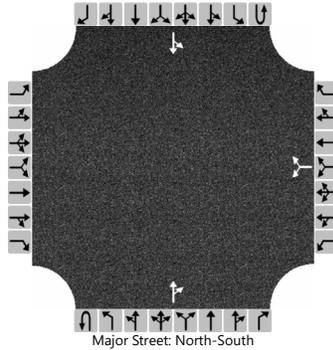
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						1000						75				
Capacity, c (veh/h)						1548						986				
v/c Ratio						0.65						0.08				
95% Queue Length, Q ₉₅ (veh)						5.1						0.2				
95% Queue Length, Q ₉₅ (ft)						127.5						5.2				
Control Delay (s/veh)						11.5	7.5					9.0				
Level of Service (LOS)						B	A					A				
Approach Delay (s/veh)					11.3				9.0							
Approach LOS					B				A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	4. Branch Rd (SR 761) at Rolling Rd (SR 620)		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Rolling Rd (SR 620)		
Analysis Year	2032			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2032 Total AM			Peak Hour Factor	0.83		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	2032 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						22		28			113	65		51	15	
Percent Heavy Vehicles (%)						7		0						10		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

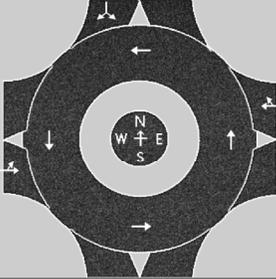
Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.47		6.20							4.20		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.56		3.30							2.29		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						60									61		
Capacity, c (veh/h)						749									1309		
v/c Ratio						0.08									0.05		
95% Queue Length, Q ₉₅ (veh)						0.3									0.1		
95% Queue Length, Q ₉₅ (ft)						7.7									2.7		
Control Delay (s/veh)						10.2									7.9	0.4	
Level of Service (LOS)						B									A	A	
Approach Delay (s/veh)						10.2								6.2			
Approach LOS						B								A			

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2032				Analysis Time Period, hrs	0.25		
Time Analyzed	2032 Total AM				Peak Hour Factor	0.83		
Project Description	2032 Total AM				Jurisdiction	VDOT		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT				TR				LR							
Volume (V), veh/h	1	313	380		2		185	892					0	121		228
Percent Heavy Vehicles, %	0	8	2		50		6	6					0	5		7
Flow Rate (v _{PCE}), pc/h	1	407	467		4		236	1139					0	153		294
Right-Turn Bypass	None				None				None							
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

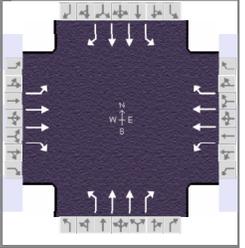
Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763						4.9763	
Follow-Up Headway, s		2.6087			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass									
Entry Flow (v _e), pc/h		875			1379						447	
Entry Volume, veh/h		836			1300						420	
Circulating Flow (v _c), pc/h	157			408			1032			241		
Exiting Flow (v _{ex}), pc/h	624			531			1546			0		
Capacity (c _{PCE}), pc/h		1176			910						1079	
Capacity (c), veh/h		1123			858						1015	
v/c Ratio (x)		0.74			1.52						0.41	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		15.6			252.7						8.1	
Lane LOS		C			F						A	
95% Queue Length, Q ₉₅ (veh)		7.3			63.0						2.1	
95% Queue Length, Q ₉₅ (ft)		182.5			1650.6						55.1	
Approach Delay, s/veh LOS	15.6	C		252.7	F					8.1	A	
Intersection Delay, s/veh LOS	134.9						F					

HCS Signalized Intersection Results Summary

General Information					Intersection Information			
Agency	TRC				Duration, h	0.250		
Analyst	Dorin Papuc	Analysis Date	12/29/2025		Area Type	Other		
Jurisdiction	VDOT	Time Period	2032 Total AM		PHF	0.90		
Urban Street	James Madison Highwa...	Analysis Year	2032		Analysis Period	1 > 7:00		
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...				
Project Description	2032 Total AM							



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	164	61	519	270	102	340	40	592	76	159	365	235

Signal Information														
Cycle, s	85.9	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	Yes	Simult. Gap E/W	On	Green	3.9	0.4	20.3	7.9	3.4	30.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	0.0	4.0				
				Red	0.0	0.0	0.0	0.0	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	11.9	34.0	15.3	37.4	7.9	24.3	12.3	28.7
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	3.0	3.2	3.0	3.2	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s	7.7	32.0	10.9	18.6	3.7	17.0	8.2	14.7
Green Extension Time (g_e), s	0.2	0.0	0.4	2.3	0.0	3.3	0.2	3.3
Phase Call Probability	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00
Max Out Probability	0.00	1.00	0.01	0.10	0.00	0.00	0.00	0.00

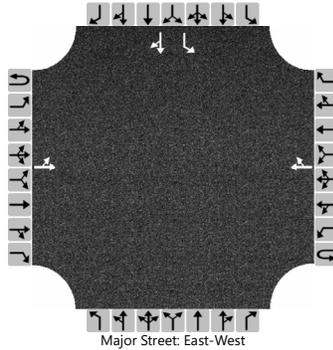
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	182	68	577	300	113	378	44	658	84	177	406	261
Adjusted Saturation Flow Rate (s), veh/h/ln	1711	1527	1535	1753	1668	1572	1668	1766	1522	1753	1766	1522
Queue Service Time (g_s), s	5.7	1.3	30.0	8.9	1.8	16.6	1.7	15.0	3.9	6.2	7.9	12.7
Cycle Queue Clearance Time (g_c), s	5.7	1.3	30.0	8.9	1.8	16.6	1.7	15.0	3.9	6.2	7.9	12.7
Green Ratio (g/C)	0.44	0.35	0.35	0.50	0.39	0.39	0.28	0.24	0.24	0.36	0.29	0.29
Capacity (c), veh/h	664	1066	536	753	1298	612	318	836	360	301	1015	438
Volume-to-Capacity Ratio (X)	0.275	0.064	1.076	0.398	0.087	0.618	0.140	0.787	0.234	0.588	0.399	0.597
Back of Queue (Q), ft/ln (95 th percentile)	95	22	717	142	32	246	30	256	63	110	142	203
Back of Queue (Q), veh/ln (95 th percentile)	3.6	0.7	27.4	5.5	1.2	9.6	1.1	10.0	2.4	4.3	5.6	7.7
Queue Storage Ratio (RQ) (95 th percentile)	0.53	0.00	1.30	0.79	0.00	1.30	0.16	0.00	0.31	0.55	0.00	0.97
Uniform Delay (d_1), s/veh	15.0	18.6	28.0	13.2	16.6	21.1	22.9	30.8	26.5	22.0	24.7	26.3
Incremental Delay (d_2), s/veh	0.1	0.0	61.1	0.1	0.0	1.4	0.1	0.6	0.1	0.7	0.1	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.1	18.6	89.0	13.3	16.6	22.5	23.0	31.4	26.6	22.7	24.7	26.8
Level of Service (LOS)	B	B	F	B	B	C	C	C	C	C	C	C
Approach Delay, s/veh / LOS	67.0		E	18.2		B	30.4		C	25.0		C
Intersection Delay, s/veh / LOS	35.3						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.43	B	2.42	B	2.44	B	2.43	B
Bicycle LOS Score / LOS	1.17	A	1.14	A	1.14	A	1.18	A

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	7. Tenaska Operations driveway at Branch Rd...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Branch Rd (SR 761)		
Analysis Year	2032			North/South Street	Tenaska Operations driveway		
Time Analyzed	2032 Total AM			Peak Hour Factor	0.86		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Total AM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6								
Priority																
Number of Lanes	0	0	1	0	0	0	1	0						1	1	0
Configuration		LT						TR						L		TR
Volume (veh/h)		80	54				29	725						0	0	0
Percent Heavy Vehicles (%)		8												0	0	0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type Storage																

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1	6.5	6.2
Critical Headway (sec)		4.18												7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2												3.5	4.0	3.3
Follow-Up Headway (sec)		2.27												3.50	4.00	3.30

Delay, Queue Length, and Level of Service

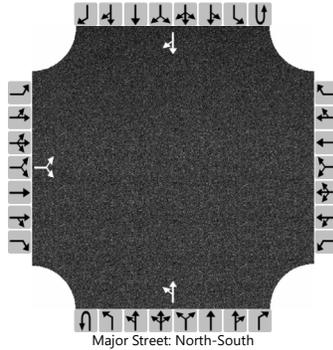
Flow Rate, v (veh/h)		93												0		0
Capacity, c (veh/h)		745												308		0
v/c Ratio		0.12												0.00		
95% Queue Length, Q ₉₅ (veh)		0.4												0.0		
95% Queue Length, Q ₉₅ (ft)		10.6												0.0		
Control Delay (s/veh)		10.5	1.4											16.7		
Level of Service (LOS)		B	A											C		
Approach Delay (s/veh)		6.8														
Approach LOS		A														

2032 Total Traffic PM

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	1. Thomas Jefferson Pkwy (SR 53) at Ruritan...				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Ruritan Lake Rd (SR 619)				
Analysis Year	2032	North/South Street	Thomas Jefferson Pkwy (SR 53)				
Time Analyzed	2032 Total PM	Peak Hour Factor	0.89				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2032 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		184		776						75	331				289	260
Percent Heavy Vehicles (%)		0		7						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.27						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.36						2.22						

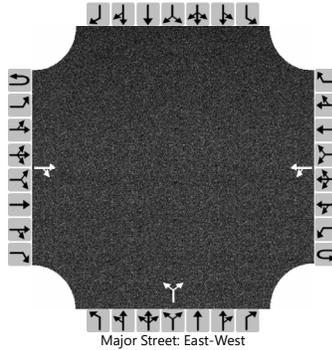
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			1079							84						
Capacity, c (veh/h)			456							963						
v/c Ratio			2.36							0.09						
95% Queue Length, Q ₉₅ (veh)			82.7							0.3						
95% Queue Length, Q ₉₅ (ft)			2161.1							7.6						
Control Delay (s/veh)			640.2							9.1	1.0					
Level of Service (LOS)			F							A	A					
Approach Delay (s/veh)	640.2								2.5							
Approach LOS	F								A							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	2. Ruritan Lake Rd (SR 619) at Sclaters Ford R...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Sclaters Ford Rd (SR 660)		
Time Analyzed	2032 Total PM			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			840	7		220	154			4		125				
Percent Heavy Vehicles (%)						1				0		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.11					6.40		6.22			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.21					3.50		3.32			

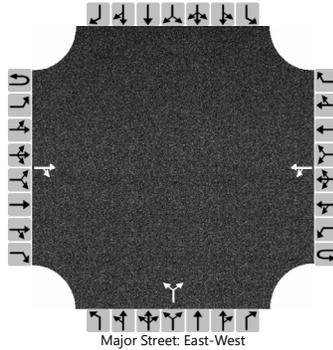
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						244						143				
Capacity, c (veh/h)						733						291				
v/c Ratio						0.33						0.49				
95% Queue Length, Q ₉₅ (veh)						1.5						2.6				
95% Queue Length, Q ₉₅ (ft)						37.8						66.0				
Control Delay (s/veh)						12.4	4.6					28.8				
Level of Service (LOS)						B	A					D				
Approach Delay (s/veh)					9.1				28.8							
Approach LOS					A				D							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	3. Ruritan Lake Rd (SR 619) at Branch Rd (SR...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Ruritan Lake Rd (SR 619)		
Analysis Year	2032			North/South Street	Branch Rd (SR 761)		
Time Analyzed	2032 Total PM			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration				TR	LT						LR					
Volume (veh/h)			44	4	45	61			1		761					
Percent Heavy Vehicles (%)					0				0		3					
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)					4.1				7.1		6.2					
Critical Headway (sec)					4.10				6.40		6.23					
Base Follow-Up Headway (sec)					2.2				3.5		3.3					
Follow-Up Headway (sec)					2.20				3.50		3.33					

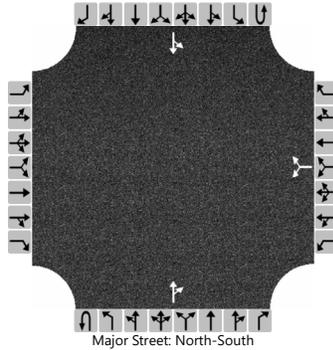
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					50				847							
Capacity, c (veh/h)					1565				1014							
v/c Ratio					0.03				0.84							
95% Queue Length, Q ₉₅ (veh)					0.1				10.2							
95% Queue Length, Q ₉₅ (ft)					2.5				261.1							
Control Delay (s/veh)					7.4	0.2			23.5							
Level of Service (LOS)					A	A			C							
Approach Delay (s/veh)					3.3				23.5							
Approach LOS					A				C							

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc	Intersection	4. Branch Rd (SR 761) at Rolling Rd (SR 620)				
Agency/Co.	TRC	Jurisdiction	VDOT				
Date Performed	12/29/2025	East/West Street	Rolling Rd (SR 620)				
Analysis Year	2032	North/South Street	Branch Rd (SR 761)				
Time Analyzed	2032 Total PM	Peak Hour Factor	0.92				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	2032 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	1	0		0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						80		49			41	14		22	119	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

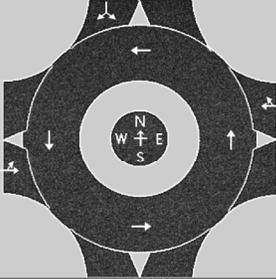
Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						140								24		
Capacity, c (veh/h)						835								1557		
v/c Ratio						0.17								0.02		
95% Queue Length, Q ₉₅ (veh)						0.6								0.0		
95% Queue Length, Q ₉₅ (ft)						15.0								0.0		
Control Delay (s/veh)						10.2								7.3	0.1	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					10.2								1.2			
Approach LOS					B								A			

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2032				Analysis Time Period, hrs	0.25		
Time Analyzed	2032 Total PM				Peak Hour Factor	0.97		
Project Description	2032 Total PM				Jurisdiction	VDOT		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT				TR				LR							
Volume (V), veh/h	1	112	215		3		315	175					0	919		182
Percent Heavy Vehicles, %	0	0	1		0		3	1					0	1		4
Flow Rate (v _{PCE}), pc/h	1	115	224		3		334	182					0	957		195
Right-Turn Bypass	None				None				None							
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							
Proportion of CAVs, %	0															

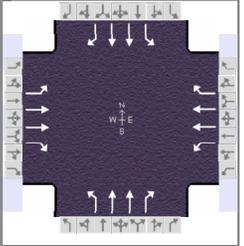
Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763						4.9763	
Follow-Up Headway, s		2.6087			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h		340			519						1152	
Entry Volume, veh/h		338			507						1135	
Circulating Flow (v _c), pc/h	960			116			1300			338		
Exiting Flow (v _{ex}), pc/h	1184			530			297			0		
Capacity (C _{PCE}), pc/h		518			1226						978	
Capacity (c), veh/h		515			1199						963	
v/c Ratio (x)		0.66			0.42						1.18	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		22.6			7.3						108.8	
Lane LOS		C			A						F	
95% Queue Length, Q ₉₅ (veh)		4.7			2.1						34.0	
95% Queue Length, Q ₉₅ (ft)		117.5			53.5						860.2	
Approach Delay, s/veh LOS	22.6	C		7.3	A					108.8	F	
Intersection Delay, s/veh LOS	68.1						F					

HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	TRC			Duration, h	0.250		
Analyst	Dorin Papuc	Analysis Date	12/29/2025	Area Type	Other		
Jurisdiction	VDOT	Time Period	2032 Total PM	PHF	0.96		
Urban Street	James Madison Highwa...	Analysis Year	2032	Analysis Period	1> 4:30		
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...			
Project Description	2032 Total PM						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	287	110	47	76	74	232	520	554	271	354	327	265

Signal Information													
Cycle, s	83.2	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	15.1	0.9	19.1	5.0	3.9	15.1			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	4.0			
				Red	0.0	0.0	0.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	17.0	27.0	9.0	19.1	24.0	28.0	19.1	23.1
Change Period, (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	3.0	3.1	3.0	3.1	3.0	3.1	3.0	3.1
Queue Clearance Time (g _s), s	12.6	4.1	5.2	14.1	21.5	14.8	14.8	15.6
Green Extension Time (g _e), s	0.3	1.0	0.1	0.9	0.0	3.5	0.4	3.5
Phase Call Probability	1.00	1.00	0.84	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.02	0.00	0.00	0.00	1.00	0.00	0.19	0.00

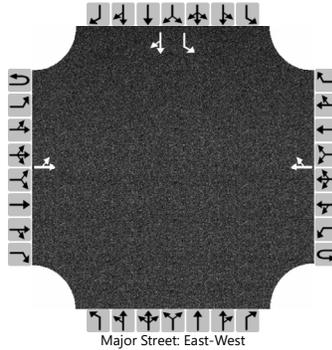
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	299	115	49	79	77	242	542	577	282	369	341	276
Adjusted Saturation Flow Rate (s), veh/h/ln	1795	1724	1560	1654	1766	1598	1711	1795	1585	1781	1795	1572
Queue Service Time (g _s), s	10.6	2.1	2.0	3.2	1.5	12.1	19.5	11.3	12.8	12.8	6.7	13.6
Cycle Queue Clearance Time (g _c), s	10.6	2.1	2.0	3.2	1.5	12.1	19.5	11.3	12.8	12.8	6.7	13.6
Green Ratio (g/C)	0.36	0.28	0.28	0.24	0.18	0.18	0.49	0.29	0.29	0.41	0.23	0.23
Capacity (c), veh/h	585	954	432	402	641	290	647	1035	457	518	826	362
Volume-to-Capacity Ratio (X)	0.511	0.120	0.113	0.197	0.120	0.834	0.837	0.558	0.618	0.712	0.412	0.763
Back of Queue (Q), ft/ln (95 th percentile)	184	37	31	57	28	203	334	200	202	218	122	218
Back of Queue (Q), veh/ln (95 th percentile)	7.3	1.4	1.2	2.1	1.1	8.1	12.7	7.9	8.0	8.6	4.8	8.5
Queue Storage Ratio (RQ) (95 th percentile)	1.02	0.00	0.06	0.32	0.00	1.07	1.76	0.00	1.01	1.09	0.00	1.04
Uniform Delay (d ₁), s/veh	20.5	22.5	22.5	25.1	28.5	32.8	16.5	25.1	25.6	18.9	27.2	29.9
Incremental Delay (d ₂), s/veh	0.3	0.0	0.0	0.1	0.0	2.4	8.9	0.2	0.5	2.1	0.1	1.3
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	20.7	22.5	22.5	25.2	28.5	35.3	25.4	25.3	26.1	21.0	27.4	31.2
Level of Service (LOS)	C	C	C	C	C	D	C	C	C	C	C	C
Approach Delay, s/veh / LOS	21.4	C		32.0	C		25.5	C		26.1	C	
Intersection Delay, s/veh / LOS	25.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.43	B	2.44	B	2.43	B	2.44	B
Bicycle LOS Score / LOS	0.87	A	0.82	A	1.64	B	1.30	A

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Dorin Papuc			Intersection	7. Tenaska Operations driveway at Branch Rd...		
Agency/Co.	TRC			Jurisdiction	VDOT		
Date Performed	12/29/2025			East/West Street	Branch Rd (SR 761)		
Analysis Year	2032			North/South Street	Tenaska Operations driveway		
Time Analyzed	2032 Total PM			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	2032 Total PM						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		1	1	0
Configuration		LT						TR						L		TR
Volume (veh/h)		0	35				60	0						725	0	80
Percent Heavy Vehicles (%)		4												0	0	0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1	6.5	6.2
Critical Headway (sec)		4.14												7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2												3.5	4.0	3.3
Follow-Up Headway (sec)		2.24												3.50	4.00	3.30

