Gay Street Corridor Traffic Operational Evaluation

PREPARED FOR:

THE CITY OF AUBURN

PREPARED BY:

SKIPPER CONSULTING INC.

JANUARY 2007

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INTRODUCTION

This section documents the results of traffic operations evaluations and traffic signal systems needs for the Gay Street Corridor from Drake Avenue to Thach Avenue in Auburn, Alabama. The intersections analyzed in this corridor include:

- Gay Street at Drake Avenue
- Gay Street at Opelika Road.
- Gay Street at Mitcham Avenue
- Gay Street at Glenn Avenue
- Gay Street at Magnolia Avenue
- Gay Street at Thach Avenue
- Gay Street at Miller Avenue
- Gay Street at Samford Avenue

The locations of the study intersections along the Gay Street Corridor are illustrated in **Figure 5-1**. In order to accomplish the traffic operations evaluations and determine the traffic signal systems needs at these locations within the study corridor, the following tasks were undertaken:

- existing peak hour turning movement counts were conducted for the study intersections;
- capacity analyses were conducted for the study intersections;
- arterial capacity analyses were conducted for Gay Street;
- current traffic operational deficiencies were identified;
- geometric and traffic control improvements were developed for the study intersections to address operational and safety deficiencies; and
- traffic signal systems needs were identified to develop a coordinated signal system.

Sources of information used in this section include: the City of Auburn, Alabama; the Institute of Transportation Engineers; American Association of State Highway and Transportation Officials; the Manual on Uniform Traffic Control Devices; the Transportation Research Board; and the files and field reconnaissance efforts of Skipper Consulting, Inc.

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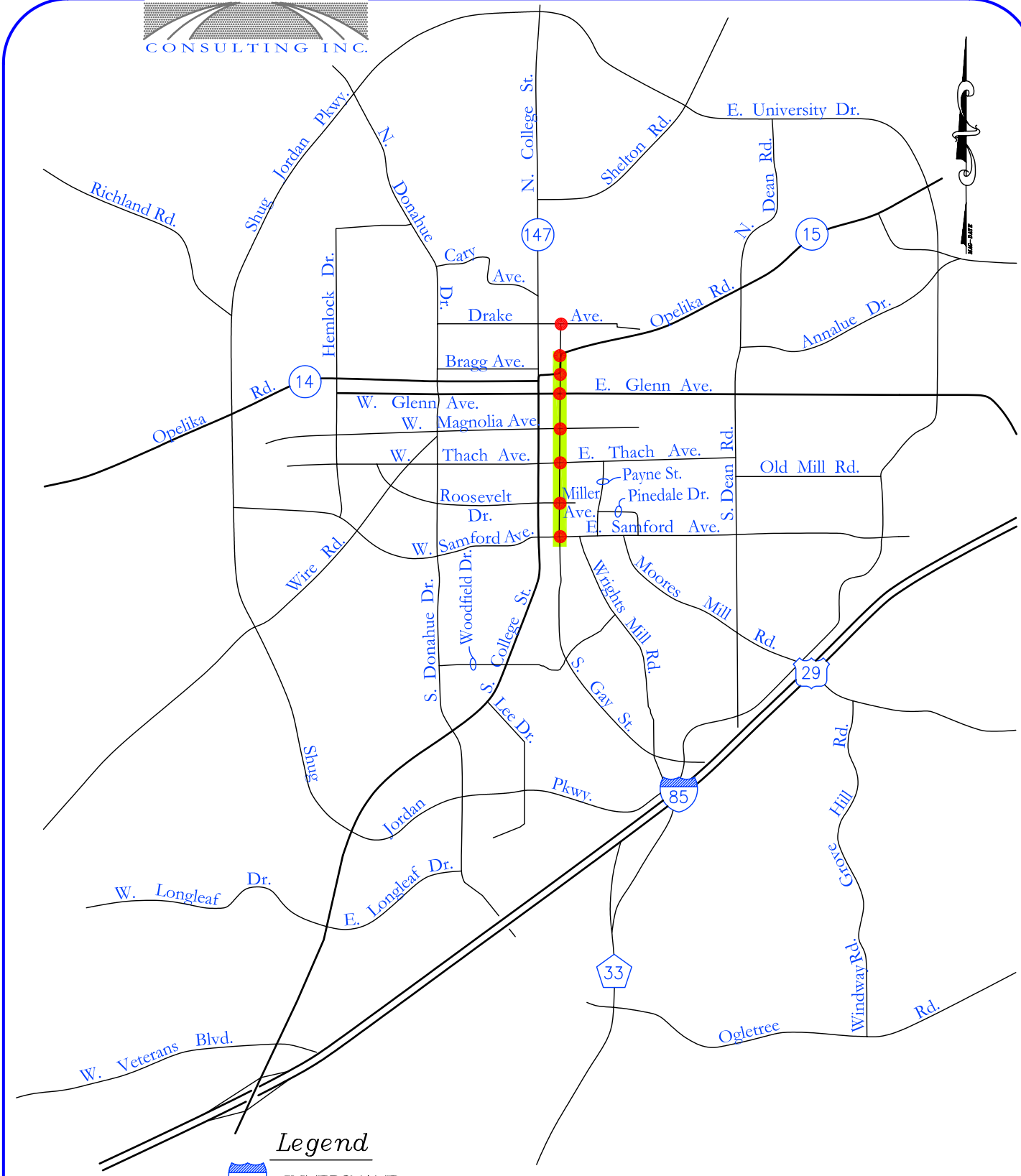

Legend

- 85 INTERSTATE
- 29 U.S. HIGHWAY
- 15 STATE ROUTE
- 33 COUNTY ROAD
- STUDY INTERSECTION
- STUDY LIMITS

DRAWING NOT TO SCALE

FIGURE 5-1
STUDY INTERSECTIONS
GAY STREET CORRIDOR
AUBURN, ALABAMA

OCTOBER 2006 1103.007

BACKGROUND INFORMATION

Study Area Roadways

The Gay Street Corridor from Drake Avenue to Samford Avenue passes through the downtown business district to the north and the campus of Auburn University to the south. This segment of Gay Street is approximately 1.0 mile in length. Characteristics for each study roadway evaluated in this corridor are provided in **Table 5-1**.

