TRAFFIC CIRCULATION
ELEMENT

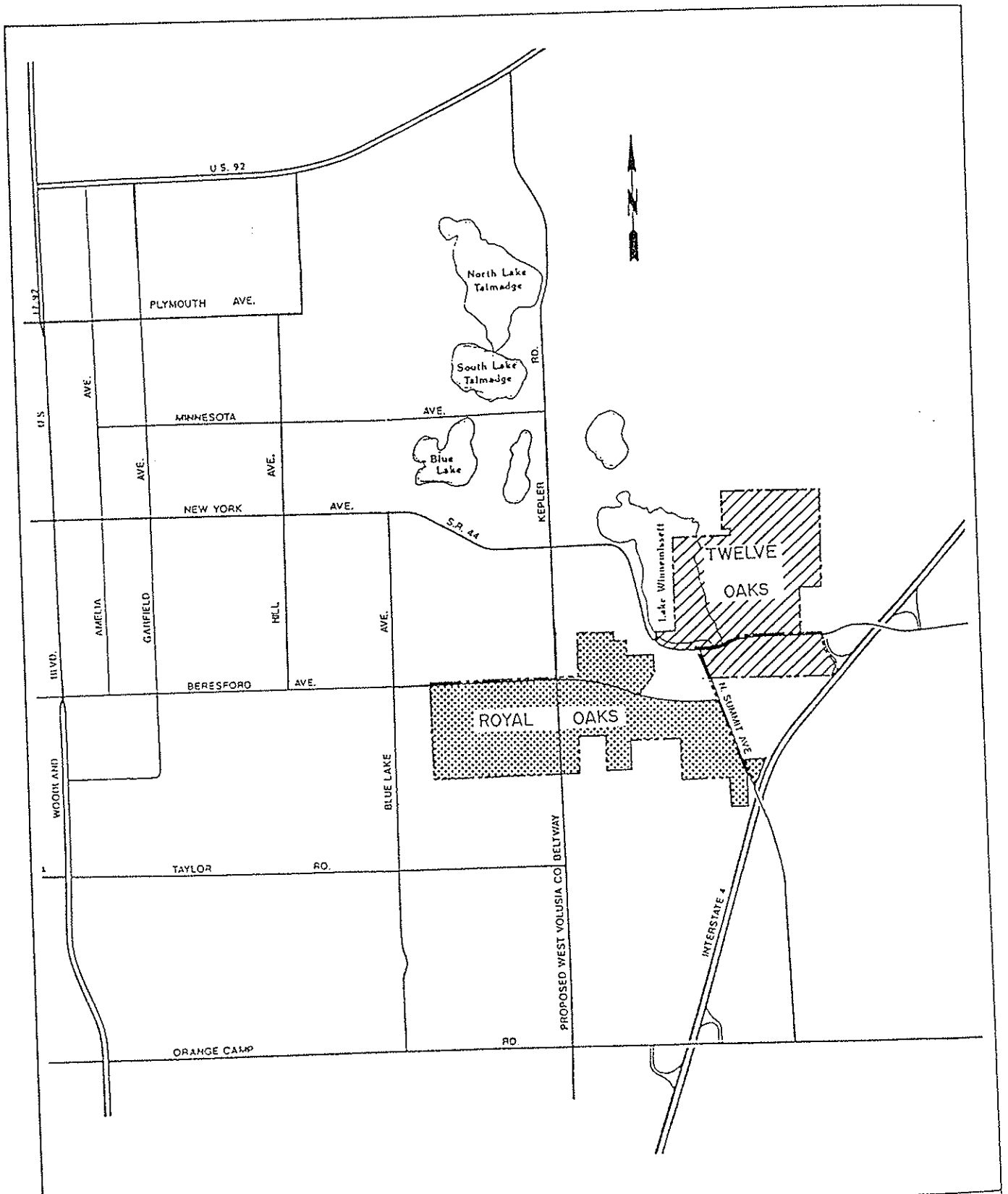
APPENDIX B

INTRODUCTION

This study was undertaken in order to assess the traffic impact of two Planned Development (P.D.) projects in the City of Deland, Volusia County. These projects are the Twelve Oaks and Royal Oaks developments proposed to be developed in eastern Deland to the west of the I-4/SR 44 interchange. Twelve Oaks is located along SR 44 between Lake Winnemissett and the I-4 interchange whereas Royal Oaks is located along Beresford Avenue/Beresford Avenue Extension to the east of Blue Lake Avenue and west of North Summit Avenue (CR 4139). Figure 1 depicts the study area and the location of the two development projects.

Twelve Oaks and Royal Oaks Planned Developments are mixed-use projects to be developed in accordance with the City's Planned Development Ordinance over a 15-20 year time period. The projects consist of the following land uses envisioned to be completed by 2010:

Land Use	Twelve Oaks	Royal Oaks
Residential		
o Single Family	458 DU	548 DU
o Multi-Family	--	149 DU
Commercial	132,000 SF	22,000 SF
Industrial	1,000,000 SF	700,000 SF
Institutional	50,000 SF	--



TPD Traffic Planning and Design Inc.
305 Whooping Loop, Suite 1333
Altamonte Springs, FL 32701 (407) 339-5368

STUDY AREA AND SITE LOCATION

FIGURE 1

EXISTING TRAFFIC CONDITIONS

An analysis of existing traffic conditions was conducted within a study area as determined in consultation with the City of Deland. As can be seen in Figure 1, the study area extends from US 92 on the north to Orange Camp Road on the south, and from I-4 on the east to Woodland Boulevard (US 17-92) on the west.

Study Roadways

The roadways to be included in the analysis were further identified as follows:

- East-West Roadways

  US 192

  Minnesota Avenue

  SR 44

  Beresford Avenue

  Taylor Road

  Orange Camp Road

- North-South Roadways

  I-4

  North Summit Avenue (CR 4139)

  Kepler Road/West Volusia Beltline

  Blue Lake Avenue

  Hill Avenue

  Amelia Avenue

  Woodland Boulevard (US 17-92)

Existing Levels of Service

Table 1 is an analysis of existing traffic conditions for the study roadways by segment. Shown in the table are number of lanes, facility type, existing daily traffic volumes/maximum service volumes and Levels of Service. The daily maximum service volumes were obtained from the Florida's Level of Service Standards and Guidelines Manual[1], for transitioning urbanized/urban areas and rural areas, as applicable.