Delay, Queue Length, and Level of Service

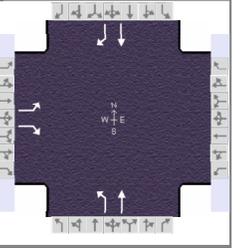
Flow Rate, v (veh/h)		0												788		87
Capacity, c (veh/h)		1524												882		1004
v/c Ratio		0.00												0.89		0.09
95% Queue Length, Q ₉₅ (veh)		0.0												12.3		0.3
95% Queue Length, Q ₉₅ (ft)		0.0												307.5		7.5
Control Delay (s/veh)		7.4	0.0											32.2		8.9
Level of Service (LOS)		A	A											D		A
Approach Delay (s/veh)		0.0												29.9		
Approach LOS		A												D		

**2032 Total Traffic
Proposed Traffic
Control Analyses**

**2032 Total Traffic Proposed
Traffic Control AM**

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TRC			Duration, h	0.250
Analyst	Dorin Papuc	Analysis Date	12/29/2025	Area Type	Other
Jurisdiction	VDOT	Time Period	M_2032 Total AM	PHF	0.94
Urban Street	James Madison Highwa...	Analysis Year	2032	Analysis Period	1> 7:00
Intersection	1. SR 53 at SR 619		File Name	1. Thomas Jefferson Pkwy (SR 53) at Ruritan Lak...	
Project Description	M_2032 Total AM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	229		101				773	389			418	68

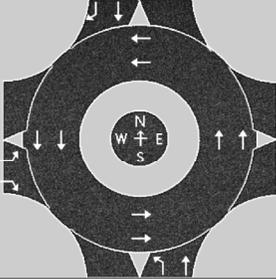
Signal Information													
Cycle, s	86.5	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	36.9	23.2	14.4	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
				Red	0.0	0.0	0.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		9.0			1.0	4.0		7.3
Phase Duration, s		18.4			40.9	68.2		27.2
Change Period, ($Y+R_c$), s		4.0			4.0	4.0		4.0
Max Allow Headway (MAH), s		3.1			3.0	2.9		2.9
Queue Clearance Time (g_s), s		13.7			35.8	8.5		22.2
Green Extension Time (g_e), s		0.6			0.9	1.6		0.9
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		0.00			0.62	0.00		0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14				5	2			6	16
Adjusted Flow Rate (v), veh/h	244		107				822	414			445	72
Adjusted Saturation Flow Rate (s), veh/h/ln	1753		1572				1739	1841			1841	1547
Queue Service Time (g_s), s	11.7		2.6				33.8	6.5			20.2	2.4
Cycle Queue Clearance Time (g_c), s	11.7		2.6				33.8	6.5			20.2	2.4
Green Ratio (g/C)	0.17		0.60				0.72	0.74			0.27	0.44
Capacity (c), veh/h	291		933				858	1366			495	673
Volume-to-Capacity Ratio (X)	0.837		0.115				0.959	0.303			0.899	0.108
Back of Queue (Q), ft/ln (95 th percentile)	220		33				653	67			352	36
Back of Queue (Q), veh/ln (95 th percentile)	8.5		1.3				25.1	2.6			13.6	1.4
Queue Storage Ratio (RQ) (95 th percentile)	0.94		0.07				0.97	0.00			0.00	0.36
Uniform Delay (d_1), s/veh	35.1		7.7				18.1	3.7			30.6	14.6
Incremental Delay (d_2), s/veh	2.5		0.0				19.4	0.0			3.8	0.0
Initial Queue Delay (d_3), s/veh	0.0		0.0				0.0	0.0			0.0	0.0
Control Delay (d), s/veh	37.6		7.7				37.5	3.8			34.4	14.6
Level of Service (LOS)	D		A				D	A			C	B
Approach Delay, s/veh / LOS	28.5		C	0.0			26.2	C			31.6	C
Intersection Delay, s/veh / LOS	27.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.95	B	0.64	A	1.92	B
Bicycle LOS Score / LOS		F			2.53	C	1.34	A

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	1. Thomas Jefferson Pkwy (S...		
Agency or Co.	TRC				E/W Street Name	Ruritan Lake Rd (SR 619)		
Date Performed	12/29/2025				N/S Street Name	Thomas Jefferson Pkwy (SR...		
Analysis Year	2032				Analysis Time Period, hrs	0.25		
Time Analyzed	M_2032 Total AM				Peak Hour Factor	0.94		
Project Description	M_2032 Total AM				Jurisdiction	VDOT		

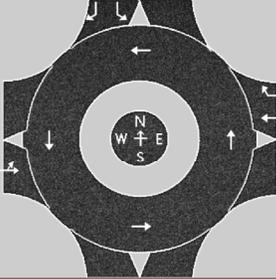
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	1	0	1	0	0	0	0	0	1	1	0	0	0	1	1
Lane Assignment	L		R						L		T		T		R	
Volume (V), veh/h	0	229		101					0	773	389		0		418	68
Percent Heavy Vehicles, %	0	4		3					0	5	4		0		4	5
Flow Rate (v _{PCE}), pc/h	0	253		111					0	863	430		0		462	76
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2								2				2			
Pedestrians Crossing, p/h	0								0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s	4.6453	4.3276					4.6453	4.3276		4.6453	4.3276	
Follow-Up Headway, s	2.6667	2.5352					2.6667	2.5352		2.6667	2.5352	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h	253	111					863	430		462	76	
Entry Volume, veh/h	244	107					825	411		444	73	
Circulating Flow (v _c), pc/h	462			1546			253			863		
Exiting Flow (v _{ex}), pc/h	0			939			683			573		
Capacity (C _{PCE}), pc/h	883	959					1070	1145		610	682	
Capacity (c), veh/h	851	925					1022	1094		586	655	
v/c Ratio (x)	0.29	0.12					0.81	0.38		0.76	0.11	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	7.4	5.0					20.4	7.1		26.5	6.7	
Lane LOS	A	A					C	A		D	A	
95% Queue Length, Q ₉₅ (veh)	1.2	0.4					9.1	1.8		6.8	0.4	
95% Queue Length, Q ₉₅ (ft)	31.0	10.2					236.6	46.4		175.4	10.4	
Approach Delay, s/veh LOS	6.6	A					16.0	C		23.7	C	
Intersection Delay, s/veh LOS	16.3						C					

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2032				Analysis Time Period, hrs	0.25		
Time Analyzed	2032 Total AM				Peak Hour Factor	0.83		
Project Description	2032 Total AM				Jurisdiction	VDOT		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	1
Lane Assignment	LT				T				R				L			
Volume (V), veh/h	1	313	380		2		185	892					0	121		228
Percent Heavy Vehicles, %	0	8	2		50		6	6					0	5		7
Flow Rate (v _{PCE}), pc/h	1	407	467		4		236	1139					0	153		294
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

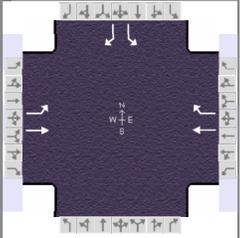
Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763		4.5436	4.5436					4.5436	4.5436	
Follow-Up Headway, s		2.6087		2.5352	2.5352					2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass									
Entry Flow (v _e), pc/h		875		240	1139					153	294	
Entry Volume, veh/h		836		226	1074					144	277	
Circulating Flow (v _c), pc/h	157			408			1032			241		
Exiting Flow (v _{ex}), pc/h	624			531			1546			0		
Capacity (c _{PCE}), pc/h		1176		980	980					1140	1140	
Capacity (c), veh/h		1123		923	923					1073	1073	
v/c Ratio (x)		0.74		0.24	1.16					0.13	0.26	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass									
Lane Control Delay (d), s/veh		15.6		6.4	103.7					4.5	5.8	
Lane LOS		C		A	F					A	A	
95% Queue Length, Q ₉₅ (veh)		7.3		1.0	31.5					0.5	1.0	
95% Queue Length, Q ₉₅ (ft)		182.5		26.2	825.3					13.0	26.4	
Approach Delay, s/veh LOS	15.6		C	86.7		F				5.4		A
Intersection Delay, s/veh LOS	50.1						F					

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TRC			Duration, h	0.250
Analyst	Dorin Papuc	Analysis Date	12/30/2025	Area Type	Other
Jurisdiction		Time Period	M_2032 Total AM	PHF	0.83
Urban Street	US 15	Analysis Year	2032	Analysis Period	1 > 7:00
Intersection	5. SR 53 at US 15	File Name	5. Thomas Jefferson Parkway (SR 53) at James...		
Project Description	M_2032 Total AM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	313	380			185	892				121		228

Signal Information												
Cycle, s	45.3	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	26.9	10.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Yellow	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

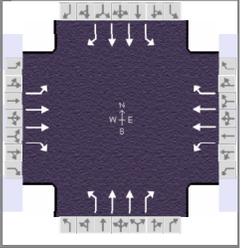
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6				4
Case Number		6.0		7.0				9.0
Phase Duration, s		30.9		30.9				14.4
Change Period, ($Y+R_c$), s		4.0		4.0				4.0
Max Allow Headway (MAH), s		3.2		3.2				3.2
Queue Clearance Time (g_s), s		15.5		20.7				9.7
Green Extension Time (g_e), s		5.6		6.2				0.8
Phase Call Probability		1.00		1.00				0.99
Max Out Probability		0.33		0.21				0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (v), veh/h	377	458			223	1075				146		275
Adjusted Saturation Flow Rate (s), veh/h/ln	1103	1870			1811	1535				1739		1522
Queue Service Time (g_s), s	10.9	6.0			2.6	18.7				3.2		7.7
Cycle Queue Clearance Time (g_c), s	13.5	6.0			2.6	18.7				3.2		7.7
Green Ratio (g/C)	0.59	0.59			0.59	0.82				0.23		0.23
Capacity (c), veh/h	750	1110			1075	1264				400		350
Volume-to-Capacity Ratio (X)	0.503	0.412			0.207	0.850				0.364		0.784
Back of Queue (Q), ft/ln (95 th percentile)	65	44			19	41				47		104
Back of Queue (Q), veh/ln (95 th percentile)	2.4	1.7			0.7	1.6				1.8		4.0
Queue Storage Ratio (RQ) (95 th percentile)	0.65	0.00			0.00	0.41				0.09		0.97
Uniform Delay (d_1), s/veh	7.4	5.0			4.3	2.4				14.7		16.4
Incremental Delay (d_2), s/veh	0.2	0.1			0.0	2.5				0.2		1.5
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (d), s/veh	7.6	5.1			4.3	4.8				14.9		17.9
Level of Service (LOS)	A	A			A	A				B		B
Approach Delay, s/veh / LOS	6.2	A		4.7	A		0.0			16.8		B
Intersection Delay, s/veh / LOS	7.2						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.65	A	1.85	B	1.92	B	1.92	B
Bicycle LOS Score / LOS	1.87	B	2.63	C				F

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TRC			Duration, h	0.250
Analyst	Dorin Papuc	Analysis Date	12/29/2025	Area Type	Other
Jurisdiction	VDOT	Time Period	M_2032 Total AM	PHF	0.90
Urban Street	James Madison Highwa...	Analysis Year	2032	Analysis Period	1 > 7:00
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...	
Project Description	M_2032 Total AM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	164	61	519	270	102	340	40	592	76	159	365	235

Signal Information				Signal Phases											
Cycle, s	85.9	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	3.9	0.4	20.3	7.9	3.4	30.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	4.0	0.0	4.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	0.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	11.9	34.0	15.3	37.4	7.9	24.3	12.3	28.7
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	3.0	3.2	3.0	3.2	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s	7.7	32.0	10.9	16.0	3.7	17.0	8.2	13.0
Green Extension Time (g_e), s	0.2	0.0	0.4	2.5	0.0	3.3	0.2	3.3
Phase Call Probability	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00
Max Out Probability	0.00	1.00	0.01	0.05	0.00	0.00	0.00	0.00

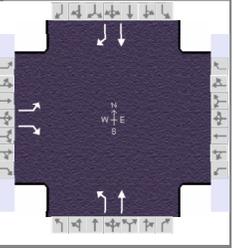
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	182	68	577	300	113	378	44	658	84	177	406	261
Adjusted Saturation Flow Rate (s), veh/h/ln	1711	1527	1535	1753	1668	1572	1668	1766	1522	1753	1766	1522
Queue Service Time (g_s), s	5.7	1.3	30.0	8.9	1.8	14.0	1.7	15.0	3.2	6.2	7.9	11.0
Cycle Queue Clearance Time (g_c), s	5.7	1.3	30.0	8.9	1.8	14.0	1.7	15.0	3.2	6.2	7.9	11.0
Green Ratio (g/C)	0.44	0.35	0.39	0.50	0.39	0.49	0.28	0.24	0.37	0.36	0.29	0.38
Capacity (c), veh/h	664	1066	606	753	1298	764	318	836	561	301	1015	577
Volume-to-Capacity Ratio (X)	0.275	0.064	0.952	0.398	0.087	0.495	0.140	0.787	0.151	0.588	0.399	0.452
Back of Queue (Q), ft/ln (95 th percentile)	95	22	536	142	32	200	30	256	49	110	142	170
Back of Queue (Q), veh/ln (95 th percentile)	3.6	0.7	20.4	5.5	1.2	7.8	1.1	10.0	1.9	4.3	5.6	6.4
Queue Storage Ratio (RQ) (95 th percentile)	0.50	0.00	0.94	0.85	0.00	0.96	0.09	0.00	0.26	0.53	0.00	0.90
Uniform Delay (d_1), s/veh	15.0	18.6	25.2	13.2	16.6	15.0	22.9	30.8	18.2	22.0	24.7	20.0
Incremental Delay (d_2), s/veh	0.1	0.0	24.9	0.1	0.0	0.2	0.1	0.6	0.0	0.7	0.1	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.1	18.6	50.1	13.3	16.6	15.2	23.0	31.4	18.2	22.7	24.7	20.2
Level of Service (LOS)	B	B	D	B	B	B	C	C	B	C	C	C
Approach Delay, s/veh / LOS	39.8		D	14.7		B	29.5		C	22.9		C
Intersection Delay, s/veh / LOS	26.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.43	B	2.42	B	2.44	B	2.43	B
Bicycle LOS Score / LOS	1.17	A	1.14	A	1.14	A	1.18	A

**2032 Total Traffic Proposed
Traffic Control PM**

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TRC			Duration, h	0.250
Analyst	Dorin Papuc	Analysis Date	12/29/2025	Area Type	Other
Jurisdiction	VDOT	Time Period	M_2032 Total AM	PHF	0.89
Urban Street	James Madison Highwa...	Analysis Year	2032	Analysis Period	1 > 7:00
Intersection	1. SR 53 at SR 619		File Name	1. Thomas Jefferson Pkwy (SR 53) at Ruritan Lak...	
Project Description	M_2032 Total PM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	184		776				75	331			289	260

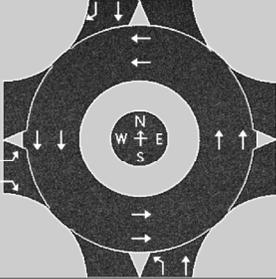
Signal Information													
Cycle, s	72.6	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	4.9	16.0	39.7	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
				Red	0.0	0.0	0.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4			5	2		6
Case Number		9.0			1.0	4.0		7.3
Phase Duration, s		43.7			8.9	28.9		20.0
Change Period, ($Y+R_c$), s		4.0			4.0	4.0		4.0
Max Allow Headway (MAH), s		3.2			3.0	3.0		3.0
Queue Clearance Time (g_s), s		39.5			4.5	13.7		14.1
Green Extension Time (g_e), s		0.2			0.1	1.7		1.8
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		1.00			0.00	0.01		0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7		14				5	2		6		16
Adjusted Flow Rate (v), veh/h	207		872				84	372		325		292
Adjusted Saturation Flow Rate (s), veh/h/ln	1810		1522				1781	1885		1841		1598
Queue Service Time (g_s), s	4.2		37.5				2.5	11.7		12.1		3.8
Cycle Queue Clearance Time (g_c), s	4.2		37.5				2.5	11.7		12.1		3.8
Green Ratio (g/C)	0.55		0.61				0.32	0.34		0.22		0.77
Capacity (c), veh/h	990		936				275	646		405		1226
Volume-to-Capacity Ratio (X)	0.209		0.931				0.306	0.576		0.802		0.238
Back of Queue (Q), ft/ln (95 th percentile)	59		484				42	203		222		19
Back of Queue (Q), veh/ln (95 th percentile)	2.3		18.3				1.7	8.0		8.6		0.7
Queue Storage Ratio (RQ) (95 th percentile)	0.25		0.94				0.06	0.00		0.00		0.19
Uniform Delay (d_1), s/veh	8.4		12.6				19.4	19.6		26.8		2.4
Incremental Delay (d_2), s/veh	0.0		15.2				0.2	0.3		1.4		0.0
Initial Queue Delay (d_3), s/veh	0.0		0.0				0.0	0.0		0.0		0.0
Control Delay (d), s/veh	8.4		27.8				19.6	19.9		28.3		2.4
Level of Service (LOS)	A		C				B	B		C		A
Approach Delay, s/veh / LOS	24.1		C	0.0			19.8	B		16.0		B
Intersection Delay, s/veh / LOS	20.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	0.71	A	1.92	B
Bicycle LOS Score / LOS		F			1.24	A	1.51	B

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	1. Thomas Jefferson Pkwy (S...		
Agency or Co.	TRC				E/W Street Name	Ruritan Lake Rd (SR 619)		
Date Performed	12/29/2025				N/S Street Name	Thomas Jefferson Pkwy (SR...		
Analysis Year	2032				Analysis Time Period, hrs	0.25		
Time Analyzed	M_2032 Total PM				Peak Hour Factor	0.89		
Project Description	M_2032 Total PM				Jurisdiction	VDOT		

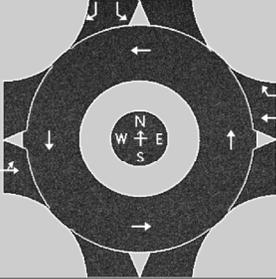
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	1	0	1	0	0	0	0	0	1	1	0	0	0	1	1
Lane Assignment	L		R						L		T		T		R	
Volume (V), veh/h	0	184		776					0	75	331		0		289	260
Percent Heavy Vehicles, %	0	0		7					0	2	1		0		4	1
Flow Rate (v _{PCE}), pc/h	0	207		933					0	86	376		0		338	295
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2								2				2			
Pedestrians Crossing, p/h	0								0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s	4.6453	4.3276					4.6453	4.3276		4.6453	4.3276	
Follow-Up Headway, s	2.6667	2.5352					2.6667	2.5352		2.6667	2.5352	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h	207	933					86	376		338	295	
Entry Volume, veh/h	196	883					85	372		329	288	
Circulating Flow (v _c), pc/h	338			669			207			86		
Exiting Flow (v _{ex}), pc/h	0			381			583			1271		
Capacity (C _{PCE}), pc/h	989	1065					1116	1191		1247	1320	
Capacity (c), veh/h	936	1008					1103	1177		1216	1287	
v/c Ratio (x)	0.21	0.88					0.08	0.32		0.27	0.22	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	5.9	26.8					3.9	6.0		5.4	4.7	
Lane LOS	A	D					A	A		A	A	
95% Queue Length, Q ₉₅ (veh)	0.8	12.0					0.3	1.4		1.1	0.9	
95% Queue Length, Q ₉₅ (ft)	20.0	316.8					7.6	35.3		28.4	22.7	
Approach Delay, s/veh LOS	23.0		C				5.6		A		5.1 A	
Intersection Delay, s/veh LOS	14.2						B					

HCS Roundabouts Report

General Information				Site Information				
Analyst	Dorin Papuc				Intersection	5. Thomas Jefferson Parkway...		
Agency or Co.	TRC				E/W Street Name	Thomas Jefferson Parkway (...)		
Date Performed	12/29/2025				N/S Street Name	James Madison Highway (U...		
Analysis Year	2032				Analysis Time Period, hrs	0.25		
Time Analyzed	2032 Total PM				Peak Hour Factor	0.97		
Project Description	2032 Total PM				Jurisdiction	VDOT		