Table 5-1
Study Corridor Roadways Characteristics

Roadway	Parking	# of Lanes	Travel Direction	Travel Speeds (mph)	Classification
Gay Street (Samford Ave. to Thach Ave.)	None	2	North/South	25	Arterial
Gay Street (Thach Ave. to Glenn Ave.)	Parallel	3	North/South	25	Arterial
Gay Street (Glenn Avenue to Opelika Rd.)	None	3	North/South	25	Arterial
Gay Street (Opelika Rd. to Drake Ave.)	None	2	North/South	25	Collector
Drake Avenue	None	2	East/West	25	Collector
Opelika Road	None	3	East/West	30	Arterial
Mitcham Avenue	None	3	East/West	25	Arterial
Glenn Avenue	None	4	East/West	30	Arterial
Magnolia Avenue	Angled	2	East/West	25	Collector
Thach Avenue	None	2	East/West	25	Collector
Miller Avenue	None	2	East/West	25	Collector
Samford Avenue	None	2	East/West	25	Arterial

Peak Hour Traffic Counts

Morning (7:00-9:00 am) and afternoon (4:00-6:00 pm) peak hour turning movement counts were conducted along the Gay Street Corridor at study intersections during the month of September 2005. Traffic count data utilized for the analyses of these intersections is summarized in **Figure 5-2** and **Figure 5-3**. Complete traffic count data is provided in **Appendix A** for reference.

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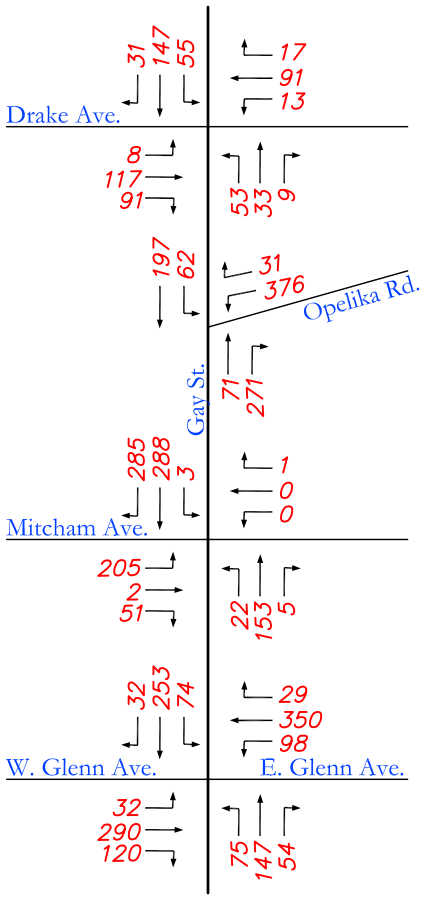

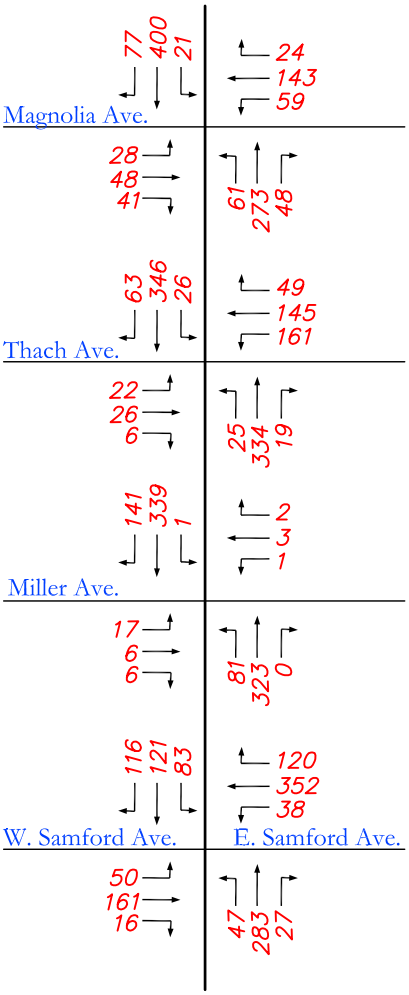

Counts taken in September 2005 except
Miller Ave. counts taken in September 2007
Typical Peak (7:15-8:15 AM)

DRAWING NOT TO SCALE

Legend

00 → TRAFFIC VOLUMES (VEHICLES)

FIGURE 5-2
EXISTING AM PEAK HOUR
TURNING MOVEMENT COUNTS
GAY STREET CORRIDOR
AUBURN, ALABAMA
1103.007

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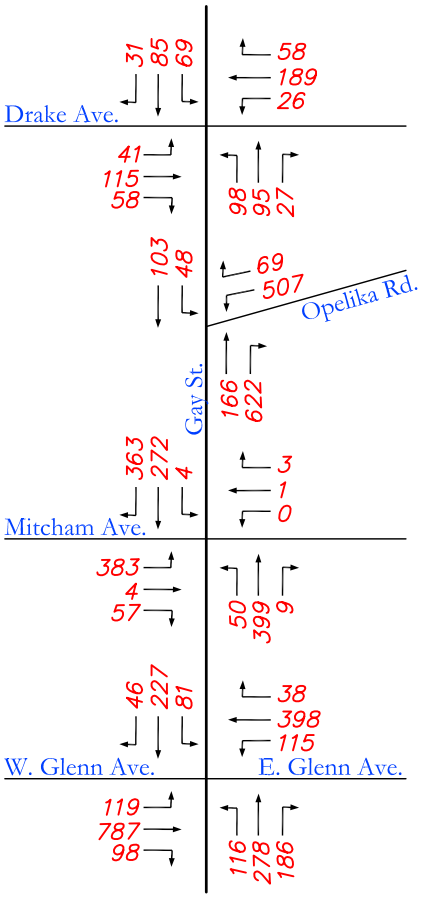
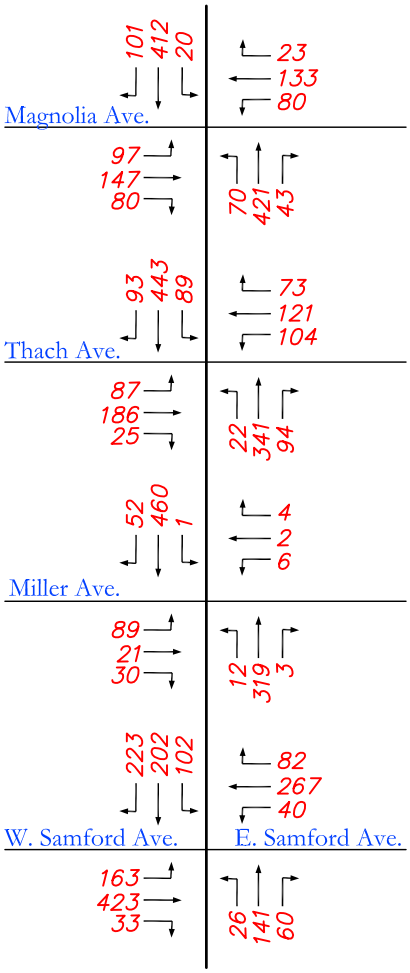




