

FDOT District IV

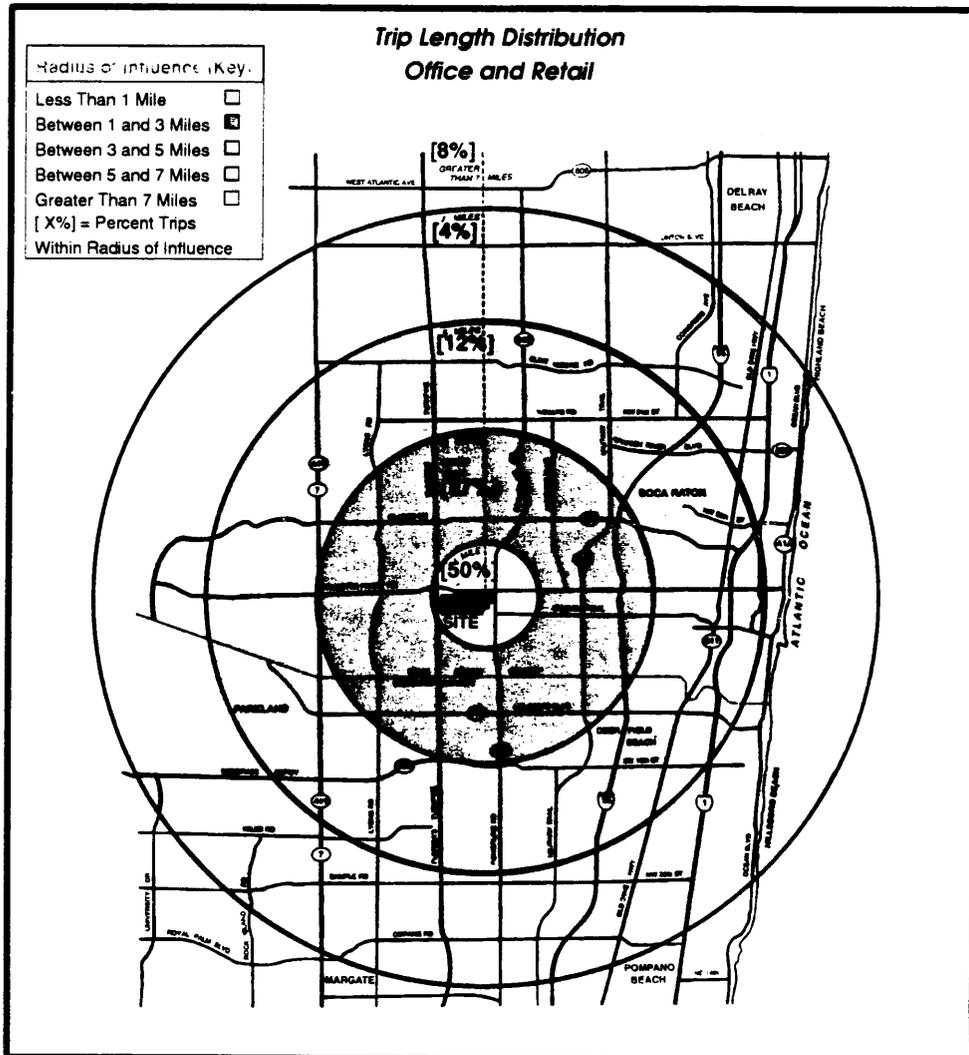
FDOT Trip Characteristics Study of Multi-Use Developments

FINAL REPORT

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FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 4
TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

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FDOT TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

SITE SELECTION PROCESS

INTRODUCTION

The FDOT selected Tindale-Oliver and Associates to perform a trip characteristics study of three multi-use developments located within District 4. The purpose of the study is to determine internal capture of trips within each of the developments. A capture rate will be developed for each development site, as well as for the land uses within each site. For the purposes of this study, the capture rate is defined as the reduction in traditionally developed trip generation to account for trips internal to the site. Data from this study will be used to develop a database of typical capture rates and the factors that influence them.

STUDY APPROACH

The study involves completion of five primary tasks plus the preparation of the final report. Below is a brief description of each of the tasks. The Selection of Study Sites, Task One, includes an extensive search and review of large scale mixed-use developments within the five county area of Broward, Palm Beach, Martin St. Lucie, and Indian River counties. The search for candidate study sites included a review of the FDOT District IV DRI database, discussions with local government and county staff about possible mixed use sites and field reconnaissance to site locations. The key criteria used to select study sites included the ability to collect vehicle counts at entrances, both perimeter and internal to the development; single-use driveway access to the site as opposed to multi-use driveways serving adjacent property; the ability to complete patron interviews at the site; minimum potential of through trips; the land-use composition of the site; and the percentage that the site is fully developed. Another key consideration in the selection of study sites was the ability to secure owner approval to do the study. The end product of the Site Selection Process was the recommendation to the FDOT of the three sites to be studied.

Once the three sites were selected, Task Two involved the documentation of the site characteristics. This includes the history and description of the development, site plan, land-use inventory, site vicinity information, and other factors which may contribute to internal capture. The end result of this task was a technical report describing each of the study sites. The report included both a narrative and reduced versions of aerial photographs of each site.

Task Three involved the collection of vehicle traffic counts at both the perimeter and internal access points to the sites. The deliverable under Task Three was a technical report documenting the traffic counts and the results. This report identified count locations, traffic count data, and summarized the results of the traffic counts. Task Four was the interview task. It occurred concurrently with the collection of traffic counts. This task involved interviewing employees and users of each development in order to define trip-making characteristics within the development. Additionally, this task involved the collection of pedestrian counts and vehicle occupancy rates which occurred concurrently with the interviews and traffic counts. The activities occurring under Task Four were summarized in a technical report. This report documented the locations where interviews were conducted, sample rates by location, and provided a summary of the results of interviews and pedestrian counts.

Once the traffic counts and interviews were completed, the data underwent extensive analysis as part of Task Five. The purpose of the analysis was to summarize the information obtained and to establish conclusions about trip-making characteristics at the multi-use developments and their associated capture rates. The analysis compared observed trip generation rates to the rates contained in the ITE Trip Generation Manual; analyzed the types of trips occurring from the surveys; developed an internal capture rate for both individual land uses within the site and the development as a whole; and produced a zone of influence of trip lengths and origin-destination information resulting from the interview surveys.

This report summarizes all the technical reports and describes the results and conclusions of the study.

SITE SELECTION CRITERIA

Seven factors were established to evaluate potential candidate sites. These factors are discussed below:

Ability to isolate or cordon off development - This factor measures the degree to which the development can be isolated and thereby reduce the potential of through traffic and the use of shared driveway access. Sites which have the potential for a high level of through traffic and/or shared driveways are not as desirable to study because it is difficult to accurately calculate site trip generation characteristics.

Site Land Use Characteristics - For the purposes of this study, the desired land use characteristics for a mixed use candidate site include office, retail and residential. Sites that include hotel and recreational uses are desirable but not considered mandatory. Additionally, the land use intensity needs to be relatively dense with the residential component being multi-family.

External Access Points - The number of external access points and the ability to accurately collect traffic count data through these access points must be considered in the evaluation process. Sites with access points, which by their design are difficult to effectively set counters, are not desirable.

Buildings and Internal Access Points - The location and number of buildings within each development site were reviewed and considered in the site evaluation process. It is desirable to have sites where specific land uses can be segregated and counted separately. Additionally, the ability to accurately collect traffic count data in light of internal driveway widths and speeds should be considered in the evaluation process.

Surrounding Area Land Use - The general demographics of the surrounding area were reviewed with respect to the land use composition surrounding each candidate site. This includes the types of surrounding land uses with specific attention paid to the magnitude of the residential component in the surrounding area.

Pedestrian Counts - Collection of pedestrian count information is desired at the main entrances to each candidate site land use. It is extremely difficult to count pedestrians at sites where each store has direct access to parking and does not have controlled access points. Controlled access points found in a mall environment are much more conducive to counting pedestrians. This factor measures the degree and ability to collect pedestrian count information at the potential candidate sites.

Owner Approval - Contact with the property owners and agents of the candidate sites occurred to ascertain the probability of receiving owner approval to conduct the trip characteristics study at their site. The purpose and data collection needs relative to the study were discussed with each property manager/site representative. The rating reflects the overall probability of securing owner approval to do the study.

SITE SELECTION CRITERIA RATING VALUES

Each of the above selection criteria was grouped into one of three levels. Level one factors were considered to have the most influence on the ability to identify sites and collect the desired trip characteristics data. These criteria were assigned a maximum weight of 25 points. Level two factors were judged the next most important and were assigned a maximum weight of 15 points. Finally, level three factors were assigned a maximum weight of 10 points because they were determined to have the least impact on the ability to identify sites and collect the desired trip characteristics data. The seven site selection criteria factors are discussed below.

Level one factors include: 1) the ability to isolate the development, 2) site land use composition and 3) the ability to obtain owner approval. Developments which can be isolated and which, therefore, do not exhibit through traffic and shared driveway access were given the highest rating. Concerning land use composition, those developments which include office, retail, residential and hotel were given the highest rating. Developments with office, retail and hotel located on the same site and with high density residential in close proximity received the next highest rating. Developments which excluded a desired land use, or did not have reasonable mixes of land use, received lower ratings. Each site was rated on

the ability to obtain owner approval. For those sites which owner approval was obtained, a score of 25 points was awarded. For those sites which discussions indicated a very positive interest, a score of 20 points was awarded; for those sites which discussions indicated a possible interest in having the study done, a score of 10 points was awarded; and for those sites which owner approval was denied, 0 points were awarded.

Level two factors include: 1) the number of buildings, their location on the site and ability to obtain traffic counts at internal access points and 2) the ability to obtain pedestrian counts. Internal site access was considered with respect to the number of access points (both driveway and pedestrian), location of buildings and the ability to obtain accurate traffic count data. Sites which had access points which lend themselves to collecting traffic count data were given higher scores. Locations where pedestrian traffic enters and exits through controlled access points were given a higher rating than locations which afford direct access to the land use.

Level three factors include: 1) the location and number of external access points and 2) the general demographics of the surrounding land use area. Sites which did not have as many external access points were given a higher rating. Additionally, sites with access points which by their design enable traffic count data to be collected more easily were given a higher score. The general demographic area was reviewed with respect to the intensity of residential development in the surrounding area, as well as the types and compatibility of other adjacent land uses. Sites with greater intensity of residential development in surrounding areas were given a higher score, as were sites with adjacent compatible land uses.

The maximum possible points for a site was 125.

REVIEW OF CANDIDATE SITES

Approximately 150 projects were reviewed as part of the site selection process. These sites were reviewed based on the FDOT District IV database of developments of regional impact, contact with

City and County personnel concerning potential mixed use sites, discussions with FDOT staff concerning possible candidate sites, review of REDI map aerial photography of possible candidate sites, and on-site visits to several potential sites. Many of the projects which were reviewed had little or no construction activity or did not possess the desired land use mix for a multi-use study site. From this initial review, 20 sites were selected for further evaluation. REDI maps for these sites were again reviewed and field reconnaissance to these sites was performed. From this effort, the nine candidate sites identified in Table I-1, Site Descriptions, were established.

FDOT Trip Characteristics Study of Multi-Use Developments		
Table I-1 - Site Descriptions		
Project Name	Location	Comments
Village Commerce Center and Village Commons Shopping Center	Palm Beach County, on Village Blvd north of Palm Beach Lakes Blvd and west of I-95	Retail component known as Village Commons; adjacent office connected directly to the retail component; multi-family located across from the Village Commons Retail Component and along Village Blvd in close proximity to the study site.
Mizner Park	Palm Beach County/City of Boca Raton; bounded by Northeast 2nd St on the south, Northeast Mizner Blvd on the East and Federal Highway on the West	Compact retail center with offices and townhouses located on the upper floors; Residential and single family located in close proximity to the East
Crocker Center	Palm Beach County; South of Glades Rd on the East side of Military Trail	Two office towers, retail shopping and hotel within self contained site; multi family apartments located adjacent (but not directly connected through a shared common driveway); significant single family and multi family located nearby on both sides of Military Trail. Significant regional mall (Town Center) and other office complexes located nearby.
Boca Bank Corporate Center	Palm Beach County; Southwest corner of West Palmetto Park Rd and Power Line Rd (West of I-95)	Office, retail and multi-family all using the same common site driveways.

FDOT Trip Characteristics Study of Multi-Use Developments

Table I-1 - Site Descriptions (cont.)

Project Name	Location	Comments
Quantum Corporate Park Area	Palm Beach County, Boynton Beach; South of NW 22nd Ave. and bordering both sides of Congress Ave.	World headquarters of Motorola industrial/office complex; retail, hotel, and multi-family land uses located on the West side of Congress Ave. with multi-family connected with shared access site driveway to hotel and retail; other retail land uses located on the NE corner of Congress Ave. and NW 22nd Ave.; other apartments and multi-family land uses located in close proximity.
Fashion Mall	Broward County; Northwest corner of University Dr. and Broward Blvd.	Vertical development with significant retail, complementary office and hotel within one self contained site with covered parking, walkways and elevators; adjacent hospital and medical office, as well as American Express corporate offices; multi-family with common direct access driveway to mall; additional multi-family on the East side of University Dr. opposite mall and to the North.
Corporate Park at Cypress Creek	Broward County; North of Cypress Creek Rd. between Power Line Rd and Andrews Ave.	Significant corporate office complex with retail component nearby, but not directly connected near executive airport; residential component in general immediate area, but not adjacent to site.
Glades Plaza	Palm Beach County; South of Glades Rd between Butts Rd and Executive Dr.	Retail hotel and office land uses having access to a common site collector roadway; major regional mall located to the West; significant multi-family located in close proximity (but not directly accessible) to the site
Bonaventure (West Gate Square)	Broward County, at Weston Rd and SR 84	Combination retail and office site with single and multi-family in close proximity.

FDOT staff reviewed the above list of candidate sites and approved evaluation of these sites to select the three final study sites. Table I-2, Site Selection Evaluation Matrix, shows the ranking of the above sites using the previously discussed rating system.

SITE APPROVAL PROCESS

Initial Approval Effort

Letters requesting approval to do the study were sent to all nine of the candidate sites. A sample of the letter is included in Figure I-1, Letter Requesting Approval to Study Site. Out of the initial nine sites, approval was obtained to study two sites (Village Commerce Center/Village Commons Shopping Center and Boca Del Mar, both in Palm Beach County).

Extensive follow-up conversations occurred with the owners and/or their agents and property managers to document why permission was denied. Among the reasons cited for not allowing the study of the various sites included: 1) business climate not conducive to study, 2) political concerns, 3) do not want new traffic counts to jeopardize recent data submitted to governmental agencies, 4) site ownership changes, and 5) do not want to inconvenience patrons coming to the site.

Review of Additional Sites

As a result of the inability to secure three approved sites out of the initial nine candidate sites, these additional sites were selected for review in Broward County; one at Weston Road and Southwest 14th Street (Country Isles/Indian Trace Development), one at Arvida Parkway, Weston Road and I-75 (Park of Commerce) and the general corridor along Weston Road from Arvida Parkway to SR 84. Table I-3, Additional Site Descriptions, shows a summary describing the additional candidate sites.

FDOT TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

TABLE I-2 - SITE SELECTION EVALUATION MATRIX

SITE NAME	ISOLATE DEVELOPMENT (25)	LANDUSE COMPOSITION (25)	EXTERNAL ACCESS POINTS (10)	BUILDINGS/ INTERNAL ACCESS POINTS (15)	SURROUNDING AREA LANDUSE (10)	PEDESTRIAN COUNTS (15)	OWNER APPROVAL (25)	TOTAL POINTS (125)	OVERALL RANK
VILLAGE COMMERCE CENTER AND VILLAGE COMMONS SHOPPING CENTER	14	15	6	5	7	5	10	62	9
MIZNER PARK	21	20	6	14	8	3	20	92	3
CROCKER CENTER	25	20	10	13	10	8	20	106	1
BOCA BANK CORPORATE CENTER AND ADJACENT RETAIL	18	23	8	10	10	5	10	84	4
QUANTUM CORPORATE PARK AREA	15	20	7	11	8	5	10	76	6
FASHION MALL	23	25	6	15	8	15	10	102	2
CORPORATE PARK AT CYPRESS CREEK	23	5	10	12	3	12	10	75	7
GLADES PLAZA	18	18	6	10	10	6	10	78	5
BONAVENTURE (WEST GATE SQUARE)	14	15	8	9	7	5	10	68	8

FDOT Trip Characteristics Study of Multi-Use Developments

Figure I-1 - Letter Requesting Approval to Study Site

June 1993

Name of Manager
Name of Company
Street Address
City, State Zip

Re: Florida Department of Transportation Trip Characteristic Study of Multi-Use Developments

Dear Name of Manager:

The Florida Department of Transportation District 4 office in Fort Lauderdale has authorized a trip characteristic study of multi-use developments and has selected Tindale-Oliver and Associates to perform the study. The purpose of the study is to develop travel characteristics about mixed use developments. More specifically, the study focuses on determining if multi-use developments exhibit lower overall trip rates than similar stand alone developments. The concept is that mixed use developments may have a significant number of internal trips within the development and therefore may not generate as many new trips as stand alone developments.

Tindale-Oliver and Associates has reviewed over 150 DRIs and major projects within Broward, Palm Beach, St. Lucie and Martin Counties, and selected your development as a potential mixed use development candidate site. Based on our evaluation of site characteristics, we will finalize three sites to be studied.

We would like permission to study your site. The study process will involve the collection of four types of data.

- 1) General information about the site (location, land uses, square footage, number of parking spaces, etc.);
- 2) Collection of traffic count data through placement of electronic traffic counters at key entrances to the site;
- 3) Collection of travel characteristics data through a *short* sample survey of patrons entering and exiting the site concerning their travel patterns (where they came from and where they are going); and
- 4) Collection of pedestrian information through manual counts of pedestrian traffic to and from the site.

Tindale-Oliver and Associates has conducted travel trip characteristic studies at over 200 locations throughout Florida. We have represented both developers and governments. Our studies are conducted in a courteous, professional manner. Data from your site will only be used for the FDOT study.

I will be contacting you in the near future to answer any questions you may have about the proposed study and your possible participation in the study.

Sincerely,

TINDALE-OLIVER AND ASSOCIATES, INC.

Robert P. Wallace, P.E.
Principal

FDOT Trip Characteristics Study of Multi-Use Developments

Table I-3 - Additional Site Descriptions

Project Name	Location	Comments
Park of Commerce	Broward County, bounded by Arvida Parkway, Weston Road and I-75	Significant master plan development; however, current buildout not sufficient for study.
Country Isles and Indian Trace Developments	Broward County, bounded by Weston Road, SW 14 Street and I-75	Two retail components separated by collector road; three office bank buildings located within the site; adjacent residential with shared common median on Weston Road; additional residential located in close proximity to the site; site land uses include day care center, movie theater, several restaurants, and gas station/convenience market.
Weston Road Corridor	Broward County along Weston Road from Arvida Parkway to SR 84	Build-out not sufficient (except for Country Isles and Indian Trace developments) for Multi-Use Development Study

As indicated above, neither the Park of Commerce nor the Weston Road corridor (except for the Country Isles and Indian Trace developments) are sufficiently built out to apply the site selection matrix evaluation criteria. As such, only the Country Isles/Indian Trace development was further reviewed against the Site Selection Evaluation Matrix.

As previously discussed, the initial site selection criteria rating for owner approval indicated the following point breakdown: 25 points - owner approval obtained; 20 points - positive interest to performing study; 10 points - general interest to doing study; and 0 points - owner approval denied. While initial discussions with property managers and leasing agents indicated a willingness to allow the study of a number of the initial nine candidate sites, final approval was obtained for only the two sites previously identified. Thus, the most critical factor in the site selection process became obtaining owner approval. Therefore, the owner approval ranking scale was revised to be 25 points for owner approval and 0 points for no approval. The original nine candidate sites and the Country Isles development were

then re-evaluated against this new criteria. Table I-4, Final Site Selection Evaluation Matrix, summarizes the results.

Final Site Selection

The final ranking in Table I-4 indicates that with owner approval, the 1st, 2nd, and 5th ranked sites (Boca Del Mar, Country Isles/Indian Trace, and Village Commons Center/Village Commons Shopping Center) were recommended for approval as the multi-use development study sites. Owner approval was not obtained for the 3rd and 4th ranked sites (Fashion Mall and Crocker Center, respectively). However, the land use composition of the recommended sites is typical of the type of development (office, retail with services and specialty uses such as day care, health spa and movie theaters) likely to be built in future projects. While not containing a hotel, these sites all contain office, retail, and residential land uses.

TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

TABLE I-4 - FINAL SITE SELECTION EVALUATION MATRIX

SITE NAME	ISOLATE DEVELOPMENT (25)	LANDUSE COMPOSITION (25)	EXTERNAL ACCESS POINTS (10)	BUILDINGS/ INTERNAL ACCESS POINTS (15)	SURROUNDING AREA LANDUSE (10)	PEDESTRIAN COUNTS (15)	OWNER APPROVAL (25)	TOTAL POINTS (125)	OVERALL RANK
VILLAGE COMMERCE CENTER/ VILLAGE COMMONS SHOPPING CENTER	14	15	6	5	7	5	25	77	5
MIZNER PARK	21	20	6	14	8	3	0	72	6
CROCKER CENTER	25	20	10	13	10	8	0	86	4
BOCA DEL MAR	18	23	8	10	10	5	25	99	1
QUANTUM CORPORATE PARK AREA	15	20	7	11	8	5	0	66	8
FASHION MALL	23	25	6	15	8	15	0	92	3
CORPORATE PARK AT CYPRESS CREEK	23	5	10	12	3	12	0	65	9
GLADES PLAZA	18	18	6	10	10	6	0	68	7
BONAVENTURE (WEST GATE SQUARE)	14	15	8	9	7	5	0	58	10
COUNTY ISLES / INDIAN TRACE	20	18	7	11	8	6	25	95	2

(1) PARK OF COMMERCE IS NOT BUILT-OUT ENOUGH TO APPLY MATRIX CRITERIA

TINDALE
OLIVER and Associates

FDOT TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

DOCUMENTATION OF SITE CHARACTERISTICS

INTRODUCTION

The purpose of this chapter is to describe the three selected study sites in terms of their development history, site plan, land use inventory, trip generation, surrounding site vicinity information, and various factors that may contribute to the determination of internal capture. The trip generation estimates presented in this chapter were used to determine potential origin/destination interview locations and in the Analysis of Results, as a comparison to observed trip generation. The format of this chapter is to present information on each topic for each study site. The final section of the chapter is a comparison of the three study sites in terms of land use and travel demand characteristics.