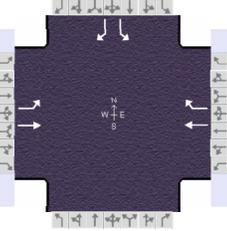
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	1
Lane Assignment	LT				T				R				L			
Volume (V), veh/h	1	112	215		3		315	175					0	919		182
Percent Heavy Vehicles, %	0	0	1		0		3	1					0	1		4
Flow Rate (V _{PCE}), pc/h	1	115	224		3		334	182					0	957		195
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763		4.5436	4.5436					4.5436	4.5436	
Follow-Up Headway, s		2.6087		2.5352	2.5352					2.5352	2.5352	

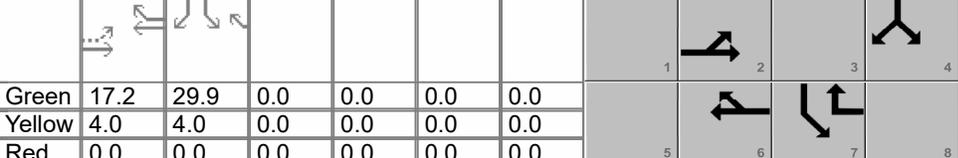
Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass									
Entry Flow (v _e), pc/h		340		337	182					957	195	
Entry Volume, veh/h		338		330	178					943	192	
Circulating Flow (v _c), pc/h	960			116			1300			338		
Exiting Flow (v _{ex}), pc/h	1184			530			297			0		
Capacity (C _{PCE}), pc/h		518		1278	1278					1044	1044	
Capacity (c), veh/h		515		1249	1249					1029	1029	
v/c Ratio (x)		0.66		0.26	0.14					0.92	0.19	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		22.6		5.2	4.1					31.7	5.2	
Lane LOS		C		A	A					D	A	
95% Queue Length, Q ₉₅ (veh)		4.7		1.1	0.5					14.2	0.7	
95% Queue Length, Q ₉₅ (ft)		117.5		28.2	12.6					357.8	18.1	
Approach Delay, s/veh LOS	22.6		C	4.8		A				27.2		D
Intersection Delay, s/veh LOS	20.7						C					

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	TRC			Duration, h	0.250	
Analyst	Dorin Papuc	Analysis Date	12/30/2025	Area Type	Other	
Jurisdiction		Time Period	M_2032 Total PM	PHF	0.97	
Urban Street	US 15	Analysis Year	2032	Analysis Period	1 > 7:00	
Intersection	5. SR 53 at US 15		File Name	5. Thomas Jefferson Parkway (SR 53) at James...		
Project Description	M_2032 Total PM					

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	112	215			315	175				919		182

Signal Information														
Cycle, s	55.1	Reference Phase	2	Green	17.2	29.9	0.0	0.0	0.0	0.0				
Offset, s	0	Reference Point	Begin	Yellow	4.0	4.0	0.0	0.0	0.0	0.0				
Uncoordinated	Yes	Simult. Gap E/W	On	Red	0.0	0.0	0.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6				4
Case Number		6.0		7.0				9.0
Phase Duration, s		21.2		21.2				33.9
Change Period, (Y+R _c), s		4.0		4.0				4.0
Max Allow Headway (MAH), s		3.1		3.1				3.1
Queue Clearance Time (g _s), s		15.6		10.0				30.1
Green Extension Time (g _e), s		1.6		1.6				0.0
Phase Call Probability		1.00		1.00				1.00
Max Out Probability		0.00		0.00				1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (v), veh/h	115	222			325	180				947		188
Adjusted Saturation Flow Rate (s), veh/h/ln	1072	1885			1856	1598				1795		1560
Queue Service Time (g _s), s	5.5	5.0			8.0	1.0				28.1		3.4
Cycle Queue Clearance Time (g _c), s	13.6	5.0			8.0	1.0				28.1		3.4
Green Ratio (g/C)	0.31	0.31			0.31	0.85				0.54		0.54
Capacity (c), veh/h	308	589			580	1365				973		845
Volume-to-Capacity Ratio (X)	0.375	0.376			0.560	0.132				0.974		0.222
Back of Queue (Q), ft/ln (95 th percentile)	54	80			128	0				474		34
Back of Queue (Q), veh/ln (95 th percentile)	2.2	3.2			5.0	0.0				18.8		1.3
Queue Storage Ratio (RQ) (95 th percentile)	0.54	0.00			0.00	0.00				0.96		0.32
Uniform Delay (d ₁), s/veh	21.4	14.7			15.7	0.7				12.2		6.6
Incremental Delay (d ₂), s/veh	0.3	0.1			0.3	0.0				22.4		0.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (d), s/veh	21.7	14.8			16.0	0.7				34.6		6.6
Level of Service (LOS)	C	B			B	A				C		A
Approach Delay, s/veh / LOS	17.2	B		10.6	B		0.0			30.0		C
Intersection Delay, s/veh / LOS	22.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.70	A	1.90	B	1.93	B	1.93	B
Bicycle LOS Score / LOS	1.04	A	1.32	A				F

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	TRC			Duration, h	0.250	
Analyst	Dorin Papuc	Analysis Date	12/29/2025	Area Type	Other	
Jurisdiction	VDOT	Time Period	2032 Total PM	PHF	0.96	
Urban Street	James Madison Highwa...	Analysis Year	2032	Analysis Period	1 > 4:30	
Intersection	6. US 250 at US 15		File Name	6. James Madison Highway (US 15) at 3 Notch R...		
Project Description	2032 Total PM					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	287	110	47	76	74	232	520	554	271	354	327	265

Signal Information												
Cycle, s	75.3	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
Green	14.3	1.4	15.6	4.9	3.4	11.8						
Yellow	4.0	4.0	4.0	4.0	4.0	4.0						
Red	0.0	0.0	0.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	16.2	23.1	8.9	15.8	23.7	25.0	18.3	19.6
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	3.0	3.1	3.0	3.1	3.0	3.1	3.0	3.1
Queue Clearance Time (g_s), s	11.9	3.9	5.0	10.8	19.6	12.7	13.9	12.1
Green Extension Time (g_e), s	0.4	1.0	0.1	1.0	0.1	3.5	0.4	3.5
Phase Call Probability	1.00	1.00	0.81	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.01	0.00	0.00	0.00	1.00	0.00	0.09	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	299	115	49	79	77	242	542	577	282	369	341	276
Adjusted Saturation Flow Rate (s), veh/h/ln	1795	1724	1560	1654	1766	1598	1711	1795	1585	1781	1795	1572
Queue Service Time (g_s), s	9.9	1.9	1.2	3.0	1.4	8.8	17.6	10.4	10.7	11.9	6.3	10.1
Cycle Queue Clearance Time (g_c), s	9.9	1.9	1.2	3.0	1.4	8.8	17.6	10.4	10.7	11.9	6.3	10.1
Green Ratio (g/C)	0.35	0.25	0.52	0.22	0.16	0.35	0.50	0.28	0.34	0.40	0.21	0.37
Capacity (c), veh/h	571	876	805	388	552	553	668	1003	545	530	744	581
Volume-to-Capacity Ratio (X)	0.524	0.131	0.061	0.204	0.140	0.437	0.811	0.575	0.518	0.696	0.458	0.475
Back of Queue (Q), ft/ln (95 th percentile)	167	34	16	52	26	132	292	180	161	199	112	150
Back of Queue (Q), veh/ln (95 th percentile)	6.6	1.3	0.6	1.9	1.0	5.2	11.1	7.2	6.4	7.8	4.4	5.9
Queue Storage Ratio (RQ) (95 th percentile)	0.88	0.00	0.03	0.31	0.00	0.63	0.90	0.00	0.85	0.96	0.00	0.79
Uniform Delay (d_1), s/veh	19.5	21.7	9.1	24.0	27.4	19.0	15.0	23.3	19.7	17.8	26.2	18.2
Incremental Delay (d_2), s/veh	0.3	0.0	0.0	0.1	0.0	0.2	6.8	0.2	0.3	1.4	0.2	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	19.8	21.7	9.1	24.1	27.5	19.2	21.8	23.5	20.0	19.2	26.3	18.4
Level of Service (LOS)	B	C	A	C	C	B	C	C	C	B	C	B
Approach Delay, s/veh / LOS	19.1	B		21.8	C		22.2	C		21.5	C	
Intersection Delay, s/veh / LOS	21.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.43	B	2.44	B	2.43	B	2.44	B
Bicycle LOS Score / LOS	0.87	A	0.82	A	1.64	B	1.30	A

APPENDIX C

**2028 Background
Traffic Signal Warrant
Analyses**

HCS Warrants Report

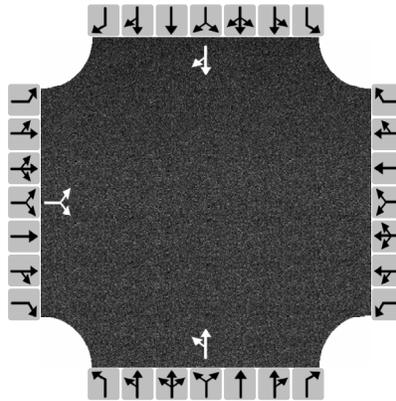
Project Information

Analyst	Dorin Papuc	Date	1/2/2026
Agency	TRC	Analysis Year	2028
Jurisdiction	VDOT	Time Period Analyzed	2028 Background
Units	U.S. Customary	MUTCD Method	MUTCD 11 (2023)
Project Description	1. Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)		

General

Major Street Direction	North-South	Population < 10,000	No
Starting Time Interval	7:00	Coordinated Signal System	No
Major Street Speed (mi/h)	45	Nearest Signal (ft)	0
Adequate Trials of Crash Exp. Alt.	No		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	0	0	0	0	0	0	1	0	0	1	0
Lane Usage		LR						LT			TR	
Vehicle Volumes Averages (veh/h)	58	0	19	0	0	0	14	86	0	0	107	48
Pedestrian median refuge available	No			No			No			No		
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	9.7			0.0			1.5			0.0		
Delay Averages (veh-hrs)	0.7			0.0			0.2			0.0		

School Crossing and Roadway Network

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

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	4

Volume Summary														
Hours	Major Volume (veh/h)	Minor Volume (veh/h)	Total Volume (veh/h)	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A ** (70%)	4B ** (70%)
7:00 - 8:00	567	256	823	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
8:00 - 9:00	859	292	1151	0	0	Yes	No	No						
9:00 - 10:00	0	0	0	0	0	No	No							
10:00 - 11:00	0	0	0	0	0	No	No							
11:00 - 12:00	0	0	0	0	0	No	No							
12:00 - 13:00	0	0	0	0	0	No	No							
13:00 - 14:00	0	0	0	0	0	No	No							
14:00 - 15:00	0	0	0	0	0	No	No							
15:00 - 16:00	0	0	0	0	0	No	No							
16:00 - 17:00	890	208	1098	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17:00 - 18:00	766	177	943	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18:00 - 19:00	0	0	0	0	0	No	No							
Total	3082	933	4015	0	0	4	4	4	4	4	1	4	0	0

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Pedestrian Volume									
15th % pedestrian speed < 3.5 ft/s				Pedestrian refuge present?			NB	SB	
Hours	Major Street Vehicular Volume (veh/h)			Major Street Pedestrian Volume (ped/h)			4A ** (70%)	4B ** (70%)	
	NB	SB	Total	NB	SB	Total			
7:00 - 8:00	201	366	567	0	0	0	No	No	
8:00 - 9:00	394	465	859	0	0	0	No	No	
9:00 - 10:00	0	0	0	0	0	0	No	No	
10:00 - 11:00	0	0	0	0	0	0	No	No	
11:00 - 12:00	0	0	0	0	0	0	No	No	
12:00 - 13:00	0	0	0	0	0	0	No	No	
13:00 - 14:00	0	0	0	0	0	0	No	No	
14:00 - 15:00	0	0	0	0	0	0	No	No	
15:00 - 16:00	0	0	0	0	0	0	No	No	
16:00 - 17:00	366	524	890	0	0	0	No	No	
17:00 - 18:00	247	519	766	0	0	0	No	No	
18:00 - 19:00	0	0	0	0	0	0	No	No	
Totals	1208	1874	3082	0	0	0	0	0	

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Warrants	
Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- more critical minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- more critical minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- more critical minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✓

Four-Hour Vehicular Volume (Both major approaches --and-- more critical minor approach)	✓
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- more critical minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. Peak-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported Crash History --and--	
B1. Angle Crashes and Pedestrian Crashes within a 1-year Period (All Severities)	
B2. Angle Crashes and Pedestrian Crashes within a 1-year Period (Fatal-and-Injury)	
B3. Angle Crashes and Pedestrian Crashes within a 3-year Period (All Severities)	
B4. Angle Crashes and Pedestrian Crashes within a 3-year Period (Fatal-and-Injury)	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS Warrants Report

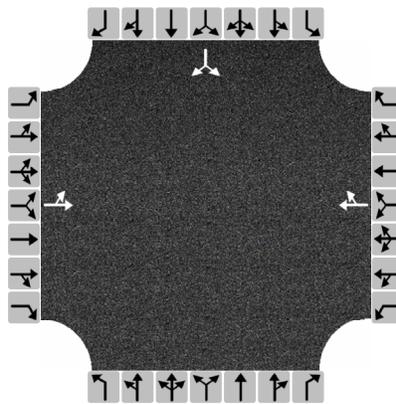
Project Information

Analyst	Dorin Papuc	Date	1/2/2026
Agency	TRC	Analysis Year	2028
Jurisdiction	VDOT	Time Period Analyzed	2028 Background
Units	U.S. Customary	MUTCD Method	MUTCD 11 (2023)
Project Description	5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7:00	Coordinated Signal System	No
Major Street Speed (mi/h)	45	Nearest Signal (ft)	0
Adequate Trials of Crash Exp. Alt.	No		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	1	0	0	1	0	0	0	0	0	0	0
Lane Usage		LT			TR						LR	
Vehicle Volumes Averages (veh/h)	56	86	0	0	81	46	0	0	0	39	0	63
Pedestrian median refuge available	No			No			No			No		
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	2.8			2.3			0.0			1.8		
Delay Averages (veh-hrs)	0.4			0.2			0.0			0.2		

School Crossing and Roadway Network

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

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	6

Volume Summary														
Hours	Major Volume (veh/h)	Minor Volume (veh/h)	Total Volume (veh/h)	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A ** (70%)	4B ** (70%)
7:00 - 8:00	815	319	1134	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
8:00 - 9:00	1003	314	1317	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
9:00 - 10:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
10:00 - 11:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
11:00 - 12:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
12:00 - 13:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
13:00 - 14:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
14:00 - 15:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
15:00 - 16:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
16:00 - 17:00	785	338	1123	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17:00 - 18:00	651	260	911	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18:00 - 19:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	3254	1231	4485	0	0	4	4	4	4	4	0	4	0	0

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Pedestrian Volume										
15th % pedestrian speed < 3.5 ft/s				Pedestrian refuge present?			EB		WB	
Hours	Major Street Vehicular Volume (veh/h)			Major Street Pedestrian Volume (ped/h)			4A ** (70%)	4B ** (70%)		
	EB	WB	Total	EB	WB	Total				
7:00 - 8:00	492	323	815	0	0	0	No	No		
8:00 - 9:00	665	338	1003	0	0	0	No	No		
9:00 - 10:00	0	0	0	0	0	0	No	No		
10:00 - 11:00	0	0	0	0	0	0	No	No		
11:00 - 12:00	0	0	0	0	0	0	No	No		
12:00 - 13:00	0	0	0	0	0	0	No	No		
13:00 - 14:00	0	0	0	0	0	0	No	No		
14:00 - 15:00	0	0	0	0	0	0	No	No		
15:00 - 16:00	0	0	0	0	0	0	No	No		
16:00 - 17:00	314	471	785	0	0	0	No	No		
17:00 - 18:00	246	405	651	0	0	0	No	No		
18:00 - 19:00	0	0	0	0	0	0	No	No		
Totals	1717	1537	3254	0	0	0	0	0		

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Warrants	
Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- more critical minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- more critical minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- more critical minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✓

Four-Hour Vehicular Volume (Both major approaches --and-- more critical minor approach)	✓
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- more critical minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. Peak-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported Crash History --and--	
B1. Angle Crashes and Pedestrian Crashes within a 1-year Period (All Severities)	
B2. Angle Crashes and Pedestrian Crashes within a 1-year Period (Fatal-and-Injury)	
B3. Angle Crashes and Pedestrian Crashes within a 3-year Period (All Severities)	
B4. Angle Crashes and Pedestrian Crashes within a 3-year Period (Fatal-and-Injury)	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

**2032 Background
Traffic Signal Warrant
Analyses**

HCS Warrants Report

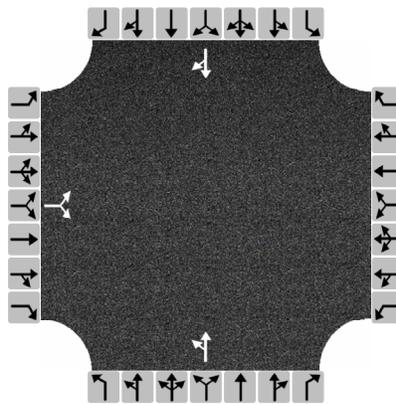
Project Information

Analyst	Dorin Papuc	Date	1/2/2026
Agency	TRC	Analysis Year	2032
Jurisdiction	VDOT	Time Period Analyzed	2032 Background
Units	U.S. Customary	MUTCD Method	MUTCD 11 (2023)
Project Description	1. Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)		

General

Major Street Direction	North-South	Population < 10,000	No
Starting Time Interval	7:00	Coordinated Signal System	No
Major Street Speed (mi/h)	45	Nearest Signal (ft)	0
Adequate Trials of Crash Exp. Alt.	No		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	0	0	0	0	0	0	1	0	0	1	0
Lane Usage		LR						LT			TR	
Vehicle Volumes Averages (veh/h)	62	0	20	0	0	0	15	92	0	0	109	50
Pedestrian median refuge available	No			No			No			No		
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	22.3			0.0			2.0			0.0		
Delay Averages (veh-hrs)	1.6			0.0			0.2			0.0		

School Crossing and Roadway Network

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

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	4

Volume Summary														
Hours	Major Volume (veh/h)	Minor Volume (veh/h)	Total Volume (veh/h)	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A ** (70%)	4B ** (70%)
7:00 - 8:00	567	256	823	0	0	Yes	No	No						
8:00 - 9:00	923	330	1253	0	0	Yes	No	No						
9:00 - 10:00	0	0	0	0	0	No	No							
10:00 - 11:00	0	0	0	0	0	No	No							
11:00 - 12:00	0	0	0	0	0	No	No							
12:00 - 13:00	0	0	0	0	0	No	No							
13:00 - 14:00	0	0	0	0	0	No	No							
14:00 - 15:00	0	0	0	0	0	No	No							
15:00 - 16:00	0	0	0	0	0	No	No							
16:00 - 17:00	955	235	1190	0	0	Yes	No	No						
17:00 - 18:00	766	177	943	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18:00 - 19:00	0	0	0	0	0	No	No							
Total	3211	998	4209	0	0	4	4	4	4	4	3	4	0	0

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Pedestrian Volume									
15th % pedestrian speed < 3.5 ft/s				Pedestrian refuge present?			NB	SB	
Hours	Major Street Vehicular Volume (veh/h)			Major Street Pedestrian Volume (ped/h)			4A ** (70%)	4B ** (70%)	
	NB	SB	Total	NB	SB	Total			
7:00 - 8:00	201	366	567	0	0	0	No	No	
8:00 - 9:00	437	486	923	0	0	0	No	No	
9:00 - 10:00	0	0	0	0	0	0	No	No	
10:00 - 11:00	0	0	0	0	0	0	No	No	
11:00 - 12:00	0	0	0	0	0	0	No	No	
12:00 - 13:00	0	0	0	0	0	0	No	No	
13:00 - 14:00	0	0	0	0	0	0	No	No	
14:00 - 15:00	0	0	0	0	0	0	No	No	
15:00 - 16:00	0	0	0	0	0	0	No	No	
16:00 - 17:00	406	549	955	0	0	0	No	No	
17:00 - 18:00	247	519	766	0	0	0	No	No	
18:00 - 19:00	0	0	0	0	0	0	No	No	
Totals	1291	1920	3211	0	0	0	0	0	