Counts taken in September 2005 except
Miller Ave. counts taken in September 2007
Typical Peak (4:30-5:30 PM)

Legend

00 → TRAFFIC VOLUMES (VEHICLES)

DRAWING NOT TO SCALE

FIGURE 5-3
EXISTING PM PEAK HOUR TURNING MOVEMENT COUNTS
GAY STREET CORRIDOR
AUBURN, ALABAMA

1103.007

EXISTING INTERSECTION CAPACITY ANALYSIS

Capacity analyses for peak hour conditions at the study intersections along the Gay Street Corridor were conducted for the morning and afternoon peak hour periods using methods outlined in the *Highway Capacity Manual, Third Edition*. According to methods of the *Highway Capacity Manual*, capacity is expressed as levels of service ranging from "A" (best) through "F" (worst). In general, a level of service "C" is considered desirable while a level of service "D" is considered acceptable during peak hour operations. Results of these capacity analyses for existing conditions are summarized in **Table 5-2**. Existing intersection capacity printouts, which present details of the capacity analyses, are provided in **Appendix B** for reference.

Table 5-2
Existing Intersection Levels of Service

Intersection (traffic control)	Approach	Movement/Lane Group	Level of Service	
			A.M. Peak Hour	P.M. Peak Hour
Gay Street at Drake Ave (all-way stop)	EB Drake Ave.	Left/ Through/Right	B	B
	WB Drake Ave.	Left/ Through/Right	B	C
	NB Gay Street	Left/ Through/Right	A	B
	SB Gay Street	Left/ Through/Right	B	B
	Overall LOS		**B**	**B**
Gay Street at Opelika Road (traffic signal)	WB Opelika Road	Left	A	A
		Right	A	A
	NB Gay Street	Through	C	C
		Right	A	A
	SB Gay Street	Left	C	C
		Through	C	C
	Overall LOS		**B**	**A**
Gay Street At Mitcham Avenue (traffic signal)	EB Mitcham Ave.	Left/Through	D	***F***
		Right	A	B
	NB Gay Street	Left	A	A
		Through/Right	C	C
	SB Gay Street	Left	A	A
		Through	C	C
		Right	A	A
	Overall LOS		**C**	**D**

Table 5-2 (continued)

Intersection (traffic control)	Approach	Movement/Lane Group	Level of Service	
			A.M. Peak Hour	P.M. Peak Hour
Gay Street at Glenn Ave (traffic signal)	EB Glenn Ave.	Left	B	B
		Through/Right	C	C
	WB Glenn Avenue	Left	B	C
		Through/Right	C	C
	NB Gay Street	Left	C	C
		Through	C	D
		Right	C	C
	SB Gay Street	Left	C	C
		Through/Right	D	D
	Overall LOS		**C**	**C**
Gay Street at Magnolia Avenue (traffic signal)	EB Magnolia Ave.	Left	B	B
		Through/Right	B	B
	WB Magnolia Ave	Left	B	B
		Through/Right	B	B
	NB Gay Street	Left	A	A
		Through/Right	A	A
	SB Gay Street	Left	A	A
		Through	A	A
		Right	A	A
	Overall LOS		**A**	**B**
Gay Street At Thach Avenue (traffic signal)	EB Thach Avenue	Left	B	B
		Through	C	D
		Right	C	C
	WB Thach Avenue	Left	B	C
		Through/Right	D	D
	NB Gay Street	Left	B	B
		Through/Right	D	***F***
	SB Gay Street	Left	B	C
		Through	***F***	***E***
		Right	C	C
	Overall LOS		**D**	**E**
Gay Street At Miller Avenue (side street stop)	EB Miller Avenue	Left/ Through/Right	D	D
	WB Miller Avenue	Left/ Through/Right	C	C
	NB Gay Street	Left/ Through/Right	A	A
	SB Gay Street	Left/ Through/Right	A	A
Gay Street At Samford Avenue (traffic signal)	EB Samford Avenue	Left	B	B
		Through/Right	B	B
	WB Samford Avenue	Left	A	B
		Through/Right	B	B
	NB Gay Street	Left	B	B
		Through/Right	B	B
	SB Gay Street	Left	B	B
		Through/Right	B	B
	Overall LOS		**B**	**B**

As shown in **Table 5-2**, all study intersections evaluated along the Gay Street Corridor operate at acceptable levels of service for both peak periods tested, with the exception of the following:

- At the intersection of Gay Street and Mitcham Avenue, the eastbound left movement on Mitcham Avenue (LOS F) during the afternoon peak hour.
- At the intersection of Gay Street and Thach Avenue, the northbound through/right movement on Gay Street (LOS F) during the afternoon peak hour, and the southbound through movement on Gay Street (LOS F, E) during the morning and afternoon peak hours.

EXISTING ARTERIAL SEGMENT CAPACITY ANALYSIS

Arterial segment capacity analyses for peak hour conditions along the Gay Street Corridor were conducted for the morning and afternoon peak hour periods using methods outlined in the *Highway Capacity Manual, Third Edition.* Levels of service for the arterial analyses conducted for Gay Street are summarized in **Table 5-3**. Capacity printouts are provided in **Appendix B**.

Table 5-3
Existing Arterial Segment Levels of Service

Northbound Gay Street Arterial Analysis				
			Arterial Level of Service by Section	
From	To	Segment Length	AM Peak	PM Peak
Samford Avenue	Thach Avenue	0.40	C	D
Thach Avenue	Magnolia Avenue	0.17	C	C
Magnolia Avenue	Glenn Avenue	0.19	D	D
Glenn Avenue	Mitcham Avenue	0.10	E	E
Mitcham Avenue	Opelika Road	0.12	D	D
Total Urban Street LOS			**D**	**D**

Southbound Gay Street Arterial Analysis				
			Arterial Level of Service by Section	
From	To	Segment Length	AM Peak	PM Peak
Opelika Road	Mitcham Avenue	0.12	E	D
Mitcham Avenue	Glenn Avenue	0.10	F	F
Glenn Avenue	Magnolia Avenue	0.19	B	B
Magnolia Avenue	Thach Avenue	0.17	F	F
Thach Avenue	Samford Avenue	0.40	B	B
Total Urban Street LOS			**D**	**D**