HISTORY AND DESCRIPTION OF THE SITES

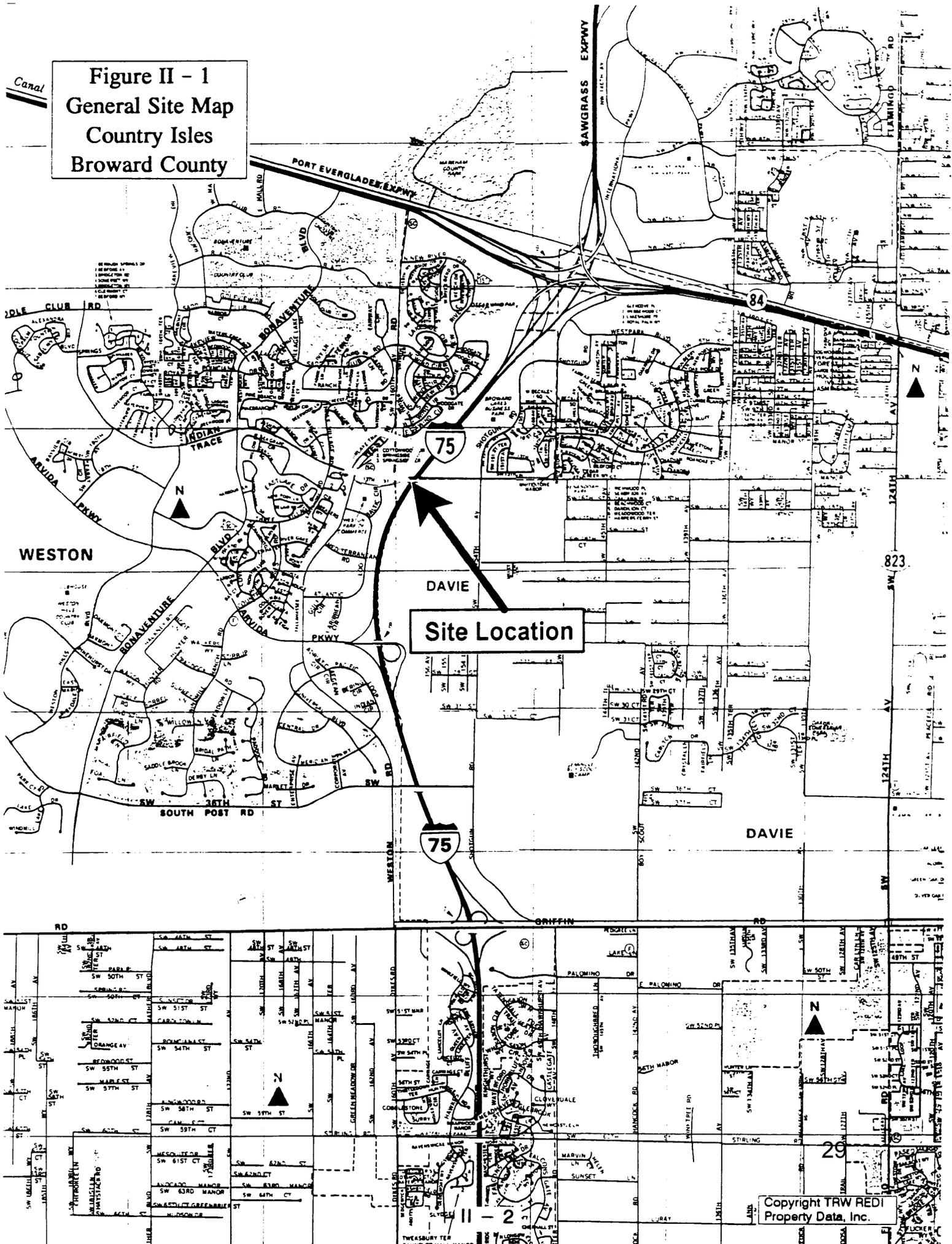
Country Isles

Site Area Demographics

The Country Isles site is located in an area of West Broward County known as Weston. Discussion with the Broward County Planning Department indicates that this area is expected to be one of the most rapidly growing areas in the County for the next several years. Figure II - 1, General Site Map, Country Isles, Broward County, illustrates the general location of the site within Broward County. Review of the 1990 Census indicates that the development site is located in census tract number 703.02 with a median income of \$49,103 per household. This income level is 61% higher than the County median

Canal

Figure II - 1
General Site Map
Country Isles
Broward County



Site Location

income of \$30,571. The population within this census tract is 97% white and hispanic as compared to 93% white and hispanic in the unincorporated areas of Broward County. Approximately 50% of the population is between the ages of 21-49 as compared to 48% for the unincorporated County. In summary, the Country Isles site is located in an area of considerably higher median income as compared to the Countywide median income, and in an area where approximately half of the population is between the ages of 21-49 years of age.

Site Plan Overview

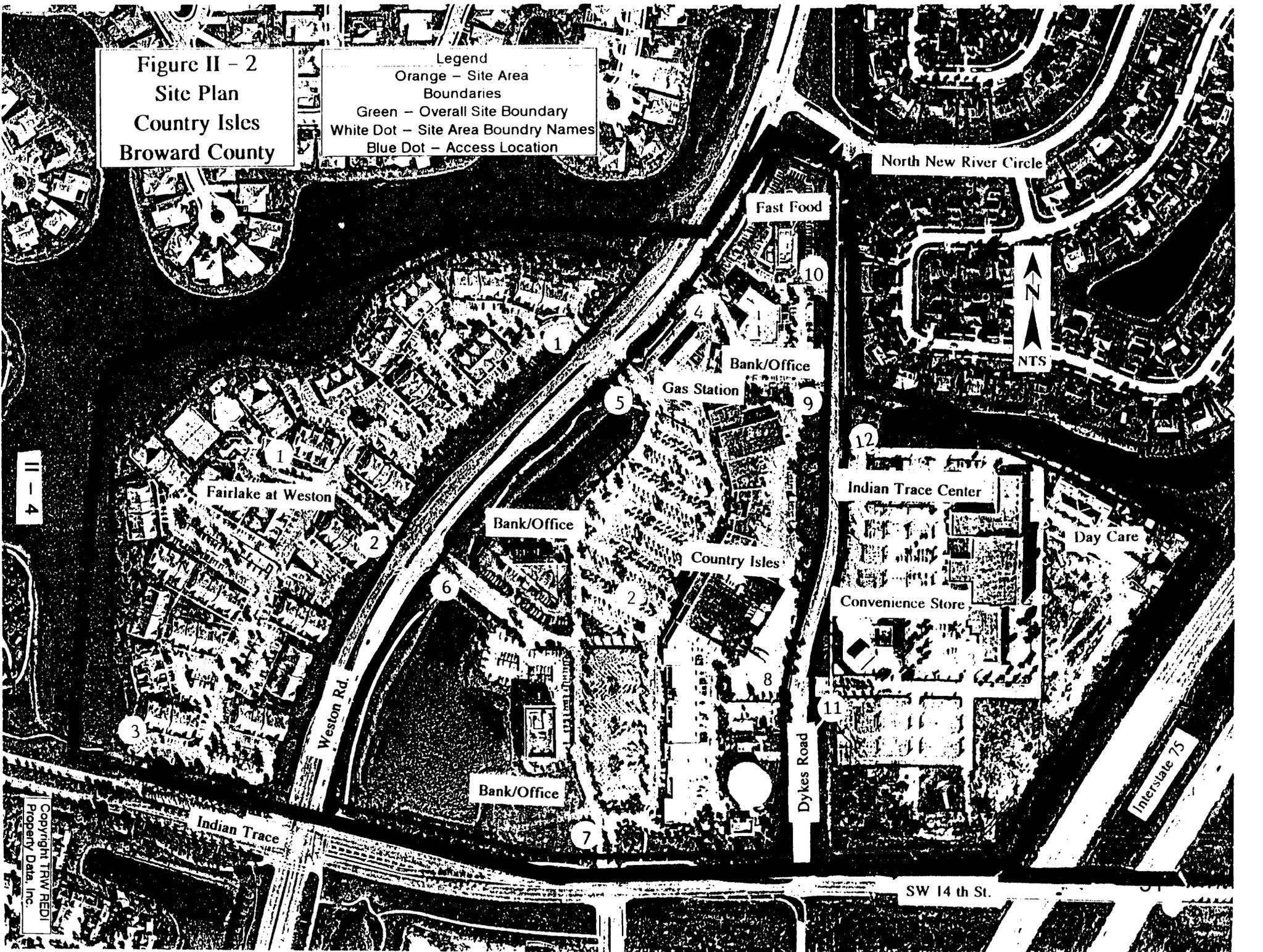
Figure II - 2, Site Plan, Country Isles, Broward County, illustrates the three major development areas of the Country Isles site. These areas are illustrated by the orange Site Area Boundaries and include: 1) Fairlake at Weston, a multi-family residential enclave located at the corner of Indian Trace and Weston Road; 2) The Country Isles Shopping Center bounded by Weston Road on the west, Dykes Road on the east, North New River Circle Road on the north, and Indian Trace on the south; and 3) The Indian Trace Shopping Center located at the corner of Dykes Road and Southwest 14th Street (Indian Trace). The site was separated into these three development areas based on land use, site circulation and site access. The access points within each development area are numbered on Figure II - 2. The first digit of the access/location number represents the major development area and the last two digits represent the actual location number indicated on the site plan map figures for each site. Table II - 1, Summary of Site Access for Country Isles, contains the following information about each access point: access location number (with prefix of Site Area Boundary) access description, access location, type of access (right in/right out, full, etc.) and type of access control (signal, stop sign or none). Each development area is discussed below.

1. Fairlake at Weston

The Fairlake at Weston development is a residential multi-family apartment development with 368 units. This area is illustrated in Figure II - 3 Site Uses, Country Isles, Broward County (see location "N"). This site is 100 percent built-out and was completed in 1988.

Figure II - 2
 Site Plan
 Country Isles
 Broward County

Legend
 Orange - Site Area
 Boundaries
 Green - Overall Site Boundary
 White Dot - Site Area Boundary Names
 Blue Dot - Access Location



II - 4

Copyright TRW RED
 Property Data, Inc.

SW 14 th St.

Interstate 75

North New River Circle



Fast Food

Bank/Office

Gas Station

Fairlake at Weston

Bank/Office

Country Isles

Indian Trace Center

Day Care

Convenience Store

Bank/Office

Dykes Road

Indian Trace

Weston Rd.

FDOT Trip Characteristics Study of Multi-Use Developments

Table II - 1 Summary of Site Access for Country Isles

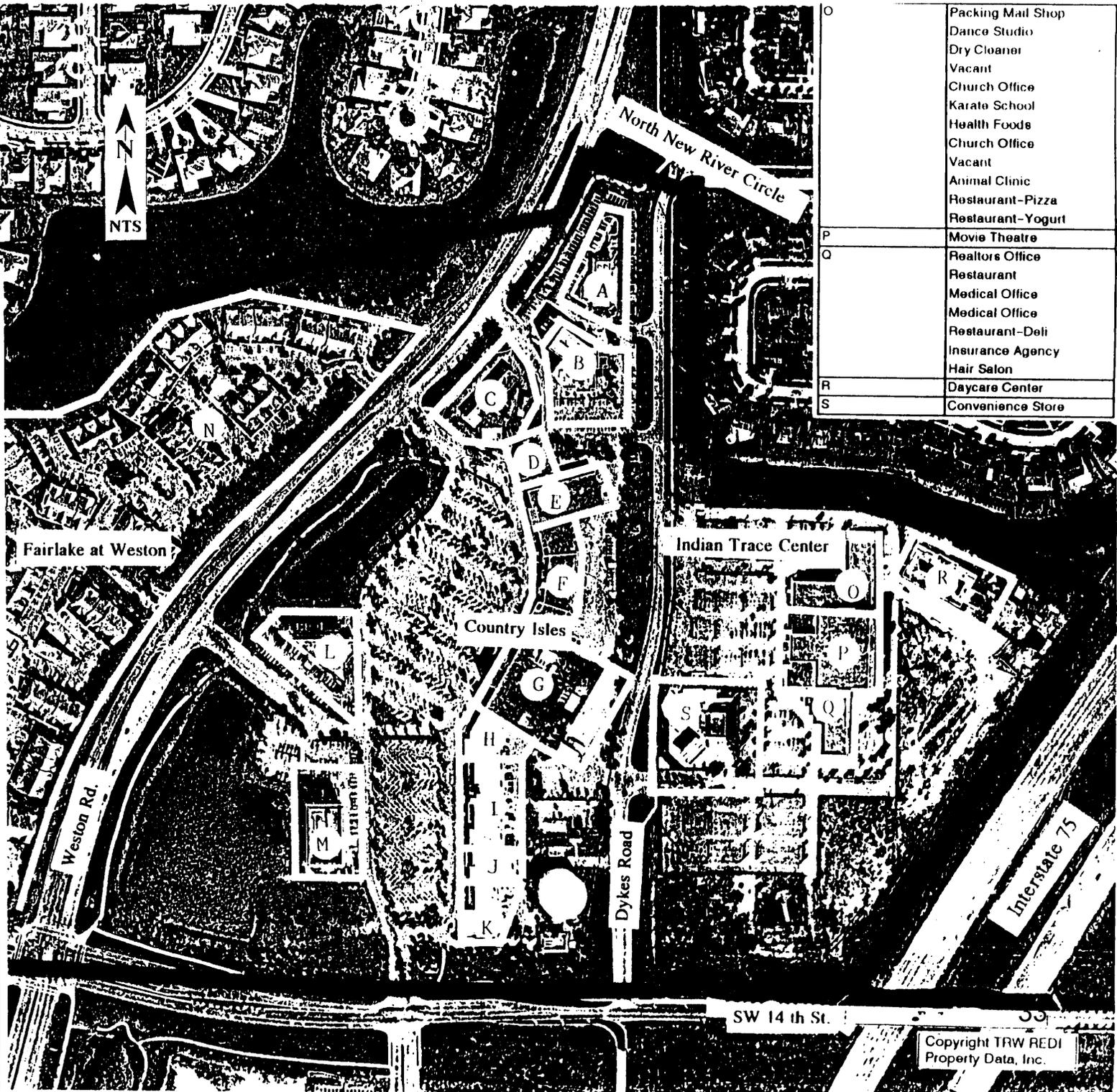
Access Location Number	Access Description	Access Location	Access Type	Type Control
101	North entrance off Weston Road to Fairlake at Weston.	On Weston Road 1,425 feet north of Indian Trace.	Full	Stop sign
102	Main entrance off Weston Road to Fairlake at Weston.	On Weston Road 690 feet north of Indian Trace.	Full	Stop sign
103	South entrance off Indian Trace To Fairlake at Weston.	On Indian Trace 360 feet west of Weston Road.	Right In/ Right Out	Stop sign
204	North entrance off Weston Road to Fast Food and Bank/Office at Country Isles Shopping Center.	On Weston Road 1,680 feet north of Indian Trace.	Right In/ Right Out	Stop sign
205	Middle entrance off Weston Road to Gas Station and Country Isles Shopping Center.	On Weston Road 1,380 feet north of Indian Trace.	Full	Stop sign
206	South entrance off Weston Road to Bank/Office Buildings and Country Isles Shopping Center.	On Weston Road 675 feet north of Indian Trace.	Full	Stop sign
207	South entrance off Indian Trace to Country Isles Shopping Center.	On Indian Trace 690 feet east of Weston Road.	Full	Stop sign
208	South entrance off Dykes Road to rear of Country Isles Shopping Center.	On Dykes Road 480 feet north of Indian Trace.	Full	Stop sign
209	Middle entrance off Dykes Road to Bank/Office and Country Isles Shopping Center.	On Dykes Road 1,230 feet north of Indian Trace.	Full	Stop sign
210	North entrance off of Dykes Road to Fast Food and Bank/Office at Country Isles Shopping Center.	On Dykes Road 1,500 feet north of Indian Trace.	Full	Stop sign
311	South entrance off Dykes Road to convenience store and Indian Trace Shopping Center.	On Dykes Road 480 feet north of Indian Trace.	Full	Stop sign
312	North entrance off Dykes Road to Indian Trace Shopping Center.	On Dykes Road 1,065 feet north of Indian Trace.	Full	Stop sign

**Figure II - 3
Site Uses
Country Isles
Broward County**



A		Restaurant-Fast Food
B	1 st Floor	Bank / Realtor
	2 st Floor	Medical Office
	3 st Floor	General Office
C		Service Station
D		Medical Office
		Medical Office
		Ice Cream
E		Drug Store
F		Medical Office
		Hair Salon
		Insurance
		Dry Cleaners
		Bank
		Card Shop
		Weight Loss
		Realtor
		Restaurant-Pizza
		Restaurant-Bagel
G		Supermarket
H		Party Sales Shop
		Restaurant-Italian
		Video Shop
		Bank
I		Shoe Repair
		Hair Salon
		Shoe Store
		Liquor Store
		Restaurant
		Childrens Store
		Eye Center
		Vacant
J		Hardware Store
K		Restaurant-Chinese
		Frame Shop
		Bicycle Shop
		Florist
		Travel Agency
L	1 st Floor	Bank
	2nd, 3rd Floor	Development Corporation
M	1 st Floor	Bank/Insurance
	2 st Floor	Professional Office
	3 st Floor	Professional Office
N		Residential Apartments

O	Packing Mail Shop
	Dance Studio
	Dry Cleaner
	Vacant
	Church Office
	Karate School
	Health Foods
	Church Office
	Vacant
	Animal Clinic
	Restaurant-Pizza
	Restaurant-Yogurt
P	Movie Theatre
Q	Realtors Office
	Restaurant
	Medical Office
	Medical Office
	Restaurant-Deli
	Insurance Agency
	Hair Salon
R	Daycare Center
S	Convenience Store



The primary access to the Fairlake at Weston residential development is provided on Weston Road just north of the intersection of Weston Road and Indian Trace (Table II - 1, location number 102). This particular access point is located directly across from the primary access point to the Country Isles Shopping Center. Additionally, there are two secondary access points to the Fairlake at Weston. One of these access points is located on Weston Road north of the main entrance previously discussed (Table II - 1, location number 101). The other access point is located on Indian Trace at the south end of the site (Table II - 1, location number 103).

2. Country Isles Shopping Center

The Country Isles Shopping Center was built in two phases. The first phase was built in 1987 and includes the northern portion of the shopping center; beginning just south of the bank office building to and including the supermarket. There are 15 businesses located within this chapter, including several restaurants, retail service stores and small offices. The types of businesses are illustrated in Figure II - 3 (see locations "D" through "G"). The remaining part of the shopping center, south of the supermarket, was completed in 1990. This section includes an additional 18 businesses, as illustrated in Figure II - 3 (see locations "H" through "K").

In addition to the retail stores, the shopping center site also includes the following five developed outparcels as illustrated in Figure II - 3 (see locations "A", "B", "C", "L" and "M", respectively).

- A fast food restaurant built in 1989 located in the northern most corner of the site;
- A three-story office building complex built in 1990 located just to the south of the fast food restaurant;
- A self-service gas station built in 1989 located in the northwest side of the site adjacent to Weston Road;
- A three-story office building complex built in 1990 located in the west central part of the site just north of the main entrance from Weston Road; and
- A three-story office building complex built in 1990 located in the south part of the site just south of the main entrance from Weston Road.

Access to the Country Isles Shopping Center is provided via Weston Road, Indian Trace and Dykes Road. Three access points to the site are provided via Weston Road. The main entrance to the site is the southern most access point directly across from the Fairlake at Weston (Table II - 1, location number 206). The central access to the site from Weston Road (Table II - 1, location number 205) provides access to the service station (Figure II - 3, location "C") and the northern part of the retail shopping center (Figure II - 3, location "D" through "F"). The northern-most entrance, off of Weston Road (Table II - 1, location number 204), provides access to the office building (Figure II - 3, location "B") and fast food restaurant (Figure II - 3, location "A") located on the north end of the site. Additionally, there is access to the site from the south via Indian Trace (Table II - 1, location number 207). Finally, on the east side of the site from Dykes Road, there are three access points serving the site. The southern most access point provides service entry and rear access to the shopping center buildings of the site (Table II - 1, location number 208). North of the service entrance on Dykes Road, there are two other access points to the site. The northern access point provides access to the fast food restaurant (Table II - 1, location number 210), while the entrance immediately to the south provides access to the office building just south of the fast food restaurant (Table II - 1, location number 209). The south access point also provides circulation to the retail shops of the shopping center.

3. Indian Trace

The Indian Trace Shopping Center was completed in 1989. It includes various restaurant, retail service, small office and movie theater land uses as illustrated in Figure II - 3 (see locations identified as "O" through "Q"). In addition, the site also includes two developed outparcels; a day-care center (Figure II - 3, location "R") and a convenience store with gas pumps (Figure II - 3, location "S"). Both of these outparcels were also completed in 1989. There remain two undeveloped outparcels on the south and north sides, and a number of retail components designated as office/showroom to the east side of the existing Indian Trace Shopping Center.

There are two access points off of Dykes Road to the Indian Trace Shopping Center. The southern most entrance is the primary entrance to the Indian Trace Shopping Center (Table II - 1, location number 311). It also provides access to the convenience store out-parcel (Figure II - 3, location "S").

The northern most entry to the site provides access to the shopping center and day-care center (Figure II - 3, location "R") located in back of the shopping center (Table II - 1, location number 312). Dykes Road provides linkage between Indian Trace on the south and New River Circle Drive and Weston Road on the north.

Village Commons

Site Area Demographics

The Village Commons site is located within the southwestern limits of the City of West Palm Beach in Palm Beach County. Figure II - 4, General Site Map, Village Commons, Palm Beach County, illustrates the location of the Village Commons site within the City of West Palm Beach and Palm Beach County. Review of the 1990 census data indicates that the site is located in census tract number 19.06 with a median income of \$36,658 per household. This income level is 12.7% higher than the County average of \$32,504. The population is 92.8% white as compared to 84.8% white in the County. Approximately, 59.6% of the population is between the ages of 25 and 54 as compared to 38.7% percent for the County. Additionally, the percentage of population over 55 is 16.5% versus 24.3% for the County. In summary, the Village Commons site is located in a census tract with a slightly higher median income than the Countywide average, 54% more working population between the ages of 25 and 54 than the Countywide average and 32.1% less population over the age of 55 than the average for the County.

