

*Transportation Concurrency Study
For Submittal to Sarasota County*

Bayonne Mixed-Use Site

Sarasota County, Florida

Prepared for:

Bayonne Development, LLC.
Osprey, Florida

Prepared by:

Kimley-Horn and Associates, Inc.
Tampa, Florida

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December 2005
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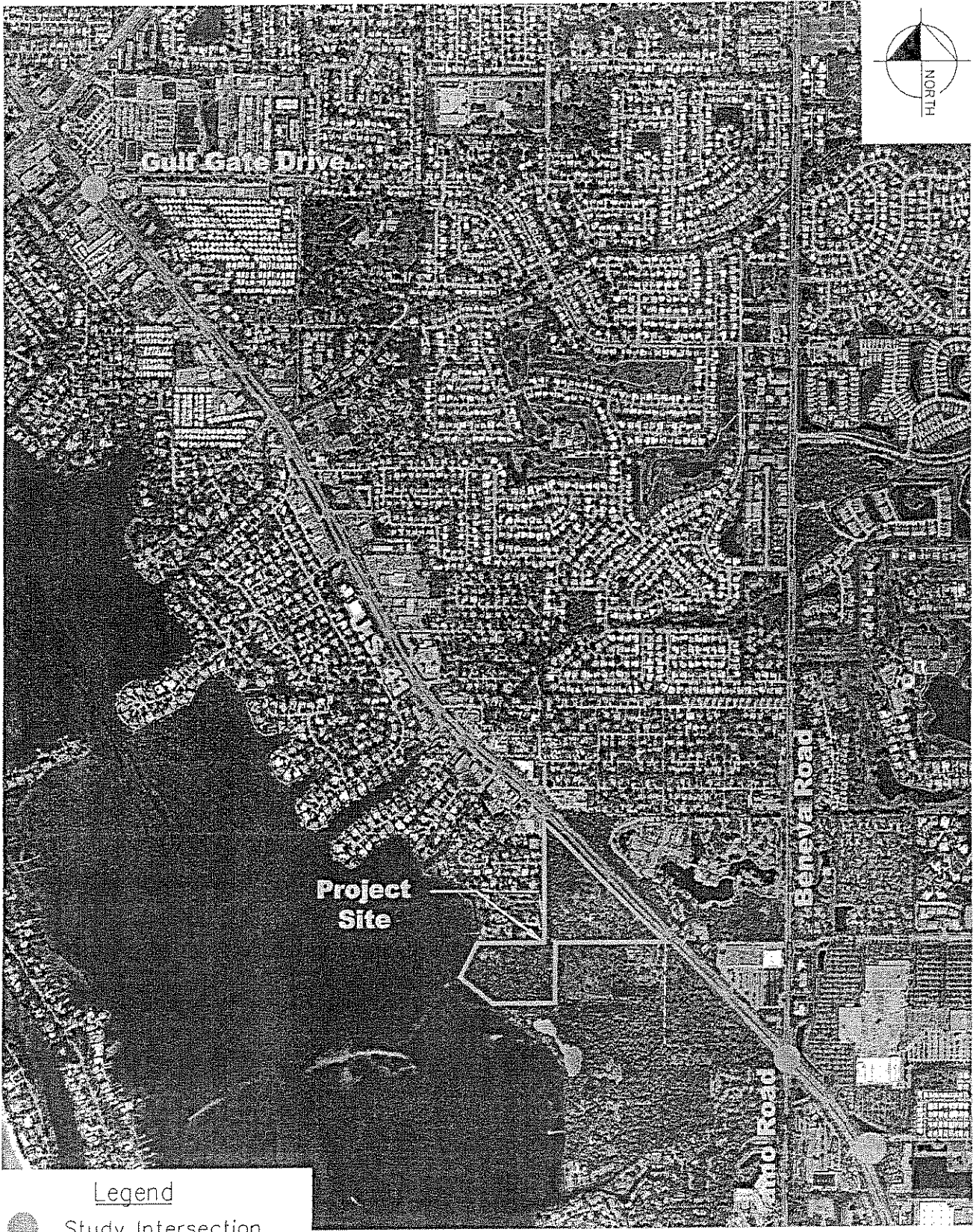
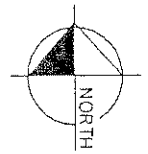
INTRODUCTION

The purpose of this report is to document a transportation concurrency study for the proposed Bayonne mixed-use site in accordance with the Sarasota County's *Resolution No. 98-169*. This report identifies the estimated traffic impacts of the proposed development. In addition, this report summarizes the procedures and findings of this analysis and presents recommendations for transportation approval.

The proposed mixed-use site is located on the west side of U.S. 41, approximately ½ mile northwest of the U.S. 41 & Beneva Road intersection in Sarasota County, Florida. The proposed development will consist of approximately 225 condominium/townhouse dwelling units and approximately 250,000 square feet of office/retail space. Access to the site will be provided onto U.S. 41 through two proposed driveways. The northernmost driveway is expected to be configured as a right-turn in/right-turn out only driveway. The southernmost driveway is expected to provide for right-turn in/right-turn out only movements and a directional left-turn in movement. Figure 1 illustrates the location of the project site, including the adjacent public roadway network.