A review of this table reveals that the study roadways are operating at satisfactory Levels of Service without exceeding the adopted Level of Service (LOS) Standards. Notable observations include:

- US 17-92 is shown to operate at an acceptable Level of Service only because its LOS Standard (or capacity) was determined as the 1989 daily volume times 1.20 representing a 20% degradation over the 1989 daily volumes on this roadway.
- SR 44 is currently operating very close to its adopted LOS Standard based upon the generalized daily maximum service volumes utilized in the analysis.

[1] Florida Department of Transportation, Florida's Level of Service Standards and Guidelines Manual for Planning, April 12, 1992.

TABLE 1

EXISTING DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# OF LANES/ FACILITY TYPE	DAILY VOLUME	DAILY MAXIMUM SERVICE VOLUMES C	D	E	ADOPTED LOS STANDARD	EXISTING LOS
US 92							
Kepler Rd/Beltline to Woodland Blvd	4/ART-A	17,300	33,800	36,900	46,800	C	B
Minnesota Avenue							
Kepler Rd/Beltline to Hill Ave	2/COLL-MINOR	2,443	4,800	9,300	10,600	E	C
Hill Ave to Garfield Ave	2/COLL-MINOR	1,776	4,800	9,300	10,600	E	C
SR 44							
Woodland Blvd to Hill Ave	2/ART-B	13,100	13,400	14,600	15,000	E	C
Hill Ave to Kepler Rd/Beltline	2/ART-B	12,950	13,400	14,600	15,000	C	C
Kepler Rd/Beltline to Summit Ave	2/ART-A	13,700	14,000	17,800	22,900	C	C
Summit Ave to I-4	2/ART-A	13,700	14,000	17,800	22,900	C	C
East of I-4	2/RURAL	8,100	8,600	13,600	22,000	C	C
Beresford Avenue							
Woodland Blvd to Hill Ave	2/ART-A	7,523	14,000	17,800	22,900	E	B
Taylor Road							
Woodland Blvd to Blue Lake Ave	2/COLL-MINOR	2,376	4,800	9,300	10,600	E	C

TABLE 1 - (CONTINUED)

EXISTING DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# OF LANES/ FACILITY TYPE	DAILY VOLUME	DAILY MAXIMUM SERVICE VOLUMES C	D	E	ADOPTED LOS STANDARD	EXISTING LOS
Orange Camp Road							
Woodland Blvd to Blue Lake Ave	2/ART-A	6,251	14,000	17,800	22,900	E	B
Blue Lake Ave to Beltline	2/ART-A	5,397	14,000	17,800	22,900	E	B
I-4							
North of SR 44	4/FREEWAY	32,100	45,900	55,400	59,600	B	B
South of SR 44	4/FREEWAY	38,500	45,900	55,400	59,600	B	C
N. Summit Avenue (CR 4139)							
SR 44 to Beresford Ave	2/COLL-MAJOR	5,359	9,900	12,200	13,400	E	C
Beresford to I-4	2/COLL-MAJOR	4,325	9,900	12,200	13,400	E	C
Kepler Road/West Volusia Beltline							
US 92 to Minnesota Ave	2/ART-A	8,591	14,000	17,800	22,900	E	B
Minnesota Ave to SR 44	2/ART-A	8,160	14,000	17,800	22,900	E	B
Blue Lake Avenue							
Minnesota Ave to SR 44	2/LOCAL	1,228	4,800	9,300	10,600	C	C
SR 44 to Beresford Ave	2/LOCAL	2,342	4,800	9,300	10,600	C	C
Beresford Ave to Taylor Rd	2/LOCAL	1,000	4,800	9,300	10,600	C	C
Taylor Rd to Orange Camp Rd	2/LOCAL	736	4,800	9,300	10,600	C	C

TABLE 1 - (CONTINUED)

EXISTING DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# OF LANES/ FACILITY TYPE	DAILY VOLUME	DAILY MAXIMUM SERVICE VOLUMES C	D	E	ADOPTED LOS STANDARD	EXISTING LOS
Hill Avenue							
Plymouth Ave to New York Ave	2/COLL-MINOR	4,345	4,800	9,300	10,600	E	C
New York Ave to Beresford Ave	2/COLL-MINOR	1,899	4,800	9,300	10,600	E	C
Amelia Avenue							
US 92 to Plymouth Ave	2/COLL-MAJOR	4,910	9,900	12,200	13,400	E	C
Plymouth Ave to Wisconsin Ave	2/COLL-MAJOR	11,675	9,900	12,200	13,400	E	D
Wisconsin Ave to New York Ave	4/COLL-MAJOR	11,427	21,700	26,900	28,800	E	C
New York Ave to Voorhis Ave	4/COLL-MAJOR	N/A	21,700	26,900	28,800	E	N/A
Voorhis Ave to Beresford Ave	2/COLL-MAJOR	N/A	9,900	12,200	13,400	E	N/A
Woodland Boulevard (US 17-92)							
US 92 to Plymouth Ave	4/ART-A	29,150	33,800	36,900	46,800	C	C
Plymouth Ave to New York Ave	2/ART-B	18,067	20,912	20,912	20,912[2]	C	C
New York Ave to Beresford Ave	2/ART-B	21,200	23,531	23,531	23,531[2]	C	C
Beresford Ave to Taylor Rd	4/ART-B	29,600	38,004	38,004	38,004[2]	C	C
Taylor Rd to Orange Camp Rd	4/ART-B	41,700	45,688	45,688	45,688[2]	C	C

[2] Backlogged facility maximum service volumes equal 1989 ADT x 1.20.

Programmed Improvements

The following roadway improvements are included in the County's Adopted Five-Year Work Program:

- Kepler Road/West Volusia Beltline

  Two lanes from SR 44 to Saxon Boulevard, 1992-93

- Prevatt Avenue

  Two lanes from Ohio Avenue to SR 44, 1995-96

- Beresford Avenue Extension

  Two lanes from Blue Lake Avenue to the West Volusia Beltline, 1995-96

- Taylor Road Extension

  Two lanes from Blue Lake Avenue to the West Volusia Beltline, 1996-97

DEVELOPMENT AND TRAFFIC GENERATION

As indicated earlier, the proposed development consists of two mixed-use projects. For the traffic impact assessment of these projects, a phased development program was devised as shown in Table 2.

Traffic Generation

The traffic generation of the proposed development was calculated by phase utilizing trip generation data compiled by the Institute of Transportation Engineers (ITE)[3]. Table 3 is a summary of the average daily vehicle trip generation thus calculated. As can be seen, the proposed development will generate an estimated 11,604 vehicles per day upon completion of Phase 1, 24,309 vehicles per day upon completion of Phase 2, and 32,072 vehicles per day upon completion of Phase 3 (or full development).

