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Traffic Impact Study for LaGrange Station

Three Rivers Regional Commission DRI# 2525

Prepared for AEC, Inc.
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Graves

EXECUTIVE SUMMARY

The proposed development, LaGrange Station, has been studied for potential impacts on the on the surrounding transportation system. The 226.63 acre site is located along SR 219 (Whitesville Rd.), south of LaGrange in Troup County Georgia. As proposed the mixed-use development consists of residential, hotel, office and retail land uses.

The development is centered on the soon to be constructed Pegasus Parkway extension with Whitesville Road to the west, Buck Murphy Road to the North and Interstate 85 to the south. Existing traffic counts collected at major intersections indicate that the current traffic operations are well within acceptable parameters.

Full buildout of the development is anticipated to take ten years. Nearby GDOT traffic count station indicate growth rates in the area average less than 2% per year. After accounting for 2% growth and assuming moderate volume on a completed Pegasus Parkway, intersection analysis continued to show optimal level of service at study intersections.

Traffic generated by the full buildout of the development is expected to approach 29,150 vehicles per day with nearly 1,375 vehicles during the pm peak hour. Project trips were distributed north to LaGrange via Whitesville Road and Hamilton Road, west and east via Pegasus Parkway and south to I-85 along Whitesville Road. With the site generated traffic added to the background traffic all study intersections continue to operate at acceptable levels of service.

The findings of this study conclude that the existing and planned transportation network accommodates anticipated traffic from general growth in the region and the proposed development with no additional improvements needed.

The following pages detail the study's methodology, results, and major findings.

PROPOSED DEVELOPMENT

Exhibit 1 and 2 show the site vicinity and proposed land plan to develop the 226.63 acre mixed-use project. The project includes a resort hotel with convention center, an outlet retail center, multifamily and single family residential, as well as a village scale office and commercial center. Access to the site will be accomplished via Whitesville Road and the soon to be constructed Pegasus Parkway.

AREA CONDITIONS

Study Area

The site is located along SR 219 (Whitesville Road) north of the interchange with I-85 (Exit 13). The Pegasus Parkway extension, which is anticipated to begin construction early 2016, bisects the site. Pegasus Parkway continues to Davis Road and intersects US 27 (Hamilton Road), nearly a mile north of I-85 (Exit 14). As configured, the site fronts both Whitesville Road and Pegasus Parkway with the most convenient freeway access being Whitesville Road. Based on the proposed site access points and the extension of Pegasus Parkway, this study concentrated on the following study intersections:

- Whitesville Road at Buck Murphy Road (minor street stop controlled)
- Whitesville Road at Pegasus Parkway (signalized)
- Whitesville Road at I-85 SB Ramps (signalized)
- Whitesville Road at I-85 NB Ramps (signalized)

The study area intersections and existing lane configurations are presented in **Figure 1**.

Study Area Land Uses

Currently, the site is primarily undeveloped with an occasional residential or commercial building along Whitesville Road. To the north is the City of LaGrange. Manufacturing and residential areas lie to the west and south. Troup County High School abuts the site to the east along Hamilton Road.

SITE ACCESSIBILITY

Area Roadway System

The primary arterial roadways within the study area are Whitesville Road and Pegasus Parkway. Whitesville Road is four lane divided roadway with a raised median through the interchange north to Pegasus Parkway where it transitions to a two lane divided roadway with a flush median. The speed limit is 45 mph. Pegasus Parkway is a four lane divided roadway with a speed limit of 35 mph west of Whitesville Road. Both existing roadways use rural typical sections with no curb, gutter, sidewalk, or bike lanes. East of Whitesville Road, Pegasus Parkway is planned to be initially constructed as a 2 lane divided roadway with a raised median. Construction is planned to begin first quarter 2016 and should be complete within 18 to 24 months. When complete, Pegasus Parkway will serve as the southern section of the LaGrange Bypass.

Existing Traffic Volumes and Peak Hour Operations

Traffic Volumes

A reconnaissance of the site and vicinity was conducted. AM and PM peak hour traffic volumes within the study area were obtained from actual weekday peak hour traffic counts conducted the week of November 30, 2015. Traffic volumes were rounded to the nearest five vehicles (**Figure 2**). These data revealed that the morning peak hour typically occurs between 7:00 and 8:00 AM and the afternoon peak hour occurs between 4:45 and 5:45 PM. Typically, between 1 and 4 percent of vehicles observed were large trucks. This study considered traffic conditions during the weekday AM and PM peak hours that corresponds to the developments hours of operations, which represent the reasonable “worst case” traffic conditions within the study area. This also corresponds with the time periods the proposed development would generate much of its traffic.

Peak Hour Traffic Operations

Traffic conditions at key intersections within the study area were analyzed during both the AM and PM peak hours. Intersection operational analyses were conducted using the procedures found in the 2010 Highway Capacity Manual (HCM) for evaluating signalized and unsignalized intersections, which describe the traffic operations at an intersection in terms of its Level of Service (LOS). For unsignalized intersections, the LOS is stated relative to the most critical intersection approach or maneuver, typically the left turn from the minor street approach. For signalized intersections and all way stop control, the LOS is a function of the average vehicle delay that vehicles on all approaches experience. The LOS criteria are stated as a letter grade, ranging from “A”, indicating little or no delay, to “F”, indicating that drivers experience long delays. The LOS worksheets for results presented in this study are attached as an appendix to this report. For the purposes of this study, intersections operating at LOS E or below will be considered deficient.

Table 1 below presents the calculated LOS results for each of the study intersections based on the most recent traffic volumes shown in **Figure 2**. All intersections in the study area were found to operate at LOS D or better during the peak hours.