Prior to undertaking this analysis, a transportation methodology conference call meeting was conducted during the week of June 20-24, 2005, along with follow-up discussions, for the study with Sarasota County staff and a study methodology was prepared and submitted to Sarasota County staff. The methodology is summarized in a letter contained in Appendix A of this report, including follow-up correspondence from Sarasota County staff. In general, the following procedural steps were undertaken:

- Traffic volumes generated by the proposed development were estimated using rates documented in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 7th Edition (2003);



Legend

● Study Intersection

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Project Location Map
Bayonne Mixed-Use Site
Sarasota County, Florida

DATE:
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FIGURE:
1

- Project traffic was distributed and assigned to the public roadway network based upon the results of a FSUTMS analysis and supplemented by existing traffic patterns near the project site;
- The study area network was defined as all segments for which project traffic is expected to consume at least 5.0 percent of Sarasota County's two-way, peak-hour level of service (LOS) C service volume for each specific segment;
- Existing p.m. peak-hour traffic volumes in the study area were collected and adjusted to reflect the peak-season volumes, and considered in the development of future background volumes;
- Work Programs of Sarasota County and the Florida Department of Transportation (FDOT) were reviewed to identify scheduled road improvements in the area;
- Traffic from other approved developments in the vicinity of the site was estimated and used in the development of background volumes; and
- Intersection and level of service (LOS) analyses within the study area for existing and future scenarios were completed using analytical methods defined in the *Highway Capacity Software (HCS)* programs and the Sarasota County's *2004 Generalized Level of Service Analysis*.

PROJECT TRAFFIC

Project traffic used in this analysis is defined as the vehicle trips expected to be generated by the development. These trips were distributed and assigned throughout the study roadway network.

Existing and Proposed Land Uses

The proposed mixed-use site is located on the west side of U.S. 41, approximately ½ mile northwest of the U.S. 41 & Beneva Road intersection in Sarasota County, Florida. The project site is currently vacant. The proposed development will consist of approximately 225 condominium/townhouse dwelling units and approximately 250,000 square feet of office/retail space.

Trip Generation

The trip generation potential of the proposed development for the p.m. peak-hour was estimated using information contained in the *ITE Trip Generation*, 7th Edition (2003), for land use code (LUC) 230, Residential Condominium/Townhouse, LUC 710, General Office, LUC 720, Medical-Dental Office Building, and LUC 814, Specialty Retail Center. The estimated gross (total) trips expected to be generated by the proposed development are 766 two-way, trip-ends (292 entering/474 exiting) in the p.m. peak hour of adjacent roadways during the 4:00 p.m. to 6:00 p.m. time period. The p.m. peak-hour trip generation potential for this development is documented in Appendix B. In addition, the daily trip generation potential is also provided in Appendix B for informational purposes only.

As part of this analysis, internal capture trips were considered and determined based upon information contained in the *ITE Trip Generation Handbook*, June 2004. Documentation of internal capture trips is provided in Appendix B.

In addition to internal trips, pass-by capture trips were evaluated in the analysis for the retail component of the site. These trips, which were also determined using the *ITE Trip Generation Handbook*, are documented in Appendix B.

The reduction of internal and pass-by capture trips from the gross trips produced 560 net, new, two-way, external project trips (189 entering/371 exiting) in the p.m. peak hour for the project site, as shown in Table 1 and documented in Appendix B. The net, new project trips were used as a basis for project distribution onto the public roadway system.

TABLE 1 P.M. Peak-Hour Project Trip Generation			
Land Use	Size	Entering	Exiting
Residential Condominium/Townhouse	225 dwelling units	78	39
General Office	75,000 square feet	28	135
Medical-Dental Office	50,000 square feet	45	120
Specialty Retail Center	125,000 square feet	141	180
Gross Project Trips =		292	474
-Internal Capture Trips =		<u>-57</u>	<u>-57</u>
Total External Vehicle Trips =		235	417
-Pass-by Capture Trips =		<u>-46</u>	<u>-46</u>
Net, New Project Trips =		189	371