Table 5-3 indicates that the total urban street level of service along Gay Street would be a level of service "D" for each direction of travel during both the morning and afternoon peak hours. **Table 5-3** also indicates the following segments would operate at a level of service "E" or worse during one or both of the peak periods evaluated:

- Northbound Gay Street from Glenn Avenue to Mitcham Avenue.
- Southbound Gay Street from Opelika Road to Mitcham Avenue.
- Southbound Gay Street from Mitcham Avenue to Glenn Avenue.
- Southbound Gay Street from Magnolia Avenue to Thach Avenue

RIGHT-TURN LANE WARRANT EVALUATIONS

An assessment of the need for right turn lanes along Gay Street was conducted. This assessment was conducted for the northbound and southbound approaches of Gay Street at each of the study intersections. The criteria utilized was based upon information contained in the *Intersection Channelization Design Guide, Report 279*, published by the Transportation Research Board. Existing peak hour traffic volumes were compared with right-turn lane warrant criteria as presented in the *Intersection Channelization Design Guide, Report 279.*

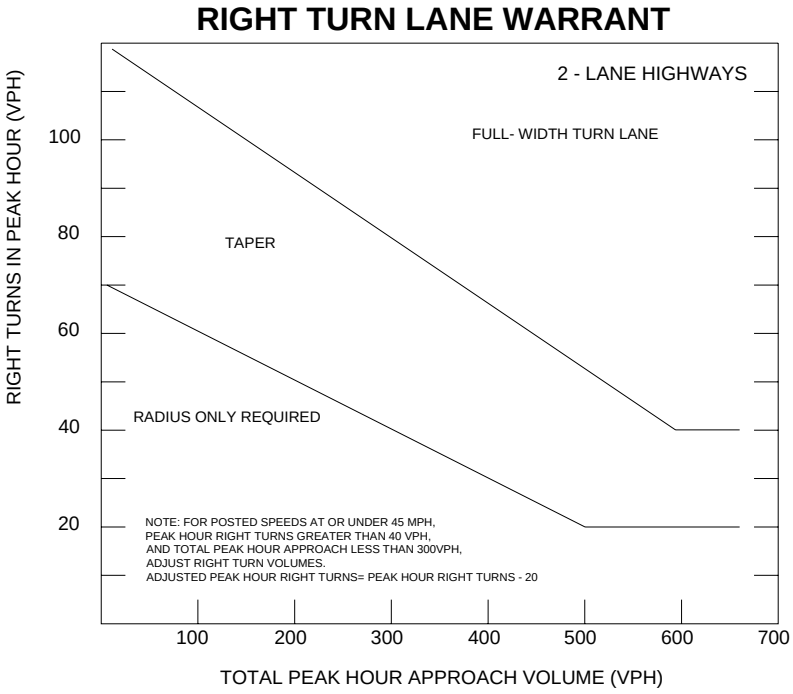
The results of these comparisons indicate current volumes are sufficient to meet the criteria for right-turn lanes as described above.

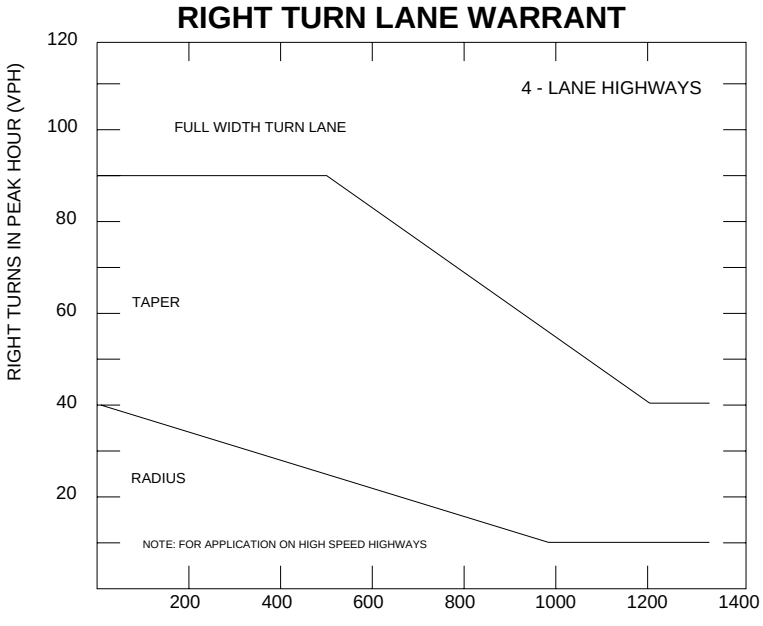
- Southbound Gay Street at Samford Avenue – During both the morning and afternoon peak hours, traffic volumes are sufficient to meet the criteria for a full length right turn lane with taper.
- Northbound Gay Street at Thach Avenue – During the afternoon peak hour, traffic volumes are sufficient to meet the criteria for a full length right turn lane with taper.
- Northbound Gay Street at Magnolia Avenue – During both the morning and afternoon peak hours, traffic volumes are sufficient to meet the criteria for a deceleration taper. While a taper or large radius would be helpful, a full length

right turn deceleration lane (including taper) would be the most effective measure to enable right turning vehicles to exit the through travel lane and is recommended at this location.

- Southbound Gay Street at Glenn Avenue – During the afternoon peak hour, traffic volumes are sufficient to meet the criteria for a deceleration taper. While a taper or large radius would be helpful, a full length right turn deceleration lane (including taper) would be the most effective measure to enable right turning vehicles to exit the through travel lane and is recommended at this location.
- Eastbound Glenn Avenue at Gay Street – During both the morning and afternoon peak hours, traffic volumes are sufficient to meet the criteria for a full length right turn lane with taper at this location.
- Southbound Gay Street at Miller Avenue – During the afternoon peak hour, traffic volumes are sufficient to meet the criteria for a full length right turn lane with taper.
- Westbound Samford Avenue at Gay Street – During both the morning and afternoon peak hours, traffic volumes are sufficient to meet the criteria for a full length right turn lane with taper at this location.

Right turn lane guidelines, as presented in the *Intersection Channelization Design Guide, Report 279,* are provided for reference in the following charts.





** Taken from Figure 4-23, Intersection Channelization Design Guide, Report 279, published by the Transportation Research Board.*

INTERSECTION ACCIDENT ANALYSIS

Skipper Consulting, Inc. performed a citywide crash study for intersections and roadway segments maintained by the City of Auburn. The results of this crash study have been documented in a separate bound report. A summary of the findings for the Gay Street Corridor is included in the paragraphs below.