Table 1: 2015 Existing Intersection Levels of Service

Intersection	AM Peak Hour		PM Peak Hour	
	LOS ₁	Delay ₂	LOS ₁	Delay ₂
Whitesville Road/Buck Murphy Road	C	16.5	C	18.1
Whitesville Road/Pegasus Parkway	B	16.8	C	20.3
Whitesville Road/I-85 SB	A	8.0	A	3.9
Whitesville Road/I-85 NB	B	11.6	B	10.5

1. Level of Service.
2. Average Delay in seconds per vehicle

PROJECTED FUTURE TRAFFIC CONDITIONS

The impact of traffic generated by the proposed mixed-use development on the surrounding street network during the critical weekday peak hours was analyzed as follows:

- The projected year of completion for the proposed mixed-use development is 2025. For this study, it is assumed that the development will be built in a single phase with the horizon year assumed to be anticipated completion date. Therefore, the existing traffic volumes were adjusted to estimate the future 2025 background traffic conditions. Because the existing traffic counts are from late 2015, a full 10 years of background traffic growth was assumed.
- Vehicles into and out of the site were estimated at full buildout. Existing traffic volumes and the site's proximity to major roadways were evaluated to estimate trip distribution patterns in the study area for vehicle trips generated by the site. Based on this distribution, site-generated traffic was assigned to the roadway system.
- Future Levels of Service at key intersections in the study area were examined under both future background and full buildout conditions.

Future Background 2025 Traffic Volumes

Full buildout of the proposed mixed-use development is anticipated for 2025. To assess the likely future traffic conditions regardless of the proposed development, increases in traffic were estimated for general growth in the surrounding area. Based on historical traffic data published by the Georgia Department of Transportation, traffic along Whitesville Road (SR 219) has increased at a rate of nearly 1.5 percent per year between 2005 and 2014. To provide a conservative estimate of potential background traffic, an annual growth rate of 2 percent per year was assumed in this study. Using this factor, existing volumes in **Figure 2** were increased nearly 22 percent to account for increases in traffic from regional sources. Thus, future 2025 background traffic volumes were estimated by multiplying existing peak hour traffic volumes by 1.219. In addition, to account for traffic that would use the new Pegasus Parkway extension without the propose development nominal traffic volumes were assumed for the anticipated roadway and added to the projected volumes. The resulting estimates for 2025 background traffic volumes are shown in **Figure 3**. Capacity analyses of these background 2025 volumes were performed and the results are presented in **Table 2** below. Comparing these results with the LOS results for existing conditions indicates that with these conservative assumptions traffic conditions degrade slightly, but all of the intersections will continue to function within acceptable operating standards.

Table 2: 2025 Background Intersection Levels of Service

Intersection	AM Peak Hour		PM Peak Hour	
	LOS ₁	Delay ₂	LOS ₁	Delay ₂
Whitesville Road/Buck Murphy Road	C	20.9	C	22.6
Whitesville Road/Pegasus Parkway	C	31.3	C	28.9
Whitesville Road/I-85 SB	A	4.8	A	1.9
Whitesville Road/I-85 NB	B	19.8	B	12.0

1. Level of Service.
2. Average Delay in seconds per vehicle

Site Generated Traffic Volumes

Estimates of traffic generated by the proposed mixed-use development were based on the rates found in the *ITE Trip Generation Manual 9th Edition, 2012*. **Table 3** presents estimates of the traffic generated by the full buildout of the proposed development. For an average weekday, traffic generated by the proposed development is expected approach 29,150 vehicle trips per day with pm peak hour trips nearing 1,375. Estimates were also made for trips between uses within the site using the rates and methodology found in NCHRP 684. Reductions ranged from 22 percent during the AM peak period to 35% during the PM peak period. In addition, estimates were made for pass-by trips. Pass-by trips are opportunistic trips from vehicles already on the road, but not originating or ending in the study site, for instance a quick stop at a convenience market or grocery store on the way home from work. These “Internal Capture” trips and “Pass-By” trips were deducted from the unadjusted trip generation volumes.

TABLE 3: Site Trip Generation, ITE 9th Edition

Land Use (ITE Code)	Intensity	Units	Weekday	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
Detached Housing (210)	150	Dwelling Units	1,428	113	28	85	150	95	55
Apartments (220)	360	Dwelling Units	2,305	180	36	144	216	140	76
Business Hotel (312)	125	Rooms	909	73	43	30	78	47	31
Resort Hotel (330)	400	Rooms		124	89	35	168	72	96
Theater (445)	40	1,000 GSA		--	--	--	--	--	--
Office (710)	50	1,000 GSA	552	78	69	9	75	13	62
Outlet Mall (823)	239	1,000 GSA	9,307	235	172	63	492	231	261
Specialty Retail (826)	100	1,000 GLA	4,432				271	119	152
Grocery Store (850)	40	1,000 GSA	4,090	136	84	52	379	193	186
Department Store (875)	100	1,000 GSA	2,288	58	37	21	187	95	92
Restaurant (932)	30	1,000 GSA	3,815	324	178	146	296	178	118
Unadjusted Volumes			29,126	1,321	736	585	2,312	1,183	1,129
Internal Capture Trips			0	250	125	125	782	391	391
Pass-By Trips			0	0	0	0	158	79	79
Volume Added to Adjacent Streets			29,126	1,071	611	460	1,372	713	659

Distribution and Assignment of Site-Generated Traffic

The directional distribution of the traffic generated by the proposed development was assigned to the roadway network by considering existing travel patterns. **Figure 4** shows the assumed trip generation and assignment of site-generated traffic throughout the study area for both AM and PM peak periods.