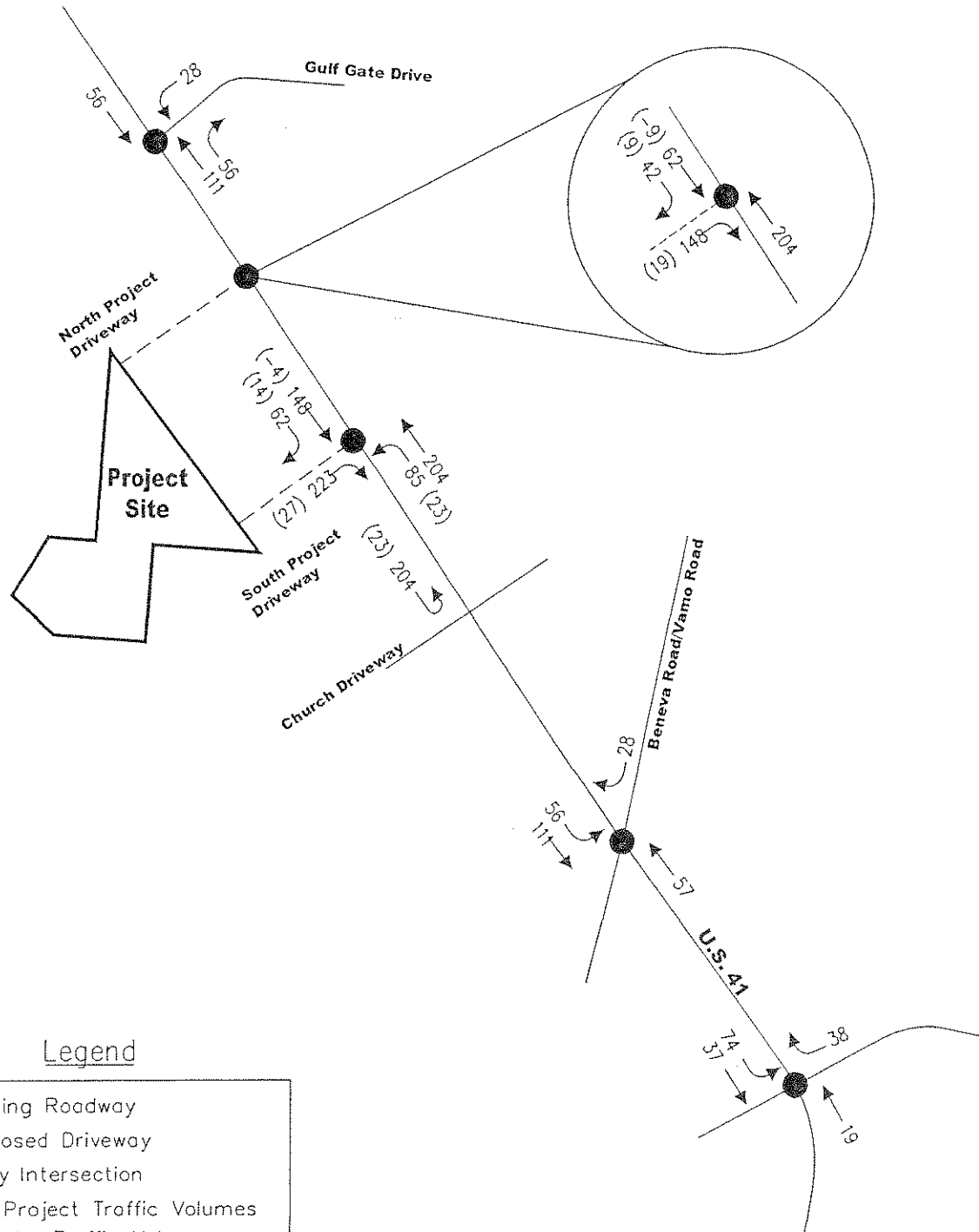
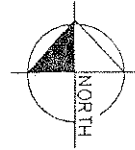
Source: ITE *Trip Generation*, 7th Edition, 2003

Trip Distribution and Assignment

New traffic expected to be generated by the proposed development was distributed and assigned to the adjacent roadway network based upon a FSUTMS analysis and supplemented by existing traffic patterns near the project site. These travel patterns were determined through current traffic counts obtained by Kimley-Horn and Associates, Inc. (KHA) as described in a later section of this report. The resulting percentages were applied to the trip generation estimates shown in Table 1 to estimate project trips within the vicinity of the project site. The distribution of project traffic, in terms of number of trips, is shown in Figure 2. Documentation of project distribution is provided in Appendix B.

As shown in Figure 2, approximately 55 percent of project trips are expected to travel to/from areas north of the project site on U.S. 41 towards Gulf Gate Drive and the remaining 45 percent of project trips are expected to travel to/from areas south of the project site on U.S. 41 towards Beneva Road. It should be noted that due to the configuration of the proposed project driveways, project traffic that wish to travel north on U.S. 41 will turn right out of one of the two project driveways and proceed south on U.S. 41 and make a u-turn at the existing median opening south of the project site, which is located across from an existing church driveway. The consideration of u-turning vehicles from the project site is illustrated in Figure 2.

For pass-by capture trips, it was estimated that these trips would be captured from existing traffic on U.S. 41. The effect of pass-by traffic was detailed at the two proposed project driveway intersections along U.S. 41. These pass-by trips are removed from the through traffic stream, become traffic turning into the site, and later out of the site, thus, returning onto their original route.



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**Kimley-Horn
and Associates, Inc.**

P.M. Peak-Hour Project Traffic Volumes
Bayonne Mixed-Use Site
Sarasota County, Florida

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FIGURE:
2

SCHEDULED IMPROVEMENTS

A review of the Work Programs for Sarasota County and FDOT District 1 revealed that no improvements are currently scheduled for construction within the next several years near the project site. Based upon this information, existing lane geometry and traffic controls were used in the analysis of existing and future conditions for all impacted intersections and roadways near the project site.

STUDY AREA DETERMINATION

The extent of the roadway network to be studied was based upon Sarasota County's *Resolution No. 98-169* which indicates that the study area shall consist of all roadway segments for which project traffic is expected to consume at least 5.0 percent of Sarasota County's two-way, peak-hour LOS C service volume for each specific segment. The results of the study area determination are shown in Table 2. Based upon the number of new p.m. peak-hour trips expected to be generated by the proposed development (560 trips), the study area analysis determined the following roadway segments are within the study area:

- U.S. 41 from Gulf Gate Drive to Project Site;
- U.S. 41 from Project Site to Beneva Road; and
- U.S. 41 from Beneva Road to Club Drive.

In addition to the above study roadway segments, three (3) existing intersections were included in the study area. These study intersections are as follows:

- U.S. 41 & Gulf Gate Drive;
- U.S. 41 & Beneva Road; and
- U.S. 41 & Club Drive.

