Traffic Evaluation for Improvements to Pleasant Hill Road and the Interchange of I-85 and Pleasant Hill Road

in

Gwinnett County, Georgia

Prepared for:

The Gwinnett Place Community Improvement District

Prepared by:

June 2007

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EXECUTIVE SUMMARY

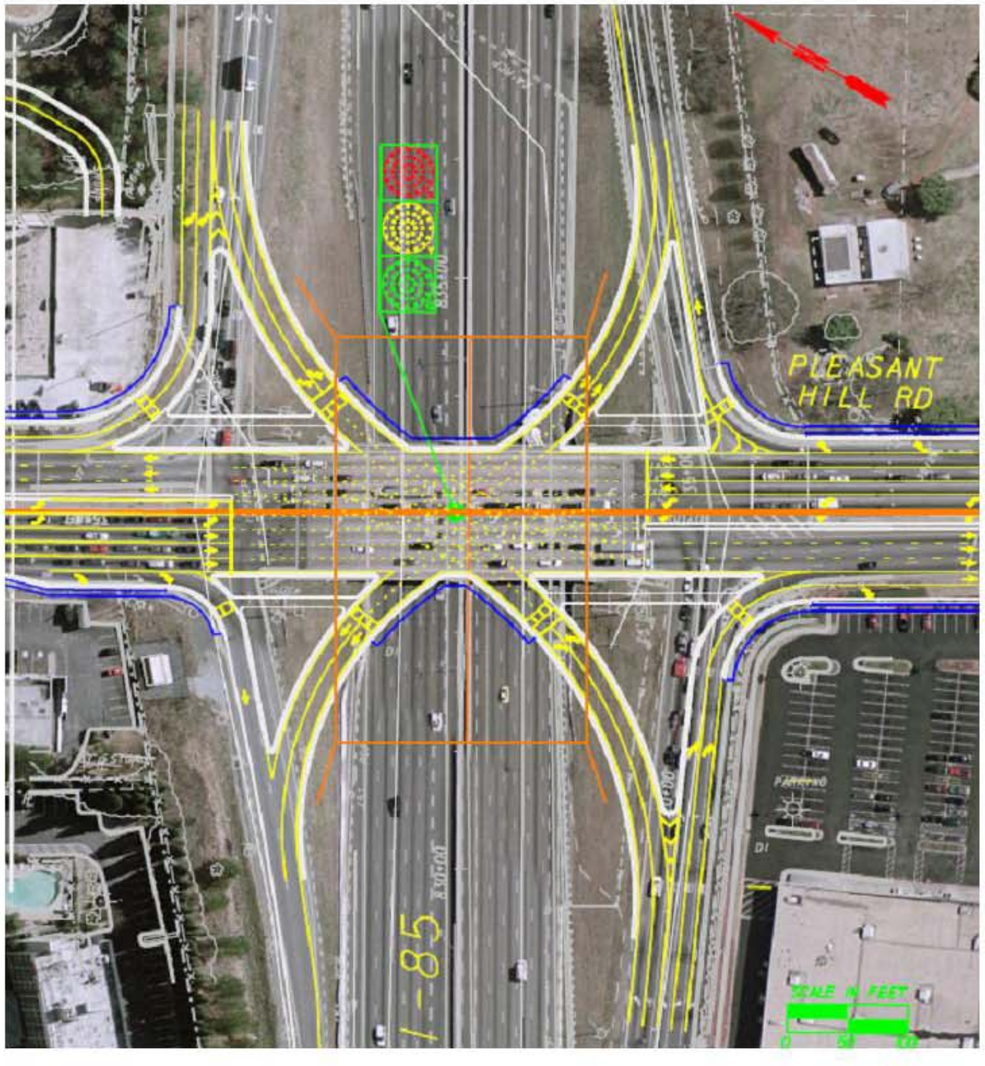
This report presents a traffic evaluation of several improvement scenarios for the Pleasant Hill Road interchange with I-85 and the adjacent signalized intersections along Pleasant Hill Road. The evaluation area is located within the Gwinnett Place Community Improvement District (GPCID) in Gwinnett County, Georgia. The improvement scenarios analyzed as part of this report were chosen based on information presented in the February 2007 "Feasibility Study for Improvements to Pleasant Hill Road and the Interchange of I-85 and Pleasant Hill Road", prepared by Street Smarts.

The focus of this evaluation was to compare the existing interchange configuration (No Build scenario) with a combination of alternatives. Alternative "Build" scenarios include the construction of a single point interchange in combination with improvements such as access management along Pleasant Hill Road, continuation of the I-85 Collector Distributor (CD) System southbound between Pleasant Hill Road and Steve Reynolds Boulevard, and reconstruction/realignement of Venture Drive. The figure on the following page illustrates the potential combination of a single point interchange at the Pleasant Hill Road interchange with I-85 and a new gateway to the area, as well as, a conceptual engineering plan.

Evaluations were made for these scenarios for both the existing traffic volumes and the projected traffic volumes anticipated 25 years from now. Currently Pleasant Hill Road in the vicinity of I-85 carries and average daily traffic volume (ADT) of 55,000 to 60,000 vehicular trips. By the Year 2032, the ADT's are anticipated to reach 71,000 to 77,000 vehicular trips.

Analysis of the critical time period along Pleasant Hill Road, the weekday PM peak hour, indicates that construction of a single point interchange would significantly improve traffic operations at the Pleasant Hill Road interchange with I-85. Motorists delay would be greatly reduced under any of the "Build" scenarios evaluated in this report. For example, given current traffic volumes at the interchange, the combined intersection delay for the two signalized I-85 ramp intersections at Pleasant Hill Road is over 300 seconds or 5 minutes. With construction of a single point interchange, the two signalized I-85 ramp intersections at Pleasant Hill Road would be replaced with one signalized intersection. The anticipated motorists delay is anticipated to be in the range of 45 seconds, less than 1 minute.

Artist Rendering



Conceptual Engineering Plan

This report presents a traffic evaluation of several improvement scenarios for the Pleasant Hill Road interchange with I-85 and the adjacent signalized intersections along Pleasant Hill Road as illustrated in Figure 1. The evaluation area is located within the Gwinnett Place Community Improvement District (GPCID) in Gwinnett County, Georgia. The improvement scenarios analyzed as part of this report were chosen based on information presented in the February 2007 "Feasibility Study for Improvements to Pleasant Hill Road and the Interchange of I-85 and Pleasant Hill Road", prepared by Street Smarts.

The improvement scenarios analyzed include the following:

- **No Build Scenario** – This scenario is based on existing roadway and intersection configurations;

- **Scenario A, Single Point Interchange with Access Management** – This scenario includes the reconstruction of the Pleasant Hill Road and I-85 interchange to provide a single point intersection, as well as, consolidation of unsignalized driveways along Pleasant Hill Road;

- **Scenario B, Single Point Interchange with Access Management and Extension of the I-85 Collector Distributor (CD) System southbound to Steve Reynolds Boulevard** – This scenario includes the improvements proposed in Scenario A with the addition of extending the southbound I-85 CD system to Steve Reynolds Boulevard;

- **Scenario C, Single Point Interchange with Access Management and Reconstruction of Venture Drive** – This scenario includes the improvements proposed in Scenario A with the addition of reconstructing Venture Drive to provide improved access between Steve Reynolds Boulevard and Pleasant Hill Road. As part of this scenario, Venture Drive will be re-routed to intersect Pleasant Hill Road opposite Gwinnett Place Drive at a full access signalized intersection. The existing traffic signal at the Pleasant Hill Road and Venture Parkway driveway will be removed and turning movements limited; and

- **Scenario D, Single Point Interchange with Access Management, Extension of the I-85 CD System southbound to Steve Reynolds Boulevard, and Reconstruction of Venture Drive** – This scenario provides a combination of all the improvements of Scenarios A, B and C.

Each of these scenarios was evaluated based on existing traffic volumes (Year 2006) and traffic volumes projected for the design year (Year 2032) of the project. The design year is 20 years after the opening or construction completion of a roadway improvement project.