The trip generation as calculated by the ITE data represents total vehicular trips generated by the various land uses of the development. This total includes internal trips as well as passerby/diverted trips which do not constitute new trips on the area roadways. To account for such trips not impacting the area roadways, the County's transportation demand model which estimates the external trips of proposed land uses (or developments) was

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[3] Institute of Transportation Engineers, Trip Generation Report, 5th Edition, 1991

TABLE 2

PHASED DEVELOPMENT PROGRAM
TWELVE OAKS/ROYAL OAKS PLANNED DEVELOPMENTS

Phase	Land Use	Twelve Oaks	Royal Oaks
1 (1992-97)	SF Residential	250 units	150 units
	Commercial	1.2 and 2.0 Acre Sites (32,000 SF)	1.0 Acre Site (10,000 SF)
	Industrial	330,000 SF	230,000 SF
2 (1998-2003)	SF Residential	208 units	98 units
	MF Residential	____	149 units
	Commercial	50,000 SF	1.2 Acre Site (12,000 SF)
	Industrial	330,000 SF	230,000 SF
3 (2004-10)	SF Residential	____	300 units
	Commercial	50,000 SF	____
	Industrial	340,000 SF	240,000 SF
	Institutional	50,000 SF	____
Total Development (1992-2010)	SF Residential	458 units	548 units
	MF Residential		149 units
	Commercial	132,000 SF	22,000 SF
	Industrial	1,000,000 SF	700,000 SF
	Institutional	50,000 SF	

TABLE 3

DAILY TRIP GENERATION SUMMARY
TWELVE OAKS/ROYAL OAKS

LAND USE	SIZE	24-HOUR TWO-WAY VOLUME
o End of Phase 1		
Single Family	400 DU	3,700
Industrial Park	560 TGSF	3,537
Shopping Center	10 TGLA	1,676
Shopping Center	12 TGLA	1,878
Specialty Retail	20 TGLA	813
	Total Trips	11,604
	Pass-by Trips[4]	2,621
	New Trips[5]	8,983
o End of Phase 2		
Single Family	706 DU	6,244
Apartment	149 DU	929
Industrial Park	1120 TGSF	6,308
Shopping Center	10 TGLA	1,676
Shopping Center	12 TGLA	1,878
Specialty Retail	20 TGLA	2,585
Shopping Center	12 TGLA	1,878
Shopping Center	50 TGLA	4,583
	Total Trips	24,309
	Pass-by Trips[4]	6,360
	New Trips[5]	17,949
o End of Phase 3		
Single Family	1006 DU	8,645
Apartment	149 DU	929
Industrial Park	1700 TGSF	9,179
Shopping Center	10 TGLA	1,676
Shopping Center	12 TGLA	1,878
Specialty Retail	20 TGLA	2,585
Shopping Center	12 TGLA	1,878
Shopping Center	100 TGLA	7,067
	Total Trips	32,072
	Pass-by Trips[4]	6,928
	New Trips[5]	25,144

[4] Determined from ITE Equation.

[5] Includes Internal Trips

employed in the impact assessment of the development. A comparison of the ITE-generated trips with the model-generated trips is as follows:

End of Phase	ITE Generated Daily Trips External	ITE Generated Daily Trips Internal[3]	Model Generated Daily Trips External
1	7,187	1,796	6,894
2	14,359	3,590	14,590
3	20,116	5,028	20,074

As can b e seen, the model-generated external trips match closely the external trips estimated from the ITE-generated trips.

Traffic Distribution/ Assignment

As will be discussed subsequently, the distribution and assignment of project trips to the area roadways were accomplished through the use of the County's transportation models.

[3] Assumes 10% Internal Capture.

FUTURE TRAFFIC CONDITIONS

Projected traffic conditions were determined for 1997, 2003 and 2010, the expected buildout years for the three phases of the proposed development. This was accomplished through the use of the County's transportation demand models. The models were utilized to generate projection of daily traffic volumes on the area roadways which involved the following procedure:

- Trip generation was accomplished with the use of Productions (P) and Attractions (A) equations and/or cross classification curves.
- The trip generation as determined above was distributed between traffic analysis zones utilizing the "Gravity Model".
- Finally, the generated trips were assigned to the highway network with an equilibrium highway loading procedure where zone-to-zone trip interchanges are loaded to roadways by minimum time path.

The socioeconomic and transportation network data used in projecting future traffic volumes were obtained from the County's Planning and Zoning Department. The transportation network data included the following roadways improvements in the study area:

a) 1997 Network:

Programmed roadway improvements as previously described.

b) 2003 Network:

W Volusia Beltline	2 to 4 lanes	From SR 44 to Graves
Beresford Rd Ext	2 lanes	From Beltline/Kepler Rd to N. Summit

c) 2010 Network:

W Volusia Beltline	2 to 4 lanes	From SR 44 to US 92
W Volusia Beltline	4 to 6 lanes	From Graves to SR 44
W Volusia Beltline	2 to 4 lanes	From Saxon to Graves
I-4	4 to 6 lanes	From Seminole County Line to I-95
Prevatt Ave	2 to 4 lanes	From Ohio Ave to SR 44
US 17-92	4 to 6 lanes	From Enterprise Rd to Beresford
Garfield Ave	2 to 4 lanes	From Beresford Rd to Plymouth

Prior to the use of the socioeconomic and transportation data, the following modifications were made in the vicinity of the project site:

- Ten new traffic analysis zones were created for the proposed Twelve Oaks and Royal Oaks Development.
- Link-node networks were modified to (a) include centroid connectors from the newly created traffic analysis zones to the adjacent roadway network, (b) add the Beresford Avenue Extension from West Volusia Beltline to North Summit Avenue in one scenario run for the year 1997 and (c) change the West Volusia Beltline laneage from 2 to 4 lanes from SR 44 to Graves Avenue in the 2003 network.

Utilizing future socioeconomic and transportation network data as model inputs, the FSUTMS (Florida Standard Urban Transportation Model Structure) Modeling package was employed to determine projected traffic volumes.

Traffic Assignment

The transportation modelling procedure employed produced a forecast of daily traffic volume data for 1997, 2003 and 2010 on the area roadways as follows:

- Background traffic, model generated traffic volumes exclusive of the proposed development.
- Project traffic, model generated traffic volumes of the proposed development.
- Total traffic, background traffic plus project traffic.