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Warrants	
Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- more critical minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- more critical minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- more critical minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✓

Four-Hour Vehicular Volume (Both major approaches --and-- more critical minor approach)	✓
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- more critical minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. Peak-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported Crash History --and--	
B1. Angle Crashes and Pedestrian Crashes within a 1-year Period (All Severities)	
B2. Angle Crashes and Pedestrian Crashes within a 1-year Period (Fatal-and-Injury)	
B3. Angle Crashes and Pedestrian Crashes within a 3-year Period (All Severities)	
B4. Angle Crashes and Pedestrian Crashes within a 3-year Period (Fatal-and-Injury)	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS Warrants Report

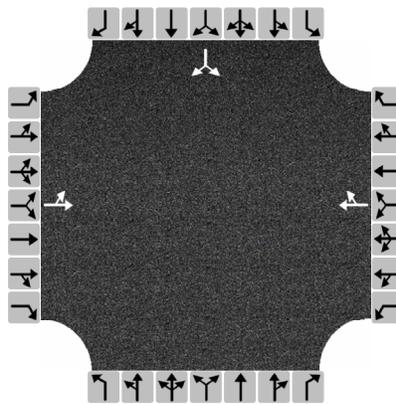
Project Information

Analyst	Dorin Papuc	Date	1/2/2026
Agency	TRC	Analysis Year	2032
Jurisdiction	VDOT	Time Period Analyzed	2032 Background
Units	U.S. Customary	MUTCD Method	MUTCD 11 (2023)
Project Description	5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7:00	Coordinated Signal System	No
Major Street Speed (mi/h)	45	Nearest Signal (ft)	0
Adequate Trials of Crash Exp. Alt.	No		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	1	0	0	1	0	0	0	0	0	0	0
Lane Usage		LT			TR						LR	
Vehicle Volumes Averages (veh/h)	57	88	0	0	82	48	0	0	0	41	0	66
Pedestrian median refuge available	No			No			No			No		
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	2.9			2.3			0.0			2.0		
Delay Averages (veh-hrs)	0.4			0.3			0.0			0.2		

School Crossing and Roadway Network

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

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	6

Volume Summary														
Hours	Major Volume (veh/h)	Minor Volume (veh/h)	Total Volume (veh/h)	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A ** (70%)	4B ** (70%)
7:00 - 8:00	815	319	1134	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
8:00 - 9:00	1046	349	1395	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
9:00 - 10:00	0	0	0	0	0	No	No							
10:00 - 11:00	0	0	0	0	0	No	No							
11:00 - 12:00	0	0	0	0	0	No	No							
12:00 - 13:00	0	0	0	0	0	No	No							
13:00 - 14:00	0	0	0	0	0	No	No							
14:00 - 15:00	0	0	0	0	0	No	No							
15:00 - 16:00	0	0	0	0	0	No	No							
16:00 - 17:00	817	376	1193	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17:00 - 18:00	651	260	911	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18:00 - 19:00	0	0	0	0	0	No	No							
Total	3329	1304	4633	0	0	4	4	4	4	4	0	4	0	0

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Pedestrian Volume									
15th % pedestrian speed < 3.5 ft/s				Pedestrian refuge present?			EB	WB	
Hours	Major Street Vehicular Volume (veh/h)			Major Street Pedestrian Volume (ped/h)			4A ** (70%)	4B ** (70%)	
	EB	WB	Total	EB	WB	Total			
7:00 - 8:00	492	323	815	0	0	0	No	No	
8:00 - 9:00	694	352	1046	0	0	0	No	No	
9:00 - 10:00	0	0	0	0	0	0	No	No	
10:00 - 11:00	0	0	0	0	0	0	No	No	
11:00 - 12:00	0	0	0	0	0	0	No	No	
12:00 - 13:00	0	0	0	0	0	0	No	No	
13:00 - 14:00	0	0	0	0	0	0	No	No	
14:00 - 15:00	0	0	0	0	0	0	No	No	
15:00 - 16:00	0	0	0	0	0	0	No	No	
16:00 - 17:00	327	490	817	0	0	0	No	No	
17:00 - 18:00	246	405	651	0	0	0	No	No	
18:00 - 19:00	0	0	0	0	0	0	No	No	
Totals	1759	1570	3329	0	0	0	0	0	

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Warrants	
Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- more critical minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- more critical minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- more critical minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✓

Four-Hour Vehicular Volume (Both major approaches --and-- more critical minor approach)	✓
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- more critical minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. Peak-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported Crash History --and--	
B1. Angle Crashes and Pedestrian Crashes within a 1-year Period (All Severities)	
B2. Angle Crashes and Pedestrian Crashes within a 1-year Period (Fatal-and-Injury)	
B3. Angle Crashes and Pedestrian Crashes within a 3-year Period (All Severities)	
B4. Angle Crashes and Pedestrian Crashes within a 3-year Period (Fatal-and-Injury)	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

**2032 Total Traffic
Signal Warrant
Analyses**

HCS Warrants Report

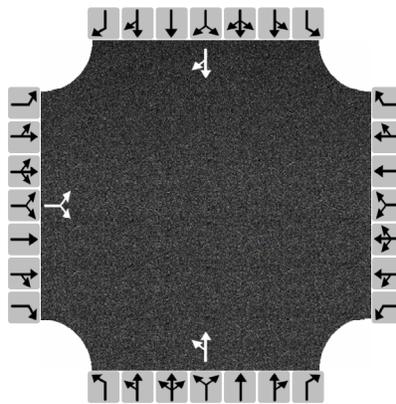
Project Information

Analyst	Dorin Papuc	Date	1/2/2026
Agency	TRC	Analysis Year	2032
Jurisdiction	VDOT	Time Period Analyzed	2032 Total Traffic
Units	U.S. Customary	MUTCD Method	MUTCD 11 (2023)
Project Description	1. Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)		

General

Major Street Direction	North-South	Population < 10,000	No
Starting Time Interval	7:00	Coordinated Signal System	No
Major Street Speed (mi/h)	45	Nearest Signal (ft)	0
Adequate Trials of Crash Exp. Alt.	No		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	0	0	0	0	0	0	1	0	0	1	0
Lane Usage		LR						LT			TR	
Vehicle Volumes Averages (veh/h)	62	0	81	0	0	0	76	92	0	0	109	50
Pedestrian median refuge available	No			No			No			No		
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	138.6			0.0			3.2			0.0		
Delay Averages (veh-hrs)	21.8			0.0			0.7			0.0		

School Crossing and Roadway Network

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

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	4

Volume Summary														
Hours	Major Volume (veh/h)	Minor Volume (veh/h)	Total Volume (veh/h)	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A ** (70%)	4B ** (70%)
7:00 - 8:00	567	256	823	0	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
8:00 - 9:00	1648	330	1978	0	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
9:00 - 10:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
10:00 - 11:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
11:00 - 12:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
12:00 - 13:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
13:00 - 14:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
14:00 - 15:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
15:00 - 16:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
16:00 - 17:00	955	960	1915	0	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
17:00 - 18:00	766	177	943	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18:00 - 19:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	3936	1723	5659	0	0	4	4	4	4	4	3	4	0	0

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Pedestrian Volume									
15th % pedestrian speed < 3.5 ft/s				Pedestrian refuge present?			NB	SB	
Hours	Major Street Vehicular Volume (veh/h)			Major Street Pedestrian Volume (ped/h)			4A ** (70%)	4B ** (70%)	
	NB	SB	Total	NB	SB	Total			
7:00 - 8:00	201	366	567	0	0	0	No	No	
8:00 - 9:00	1162	486	1648	0	0	0	No	No	
9:00 - 10:00	0	0	0	0	0	0	No	No	
10:00 - 11:00	0	0	0	0	0	0	No	No	
11:00 - 12:00	0	0	0	0	0	0	No	No	
12:00 - 13:00	0	0	0	0	0	0	No	No	
13:00 - 14:00	0	0	0	0	0	0	No	No	
14:00 - 15:00	0	0	0	0	0	0	No	No	
15:00 - 16:00	0	0	0	0	0	0	No	No	
16:00 - 17:00	406	549	955	0	0	0	No	No	
17:00 - 18:00	247	519	766	0	0	0	No	No	
18:00 - 19:00	0	0	0	0	0	0	No	No	
Totals	2016	1920	3936	0	0	0	0	0	

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Warrants	
Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- more critical minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- more critical minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- more critical minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✓

Four-Hour Vehicular Volume (Both major approaches --and-- more critical minor approach)	✓
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- more critical minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. Peak-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported Crash History --and--	
B1. Angle Crashes and Pedestrian Crashes within a 1-year Period (All Severities)	
B2. Angle Crashes and Pedestrian Crashes within a 1-year Period (Fatal-and-Injury)	
B3. Angle Crashes and Pedestrian Crashes within a 3-year Period (All Severities)	
B4. Angle Crashes and Pedestrian Crashes within a 3-year Period (Fatal-and-Injury)	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS Warrants Report

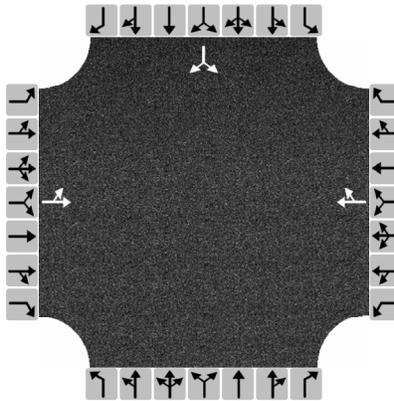
Project Information

Analyst	Dorin Papuc	Date	1/2/2026
Agency	TRC	Analysis Year	2032
Jurisdiction	VDOT	Time Period Analyzed	2032 Total Traffic
Units	U.S. Customary	MUTCD Method	MUTCD 11 (2023)
Project Description	5. Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7:00	Coordinated Signal System	No
Major Street Speed (mi/h)	45	Nearest Signal (ft)	0
Adequate Trials of Crash Exp. Alt.	No		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	1	0	0	1	0	0	0	0	0	0	0
Lane Usage		LT			TR						LR	
Vehicle Volumes Averages (veh/h)	57	88	0	0	82	108	0	0	0	102	0	66
Pedestrian median refuge available	No			No			No			No		
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay Averages (s/veh)	4.2			22.5			0.0			14.2		
Delay Averages (veh-hrs)	0.6			6.5			0.0			3.3		

School Crossing and Roadway Network

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

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	6

Volume Summary														
Hours	Major Volume (veh/h)	Minor Volume (veh/h)	Total Volume (veh/h)	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (56%)	4A ** (70%)	4B ** (70%)
7:00 - 8:00	815	319	1134	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
8:00 - 9:00	1771	349	2120	0	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
9:00 - 10:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
10:00 - 11:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
11:00 - 12:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
12:00 - 13:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
13:00 - 14:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
14:00 - 15:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
15:00 - 16:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
16:00 - 17:00	818	1101	1919	0	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
17:00 - 18:00	651	260	911	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18:00 - 19:00	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	4055	2029	6084	0	0	4	4	4	4	4	2	4	0	0

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Pedestrian Volume									
15th % pedestrian speed < 3.5 ft/s				Pedestrian refuge present?			EB	WB	
Hours	Major Street Vehicular Volume (veh/h)			Major Street Pedestrian Volume (ped/h)			4A ** (70%)	4B ** (70%)	
	EB	WB	Total	EB	WB	Total			
7:00 - 8:00	492	323	815	0	0	0	No	No	
8:00 - 9:00	694	1077	1771	0	0	0	No	No	
9:00 - 10:00	0	0	0	0	0	0	No	No	
10:00 - 11:00	0	0	0	0	0	0	No	No	
11:00 - 12:00	0	0	0	0	0	0	No	No	
12:00 - 13:00	0	0	0	0	0	0	No	No	
13:00 - 14:00	0	0	0	0	0	0	No	No	
14:00 - 15:00	0	0	0	0	0	0	No	No	
15:00 - 16:00	0	0	0	0	0	0	No	No	
16:00 - 17:00	328	490	818	0	0	0	No	No	
17:00 - 18:00	246	405	651	0	0	0	No	No	
18:00 - 19:00	0	0	0	0	0	0	No	No	
Totals	1760	2295	4055	0	0	0	0	0	

** Warrant 4 should not be applied where the nearest traffic signal or stop-sign control is < 300 ft, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Warrants	
Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- more critical minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- more critical minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- more critical minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✓

Four-Hour Vehicular Volume (Both major approaches --and-- more critical minor approach)	✓
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- more critical minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. Peak-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported Crash History --and--	
B1. Angle Crashes and Pedestrian Crashes within a 1-year Period (All Severities)	
B2. Angle Crashes and Pedestrian Crashes within a 1-year Period (Fatal-and-Injury)	
B3. Angle Crashes and Pedestrian Crashes within a 3-year Period (All Severities)	
B4. Angle Crashes and Pedestrian Crashes within a 3-year Period (Fatal-and-Injury)	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

APPENDIX D

**WARRANTS FOR LEFT TURN
STORAGE LANES**

INTERSECTION 2

Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

2

S=200 ft

AM

$V_a = 852$ VPH

$V_o = 143$ VPH

L=65

L%=7.63%

V=45MPH. Use 50MPH

T% (WBL) = 7.7% < 10%

No Truck Adj.

FIGURE 3-10 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

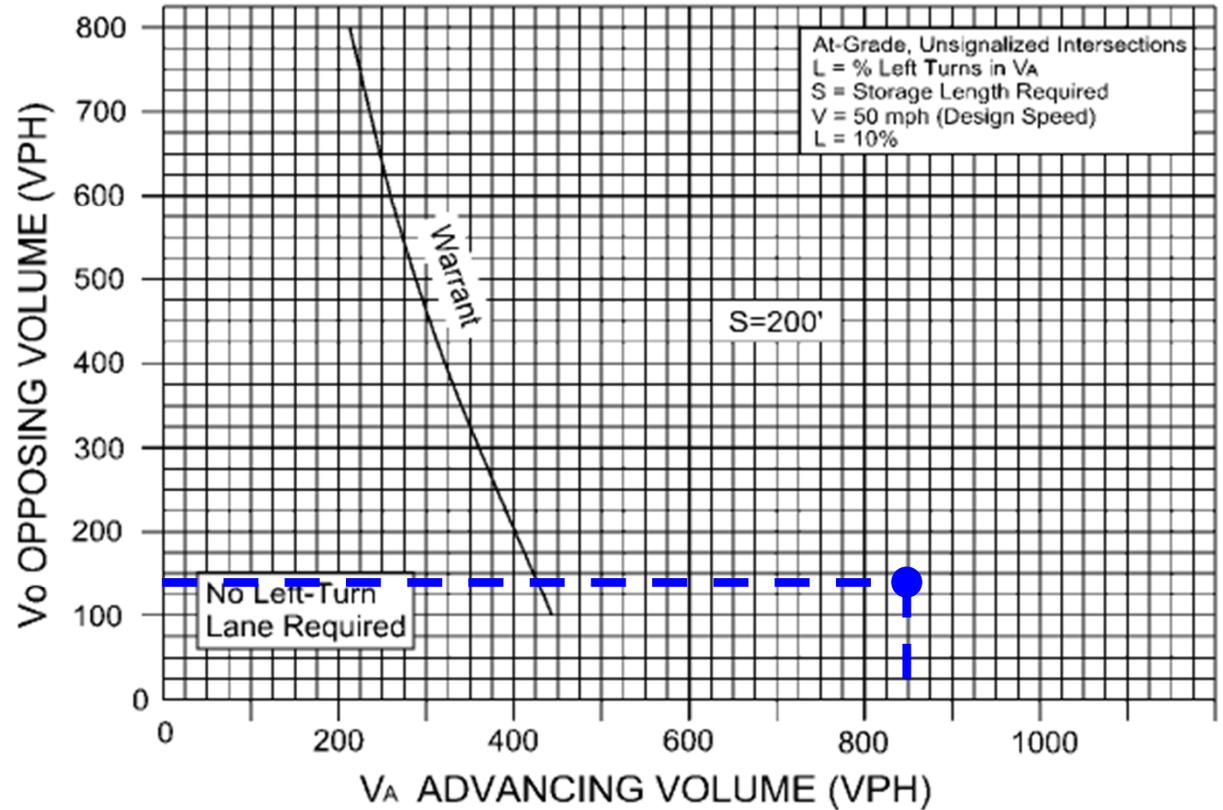


FIGURE 3-11 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

FIGURE 51A: Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

2

S=200 ft

PM

V_a=374 VPH

V_o=847 VPH

L=220

L%=58.82%

V=45MPH. Use 50MPH

T% (WBL) =0.6% < 10%

No Truck Adj.

FIGURE 3-14 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

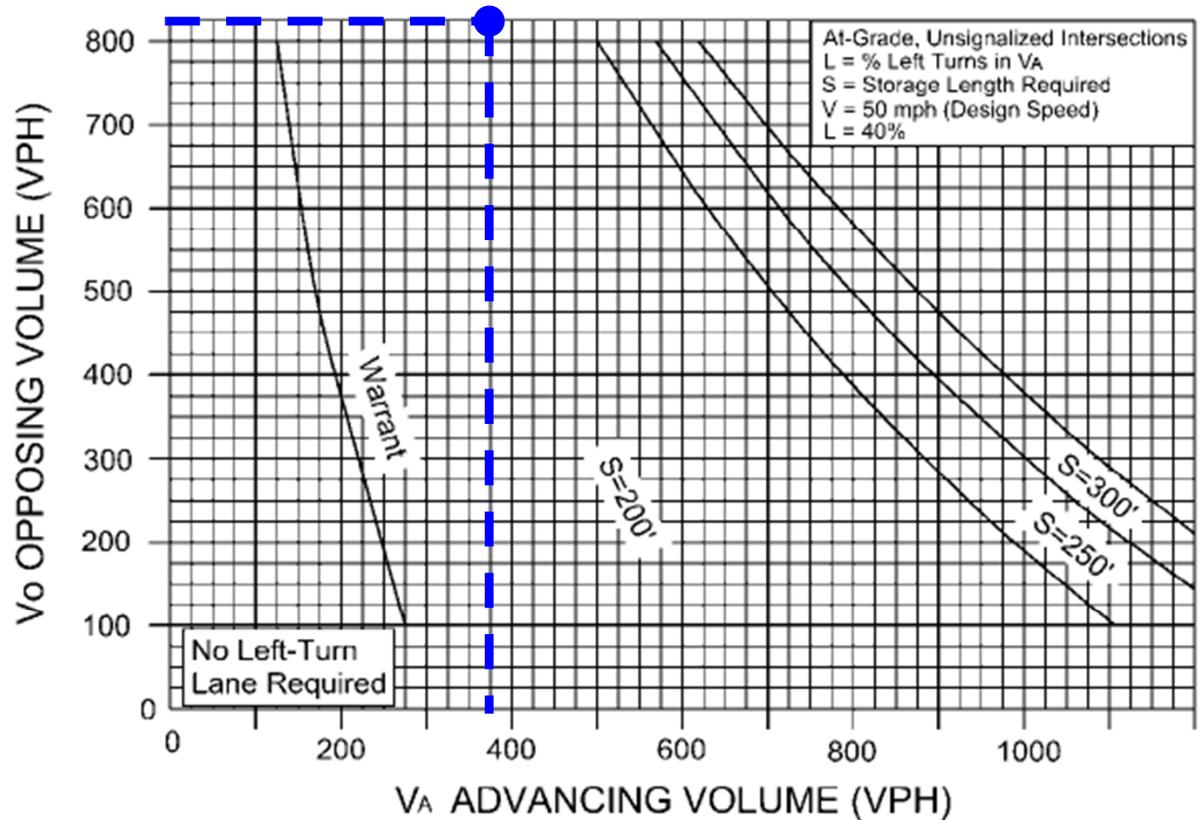


FIGURE 3-15 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

FIGURE 51B: Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

INTERSECTION 3

Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

3

S=200 ft

FIGURE 3-14 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

AM

V_a=775 VPH

V_o=50 VPH

L=750

L%=96.77%.

V=45MPH. Use 50MPH

T% (WBL) =0% < 10%

No Truck Adj.