The current average daily traffic volume (ADT) along Pleasant Hill Road within the vicinity of the I-85 interchange is in the range of 55,000 to 60,000 vehicular trips. By the design year of this project, 25 years from now, the ADT is anticipated to reach between 71,000 and 77,000 vehicular trips.

Preliminary analysis performed for the "Feasibility Study for Improvements to Pleasant Hill Road and the Interchange of I-85 and Pleasant Hill Road" indicated that the weekday PM peak hour was the critical time period for traffic operations. The evaluation presented in this report focused on this critical time period. Additional analysis of other time periods and intersections will be required as this project moves forward.

This traffic evaluation included the following steps to determine the anticipated traffic operations of each of the improvement scenarios:

- an understanding of the operations and analysis of single point interchanges;
- field observations of the traffic operations of the existing diamond type interchange of Pleasant Hill Road and I-85, as well as the adjacent evaluation intersections;
- field observations of an existing single point interchange (Peachtree Industrial Boulevard at Jimmy Carter Boulevard);
- data collection to verify published information regarding driver behavior at typical intersections versus a single point intersection;
- collection and review of historical traffic volume data, projected traffic volume, population and employment information for the purposes of developing projected design year traffic volumes;
- develop year 2006 and year 2032 traffic volumes for each of the evaluation scenarios;
- perform capacity analysis for year 2006 and 2032 for each of the evaluation scenarios for the weekday PM peak hour; and
- report of results and conclusions.

In addition to the traffic evaluation, a 3D simulation of the anticipated operations of the single point interchange given Scenario D conditions was prepared, as well as, a 3D rendering. These items are provided separately from this report.

Two types of summaries of the capacity analysis results have been provided in this Executive Summary. The first type of summary provides a comparison of the anticipated overall intersection levels of service (LOS) and associated overall intersection delays. LOS is a letter grade that is assigned based on the amount of delay anticipated to be experienced. The letter "A" represents a minimal amount of delay while "F" indicates the highest amount of delay. The capacity analysis methodology and LOS are determined based on information provided in the Highway Capacity Manual, published by the Transportation Research Board. Tables 1A and 1B, summarize the overall intersection LOS and delay for each of the evaluation intersections for the existing and design year traffic volumes, respectively.

The second type of summary takes a more detailed look at the Pleasant Hill Road and I-85 interchange operations. Tables 2A and 2B, summarize the LOS, delay (in seconds) and capacity utilized (in percent) by movements on and off I-85 at Pleasant Hill Road. A capacity over 100% indicates that the demand on the movement is greater than the capacity available.

Figure 1. Location Map

Table 1A. Overall Intersection Level of Service and Delay (seconds) – Year 2006

				Build							
		No Build		Scenario A		Scenario B		Scenario C		Scenario D	
ID	Intersection	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Pleasant Hill Road at Gwinnett Place Drive	C	30	C	35	C	31	D	49	D	48
2	Pleasant Hill Road at Venture Pkwy/Ventue Dr	A	9	A	9	A	9	-	-	-	-
3a	Pleasant Hill Road at I-85 SB Ramps	F	230	-	-	-	-	-	-	-	-
3	Pleasant Hill Road at I-85 Ramps	-	-	D	45	D	44	D	47	D	46
3b	Pleasant Hill Road at I-85 NB Ramps	F	107	-	-	-	-	-	-	-	-
4	Pleasant Hill Road at Breckenridge Blvd/Shackleford Rd	D	54	D	55	D	55	D	53	D	54

Table 1B. Overall Intersection Level of Service and Delay (seconds) – Year 2032

				Build							
		No Build		Scenario A		Scenario B		Scenario C		Scenario D	
ID	Intersection	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Pleasant Hill Road at Gwinnett Place Drive	D	52	D	54	D	38	F	92	E	68
2	Pleasant Hill Road at Venture Pkwy/Ventue Dr	B	14	B	16	B	15	-	-	-	-
3a	Pleasant Hill Road at I-85 SB Ramps	F	323	-	-	-	-	-	-	-	-
3	Pleasant Hill Road at I-85 Ramps	-	-	F	98	F	94	F	100	F	98
3b	Pleasant Hill Road at I-85 NB Ramps	F	246	-	-	-	-	-	-	-	-
4	Pleasant Hill Road at Breckenridge Blvd/Shackleford Rd	F	122	F	89	F	87	F	83	F	85

Table 2A. Pleasant Hill Road interchange with I-85 – No Build versus Scenario D Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2006

Intersection Movement		No Build			Scenario D		
		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	B	14	56%	E	57	80%
	Pleasant Hill Rd RT On	B	15	82%	A	1	41%
	NB Off Ramp LT Off	F	114	105%	E	68	89%
	NB Off Ramp LT/THRU Off	F	111	104%	-	-	-
	NB Off Ramp RT Off	F	225	139%	A	1	36%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	475	162%	F	88	103%
	Pleasant Hill Rd RT On	F	179	131%	B	17	84%
	NB Off Ramp LT Off	F	501	202%	F	83	99%
	NB Off Ramp LT/THRU Off	F	443	188%	-	-	-
	NB Off Ramp RT Off	F	288	154%	A	1	31%

NOTE**:** The LT On movement from Pleasant Hill Rd to I-85 NB is the only movement that declines in LOS and capacity. This is due to the simple phasing of a single point interchange. It is a small trade off given the improvement for the other critical movements.

Table 2B. Pleasant Hill Road interchange with I-85 – No Build versus Scenario D Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2032

		No Build			Scenario D		
Intersection Movement		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	F	151	110%	E	70	93%
	Pleasant Hill Rd RT On	F	171	122%	A	6	68%
	NB Off Ramp LT Off	F	155	120%	F	140	120%
	NB Off Ramp LT/THRU Off	F	152	119%	-	-	-
	NB Off Ramp RT Off	F	335	165%	A	1	51%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	696	194%	F	278	152%
	Pleasant Hill Rd RT On	F	414	182%	E	69	109%
	NB Off Ramp LT Off	F	284	153%	D	54	84%
	NB Off Ramp THRU/RT Off	F	377	175%	-	-	-
	NB Off Ramp RT Off	F	401	181%	A	1	46%

APPENDIX

NO BUILD SCENARIO

- **Year 2006 and 2032 Traffic Volumes**
- **Year 2006 and 2032 Capacity Analyses**