For 1997, two scenarios were used in the traffic forecast estimation as follows:

(1) Beresford Avenue not extended to N. Summit Avenue

(2) Beresford Avenue extended to N. Summit Avenue

Projected Traffic Volumes/LOS Analysis

Table 4, 5, 6 and 7 show projected traffic volumes for 1997, 2003 and 2010 along with a Level of Service (LOS) analysis of each study roadway by segment. The LOS analysis was accomplished similar to existing conditions by comparing the projected traffic volume of each roadway segment with the capacity (or adopted LOS Standard) of the segment. The daily maximum service volumes shown in the tables were obtained from the Florida DOT's generalized annual average daily volumes with the exception of SR 44. To determine daily maximum service volumes for this facility, the Florida DOT's computer model was utilized along with signal timing/phasing data as obtained from Volusia County Traffic Engineering and field observations during the P.M. peak hour. The daily maximum service volume calculation along with signal timing/phasing data in terms of G/C ratios for SR 44 are included in the Appendix.

TABLE 4

1997 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE
ANALYSIS DOES NOT INCLUDE BERESFORD ROAD EXTENSION

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
US 92									
Kepler Rd/Beltline to Woodland Blvd	4/ART-A	28,113	103	28,216	33,800	36,900	46,800	C	B
Minnesota Avenue									
Kepler Rd/Beltline to Hill Ave	2/COLL-MIN	2,554	56	2,610	4,800	9,300	10,600	E	C
Hill Ave to Garfield Ave	2/COLL-MIN	2,660	65	2,725	4,800	9,300	10,600	E	C
SR 44									
Woodland Blvd to Hill Ave	2/ART-B	14,252	486	14,738	16,200	17,600	18,600[6]	E	C
Hill Ave to Kepler Rd/Beltline	2/ART-B	14,200	815	15,015	16,200	17,600	18,600[6]	C	C
Kepler Rd/Beltline to Summit Ave	2/ART-B	14,324	1,442	15,766	16,200	17,600	18,600[6]	C	C
Summit Ave to I-4	2/ART-B	14,114	2,021	16,135	16,200	17,600	18,600[6]	C	C
I-4 to Prevatt Ave	2/ART-B	9,280	424	9,704	16,200	17,600	18,600[6]	C	B
East of Prevatt Ave	2/RURAL	7,494	144	7,638	8,600	13,600	22,000	C	C
Beresford Avenue									
Woodland Blvd to Hill Ave	2/ART-A	4,260	270	4,530	14,000	17,800	22,900	E	B
Hill Ave to Beltline	2/ART-A	8,347	573	8,920	14,000	17,800	22,900	E	B

[6] See Appendix for calculation of daily maximum service volumes for SR 44.

TABLE 4 - (CONTINUED)

1997 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE
ANALYSIS DOES NOT INCLUDE BERESFORD ROAD EXTENSION

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Taylor Road									
Woodland Blvd to Blue Lake Ave	2/COLL-MIN	6,704	360	7,064	4,800	9,300	10,600	E	D
Blue Lake Ave to Beltline	2/COLL-MIN	5,880	275	6,155	4,800	9,300	10,600	E	D
Orange Camp Road									
Woodland Blvd to Blue Lake Ave	2/ART-A	10,992	87	11,079	14,000	17,800	22,900	E	C
Blue Lake Ave to Beltline	2/ART-A	8,461	155	8,616	14,000	17,800	22,900	E	B
I-4									
North of SR 44	4/FREEWAY	45,576	440	46,016	49,100	59,300	63,800	C	C
South of SR 44	4/FREEWAY	34,389	2,283	36,672	49,100	59,300	63,800	C	C
N. Summit Avenue (CR 4139)									
SR 44 to Beresford Ave	2/COLL-MAJ	10,922	943	11,865	9,900	12,200	13,400	E	D
Beresford to I-4	2/COLL-MAJ	9,871	610	10,481	9,900	12,200	13,400	E	D

TABLE 4 - (CONTINUED)

1997 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE
ANALYSIS DOES NOT INCLUDE BERESFORD ROAD EXTENSION

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Kepler Road/West Volusia Beltline									
US 92 to Minnesota Ave	2/ART-A	9,093	269	9,362	14,000	17,800	22,900	E	C
Minnesota Ave to SR 44	2/ART-A	10,720	363	11,083	14,000	17,800	22,900	E	C
SR 44 to Beresford Ave	2/ART-A	9,946	460	10,406	14,000	17,800	22,900	E	C
Beresford Ave to Taylor Rd	2/ART-A	15,542	483	16,025	14,000	17,800	22,900	E	D
Taylor Rd to Orange Camp Rd	2/ART-A	16,915	537	17,452	14,000	17,800	22,900	E	D
Blue Lake Avenue									
Minnesota Ave to SR 44	2/LOCAL	3,770	50	3,820	4,800	9,300	10,600	C	C
SR 44 to Beresford Ave	2/LOCAL	2,113	172	2,285	4,800	9,300	10,600	C	C
Beresford Ave to Taylor Rd	2/LOCAL	1,946	137	2,083	4,800	9,300	10,600	C	C
Taylor Rd to Orange Camp Rd	2/LOCAL	1,759	213	1,972	4,800	9,300	10,600	C	C
Hill Avenue									
Plymouth Ave to New York Ave	2/COLL-MIN	6,888	180	7,068	4,800	9,300	10,600	E	D
New York Ave to Beresford Ave	2/COLL-MIN	6,244	206	6,450	4,800	9,300	10,600	E	D

TABLE 4 - (CONTINUED)

1997 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE
ANALYSIS DOES NOT INCLUDE BERESFORD ROAD EXTENSION

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Amelia Avenue									
US 92 to Plymouth Ave	2/COLL-MAJ	2,645	55	2,700	9,900	12,200	13,400	E	C
Plymouth Ave to Wisconsin Ave	2/COLL-MAJ	7,089	48	7,137	9,900	12,200	13,400	E	C
Wisconsin Ave to New York Ave	4/COLL-MAJ	9,406	104	9,510	21,700	26,900	28,800	E	C
New York Ave to Voorhis Ave	4/COLL-MAJ	7,142	12	7,154	21,700	26,900	28,800	E	C
Voorhis Ave to Beresford Ave	2/COLL-MAJ	6,282	5	6,287	9,900	12,200	13,400	E	C
Woodland Boulevard (US 17-92)									
US 92 to Plymouth Ave	4/ART-A	24,529	110	24,639	33,800	36,900	46,800	C	C
Plymouth Ave to New York Ave	2/ART-B	15,132	35	15,167	20,912	20,912	20,912[1]	C	C
New York Ave to Beresford Ave	2/ART-B	16,306	15	16,321	23,531	23,531	23,531[1]	C	C
Beresford Ave to Taylor Rd	4/ART-B	33,133	78	33,211	38,004	38,004	38,004[1]	C	C
Taylor Rd to Orange Camp Rd	4/ART-B	38,484	33	38,517	45,688	45,688	45,688[1]	C	C

[1] Backlogged facility maximum service volumes equal 1989 ADT x 1.20.