All of these existing intersections are currently signalized with appropriate turn lanes on each approach. It should be noted that the adopted LOS performance standard for each of the above study roadway segments and intersections is LOS D. This performance standard was compared to the existing and future operating conditions shown in later sections of this report to determine transportation concurrency impacts for this development.

TABLE 2
STUDY NETWORK IDENTIFICATION

ROADWAY	FROM	TO	SERVICE VOLUMES		PROJECT VOLUMES		STUDY NETWORK DETERMINATION	
			EXISTING + COMMITTED LANEAGE	P.M. PEAK- HOUR LOS STANDARD SERVICE	PROJECT TRAFFIC ASSIGN.	P.M. PEAK- HOUR PROJECT TRAFFIC	PROJECT PERCENT OF SERVICE VOLUME	WITHIN STUDY NETWORK?
U.S. 41	Stickney Point Road	Gulf Gate Drive	6LD	3,740	30.0%	168	4.49%	N
	Gulf Gate Drive	Project Site	4LD	3,540	50.0%	280	7.91%	Y
	Project Site	Beneva Road	4LD	3,540	45.0%	252	7.12%	Y
	Beneva Road	Club Drive	4LD	2,540	30.0%	168	6.61%	Y
	Club Drive	Central Sarasota Pkwy	4LD	2,540	10.0%	56	2.20%	N
Stickney Point Road	Midnight Pass	U.S. 41	4LD	3,180	5.0%	28	0.88%	N
	U.S. 41	Gulf Gate Mall	6LD	3,740	15.0%	84	2.25%	N
Beneva Road	K-Mart	U.S. 41	4LD	2,540	15.0%	84	3.31%	N

Source: Sarasota County's 2004 Generalized Level of Service Analysis
Kimley-Horn and Associates Inc., 2005

EXISTING TRAFFIC CONDITIONS

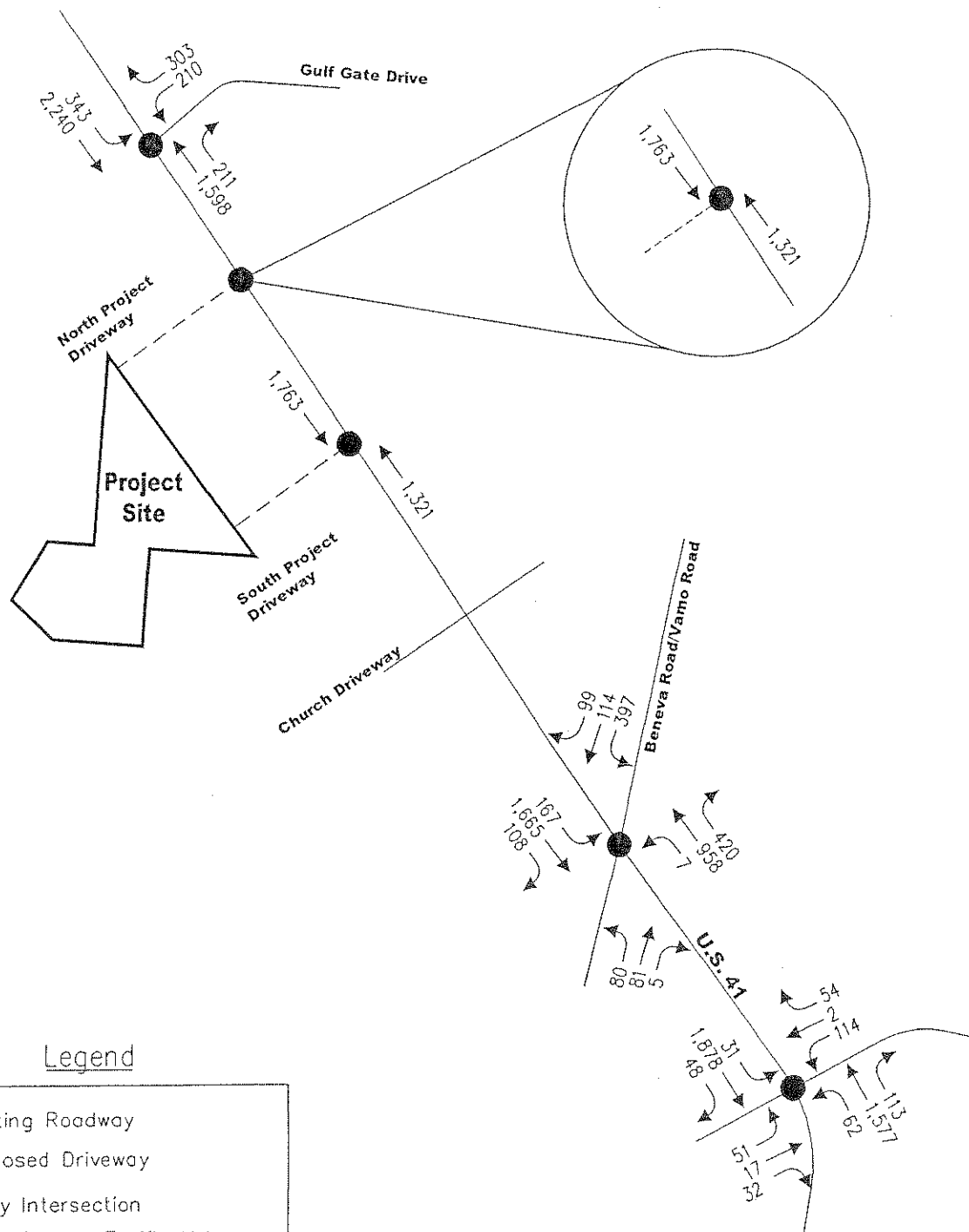
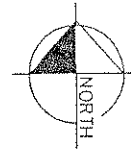
In accordance with Sarasota County's *Resolution No. 98-169*, existing traffic conditions were evaluated within the study network. The procedures used in this analysis are discussed below.