Figure 2. No Build Scenario Traffic Volumes – Year 2006

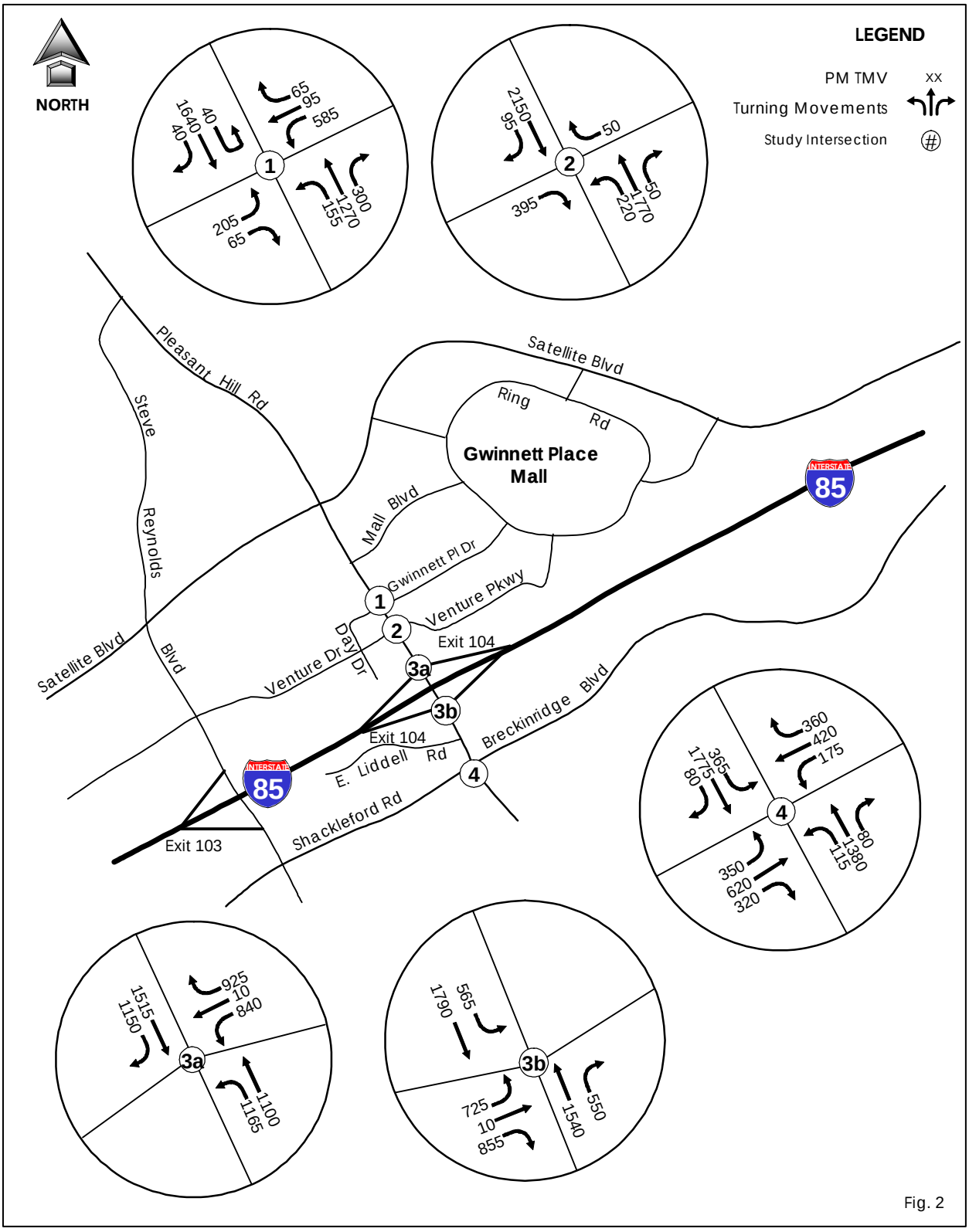


Fig. 2

Figure 3. No Build Scenario Traffic Volumes – Year 2032

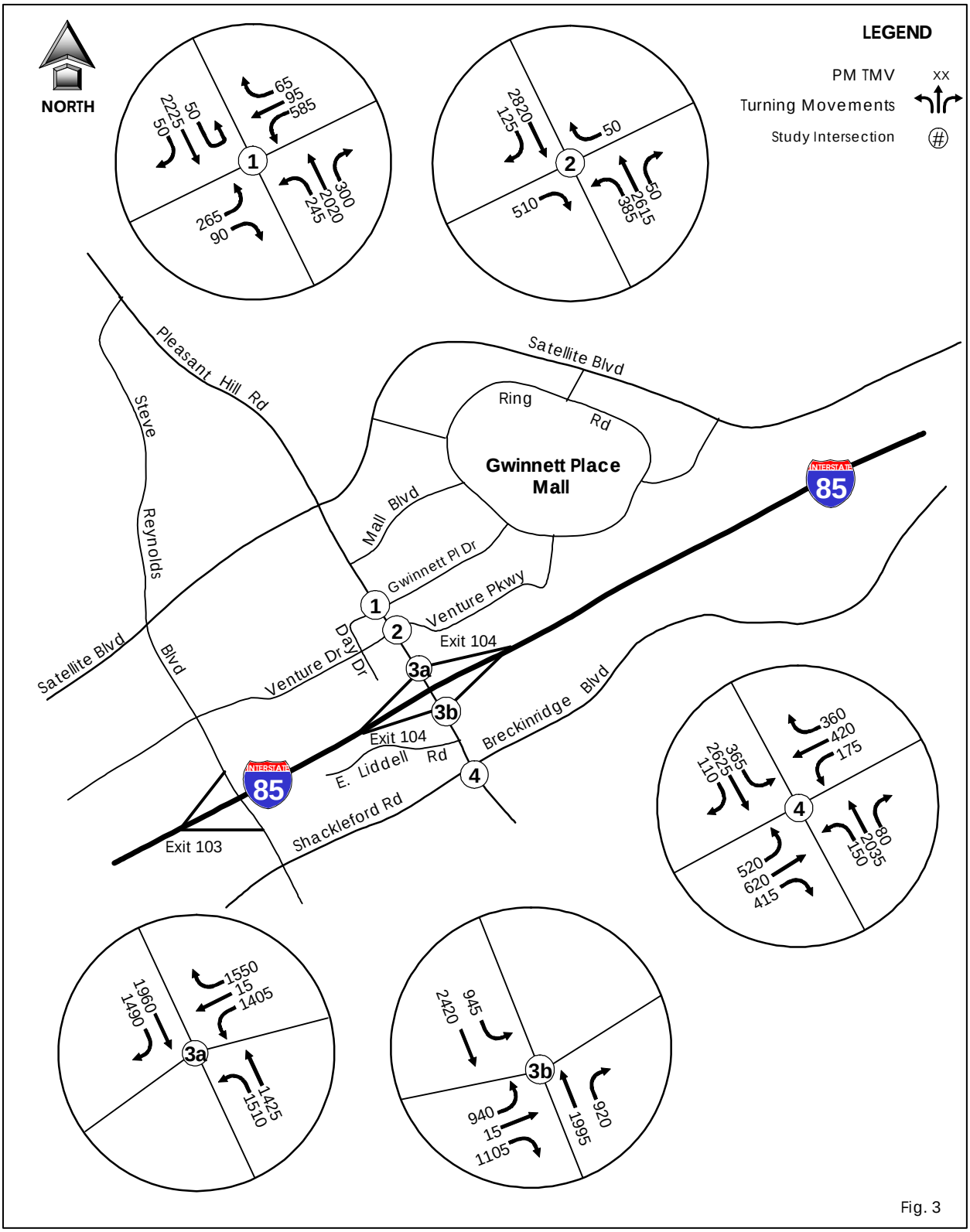


Fig. 3

Capacity Analysis:
No Build Year 2006
(Available Upon Request)

Capacity Analysis:
No Build Year 2032
(Available Upon Request)

SCENARIO A
(SINGLE POINT INTERCHANGE WITH ACCESS MANAGEMENT)

- **Year 2006 and 2032 Traffic Volumes**
- **Year 2006 and 2032 Summary Tables**
- **Year 2006 and 2032 Capacity Analyses**