TABLE 5

1997 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE
ANALYSIS INCLUDES BERESFORD ROAD EXTENSION

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
US 92									
Kepler Rd/Beltline to Woodland Blvd	4/ART-A	26,945	153	27,098	33,800	36,900	46,800	C	C
Minnesota Avenue									
Kepler Rd/Beltline to Hill Ave	2/COLL-MIN	2,659	187	2,846	4,800	9,300	10,600	E	C
Hill Ave to Garfield Ave	2/COLL-MIN	3,550	98	3,648	4,800	9,300	10,600	E	C
SR 44									
Woodland Blvd to Hill Ave	2/ART-B	12,447	509	12,956	16,200	17,600	18,600[8]	E	C
Hill Ave to Kepler Rd/Beltline	2/ART-B	12,810	814	13,624	16,200	17,600	18,600[8]	C	C
Kepler Rd/Beltline to Summit Ave	2/ART-B	12,975	1,804	14,579	16,200	17,600	18,600[8]	C	C
Summit Ave to I-4	2/ART-B	16,360	2,239	18,599	16,200	17,600	18,600[8]	C	D
I-4 to Prevatt Ave	2/ART-B	9,056	566	9,622	16,200	17,600	18,600[8]	C	C
East of Prevatt Ave	2/RURAL	7,774	180	7,954	8,600	13,600	22,000	C	C
Beresford Avenue									
Woodland Blvd to Hill Ave	2/ART-A	6,728	325	7,053	14,000	17,800	22,900	E	C
Hill Ave to Beltline	2/ART-A	9,093	547	9,640	14,000	17,800	22,900	E	C
Beltline to Summit Ave	2/ART-A	12,643	688	13,331	14,000	17,800	22,900	E	C

[8] See Appendix for calculation of daily maximum service volumes for SR 44.

TABLE 5 - (CONTINUED)

1997 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE
ANALYSIS INCLUDES BERESFORD ROAD EXTENSION

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Taylor Road									
Woodland Blvd to Blue Lake Ave	2/COLL-MIN	4,671	310	4,981	4,800	9,300	10,600	E	D
Blue Lake Ave to Beltline	2/COLL-MIN	4,132	153	4,285	4,800	9,300	10,600	E	C
Orange Camp Road									
Woodland Blvd to Blue Lake Ave	2/ART-A	11,143	206	11,235	14,000	17,800	22,900	E	C
Blue Lake Ave to Beltline	2/ART-A	8,984	92	9,190	14,000	17,800	22,900	E	C
I-4									
North of SR 44	4/FREEWAY	46,082	396	46,428	49,100	59,300	63,800	C	C
South of SR 44	4/FREEWAY	34,883	2,996	37,879	49,100	59,300	63,800	C	C
N. Summit Avenue (CR 4139)									
SR 44 to Beresford Ave	2/COLL-MAJ	12,144	1,166	13,310	9,900	12,200	13,400	E	E
Beresford to I-4	2/COLL-MAJ	12,061	885	12,946	9,900	12,200	13,400	E	E

TABLE 5 - (CONTINUED)

1997 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE
ANALYSIS INCLUDES BERESFORD ROAD EXTENSION

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Kepler Road/West Volusia Beltline									
US 92 to Minnesota Ave	2/ART-A	7,303	331	7,634	14,000	17,800	22,900	E	C
Minnesota Ave to SR 44	2/ART-A	9,119	570	9,689	14,000	17,800	22,900	E	C
SR 44 to Beresford Ave	2/ART-A	12,354	494	12,848	14,000	17,800	22,900	E	C
Beresford Ave to Taylor Rd	2/ART-A	13,301	488	13,789	14,000	17,800	22,900	E	C
Taylor Rd to Orange Camp Rd	2/ART-A	14,286	376	14,662	14,000	17,800	22,900	E	D
Blue Lake Avenue									
Minnesota Ave to SR 44	2/LOCAL	3,732	104	3,836	4,800	9,300	10,600	C	C
SR 44 to Beresford Ave	2/LOCAL	1,870	138	2,008	4,800	9,300	10,600	C	C
Beresford Ave to Taylor Rd	2/LOCAL	2,147	182	2,329	4,800	9,300	10,600	C	C
Taylor Rd to Orange Camp Rd	2/LOCAL	2,058	354	2,412	4,800	9,300	10,600	C	C
Hill Avenue									
Plymouth Ave to New York Ave	2/COLL-MIN	7,597	105	7,702	4,800	9,300	10,600	E	D
New York Ave to Beresford Ave	2/COLL-MIN	4,624	76	4,700	4,800	9,300	10,600	E	C

TABLE 5 - (CONTINUED)

1997 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE
ANALYSIS INCLUDES BERESFORD ROAD EXTENSION

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Amelia Avenue									
US 92 to Plymouth Ave	2/COLL-MAJ	3,560	14	3,574	9,900	12,200	13,400	E	C
Plymouth Ave to Wisconsin Ave	2/COLL-MAJ	6,595	20	6,615	9,900	12,200	13,400	E	C
Wisconsin Ave to New York Ave	4/COLL-MAJ	8,123	72	8,195	21,700	26,900	28,800	E	C
New York Ave to Voorhis Ave	4/COLL-MAJ	6,939	11	6,950	21,700	26,900	28,800	E	C
Voorhis Ave to Beresford Ave	2/COLL-MAJ	6,262	15	6,277	9,900	12,200	13,400	E	C
Woodland Boulevard (US 17-92)									
US 92 to Plymouth Ave	4/ART-A	24,848	158	25,006	33,800	36,900	46,800	C	C
Plymouth Ave to New York Ave	2/ART-B	16,589	78	16,667	20,912	20,912	20,912[§]	C	C
New York Ave to Beresford Ave	2/ART-B	19,634	44	19,678	23,531	23,531	23,531[§]	C	C
Beresford Ave to Taylor Rd	4/ART-B	36,267	96	36,363	38,004	38,004	38,004[§]	C	C
Taylor Rd to Orange Camp Rd	4/ART-B	42,429	45	42,474	45,688	45,688	45,688[§]	C	C

[§] Backlogged facility maximum service volumes equal 1989 ADT x 1.20.