Total Future 2025 traffic volumes with Proposed Mixed-Use Development

Total future 2025 peak hour traffic volumes were estimated by adding the future background traffic volumes displayed in **Figure 3** to the volumes that would be generated by the proposed development shown in **Figure 4**. **Figure 5** displays the total future 2025 peak hour traffic volumes

considering background traffic growth, traffic expected from the completion of Pegasus Parkway, and traffic generated by the proposed mixed-use development. **Table 4** summarizes the results of the intersection LOS analyses for the total future buildout scenario. The LOS results in this table are very similar to the future 2025 background conditions. Again all intersections will degrade slightly, however they will still operate above acceptable LOS standards.

Table 4: 2025 Total Future Intersection Levels of Service

Intersection	AM Peak Hour		PM Peak Hour	
	LOS ₁	Delay ₂	LOS ₁	Delay ₂
Whitesville Road/Buck Murphy Road	D	28.2	C	24.9
Whitesville Road/Pegasus Parkway	D	36.8	D	36.5*
Whitesville Road/I-85 SB	A	3.8	A	2.3
Whitesville Road/I-85 NB	C	27.0	B	18.0

1. Level of Service.
 2. Average Delay in seconds per vehicle
- * Results assume adding right turn overlap to the signal phasing

Site Access and Circulation Plan

Site access is proposed at several driveways along Whitesville Road and Pegasus Parkway. Intersection spacing averages in excess of 600 feet. Whitesville Road is a divided two lane facility with a flush median. Along Whitesville Road, five site driveways are currently proposed. Pegasus Parkway is a divided two lane facility with a raised median. While driveway spacing continues to average around 600 feet, full access driveways are spaced over 1,000 feet apart. Within the site boundaries, three median openings provide full access driveways. An additional seven site access driveways are also provided along Pegasus Parkway with the median limiting movements to right-in/right-out. Intersection analysis was not conducted for specific driveway operations, however driveway spacing, limited access driveways, and good interconnected internal streets provide an abundance of options traveling through the site and dispersing to external roadways. The driveways along Whitesville Road should be sufficient with simple stop control driveways. At full buildout a traffic signal may be warranted at one of the median openings along Pegasus Parkway. At this time, however, it is recommended to only monitor traffic as site construction progresses.







Conclusion

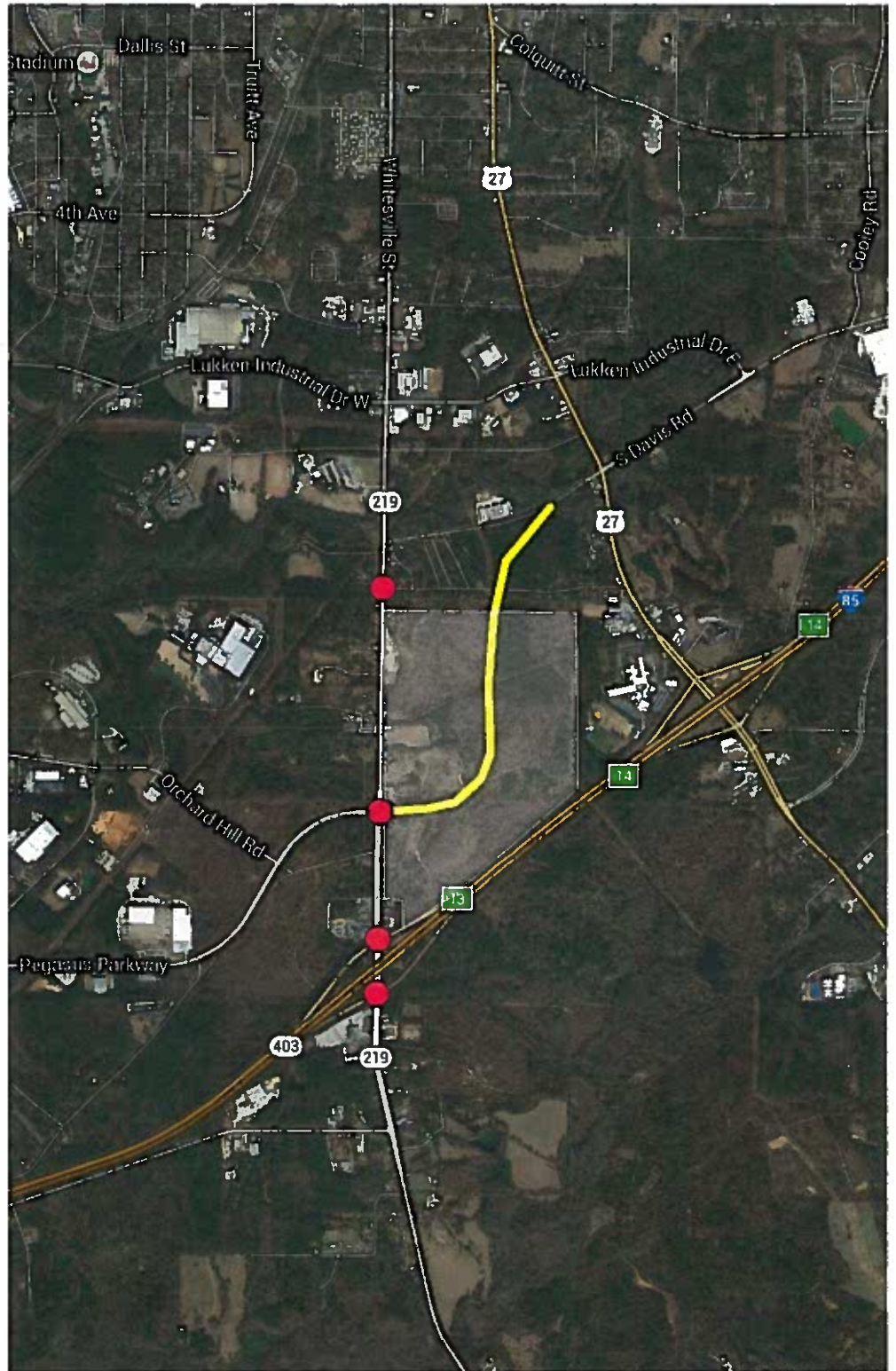
Based on the results of the analyses described in this report, it is concluded that the proposed mixed-use development will have some impact on future traffic conditions in the vicinity of the site, however all major roadways and intersections in the study area will function at or above acceptable operating standards with construction of the planned Pegasus Parkway. No other roadway improvements are recommended to specifically accommodate this development or mitigate its traffic impact.