Figure 4. Scenario A Traffic Volumes – Year 2006

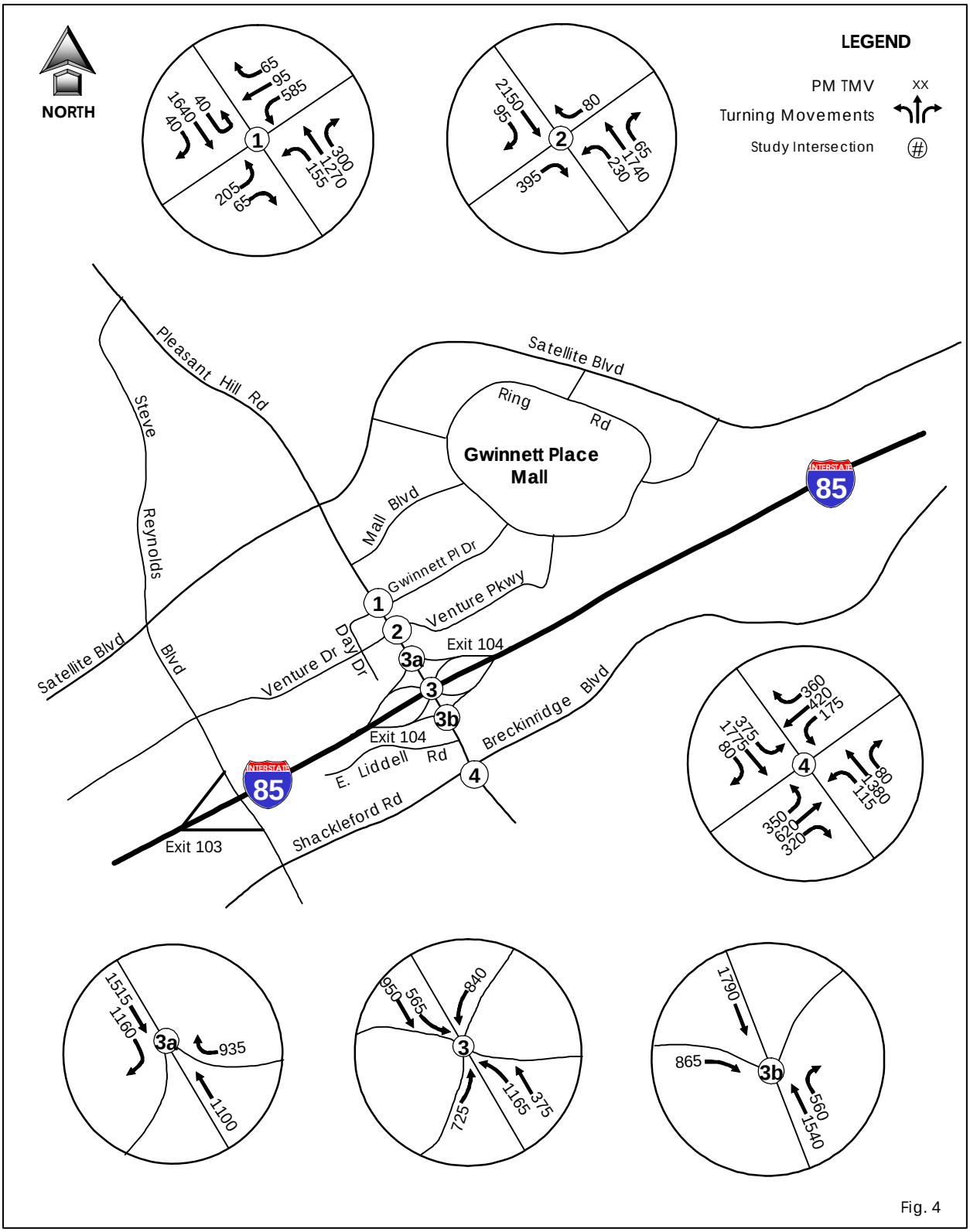


Fig. 4

Figure 5. Scenario A Traffic Volumes – Year 2032

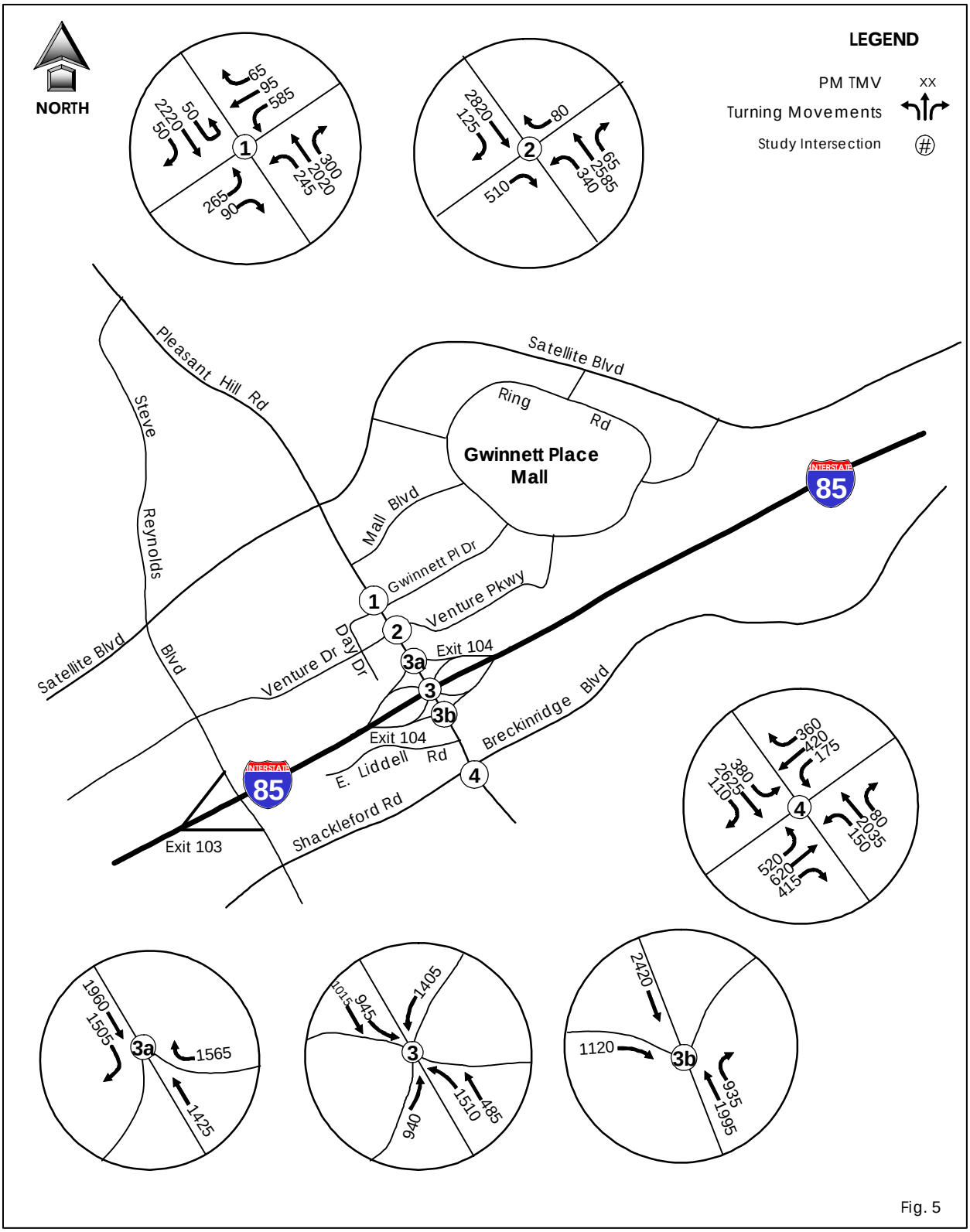


Fig. 5

Table 3A. Pleasant Hill Road interchange with I-85 – No Build versus Scenario A Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2006

Intersection Movement		No Build			Scenario A		
		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	B	14	56%	E	64	81%
	Pleasant Hill Rd RT On	B	15	82%	A	1	41%
	NB Off Ramp LT Off	F	114	105%	E	63	85%
	NB Off Ramp LT/THRU Off	F	111	104%	-	-	-
	NB Off Ramp RT Off	F	225	139%	A	1	36%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	475	162%	F	99	106%
	Pleasant Hill Rd RT On	F	179	131%	B	11	84%
	SB Off Ramp LT Off	F	501	202%	F	80	98%
	SB Off Ramp LT/THRU Off	F	443	188%	-	-	-
	SB Off Ramp RT Off	F	288	154%	A	1	38%

NOTE**:** The LT On movement from Pleasant Hill Rd to I-85 NB is the only movement that declines in LOS and capacity. This is due to the simple phasing of a single point interchange. It is a small trade off given the improvement for the other critical movements.