Vehicle turning movement volume counts were obtained by KHA at the three existing study intersections, as identified in the previous section of this report, during the p.m. peak-period (4:00 P.M. to 6:00 P.M.) to quantify existing p.m. peak-hour conditions near the proposed project. In addition to these study intersections, the unsignalized intersection of U.S. 41 & Church Driveway, adjacent to the project site, was counted to obtain existing turning movement information at this location. The information at this additional intersection was used for future conditions only. All the counts were conducted in July 2005. The raw counts are provided in Appendix C.

The vehicle counts at the three study intersections were adjusted to reflect peak-season conditions. This modification was performed using Sarasota County's seasonal adjustment factor. This factor, including the existing peak-season traffic volumes, is provided in Appendix D. The existing peak-season traffic volumes are also shown in Figure 3.

Using the existing peak-season traffic volumes identified in Figure 3, an intersection analysis was conducted for the three existing study intersections. The intersection analysis was performed using the most recent version of the *HCS* program for signalized intersections. As part of this analysis, existing lane geometry and traffic controls were used for the intersections.

The results of this analysis are summarized in Table 3 and indicate that all study intersections are currently operating above the LOS D performance standard during the p.m. peak hour. Summary worksheets of the intersection analysis are provided in Appendix E.



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and Associates, Inc.

2005 Existing P.M. Peak-Hour Traffic Volumes
Bayonne Mixed-Use Site
Sarasota County, Florida

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FIGURE:
3

TABLE 3
2005 Existing P.M. Peak-Hour Intersection Conditions

Intersection	Overall Intersection LOS		Approach LOS			
	Standard	Existing Traffic	NB	SB	EB	WB
U.S. 41 & Gulf Gate Drive	D	C	B	B	--	D
U.S. 41 & Beneva Road	D	C	B	C	D	E
U.S. 41 & Club Drive	D	B	B	B	D	D

In addition to the intersection analysis, a roadway analysis was conducted for the study roadway segments on U.S. 41 extending from Gulf Gate Drive to Club Drive. For the analysis of these roadway segments, the service volumes found in Sarasota County's *2004 Generalized Level of Service Analysis* were initially used. The use of the service volumes found in Sarasota County's *2004 Generalized Level of Service Analysis* provided a conservative (worst-case) estimate of operating conditions along the impacted roadway segments. Since the actual traffic volumes exceeded the generalized service volume for the segment of U.S. 41 from Beneva Road to Club Drive, a detailed analysis using the *HCS* program for arterials was undertaken. The results of the generalized and detailed analyses, which are summarized in Table 4, indicate that all study roadway segments currently operate at the adopted LOS D performance standard during the p.m. peak hour. As part of this analysis, existing lane geometry was considered along these impacted roadway segments. Worksheets documenting the roadway analysis are provided in Appendix E.

TABLE 4		
2005 Existing P.M. Peak-Hour Roadway Conditions		
Roadway	LOS Standard	Roadway LOS (Two-Way)
U.S. 41 Gulf Gate Drive to Beneva Road	D	D
U.S. 41 Beneva Road to Club Drive	D	D*

*LOS based upon detail arterial analysis for worst-case direction.