TABLE 6

2003 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
US 92									
Kepler Rd/Beltline to Woodland Blvd	4/ART-A	34,081	174	34,255	33,800	36,900	46,800	C	D
Minnesota Avenue									
Kepler Rd/Beltline to Hill Ave	2/COLL-MIN	4,389	215	4,604	4,800	9,300	10,600	E	C
Hill Ave to Garfield Ave	2/COLL-MIN	3,799	133	3,932	4,800	9,300	10,600	E	C
SR 44									
Woodland Blvd to Hill Ave	2/ART-B	12,763	906	13,669	16,200	17,600	18,600[10]	E	C
Hill Ave to Kepler Rd/Beltline	2/ART-B	12,431	1,576	14,007	16,200	17,600	18,600[10]	D	C
Kepler Rd/Beltline to Summit Ave	2/ART-B	12,208	2,649	14,857	16,200	17,600	18,600[10]	C	C
Summit Ave to I-4	2/ART-B	14,890	4,334	19,224	16,200	17,600	18,600[10]	C	F
I-4 to Prevatt Ave	2/ART-B	17,954	952	18,906	16,200	17,600	18,600[10]	C	F
East of Prevatt Ave	2/RURAL	10,620	344	10,964	8,600	13,600	22,000	C	D
Beresford Avenue									
Woodland Blvd to Hill Ave	2/ART-A	8,456	425	8,881	14,000	17,800	22,900	E	C
Hill Ave to Beltline	2/ART-A	12,285	1,136	13,421	14,000	17,800	22,900	E	C
Beltline to Summit Ave	2/ART-A	13,121	1,464	14,505	14,000	17,800	22,900	E	D

[illegible] volumes for SR 44

TABLE 6 - (CONTINUED)

2003 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Taylor Road									
Woodland Blvd to Blue Lake Ave	2/COLL-MIN	7,018	312	7,330	4,800	9,300	10,600	E	D
Blue Lake Ave to Beltline	2/COLL-MIN	6,191	655	6,846	4,800	9,300	10,600	E	D
Orange Camp Road									
Woodland Blvd to Blue Lake Ave	2/ART-A	15,483	371	15,854	14,000	17,800	22,900	E	D
Blue Lake Ave to Beltline	2/ART-A	13,221	219	13,440	14,000	17,800	22,900	E	C
I-4									
North of SR 44	4/FREEWAY	49,626	762	50,388	49,100	59,300	63,800	C	D
South of SR 44	4/FREEWAY	41,395	3,924	45,319	49,100	59,300	63,800	C	C
N. Summit Avenue (CR 4139)									
SR 44 to Beresford Ave	2/COLL-MAJ	12,668	2,469	15,137	9,900	12,200	13,400	E	F
Beresford to I-4	2/COLL-MAJ	12,504	1,654	14,158	9,900	12,200	13,400	E	F

TABLE 6 - (CONTINUED)

2003 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Kepler Road/West Volusia Beltline									
US 92 to Minnesota Ave	2/ART-A	10,158	643	10,801	14,000	17,800	22,900	E	C
Minnesota Ave to SR 44	2/ART-A	13,955	987	14,942	14,000	17,800	22,900	E	D
SR 44 to Beresford Ave	4/ART-A	18,208	1,420	19,628	33,800	36,900	46,800	E	C
Beresford Ave to Taylor Rd	4/ART-A	19,431	1,366	20,797	33,800	36,900	46,800	E	C
Taylor Rd to Orange Camp Rd	4/ART-A	19,559	1,130	20,689	33,800	36,900	46,800	E	C
Blue Lake Avenue									
Minnesota Ave to SR 44	2/LOCAL	4,231	187	4,418	4,800	9,300	10,600	C	C
SR 44 to Beresford Ave	2/LOCAL	2,716	170	2,886	4,800	9,300	10,600	C	C
Beresford Ave to Taylor Rd	2/LOCAL	2,466	212	2,678	4,800	9,300	10,600	C	C
Taylor Rd to Orange Camp Rd	2/LOCAL	2,608	105	2,713	4,800	9,300	10,600	C	C
Hill Avenue									
Plymouth Ave to New York Ave	2/COLL-MIN	8,736	122	8,858	4,800	9,300	10,600	E	D
New York Ave to Beresford Ave	2/COLL-MIN	6,309	96	6,405	4,800	9,300	10,600	E	D

TABLE 6 - (CONTINUED)

2003 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Amelia Avenue									
US 92 to Plymouth Ave	2/COLL-MAJ	3,136	78	3,214	9,900	12,200	13,400	E	C
Plymouth Ave to Wisconsin Ave	2/COLL-MAJ	7,816	134	7,950	9,900	12,200	13,400	E	C
Wisconsin Ave to New York Ave	4/COLL-MAJ	9,264	221	9,485	21,700	26,900	28,800	E	C
New York Ave to Voorhis Ave	4/COLL-MAJ	8,914	56	8,970	21,700	26,900	28,800	E	C
Voorhis Ave to Beresford Ave	2/COLL-MAJ	5,430	50	5,480	9,900	12,200	13,400	E	C
Woodland Boulevard (US 17-92)									
US 92 to Plymouth Ave	4/ART-A	25,701	266	25,967	33,800	36,900	46,800	C	C
Plymouth Ave to New York Ave	2/ART-B	16,599	173	16,772	20,912	20,912	20,912[11]	C	C
New York Ave to Beresford Ave	2/ART-B	17,275	88	17,363	23,531	23,531	23,531[11]	C	C
Beresford Ave to Taylor Rd	4/ART-B	35,529	116	35,645	38,004	38,004	38,004[11]	C	C
Taylor Rd to Orange Camp Rd	4/ART-B	37,132	59	37,191	45,688	45,688	45,688[11]	C	C

[illegible] volumes equal 1989 ADT x 1.20.

TABLE 7

2010 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
US 92									
Kepler Rd/Beltline to Woodland Blvd	4/ART-A	36,399	248	36,647	33,800	36,900	46,800	C	D
Minnesota Avenue									
Kepler Rd/Beltline to Hill Ave	2/COLL-MIN	8,721	786	9,507	5,200	10,300	11,700	E	D
Hill Ave to Garfield Ave	2/COLL-MIN	6,137	237	6,374	5,200	10,300	11,700	E	D
SR 44									
Woodland Blvd to Hill Ave	2/ART-B	13,030	995	14,025	16,200	17,600	18,600[12]	E	C
Hill Ave to Kepler Rd/Beltline	2/ART-B	12,790	1,462	14,252	16,200	17,600	18,600[12]	C	C
Kepler Rd/Beltline to Summit Ave	2/ART-A	13,076	4,164	17,240	16,200	18,000	19,900[12]	C	D
Summit Ave to I-4	2/ART-A	15,106	5,667	20,776	16,200	18,000	19,900[12]	C	F
I-4 to Prevatt Ave	2/ART-A	15,267	1,447	16,714	16,200	18,000	19,900[12]	C	D
East of Prevatt Ave	2/RURAL	11,093	454	11,547	8,600	13,600	22,000	C	D
Beresford Avenue									
Woodland Blvd to Hill Ave	2/ART-A	8,264	734	8,998	14,000	17,800	22,900	E	C
Hill Ave to Beltline	2/ART-A	8,773	1,955	10,728	14,000	17,800	22,900	E	C
Beltline to Summit Ave	2/ART-A	13,927	1,900	15,827	14,000	17,800	22,900	E	C

[illegible] maximum service volumes for SR 44.