Table 3B. Pleasant Hill Road interchange with I-85 – No Build versus Scenario A Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2032

Intersection Movement		No Build			Scenario A		
		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	B	14	56%	E	64	81%
	Pleasant Hill Rd RT On	B	15	82%	A	1	41%
	NB Off Ramp LT Off	F	114	105%	E	63	85%
	NB Off Ramp LT/THRU Off	F	111	104%	-	-	-
	NB Off Ramp RT Off	F	225	139%	A	1	36%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	475	162%	F	99	106%
	Pleasant Hill Rd RT On	F	179	131%	B	11	84%
	SB Off Ramp LT Off	F	501	202%	F	80	98%
	SB Off Ramp LT/THRU Off	F	443	188%	-	-	-
	SB Off Ramp RT Off	F	288	154%	A	1	38%

NOTE**:** The LT On movement from Pleasant Hill Rd to I-85 NB is the only movement that declines in LOS and capacity. This is due to the simple phasing of a single point interchange. It is a small trade off given the improvement for the other critical movements.

Capacity Analysis:
Scenario A Year 2006
(Available Upon Request)

Capacity Analysis:
Scenario Year 2032
(Available Upon Request)

SCENARIO B
(SINGLE POINT INTERCHANGE WITH ACCESS MANAGEMENT AND EXTENSION OF COLLECTOR DISTRIBUTOR SYSTEM SB)

- **Year 2006 and 2032 Traffic Volumes**
- **Year 2006 and 2032 Summary Tables**
- **Year 2006 and 2032 Capacity Analyses**

Figure 6. Scenario B Traffic Volumes – Year 2006

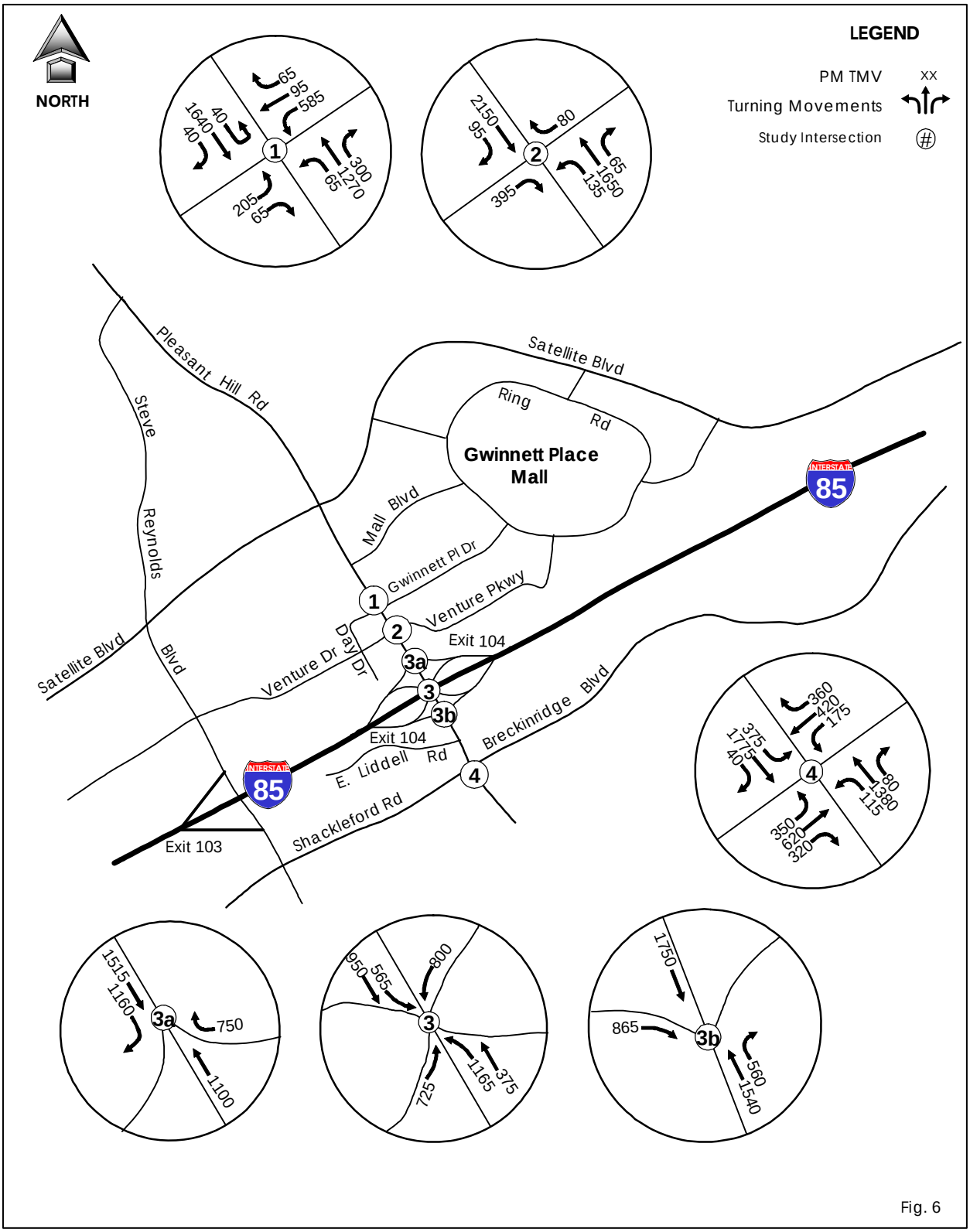


Fig. 6

Figure 7. Scenario B Traffic Volumes – Year 2032

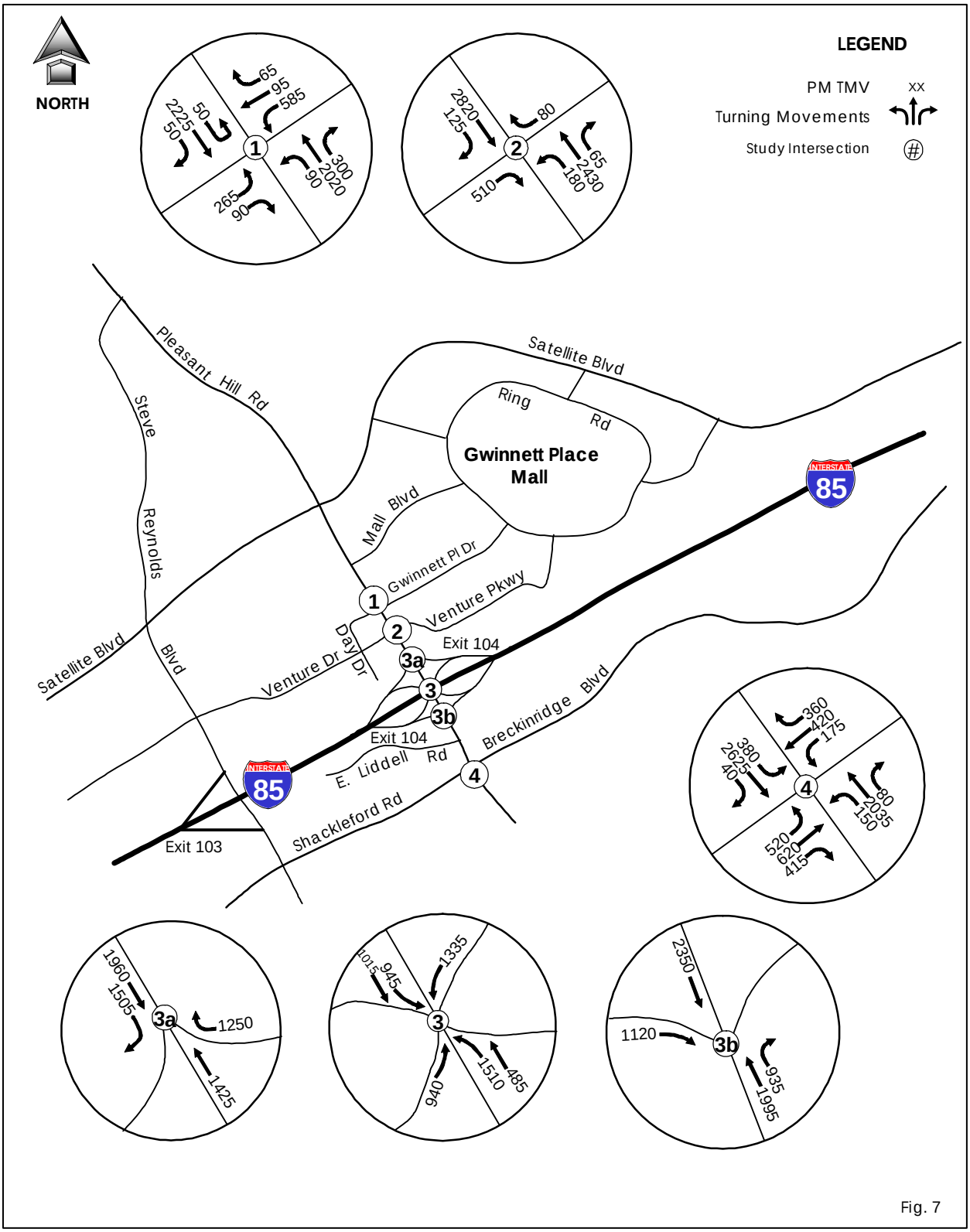


Fig. 7

Table 4A. Pleasant Hill Road interchange with I-85 – No Build versus Scenario B Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2006