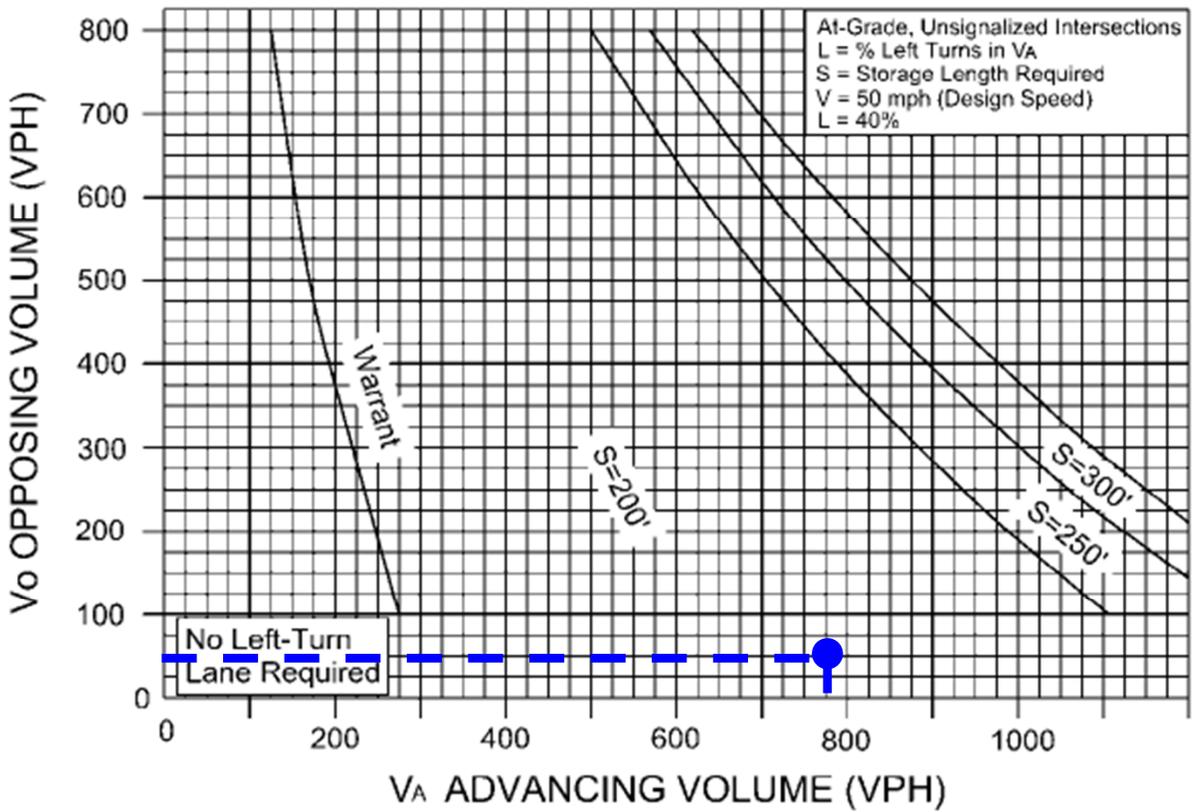


FIGURE 3-15 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

FIGURE 52A: Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

PM

$V_a = 106$ VPH

$V_o = 48$ VPH

$L = 45$

$L\% = 42.45\%$

$V = 45$ MPH. Use 50 MPH

$T\% (WBL) = 0\% < 10\%$

No Truck Adj.

FIGURE 3-14 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

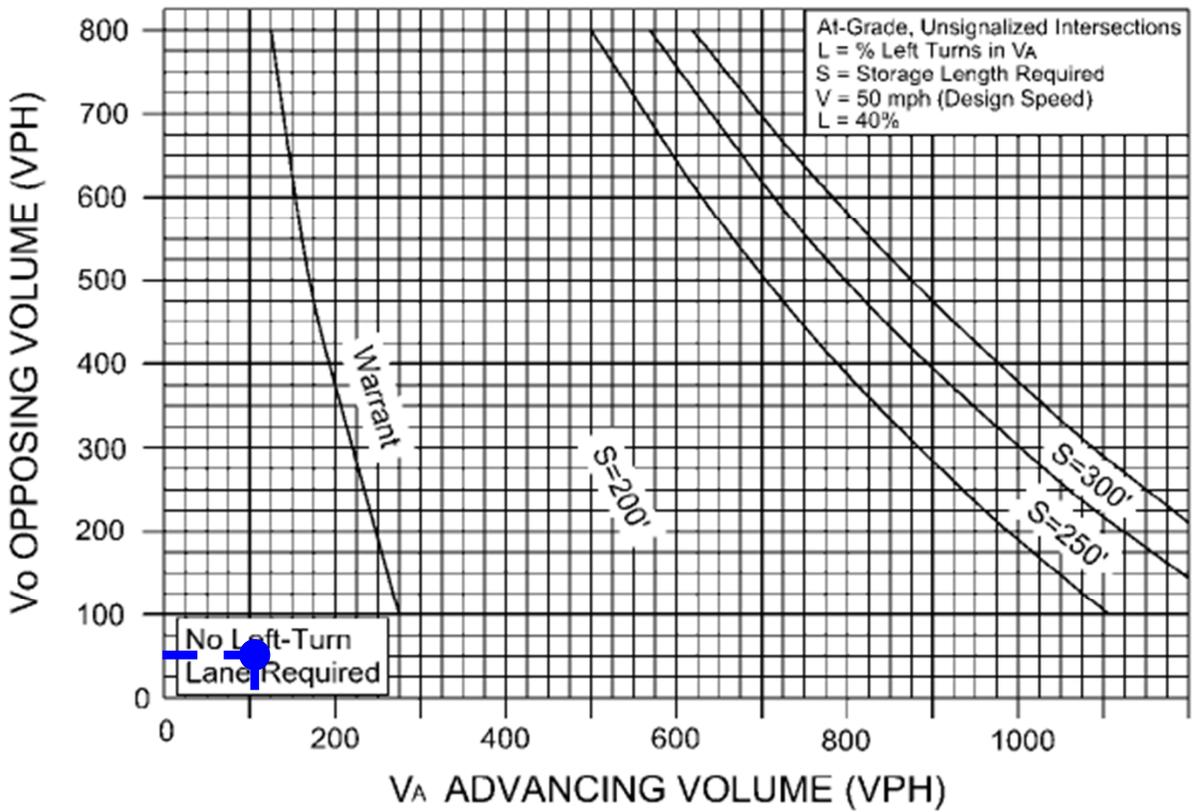


FIGURE 3-15 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

INTERSECTION 4

Branch Rd (SR 761) at Rolling Rd (SR 620)

AM

$V_a = 66$ VPH

$V_o = 178$ VPH

$L = 51$

$L\% = 77.27\%$

$V = 45$ MPH. Use 50 MPH

$T\% (SBL) = 10\%$

Truck Adj. = +25 feet

CHART VALUE OF STORAGE LANE REQUIRED	% TL=% TRUCKS IN VPH turning left					
	0%	10%	20%	30%	40%	50%
100'	0'	25'	25'	50'	50'	50'
125'	0'	25'	25'	50'	50'	75'
150'	0'	25'	50'	50'	75'	75'
175'	0'	25'	50'	75'	75'	100'
200'	0'	25'	50'	75'	100'	100'
250'	0'	25'	50'	75'	100'	125'
300'	0'	50'	75'	100'	125'	150'
350'	0'	50'	75'	125'	150'	175'
400'	0'	50'	100'	125'	175'	200'
450'	0'	50'	100'	150'	200'	225'
500'	0'	50'	100'	150'	200'	250'

TABLE 3-1 TRUCK ADJUSTMENTS

FIGURE 3-14 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

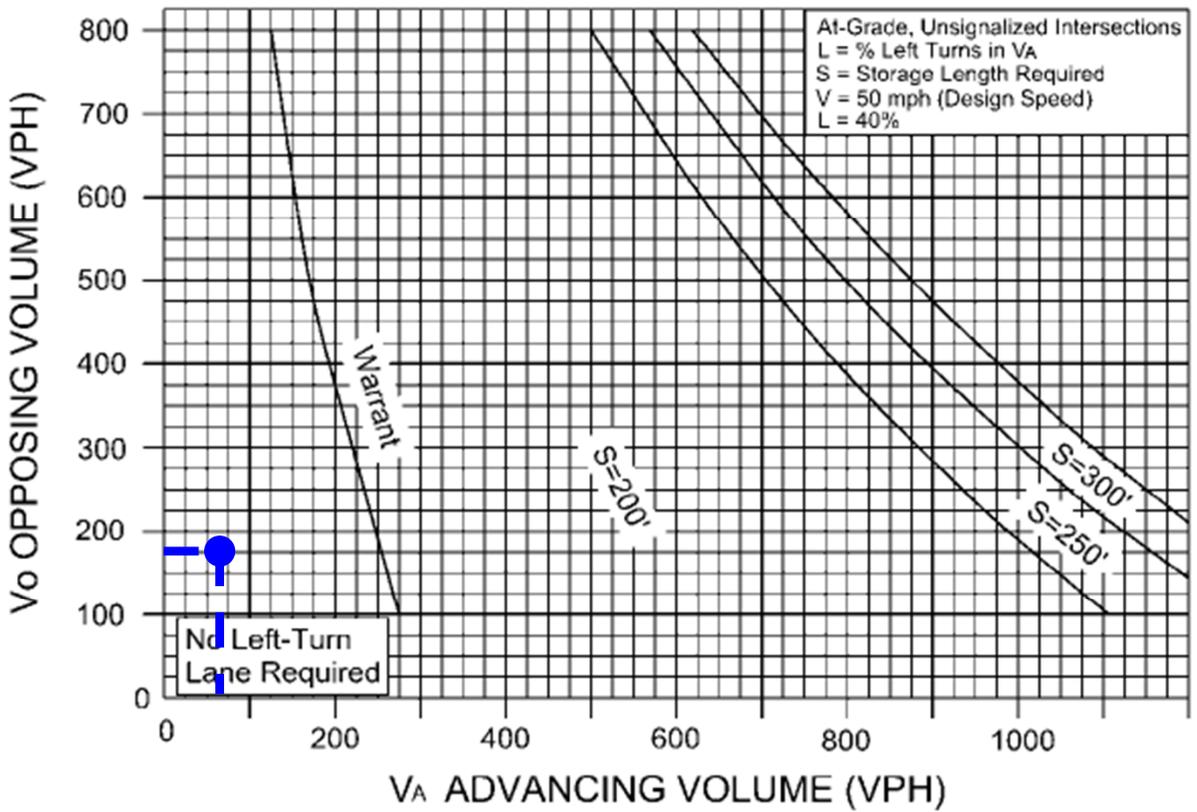


FIGURE 3-15 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

4

NO LANE REQUIRED

FIGURE 3-12 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

PM

$V_a = 141$ cars

$V_o = 55$ cars

$L = 22$

$L\% = 15.60\%$

$V = 45$ MPH. Use 50 MPH

$T\% (SBL) = 0\% < 10\%$

No Truck Adj.

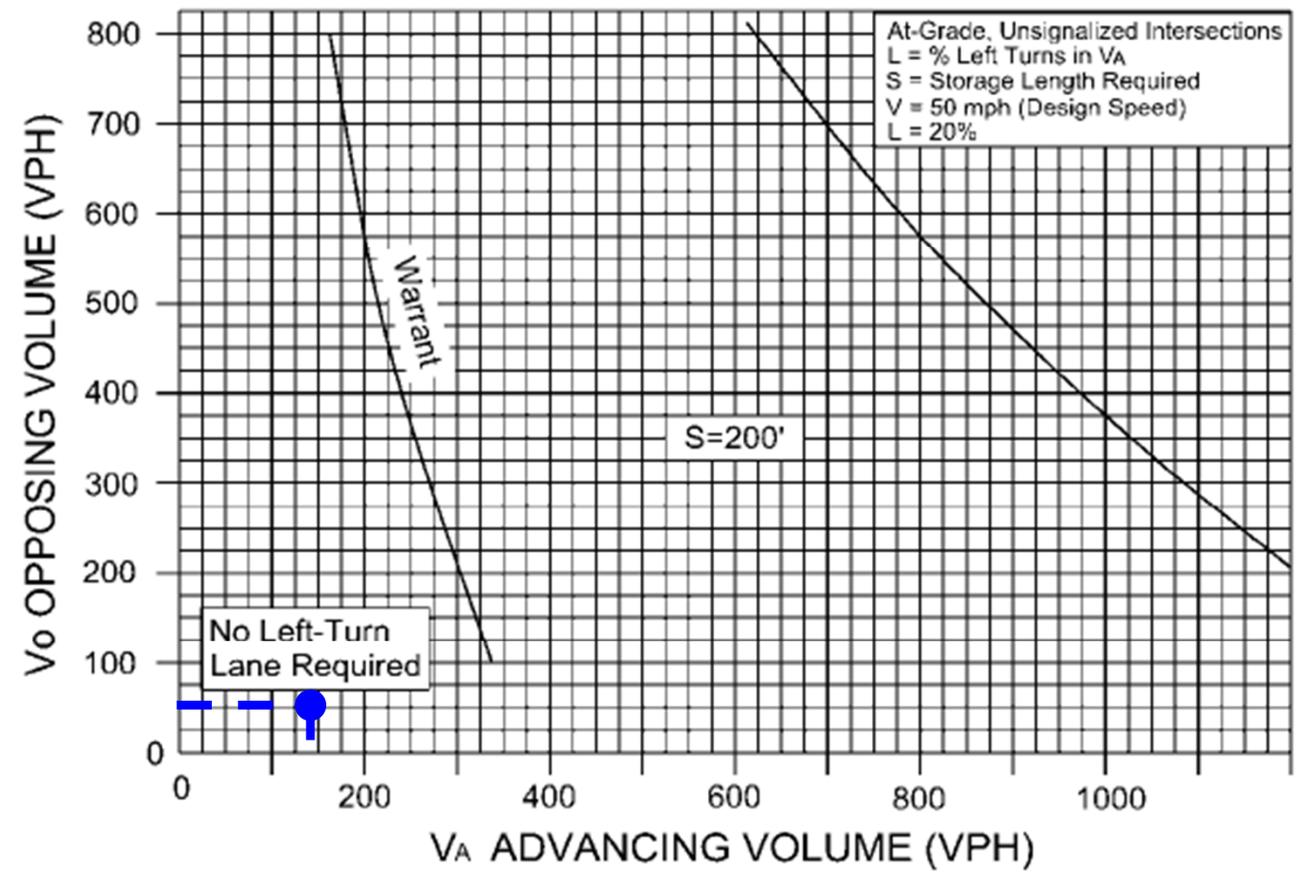


FIGURE 3-13 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

FIGURE 53B: Branch Rd (SR 761) at Rolling Rd (SR 620)

INTERSECTION 7

Tenaska Operations driveway at Branch Rd (SR 761)

7

S=200 ft

AM

$V_a=134$ VPH

$V_o=754$ VPH

L=80

L%=59.70%.

V=45MPH. Use 50MPH

T% (EBL) =0%<10%

No Truck Adj.

FIGURE 3-14 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

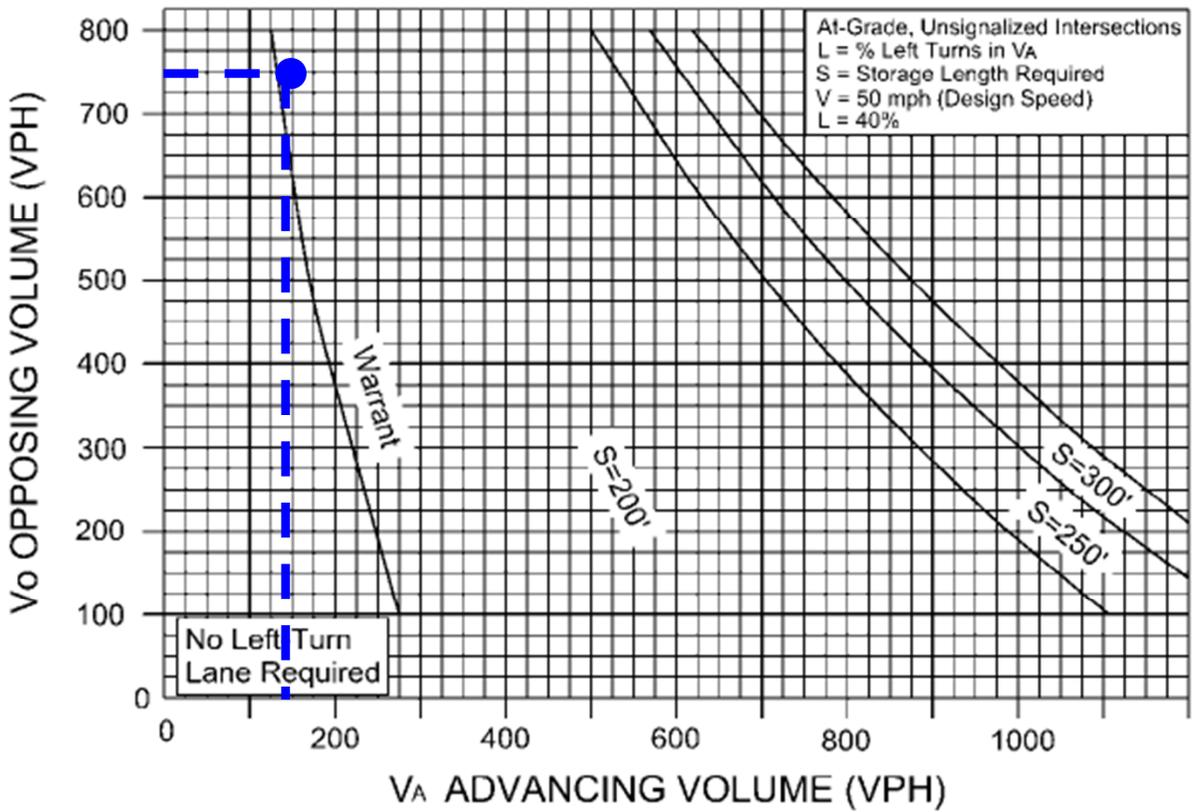


FIGURE 3-15 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

FIGURE 54A: Tenaska Operations driveway at Branch Rd (SR 761)

7

NO LANE REQUIRED

PM

$V_a = 35$ cars

$V_o = 60$ cars

$L = 0$

$L\% = 0\%$

$V = 45$ MPH. Use 50 MPH

$T\% (EBL) = 0\%$

No Truck Adj.