Site Plan Overview

Figure II - 5, Site Plan, Village Commons, Palm Beach County, illustrates the four major development areas of the Village Commons development site. These include: 1) the Village Commons Shopping Center located on the southwest corner of Brandywine Road and Village Boulevard directly across from The Pointe residential community; 2) The Pointe multi-family residential community located at the northwest corner of Brandywine Road and Village Boulevard; 3) Brandywine Center located at the northeast corner of Brandywine Road and Village Boulevard; and 4) bank/offices and health spa located at the southeast corner of Village Boulevard and Brandywine Road, as well as various offices

Figure II - 4
General Site Map
Village Commons
Palm Beach County

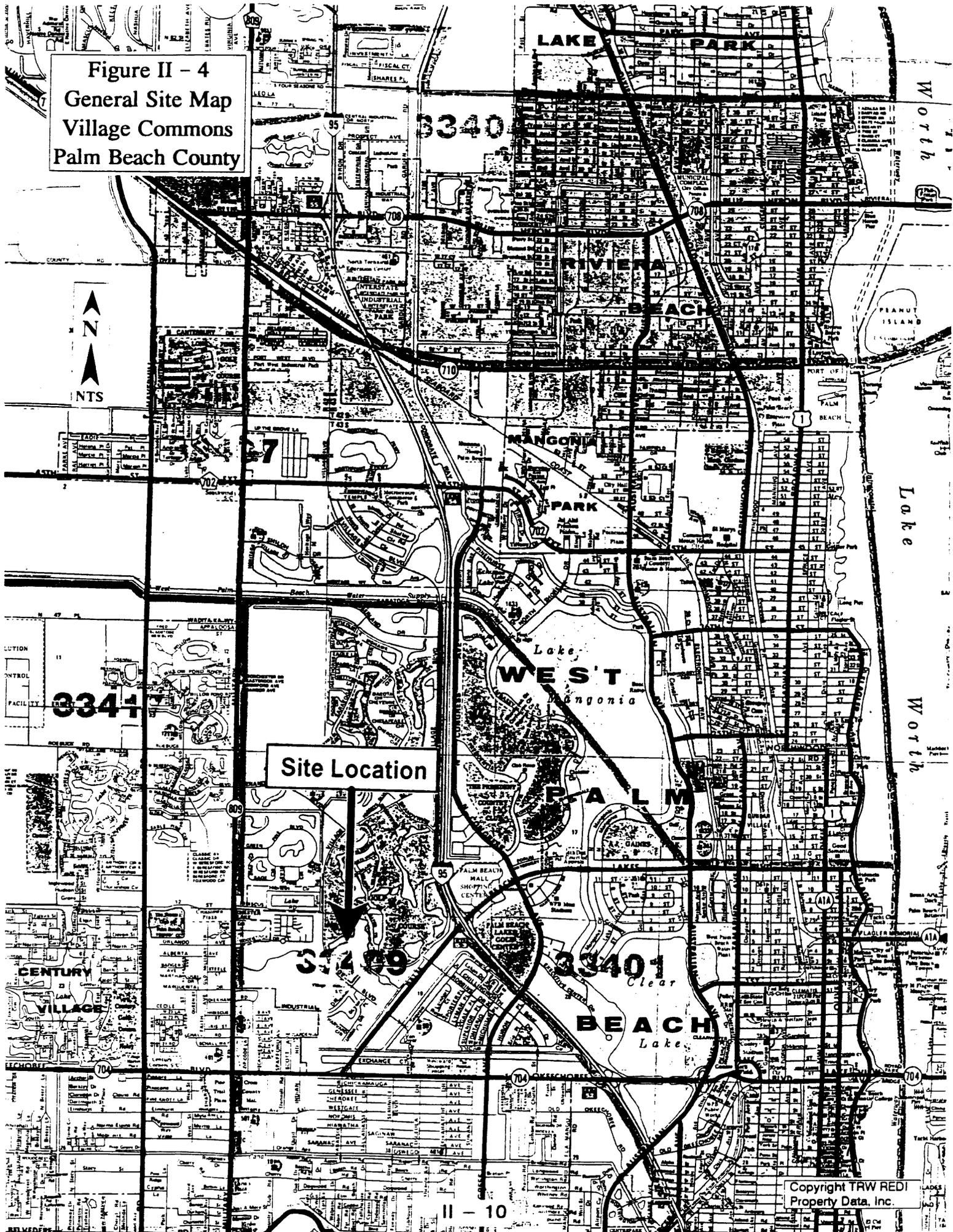
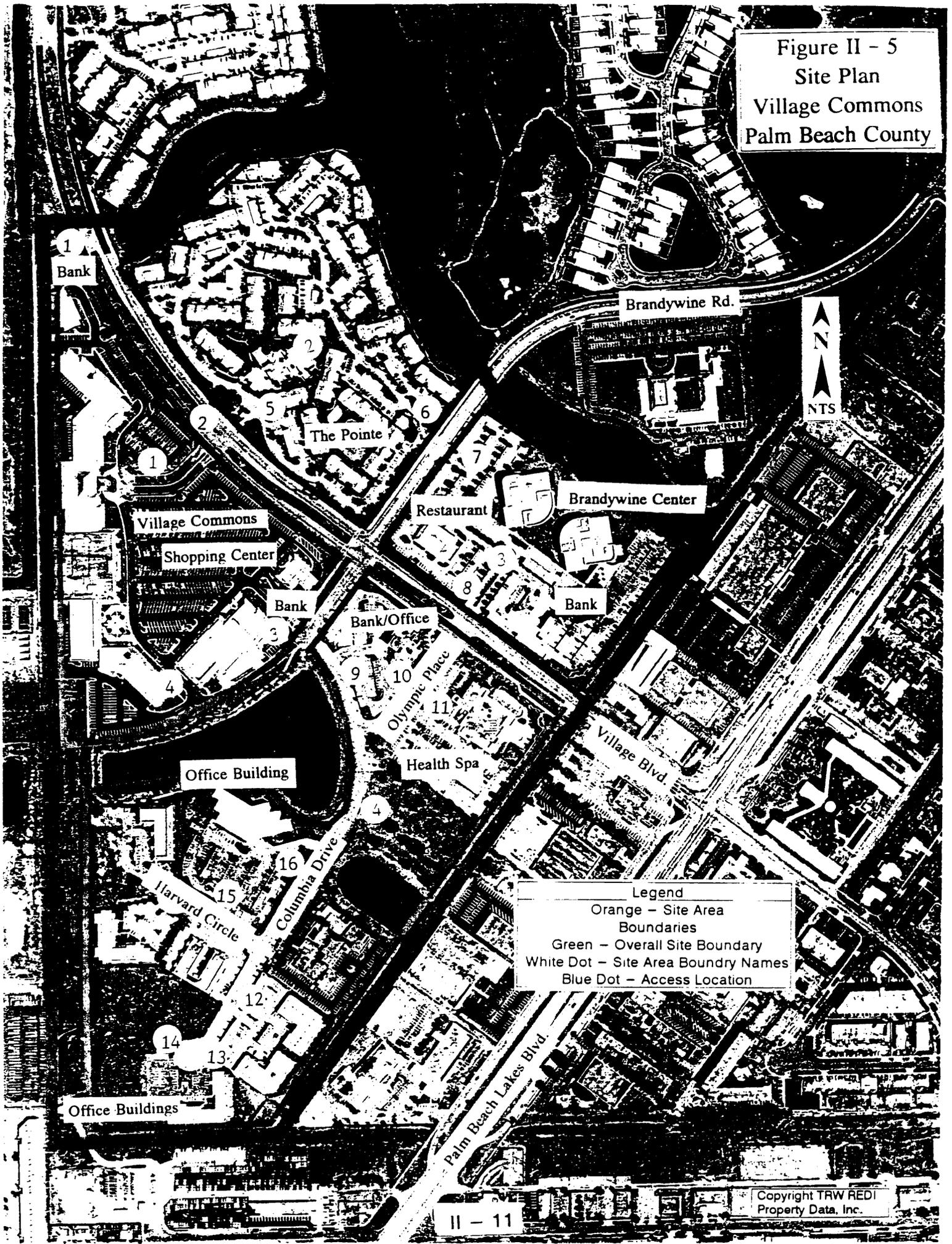


Figure II - 5
 Site Plan
 Village Commons
 Palm Beach County



Legend
 Orange - Site Area
 Boundaries
 Green - Overall Site Boundary
 White Dot - Site Area Boundary Names
 Blue Dot - Access Location

located along the Columbia Drive and Harvard Circle cul-de-sacs. The site was separated into these four development areas based on land use, site circulation and site access. The access points within each area are numbered on Figure II - 5. Table II - 2, Summary of Site Access for Village Commons, contains the following information about each access point: access location number (with prefix of Site Area Boundary) access description, access location, type of access (right in/right out, full, etc.) and type of access control (signal, stop sign or none). Each development area is discussed below.

FDOT Trip Characteristics Study of Multi-Use Developments				
Table II - 2 Summary of Site Access for Village Commons				
Access Location Number	Access Description	Access Location	Access Type	Type Control
101	North entrance off Village Blvd. to Village Commons Shopping Center.	On Village Boulevard 1,350 feet northwest of Brandywine Rd.	Full	Stop sign
102	South entrance off of Village Blvd. to Village Commons Shopping Center.	On Village Boulevard 525 feet northwest of Brandywine Rd.	Full	Stop sign
103	East entrance off Brandywine Rd. to Village Commons Shopping Center.	On Brandywine Rd. 225 feet southeast of Village Blvd.	Full	Stop sign
104	West entrance off Brandywine Rd. to Village Commons Shopping Center.	On Brandywine Rd. 600 feet southeast of Village Blvd.	Full	Stop sign
205	Entrance off Village Blvd. to The Pointe.	On Village Boulevard 525 feet northwest of Brandywine Rd.	Full	Stop sign
206	Entrance off Brandywine Rd. to The Pointe.	On Brandywine Road 300 feet northeast of Village Blvd.	Full	Stop sign
307	Entrance off Village Blvd. to Brandywine Center.	On Brandywine Road 300 feet northeast of Village Blvd.	Full	Stop sign
308	Entrance off Village Blvd. to Brandywine Center.	On Village Boulevard 270 feet southeast of Brandywine Rd.	Full	Stop sign

FDOT Trip Characteristics Study of Multi-Use Developments

Table II - 2 Summary of Site Access for Village Commons (cont.)

Access Location Number	Access Description	Access Location	Access Type	Type Control
409	Entrance off Columbia Drive to Bank/Office.	On Columbia Drive 75 feet south of Brandywine Road.	Full	Stop sign
410	Entrance off Olympic Place to Bank/Office.	On Olympic Place 275 feet southwest of Village Blvd.	Full	Stop sign
411	Entrance off Olympic Place to Health Spa.	On Olympic Place 225 feet southwest of Village Blvd.	Full	Stop sign
412	Entrance off Columbia Drive to Office.	On Columbia Drive 210 feet southwest of Harvard Circle.	Full	Stop sign
413	East entrance off Columbia Drive to office located at end of cul de sac.	On Columbia Drive 390 feet southwest of Harvard Circle.	Full	Stop sign
414	West entrance off Columbia Drive to office located at end of cul de sac.	On Columbia Drive 400 feet southwest of Harvard Circle.	Full	Stop sign
415	Entrance off Harvard Circle to multi-story office.	On Harvard Circle 150 feet northwest of Columbia Drive.	Full	Stop sign
416	Entrance off Columbia Drive to multi-story office.	On Columbia Drive 390 feet northeast of Harvard Circle.	Full	Stop sign

1. Village Commons Shopping Center

The Village Commons Shopping Center was built in 1987 and includes several restaurants, retail shops, doctor's offices and small offices. The types of businesses located in the shopping center are illustrated in Figure II - 6, Site Uses, Village Commons, Palm Beach County (see locations "B" through "G"). In addition to the major shopping center located on the site, there are two developed outparcels, both banks (Figure II - 6, locations "A" and "H"). Both of these outparcels were completed in 1989. This site is 100 percent built-out.

Figure II - 6
Site Uses
Village Commons
Palm Beach County



A	Bank
B	Computer Store Mail Box Vacant Medical Office Dry Cleaner Clothes Store
C	Restaurant-Natural Video Store Clothes Store Restaurant-Bagel Restaurant / Bar Framo Shop Gift Shop Restaurant-Japanese Restaurant-Chain
D	Clothes Store Shoe Store Card Shop Jewelry Store Vacant Supermarket
E	Restaurant Vacant Vacant Vacant Maternity Shop Sports Store Leasing Office Consignment Shop Ice Cream Restaurant-Italian Weight Clinic Hair Salon Tanning Salon Realtor Travel Agency Medical Office Spa Store Animal Clinic
F	Restaurant-Italian Liquor Store Vacant Drugstore Florist Restaurant / Billards
G	Vacant Paint Center Mortgage Loans Cellular Phones Insurance Agency
H	Bank
I	Professional Office
J	Professional Office
K	Professional Office Professional Office
L	Multi-story Bank / Offices Health Spa
M	Multi-story Professional Office Multi-story Professional Office Bank 41 Restaurant-Chain
N	Residential Multi-Family

Legend
 Blue - Site Partitions
 Green - Overall Site Boundary

There are four major access points to the Village Commons Shopping Center, two along Village Boulevard and two along Brandywine Road. The primary access point to the shopping center is the southern access point along Village Boulevard (Table II - 2, location number 102). The northern access point off of Village Boulevard (Table II - 2, location number 101) provides access to the outparcel bank (Figure II - 6, location "A"), the northern part of the shopping center (Figure II - 6, location "B") and the service areas to the rear of the shopping center buildings. The east access point along Brandywine Boulevard (Table II - 2, location number 103) provides entry to the site via the west leg of the intersection of Brandywine Road and Columbia Drive. This location is a four way stop sign controlled intersection. This entrance to the site provides access to the bank building (Figure II - 6, location "H") located at the southwest corner of Brandywine Road and Village Boulevard. The entrance to the site south of the intersection at Columbia Drive and Brandywine Road (Table II - 2, location number 104), serves as both a service entrance to the rear of the shopping center buildings and as an entrance to the buildings located in the southern part of the shopping center (Figure II - 6, locations "D" through "G").

2. The Pointe

The Pointe development is a residential multi-family development containing 317 units. This area is illustrated in Figure II - 6 (see location "N"). The area is 100 percent built-out and was completed in 1988.

The primary access point to The Pointe is provided from Village Boulevard (Table II - 2, location number 205). This access point is the north leg of the intersection on Village Boulevard. The south leg of this intersection provides access to the Village Commons Shopping Center. This intersection is controlled by stop signs. A secondary access point to The Pointe is located on Brandywine Road at the southeast portion of the site (Table II - 2, location number 206).

3. Brandywine Center

The Brandywine Center area contains four buildings and is illustrated in Figure II - 6 (see location "M"). This site is 100 percent built-out. The first building to be completed on the site was the restaurant completed in 1986 and located on the southwest part of the site. The bank, located on the southeast

part of the site, was completed in 1987, along with the first three-story office tower located just north of the bank. The final office tower, located northwest of the first office tower, was completed in 1989. There are two major entrances to the Brandywine Center area within the Village Commons site. The primary entrance to the site is from the north leg of the intersection of Village Boulevard and Olympic Place (Table II - 2, location number 308). This access point provides entry through the central portion of the site to all buildings described above. The other access point to the site is from Brandywine Road (Table II - 2, location number 307) providing access for the west side of the site.

4. Columbia Drive, Olympic Place and Harvard Circle

The developments along Columbia Drive, Olympic Place and Harvard Circle, considered as part of the study area are identified in Figure II - 6 (see locations "I" through "L") and include the following buildings:

- An office building (Figure II - 6, location "I") located at the northeast corner of Harvard Circle built in 1988. This building has access from both Harvard Circle and Columbia Drive (Table II - 2, location numbers 415 and 416, respectively).
- Three office buildings (Figure II - 6, locations "J" and "K") located along Columbia Drive built between 1988 and 1991. These office buildings include professional in accounting, engineering and marketing businesses. Access to these buildings is provided from Columbia Drive (Table II - 2, location numbers 412, 413, 414).
- A multi-story office/bank building (Figure II - 6, location "L") located at the southeast corner of Brandywine Road and Village Boulevard bounded by Columbia Drive and Olympic Place. This building was completed in 1989 and has access via Columbia Drive (Table II - 2, location number 409) from the west side of the site and Olympic Place (Table II - 2, location number 410) on the east side of the site.
- A health spa (Figure II - 6, location "L") bounded by Village Boulevard and Olympic

Place, built in 1987. The only access to the health spa is from Olympic Place (Table II - 2, location number 411).

Approval to obtain traffic counts and collect origin destination interview data was not authorized by representatives of the buildings located in the area "L" of Figure II - 6 (bank office building and health spa). The Pointe residential area permitted traffic counts to be collected at site entrances, but not origin destination interviews. All other locations identified in Figure II - 6 allowed collection of traffic counts and origin destination surveys.

Boca Del Mar

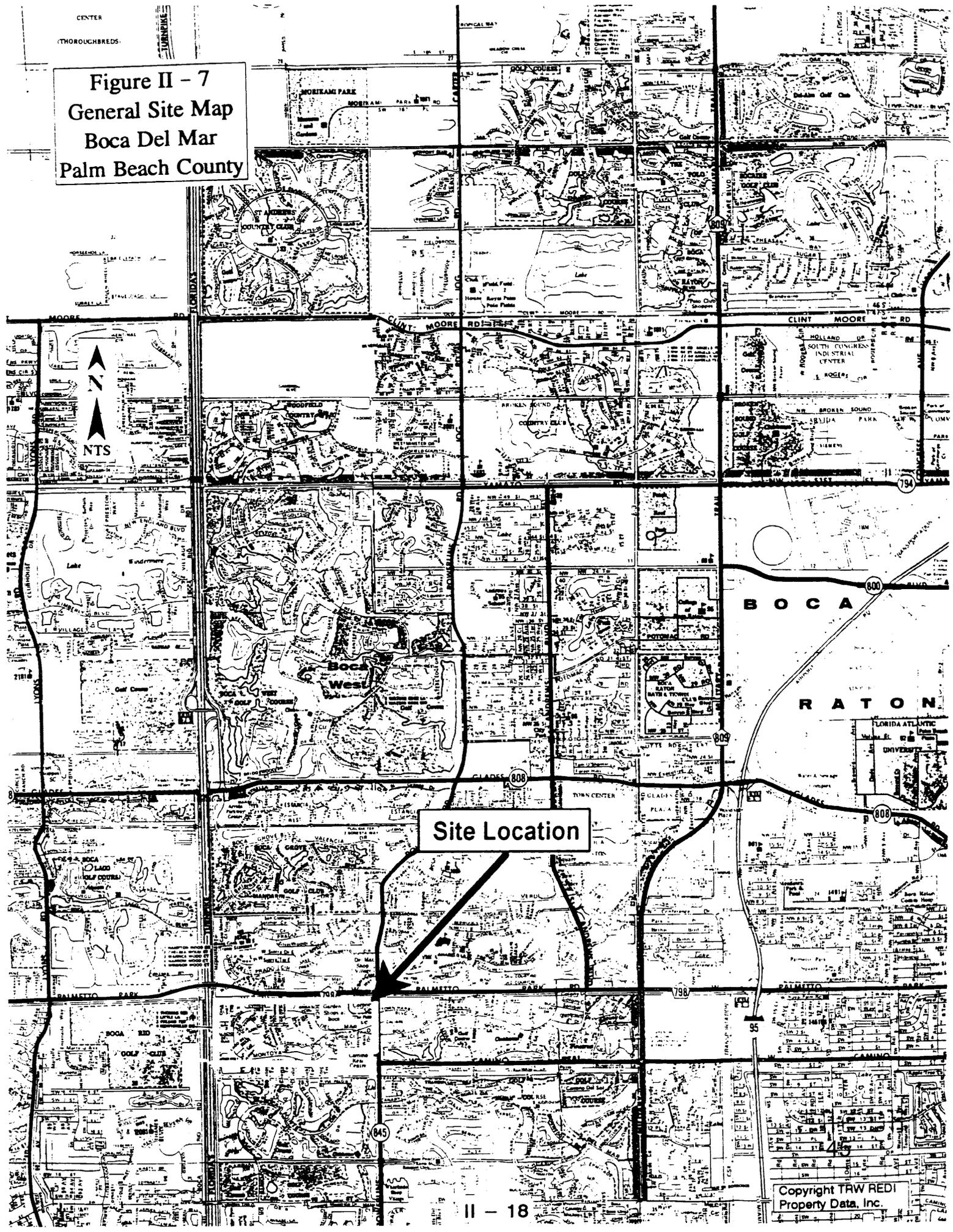
Site Area Demographics

The Boca Del Mar site is located in southwest Palm Beach County. Figure II - 7, General Site Map, Boca Del Mar, Palm Beach County, illustrates the general location of the site within Palm Beach County. Review of the 1990 census data indicates that the site is located within census tract number 76.06 with a median income of \$62,166 per household. This income level is 91% higher than the County average of \$32,524 . The population is 98% white as compared to 84.8% white in the County. Approximately 40.5% of the population is between the ages of 25 and 54 as compared to 38.7% in the County. Additionally, the percentage of population over 55 years of age in the site census tract is 36.9% versus 24.3% for the County. In summary, the Boca Del Mar site is located in an area with a considerably higher median income than the County average, similar percentages of working population between the ages of 25 and 54, and a considerably greater elder population percentage than the County average. Other surrounding census tracts within a four mile radius of the site were reviewed and also indicated a considerably higher median household income than the County average. This indicates that the amount of potential disposable income within the immediate area of the site is considerably higher than other areas of the County.

Site Plan Overview

Figures II - 8a and II - 8b, Site Plan, Boca Del Mar, Palm Beach County, illustrate the six major

Figure II - 7
 General Site Map
 Boca Del Mar
 Palm Beach County



Site Location

Palmetto Park Rd.

Powertine Rd

11 Fast Food

12 Bank/Office Center

13

14 Restaurant

15 Palms Plaza

16

Boca Del Mar Dr.



Legend

- Orange - Site Area
- Boundaries
- Green - Overall Site Boundary
- White Dot - Site Area Boundary Names
- Blue Dot - Access Location

Figure II - 8a
 Site Plan
 Boca Del Mar
 Palm Beach County

3 Savings Bank

4

5

6

7

8

9 Garden Shops

10

11

12

13

14

15

16

17

Camden Court

5

Montoya Circle

26

1 Office Building

2

Boca Del Mar Dr.