FUTURE TRAFFIC VOLUMES

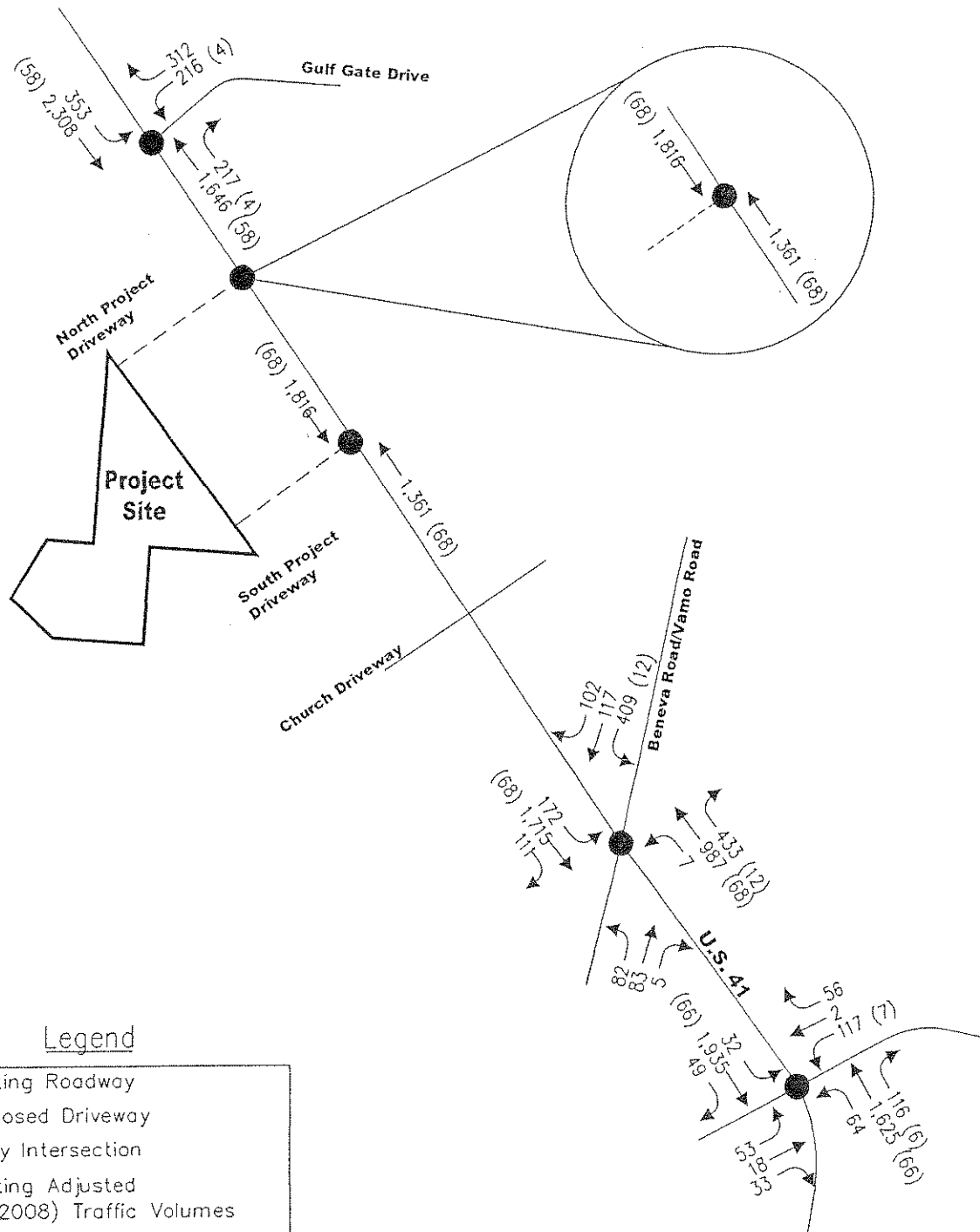
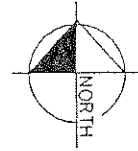
Future traffic volumes consist of two components: project traffic and background (non-project) traffic estimates. Project traffic volumes have been previously identified in this report. Future background traffic volumes, including the procedures used to develop these estimates, are provided below.

Future background traffic is defined as expected traffic on the roadway network in the future year at buildout of the proposed project. For the purposes of this analysis, it was determined that 2008 conditions would be evaluated as the "future" year scenario. The following procedure was undertaken to develop future 2008 background volume estimate. This estimate considered existing traffic volumes and estimated volumes from other approved developments in the area.

To develop future background volumes, the existing 2005 peak-season volumes, as previously identified in Appendix D, were first adjusted by a one percent (1%) annual growth rate to reflect 2008 conditions. It should be noted that this percentage, which was based upon historical traffic data along U.S. 41 in the area and documented in Appendix C, was applied to the existing traffic counts at all study intersections.

In addition to existing traffic volumes, traffic volumes associated with approved developments in the area were added to the adjusted, existing traffic volumes to determine future background traffic estimates. Based upon the agreed methodology with Sarasota County staff, only one approved development, Palmer Ranch, was incorporated into the analysis. The traffic volumes from this approved development were added to the adjusted, existing traffic volumes to produce 2008 total background traffic volume estimates.

The total background traffic volumes are illustrated in Figure 4 and are documented in Appendix D, including the approved development traffic. The project traffic volumes, as previously shown, were then added to these background traffic volumes to determine total traffic volumes. The total traffic volumes are provided in Figure 5 and are documented in Appendix D.