TABLE 7 - (CONTINUED)

2010 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Taylor Road									
Woodland Blvd to Blue Lake Ave	2/COLL-MIN	9,364	733	10,097	4,800	9,300	10,600	E	E
Blue Lake Ave to Beltline	2/COLL-MIN	8,250	616	8,866	4,800	9,300	10,600	E	D
Orange Camp Road									
Woodland Blvd to Blue Lake Ave	2/COLL-MIN	19,458	221	19,679	14,000	17,800	22,900	E	D
Blue Lake Ave to Beltline	2/COLL-MIN	10,975	195	11,170	14,000	17,800	22,900	E	C
I-4									
North of SR 44	6/FREEWAY	62,416	942	63,358	73,700	89,000	95,700	C	C
South of SR 44	6/FREEWAY	52,178	5,000	57,178	73,700	89,000	95,700	C	C
N. Summit Avenue (CR 4139)									
SR 44 to Beresford Ave	2/COLL-MAJ	15,032	2,394	17,426	9,900	12,200	13,400	E	F
Beresford to I-4	2/COLL-MAJ	14,246	1,829	16,075	9,900	12,200	13,400	E	F

TABLE 7 - (CONTINUED)

2010 DAILY TRAFFIC VOLUMES/LEVELS OF SERVICE

ROAD/SEGMENT	# LANES/ FACILITY TYPE	DAILY VOLUME			MAXIMUM SERVICE VOLUMES			ADOPTED LOS STANDARD	PROJECTED LOS
		BACK-GROUND	PROJECT	TOTAL	C	D	E		
Kepler Road/West Volusia Beltline									
US 92 to Minnesota Ave	4/ART-A	13,706	869	14,575	33,800	36,900	46,800	E	C
Minnesota Ave to SR 44	4/ART-A	21,473	1,861	23,334	33,800	36,900	46,800	E	C
SR 44 to Beresford Ave	6/ART-A	21,056	2,025	23,081	51,700	59,700	70,200	E	C
Beresford Ave to Taylor Rd	6/ART-A	25,482	1,439	26,921	51,700	59,700	70,200	E	C
Taylor Rd to Orange Camp Rd	6/ART-A	24,831	823	25,654	51,700	59,700	70,200	E	C
Blue Lake Avenue									
Minnesota Ave to SR 44	2/LOCAL	5,153	204	5,357	4,800	9,300	10,600	C	D
SR 44 to Beresford Ave	2/LOCAL	2,794	348	3,142	4,800	9,300	10,600	C	C
Beresford Ave to Taylor Rd	2/LOCAL	2,497	583	3,080	4,800	9,300	10,600	C	C
Taylor Rd to Orange Camp Rd	2/LOCAL	3,054	328	3,382	4,800	9,300	10,600	C	C
Hill Avenue									
Plymouth Ave to New York Ave	2/COLL-MIN	9,965	221	10,186	4,800	9,300	10,600	E	E
New York Ave to Beresford Ave	2/COLL-MIN	7,855	128	7,983	4,800	9,300	10,600	E	D

STUDY CONCLUSIONS

A review of the projected traffic volumes on each roadway and the daily maximum service volumes reveals the need of the following roadways improvements in order to maintain acceptable Levels of Service:

Phase 1 (1997) Improvements

- Construct access connections for the proposed development as per City of Deland and Florida DOT requirements providing separate right/left turn lanes.
- As development occurs in Royal Oaks, construct Beresford Avenue Extension to connect the development to the West Volusia Beltline or N. Summit Ave as needed to serve the proposed development. This extension should be accomplished to City and County Standards for arterial roads.
- Monitor the intersections of SR 44 with N. Summit Ave and Kepler/West Volusia Beltline for possible signalization and/or need for separate turn lanes.

Phase 2 (2003) Improvements

- Improvements identified in Phase 1
- US 92 - Widen to 6 lanes, Kepler Rd/Beltline to Woodland Blvd. This improvement will be needed even if project is not constructed.
- SR 44 - Widen to 4 lanes, N. Summit to Prevatt Ave. This improvement will be needed by both background traffic and project traffic.

- Beresford Avenue - Construct 2 lanes from West Volusia Beltline to N. Summit Ave. As Royal Oaks develops, this improvement will be needed to provide an alternative route to SR 44. It will serve both project traffic and background traffic.
- I-4[14] - Widen to 6 lanes, north of SR 44. This improvement is an areawide need and not a project need.
- N. Summit Ave (CR 4139) - Widen to 4 lanes, SR 44 to I-4. As development occurs in Royal Oaks, this improvement will be needed to serve project traffic as well as background traffic.

Phase 3 (2010) Improvements

- Improvements identified in Phase 2
- SR 44 - Widen to 4 lanes, Kepler/Beltline to N. Summit Ave. As development occurs in Twelve Oaks/Royal Oaks, this improvement needed to serve project traffic as well as background traffic.
- Blue Lake Ave - Upgrade from Local to Minor Collector facility
- I-4[14] - Widen to 6 lanes, south of SR 44. This improvement is an areawide need and not a project need.
- Woodland Blvd (US 17-92)[14] - Widen to 6 lanes, Taylor Rd to Orange Camp Rd. This improvement is an areawide need and not a project need.

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[14] Project included in Volusia County Comprehensive Plan.