Various Residential Enclaves

Montoya Circle

6

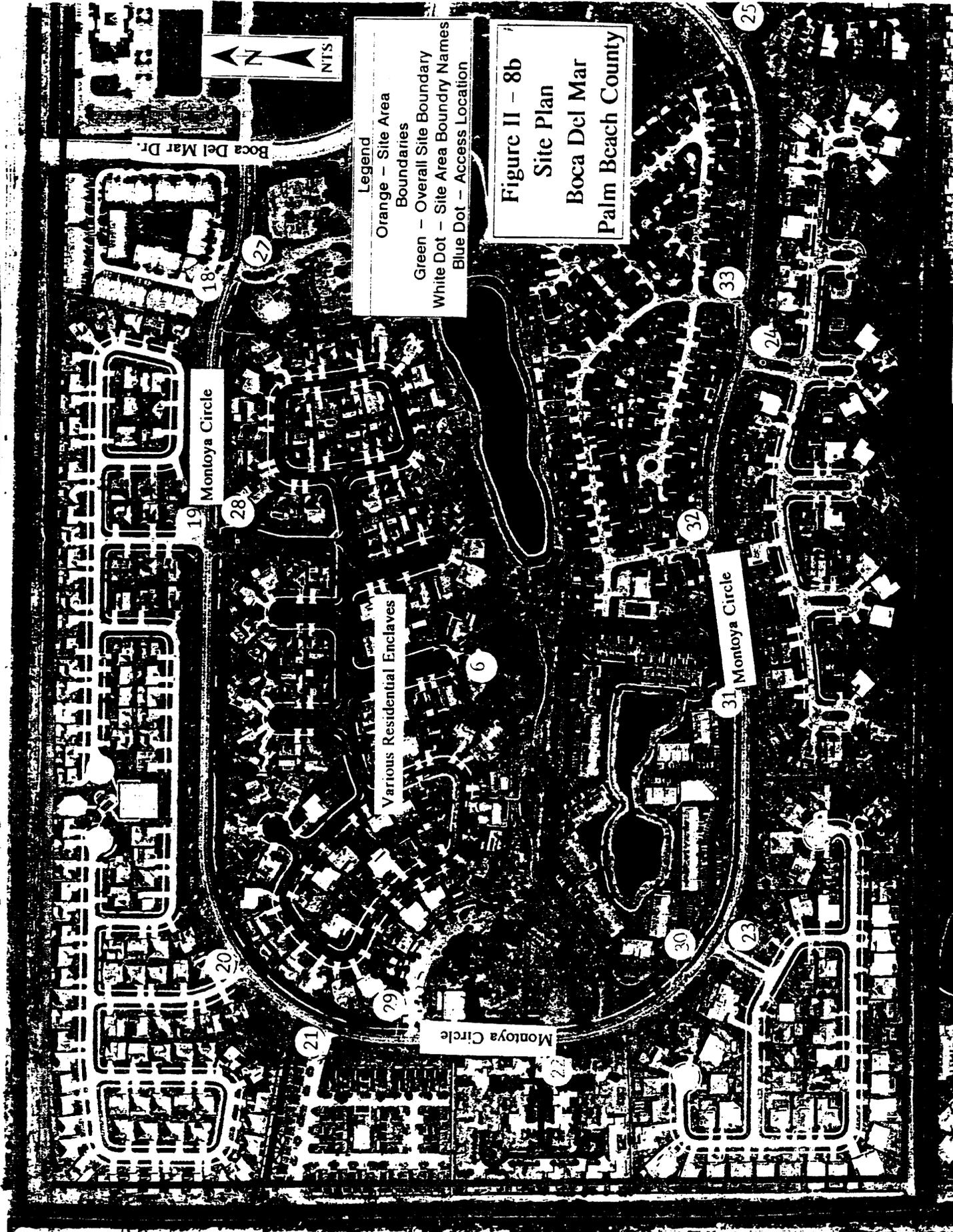
Montoya Circle



Legend

- Orange - Site Area
- Green - Overall Site Boundary
- White Dot - Site Area Boundary Names
- Blue Dot - Access Location

Figure II - 8b
Site Plan
 Boca Del Mar
 Palm Beach County



development components considered as part of the Boca Del Mar site. These include: 1) the multi-story office building bounded by Boca Del Mar Drive on the west, Montoya Circle on the east and south, and Palmetto Park Road on the north; 2) the Garden Shops at Boca bounded by Montoya Circle on the west, a service road on the east, Palmetto Park Road on the north and Boca Del Mar Drive on the south; 3) a multi-story bank and office building at the southwest corner of Palmetto Park Road and Powerline Road bounded by a service road on the south and west sides of the site; 4) the Palms Plaza bounded by a service road on the west side, Powerline Road on the east side, a service road on the north side, and Boca Del Mar Drive on the south; 5) Camden Court, a multi-family residential complex bounded by Boca Del Mar Drive on the north; and 6) various residential enclaves on both sides of Montoya Circle. The site was separated into these six development areas based on land use, site circulation and site access. The access points within each area are numbered on Figure II - 8a, Figure II - 8b, and presented in Table II - 3, Summary of Site Access for Boca Del Mar. Table II - 3 contains the following information about each access point: access location number (with prefix of Site Area Boundary) access description, access location, type of access (right in/right out, full, etc.) and type of access control (signal, stop sign or none). Each development area is discussed below.

1. Office Building

The multi-story office complex on the west side of the site was built in 1989. This area is illustrated in Figure II - 9, Site Uses, Boca Del Mar, Palm Beach County (see location "A"). In addition to surface parking around the building, the site also has secured underground parking. There are a variety of professional businesses including some medical offices located within the office complex. The office complex site is 100 percent built-out.

While there are two access points to the site, only the east entrance off of Montoya Circle (Table II - 3, location number 101) is presently used. This access road connects to Palmetto Park Road and

FDOT Trip Characteristics Study of Multi-Use Developments

Table II - 3 Summary of Site Access for Boca Del Mar

Access Location Number	Access Description	Access Location	Access Type	Type Control
101	Entrance off Montoya Circle to office building	On Montoya Circle 380 feet south of Palmetto Park Road.	Full	Stop sign
102	Entrance off Montoya Circle to office building (currently gated off and not used)	On Montoya Circle 130 feet east of Boca Del Mar Drive.	Full	Not in use
203	North entrance off Montoya Circle to the Garden Shops at Boca shopping Center.	On Montoya Circle 280 feet south of Palmetto Park Road.	Full	Stop sign
204	Delivery entrance only off Montoya Circle to the Garden Shops at Boca Shopping Center.	On Montoya Circle 410 feet south of Palmetto Park Road.	Full	Stop sign
205	South entrance off Montoya Circle to the rear of the Garden Shops at Boca Shopping Center.	On Montoya Circle 1,070 feet from Palmetto Park Road.	Full	Stop sign
206	South entrance on site service road to the rear of the Garden Shops at Boca Shopping Center.	On site service road 115 square feet north of Boca Del Mar Drive.	Full	Stop sign
207	Exit off site service road paired with entrance number 208 to the rear of the Garden Shops at Boca Shopping Center.	On site service road 240 feet north of Boca Del Mar Drive.	Full	Stop sign
208	One-way entrance off site service road paired with exit 207 to the rear of the Garden Shops of Boca Shopping Center.	On site service road 350 feet north of Boca Del Mar Drive.	Full	Stop sign
209	Main entrance off site service road to the Garden Shops at Boca Shopping Center.	On site service road 740 feet south of Palmetto Park Road.	Full	Stop sign
210	North entrance off of site service road to Garden Shops at Boca Shopping Center.	On site service road 290 feet south of Palmetto Park Road.	Full	Stop sign
311	Entrance off site service road to fast food restaurant.	On site service road 160 feet south of Palmetto Park Road.	Full	Stop sign
312	North entrance off site service road to the bank/office center.	On site service road 300 feet south of Palmetto Park Road.	Full	Stop sign
313	South entrance off site service road to the bank/office center	On site service road 230 feet west of Powerline Road.	Full	Stop sign

FDOT Trip Characteristics Study of Multi-Use Developments

Table II - 3 Summary of Site Access for Boca Del Mar (cont.)

Access Location Number	Access Description	Access Location	Access Type	Type Control
414	North entrance on site service road to the Palms Plaza Shopping Center.	On site service road 230 feet west of Powerline Road.	Full	Stop sign
415	South entrance on site service road to the rear of the Palms Plaza Shopping Center.	On site service road 130 feet north of Boca Del Mar Drive.	Full	Stop sign
416	East entrance off Powerline Road to Palms Plaza Shopping Center.	On Powerline Road 1,110 feet from Palmetto Park Road.	Right in - Right out	Stop sign
517	Entrance off Boca Del Mar to Camden Court.	On Boca Del Mar Drive 630 feet west of Powerline Road.	Full	Stop sign
618	Entrance off Montoya Circle to residential development.	On Montoya Circle 315 feet west of Boca Del Mar Drive.	Full	Stop sign
619	Entrance off Montoya Circle to residential development.	On Montoya Circle 1,160 feet west of Boca Del Mar Drive.	Full	Stop sign
620	Entrance off Montoya Circle to residential development.	On Montoya Circle 2,470 feet west of Boca Del Mar Drive.	Full	Stop sign
621	Entrance off Montoya Circle to residential development.	On Montoya Circle 2,800 feet west of Boca Del Mar Drive.	Full	Stop sign
622	Entrance off Montoya Circle to residential development.	On Montoya Circle 3,430 feet west of Boca Del Mar Drive.	Full	Stop sign
623	Entrance off Montoya Circle to residential development.	On Montoya Circle 4,080 feet west of Boca Del Mar Drive.	Full	Stop sign
624	Entrance off Montoya Circle to residential development.	On Montoya Circle 5,895 feet west of Boca Del Mar Drive.	Full	Stop sign
625	Entrance off Montoya Circle to residential development.	On Montoya Circle 6,870 feet west of Boca Del Mar Drive.	Full	Stop sign
626	Entrance off Montoya Circle to residential development.	On Montoya Circle 7,350 feet west of Boca Del Mar Drive.	Full	Stop sign
627	Entrance off Montoya Circle to residential development.	On Montoya Circle 315 feet west of Boca Del Mar Drive.	Full	Stop sign
628	Entrance off Montoya Circle to residential development.	On Montoya Circle 1,160 feet west of Boca Del Mar Drive.	Full	Stop sign

FDOT Trip Characteristics Study of Multi-Use Developments

Table II - 3 Summary of Site Access for Boca Del Mar (cont.)

Access Location Number	Access Description	Access Location	Access Type	Type Control
629	Entrance off Montoya Circle to residential development.	On Montoya Circle 3,060 feet west of Boca Del Mar Drive.	Full	Stop sign
630	Entrance off Montoya Circle to residential development.	On Montoya Circle 3,870 feet west of Boca Del Mar Drive.	Full	Stop sign
631	Entrance off Montoya Circle to residential development.	On Montoya Circle 4,920 feet west of Boca Del Mar Drive.	Full	Stop sign
632	Entrance off Montoya Circle to residential development.	On Montoya Circle 5,430 feet west of Boca Del Mar Drive.	Full	Stop sign
633	Entrance off Montoya Circle to residential development.	On Montoya Circle 6,075 feet west of Boca Del Mar Drive.	Full	Stop sign
* Note: All measurements on Montoya Circle for the various residential enclaves were measured in a counter-clockwise direction starting at the northern intersection of Montoya Circle and Boca Del Mar Drive going to the west (all measurements are estimated).				

Boca Del Mar Drive. The south access point from Montoya Circle (Table II-3, location Number 102) is gate controlled and presently not used.

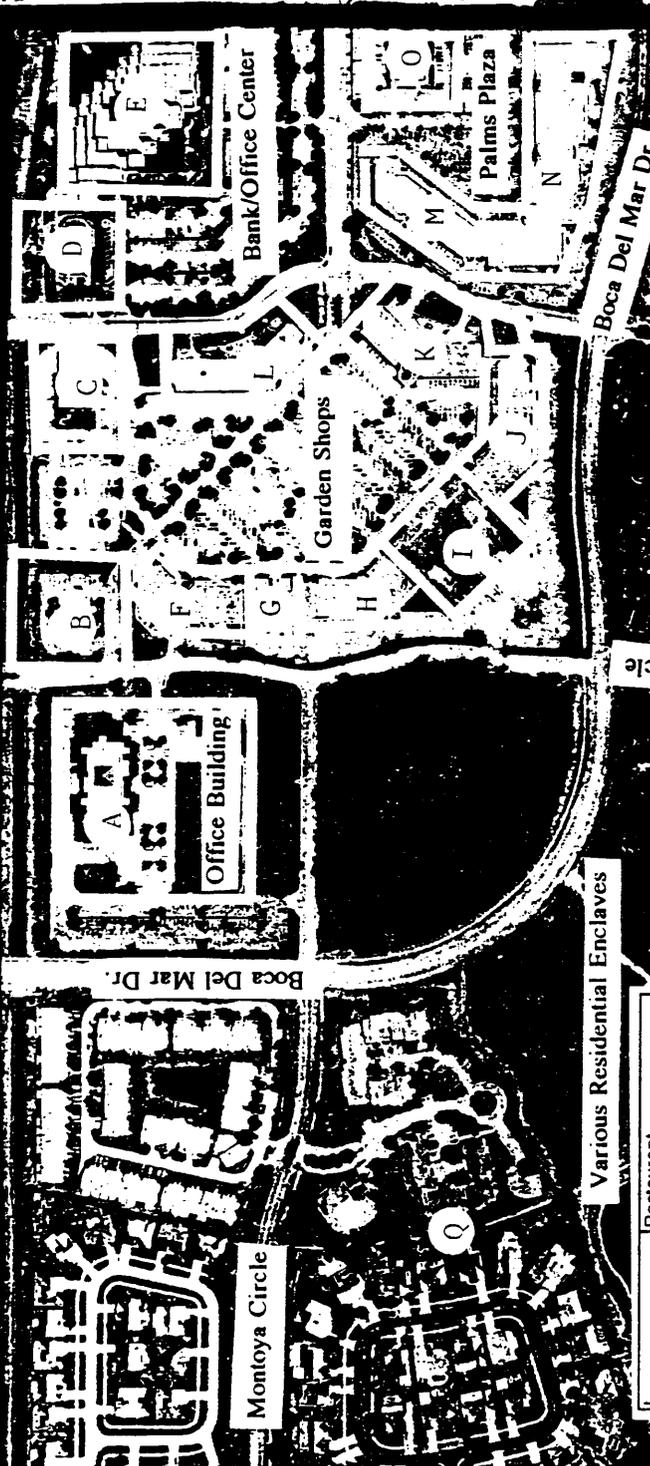
2. Garden Shops at Boca

The Garden Shops at Boca were built in 1985 and are 100 percent built-out. There are 52 leasing units located in the main shopping center, including a variety of restaurants, retail shops, small offices, and a supermarket and drugstore. The types of businesses are illustrated in Figure II - 9 (see locations "F" through "L").

There are three major access points to the Garden Shops at Boca. One access point to the site is provided from Montoya Circle (Table II - 3, location Number 203) and provides access to the west areas of the site. Montoya Circle provides connectivity between Palmetto Park Road and Boca Del Mar Drive. Two other access points on the east side of the site provide access via the site Service Road

Palmetto Park Rd.

Powerline Rd.



Legend
 Blue - Site Partitions
 Green - Overall Site Boundary

Figure II - 9
Site Uses
 Boca Del Mar
 Palm Beach County

A	Professional Office
B	Bank
C	Bank
D	Restaurant-Fast Food
E	Bank / Professional Office
F	Restaurant Medical Office Medical Office Realtor Restaurant-Bagel Clothes Store-Men Bookstore Gift Shop
G	Drugstore
H	Dry Cleaner Ice Cream Jewelry Clothes Store-Children Clothes Store-Women Eye Care Clothes Store-Women Vacant Vacant Vacant
I	Physic Reading Realtor
J	Supermarket Liquor Store Vacant Manicure/Facials Luggage Vacant Boutique Florist Medical Office Photo Development Restaurant Interior Design Cosmetics Travel Agency Hair Salon Lamp Store Frame Store Ice Cream Mail Shipper Clothes Store Restaurant

L	Restaurant Clothes Store Vacant Pet Shop Shoe Store Clothes Store Restaurant-Pizza Vacant Vacant Realtor Restaurant / Bar Travel Agency Photo Development Hair Salon Frame Shop Clothes Store Bakery Restaurant-Japanese Gift Shop Vacant Dry Cleaner Jewelry Vacant Computer Store
M	
N	Maternity Shop Clothes Shop Vacant Gift Shop Travel Agency Clothes-Women Clothes-Childrens Card Shop Vacant Realtor Eye Wear Restaurant-Fast Food Bank Restaurant-Chain Residential Apartments Single/Multifamily Residential
O	
P	
Q	

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(Table II - 3, location numbers 209 and 210) that bisects the entire Boca Del Mar site. The service road provides access to Palmetto Park Road, Powerline Road and Boca Del Mar Drive. Additionally, there are five service entrances to the Garden Shops at Boca. These entrances provide access to the rear of buildings for deliveries. Two of the service entrances are located along Montoya Circle (Table II - 3, location numbers 204 and 205) and three are located along the south section of the site Service Road (Table II - 3, location numbers 206 through 208).

3. Bank/Office Center

The multi-story bank/office center was completed in 1986 and is illustrated in Figure II - 9 (see location "E"). This area of the Boca Del Mar Site also has one outparcel building, a fast food restaurant, completed in 1991 (Figure II - 9 location "D"). Located in the office building are a bank and professional offices including a number of medical offices. Permission to obtain traffic counts at the access points and origin/destination surveys at this part of the site was not granted by the site property manager. However, permission was obtained to collect origin destination interviews at the fast food restaurant.

Site access is provided by three access points from the site Service Road previously discussed above. The northern most access point (Table II - 3, location number 311) provides entry to the fast food restaurant. The next access point, (Table II - 3, location number 312) just south of the northern access point, provides entry to the bank/office complex. This particular access point is located directly across from an access point to The Garden Shops at Boca Shopping Center. The southern access point (Table II - 3, location number 313), is west of Powerline Road on the site Service Road that bisects the site. This particular access point is located directly across from the main access point to the Palms Plaza Shopping Center. The site has the ability to support additional outparcel development at the southeast corner of the site. However, no schedule of development was available at the time of this study.

4. Palms Plaza Shopping Center

The Palms Plaza Shopping Center was built in 1988, and the site is currently 100 percent built-out. There are 27 leasing units located in the main shopping center, including a variety of restaurants, retail

shops, small offices, a bank and fast food restaurant. The types of businesses are illustrated in Figure II - 9 (see locations "M" and "N"). Additionally, the site includes one outparcel building constructed in 1988. The outparcel site is a sit down restaurant of a major restaurant chain (Figure II - 9, location "O").

There are two major access points to the Palms Plaza Shopping Center. One access point to the site is provided by the site Service Road (Table II - 3, location number 414) which bisects the Boca Del Mar site at the north side of the Palms Plaza site. The second access point to the Palms Plaza site is provided from Powerline Road (Table II - 3, location number 416). Additionally, service entry access is provided to the rear of the shopping center on the west side of the site via the site Service Road (Table II - 3, location number 415).

5. Camden Court

Camden Court is a residential multi-family community located immediately to the south of the retail shopping center. It is illustrated in Figure II - 9 as location "P". Camden Court was completed in 1988 and includes 190 multi-family apartment units.

The residential community has a single point of entry and exit along Boca Del Mar Drive. The site Service Road previously discussed intersects Boca Del Mar at the Camden Court entrance (Table II - 3, location number 517) creating a four legged intersection aligned directly across from the retail shops.

Various Residential Enclaves

Montoya Circle creates a closed loop from which 14 residential enclaves have access. It is illustrated in Figures II - 8a and II - 8b as "Various Residential Enclaves". Single family, multi-family and apartment complexes are located off of Montoya Circle. There are 513 single family units, 327 multi-family units and 114 town house units located within the various residential enclaves. The site is approximately 90% built-out with the majority of construction occurring since 1985.

Access to all 14 residential enclaves is provided via Montoya Circle (Table II - 3, location numbers 618 through 633) which intersects Boca Del Mar Drive. Boca Del Mar Drive provides access to both Palmetto Park Road and Powerline Road. Additionally, Montoya Circle also connects to Palmetto Park Road.

LAND USE INVENTORY

Land Use Overview

All three sites were inventoried based on several different land use characteristics. These characteristics include types of land use, gross square footage, total acreage, number of parking spaces, number of bank and fast food drive-through windows and several other land use features. Once the land uses were identified, the estimated trip generation rate was calculated using the 5th Edition of the Institute of Transportation Engineers (ITE) Trip Generation manual. The estimated trip generation was used to determine origin/destination survey locations at the various site land uses. Table II - 4, Land Use Summary and Estimated Trip Generation for All Sites, shows the different land uses, the corresponding gross square feet and the estimated trip generation rates for all three sites. The estimated trip generation rate of the residential land uses were determined by the number of dwelling units.

Table II - 4 was created using the estimated trip generation computed from the trip rates contained in the Trip Generation. From this table the site at Boca Del Mar has the potential of generating the most trips of the three study sites. This is due to the large adjacent residential area considered as part of the site. This area contains approximately 1,144 mixed-use residential dwelling units and is estimated to generate approximately 8,650 weekday trips. The largest site in terms of square footage, Village Commons, generates the least number of estimated weekday trips. This is mainly due to the large proportion of office space making up the site. Office space, whether general or medical, generates a smaller number of trips compared to general retail. Also, the Village Commons site has a large health club which also generates a small number of trips (according to the 5th Edition of Trip Generation manual). The retail land uses at Country Isles, based on trip rates contained in the Trip Generation manual, are estimated to generate more trips than the retail land uses at Village Commons, even though Village Commons contains more shopping center square footage. This is due to the fact that the

FDOT Trip Characteristics Study of Multi-Use Developments

Table II - 4 Land Use Summary and Estimated

Trip Generation for All Sites

ITE Land Use	Country Isles (60.8 Acres)		Village Commons (72.2 Acres)		Boca Del Mar (252.9 Acres)	
	Total Sq. Footage	Weekday Trip Gener.	Total Sq. Footage	Weekday Trip Gener.	Total Sq. Footage	Weekday Trip Gener.
Shopping Center	69,545	7,298	80,840	6,188	109,462	9,618
High turnover Sit Down Rest.	16,959	3,483	41,900	8,606	28,808	5,917
General Office	39,927	1,053	288,631	4,327	298,867	3,974
Medical Office	19,318	356	4,850	103	4,370	91
Supermarket	39,795	4,994	39,800	4,995	41,255	5,178
Bank w/ Drive-through	16,238	3,667	21,400	4,333	13,261	3,296
Walk-In Bank	4,500	632	N/A	N/A	N/A	N/A
Fast Food w/ Drive-through	3,776	2,387	N/A	N/A	4,031	2,548
Fast Food w/o Drive-through	N/A	N/A	N/A	N/A	1,200	972
Health Club	N/A	N/A	46,929	804	N/A	N/A
Day-care	12,750	1,011	N/A	N/A	N/A	N/A
Movie Theater	26,000	1,760	N/A	N/A	N/A	N/A
Convenience Market	3,870	3,526	N/A	N/A	N/A	N/A
Single Family DUs	N/A	N/A	N/A	N/A	513*	4,653
Apartment DUs	368*	2,345	317*	2,012	517*	3,269
Town house DUs	N/A	N/A	N/A	N/A	114*	728
Total Excluding Residential Units	252,678	30,167	524,350	29,358	501,254	31,595
Total Residential Units	368	2,345	317	2,012	1,144	8,650
Total All Uses	N/A	32,512	N/A	31,370	N/A	40,245

* Rates are per unit, rather than per 1,000 gross square feet. Note: May be error due to rounding.