The following intersections and roadway segments within the Gay Street Corridor were analyzed: Gay Street at Thach Avenue; and Gay Street from Magnolia Avenue to Thach Avenue.

The recommendations which were derived from the study process are as follows:

Gay Street at Thach Avenue

- Examine and adjust the traffic signal timings at this intersection

Gay Street from Magnolia Avenue to Thach Avenue

- None at this time

TRAFFIC SIGNAL SYSTEMS EVALUATION

Skipper Consulting, Inc. performed an evaluation of traffic signal spacing and traffic flow characteristics on Gay Street. It is recommended that a coordinated traffic signal system be implemented on Gay Street from Opelika Road to Samford Avenue. This system would include six signalized intersections, which includes all of the signalized study intersections in the corridor. It is anticipated that these intersections could easily be supervised by the on-street master controller currently located at the water tank at the corner of Donahue Drive and Glenn Avenue using spread spectrum radios.

The traffic signal system recommendations for Gay Street as listed in the previous paragraph of this report should be designed in an integrated manner within an overall traffic signal system plan for the City of Auburn. Recommendations are made concerning traffic signal systems in other sections of this report; however due to the overlapping nature of the corridors the signal systems are interdependent. The relationship of the Gay

Street signal system with other signal systems recommended in this report is shown in **Figure 5-4**. As shown in this figure, the Gay Street traffic signal system is proposed to be cross-linked with the Glenn Avenue signal system.

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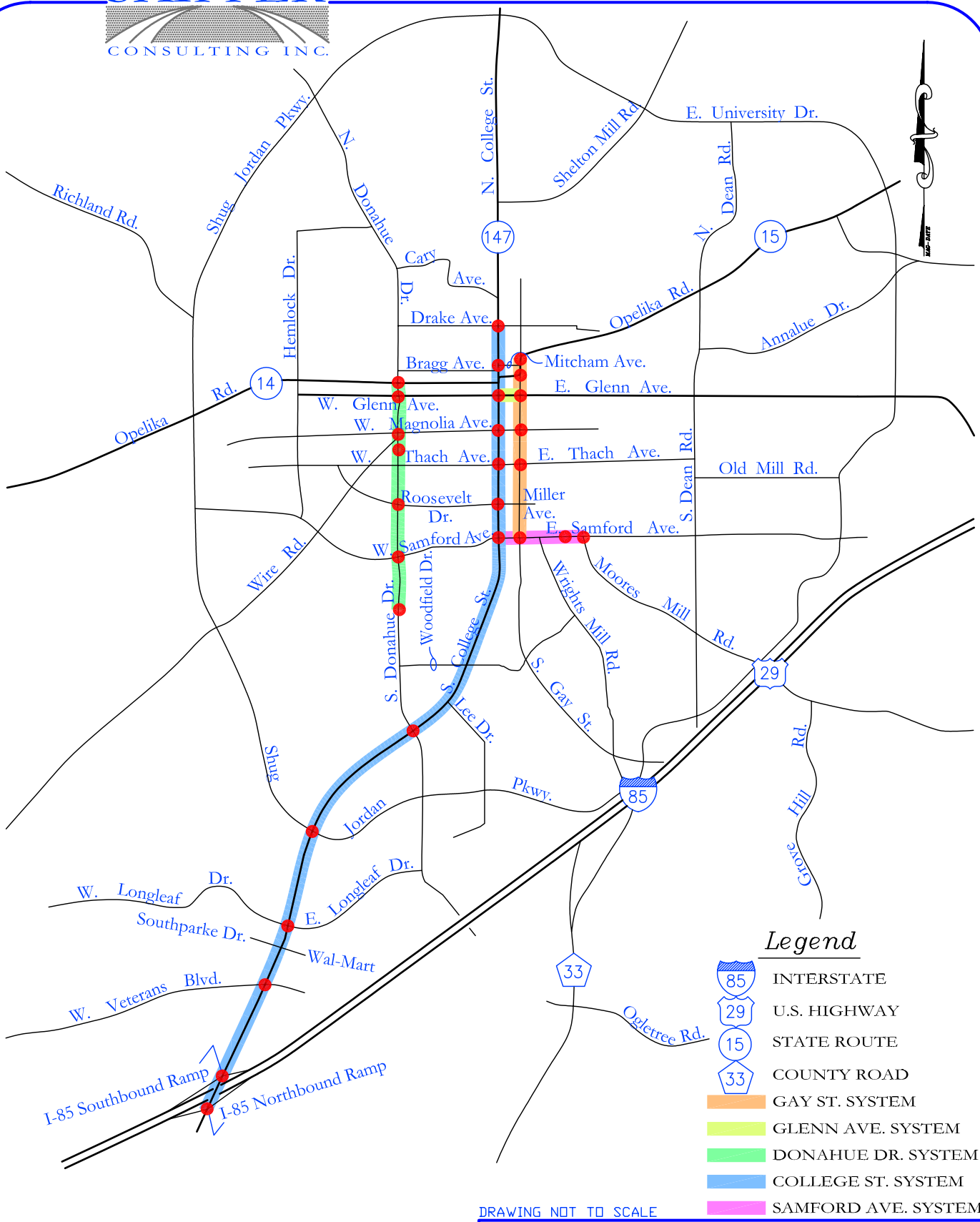

DRAWING NOT TO SCALE

FIGURE 5-4
TRAFFIC SIGNAL SYSTEMS
AUBURN TRAFFIC STUDY
AUBURN, ALABAMA

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RECOMMENDED IMPROVEMENTS

Based upon the analyses and evaluations conducted for the Gay Street Corridor, recommendations are being made to improve traffic flow along the corridor at study intersections and to address any capacity or safety deficiencies identified. The following outlines the recommended improvements for the Gay Street Corridor from Samford Avenue to Drake Avenue:

Gay Street Signal System

It is recommended that a coordinated traffic signal system be implemented on Gay Street from Opelika Road to Samford Avenue.

Gay Street at Samford Avenue

- Implement signal timing and phasing modifications to include:
  - Adjust signal timings to improve traffic operations and to meet the cycle length requirements for a coordinated signal system on Gay Street.
  - Adding eastbound protected/permissive left turn phasing.
  - Adding westbound protected/permissive left turn phasing.
- Construct a right turn lane on southbound Gay Street at Samford Avenue.
- Construct a westbound right turn lane on Samford Avenue at Gay Street.

Gay Street at Miller Avenue

- Construct a right turn lane on southbound Gay Street at Miller Avenue.

Gay Street at Thach Avenue

- Adjust signal timings to improve traffic operations and to meet the cycle length requirements for a coordinated signal system on Gay Street.
- Construct a right turn lane on northbound Gay Street at Thach Avenue.