Intersection Movement		No Build			Scenario B		
		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	B	14	56%	E	67	81%
	Pleasant Hill Rd RT On	B	15	82%	A	1	41%
	NB Off Ramp LT Off	F	114	105%	E	68	89%
	NB Off Ramp LT/THRU Off	F	111	104%	-	-	-
	NB Off Ramp RT Off	F	225	139%	A	1	36%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	475	162%	F	86	103%
	Pleasant Hill Rd RT On	F	179	131%	B	12	84%
	SB Off Ramp LT Off	F	501	202%	F	83	99%
	SB Off Ramp LT/THRU Off	F	443	188%	-	-	-
	SB Off Ramp RT Off	F	288	154%	A	1	31%

NOTE**:** The LT On movement from Pleasant Hill Rd to I-85 NB is the only movement that declines in LOS and capacity. This is due to the simple phasing of a single point interchange. It is a small trade off given the improvement for the other critical movements.

Table 4B. Pleasant Hill Road interchange with I-85 – No Build versus Scenario B Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2032

Intersection Movement		No Build			Scenario B		
		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	B	14	56%	E	67	81%
	Pleasant Hill Rd RT On	B	15	82%	A	1	41%
	NB Off Ramp LT Off	F	114	105%	E	68	89%
	NB Off Ramp LT/THRU Off	F	111	104%	-	-	-
	NB Off Ramp RT Off	F	225	139%	A	1	36%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	475	162%	F	86	103%
	Pleasant Hill Rd RT On	F	179	131%	B	12	84%
	SB Off Ramp LT Off	F	501	202%	F	83	99%
	SB Off Ramp LT/THRU Off	F	443	188%	-	-	-
	SB Off Ramp RT Off	F	288	154%	A	1	31%

NOTE**:** The LT On movement from Pleasant Hill Rd to I-85 NB is the only movement that declines in LOS and capacity. This is due to the simple phasing of a single point interchange. It is a small trade off given the improvement for the other critical movements.

Capacity Analysis:
Scenario B Year 2006
(Available Upon Request)

Capacity Analysis:
Scenario B Year 2032
(Available Upon Request)

SCENARIO C
(SINGLE POINT INTERCHANGE WITH ACCESS MANAGEMENT AND RECONSTRUCTION OF VENTURE DRIVE)

- **Year 2006 and 2032 Traffic Volumes**
- **Year 2006 and 2032 Summary Tables**
- **Year 2006 and 2032 Capacity Analyses**