Country Isles site is divided into 2 smaller shopping centers whereas the shopping center at Village Commons is one large shopping center. According to the Trip Generation manual, smaller shopping centers added together produce a greater number of trips than a larger shopping center of the same square footage. The Country Isles site has the least amount of square footage classified as office space as compared to the other two sites. Country Isles has approximately 23% of the total square footage dedicated to office space whereas the Village Commons site and the Boca Del Mar site have approximately 56% and 60%, respectively.

The Boca Del Mar site is the largest of the three sites in total site acreage, covering approximately 253 acres. This is mainly due to the large residential area considered as part of the site. The Village Commons and Country Isles sites were second and third, totaling approximately 72 acres and 61 acres, respectively.

The following sections discuss the specific land uses within each site. All generation rates mentioned in the following sections are estimated using the 5th Edition of the Trip Generation manual (unless otherwise specified).

Country Isles

Overview

The site at Country Isles is divided into three components: 1) the Fairlake at Weston Apartments; 2) the Country Isles Shopping Center; and 3) the Indian Trace Shopping Center (refer to Figure II - 2). The Fairlake at Weston component consists only of residential land uses, whereas the Country Isles and Indian Trace components consist of a mix of office and retail uses. Table II - 5, Land Use Summary and Estimated Trip Generation for Country Isles, shows a detailed break down of the land uses for each component of the site. Table II - 5 also shows the ITE Land Use Code (LUC), the ITE Trip Generation rates, the number of parking spaces, the number of trips per parking space, and the number and type (shared, exclusive) of access points.

FDOT Trip Characteristics Study of Multi-Use Developments

Table II-5 Land Use Summary and Estimated Trip Generation for Country Isles

Map Area(1)	Land Use Description	Total Square Footage	ITE Land Use Code	ITE Land Use Description	ITE Trip Generation Rate	Estimated TGR	Parking Spaces	Access Points	Trips/ Parking Space
Country Isles Plaza North Site Plan (4.29 Acres)									
A	Fast Food w/ Drive-Thru	3,776	834	Fast Food w/ Drive-Thru	632.1	2,387	78	2S	
B	Office Building						118	2E, 2S	
	Bank w/ Drive Thru	8,666	912*	Bank w/ Drive Thru	187.8	1,627			
	General Office	8,666	710*	General Office	25.5	221			
	Medical Office	8,666	720*	Medical Office	23.6	205			
C	Conv. Mrkt w/ Pumps	924	845 (2)	Conv. Mrkt w/ Pumps	911.0	842	4	2S	
	Total for Component Above	30,698				5,281	196		
Weston Neighborhood Center North Site Plan (13.26 Acres)									
D-F	Shopping Center	17,200	820*	Shopping Center	136.8	2,352	331	4S	
	High Turnover Rest.	3,981	832	High Turnover Rest.	205.4	818			
	General Office	4,052	720*	General Office	30.7	124			
	Medical Office	1,200	710*	Medical Office	16.6	20			
	Walk-In Bank	2,400	911	Walk-In Bank	140.6	337			
G	Supermarket	39,795	850 (3)	Supermarket	125.5	4,994			
L	Office Bldg - Parcel A						46	2S	
	General Office	6,666	710*	General Office	27.2	181			
	Bank w/ Drive Thru	3,333	912*	Bank w/ Drive Thru	285.3	951			
	Total for Component Above	78,627				9,778	377		
Weston Neighborhood Center South Site Plan (1.71 Acres)									
M	General Office Building(3-story)								
	General Office	21,195	710*	General Office	20.5	434			
	Medical Office	2,800	720*	Medical Office	19.3	54			
	Bank w/ Drive Thru	4,239	912*	Bank w/ Drive Thru	256.8	1,089			
	Total for Component Above	28,234				1,577	113	2E	
Country Isles Plaza South Site Plan (9.75 Acres)									
H-K	Shopping Center	20,545	820*	Shopping Center	127.9	2,628			
	High Turnover Rest.	7,378	832	High Turn-over, Sit Down	205.4	1,515			
	General Office	1,000	710*	General Office	43.2	43			
	Walk-In Bank	2,100	911	Walk-In Bank	140.6	295			
	Total	31,023				4,482	167	3S	
	Shopping Center for Site Above	37,745	820*	Shopping Center	101.8	3,844			
	Total for Component Above	168,582				19,982	853		23

(1) Refer to Figure II-3

(2) Used ITE Code 845, assumed peak to daily ratio of 9%

(3) Used ITE Land Use Code 850-4th Edition

(4) Used ITE Land Use Code 444-4th Edition (converted rate/screen to rate/sq. ft.)

(5) Rates are per unit, rather than per 1000 sq. ft.

(6) Acreage is estimated

(*) Used ITE Fitted Curve Equation

Access Point Legend: S = Shared Access, E = Exclusive Access

FDOT Trip Characteristics Study of Multi-Use Developments

Table II-5 Land Use Summary and Estimated Trip Generation for Country Isles

Map Area(1)	Land Use Description	Total Square Footage	ITE Land Use Code	ITE Land Use Description	ITE Trip Generation Rate	Estimated TGR	Parking Spaces	Access Points	Trips/Parking Space
Indian Trace Center (17.06 Acres)									
O-Q	Shopping Center	31,800	820*	Shopping Center	108.6	3,454	128	1S	
	High Turnover Rest.	5,600	832	High Turn-over, Sit Down	205.4	1,150			
	General Office	1,200	710*	General Office	41.3	50			
	Medical Office	3,800	720*	Medical Office	20.4	77			
P	Movie Theatre with Matinee	26,000	444 (4)	Movie Theatre with Mat.	67.7	1,760	320	1S	
S	Conv. Mrkt w/ Pumps	2,946	845 (2)	Conv. Mrkt w/ Pumps	911.0	2,684	20	1S	
R	Daycare Center	12,750	565	Daycare Center	79.3	1,011	32	1S	
	Total for Component Above	84,096				10,185	448		23

FairLake At Weston (MDU) (14.7 Acres) (6)

N	FairLake At Weston (MDU)	368	220* (5)	FairLake At Weston	6.4	2,345		3E	
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Total Building Square Footage	252,678	Total Estimated TGR	32,512
Total Site Acreage	60.77		

- (1) Refer to Figure II-3
- (2) Used ITE Code 845, assumed peak to daily ratio of 9%
- (3) Used ITE Land Use Code 850-4th Edition
- (4) Used ITE Land Use Code 444-4th Edition (converted rate/screen to rate/sq. ft)
- (5) Rates are per unit, rather than per 1000 sq. ft.
- (6) Acreage is estimated
- (*) Used ITE Fitted Curve Equation

Site Summary w/out Residential Uses	
Total Trips less Residential	30,168
Total Acres less Residential	46
Trips/Acre	655
Total Parking Spaces	1,301
Trips/Parking Space	23

Access Point Legend: S = Shared Access, E = Exclusive Access

Office Land Uses

The General and Medical Office land uses within Country Isles are scattered throughout both shopping centers. General Office is also located in the detached office buildings, illustrated as locations "B", "L", and "M" in Figure II - 3. The General Office land uses consist of 39,927 gross square feet and is estimated to generate approximately 1,053 weekday trips. The Medical Office land uses consist of 19,318 gross square feet and is estimated to generate approximately 356 weekday trips. The General Office located in building "B" has approximately 118 parking spaces. The General Office located in building "L" has approximately 46 parking spaces and the General Office located in building "M" has approximately 113 parking spaces. There are no government offices at this site. Some examples of the General Office and Medical Office land uses at this site are insurance, dentist, church, eye center, chiropractor, and pediatrician.

Commercial Land Uses

The Commercial uses within the site are indicated by locations "D" through "K" at the Country Isles shopping center and "O" through "Q" at the Indian Trace shopping center (refer to Figure II - 3). The Commercial land uses are identified by the ITE LUC 820 for the Shopping Center uses and ITE LUC 850 for the supermarket uses. The Shopping Center land use consists of 69,545 gross square feet and is estimated to generate approximately 7,298 trips. The Supermarket land use consist of 39,795 gross square feet and is estimated to generate approximately 4,994 weekday trips. These land uses have approximately 459 parking spaces associated with them. The shopping center was approximately 90% percent occupied as of July, 1993. Some examples of the Commercial land uses at this site are dry cleaners, hair salon, card shop, florist, bicycle shop and video store.

Residential Land Uses

Fairlake at Weston, the Residential land use within the Country Isles site, consists of 368 apartment units (ITE LUC 220). These apartments are estimated to generate approximately 2,345 weekday trips. The occupancy level at the time of this study was estimated at 90%. The apartments are indicated by location "N" in Figure II - 3.

Restaurant Land Uses

The Restaurant land uses within the site consist of several high-turnover sit down restaurants (ITE LUC 832) and one fast food restaurant with a drive-through window (ITE LUC 834). The high-turnover sit down restaurants consist of 16,959 gross square feet and are estimated to generate approximately 3,483 weekday trips. The fast food restaurant consists of 3,776 gross square feet and is estimated to generate 2,387 weekday trips. The fast food restaurant is located at the northern most tip of the site and is indicated by location "A" in Figure II - 3. All the high-turnover restaurants were in the retail portion of the shopping center (i.e. no stand alone restaurants). Some examples of Restaurant land uses are pizza, bagel, Italian, and Chinese restaurants.

Bank Land Uses

The Bank land uses within the site consist of three drive-in banks (ITE LUC 912) and two walk-in banks (ITE LUC 911). The three drive-in banks consist of 16,238 gross square feet and are estimated to generate approximately 3,667 weekday trips. One drive-in bank is located on the first floor of the northern most office building illustrated by location "B" in Figure II - 3. Another drive-in bank is located on the first floor of the Office Building situated on the western edge of the Commercial uses, and is illustrated by location "L" in Figure II - 3. Both of these banks have two drive-in windows. The remaining drive-through bank is located on the first floor of the building illustrated by location "M" in Figure II - 3. This bank has one drive-through window. All three of the above mentioned banks share the office space with other General and Medical Office uses. One of the walk-in banks is located in the shopping center of Country Isles within the area illustrated by location "F" in Figure II - 3. This bank consists of 2,400 gross square feet and is estimated to generate approximately 337 weekday trips. The other walk-in bank is located in the area illustrated by "H" in Figure II - 3. This bank contains 2100 square feet and is estimated to generate approximately 295 weekday trips.

Other Land Uses

The site contains several Other land uses including two convenience markets with gas pumps (ITE LUC 845), one day-care center (ITE LUC 565), and one movie theater with matinee (ITE LUC 444). One

of the convenience markets, the day-care center and the movie theater are located within the Indian Trace Center. The other convenience market is located in the Country Isles development.

The convenience market located within the Country Isles development consists of 924 gross square feet and is estimated to generate approximately 842 weekday trips (Figure II - 3 location "C"). It has 6 gas pumps and 4 gas islands (or 12 vehicle fueling positions). The Indian Trace convenience market is located at the southern end of the Indian Trace site and is denoted by "S" in Figure II - 3. This convenience market consists of 2,946 gross square feet and is estimated to generate approximately 2,684 weekday trips. It has 4 gas pumps and 2 gas islands (or 8 vehicle fueling positions). The day-care center is located in the northern section of the Indian Trace Center and is denoted by "R" in Figure II - 3. It consists of 12,750 gross square feet and is estimated to generate approximately 1,011 weekday trips. The movie theater is denoted by "P" in Figure II - 3. It has 26,000 gross square feet, 8 movie screens, 1,600 total seats and is estimated to generate approximately 1,760 weekday trips.

Summary

Overall, this site has 252,678 gross square feet of non-residential buildings, includes 368 residential dwelling units, and is estimated to generate 35,512 weekday trips. It contains 60.8 acres and has 1301 parking spaces for Office and Retail uses. The non-residential portion of the site is estimated to generate 30,167 trips, produce 655 trips per acre and generate 23 trips per parking space. Table II - 6, Comparison of Study Sites Square Footage and Daily Trip Generation by Land Use Category for Country Isles, shows the contribution of each non-residential land use in terms of percent of square footage and percent of trips for the site. The Shopping Center land use has the largest contribution in terms of square footage, whereas Drive-through and High-turnover uses have the least amount of square footage. However, the Drive-through uses have the highest percentage of estimated weekday trips from the Trip Generation manual.

The Residential use contributes 7% to the total trip generation and is estimated to generate 159 trips per acre.

FDOT Trip Characteristic Study of Multi-Use Developments

Table II - 6 Comparison of Study Sites Square Footage and

Daily Trip Generation by Land Use Category for Country Isles

	Country Isles	
Land Use	% Square Footage	% Weekly Trips
Shopping Center (1)	28	24
High-turnover (2)	9	14
Drive-through (3)	9	32
Office (4)	23	5
Supermarket	16	16
Other (5)	15	9

- (1) Includes retail uses
- (2) Includes sit down high turnover restaurants, fast food without drive-through, and banks without drive-through.
- (3) Includes fast food with drive-through, banks with drive-through and convenience stores with pumps.
- (4) Includes both general and medical offices.
- (5) May include day-care, health club, and/or movie theater.

Village Commons

Overview

The Village Commons site is divided into four components: 1) the Village Commons Shopping Center; 2) The Pointe apartment complex; 3) the Brandywine Center office complex; and 4) the Harvard Circle Columbia Drive and Olympic Place office buildings and the health spa (refer to Figure II - 5). The Pointe apartment complex consists of Residential land uses, the Village Common Shopping Center consists of Commercial and Office land uses, the Brandywine office complex includes Office, Restaurant and Bank land uses and the Harvard Circle, Columbia Drive and Olympic Place area includes Office, Health Spa and Bank land uses. Table II - 7, Land Use Summary and Estimated Trip Generation for Village Commons, shows the detailed break down of the land uses for each component of the site. Table II - 7 also shows the ITE Land Use Code, the ITE Trip Generation rates, the number of parking spaces, trips per parking space, and the number and type of access points.

FDOT Trip Characteristics of Multi-Use Developments

Table II-7 Land Use Summary and Estimated Trip Generation for Village Commons

Map Area(1)	Land Use Description	Total Square Footage	ITE Land Use Code	ITE Land Use Description	ITE Trip Generation Rate	Estimated TGR	Parking Spaces	Access Points	Trips/ Parking Space
Village Commons (20.47 Acres)									
B-G	Shopping Center	80,840	820*	Shopping Center	76.5	6,188			
	High Turnover Rest.	32,800	832	High Turnover Rest.	205.4	6,737			
	General Office	2,450	710*	General Office	34.7	85			
	Medical Office	4,850	720*	Medical Office	21.3	103			
D	Supermarket	39,800	850 (2)	Supermarket	125.5	4,995			
A,H	Bank w/ Drive Thru	10,000	912*	Bank w/ Drive Thru	176.3	1,763			
	Total for Component Above	170,740				19,871	900	4S	22
Brandywine I & II (18.17 Acres)									
M	General Office	117,470	710*	General Office	13.5	1,585			
M	High Turnover Rest.	9,100	832	High Turnover Rest.	205.4	1,869			
M	Bank w/ Drive Thru	5,400	912*	Bank w/ Drive Thru	231.0	1,247			
	Total for Component Above	131,970				4,701	599	2S	8
Bank Building (Olympic Place)(2.41 Acres) (5)									
L	Bank w/ Drive Thru	6,000	912*	Bank w/ Drive Thru	220.6	1,323			
L	General Office	26,917	710*	General Office	19.3	520			
	Total	32,917				1,844	117	2E	
Health Spa (3.49 Acres) (5)									
L	Health Spa	46,929	493 (3)	Health Club	17.1	804	231	1E	
Harvard Circle (4.48 Acres) (5)									
I	General Office	96,270	710*	General Office	14.2	1,363	335	1E	
Columbia Drive (5.51 Acres) (5)									
J,K	General Office	45,524	710*	General Office	17.0	774	314	1E	
	Total for Component Above	221,640				4,785	997		5
The Pointe Apartments (17.68 Acres) (5)									
N	Multifamily Dwellings - Rent	317	220* (4)	Apartment	6.3	2,012		2E	

Total Site Square Footage 524,350
 Total Acreage 72.21

Total Estimated TGR 31,371

- (1) Refer to Figure II-6
- (2) Used ITE Code 850-4th Edition
- (3) Used ITE Code 492-Raquet Club Rates
- (4) Rates are per unit, rather than per 1000 sq ft
- (5) Acreage is estimated
- (*) Used ITE Fitted Curve Equation

Site Summary w/out Residential Uses	
Total Trips less Residential	29,358
Total Acres less Residential	55
Trips/Acre	538
Total Parking Spaces	2,496
Trips/Parking Space	12

Access Point Legend: S = Shared Access, E = Exclusive Access

Office Land Uses

The Office land uses within the site consist of both General and Medical uses. The General and Medical Office land uses are scattered throughout the Village Commons Shopping Center, the Brandywine Center office complex and the Columbia Drive, Harvard Circle and Olympic Place office buildings. The General Office land uses in the detached buildings are illustrated by locations "I", "J", "K", and within the areas "L" and "M" in Figure II - 6. The General Office land use within the site consists of 288,631 gross square feet and is estimated to generate approximately 4,327 weekday trips. The Medical Office land use consists of 4,850 gross square feet and is estimated to generate approximately 103 weekday trips. The Brandywine Center has approximately 599 parking spaces. The bank/office building located between Columbia Drive and Olympic Place has approximately 117 parking spaces and the Harvard and Columbia Drive office buildings have approximately 649 parking spaces. The occupancy rate for the Office land uses was approximately 90% as of July, 1993. There were no government offices at this site. Some examples of the General and Medical Office land uses at this site are chiropractor, animal clinic and engineering.

Commercial Land Uses

The Commercial land uses of the Village Commons site are all located within the shopping center illustrated by locations "B" through "G" in Figure II - 6. The Commercial land uses are identified by ITE LUC 820 for the Shopping Center and ITE LUC 850 for the Supermarket. The Shopping Center land use consists of 80,840 gross square feet and is estimated to generate approximately 6,188 weekday trips. The Supermarket land use consists of 39,800 gross square feet and is estimated to generate approximately 4,995 weekday trips. The Commercial uses have approximately 700 parking spaces associated with them. The shopping center was approximately 92 percent occupied as of July, 1993. Some examples of the Commercial land uses for this site are paint center, florist, liquor store, tanning salon, consignment shop and sports store.

Residential Land Uses

The Pointe consists of 317 apartment units (ITE LUC 220) and is the only Residential land use within the site. The apartments are located within the area illustrated by location "N" in Figure II - 6. This

land use is estimated to generate approximately 2,012 weekday trips. The occupancy rate for The Pointe apartment complex was approximately 93% as of October, 1993. Permission was not granted to conduct surveys within this residential area.

Restaurant Land Uses

The Village Commons site contains the largest square footage (41,900 gross square feet) of High-turnover Restaurants (ITE LUC 832) of all the study sites. This site is estimated to generate approximately 8,606 weekday trips. One High-turnover Restaurant (9,100 gross square feet) is located in the Brandywine Center (Figure II - 6 location "M"), while the balance of the restaurants are located within the Village Commons Shopping Center. Some examples of the Restaurant land uses are a bagel, Italian, Japanese and steak restaurants.

Bank Land Uses

The Bank land uses within the Village Commons site consist of four banks with drive-through windows (ITE LUC 912). Two of the drive-through banks are located within the Village Commons Shopping Center; one to the north and one to the southeast illustrated by locations "A" and "H", respectively, in Figure II - 6. Both of these banks have 5,000 gross square feet, three drive-through windows and are estimated to generate approximately 882 weekday trips each. Another drive-through bank is located in the southern end of the Brandywine Center office complex located within area "M" in Figure II - 6. This bank has 5,400 gross square feet, three drive-through windows and is estimated to generate approximately 1,247 weekday trips. The final drive through bank is located in the bank/office building opposite the Village Commons Shopping Center and is illustrated in the northwest part of location "L" in Figure II - 6. This bank consists of 6,000 gross square feet and is estimated to generate approximately 1,323 weekday trips. The bank has one drive-through window and shares the building with other office uses.

Other Land Uses

The only Other land use within the site is a health club (ITE LUC 492, Racquet Club). This health club is located in the southeast part of location "L" in Figure II - 6. The Other land use has 46,929 gross square feet and is estimated to generate approximately 804 weekday trips.

Summary

Overall, this site has 524,350 gross square feet of non-residential buildings, includes 317 residential dwelling units and is estimated to generate 31,370 weekday trips. It contains 72.2 acres and has 997 parking spaces. The non-residential portion of this site is estimated to generate 29,358 trips, produce 538 trips per acre and generate 12 trips per parking space. Table II - 8 shows the contribution of each non-residential land use in terms of percent of square footage and percent of trips for the site. Office uses have the largest contribution to square footage (56%) whereas Drive-through uses have the least (4%). High-turnover uses have the largest contribution in terms of estimated trip generation (29%). The Residential use contributes 6% of the trip generation and is estimated to generate 117 trips per acre.

FDOT Trip Characteristics Study of Multi-Use Developments		
Table II - 8 Comparison of Study Sites Square Footage and		
Daily Trip Generation by Land Use Category (Non-Residential) for Village Commons		
	Village Commons	
Land Use	% Square Footage	% Weekly Trips
Shopping Center (1)	15	21
High-turnover (2)	8	29
Drive-through (3)	4	15
Office (4)	56	15
Supermarket	8	17
Other (5)	9	3

- (1) Includes retail uses
- (2) Includes sit down high turnover restaurants, fast food without drive-through, and banks without drive-through.
- (3) Includes fast food with drive-through, banks with drive-through, and convenience stores with pumps.
- (4) Includes both general and medical offices.
- (5) May include day-care, health club, and/or movie theater.

Boca Del Mar

Overview

The Boca Del Mar site is divided into six components: 1) office building; 2) the Garden Shops at Boca; 3) a five-story bank/office center and a fast food restaurant; 4) Palms Plaza; 5) Camden Court

Apartments; and 6) a 211 acre residential area containing both single family and multi-family dwellings, (refer to Figures II - 8a and II - 8b). Table II - 9, Land Use Summary and Estimated Trip Generation for Boca Del Mar, shows a detailed break down of each component of the site. Table II - 9 also shows the ITE Land Use Code, ITE Trip Generation rates, the number of parking spaces, the number of trips per parking space and the number and type of access points.