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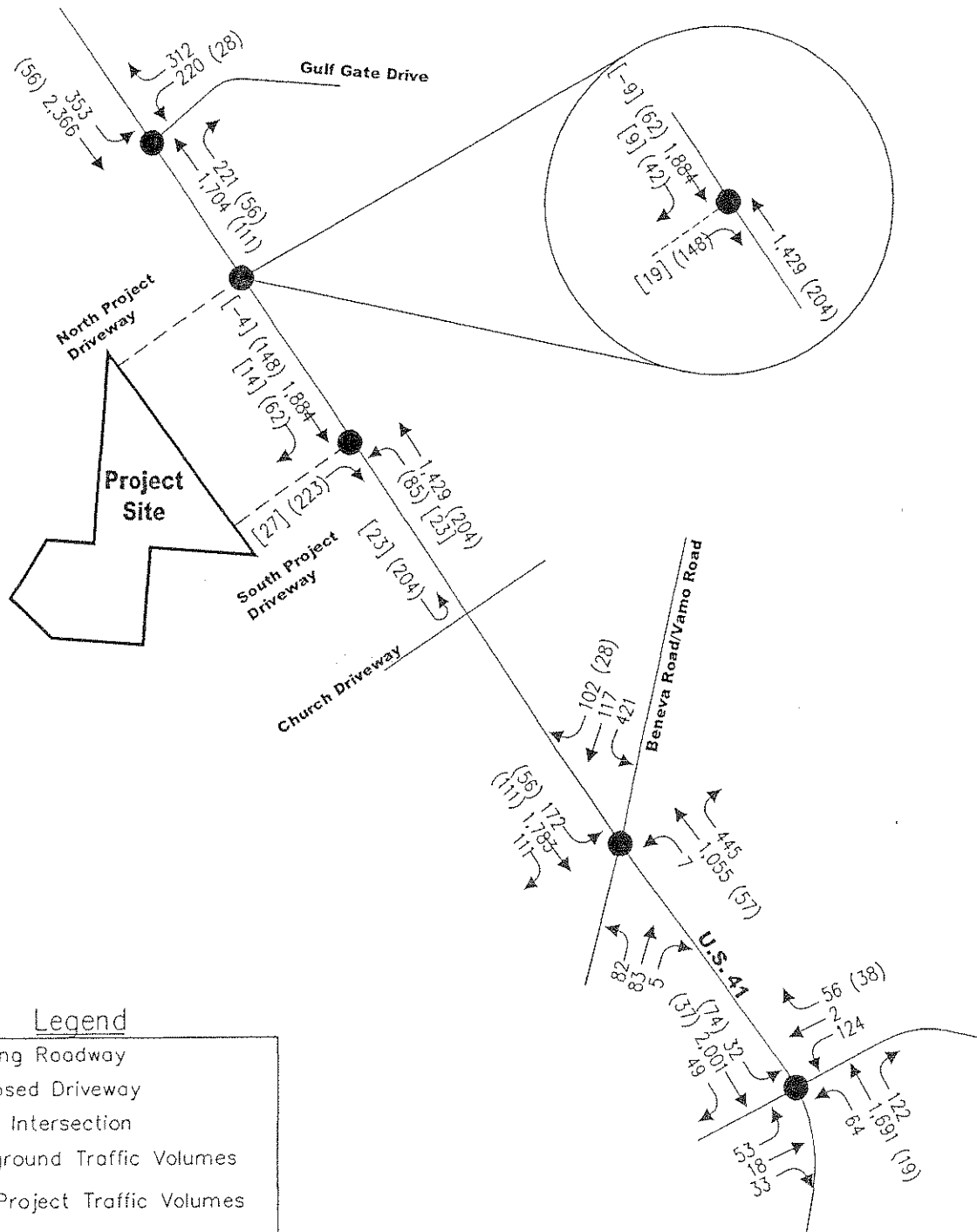
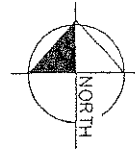
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2008 P.M. Peak-Hour Background Traffic Volumes
Bayonne Mixed-Use Site
Sarasota County, Florida

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2008 P.M. Peak-Hour Total Traffic Volumes
Boyonne Mixed-Use Site
Sarasota County, Florida

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FIGURE:
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BACKGROUND (NON-PROJECT) TRAFFIC CONDITIONS

Background (non-project) traffic conditions were evaluated for the 2008 buildout year of the development during the p.m. peak hour. For this analysis, background (non-project) traffic estimates and existing lane geometry were considered. A determination of the impact of the background (non-project) traffic volumes on the roadway network was made, including LOS conditions for intersections and roadway segments within the study area.

Using the background (non-project) traffic volumes, as shown in Figure 4, an intersection analysis was conducted at the three existing study intersections. The analysis procedures used in this evaluation were identical to those used to evaluate existing traffic conditions.

The results of this analysis are summarized in Table 5 and indicate that all study intersections are expected to operate above the LOS D performance standard during the p.m. peak hour and without any improvements. Summary worksheets of the intersection analysis are provided in Appendix F.

TABLE 5 2008 P.M. Peak-Hour Background Traffic Intersection Conditions						
Intersection	Overall Intersection LOS		Approach LOS			
	Standard	Back- ground Traffic	NB	SB	EB	WB
U.S. 41 & Gulf Gate Drive	D	C	B	B	---	D
U.S. 41 & Beneva Road	D	C	B	C	D	E
U.S. 41 & Club Drive	D	B	B	B	D	D

In addition to the intersection analysis, a roadway analysis was undertaken on the previously identified study roadway segments within the study area. The analysis procedures for this evaluation were identical to those used to evaluate existing traffic conditions.

The results of the roadway analysis are summarized in Table 6 and indicate that all study roadway segments are expected to operate at or above the LOS D performance standard with background (non-project) traffic during the future 2008 p.m. peak-hour and with no roadway improvements required. Worksheets documenting the roadway analysis are provided in Appendix F.

TABLE 6 2008 P.M. Peak-Hour Background Traffic Roadway Conditions		
Roadway	LOS Standard	Roadway LOS (Two-Way)
U.S. 41 Gulf Gate Drive to Beneva Road	D	A*
U.S. 41 Beneva Road to Club Drive	D	D*

*LOS based upon detailed arterial analysis for worst-case direction.

TOTAL TRAFFIC CONDITIONS

Future total traffic conditions were evaluated for the 2008 buildout year of the development during the p.m. peak hour. For this analysis, total traffic estimates and existing lane geometry were considered. A determination of the impact of the total traffic volumes on the roadway network was made, including LOS conditions for intersections and roadway segment within the study area.