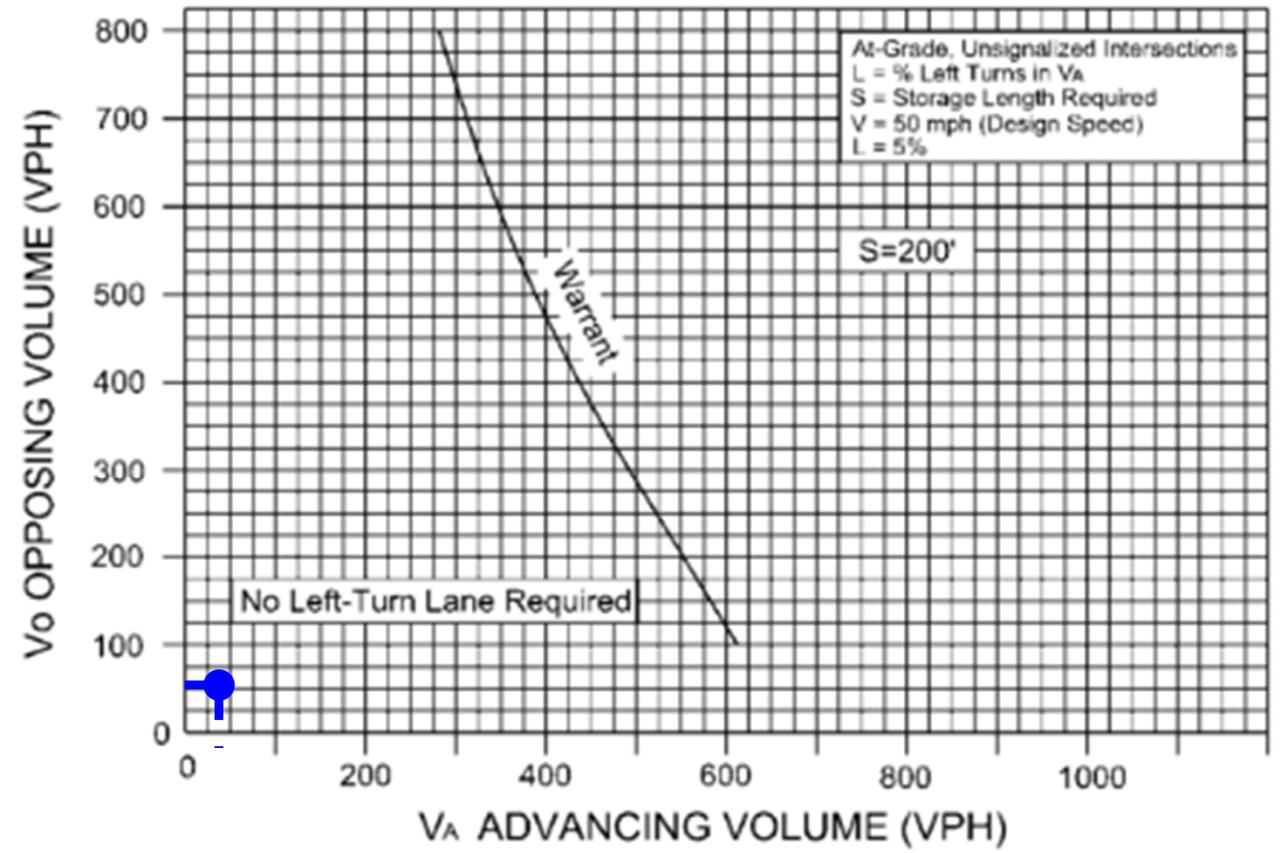


FIGURE 3-10 WARRANT FOR LEFT TURN STORAGE LANES ON TWO LANE HIGHWAY

**WARRANTS FOR RIGHT TURN
STORAGE LANES**

INTERSECTION 2

Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

2

NO LANE REQUIRED

AM

$PHV_{AT} = 143$ VPH

$PHV_{RT} = 6$ VPH

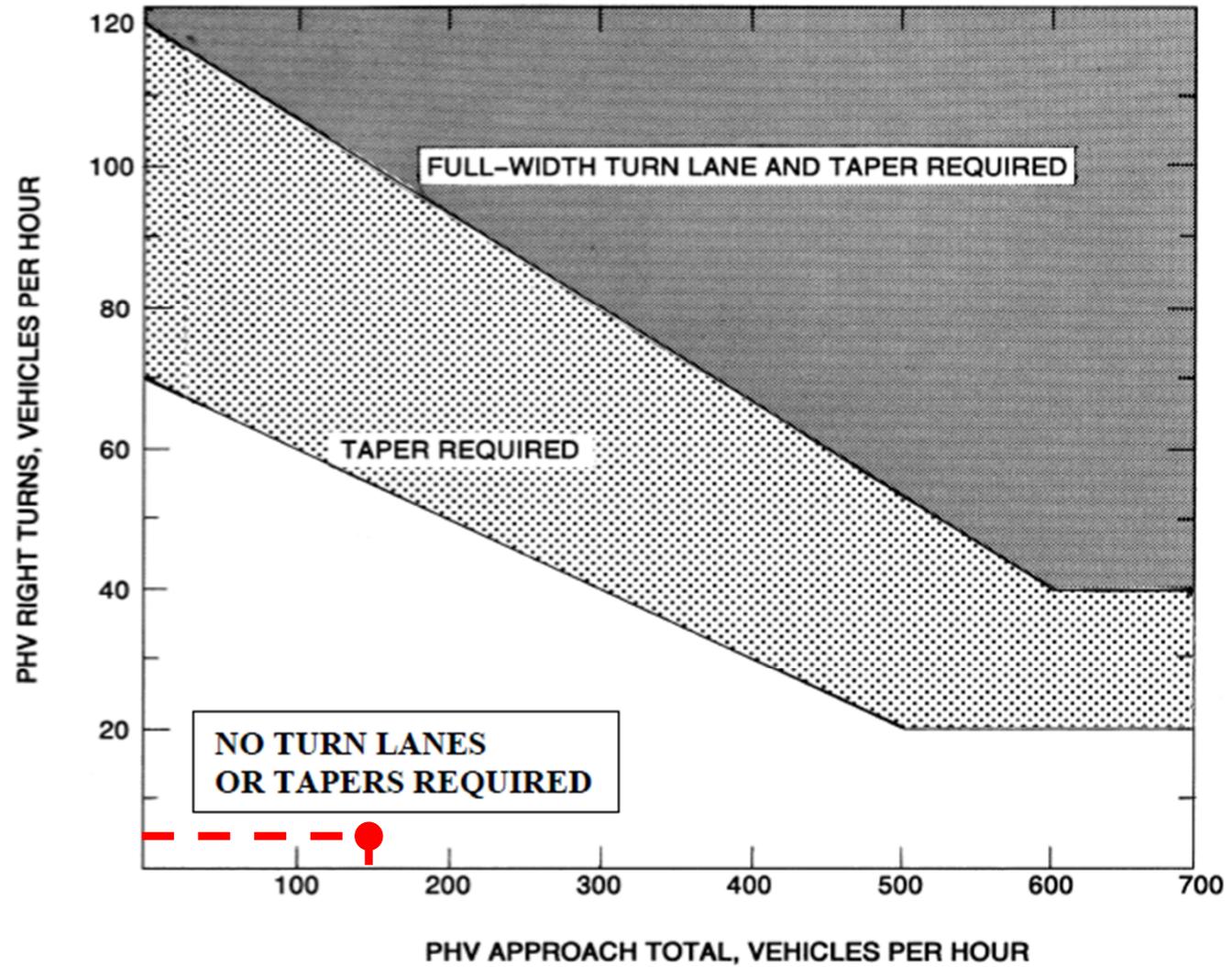


FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

FIGURE 55A: Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

2

NO LANE REQUIRED

PM

$PHV_{AT} = 847$ VPH

$PHV_{RT} = 7$ VPH

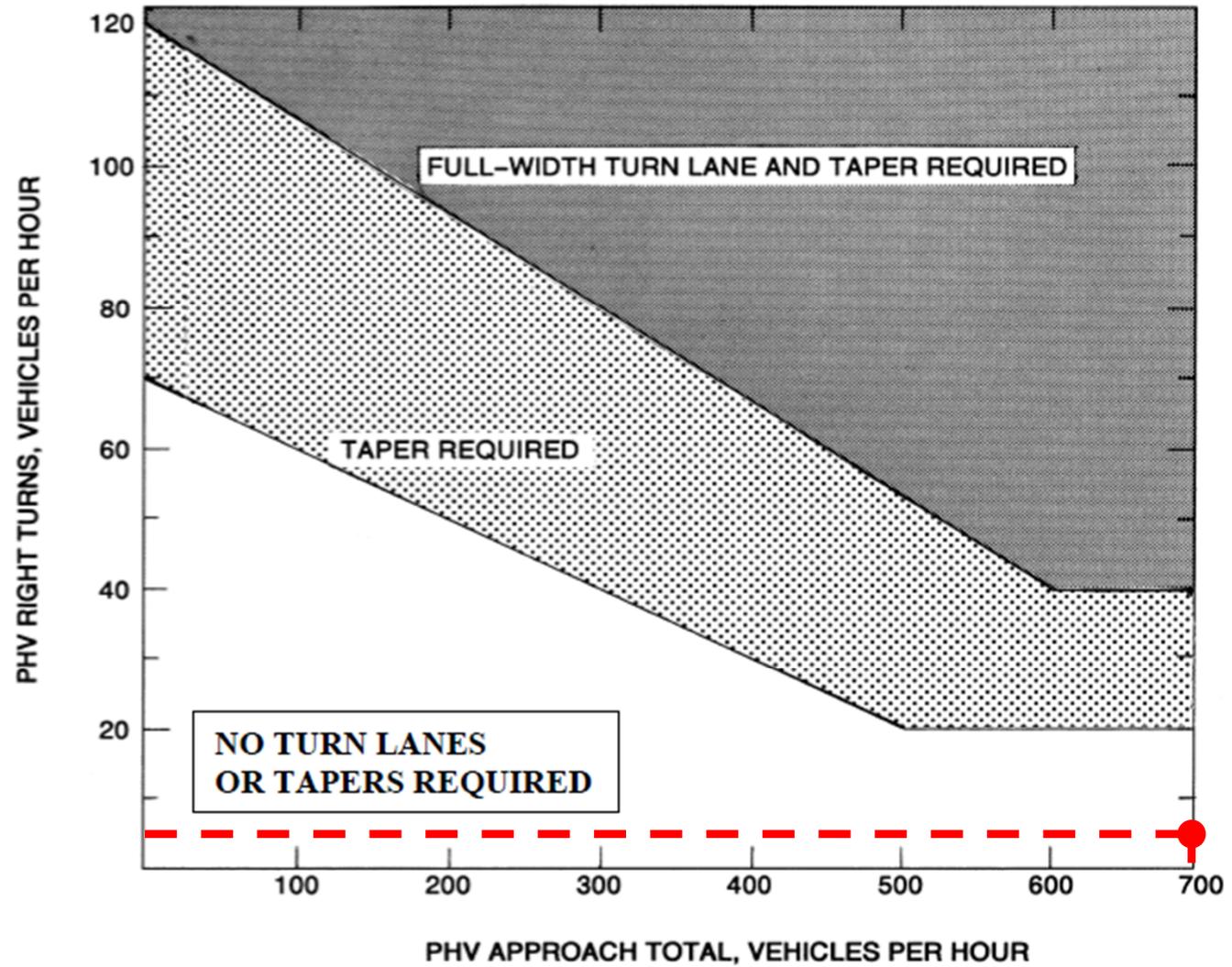


FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

FIGURE 55B: Ruritan Lake Rd (SR 619) at Sclaters Ford Rd (SR 660)

INTERSECTION 3

Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

3

NO LANE REQUIRED

AM

$PHV_{AT} = 50$ VPH

$PHV_{RT} = 0$ VPH

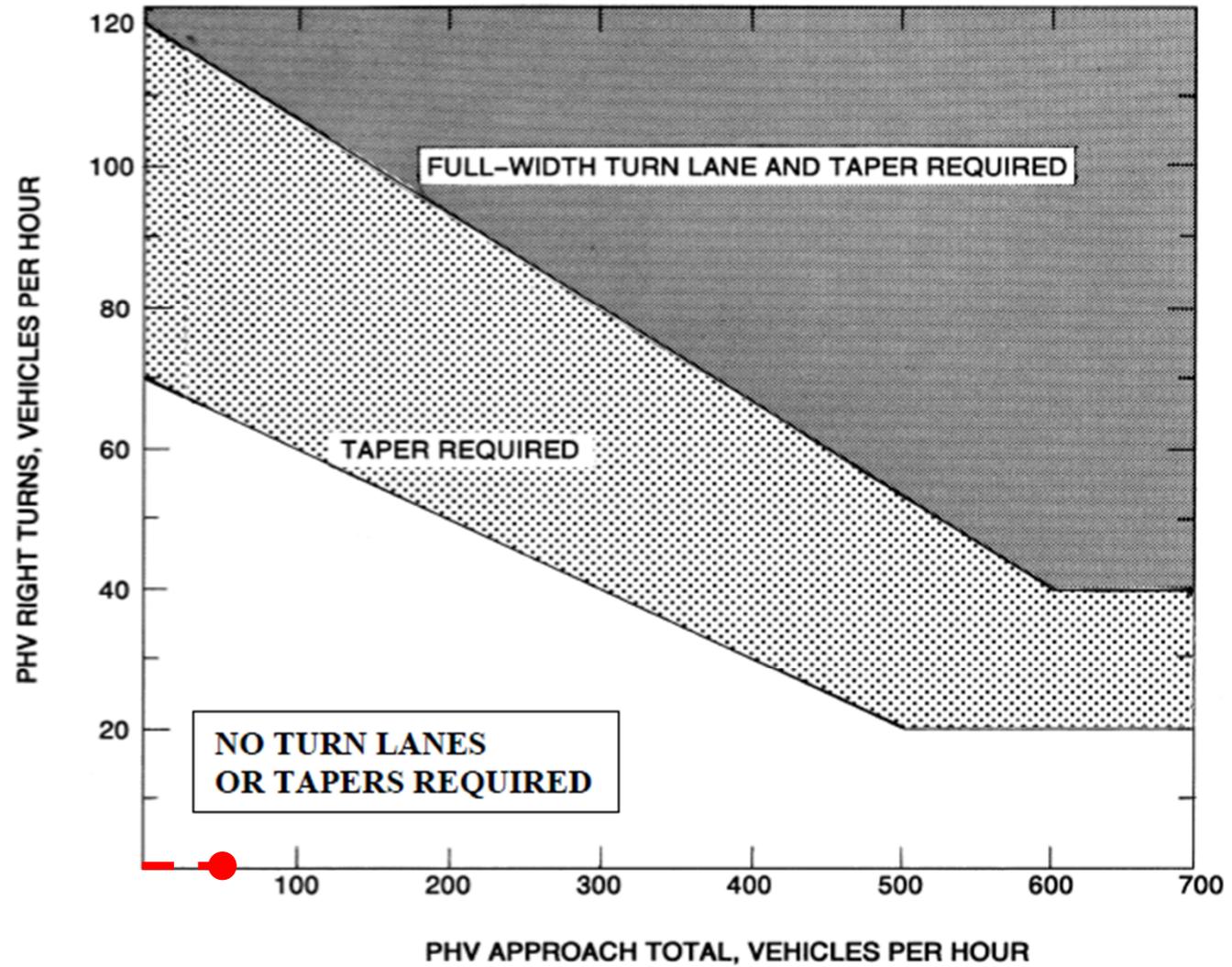


FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

FIGURE 56A: Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

3

NO LANE REQUIRED

PM

$PHV_{AT} = 44$ VPH

$PHV_{RT} = 4$ VPH

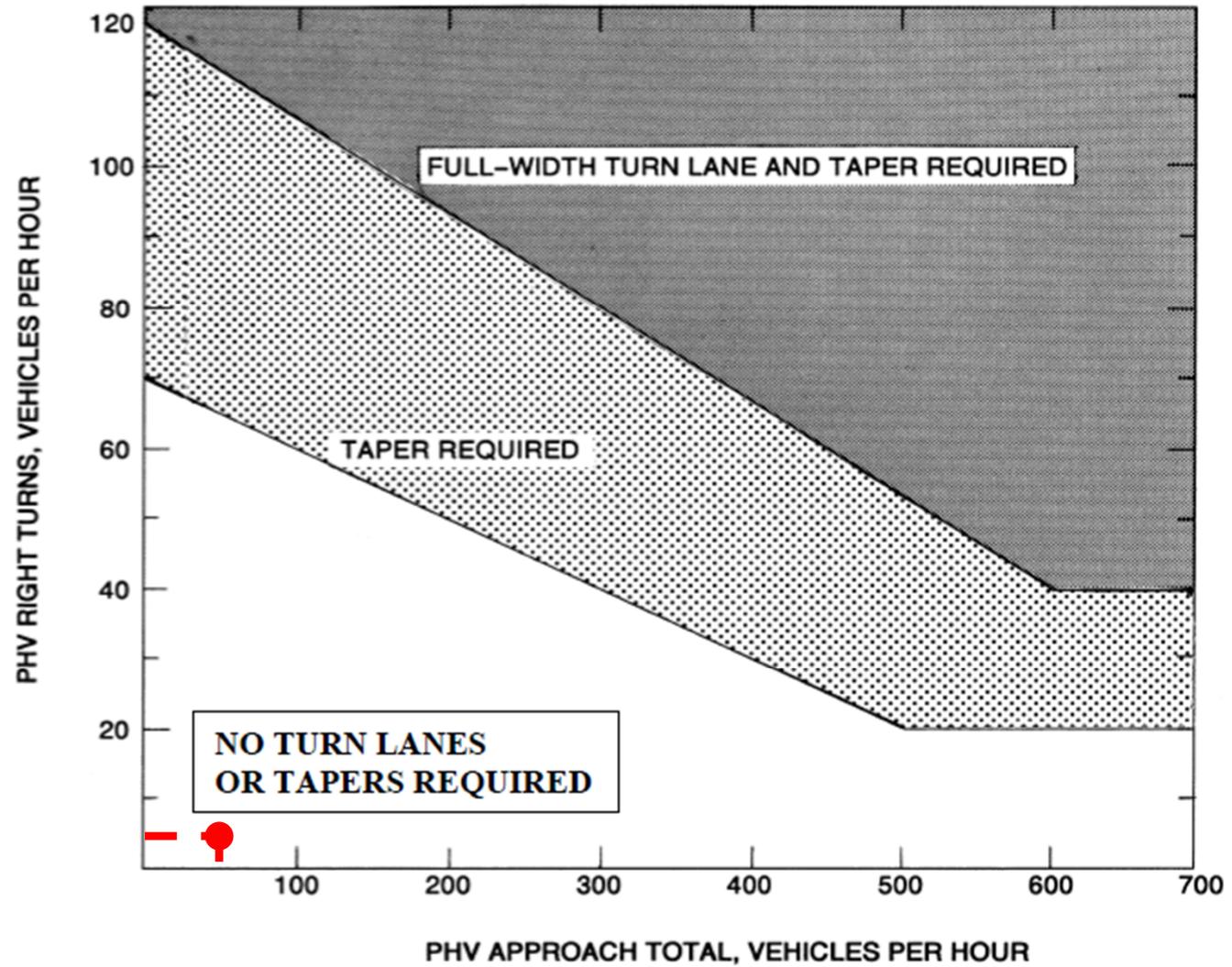


FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

FIGURE 56B: Ruritan Lake Rd (SR 619) at Branch Rd (SR 761)

INTERSECTION 4

Branch Rd (SR 761) at Rolling Rd (SR 620)