Office Land Uses

The Office land uses within the site consist of both General and Medical uses. The General Office land use contains 298,867 gross square feet and is estimated to generate approximately 3,974 weekday trips. The General Office is located in both shopping centers and also in the buildings illustrated by locations "A" and "E" in Figure II - 9. The medical offices are located in the Garden Shops at Boca Shopping Center within locations identified by "F" and "J" in Figure II - 9. This land use has 4,370 gross square feet and is estimated to generate approximately 91 weekday trips. Office building "A" has a contribution of 511 underground and above ground parking spaces located on site. This office building has a 70 percent occupancy rate. Office building "E" has 443 above ground parking spaces and an estimated occupancy rate of 85 percent. There are no government offices at this site. Some examples of General and Medical Office land uses for this site are an eye care center, realty, dentist and podiatry offices.

Commercial Land Uses

The Commercial uses within Boca Del Mar are located in the Garden Shops at Boca Shopping Center, illustrated by locations "F" through "L" in Figure II - 9 and in the Palms Plaza shopping center by locations "M" and "N" in Figure II - 9. The Commercial land uses are identified by ITE LUC 820 for the Shopping Center and ITE LUC 850 for the Supermarket. The Shopping Center land use consists of approximately 109,462 gross square feet and is estimated to generate approximately 9,618 weekday trips. The supermarket consists of 41,255 gross square feet and is estimated to generate approximately 5,178 weekday trips. These land uses have approximately 606 parking spaces. The Garden Shops at Boca and Palms Plaza shopping centers are approximately 95 percent and 80 percent occupied as of

FDOT Trip Characteristics of Multi-Use Developments

Table II-9 Land Use Summary And Estimated Trip Generation for Boca Del Mar

Map Area(1)	Land Use Description	Total Square Footage	ITE Land Use Code	ITE Land Use Description	ITE Trip Generation Rate	Estimated TGR	Parking Spaces	Access Points	Trips/Parking Space												
Garden Shops (18.73 Acres)																					
F-L I B,C	Shopping Center	69,125	820*	Shopping Center	81.2	5,611															
	High Turnover Rest	14,275	832	High Turnover Rest	205.4	2,932															
	General Office	5,200	710*	General Office	28.9	150															
	Medical Office	4,370	720*	Medical Office	20.9	91															
	Supermarket	41,255	850 (2)	Supermarket	125.5	5,178															
	Bank w/ Drive Thru	6,461	912*	Bank w/ Drive Thru	213.5	1,380															
	Total for Component Above	140,686				15,341	736	8S	21												
Palms Plaza (7.56 Acres)																					
M-N O	Shopping Center	40,337	820*	Shopping Center	99.3	4,007															
	High Turnover Rest	14,533	832	High Turnover Rest	205.4	2,985															
	General Office	4,200	710*	General Office	30.4	128															
	Fast Food w/out Drive Thru	1,200	833*	Fast Food w/out Drive Thru	810.4	972															
	Bank w/ Drive Thru	2,800	912*	Bank w/ Drive Thru	308.0	862															
	Total for Component Above	63,070				8,955	342	1E,3S	26												
Office Building (6.63 Acres) (4)																					
A	General Office	114,881	710*	General Office	13.6	1,558	511	2S	3												
Fast Food Rest. Parcel (.71 Acres) (4)																					
D	Fast Food w/ Drive Thru	4,031	834	Fast Food w/ Drive-Throug	632.1	2,548	25	4S	102												
5 Story Office Tower (8.25 Acres) (4)																					
E E	General Office	174,586	710*	General Office	12.2	2,138	443														
	Bank w/ Drive Thru	4,000	912*	Bank w/ Drive Thru	263.4	1,054															
	Total for Component Above	182,617				5,740	468	2S	12												
Residential (211 Acres) (4)																					
Q	Single Family DU's	513	210*(3)	Single-Family Detached	9.1	4,653		2E													
P	Camden Court	190	220*(3)	Apartment	6.3	1,191		2E													
Q	Multi-Family DU's	327	220*(3)	Apartment	6.4	2,077		2E													
Q	Townhouse DU's	114	230*(3)	Residential Townhouse	6.4	728		N/A													
	Total for Component Above	1,144				8,650															
Total Site Square Footage		501,254	Total Estimated TGR		40,245																
Total Site Acreage		252.88																			
(1) Refer to Figure II-9 (2) Used ITE Code 850-4th Edition (3) Rates are per unit, rather than per 1000 sq. ft. (4) Acreage is estimated (*) Used ITE Fitted Curve Equation						<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Site Summary w/out Residential Uses</th> </tr> </thead> <tbody> <tr> <td>Total Trips less Residential</td> <td style="text-align: right;">31,595</td> </tr> <tr> <td>Total Acres less Residential</td> <td style="text-align: right;">42</td> </tr> <tr> <td>Trips/Acre</td> <td style="text-align: right;">754</td> </tr> <tr> <td>Total Parking Spaces</td> <td style="text-align: right;">2,082</td> </tr> <tr> <td>Trips/Parking Spaces</td> <td style="text-align: right;">15</td> </tr> </tbody> </table>				Site Summary w/out Residential Uses		Total Trips less Residential	31,595	Total Acres less Residential	42	Trips/Acre	754	Total Parking Spaces	2,082	Trips/Parking Spaces	15
Site Summary w/out Residential Uses																					
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Total Parking Spaces	2,082																				
Trips/Parking Spaces	15																				
Access Point Legend: S = Shared Access, E = Exclusive Access																					

July, 1993, respectively. Some examples of the land uses at this site are a luggage store, barber, pet shop, book store, and children's clothing store.

Residential Land Uses

Three different Residential land uses are contained within this site: detached single family units (ITE LUC 210), apartment/multi-family units (ITE LUC 220) and townhouse units (ITE LUC 230). The apartments, called Camden Court, are located to the south of Boca Del Mar Drive, adjacent to the Palms Plaza and are illustrated by location "P" in Figure II - 9. Single family, multi-family and townhouse dwelling units are located in the western portion of the site illustrated by location "Q" in Figure II - 9. The multi-family apartment land use has 517 dwellings units and is estimated to generate approximately 3,269 weekday trips. The townhouse land use contains 114 dwelling units and is estimated to generate approximately 728 weekday trips. Finally, the detached single family land use contains 513 dwelling units and is estimated to generate approximately 4,653 weekday trips. The apartment complex has an estimated occupancy rate of 97 percent as of October, 1993. All other Residential uses are estimated to have an occupancy rate of 92 percent as of October, 1993.

Restaurant Land Uses

The Restaurant land uses within the Boca Del Mar site consist of several high-turnover sit down restaurants (ITE LUC 832), one fast food restaurant with a drive-through window (ITE LUC 834), and one fast food restaurant without a drive-through window (ITE LUC 833). The High-turnover Restaurants are located throughout both shopping centers and also in the building illustrated by location "O" in Figure II - 9. The High-turnover Restaurant land uses consist of 28,808 gross square feet and are estimated to generate approximately 5,917 weekday trips. Some examples within this site are an Italian, Japanese and pizza restaurants. The fast food restaurant with a drive-through window is located west of the bank/office center and is illustrated by location "D" in Figure II - 9. This restaurant consists of 4,031 gross square feet and is estimated to generate approximately 2,548 weekday trips. The fast food restaurant without the drive-through window is located in the southeast area of the Palms Plaza and is located within area "N" in Figure II - 9. This restaurant consists of 1200 gross square feet and is estimated to generate approximately 972 weekday trips.

Bank Land Uses

The Bank land uses within the Boca Del Mar site consist of four drive-through banks (ITE LUC 912). Two of the drive-through banks are located to the north of the Garden Shops at Boca in separate buildings illustrated by locations "B" and "C" in Figure II - 9. Each of these banks have four drive-through windows and a combined total of 6,461 gross square feet. They are estimated to generate approximately 1,380 weekday trips. Another drive-through bank is attached to the southeast area of the Palms Plaza located within area "N" in Figure II - 9. This bank has two drive-through windows, consists of 2,800 gross square feet and is estimated to generate approximately 862 weekday trips. The final drive-through bank is located within the office building illustrated by location "E" in Figure II - 9. This bank has approximately 4,000 gross square feet and is estimated to generate 1,054 weekday trips. Permission was not granted to conduct interviews at this building.

Summary

Overall, this site has 501,254 gross square feet, includes 1,144 residential dwelling units and is estimated to generate 40,245 weekday trips. It contains 252.9 acres and has 2,082 parking spaces for Office and Retail uses. The non-residential portion of this site is estimated to generate 31,595 trips, produce 754 trips per acre and generate 15 trips per parking space. Table II - 10 shows the contribution of each Non-residential land use in terms of percent of square footage and percent of trips for the site. Office uses have the largest contribution to square footage (60%) whereas drive-through uses have the least (4%). The Shopping Center uses have the largest contribution in terms of estimated trip generation (30%)

The Residential land use contributes 21% of the total trips of the site and is estimated to generate 41 trips per acre.

SITE VICINITY INFORMATION

Adjacent Street Volumes and Level of Service

The average annual daily traffic (AADT), the peak hour volume, and the level of service (LOS) of the roads within the vicinity of all three sites were examined. Level of service was estimated by using Palm

FDOT Trip Characteristics Study of Multi-Use Developments

Table II - 10 Comparison of Study Sites Square Footage and

Daily Trip Generation by Land Use Category (Non-Residential) for Boca Del Mar

Land Use	Boca Del Mar	
	% Square Footage	% Weekly Trips
Shopping Center (1)	22	30
High-turnover (2)	6	22
Drive-through (3)	4	18
Office (4)	60	14
Supermarket	8	16
Other (5)	0	0

- (1) Includes retail uses.
- (2) Includes sit down high turnover restaurants, fast food without drive-through, and banks without drive-through.
- (3) Includes fast food with drive-through, banks with drive-through, and convenience stores with pumps.
- (4) Includes both general and medical offices.
- (5) May include day-care, health club, and/or movie theater.

Beach County's AADT or counts conducted by Tindale-Oliver and Associates (TOA) and comparing them to the appropriate level of service threshold contained in the FDOT Generalized Planning Capacity Tables. If raw counts were used, they were adjusted to AADT's by the appropriate seasonal adjustment factor for Palm Beach and Broward County. These factors were obtained from the Florida Department of Transportation (FDOT). P.M. peak hour volumes for Palm Beach County AADT Counts were determined by multiplying the count by the standard default value of 9.6 percent (as used by Palm Beach County staff). Actual peak hour volumes were determined for all counts conducted by TOA. Table II - 11, Adjacent Street Traffic Volumes and Level of Service (LOS), summarizes this information, and shows the corresponding laneage (road type), FDOT group, source of count and date of count for each of the roads which were examined. The following sections discuss the traffic volumes and LOS of each site.

**FDOT Trip Characteristics Study of Multi-Use Developments
Table II-11 Adjacent Street Traffic Volumes
And Level Of Service**

Street Name	From/To	Road Type	FDOT Group (1)	Source of Count	Date of Count	PM Peak Hour Vol.*	Peak LOS	AADT	Daily LOS
<i>CountryIsles</i>									
Weston Road	Indian Trace/N River Cir	4D	Group B	TOA	AADT 93	1,290	B	15,876	B
Indian Trace	Weston/Dykes	2D	Group A	TOA	AADT 93	984	B	10,697	B
Dykes Road	Indian Trace/N. New River Cir	2U	Group A	TOA	AADT 93	361	A	4,169	A
<i>Village Commons</i>									
Palm Beach Lakes Blvd	Okechobee/W of I95 Entrance	6D	Group C (2)	PBC	AADT 92	3,521	D	36,681	D
Village Blvd	Palm Beach Lakes/North of Site	4D	Group C (2)	TOA	AADT 93	2,346	D	26,352	D
Brandywine Road	Village /Canal E of Site	2U	Group C (2)	TOA	AADT 93	890	D	8,618	C
<i>Boca Del Mar</i>									
Palmetto Park Road	Turnpike/Powerline	6D	Group C (2)	PBC	AADT 92	3,532	D	36,793	D
Palmetto Park Road	Powerline/Military Tr	6D	Group C (2)	PBC	AADT 92	3,637	D	37,883	D
Powerline Road	Camino Real/Palmetto Park	4D	Group C (2)	PBC	AADT 92	3,076	F	32,039	E
Powerline Road	Palmetto Park/Glades	4D	Group C (2)	PBC	AADT 92	2,629	D	27,388	D
Montoya Cir	Boca Del Mar/Palmetto Pk	2U	Group A	TOA	AADT 93	267	A	3,090	A
Boca Del Mar Drive	Palmetto Park/Powerline	2U	Group A	TOA	AADT 93	418	B	9,374	B

(1) From FDOT Capacity Tables for Urbanized Areas

(2) Palm Beach County uses FDOT Group C for all county roads

(*) Used a factor of .096 for Palm Beach County's (PBC) AADT to get two-way peak hour; for TOA counts peak hour is from actual counts

Country Isles

Three roads were analyzed in the vicinity of the Country Isles Site: Weston Road, Indian Trace, and Dykes Road. Weston Road is a four-lane collector road that currently operates at daily LOS B and P.M. peak hour LOS B from Indian Trace to New River Circle. The AADT of this road segment is 15,876 vehicles with a peak-hour volume of 1,290 vehicles. Indian Trace is a two-lane divided collector that currently operates at daily LOS B and a P.M. peak hour LOS B from Weston Road to Dykes Road. The AADT of this road segment is 10,697 vehicles with a peak-hour volume of 984 vehicles. Dykes Road is a two-lane collector road segment that currently operates at LOS A daily and P.M. peak hour LOS A from Indian Trace to New River Circle. The AADT of this road segment is 4,169 vehicles with a peak-hour volume of 361 vehicles. The LOS on all of the above roads was calculated by using the counts conducted by TOA.

In summary, all the roads adjacent to the Country Isles site operate at an excellent daily LOS (LOS A/B). The P.M. peak hour LOS ranges from LOS A on Dykes Road to LOS B on Weston Road and Indian Trace. This is to be expected since the area is not built-out and is expected to see further growth over the next several years.

Village Commons

Three roads were analyzed in the vicinity of the Village Commons Site: Palm Beach Lakes Boulevard, Village Boulevard and Brandywine Road. Palm Beach Lakes Boulevard is a six lane divided arterial that currently operates at daily LOS D and peak hour LOS D from Okeechobee Road to west of the I-95 entrance. The AADT of this road segment is 36,681 vehicles with a peak-hour volume of 3,521 vehicles. The analysis of this road segment was determined by using Palm Beach County's 1992 AADT's. Village Boulevard is a four-lane collector that currently operates at daily LOS D and peak hour LOS D from Palm Beach Lakes Boulevard to just north of the site. The AADT of this road segment is 26,352 vehicles with a peak-hour volume of 2,346 vehicles. Brandywine is a two-lane collector that currently operates at daily LOS C and peak hour LOS D from Village Boulevard to east of the site. The AADT of this road segment is 8,618 vehicles with a peak-hour volume of 890 vehicles.

The above two road segments (Village Boulevard and Brandywine Road) were analyzed using the counts conducted by TOA.

In summary, the roads adjacent to the site are operating at an adequate daily level of service (LOS C/D). P.M. peak hour LOS on roads adjacent to the site is LOS D. While LOS D indicates high traffic density and congestion, significant delays were not observed from traffic entering and exiting the site on Village Boulevard. Adequate gaps were observed at the shopping center main entrance on Village Boulevard to permit reasonable entry and exit to and from the shopping center. Further, while formal travel time and delay studies were not conducted, general observation of the signalized intersection at Village Boulevard and Brandywine did not indicate cycle failure during the P.M. peak hour.

Boca Del Mar

Four roads were analyzed in the Boca Del Mar Site: Palmetto Park Road, Powerline Road, Montoya Circle and Boca Del Mar Drive. Two segments were analyzed on Palmetto Park Road, a six lane divided arterial. The first segment was from the Florida Turnpike to Powerline Road and the second segment was from Powerline Road to Military Trail. Both of these segments operate at daily LOS D and P.M. peak hour LOS D. The road segment from the Florida Turnpike to Powerline Road has an AADT of 36,793 vehicles with a peak-hour volume of 3,532 vehicles. The road segment from Powerline Road to Military Trail has an AADT of 37,883 vehicles with a peak-hour volume of 3,637 vehicles. Two segments were analyzed on Powerline Road, a four-lane divided arterial. The first segment on Powerline Road, from Camino Real Road to Palmetto Park Road, operates at daily LOS E and P.M. peak hour LOS F. The AADT on this segment is 32,039 vehicles with a P.M. peak-hour volume of 3,076 vehicles. The segment on Powerline Road from Palmetto Road to Glades Road operates at daily LOS D and P.M. peak hour LOS D. The AADT of this segment is 27,388 vehicles with a peak-hour volume of 2,629 vehicles. Both of the above roads were analyzed using Palm Beach County's 1992 AADT's. Montoya Circle is a two-lane collector road that currently operates at daily LOS A and P.M. peak hour LOS A. The segment that was analyzed starts at Boca Del Mar Drive, continues in a counter clockwise fashion around the circle, and ends at Palmetto Park Road. The AADT of this segment is

3,090 vehicles with a P.M. peak-hour volume of 267 vehicles. Boca Del Mar Drive is a two-lane collector road that currently operates at daily LOS B and P.M. peak hour LOS B. The segment that was analyzed starts at Palmetto Park Road and ends at Powerline Road. The AADT of this road is 9,374 vehicles with a P.M. peak-hour volume of 418 vehicles. Both Montoya Circle and Boca Del Mar Drive were analyzed using TOA traffic counts.

In summary, access to the site via the collector road system serving the residential community to the south and west of the site is excellent (LOS A/B in the daily and P.M. peak hour). Daily and P.M. peak hour LOS on Palmetto Park Road, the east/west arterial just north of the site is at D. However, no significant delays were observed entering or exiting the site from Palmetto Park Road at Montoya Circle, Boca Del Mar Drive or the site service road. Powerline Road operates at daily LOS D/E and P.M. peak hour LOS D/F. Northbound access to the site is accomplished by making a left onto the site Service Road. Even though Powerline Road currently operates at a marginal daily LOS and poor P.M. peak hour LOS (using FDOT Generalized Planning Capacity Tables), there are sufficient gaps created by the signalized intersection at Powerline Road and Palmetto Park Road to make this movement without excessive delay. Northbound access to Boca Del Mar Drive was eliminated by closing the median opening on Powerline Road. This was done approximately one year ago to improve operational efficiency and safety of Powerline Road near Palmetto Park Road. Southbound traffic on Powerline Road can enter the site at the service road south of the intersection of Palmetto Park Road and Powerline Road. Review of Palm Beach County's annual traffic growth rates from 1989 to 1992 indicate annual growth rates on Palmetto Park Road and Powerline Road during this time period of approximately 1.1 percent and 1.4 percent, respectively. These growth rates indicate that the recent traffic growth has not been significant.

REVIEW OF ADJACENT DEVELOPMENT

Country Isles

The Country Isles development is located in a relatively new area of West Broward County. It is the primary shopping center site serving the Weston and Bonaventure areas. Westgate Square, located at the intersection of Weston Road and SR 84, is the closest competing shopping center to Country Isles.

This site is approximately 2 miles north of the Country Isles site. Similarities between these two sites include supermarket, drug store, restaurant, bank and small retail land uses. However, the Country Isles site is larger and more centrally located within the Weston community. It also offers a wider variety of land uses including office, movie theater, day-care, and convenience store. Additionally, the land uses at the Country Isles site seem to better complement each other than do the land uses at Westgate Square. The three office buildings are supported by a variety of restaurants and retail shops. Finally, the general appearance of the Country Isles site (landscaping, site entrance, etc.) is more appealing than that of Westgate Square.

There is also a commerce park located about one mile south of Country Isles at Arvida Parkway and Weston Road. However, the commerce park is not built out and only has office type buildings. Future development is planned at this site, but at the time of this study, the commerce park did not offer the variety of land uses as the Country Isles site.

Village Commons

The Village Commons site is located approximately a quarter mile north of Palm Beach Lakes Boulevard on Village Boulevard. Along Palm Beach Lakes Boulevard from Okeechobee Boulevard to Congress Avenue (approximately 2 miles) there are office, restaurant (sit-down), hotel, health spa, furniture and retail land uses, including a regional mall just east of I-95. While there are individual competing land uses close to the Village Commons site, the site's location adjacent to the residential communities along Village Boulevard, and the combination of land uses at the Village Common site appear to allow it to compete favorably with other surrounding developments. Estimated occupancy rates at the retail and other land uses within the Village Commons site is greater than 85 percent. This indicates that the Village Commons site is competitive within the area.

Boca Del Mar

The Boca Del Mar site has a competing shopping center and office building complex located immediately to the north of the site at the intersection of Palmetto Park Road and Powerline Road. This site has many similar retail businesses, including a supermarket and the same brand name

drugstore. However, the site is older than the study site and its general appearance (landscaping, site entrance, etc.) is not as appealing as the Boca Del Mar study site.

Less than two miles to the north of the study site, on Glades Road at the Florida Turnpike interchange, there is another shopping center offering similar amenities and retail businesses. Further east on Glades Road at I-95 (approximately 3 miles from the Boca Del Mar site) is a major retail mall and established business community. There are several hotels and major office complexes located within this area.

As indicated in the History and Description chapter of this report, the median household income of the census tract in which the Boca Del Mar site is located is nearly double that of the county average. Further, the median household income of other surrounding census tracts is also significantly higher than the county average. This indicates that the area may be able to support multiple competing land uses in close proximity to each other. This is further evidenced by the fact that the Boca Del Mar site has a relatively high occupancy rate for the retail site land uses. The lower occupancy rate of the newer office complex located on the west side of the Boca Del Mar site may be due to the adjacent on and off site competing office land uses.

POSSIBLE FACTORS AFFECTING INTERNAL CAPTURE

All sites were reviewed with respect to site location, land uses and surrounding demographics to determine factors which could potentially influence internal capture. The results of this review for each site is summarized in the following sections.

Country Isles

The review of the Country Isles site indicates three primary factors which could contribute to the internal capture of the Country Isles site. First, the Country Isles site is centrally located in the Weston Community. There is not a convenient competing site with similar land uses close by. Thus, at the present time, the Country Isles site has a highly captive market.

Second, the combination of land uses present at the Country Isles site should induce internal capture. For example, the day-care center provides a convenient drop-off of children for parents working at the site. Also, parents not working at this site, but living close by, could stop at the drug store, restaurant or supermarket prior to picking up or dropping off their children.