Figure 8. Scenario C Traffic Volumes – Year 2006

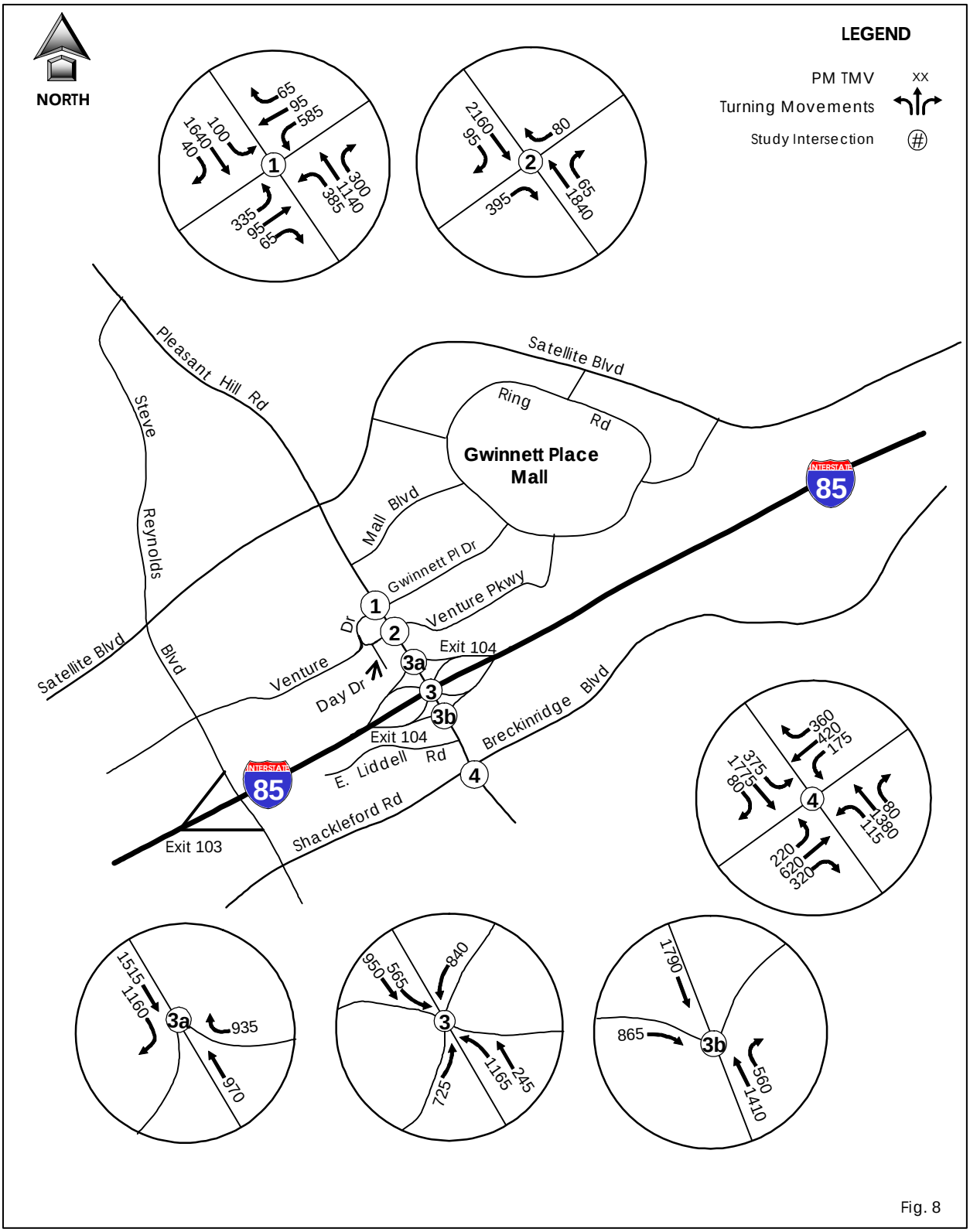


Figure 9. Scenario C Traffic Volumes – Year 2032

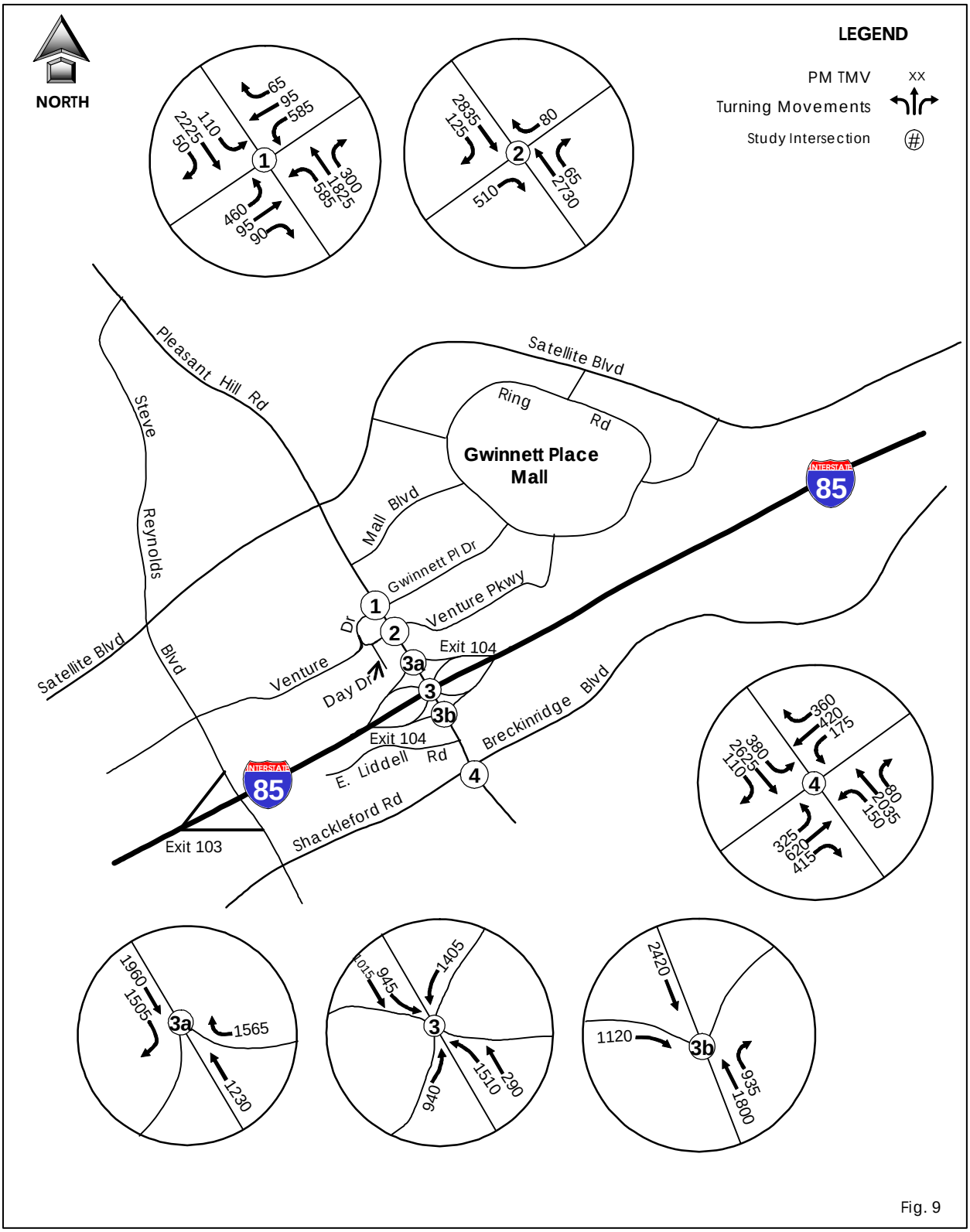


Table 5A. Pleasant Hill Road interchange with I-85 – No Build versus Scenario C Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2006

Intersection Movement		No Build			Scenario C		
		LOS	Delay	Capacity	C	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	B	14	56%	E	59	81%
	Pleasant Hill Rd RT On	B	15	82%	A	1	41%
	NB Off Ramp LT Off	F	114	105%	E	63	85%
	NB Off Ramp LT/THRU Off	F	111	104%	-	-	-
	NB Off Ramp RT Off	F	225	139%	A	1	36%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	475	162%	F	102	106%
	Pleasant Hill Rd RT On	F	179	131%	B	18	84%
	SB Off Ramp LT Off	F	501	202%	F	80	98%
	SB Off Ramp LT/THRU Off	F	443	188%	-	-	-
	SB Off Ramp RT Off	F	288	154%	A	1	38%

NOTE**:** The LT On movement from Pleasant Hill Rd to I-85 NB is the only movement that declines in LOS and capacity. This is due to the simple phasing of a single point interchange. It is a small trade off given the improvement for the other critical movements.

Table 5B. Pleasant Hill Road interchange with I-85 – No Build versus Scenario C Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2032

		No Build			Scenario C		
Intersection Movement		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	F	151	110%	E	73	97%
	Pleasant Hill Rd RT On	F	171	122%	A	6	68%
	NB Off Ramp LT Off	F	155	120%	D	49	80%
	NB Off Ramp LT/THRU Off	F	152	119%	-	-	-
	NB Off Ramp RT Off	F	335	165%	A	1	46%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	696	194%	F	317	161%
	Pleasant Hill Rd RT On	F	414	182%	E	69	109%
	SB Off Ramp LT Off	F	284	153%	F	135	119%
	SB Off Ramp THRU/RT Off	F	377	175%	-	-	-
	SB Off Ramp RT Off	F	401	181%	A	1	64%

Capacity Analysis:
Scenario C Year 2006
(Available Upon Request)

Capacity Analysis:
Scenario C Year 2032
(Available Upon Request)

SCENARIO D
(SINGLE POINT INTERCHANGE WITH ACCESS MANAGEMENT, EXTENSION OF COLLECTOR DISTRIBUTOR SYSTEM SB, AND RECONSTRUCTION OF VENTURE DRIVE)

- **Year 2006 and 2032 Traffic Volumes**
- **Year 2006 and 2032 Summary Tables**
- **Year 2006 and 2032 Capacity Analyses**