It should be noted that the intersection of Pegasus Parkway benefited from the addition of a right turn overlap phase for the eastbound right maneuver. While this is a minor signal modification, the projected 2025 traffic is accommodated within the current planned intersection configuration. Furthermore, the signal modification is needed to accommodate the significant right turn traffic demand which is not increased with anticipated project trips.

LaGrange Station

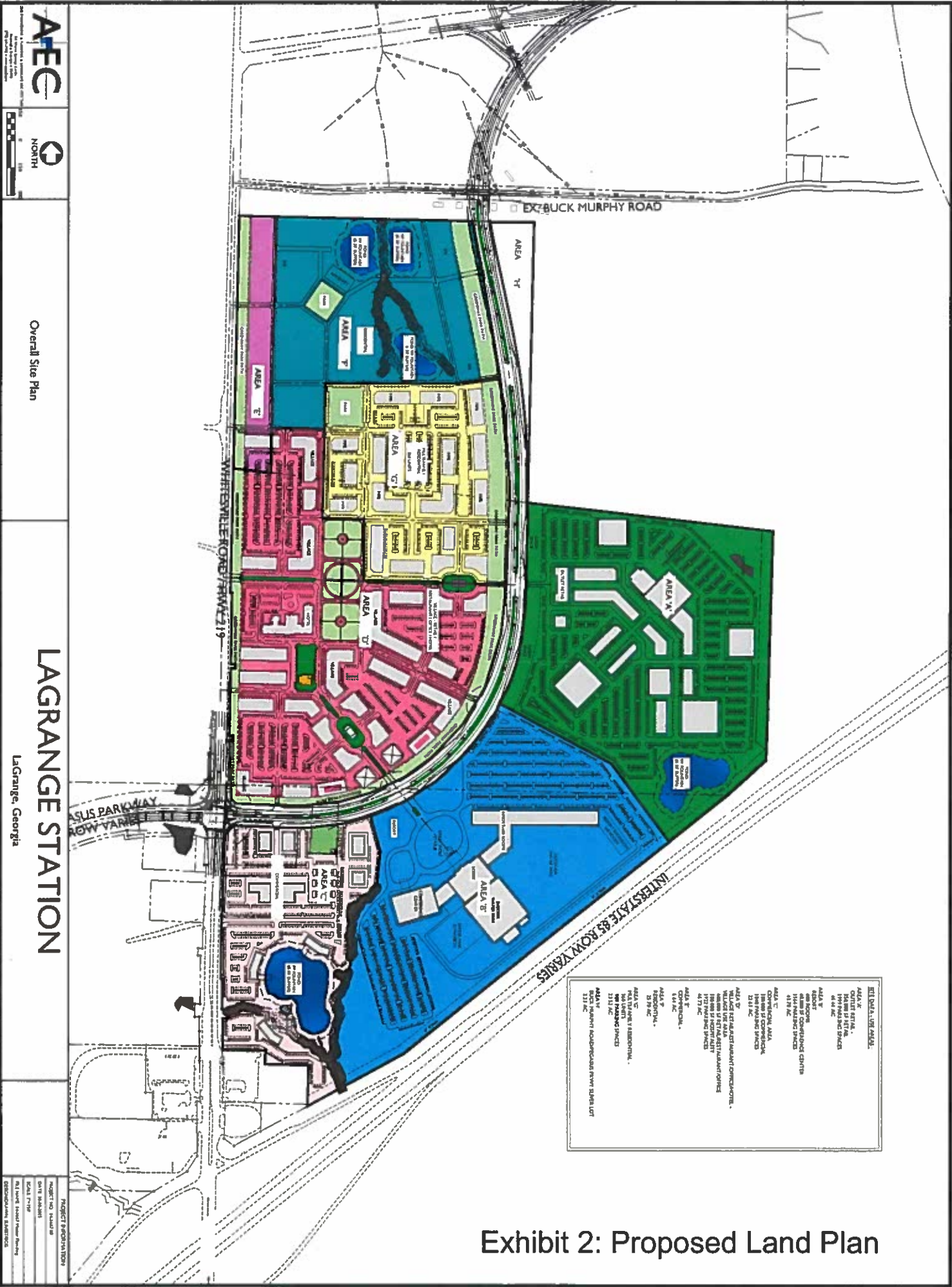
Annotation

-  Pegasus Parkway
-  Int 1
-  Int 2
-  Int 3
-  Int 4
-  Proposed Site



15 Google, Imagery ©2015 DigitalGlobe, Landsat, U.S. Geological Survey, USDA Farm Service Agency

Exhibit 1: Site Vicinity



AREA 1	1.0 AC
AREA 2	1.0 AC
AREA 3	1.0 AC
AREA 4	1.0 AC
AREA 5	1.0 AC
AREA 6	1.0 AC
AREA 7	1.0 AC
AREA 8	1.0 AC
AREA 9	1.0 AC
AREA 10	1.0 AC
AREA 11	1.0 AC
AREA 12	1.0 AC
AREA 13	1.0 AC
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AREA 18	1.0 AC
AREA 19	1.0 AC
AREA 20	1.0 AC
AREA 21	1.0 AC
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AREA 33	1.0 AC
AREA 34	1.0 AC
AREA 35	1.0 AC
AREA 36	1.0 AC
AREA 37	1.0 AC
AREA 38	1.0 AC
AREA 39	1.0 AC
AREA 40	1.0 AC
AREA 41	1.0 AC
AREA 42	1.0 AC
AREA 43	1.0 AC
AREA 44	1.0 AC
AREA 45	1.0 AC
AREA 46	1.0 AC
AREA 47	1.0 AC
AREA 48	1.0 AC
AREA 49	1.0 AC
AREA 50	1.0 AC