Third, the internal site circulation is good with relatively easy access to all areas of the site. Workers at the three office buildings can either walk or drive to the various land uses located within the Country Isles site. Walking distance to the Country Isles Shopping Center Area ranges from 200 - 300 feet from the three offices. Depending on the destination in the shopping center, the total estimated walking distance could range from 200 to 1000 feet. Access to the adjacent Indian Trace shopping center can occur via Dykes Road. As previously discussed, Dykes Road provides connectivity between Indian Trace on the south and North New River Circle and Weston Road on the north. This connectivity allows people both passing by the site and visiting the Country Isles shopping center easy access to the Indian Trace shopping center. The walking distance between the shopping centers ranges between 1000 and 2000 feet depending on the starting and ending point within the site. While sidewalks are available, most movement between the shopping centers will probably be by vehicle.

Other factors which might be expected to contribute to internal capture include the availability of transit service and parking and its associated cost. Transit service to the Country Isles site area was scheduled to begin in May of 1993 with a new route scheduled to stop at Indian Trace and Weston Road. However, due to funding issues, the route was canceled. Based on site observations, there appears to be ample parking. There is no charge for parking anywhere within the site. Therefore, transit and parking should not influence the internal capture rate at this site.

Village Commons

The most influential factor that could affect internal capture at the Village Commons site is the combination and interaction of the site land uses. There is a significant number of restaurants located within the site that should complement the office employment lunchtime and after-hours food and beverage needs. Further, the health spa located within the site could promote trips from other site land

uses during the lunchtime and after work hours. Finally, the site has several banks and other retail stores (video store, card shop, drug store, etc.) which could also influence internal capture during the lunchtime hours and when leaving the work place.

Site circulation is generally good and conducive to internal capture. The office locations along the Columbia Drive and along Harvard Circle cul-de-sacs have easy access to both the Village Commons shopping center and the health spa. People parking at the Village Commons shopping center can walk to the various site land uses. The Shopping Center site is relatively compact and the maximum walking distance anywhere in the site is approximately 1,000 feet. The walking distance from the shopping center to the health spa or bank office building ranges from 900 to 1800 feet. There are sidewalks available for pedestrian use, but use of the sidewalk requires crossing Columbia Drive.

The site circulation at the Brandywine Center is excellent. People can walk or drive to the site restaurant and bank. The maximum walking distance to land uses within the Brandywine Center site is 300 feet. People working at or visiting the Brandywine Center complex, and desiring to go to the shopping center or health spa across Village Boulevard, can drive their vehicles to these locations via Brandywine Road to Columbia Drive, and then enter the shopping center, or go to Olympic Place to get to the bank/office or health spa, as desired. While the maximum walking distance is approximately 2,000 feet between Brandywine and Village Commons centers, and sidewalks are available for pedestrian use, the fact that Village Boulevard is a four-lane divided roadway may tend to discourage pedestrian movement between the centers.

There is no charge for parking anywhere within the site. Also, based on field observations, there is an adequate parking supply to service all land uses, with the possible exception of the health spa. Cars were occasionally observed parking off the adjacent street to the health spa during after-work hours. However, this situation did not appear to negatively impact the use of the health spa.

There is no formal transit service provided to the Village Commons site. However, non fixed-route trips from retirement areas are occasionally provided via a large van. If these trips were routinely scheduled,

they could contribute to the internal capture of the site; but due to their inconsistent scheduling, they will not have a significant impact on the internal capture at the Village Commons site.

Boca Del Mar

As was the situation at the other two sites, the combination and interaction of land uses at the Boca Del Mar site should contribute to the site's overall internal capture. There are a significant number of restaurants located within the site that should complement the extensive office-employment lunchtime and after-hour food and beverage needs. Further, located internally within the site, are two fast food restaurants which should contribute to the internal capture of the site. Finally, this site has three banks and numerous other retail stores (drug store, supermarket, video stores, etc.) which could also influence internal capture during the lunchtime hours and when employees are leaving the work place.

Site circulation is excellent and conducive to internal capture. All land uses located within the site are accessible via a service road system that bisects the site. All vehicular trips between site land uses can be made without having to utilize the arterial road system adjacent to the site. Additionally, the maximum walking distance anywhere within the site is 1500 feet.

While there is no formal transit system serving the site, a shuttle-van-bus was observed providing drop-off service within the site for the elderly population. As previously discussed, nearly 40 percent of the population within the Boca Del Mar census tract is over the age of 55 years. Discussions with the site property manager indicate that this shuttle service periodically visits the site during the week. Thus, this shuttle service could have some impact on the sites' internal capture rate as a result of people walking to and from the various land uses between shuttle visits.

Based on field observations, there appears to be an ample parking supply to support the site land uses and there is no charge for parking at the site. Thus, the parking supply should not adversely affect the internal capture of the site.

The competing shopping center directly north of the site at the intersection of Palmetto Park and Powerline Road could adversely affect the internal capture rate of the Boca Del Mar site. Review of the adjacent land uses of this shopping center and office complex indicate many similarities. However, it is more convenient for the large adjacent residential population which has direct access to the Boca Del Mar site to utilize the various land uses of the study site as opposed to having to travel on the arterial road system to get to the competing site.

COMPARISON OF SITE CHARACTERISTICS

Land Use

A comparison of the land uses of the three study sites is presented in Table II - 12, Comparison of Study Sites Square Footage and Daily Trip Generation by Land Use Category. This table provides the percentage of square footage and daily trip generation for the following land use categories: (1) Shopping Center (includes retail uses), (2) High Turnover (includes sit down high turnover restaurants, fast food without drive-through, and banks without drive-through), (3) Drive Through (includes fast food and banks with drive-through and convenience stores with gas pumps), (4) Office (includes both general and medical offices), (5) Supermarket, and (6) Other (may include day-care, health club, and/or movie theaters). Each of these land use categories is discussed below.

Shopping Center Land Use

The percentage Shopping Center land uses ranges from a low of 15 percent of the total square footage at Village Commons to a high of 28 percent of the total square footage at Country Isles. The Boca Del Mar site, with 22 percent of the total square footage, is almost directly in between the percentage of square footage at the Village Commons and Country Isles sites.

The percentage of daily trips at the three sites ranges from 21 percent at Village Commons to 30 percent at Boca Del Mar. The Country Isles Shopping Center land use site was near the total percentage of the Village Commons site with 24 percent.

FDOT Trip Characteristic Study of Multi-Use Developments

Table II - 12 Comparison of Study Sites Square Footage and Daily

Trip Generation by Land Use Category for All Sites

Land Use Category	Country Isles		Village Commons		Boca Del Mar	
	% Square Footage	% Wkday Trip	% Square Footage	% Wkday Trips	% Square Footage	% Wkday Trips
Shopping Center (1)	28	24	15	21	22	30
High-turnover (2)	9	14	8	29	6	22
Drive-through (3)	9	32	4	15	4	18
Office (4)	23	5	56	15	60	14
Supermarket	16	16	8	17	8	16
Other (5)	15	9	9	3	0	0

- (1) Includes retail uses.
- (2) Includes sit down high turnover restaurants, fast food without drive-through, and banks without drive-through.
- (3) Includes fast food and banks with drive-through and convenience stores with pumps.
- (4) Includes both general and medical offices.
- (5) May include day-care, health club, and/or movie theater.

High-turnover Land Use

The percentage of square footage of High-turnover land uses ranges from 6 percent at Boca Del Mar to 9 percent at Country Isles. Village Commons is close to Country Isles site in percentage of High-turnover square footage, at 8 percent. High-turnover percentage of daily trips at all sites is higher than the corresponding percentage of square footage because the trip generation rate for High-turnover type land uses is generally higher than the trip rates of other land uses. The High-turnover percentage of daily trips for the three sites ranges from 30 percent in Country Isles to 29 percent at Village Commons. The Boca Del Mar site has 22 percent of the total daily trips in the High-turnover land use category.

Drive-through Land Use

The Drive-through percentage of the total square footage at the three study sites is 4 percent at both the Village Commons and Boca Del Mar sites and 9 percent at the Country Isles site. The higher percentage of the Drive-through land use at the Country Isles site results from the two convenience markets with gas pumps, three drive-through banks and one fast food restaurant with Drive-through service.

The percentage of total daily trips for the Drive-through land use is higher than the corresponding percentage of total square footage because the trip generation rates of the Drive-through land uses are generally high per unit of square footage. The percentage of Drive-through daily trips for the three sites ranged from 15 percent at Village Commons to 32 percent at Country Isles, with the Boca Del Mar site in between at 18 percent.

Office Land Use

The percentage of square footage of Office land use varies considerably between the three sites. The Country Isles site had the lowest percentage of Office square footage at 23 percent, while the Village Commons and Boca Del Mar sites had significantly greater percentages of Office square footage at 56 percent and 60 percent, respectively. The higher percentage of total square footage of Office (over 50 percent of total square footage) at both the Village Commons and Boca Del Mar sites results in smaller percentage totals for the Other land use categories.

The percentage of Office daily trips to the total daily trips is significantly lower than the corresponding percentages of square footage. This is because Office land uses have a low trip generation rate per unit of square footage. The percentage of Office daily trips for the three sites ranged from 5 percent at the Country Isles site to 14 percent at the Boca Del Mar site.

Supermarket Land Use

All three study sites had a major supermarket located within the site. The Supermarket percentage of total square footage is 8 percent at both the Village Commons and Boca Del Mar sites and 16 percent

at the Country Isles site. The reason why the Supermarket percentage of total square footage at the Country Isles site is twice that of the other two sites is that the total square footage of the Country Isles site is approximately one-half that of the other two sites.

The percentage of Supermarket daily trips to total site daily trips range from 16 percent to 17 percent. The percentage of total daily trips of the Supermarket land use to the total daily trips of each site is consistent.

Other Land Uses

As indicated previously, Other land uses include day-care, health club and movie theaters. The Boca Del Mar site contained no Other land uses and therefore the percentage of square footage and daily trips is zero. The Village Commons site contained a health club while the Country Isles site contained both a day-care facility and movie theater. The resulting percentage of total square footage for the Other land use category is 9 percent at the Village Commons site and 15 percent at the Country Isles site.

The percentage of weekday trips for the Other land use category is 3 percent at the Village Common site and 9 percent at the Country Isles site. The greater percentage of the Other land use category is due to the day-care and movie theater land uses at the Country Isles site.

Travel Demand

The Travel Demand characteristics of each site in terms of trips, acres, parking spaces and building square footage is illustrated in Table II - 13, Comparison of Study Sites Travel Demand. This table indicates that the total trips estimated to be generated at the three sites range from 31,370 for the Village Commons site to 40,245 for the Boca Del Mar site. The Country Isles site is projected to generate 32,512 daily trips. The primary reason for the larger number of daily trips being generated at the Boca Del Mar site is due to the extensive residential development that was considered as part of the site. The Boca Del Mar site has 1,144 residential units as compared to 368 and 317 at the Country Isles and

Village Commons, respectively. When the residential development is excluded from all three sites, the resulting total trips range from 29,138 to 32,393 per day.

FDOT Trip Characteristics Study of Multi-Use Developments			
Table II - 13 Comparison of Study Sites Travel Demand			
	Country Isles	Village Commons	Boca Del Mar
Total Trips	32,512	31,370	40,245
Total Trips excluding residential	30,167	29,358	31,595
Total Acres excluding residential	46	55	42
Trips/Acre	655	538	754
Parking Spaces	1,301	2,496	2,082
Trips/Space	23	12	15
Total Square Footage excluding residential	252,678	524,350	501,254
Trips/1000 Square Feet excluding residential	119.4	56.0	63.0

The total acres per site, excluding residential land uses, ranges from 42 acres for the Boca Del Mar site to 55 acres for the Village Commons site. This results in a range of trips per acre of 538 for the Village Commons site to 754 for the Boca Del Mar site. The trips per acre for the Country Isles site is 655. Parking spaces for the three sites range from 1,301 at the Country Isles site to 2,496 at the Village Commons site. The lower number of parking spaces at the Country Isles site is expected since the site has approximately one-half the total square footage of the other two sites. The resulting trips per parking space ranges from 12 at the Village Commons site to 23 at the Country Isles site. The higher trips per parking space estimated to occur at the Country Isles site is due to the greater percentage of shopping center and other land use category at this site. These types of land uses generate a greater parking space turnover than do the office developments at the Village Commons and Boca Del Mar sites.

Site Comparison Summary

Review of the land use composition and estimated daily trip generation rates for the three sites indicate the following:

- The Boca Del Mar and Village Commons sites contain nearly twice the square footage as the Country Isles site. The major difference in square footage between the Country Isles site and the two other sites is in the Office land use category. There is approximately six times more office square footage at the Village Commons and Boca Del Mar sites than at the Country Isles site (see Table II - 4).
- The distribution of the percentage of total square footage at the Country Isles site indicates a more even distribution by land use category than at the Village Commons and Boca Del Mar sites. This is due to the fact that the Country Isles site has a greater percentage of the Other land use category and a much lower percentage of the Office land use category. In contrast, the Boca Del Mar and Village Common sites have significant percentages of their square footage in the Office land use category.
- While the square footage of the Boca Del Mar site is nearly double that of the Country Isles site, all three sites are estimated to produce very similar non-residential trip totals. The resulting estimated range is from 29,358 for the Village Commons site to 31,595 for the Boca Del Mar site. The Country Isles site is estimated to produce 30,167 daily trips. The reasons why the Village Commons and Boca Del Mar sites are estimated to generate similar numbers of trips as the Country Isles site, even though they have twice the square footage, are that the office land use generates a minimal trip generation rate per unit of land use and the other land use categories at the Country Isles site have a high trip generation rate per unit of land use. This combination results in very similar estimates of daily trip generation between all three sites.
- When residential trips are considered in the total daily trips for each site, the Boca Del Mar site is estimated to generate approximately 8,000 and 9,000 more trips than the

Country Isles and Village Commons sites, respectively. This is due to the greater number of residential units at the Boca Del Mar site.

- The 25 estimated trips per parking space at the Country Isles site is significantly higher than the 12 and 15 trips per parking space estimated to occur at the Village Commons and Boca Del Mar sites, respectively. This is due to the high concentration of the Office land use category at the Village Commons and Boca Del Mar sites which result in a greater number of needed parking spaces and lower parking space turnover. Conversely, the Country Isles land use composition includes significant percentages of Shopping Center, High-turnover, Drive-through and other categories which have a shorter trip duration and higher parking space turnover.

TRIP CHARACTERISTICS OF MULTI-USE DEVELOPMENTS

TRAFFIC COUNTS AND RESULTS

INTRODUCTION

Task Three of the Trip Characteristics Study of Multi-Use Developments involved the collection of traffic count data at each of the three selected study sites. Aerial photographs and field reconnaissance were used to establish count locations for each of the three sites. Site 1, known as Country Isles (see Figure III-1) is located in Broward County. Both Village Commons, Site 2 (see Figure III-2) and Boca Del Mar, Site 3 (see Figure III-3) are located in Palm Beach County.

Site configurations did not always lend themselves to perfect isolation of individual land uses. However, count locations were chosen so that each use, where possible, could be segregated from other uses within the site. These locations were numbered, color coded and placed on photocopies of aerial photographs. The Traffic Count Location maps were submitted to and subsequently approved by the FDOT Project Manager.

The numbers on the maps reflect only the last two digits of the count location number. The full location number includes a numerical prefix. For Country Isles, Site 1, a 1 was placed in front of all the location numbers (i.e. 101, 102, 103, etc.). Correspondingly, a 2 was used for Site 2, Village Commons (i.e. 201, 212, 216) and a 3 for Site 3, Boca Del Mar. (i.e. 302, 309, 314).

On the count location maps (Figures III - 1 to III - 3) two color schemes were used to denote the proposed equipment to be used at each count location. Yellow dots show where road tube counters were to be placed and orange dots indicate the proposed placement of wire loop counts. Actual field

Figure III - 1
Traffic Count Locations
Country Isles
Broward County

Orange: Wire Loop Count
Yellow: Road Tube Count



III - 2

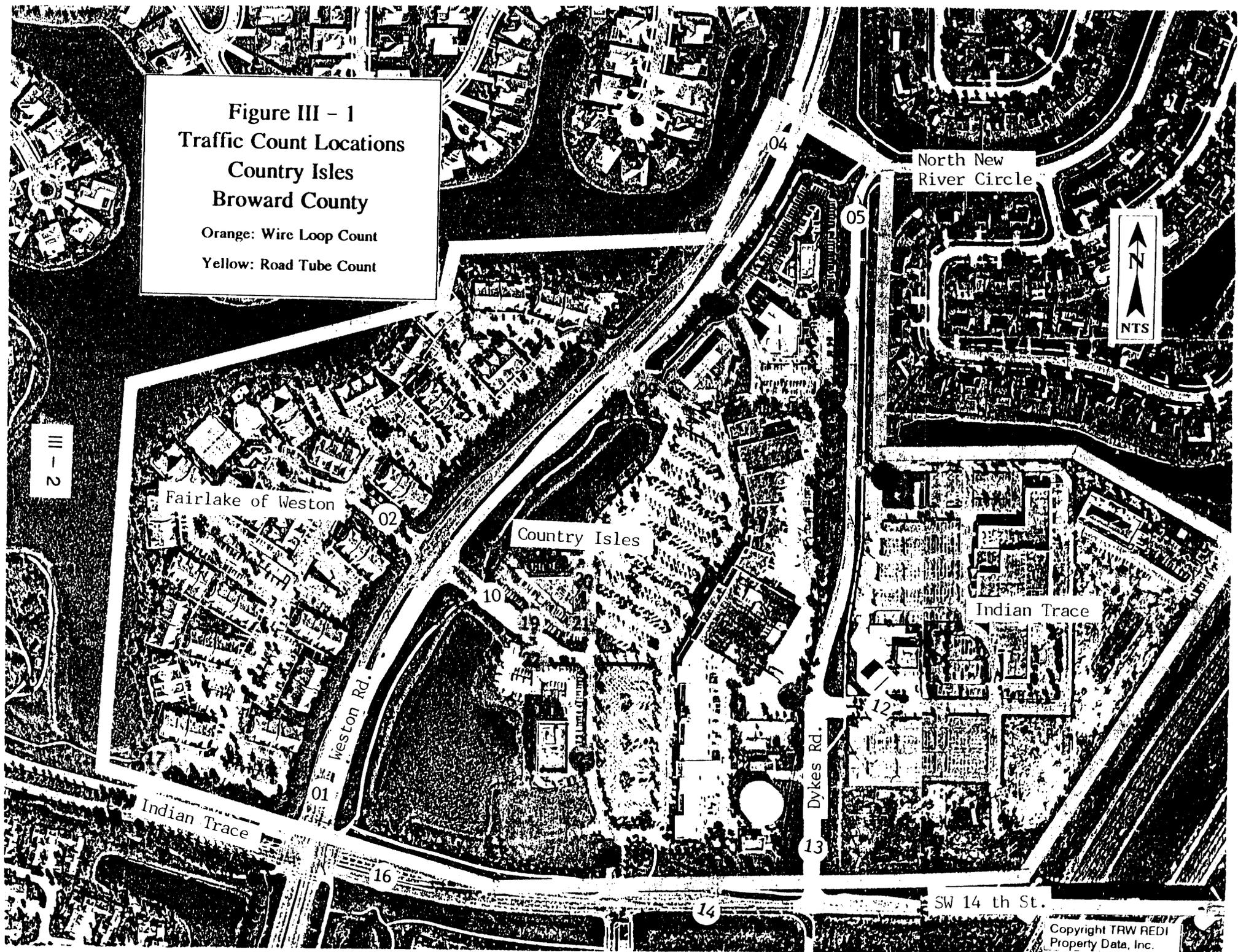


Figure III - 2
Traffic Count Locations
Village Commons
Palm Beach County

Orange: Wire Loop Count
Yellow: Road Tube Count

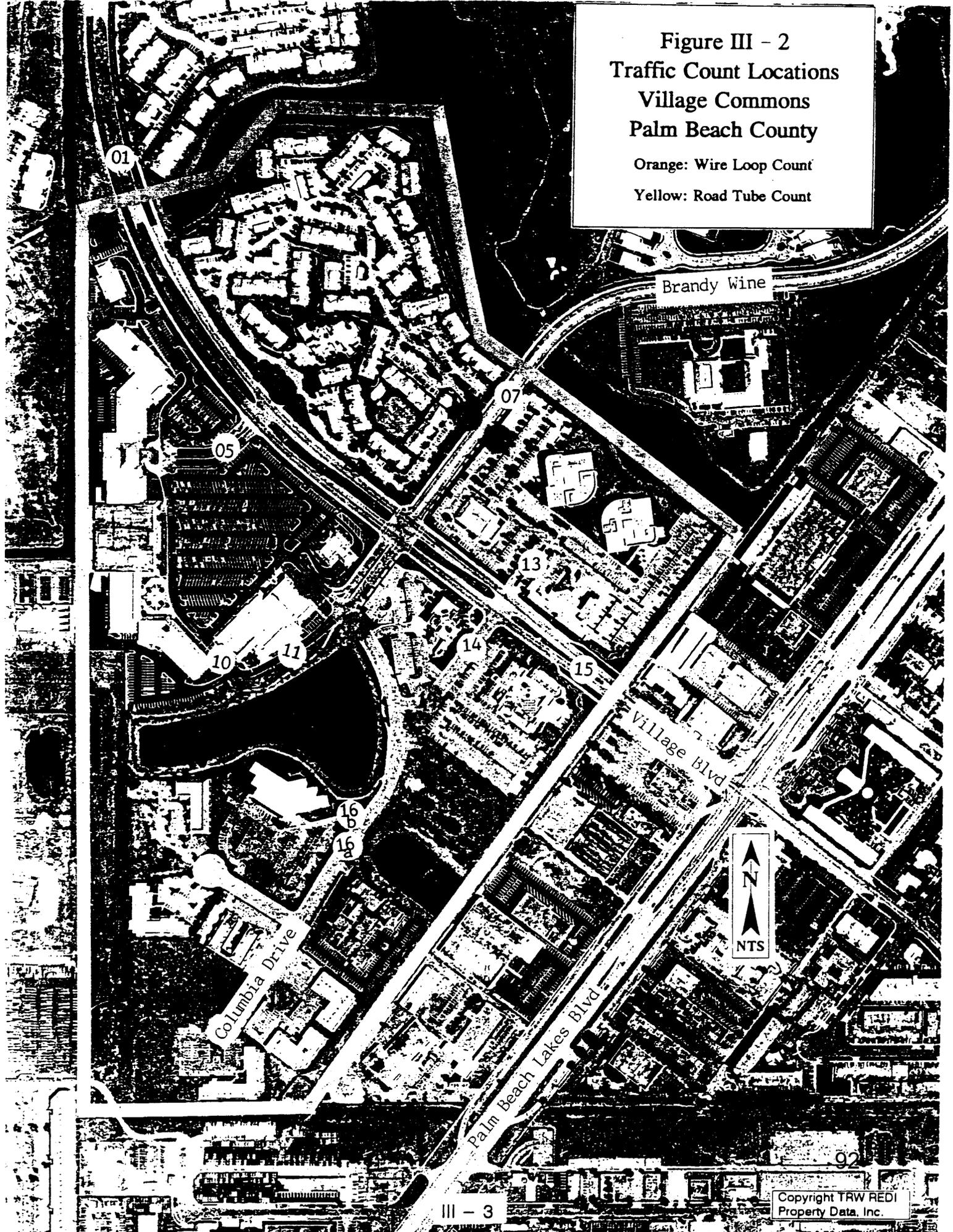




Figure III - 3
Traffic Count Locations
Boca Del Mar
Palm Beach County
 Orange: Wire Loop Count
 Yellow: Road Tube Count

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conditions made it necessary to make minor adjustments in counter placement (due to driveway locations and median openings) and type of counter (tube versus wire loop).