Using the total traffic volumes, as shown in Figure 5, an intersection analysis was conducted at the three existing study intersections. In addition, an analysis was also undertaken for the two proposed project driveway intersections, U.S. 41 & North Project Driveway and U.S. 41 & South Project Driveway. Both project driveway intersections are expected to be unsignalized locations with stop-sign control on the cross-street (project) approach. As previously stated, the North Project Driveway intersection will be configured to allow for right-turn in/right-turn out only movements and the South Project Driveway intersection will provide for right-turn in/right-turn out only movements and a directional left-turn in movement. The configuration of the driveways has been previously discussed and agreed upon with FDOT staff. The analysis procedures used in this evaluation were identical to those used to evaluate existing traffic and background traffic only conditions.

The results of this analysis are summarized in Table 7 and indicate that all existing study intersections are expected to operate at or above the LOS D performance standard during the p.m. peak hour with project traffic and without any improvements.

For the project driveway intersections with U.S. 41, an analysis was conducted for the cross-street movements and/or approaches only because the *HCS* unsignalized intersection analysis techniques primarily evaluate the cross-street movements and do not provide an overall LOS for the intersection. Thus, the LOS results shown in Table 7 for these driveways indicate the operating condition on the cross street and a critical main street turning movement (i.e. northbound left-turn movement).

At the North Project Driveway intersection with U.S. 41, the cross-street movement/approach is expected to operate at the LOS D performance standard. At the South Project Driveway intersection with U.S. 41, the results indicated that the cross-street movement/approach (the eastbound right-turn movement exiting the project site) may operate below the LOS D performance standard. To determine if a potential deficiency may occur for this movement, a field vehicle gap study was conducted by KHA along U.S. 41 near the project site, during the p.m. peak-hour period. The results of the study, which are provided in Appendix F, indicated that adequate gaps in through traffic along U.S. 41 should be available to allow the right-turning vehicles to exit the project site without adversely impacting the operation of this project driveway intersection.

Summary worksheets of the intersection analysis are provided in Appendix F.

TABLE 7 2008 P.M. Peak-Hour Total Traffic Intersection Conditions						
Intersection	Overall Intersection LOS		Approach LOS			
	Standard	Total Traffic	NB	SB	EB	WB
U.S. 41 & Gulf Gate Drive	D	C	C	B	---	E
U.S. 41 & Beneva Road	D	D	B	D	D	E
U.S. 41 & Club Drive	D	C	B	C	D	D
U.S. 41 & North Project Driveway	D	---	---	---	D	---
U.S. 41 & South Project Driveway	D	---	D	---	F	

In addition to the intersection analysis, a roadway analysis was undertaken on the previously identified study roadway segments within the study area. The analysis procedures for this evaluation were identical to those used to evaluate existing traffic and background traffic only conditions.

The results of the roadway analysis are summarized in Table 8 and indicate that all study roadway segments are expected to operate at or above the LOS D performance standard with project traffic during the future 2008 p.m. peak hour and with no roadway improvements required. Worksheets documenting the roadway analysis are provided in Appendix F.

TABLE 6 2008 P.M. Peak-Hour Total Traffic Roadway Conditions		
Roadway	LOS Standard	Roadway LOS (Two-Way)
U.S. 41 Gulf Gate Drive to Project Site	D	A*
U.S. 41 Project Site to Beneva Road	D	D
U.S. 41 Beneva Road to Club Drive	D	D*

*LOS based upon detailed arterial analysis for worst-case direction.

As part of the above analyses, a preliminary review was conducted to determine the need for a right-turn lane on U.S. 41 at the two project driveways. This review was undertaken using criteria from the *National Cooperative Highway Research Program* (NCHRP) Report 279, and traffic volumes at the intersections as found in Appendix D.

The results of this review determined that a southbound right-turn lane at both project driveway intersections of U.S. 41 is warranted. The worksheets documenting this analysis are provided in Appendix G.

In addition to the above analysis, a review of the turn lane length requirements for the southbound right-turn lane at both project driveways and for the proposed northbound left-turn lane at the U.S. 41 & South Project Driveway intersection was undertaken. The procedures used for this review included FDOT design guidelines for turn lanes at unsignalized intersections that determine appropriate deceleration length and queue length requirements. The results of this review are documented in Appendix G.

The results of the turn lane length analysis indicated that a turn lane length of 290 feet (taper and deceleration) would be required for the southbound right-turn lane at both project driveways. The results of the turn lane length analysis indicated that a turn lane length of 390 feet (290 feet for a taper and deceleration, and 100 feet for queue storage) would be required for the proposed northbound left-turn lane at the intersection of U.S. 41 & South Project Driveway.

As part of the turn lane length analysis, the existing southbound left-turn lane on U.S. 41, south of the project site at the median opening across from a church driveway, was evaluated to determine if this left-turn lane (length) would be adequate to accommodate u-turning traffic from the project site. The results of this evaluation indicated that this left-turn lane will need to be 490 feet in length. Since the existing length of this lane is approximately 230 feet, this turn lane will need to be extended by 260 feet. The results of this evaluation are documented in Appendix G.

CONCLUSION

Based upon the results of the analyses conducted for 2008 p.m. peak-hour conditions, the existing roadway network, including the intersection improvements at the project driveway intersections and at the existing median opening south of the site, is expected to be adequate to accommodate traffic generated by the project site and background traffic. In view of the above findings, transportation concurrency approval of the proposed Bayonne mixed-use site is recommended.