Gay Street at Magnolia Avenue

- Adjust signal timings to improve traffic operations and to meet the cycle length requirements for a coordinated signal system on Gay Street.

- Modify signal phasing to include eastbound and westbound protected/permissive left turn phasing as well as northbound left turn protected/permissive phasing.
- Construct a right turn lane on northbound Gay Street at Magnolia Avenue.

Gay Street at Glenn Avenue

- Adjust signal timings to improve traffic operations and to meet the cycle length requirements for a coordinated signal system on Gay Street.
- Construct a right turn lane on southbound Gay Street at Glenn Avenue.
- Construct a right turn lane on eastbound Glenn Avenue at Gay Street.

Gay Street at Mitcham Avenue

- Adjust signal timings to improve traffic operations and to meet the cycle length requirements for a coordinated signal system on Gay Street.

Gay Street at Opelika Road

- Adjust signal timings to improve traffic operations and to meet the cycle length requirements for a coordinated signal system on Gay Street.

Improvements for each of the study intersections are illustrated in Figures 5-5 through 5-10 as summarized in the following:

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FIGURE 5-5
GAY ST. @ SAMFORD AVE.
IMPROVEMENTS
AUBURN TRAFFIC STUDY
AUBURN, ALABAMA

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0 50
APPROX. SCALE IN FT.

FIGURE 5-6
GAY ST. @ MILLER AVE.
IMPROVEMENTS
AUBURN TRAFFIC STUDY
AUBURN, ALABAMA

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FIGURE 5-7
GAY ST. @ THACH AVE.
IMPROVEMENTS
AUBURN TRAFFIC STUDY
AUBURN, ALABAMA

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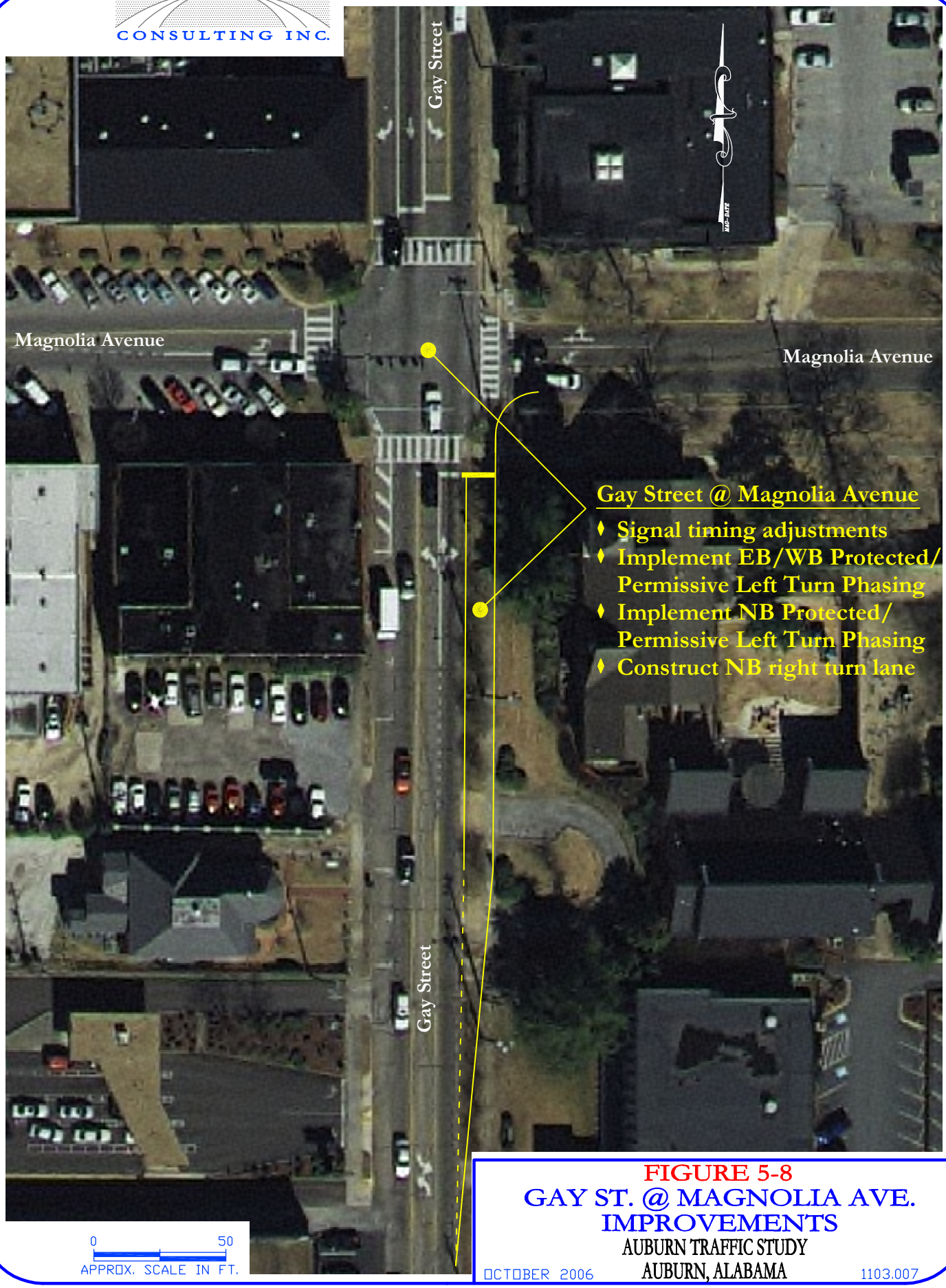

FIGURE 5-8
GAY ST. @ MAGNOLIA AVE. IMPROVEMENTS
AUBURN TRAFFIC STUDY
AUBURN, ALABAMA
OCTOBER 2006
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FIGURE 5-9
GAY ST. @ GLENN AVE. IMPROVEMENTS
AUBURN TRAFFIC STUDY
AUBURN, ALABAMA
OCTOBER 2006
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FIGURE 5-10
GAY ST. @ MITCHAM AVE.
IMPROVEMENTS
AUBURN TRAFFIC STUDY
AUBURN, ALABAMA

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APPROX. SCALE IN FT.

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APPROX. SCALE IN FT.