Figure 10. Scenario D Traffic Volumes – Year 2006

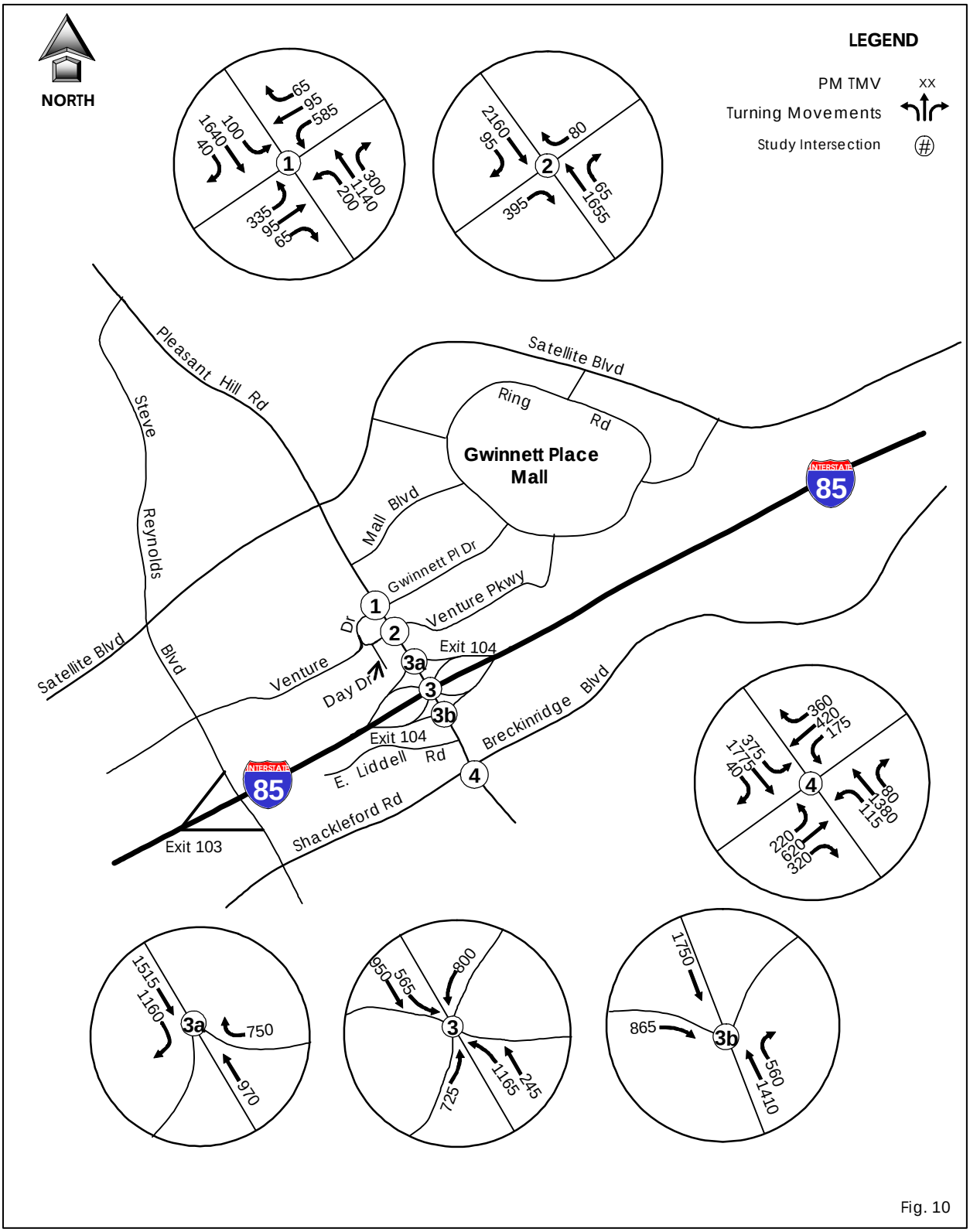


Fig. 10

Figure 11. Scenario D Traffic Volumes – Year 2032

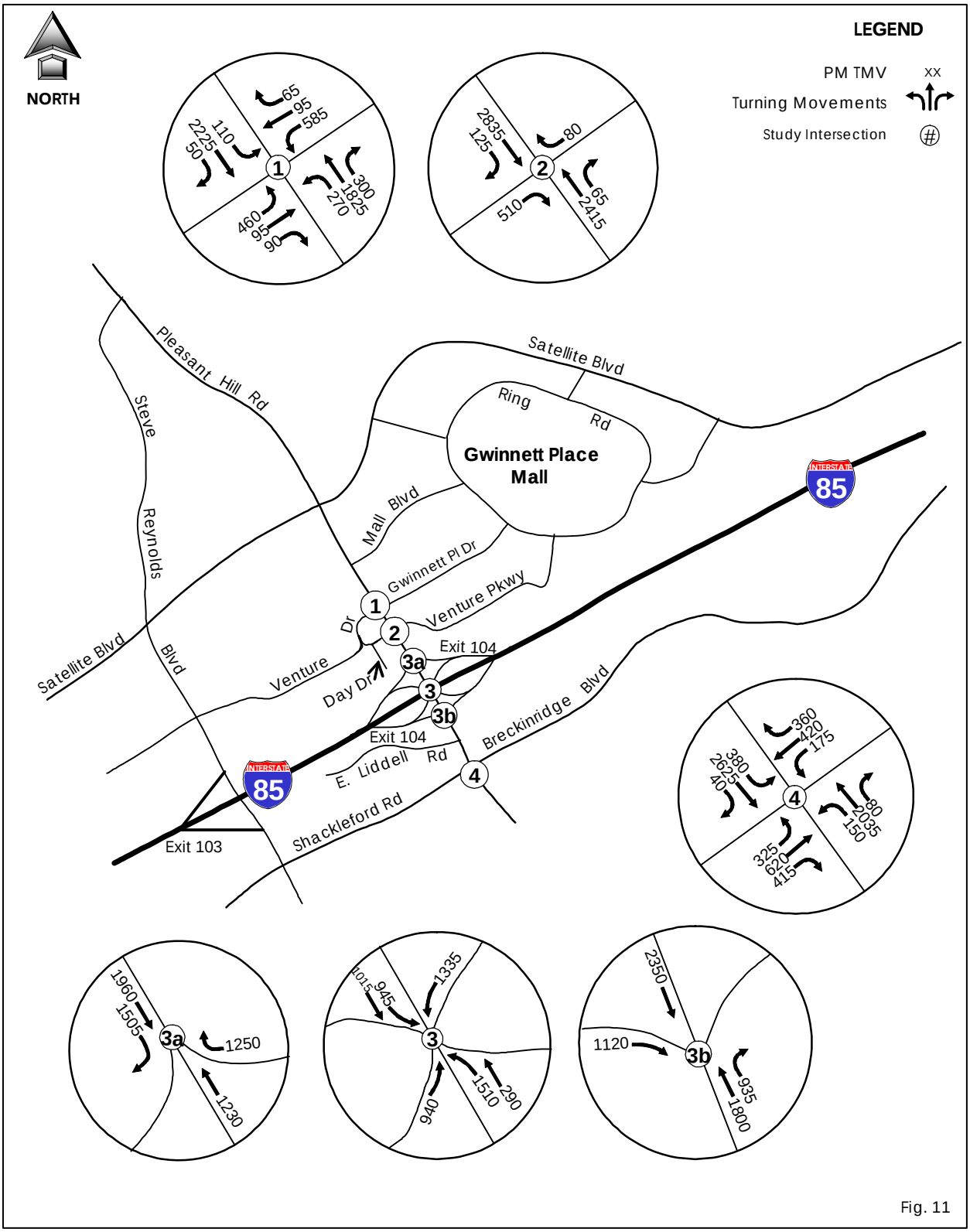


Fig. 11

Table 6A. Pleasant Hill Road interchange with I-85 – No Build versus Scenario D Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2006

Intersection Movement		No Build			Scenario D		
		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	B	14	56%	E	57	80%
	Pleasant Hill Rd RT On	B	15	82%	A	1	41%
	NB Off Ramp LT Off	F	114	105%	E	68	89%
	NB Off Ramp LT/THRU Off	F	111	104%	-	-	-
	NB Off Ramp RT Off	F	225	139%	A	1	36%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	475	162%	F	88	103%
	Pleasant Hill Rd RT On	F	179	131%	B	17	84%
	SB Off Ramp LT Off	F	501	202%	F	83	99%
	SB Off Ramp LT/THRU Off	F	443	188%	-	-	-
	SB Off Ramp RT Off	F	288	154%	A	1	31%

NOTE**:** The LT On movement from Pleasant Hill Rd to I-85 NB is the only movement that declines in LOS and capacity. This is due to the simple phasing of a single point interchange. It is a small trade off given the improvement for the other critical movements.

Table 6B. Pleasant Hill Road interchange with I-85 – No Build versus Scenario D Individual Movement Level of Service, Delay (seconds), and Utilized Capacity (percent) – Year 2032

		No Build			Scenario D		
Intersection Movement		LOS	Delay	Capacity	LOS	Delay	Capacity
To/From I-85 NB:	Pleasant Hill Rd LT On	F	151	110%	E	70	93%
	Pleasant Hill Rd RT On	F	171	122%	A	6	68%
	NB Off Ramp LT Off	F	155	120%	F	140	120%
	NB Off Ramp LT/THRU Off	F	152	119%	-	-	-
	NB Off Ramp RT Off	F	335	165%	A	1	51%
To/From I-85 SB:	Pleasant Hill Rd LT On	F	696	194%	F	278	152%
	Pleasant Hill Rd RT On	F	414	182%	E	69	109%
	SB Off Ramp LT Off	F	284	153%	D	54	84%
	SB Off Ramp THRU/RT Off	F	377	175%	-	-	-
	SB Off Ramp RT Off	F	401	181%	A	1	46%

NOTE**:** The LT On movement from Pleasant Hill Rd to I-85 NB is the only movement that declines in LOS and capacity. This is due to the simple phasing of a single point interchange. It is a small trade off given the improvement for the other critical movements.

Capacity Analysis:
Scenario D Year 2006
(Available Upon Request)

Capacity Analysis:
Scenario D Year 2032
(Available Upon Request)