Exhibit 2: Proposed Land Plan

AEC

NORTH

Overall Site Plan

LAGRANGE STATION
LaGrange, Georgia

PROJECT ARCHITECT
DAVE BARRETT
DATE: 7/19
SHEET: 10001-001-001-001

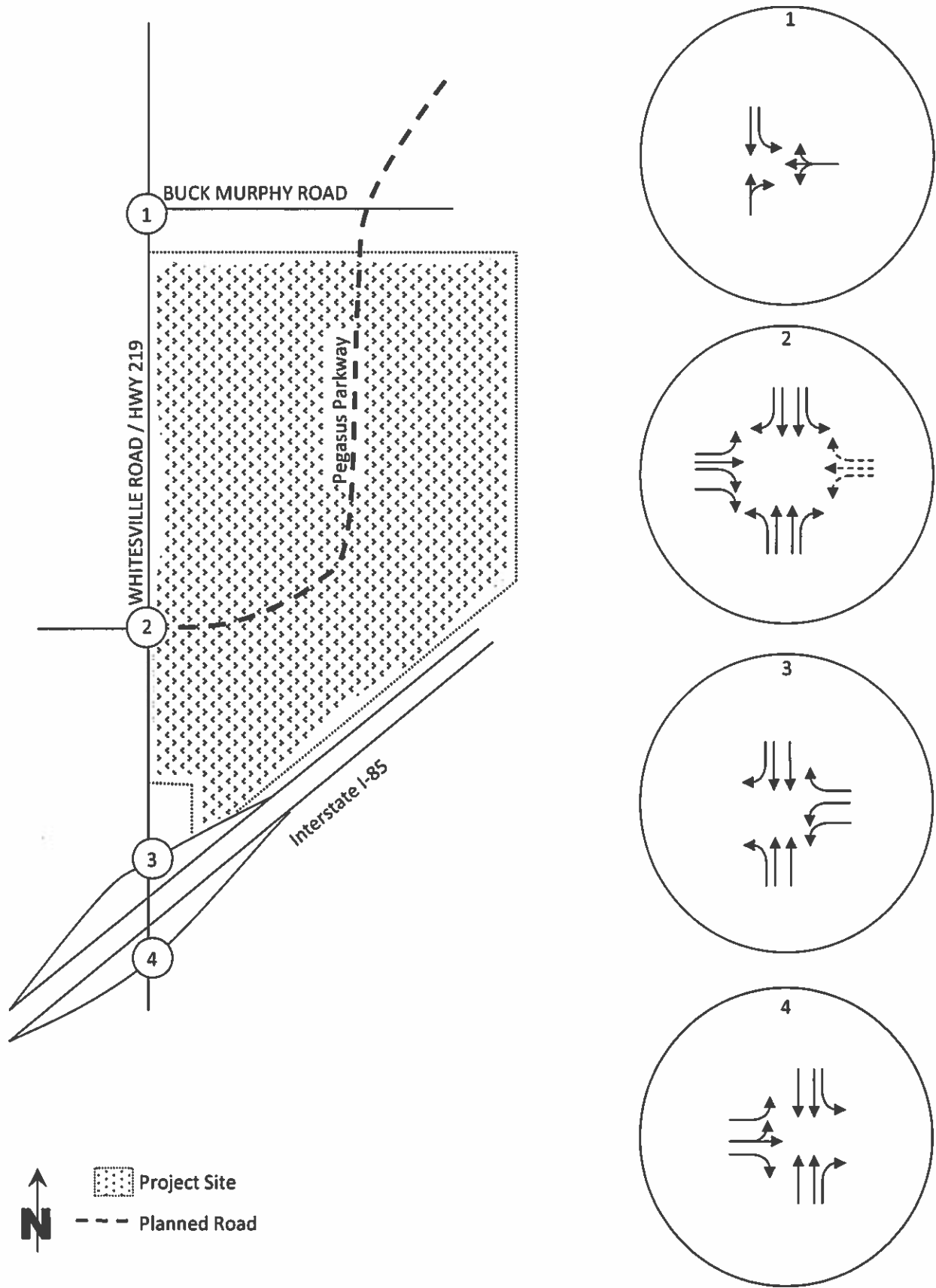


Figure 1: Existing Lane Configuration

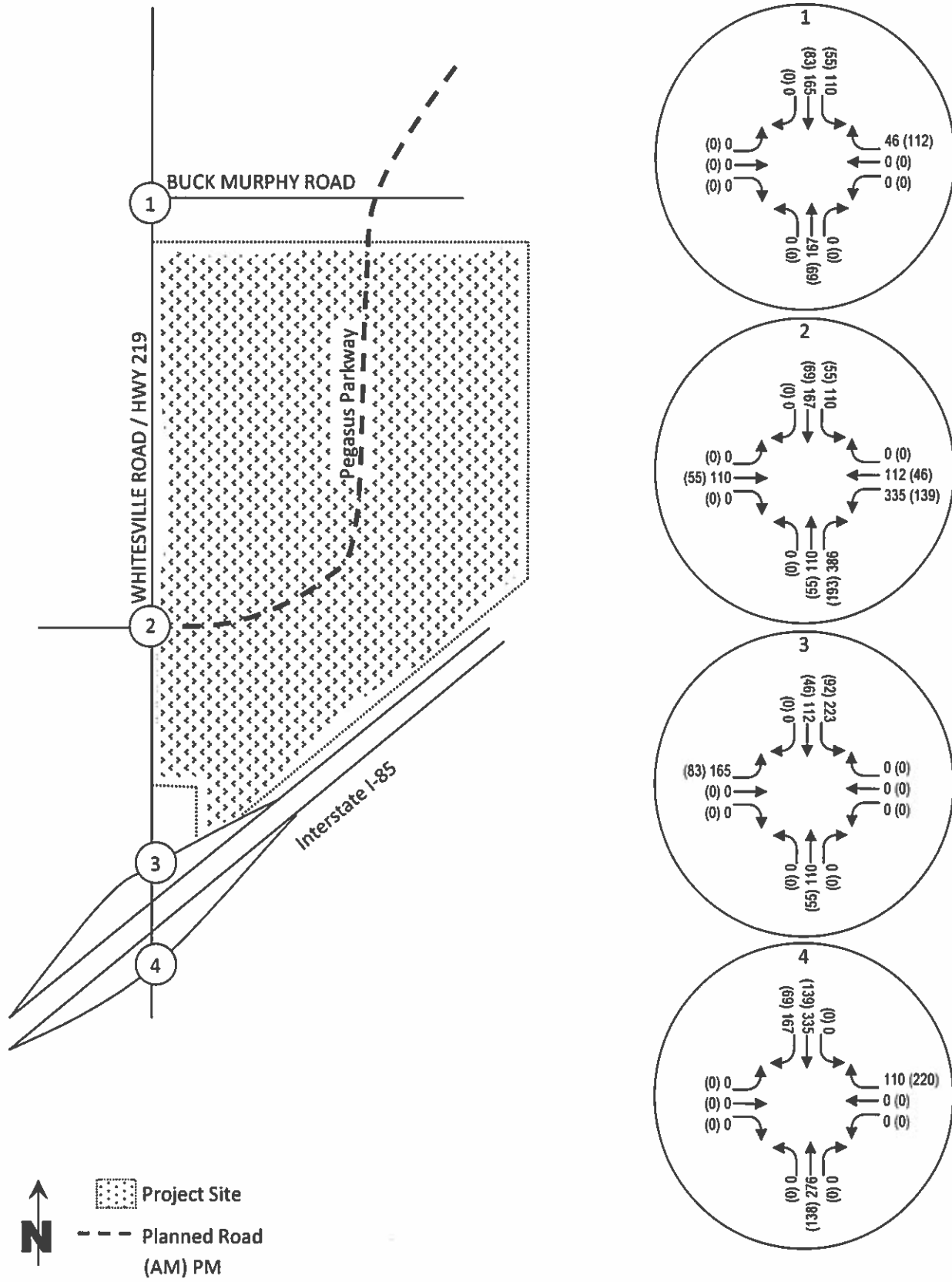


Figure 2: Existing Traffic Volumes