FIGURE 5-11
GAY ST. @ OPELIKA ROAD IMPROVEMENTS
AUBURN TRAFFIC STUDY
AUBURN, ALABAMA
OCTOBER 2006 1103.007

INTERSECTION CAPACITY ANALYSIS WITH RECOMMENDED IMPROVEMENTS

Capacity analyses were conducted for study intersections which improvements were recommended and assumed to be in place. Capacity analyses were conducted using methods of the *Highway Capacity Manual*, as previously introduced. **Table 5-4** provides a summary of the levels of service for study intersections with the recommended improvements in place. For comparative purposes, existing levels of service are shown in red in **Table 5-4**. **Appendix C** provides capacity printouts for the study intersections with recommended improvements assumed to be in place.

Table 5-4
Intersection Levels of Service – With Recommended Improvements
(Existing LOS indicated in RED)

Intersection (traffic control)	Approach	Movement/Lane Group	Level of Service			
			A.M. Peak Hour		P.M. Peak Hour	
Gay Street at Opelika Road (traffic signal)	WB Opelika Road	Left	B	A	B	A
		Right	B	A	B	A
	NB Gay Street	Through	B	C	B	C
		Right	A	A	A	A
	SB Gay Street	Left	B	C	B	C
		Through	B	C	B	C
	Overall LOS		**B**	**B**	**B**	**A**
Gay Street At Mitcham Avenue (traffic signal)	EB Mitcham Ave.	Left	C	D	C	F
		Right	B	A	B	B
	NB Gay Street	Left	B	A	B	A
		Through	C	C	D	C
	SB Gay Street	Left	B	A	B	A
		Through	C	C	C	C
		Right	A	A	A	A
	Overall LOS		**B**	**C**	**C**	**D**
Gay Street at Glenn Ave (traffic signal)	EB Glenn Ave.	Left	B	B	B	B
		Through	C	C	C	C
		Right	B		B	
	WB Glenn Avenue	Left	B	B	B	C
		Through/Right	C	C	C	C
	NB Gay Street	Left	B	C	C	C
		Through	C	C	C	D
		Right	C	C	C	C
	SB Gay Street	Left	B	C	C	C
		Through	C	D	C	D
		Right	B		B	
	Overall LOS		**C**	**C**	**C**	**C**

Table 5-4 (continued)
(Existing LOS indicated in RED)

Intersection (traffic control)	Approach	Movement/Lane Group	Level of Service			
			A.M. Peak Hour		P.M. Peak Hour	
Gay Street at Magnolia Avenue (traffic signal)	EB Magnolia Ave.	Left	B	B	C	B
		Through/Right	C	B	C	B
	WB Magnolia Ave	Left	B	B	C	B
		Through/Right	C	B	C	B
	NB Gay Street	Left	B	A	B	A
		Through	B	A	B	A
		Right	B		B	
	SB Gay Street	Left	B	A	B	A
		Through	C	A	B	A
		Right	B	A	B	A
	Overall LOS		**B**	**A**	**C**	**B**
Gay Street At Thach Avenue (traffic signal)	EB Thach Avenue	Left	C	B	C	B
		Through	C	C	D	D
		Right	C	C	B	C
	WB Thach Avenue	Left	C	B	C	C
		Through/Right	C	D	C	D
	NB Gay Street	Left	B	B	C	B
		Through	C	D	C	F
		Right	B		B	
	SB Gay Street	Left	B	B	B	C
		Through	C	F	C	E
		Right	B	C	B	C
	Overall LOS		**C**	**D**	**C**	**E**
Gay Street At Miller Avenue (side street stop)	EB Miller Avenue	Left/ Through/Right	C	D	D	D
	WB Miller Avenue	Left/ Through/Right	C	C	C	C
	NB Gay Street	Left/ Through/Right	A	A	A	A
	SB Gay Street	Left/ Through	A	A	A	A
Gay Street At Samford Avenue (traffic signal)	EB Samford Avenue	Left	C	B	C	B
		Through/Right	C	B	C	B
	WB Samford Avenue	Left	C	A	C	B
		Through	C	B	C	B
		Right	B		B	
	NB Gay Street	Left	B	B	B	B
		Through/Right	C	B	B	B
	SB Gay Street	Left	B	B	B	B
		Through	B	B	B	B
		Right	A		A	
	Overall LOS		**C**	**B**	**C**	**B**

Table 5-4 indicates the capacity deficiencies for existing conditions noted for the Gay Street intersections with Mitcham Avenue and Thach Avenue would be addressed with the recommended improvements. The deficient movements would be improved as well as the intersections overall. In addition, acceptable levels of service would continue to be

provided at the remaining study intersections along Gay Street (Samford Avenue, Magnolia Avenue, Glenn Avenue, and Opelika Road).

At the following locations and time periods, the overall intersection level of service is expected to decline with the implementation of the recommended improvements.

- Gay Street at Opelika Road is expected to go from an overall level of service "A" for existing conditions to a level of service "B" during the afternoon peak hour.
- Gay Street at Magnolia Avenue is expected to go from an overall level of service "A" for existing conditions to a level of service "B" during the morning peak hour.
- Gay Street at Samford Avenue is expected to operate at overall levels of service "C" during each peak hour compared to overall levels of service "B" during each peak hour for existing conditions.

The primary reason for the expected decline in levels of service at the locations listed above is a result increases in the cycle length for the intersections. This increase in cycle length would be required to implement a coordinated signal system on Gay Street as recommended previously in this report. Although the overall levels of service at the intersections listed above would decline slightly, it is anticipated that the overall traffic flows for these study intersections and the Gay Street Corridor as a whole would significantly improve with the implementation of the recommended improvements as outlined for the Gay Street Corridor.

ARTERIAL SEGMENT CAPACITY ANALYSIS WITH RECOMMENDED IMPROVEMENTS

Arterial segment capacity analyses for peak hour conditions along the Gay Street Corridor were conducted assuming the recommended improvements, outlined above, would be in place at the study intersections along Gay Street. These capacity analyses were conducted using methods outlined in the *Highway Capacity Manual, Third Edition*. Levels of service for the arterial analyses conducted for Gay Street are summarized in

Table 5-5. For comparative purposes, existing levels of service are shown in red in **Table 5-5**. Capacity printouts are provided in **Appendix C** for reference.