4

NO LANE REQUIRED

AM

$PHV_{AT}=178$ VPH

$PHV_{RT}=65$ VPH

$N_{RT}=65 > 40$

$N_{AT}=178 < 300$

$Adj_{RT}=65 - 20 = 40$ VPH

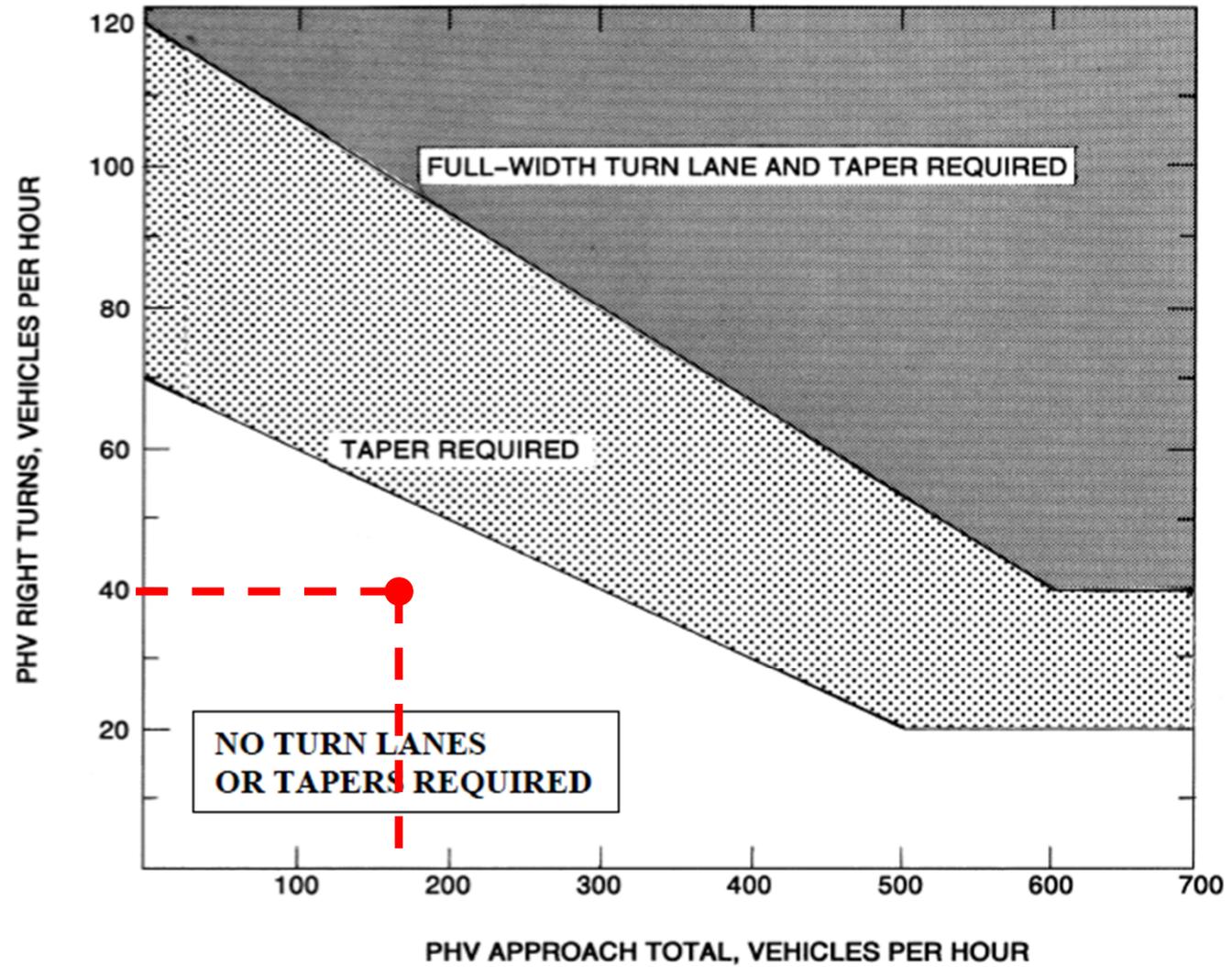


FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

FIGURE 57A: Branch Rd (SR 761) at Rolling Rd (SR 620)

4

NO LANE REQUIRED

PM

$PHV_{AT} = 55$ VPH

$PHV_{RT} = 14$ VPH

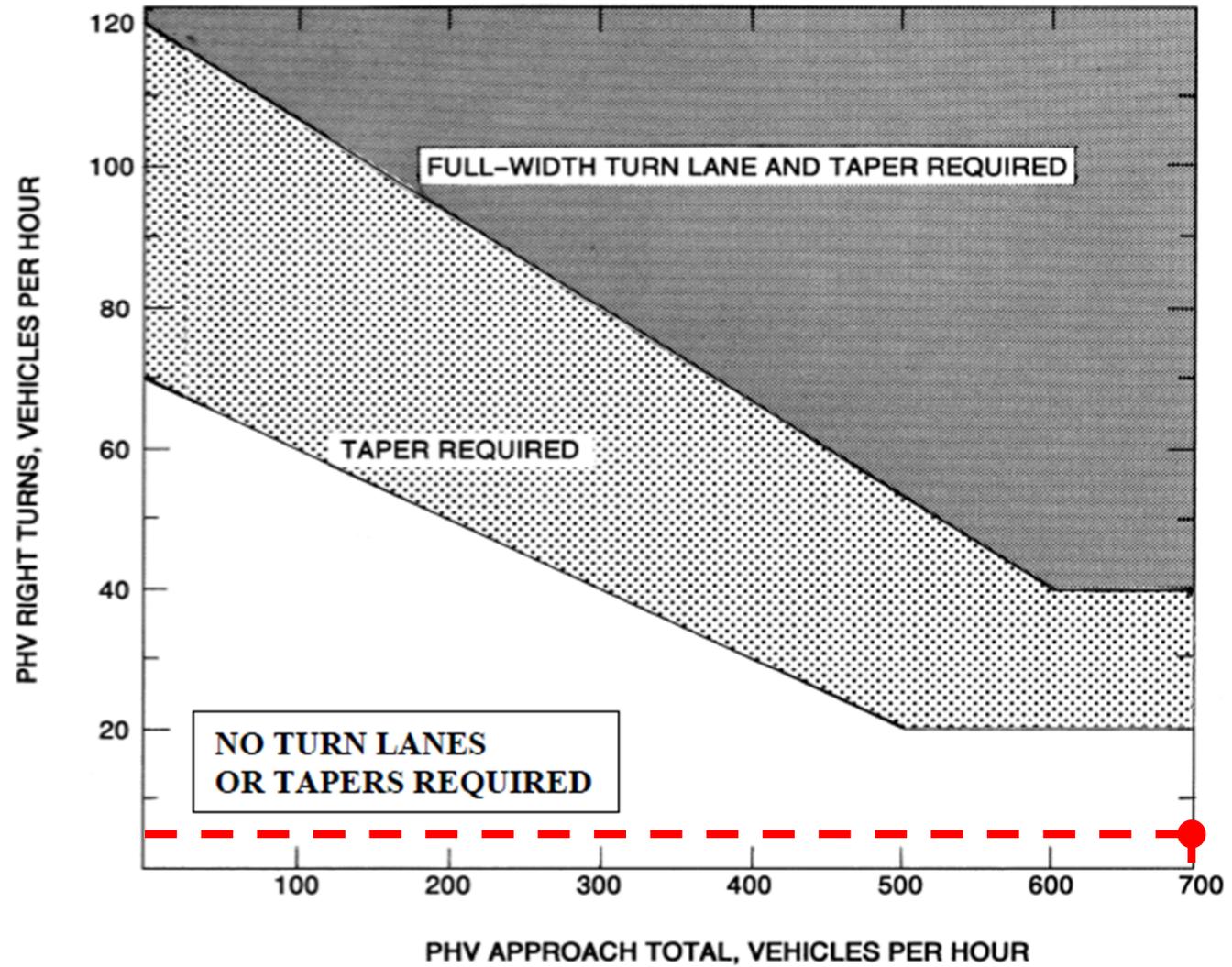


FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

FIGURE 57B: Branch Rd (SR 761) at Rolling Rd (SR 620)

INTERSECTION 7

Tenaska Operations driveway at Branch Rd (SR 761)

7

RT LANE REQUIRED

AM

$PHV_{AT} = 754$ VPH

$PHV_{RT} = 725$ VPH

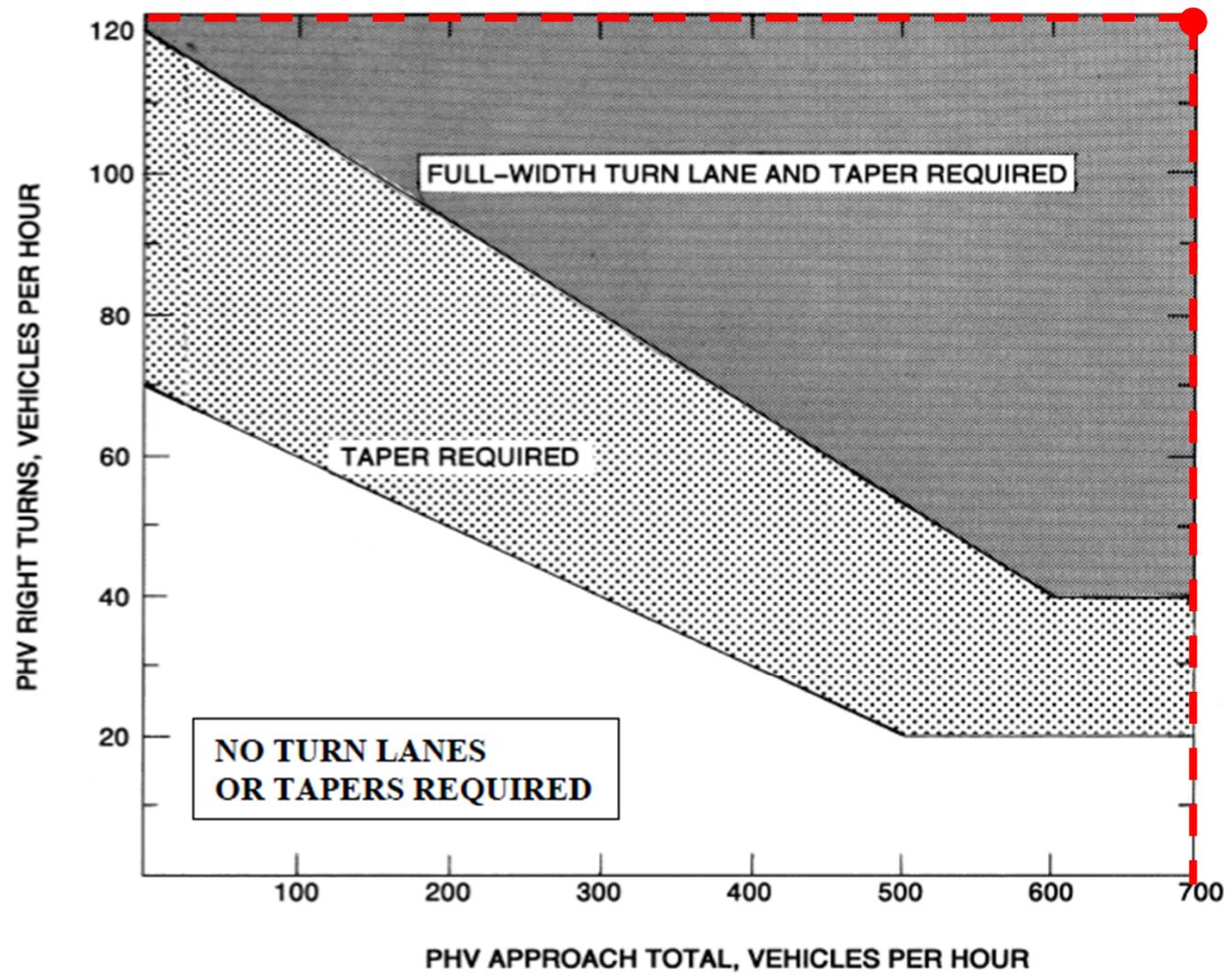


FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

FIGURE 58A: Tenaska Operations driveway at Branch Rd (SR 761)

7

NO LANE REQUIRED

PM

$PHV_{AT} = 60$ VPH

$PHV_{RT} = 0$ VPH

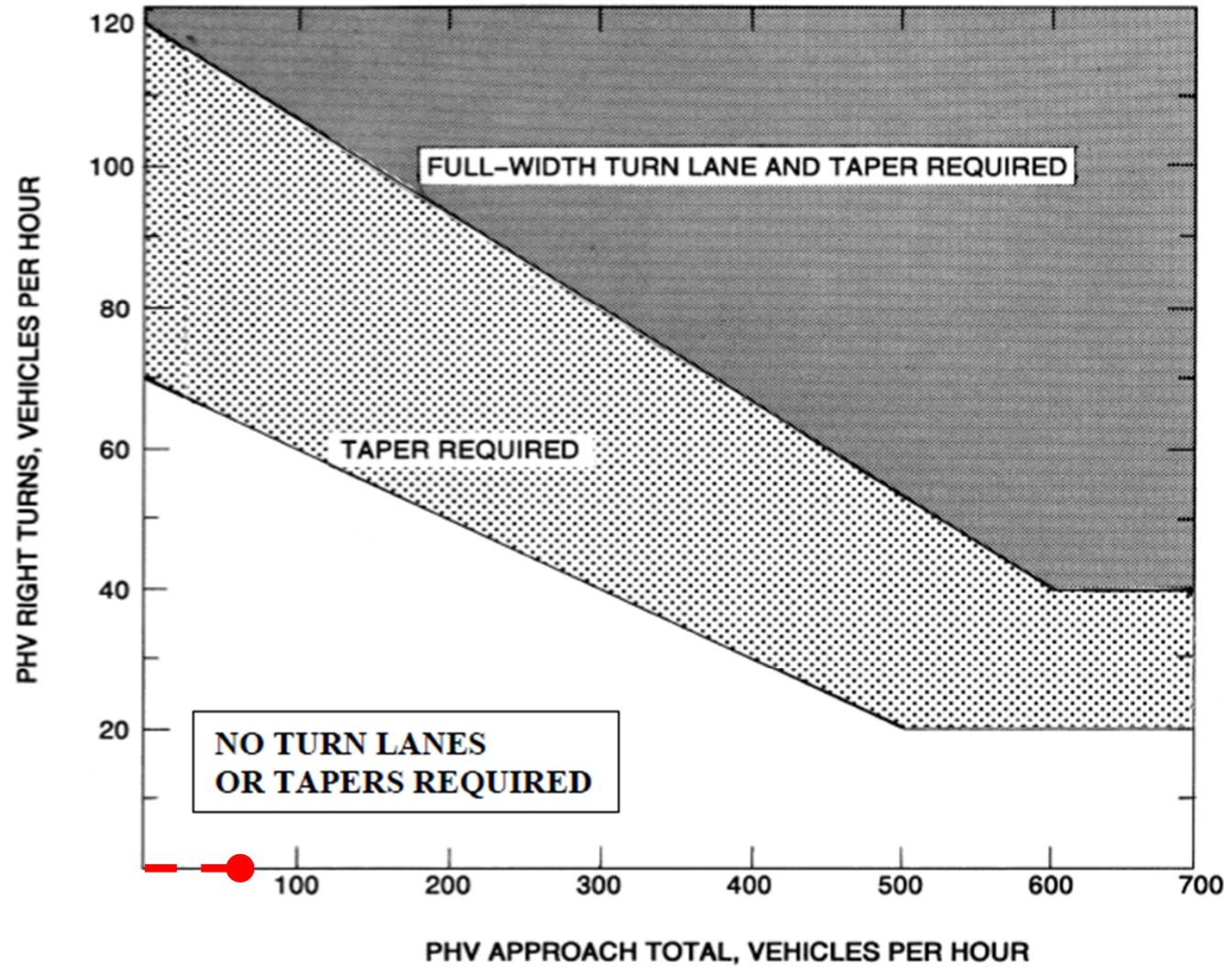
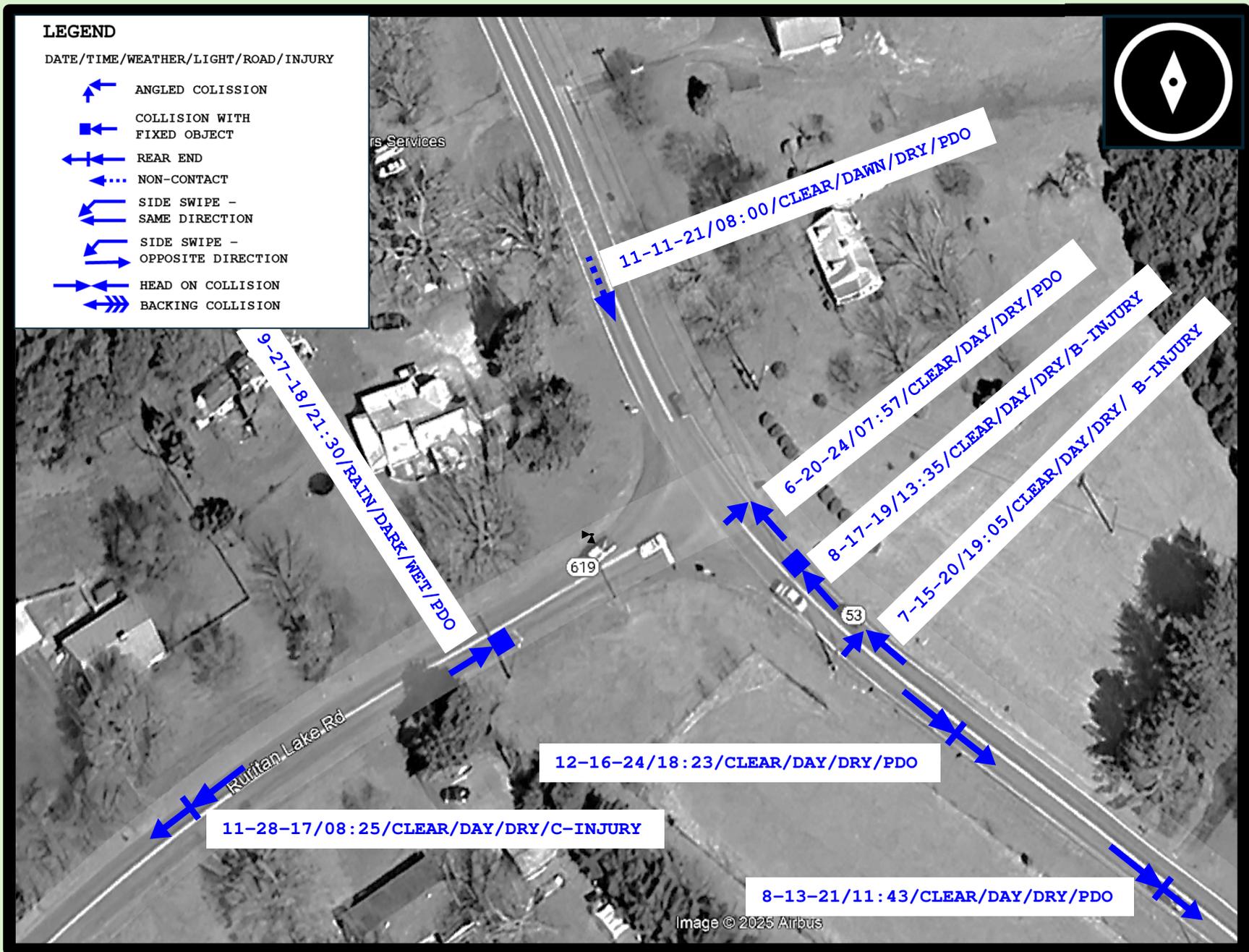


FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

FIGURE 58B: Tenaska Operations driveway at Branch Rd (SR 761)

APPENDIX E

Collision Diagrams



INTERSECTION 1: Thomas Jefferson Pkwy (SR 53) at Ruritan Lake Rd (SR 619)

LEGEND

DATE/TIME/WEATHER/LIGHT/ROAD/INJURY

-  ANGLED COLLISION
-  COLLISION WITH
FIXED OBJECT
-  REAR END
-  NON-CONTACT
-  SIDE SWIPE -
SAME DIRECTION
-  SIDE SWIPE -
OPPOSITE DIRECTION
-  HEAD ON COLLISION
-  BACKING COLLISION



**INTERSECTION 2: Ruritan Lake Rd (SR 619) at
Sclaters Ford Rd (SR 660)**

LEGEND

DATE/TIME/WEATHER/LIGHT/ROAD/INJURY

-  ANGLED COLLISION
-  COLLISION WITH
FIXED OBJECT
-  REAR END
-  NON-CONTACT
-  SIDE SWIPE -
SAME DIRECTION
-  SIDE SWIPE -
OPPOSITE DIRECTION
-  HEAD ON COLLISION
-  BACKING COLLISION