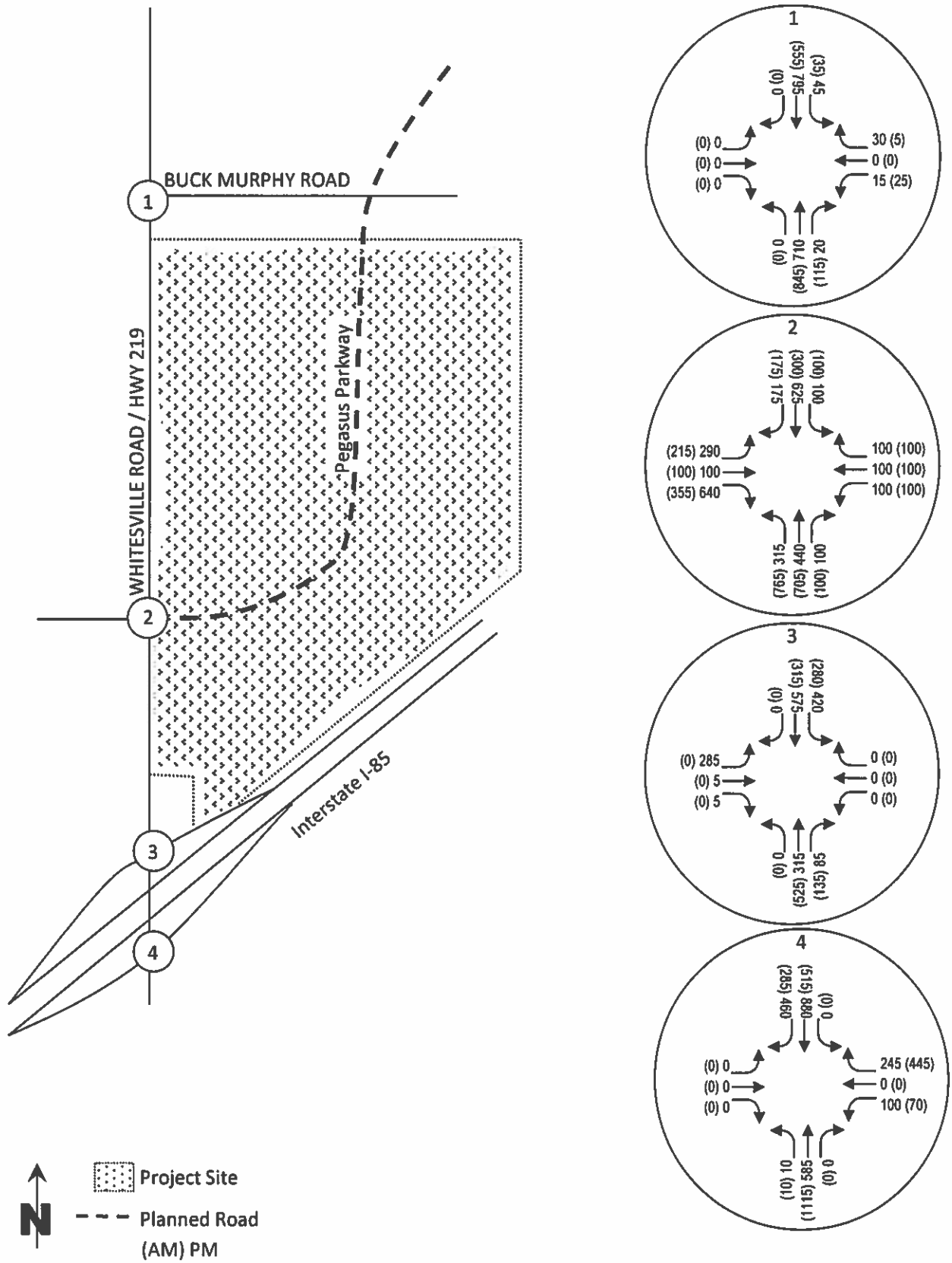


Figure 3: 2025 Background Traffic Volumes

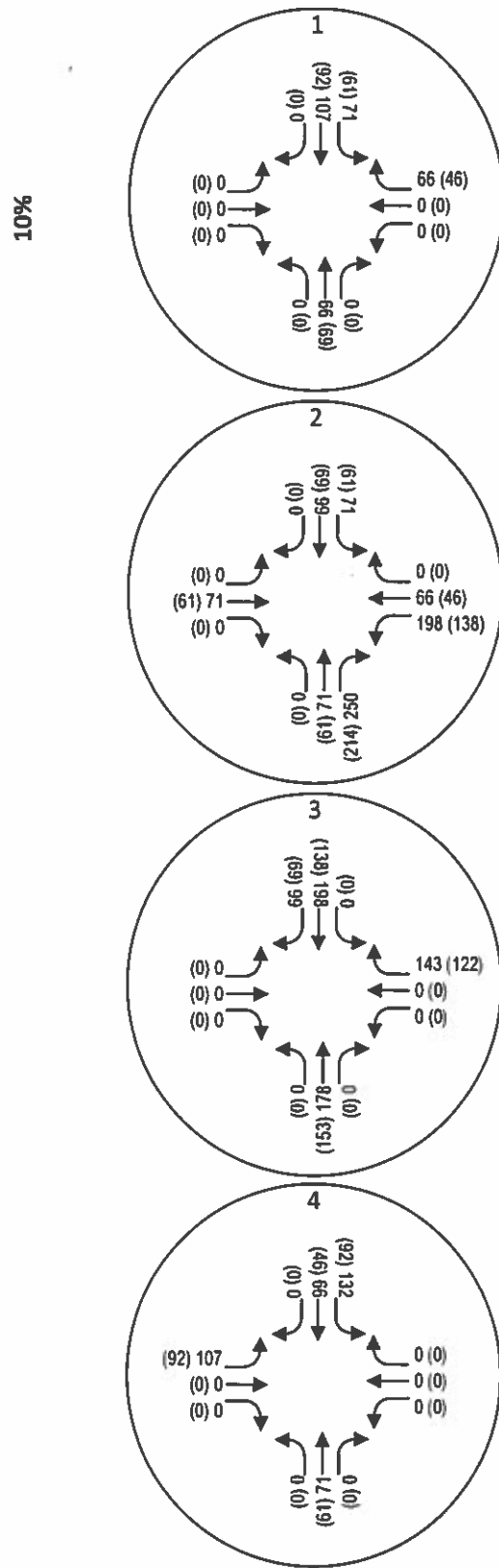
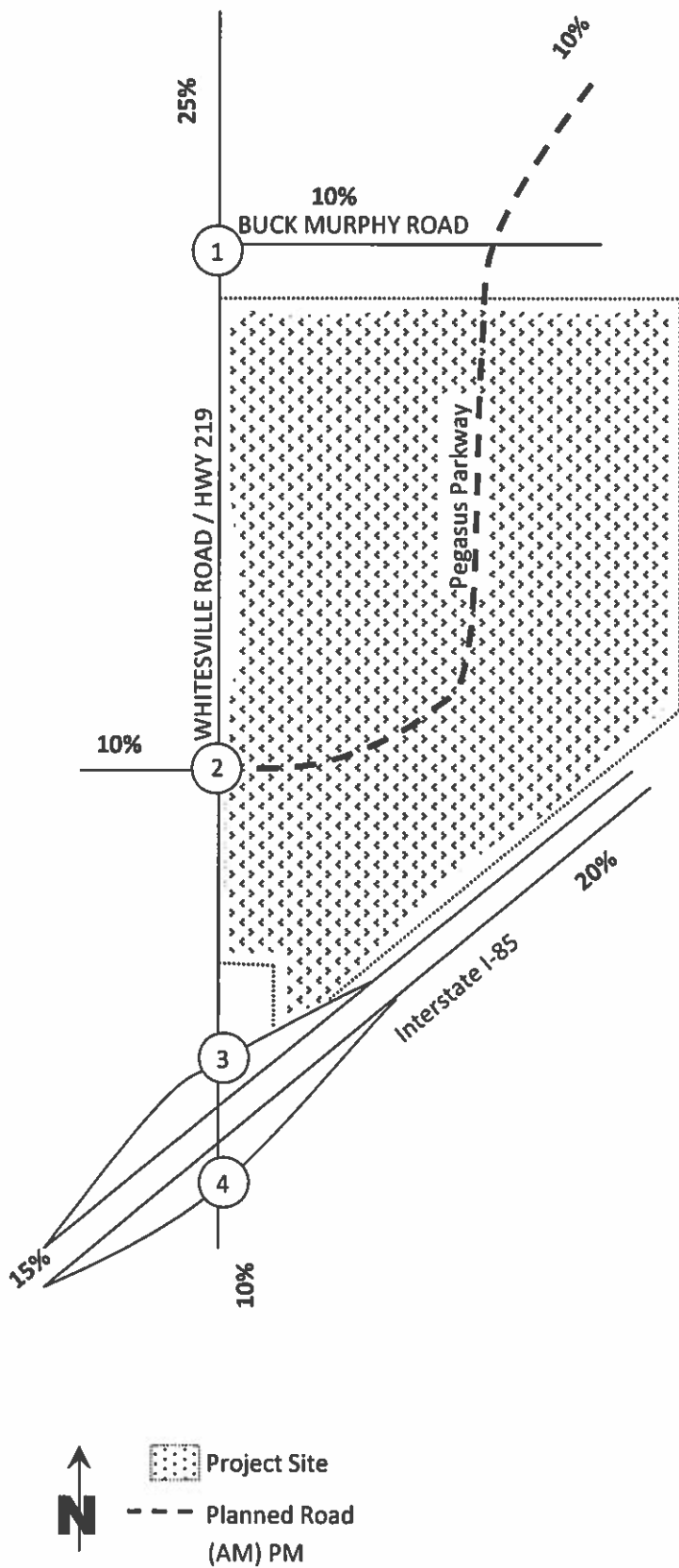