Table 5-5
Arterial Segment Levels of Service with Improvements
(Existing LOS indicated in RED)

Northbound Gay Street Arterial Analysis						
From	To	Segment Length	Arterial Level of Service by Section			
			AM Peak		PM Peak	
Samford Avenue	Thach Avenue	0.40	C	C	C	D
Thach Avenue	Magnolia Avenue	0.17	C	C	C	C
Magnolia Avenue	Glenn Avenue	0.19	D	D	D	D
Glenn Avenue	Mitcham Avenue	0.10	E	E	F	E
Mitcham Avenue	Opelika Road	0.12	D	D	D	D
Total Urban Street LOS			**C**	**D**	**D**	**D**

Southbound Gay Street Arterial Analysis						
From	To	Segment Length	Arterial Level of Service by Section			
			AM Peak		PM Peak	
Opelika Road	Mitcham Avenue	0.12	D	E	E	D
Mitcham Avenue	Glenn Avenue	0.10	F	F	E	F
Glenn Avenue	Magnolia Avenue	0.19	C	B	C	B
Magnolia Avenue	Thach Avenue	0.17	D	F	D	F
Thach Avenue	Samford Avenue	0.40	B	B	B	B
Total Urban Street LOS			**C**	**D**	**C**	**D**

Table 5-5 indicates that with the implementation of the improvements outlined for the Gay Street Corridor, improvement in arterial levels of service would be realized. The total urban street levels of service for each direction during the morning peak hour would be a level of service "C" as well as the southbound direction during the afternoon peak hour. The northbound direction would continue to operate at a level of service "D" during the afternoon peak hour. In comparison to existing conditions (levels of service "D" for both direction for each peak hour) indicates the improvements at the study intersections would significantly improve traffic flows along Gay Street.

For northbound Gay Street, the only segment which would operate at a level of service "E" or worse would be from Glenn Avenue to Mitcham Avenue during the morning peak

hour. During the afternoon peak hour, the only segments that would operate with a level of service "E" or worse would be between Mitcham Avenue and Opelika Road.

The primary factor for the poor levels of service calculated in the arterial analysis for Gay Street between Glenn Avenue and Mitcham Avenue is due to the spacing between these signalized intersections. With spacing of approximately 530 feet, the travel speeds for these segments is relatively low resulting in poor levels of service. Northbound from Glenn Avenue to Mitcham Avenue during the morning peak hour, a travel speed of 8.9 miles per hour is calculated in the analysis. During the morning peak hour, the southbound segment of Gay Street from Mitcham Avenue to Glenn Avenue is 7.0 miles per hour. These resultant speeds reflect the delay being experienced for the northbound and southbound through movements at these signalized intersections. Intersection capacity analyses indicate levels of service "C" or "D" would be provided for the through movements on Gay Street at these intersections.

With the implementation of the recommended improvements at the Gay Street intersections, increases in average travel speed for the overall arterial would be realized. **Table 5-6** provides a summary of the increases in travel speeds calculated for existing conditions and conditions expected with the implementation of the recommended improvements.

Table 5-6
Overall Arterial Segment Travel Speed Comparisons

Condition	Northbound Gay Street		Southbound Gay Street	
	AM Peak	PM Peak	AM Peak	PM Peak
Existing	12.8 mph	10.6 mph	11.3 mph	11.9 mph
With Improvements	14.2 mph	12.8 mph	13.4 mph	13.3 mph
Average Travel Speed Increase	**1.4 mph**	**2.2 mph**	**2.1 mph**	**1.4 mph**

Based upon the intersection capacity analyses and the overall Gay Street levels of service and calculated travel speeds, it is anticipated that the traffic flows on Gay Street would be improved with the recommended improvements in place. As a result of the analyses for the intersection and overall urban street operations, no additional improvements on this segment of Gay Street are recommended at this time.

Potential Arterial Modifications

As outlined above, the current spacing of traffic signals along Gay Street appears to be the primary factor impacting arterial segment levels of service. In order to address arterial segments operating at levels of service "E" or "F" along Gay Street modifications would be required that either adjust the signal spacing or significantly widen the roadway within those segments where levels of service are below acceptable levels. The following provides a summary of the potential modification which would be required along these Gay Street segments in order to achieve levels of service "D" or better:

- Remove the traffic signal at Mitcham Avenue to increase signal spacing and in turn increase travel speeds along the arterial.
- Relocate Mitcham Avenue to align with Opelika Road to increase signal spacing and in turn increase travel speeds along the arterial.
- Reallocate traffic signal timings to further prioritize Gay Street.
- Significantly widen Gay Street from Glenn Avenue to Opelika Road.

Although these potential modifications would improve arterial levels of service on Gay Street, the practicality of implementing these modifications with the associated negative impacts on adjacent roadways and land uses would be significant. Brief descriptions of the implications of implementing these modifications are summarized as follows:

- Removing the traffic signal at Mitcham Avenue and Gay Street would most like result in significant changes in area travel patterns to an extent that additional improvements would be required on adjacent roadways to accommodate these changes in travel patterns.
- Relocating Mitcham Avenue to align with Opelika Road would require a new roadway to be built along with the substantial acquisition of right or way for the new roadway alignment.
- Reallocation of green time to prioritize Gay Street would have significant negative impacts on Glenn Avenue, Mitcham Avenue, and Opelika Road and their ability to accommodate traffic flows. In addition, decreasing green time for Glenn Avenue would result in significant negative impacts on the flow of traffic

along Glenn Avenue. The results of reallocating green time for Gay Street would likely require significant roadway improvements for Glenn Avenue, Mitcham Avenue, and Opelika Road in order to maintain acceptable levels of service.

- The widening that would be required for Gay Street from Glenn Avenue to Opelika Road to obtain roadway segment levels of service "D" or better would be extensive. For example, a six-lane cross-section plus turn lanes would likely be required along these segments of Gay Street. This extensive widening would require additional right of way and impact several adjacent properties in order to provide the roadway width required to achieve desirable arterial level of service.

Overall, the arterial levels of service along Gay Street would be acceptable (levels of service "C" or "D"). The exception along Gay Street would be the segments from Glenn Avenue to Opelika Road operating at levels of service "E" or "F". Based upon the intersection levels of service, overall arterial levels of service, improvements in travel speed for Gay Street with the recommended improvements, and the level of improvements (outlined above) that would be required to accomplish an acceptable level of service for the Gay Street arterial from Glenn Avenue to Opelika Road, it is suggested that such modifications are not practical and should not be considered for implementation at this time. However, it is recommended that these segments along Gay Street from Glenn Avenue to Opelika Road be monitored and should conditions deteriorate, further investigation of potential improvements would be needed. Additionally, it is recommended that the City of Auburn apply access management techniques to these segments of Gay Street where levels of service fall below acceptable levels. Such techniques would include combining driveways to reduce access points to Gay Street, modifications of current access points to restrict left turn movements and investigate alternative access from adjacent streets. This recommendation is based on the premise that the maximum utilization of the current roadway should be obtained by limiting conflict point along the deficient segments prior to implementing other modifications.