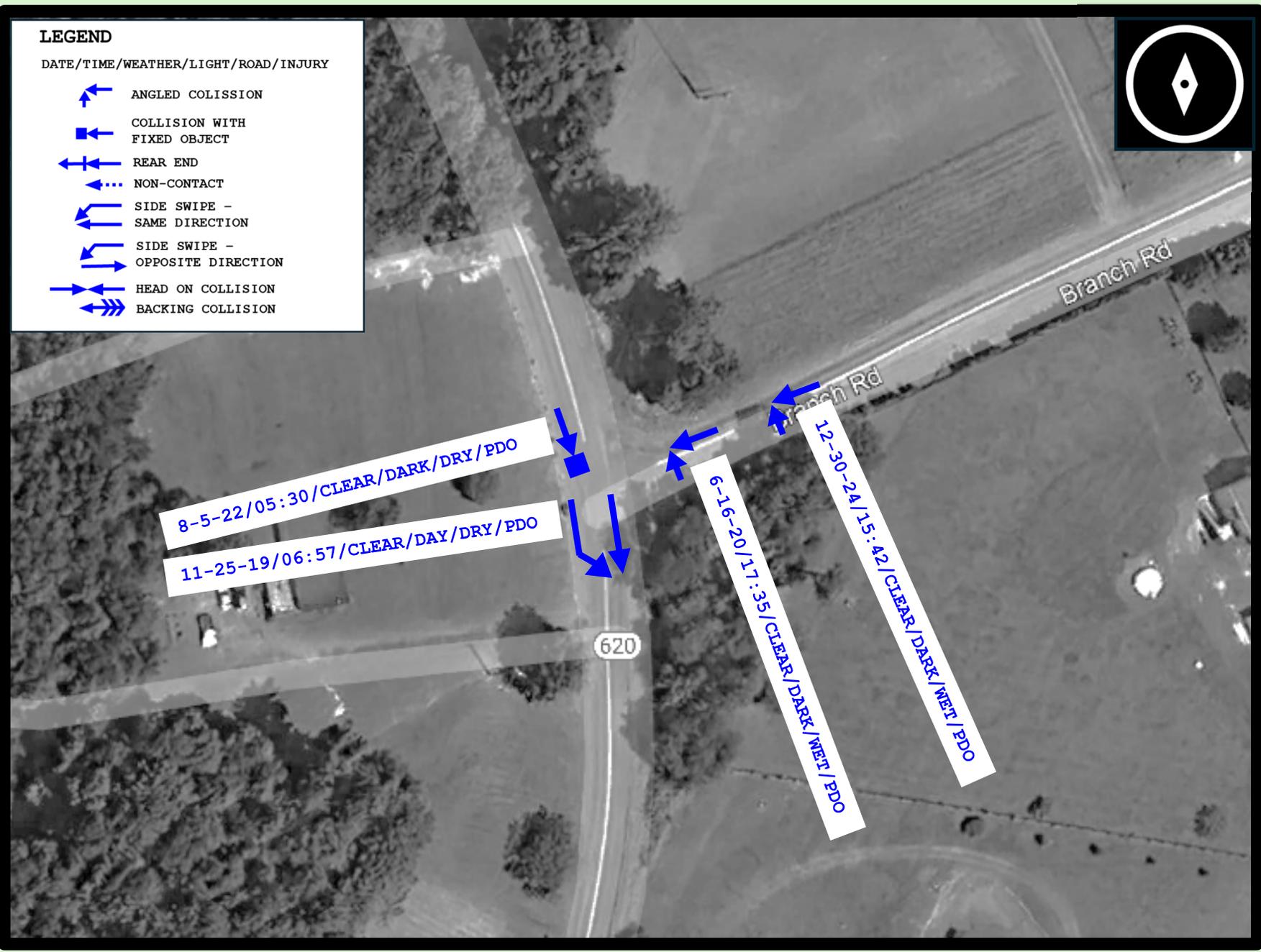
**INTERSECTION 3: Ruritan Lake Rd (SR 619) at
Branch Rd (SR 761)**



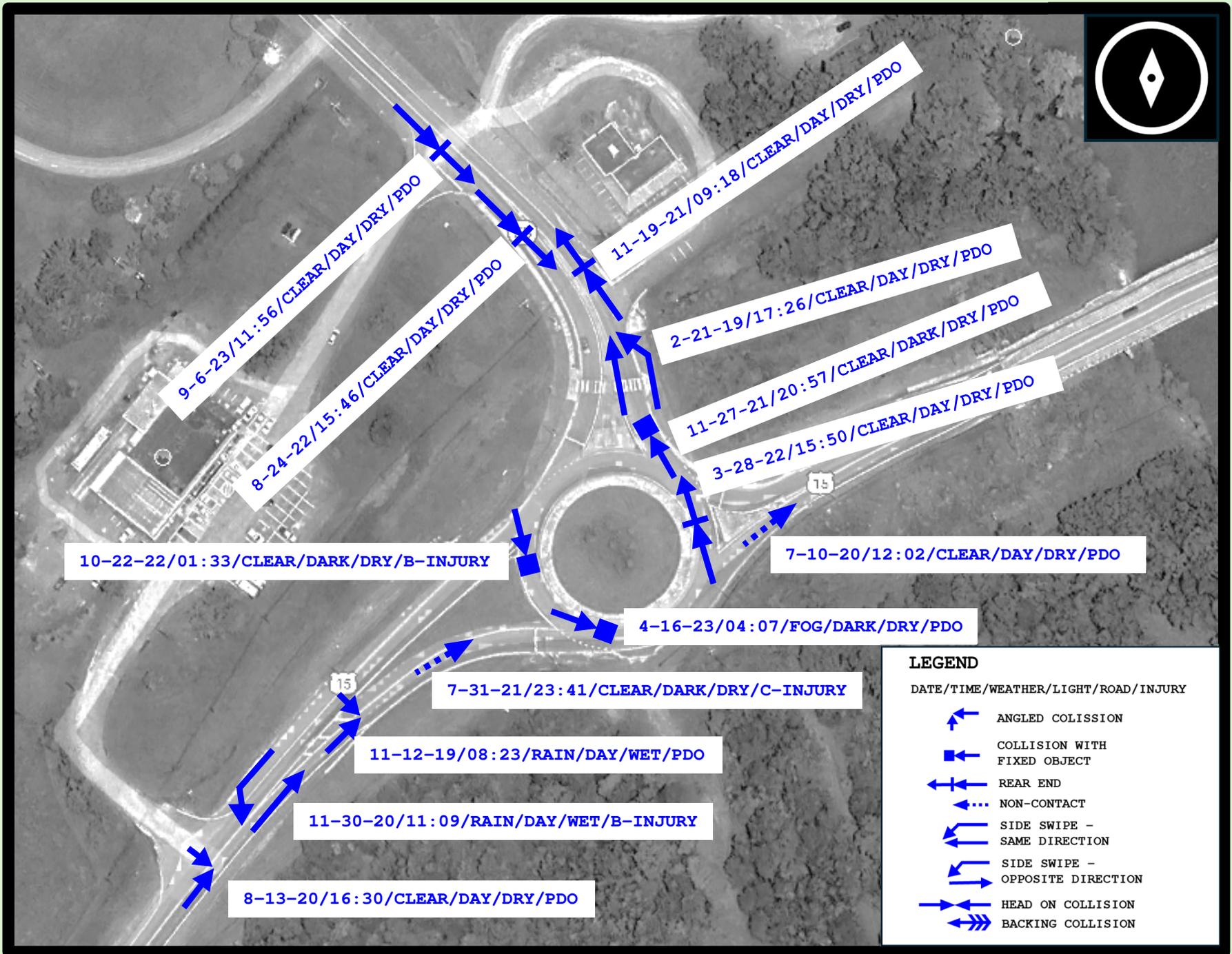
LEGEND

DATE/TIME/WEATHER/LIGHT/ROAD/INJURY

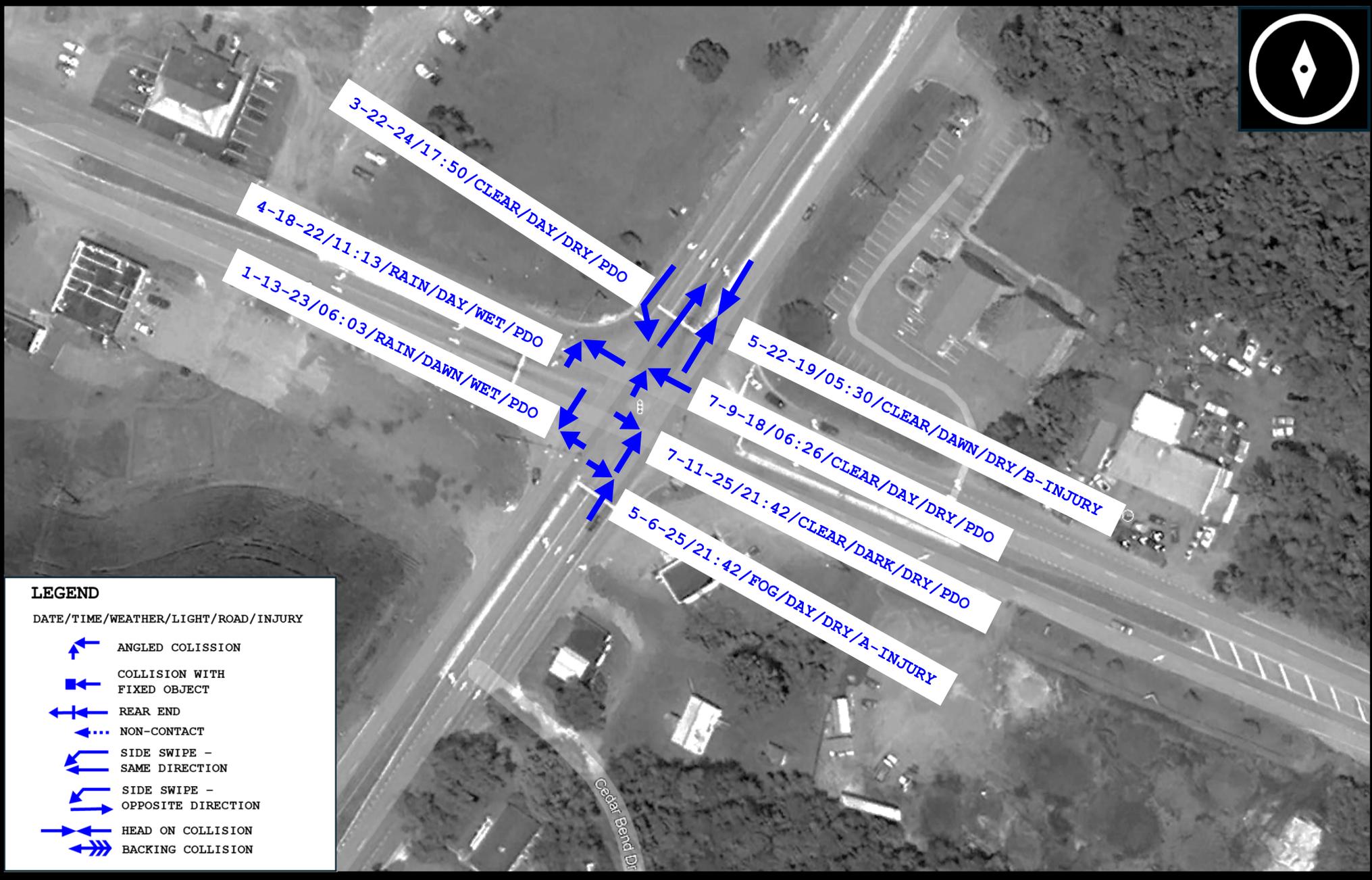
-  ANGLED COLLISION
-  COLLISION WITH FIXED OBJECT
-  REAR END
-  NON-CONTACT
-  SIDE SWIPE - SAME DIRECTION
-  SIDE SWIPE - OPPOSITE DIRECTION
-  HEAD ON COLLISION
-  BACKING COLLISION



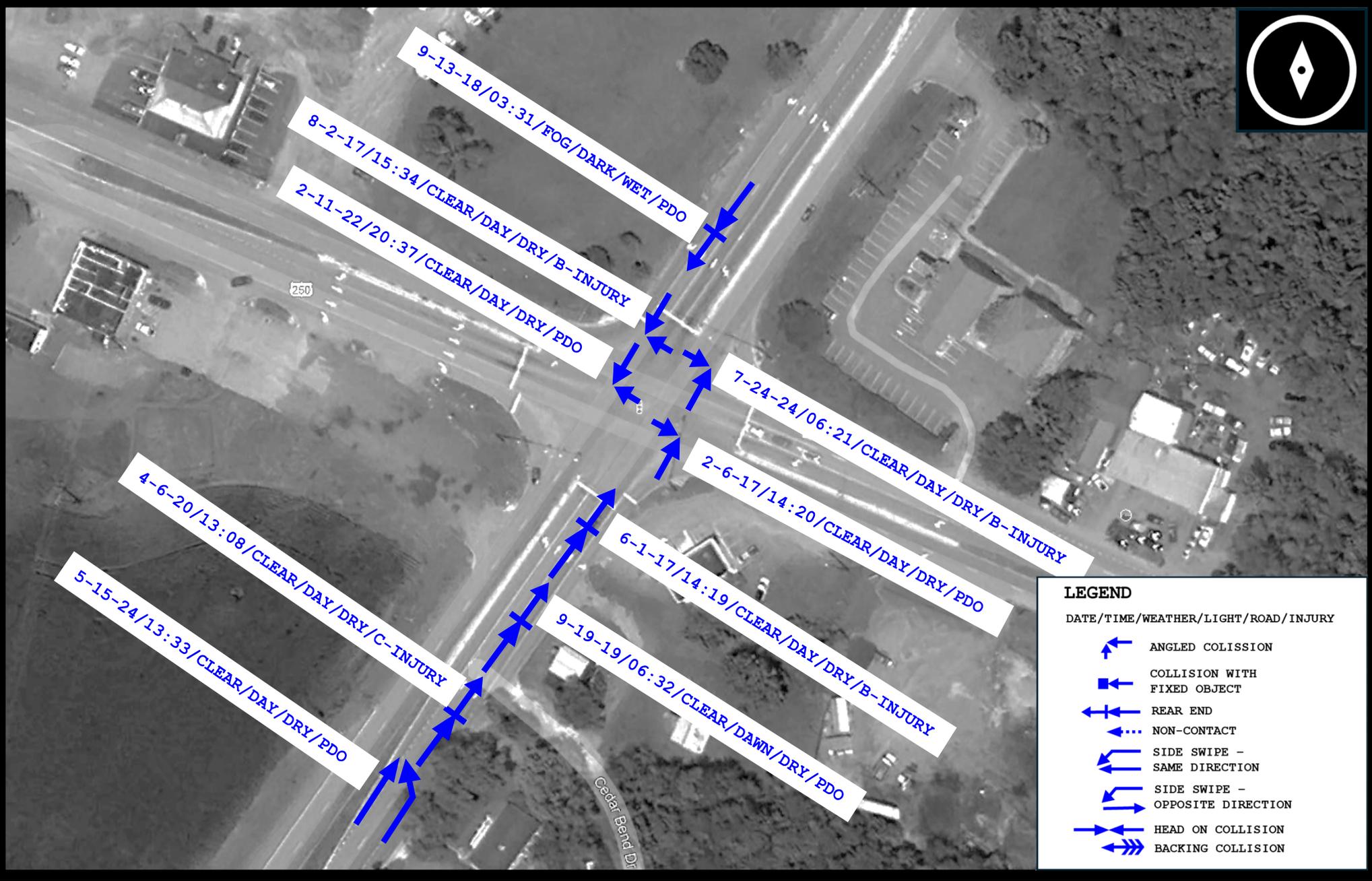
INTERSECTION 4: Branch Rd (SR 761) at Rolling Rd (SR 620)



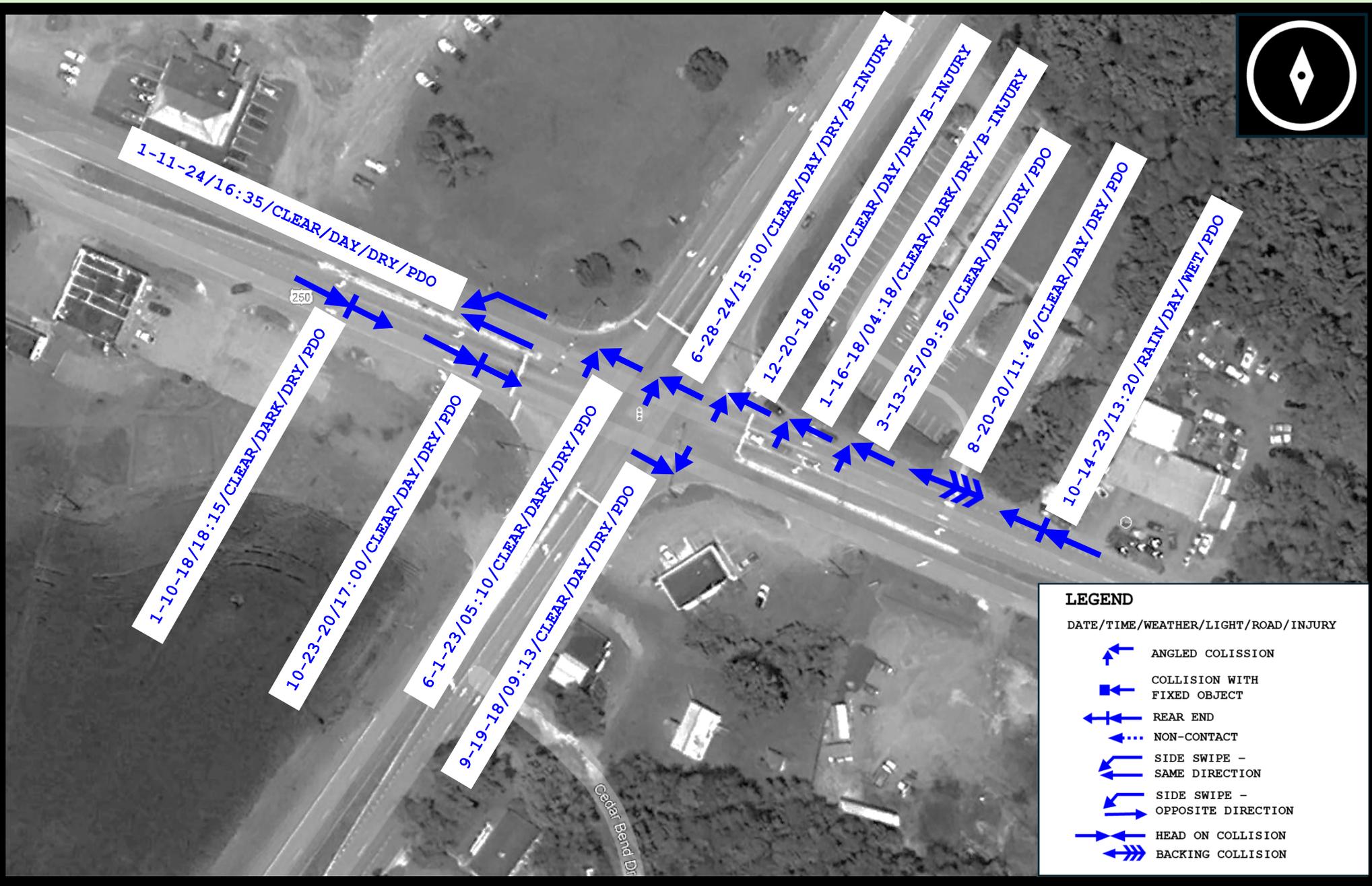
INTERSECTION 5: Thomas Jefferson Parkway (SR 53) at James Madison Highway (US 15)



INTERSECTION 6: James Madison Highway (US 15) at 3 Notch Road (US 250)



INTERSECTION 6: James Madison Highway (US 15) at 3 Notch Road (US 250)



1-11-24/16:35/CLEAR/DAY/DRY/PDO

1-10-18/18:15/CLEAR/DARK/DRY/PDO

10-23-20/17:00/CLEAR/DAY/DRY/PDO

6-1-23/05:10/CLEAR/DARK/DRY/PDO

9-19-18/09:13/CLEAR/DAY/DRY/PDO

6-28-24/15:00/CLEAR/DAY/DRY/B-INJURY

12-20-18/06:58/CLEAR/DAY/DRY/B-INJURY

1-16-18/04:18/CLEAR/DARK/DRY/B-INJURY

3-13-25/09:56/CLEAR/DAY/DRY/PDO

8-20-20/11:46/CLEAR/DAY/DRY/PDO

10-14-23/13:20/RAIN/DAY/WET/PDO

LEGEND
DATE/TIME/WEATHER/LIGHT/ROAD/INJURY

- ANGLED COLLISION
- COLLISION WITH FIXED OBJECT
- REAR END
- NON-CONTACT
- SIDE SWIPE - SAME DIRECTION
- SIDE SWIPE - OPPOSITE DIRECTION
- HEAD ON COLLISION
- BACKING COLLISION

INTERSECTION 6: James Madison Highway (US 15) at 3 Notch Road (US 250)