Figure 4: Estimated Project Trips

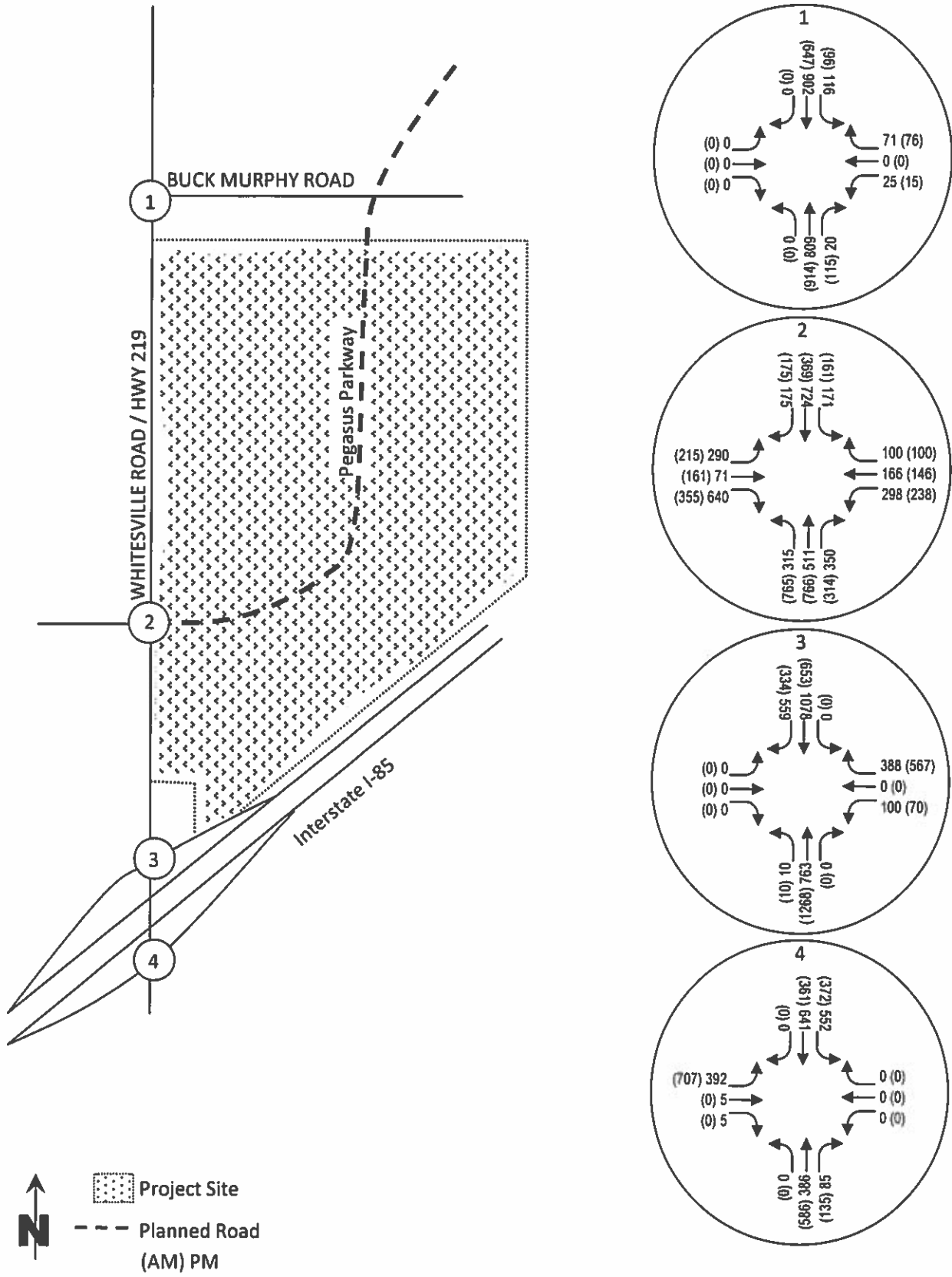


Figure 5: 2025 Total Future Traffic Volumes