Florida Department of Transportation
Signalized Intersection Level of Service Tables
Based on the 1985 Highway Capacity Manual
SIG_TAB Version 1.0
Date: 12-14-91
Developed by: E.Shenk, D.McLeod, and W.McShane

DESCRIPTION

Road Name: SR 44
PEAK >>>>>>>>>> PEAK DIRECTION: WB
Study Time Period: PM PEAK
Analysis Date: Nov. 20, 1992
Number of Lanes: 2
AADT:

TRAFFIC CHARACTERISTICS

		----Range----
K FACTOR:	0.093	(0.06 - 0.20)
D FACTOR:	0.568	(0.50 - 1.00)
PHF:	0.910	(0.70 - 1.00)
ADJ. SATURATION FLOW RATE:	1,800	(1400 - 2000)
% TURNS FROM EXCLUSIVE LANES:	12	(0 - 100)

ROADWAY CHARACTERISTICS

URBAN, TRANSITIONING, OR RURAL DEVELOPED (U/T/R):	T
MEDIANS (Y/N):	N
LEFT TURN BAYS (Y/N):	Y

SIGNALIZATION CHARACTERISTICS

ARRIVAL TYPE, PEAK DIRECTION:	3	(1, 2, 3, 4,or 5)
TYPE SIGNAL SYSTEM:	1	(1, 2, or 3)
		(1=Actuated, 2=Pretimed, 3=Semiactuated)
CYCLE LENGTH (sec):	90	(60 - 180)
THRU MOVEMENT g/C:	0.51	(0.20 - 0.80)

SR 44
US 17-92 TO I-4

DAILY MAXIMUM SERVICE VOLUME CALCULATION

PEAK HOUR PEAK DIRECTION VOLUME
(Includes vehicles in exclusive lanes)

LANES	Level of Service A	B	C	D	E
1	N/A	720	860	930	980
2	N/A	1,550	1,770	1,890	1,980
3	N/A	2,380	2,710	2,870	2,970
4	N/A	3,250	3,640	3,820	3,960

PEAK HOUR VOLUME (BOTH DIRECTIONS)
(Includes vehicles in exclusive lanes)

LANES	Level of Service A	B	C	D	E
2	N/A	1,270	1,510	1,640	1,730
4	N/A	2,730	3,110	3,330	3,490
6	N/A	4,190	4,760	5,050	5,230
8	N/A	5,720	6,410	6,730	6,980

AVERAGE ANNUAL DAILY TRAFFIC (AADT)
(Includes vehicles in exclusive lanes)

LANES	Level of Service A	B	C	D	E
2	N/A	13,700	16,200	17,600	18,600
4	N/A	29,400	33,500	35,900	37,500
6	N/A	45,100	51,200	54,300	56,300
8	N/A	61,500	69,000	72,400	75,000

N/A means the level of service is not achievable

Peak hour peak direction thru/right V/C ratios

LANES	A	B	C	D	E
1	N/A	0.73	0.86	0.94	0.99
2	N/A	0.78	0.89	0.96	1.00
3	N/A	0.80	0.91	0.96	1.00
4	N/A	0.82	0.92	0.96	1.00

CALCULATION OF G/C

SR 44 FROM WOODLAND BOULEVARD TO I-4

(GREEN + AMBER) ÷ SIGNAL CYCLE = G/C

- At Woodland Boulevard

  (60 + 5) ÷ 130 = 0.500

- At Amelia

  (30 +15) ÷ 70 = 0.500

- At Hill[4]

  (32 + 5) ÷ 65 = 0.569

- At Kepler

  (40 +5) ÷ 90 = 0.500

  Average = 0.517

Weighted Average = $\frac{0.517 + 0.500}{2}$

Weighted G/C = 0.5085

[4] Based on field measurements during P.M. peak hour.

TWELVE OAKS/ROYAL OAKS

SUMMARY OF AVERAGE VEHICLE TRIP GENERATION

AVERAGE WEEKDAY DRIVEWAY VOLUMES

PHASE I

LAND USE	SIZE	24 HOUR TWO-WAY VOLUME	AM PK HOUR ENTER	AM PK HOUR EXIT	PM PK HOUR ENTER	PM PK HOUR EXIT
SINGLE FAMILY DWELLINGS	400 DWELLING UNITS	3700	70	199	245	13
INDUSTRIAL PARK	560 TH.GR.SQ.FT.	3537	363	80	85	31
SHOPPING CENTER	10 T.G.L.A.	1676	26	15	76	7
SHOPPING CENTER	12 T.G.L.A.	1878	29	17	85	8
SPECIALTY RETAIL CENTER	20 TH.GR.SQ.FT.	813	0	0	0	
TOTAL		11604	488	311	491	61

Note: A zero rate indicates no rate data available

TWELVE OAKS/ROYAL OAKS

SUMMARY OF AVERAGE VEHICLE TRIP GENERATION

AVERAGE WEEKDAY DRIVEWAY VOLUMES

PHASE II

LAND USE	SIZE	24 HOUR TWO-WAY VOLUME	AM PK HOUR ENTER	AM PK HOUR EXIT	PM PK HOUR ENTER	PM PK HOUR EXIT
SINGLE FAMILY DWELLINGS	706 DWELLING UNITS	6244	114	325	409	22[illegible]
APARTMENT	149 DWELLING UNITS	929	13	64	63	3[illegible]
INDUSTRIAL PARK	1120 TH.GR.SQ.FT.	6308	640	140	135	50[illegible]
SHOPPING CENTER	10 T.G.L.A.	1676	26	15	76	7[illegible]
SHOPPING CENTER	12 T.G.L.A.	1878	29	17	85	8[illegible]
SPECIALTY RETAIL CENTER	20 TH.GR.SQ.FT.	813	0	0	0	[illegible]
SHOPPING CENTER	12 T.G.L.A.	1878	29	17	85	8[illegible]
SHOPPING CENTER	50 T.G.L.A.	4583	68	40	211	21[illegible]
TOTAL		24309	919	618	1064	121[illegible]

Note: A zero rate indicates no rate data available

TWELVE OAKS/ROYAL OAKS

SUMMARY OF AVERAGE VEHICLE TRIP GENERATION

AVERAGE WEEKDAY DRIVEWAY VOLUMES

PHASE III

LAND USE	SIZE	24 HOUR TWO-WAY VOLUME	AM PK HOUR ENTER	AM PK HOUR EXIT	PM PK HOUR ENTER	PM PK HOUR EXIT
SINGLE FAMILY DWELLINGS	1006 DWELLING UNITS	8652	155	442	563	30[illegible]
APARTMENT	149 DWELLING UNITS	929	13	64	63	3[illegible]
INDUSTRIAL PARK	1700 TH.GR.SQ.FT.	9179	900	198	169	63[illegible]
SHOPPING CENTER	10 T.G.L.A.	1676	26	15	76	7[illegible]
SHOPPING CENTER	12 T.G.L.A.	1878	29	17	85	8[illegible]
SPECIALTY RETAIL CENTER	20 TH.GR.SQ.FT.	813	0	0	0	[illegible]
SHOPPING CENTER	12 T.G.L.A.	1878	29	17	85	8[illegible]
SHOPPING CENTER	100 T.G.L.A.	7067	102	60	328	32[illegible]
TOTAL		32072	1254	813	1369	154[illegible]

Note: A zero rate indicates no rate data available