METHODOLOGY

Traffic counts were performed concurrently with the origin/destination interviews that were conducted for Task IV. Site 1, Country Isles, was counted from June 29 through July 1, 1993. Counts for Site 2, Village Commons, were performed from July 12 through July 15, 1993. The third site, Boca Del Mar, was counted from July 19 through July 22, 1993. Recounts of necessary locations were performed from August 16 through August 19, 1993.

The count locations at all sites were set in place during the weekend prior to the count dates, and retrieved on Thursday morning of the count week. By doing this, 24-hour counts, (at 15 minute intervals) were obtained for Monday, Tuesday and Wednesday of each week. Average Daily Traffic (ADT) was calculated from the results of these weekday counts. Perimeter counts were done at entry points to the site, (as defined by the green line on the maps), as well as at a variety of internal count locations.

Directional counts were attempted at every driveway where feasible to do so. Some driveways were undivided and it was observed that drivers did not drive in the proper "lane". Since this can cause double counting, only total volumes for these driveway locations were counted.

Traffic count data for each site was downloaded and analyzed. A directional comparison was made to determine the reasonableness of the count results, and to identify potential recount locations. Count locations were generally grouped by access points to the major site generators as illustrated by the orange site area boundaries in Figures II - 2, II - 5, II - 8a and II - 8b, and by the perimeter count locations of each site. Non-directional counts made at internal site buildings were assumed to have an equal distribution of incoming and outgoing trips. Non-directional counts made where there were multiple access points to a major site generator were adjusted by the incoming and outgoing directional

split of the nearest vehicle occupancy count within the site area boundary. Comparisons were made between inbound and outbound ADT for the three day count period. Discussions with representatives of the study sites and review of ITE study information for shopping centers indicated that seasonal adjustments to the internal and external traffic count data was not necessary because the studies occurred during average traffic generation time periods. While the In/Out Ratio can vary significantly between access points to the major site generator, theoretically, the Total In/Out Ratio for the sum of all access points to each area of the site, as well as the site as a whole, should approximate 1.0.

In an effort to reduce the possibility of having incorrect counter data due to counter errors, manual counts were conducted simultaneously with the machine counts both during the patron interview day and the day before the patron interviews. The manual counts were generally done for a 5 to 15 minute period and compared to the machine counts. Machine counters that were found functioning improperly were adjusted and/or reset, and manually verified again.

DATA REVIEW AND QUALITY CONTROL

The traffic count data was downloaded into raw count files which were used to create a 72 Hour Count Summary for each location. The count summaries were then grouped by site area within each site to review inbound/outbound ratios and to identify potential recount locations. Below is a summary, by site, of the recounted locations and results.

Country Isles - Site 1

A directional comparison of the Country Isles and Indian Trace Shopping Centers within Site 1 revealed an In/Out ratio of .83. The outbound volumes for counter Locations 106, 110, 115, for the Country Isles Shopping Center and 118 for the Indian Trace Shopping Center were considerably higher than the inbound volumes. One possible explanation for this was that the counter sensitivity needed to be further adjusted to compensate for the slow vehicular travel speeds. Therefore, all these locations, as well as Locations 109 and 112, were recounted. Counts at Locations 109 and 112 appeared reasonable

and were used as control stations. Table III-1, Summary of Site 1 Recounts, illustrates the recounted locations at Site 1.

Recounts of Locations 106, 109, 112, and 115 produced results similar to those initially obtained. A significant difference occurred at Location 110, where the recounted outbound volumes dropped by

FDOT Trip Characteristics Study of Multi-Use Developments						
Table III-1 Summary of Site 1 Recounts						
Location	Initial Count			Recount		
Country Isles	In	Out	Total	In	Out	Total
106	697	1037	1734	725	941	1666
109	2792	2887	5697	2998	2910	5908
110	2265	2915	5180	2225	2005	4230
115	1959	2429	4388	2054	2265	4319
Total	7713	9268	16981	8002	8121	16123
In/Out Ratio			.82			.99
Indian Trace	In	Out	Total	In	Out	Total
112	1528	1468	2996	1494	1245	2739
118	1056	1630	2686	1251	1476	2727
Total	2584	3098	5682	2745	2721	5466
In/Out Ratios			.83			1.01

approximately 900 trips. The recount at Location 118 balanced out more evenly than the original count, resulting in a In/Out ratio for the Indian Trace Shopping Center of 1.01.

A review of the control locations' (109 and 112) volumes indicates that the recount total volume of 8,647 compares very closely to the original count volume of 8,675. Therefore, no adjustment to the recounted volumes was necessary to account for date differences between the counts. Data from all recounts were used in the Summary of Traffic Count Data section.

Village Commons - Site 2

There were concerns with the imbalanced directional volumes (In/Out) at Locations 205, 212, 213, and 216A requiring them to be recounted. Count Location 216A was especially questionable. It counted a dead end road and the In/Out ratio should have been much nearer to 1.0 than the .29 that actually occurred. It was observed by several staff members that southbound traffic frequently hit both sets of hoses. Therefore, during the recount, the hoses were set with careful attention to minimize the possibility of dual counts. Count Location 202 also had to be recounted as a result of counter failure during the original count. Table III - 2, Summary of Site 2 Recounts, illustrates the recounted locations at Village Commons.

FDOT Trip Characteristics Study of Multi-Use Developments						
Table III-2 Summary of Site 2 Recounts						
Location	Initial Count			Recount		
	In	Out	Total	In	Out	Total
202	N/A	N/A	N/A	839	1349	2188
205	3106	2531	5637	3082	2488	5570
212	919	529	1448	941	534	1475
213	1463	1244	2707	1453	1436	2889
216A	810	1131	1941	733	784	1517

Note: N/A - not available due to counter failure.

The recounts indicated that the directional splits of the original counts were reasonable for Locations 205 and 212, while the recounts for Locations 213 and 216A indicated a more even directional split than initially achieved at these locations.

Since the original counts at Locations 205 and 212 produced similar results, they were used as a control to compare original and recounted total volumes. The recounted total volume of 7,045 for these two stations compares very closely to the original counted volume of 7,085. Therefore, no adjustment to account for date differences between the original and recounted volumes was necessary.

Based on the above comparison, the original count volumes for locations 205 and 212 were used, while the recounted volumes were used for 213 and 216A. The recounted volume for Location 202 was used due to the counter failure during the original count.

Boca Del Mar - Site 3

Review of directional volumes at this site did not reveal any major problems. However, several counts were lost as a result of rainfall and acts of vandalism. Locations 306, 313, 320, 322, 325, and 326 were recounted to replace lost counts. Stations 312, 317, and 319 were also reset as control locations. Table III - 3, Summary of Site 3 Recounts, illustrates the recounted locations at Boca Del Mar.

FDOT Trip Characteristics of Multi-Use Developments						
Table III - 3 Summary of Site 3 Recounts						
Location	Initial Count			Recount		
	In	Out	Total	In	Out	Total
306	N/A	N/A	N/A	825	1045	1870
312	2711	2439	5150	2766	2571	5337
313	N/A	N/A	N/A	115	115	230
317	2323	2633	4956	2281	2514	4795
319	1646	1511	3157	N/A	N/A	N/A
320	N/A	N/A	N/A	4715	4134	8849
322	N/A	N/A	N/A	68	68	136
325	N/A	N/A	N/A	189	189	378
326	N/A	N/A	N/A	753	753	1506

Note: N/A - not available due to counter failure.

All recounts were successful with the exception of control Location 319, which failed as a result of road tube breakage. The other control count Locations, 312 and 317, were compared to original counts in order to determine if an adjustment to the recounted volumes was necessary. The results indicate that the recounted total volume of 10,132 at the two remaining control count locations compares very closely to the original count total of 10,106 and therefore no adjustment to account for date differences between the original and recounted volumes was necessary. Thus, the traffic counts in the Summary of Traffic Count Data section reflect the results from the original counts except for recounted locations where the original count was lost (locations 306, 313, 320, 322, 325 and 326).

SUMMARY OF TRAFFIC COUNT DATA

Appendix A, 72 Hour Traffic Count Summary, contains the summarized traffic count forms for each location. These forms reflect the use of the recounted data as discussed in the Data Review and Quality Control Section. These forms are organized by site and location (station) number (i.e., 101, 205, 303, etc.), and include the raw data file name(s) that they were created from.

These summaries include count start dates and times, counter identification numbers, hour-ending totals for each day of the counts, daily totals, and averages of all three days both by hour and daily total. Also shown on the 72-hour Count Summary Form are the AM, Midday, and PM peak-hour volumes and starting times, the peak direction factors, 3 day averages and ranges of deviation. The range of deviation is compared to a general traffic count standard. Finally, each 72-hour Count Summary Form has a graph at the bottom which illustrates the number of vehicles per hour throughout the day by direction and total.

A Traffic Count Location Summary Table for each site, respectively titled Table III - 4 for Country Isles, Table III - 5 for Village Commons, and Table III - 6 for Boca Del Mar, summarizes key data from the 72-Hour Count Summary Forms including the location numbers and descriptions. Each table also includes a bi-directional summary of volumes and two-way volume totals (averaged over the three-day count period). Also shown in each table are the average A.M., midday and P.M. peak-hour

FDOT Trip Characteristics Study of Multi-Use Developments
Table III - 4 - Traffic Count Location Summary
Country Isles / Indian Trace - Site 1

Location Number	Location Description	Lane 1 Direction	Lane 2 Direction	Lane 1 Volumes	Lane 2 Volumes	Two-Way Total	AM Peak Hr	AM Pk Hr Vol	Mid-day Peak Hr	Mid-day Pk Hr Vol	PM Peak Hr	PM Pk Hr Vol
101	Weston Rd, N of Indian Trace	NB	SB	8515	7451	15966	07:45 AM	1186	11:40 AM	1116	05:05 PM	1301
102	FairLake of Weston, Main Entrance	WB	EB	578	653	1231	07:10 AM	104	12:35 PM	68	05:40 PM	126
103	FairLake of Weston, North Entrance	EB	WB	298	324	622	08:15 AM	42	01:15 PM	47	05:10 PM	66
104	Weston Rd, South of S. New River Circle	NB	SB	8304	6846	15150	07:55 AM	1033	11:55 AM	1049	05:00 PM	1226
105	Dykes Rd., S of South New River Circle	NB	SB	1695	1682	3377	07:55 AM	223	12:10 PM	253	05:10 PM	296
106	Country Isles, between McDonalds & Mobil	EB	WB	725	941	1666	08:50 AM	131	11:55 AM	188	03:15 PM	119
107	Country Isles, off Dykes Rd, near McDonalds	EB	WB	1596	0	1596	07:50 AM	130	11:55 AM	168	04:35 PM	118
108	Country Isles, near Great Western Office Bldg	EB	WB	2288	0	2288	09:15 AM	153	11:50 AM	187	05:00 PM	201
109	Country Isles, Entrance at S End of Mobil Stn	EB	WB	2998	2910	5908	09:20 AM	472	11:20 AM	476	03:35 PM	452
110	Country Isles, Main Entrance off Weston	EB	WB	2225	2005	4230	09:35 AM	300	11:55 AM	341	04:45 PM	401
111	Country Isles off Dykes, South Entrance	EB	WB	378	0	378	09:05 AM	41	12:20 PM	37	04:35 PM	37
112	Indian Trace, Main Entrance near Circle K	EB	WB	1494	1245	2739	08:05 AM	193	11:55 AM	203	04:40 PM	234
113	Dykes Rd, North of SW 14 th St	NB	SB	2520	2265	4794	07:30 AM	327	11:55 AM	368	05:10 PM	411
114	SW 14th St/Indian Trace, West of Dykes Rd	WB	EB	5171	4881	10032	07:50 AM	796	11:55 AM	655	05:00 PM	916
115	Country Isles, S Entrance off SW 14th St	NB	SB	2054	2265	4319	09:25 AM	250	12:10 PM	419	04:30 PM	395
116	SW 14th St/Indian Trace, East of Weston Rd	WB	EB	5578	5356	10934	07:50 AM	833	12:00 PM	721	05:05 PM	1012
117	FairLake of Weston, Indian Trace Ent	NB	SB	172	148	320	07:50 AM	16	12:10 PM	23	06:20 PM	42
118	Indian Trace, North Entrance	EB	WB	1251	1476	2727	09:10 AM	157	12:15 PM	206	05:10 PM	287
119	Sun Bank, SW Entrance	NB	SB	480	0	480	09:10 AM	45	11:35 AM	66	03:10 PM	44
120	Sun Bank Driveway, North Entrance	WB	EB	86	350	436	09:25 AM	44	12:20 PM	53	04:20 PM	47
121	Sunbank, South Entrance	WB	EB	158	104	262	09:35 AM	27	12:20 PM	43	03:30 PM	22
122	Glendale Federal, North Entrance	NB	SB	366	0	366	08:55 AM	40	12:55 PM	48	03:05 PM	43
123	Glendale Federal - 1 loop - SE Entrance	NB	SB	240	0	240	08:25 AM	27	11:50 AM	35	04:00 PM	22

FDOT Trip Characteristics Study of Multi-Use Developments
Table III – 5 – Traffic Count Location Summary
Village Commons / Brandywine – Site 2

Location Number	Location Description	Lane 1 Direction	Lane 2 Direction	Lane 1 Volumes	Lane 2 Volumes	Two-Way Total	AM Peak Hr	AM Pk Hr Vol	Mid-day Peak Hr	Mid-day Pk Hr Vol	PM Peak Hr	PM Pk Hr Vol
201	Village Blvd, North of Site	NB	SB	13276	13694	26971	07:40 AM	1849	12:30 PM	1935	04:55 PM	2452
202	VC, North Entrance off Village Blvd.	WB	EB	839	1349	2188	10:00 AM	154	12:15 PM	211	04:55 PM	178
203	VC, btwn Bank and Computer Store	NB	SB	1841	0	1841	09:45 AM	135	12:55 PM	184	04:45 PM	157
204	The Pointe, Village Blvd Entrance	EB	WB	494	419	913	07:40 AM	57	01:15 PM	58	04:55 PM	85
205	VC, Main Entrance, off Village Blvd	WB	EB	3106	2531	5637	09:50 AM	304	12:20 PM	482	05:25 PM	485
206	The Pointe Complex, Brandywine Entrance	NB	SB	519	674	1193	07:20 AM	110	11:50 AM	78	04:25 PM	111
207	Brandywine Blvd., East of Brandywine Site	WB	EB	4263	4096	8359	07:30 AM	652	12:15 PM	642	04:50 PM	863
208	Brandywine, Ent off Brandywine Bl - 1 loop, non	EB	WB	1475	0	1475	07:45 AM	92	12:20 PM	188	04:30 PM	126
209	Driveway, North of Brandywine	NB	SB	3122	2219	5341	10:00 AM	299	12:20 PM	501	05:05 PM	486
210	VC, Entrance in SW Corner	SB	NB	893	142	1035	09:40 AM	58	12:30 PM	118	04:55 PM	97
211	Brandywine Blvd, Behind Eckerds	EB	WB	1077	324	1400	09:40 AM	87	01:00 PM	149	04:50 PM	124
212	Columbia Drive, South of Brandywine	SB	NB	529	919	1448	07:45 AM	105	12:00 PM	174	04:15 PM	157
213	Brandywine, Entrance off Village Blvd	EB	WB	1453	1436	2889	08:40 AM	222	11:55 AM	379	04:10 PM	213
214	VC, In Front of Spa, West of Village Bl	WB	EB	2665	2363	5028	08:30 AM	299	12:10 PM	384	04:45 PM	454
215	Village Blvd, W of Palm Beach Lakes Blvd	WB	EB	11832	12318	24150	07:40 AM	1486	12:10 PM	1909	04:45 PM	2099
216A	Columbia Drive, S of G & J Entrance	SB	NB	733	784	1517	07:45 AM	144	12:25 PM	171	04:30 PM	160
216B	Gee & Jensen, East Entrance - 1 hose, non direc	SB	NB	486	0	486	07:20 AM	62	11:30 AM	74	04:45 PM	79
217	Gee & Jensen, South Entrance	NB	SB	52	0	52	09:15 AM	8	10:55 AM	10	04:25 PM	9
218	Driveway at End of Columbia Dr - 1 loop - non	NB	SB	334	0	334	07:50 AM	37	12:25 PM	36	04:50 PM	49
219	VC, In Front of Spa, W of Columbia Drive	WB	EB	1182	743	1925	07:40 AM	179	12:00 PM	198	04:20 PM	206

FDOT Trip Characteristics Study of Multi-Use Developments
Table III - 6 - Traffic Count Location Summary
Boca Del Mar - Site 3

Location Number	Location Description	Lane 1 Direction	Lane 2 Direction	Lane 1 Volumes	Lane 2 Volumes	Two-Way Total	AM Peak Hr	AM Pk Hr Vol	Mid-day Peak Hr	Mid-day Pk Hr Vol	PM Peak Hr	PM Pk Hr Vol
301	Boca Del Mar, West of Powerline	WB	EB	2406	1825	4231	07:50 AM	307	12:00 PM	301	05:05 PM	383
302	Camden Court Driveway	SB	NB	763	711	1474	07:25 AM	102	01:45 PM	106	05:20 PM	139
303	Montoya Circle, South of Boca Del Mar	SB	NB	1371	1259	2630	07:40 AM	204	01:30 PM	190	05:05 PM	244
304	Garden Shops Back Entrance, near Publix	EB	WB	193	0	193	08:55 AM	24	10:00 AM	22	04:00 PM	19
305	Garden Shops Back Entrance, South End	WB	EB	140	150	290	09:25 AM	28	11:45 AM	30	03:00 PM	25
306	Palms Plaza, Entrance off Powerline Rd E Site	WB	EB	825	1045	1870	09:40 AM	133	12:20 PM	217	03:10 PM	126
307	Main Entrance, W of Palms Plaza	WB	EB	3303	3216	6519	10:00 AM	407	12:50 PM	569	04:25 PM	539
308A	Garden Shops, One Way Loop	WB	EB	46	0	46	08:35 AM	6	11:45 AM	7	04:25 PM	7
308B	Garden Shops, One Way Loop	EB	WB	12	0	12	07:20 AM	2	10:20 AM	3	04:10 PM	3
309	Garden Shops, South East Entrance	EB	WB	3227	3053	6280	10:00 AM	383	12:30 PM	551	04:15 PM	554
310	Driveway Between Garden Shops & Bank Ctr	NB	SB	1089	756	1845	08:55 AM	126	12:15 PM	173	03:40 PM	134
311	Garden Shops, NE Entrance, near Barnett	WB	EB	1719	856	2575	08:50 AM	192	12:35 PM	265	03:35 PM	194
312	Main Entrance, S of Palmetto Park Rd	SB	NB	2711	2439	5150	08:25 AM	361	11:50 AM	453	04:05 PM	350
313	Garden Shops at Boca, West Entrance	NB	SB	230	0	230	09:20 AM	29	12:05 PM	31	03:50 PM	22
314	Driveway, in front of Bank	WB	EB	2426	1674	4100	10:00 AM	269	12:05 PM	384	04:20 PM	319
315	Scheaver Inc., Driveway	WB	EB	567	561	1128	10:00 AM	101	11:50 AM	130	03:30 PM	106
316	Montoya Circle, S of Palmetto Park Dr	SB	NB	1939	2656	4595	10:00 AM	318	12:15 PM	412	04:20 PM	354
317	Boca Del Mar Dr, S of Palmetto Park Dr	SB	NB	2323	2633	4956	08:00 AM	431	02:30 PM	339	05:05 PM	437
318	Montoya Circle, West of Boca Del Mar	EB	WB	1777	1650	3427	08:10 AM	292	12:50 PM	243	05:30 PM	296
319	Palm Plaza, North Entrance	SB	NB	1646	1511	3157	09:50 AM	175	12:00 PM	299	05:25 PM	277
320	East Entrance to Site, W of Powerline	EB	WB	4134	4715	8849	10:00 AM	510	12:50 PM	706	05:00 PM	663
321	Palms Plaza, West Entrance	NB	SB	1146	0	1146	09:50 AM	116	11:00 AM	132	03:00 PM	93
322	World Bank, East Entrance	NB	SB	136	0	136	09:00 AM	18	01:05 PM	29	03:10 PM	12
323	World Bank, West Entrance	NB	SB	21	0	21	09:15 AM	4	11:35 AM	5	03:00 PM	4
325	Barnett Bank - West (Ln 1) & Center (2)	NB	SB	225	153	378	09:30 AM	46	12:30 PM	49	04:15 PM	28
326	Barnett Bank, East Entrance	NB	SB	1506	0	1506	09:50 AM	162	12:45 PM	203	03:00 PM	103

volumes and corresponding time periods. Note, where counts were not directional, the total volume for the driveway was reported in the Lane 1 Volume column.

Traffic Count Directional Comparison tables were prepared for each site. These tables, labeled Table III-7 for Country Isles, Table III-8 for Village Commons, and Table III-9 for Boca Del Mar, reflect the use of the recounted data as recommended in the Data Review and Quality Control Section. Additionally, non-directional counts made at access points to major site generators were adjusted by the nearest directional split of the vehicle occupancy count used to adjust non-directional counts within the site area boundary. The vehicle occupancy location number and directional split, are illustrated in Tables III - 7, III - 8, and III - 9.

The daily traffic count totals for the major site generators of each study site were reviewed to determine the magnitude of the difference in counts by the day of the count. The results of this review are summarized in Table III - 10, Daily Comparison of Traffic Counts. The daily variation as a percent of the total site average count ranged from 0.4% at the Boca Del Mar site to 3.0% at the Country Isles site to 3.8% at the Village Commons site. The daily variation of the total of all three study sites as a percent of the three site average count was 2.0%. These daily variations as a percent of the total site average count indicate that there was minimal variation in traffic counts between Monday, Tuesday, and Wednesday. Two sites, Country Isles and Village Commons, had the highest counts on Monday, with the lowest counts on Tuesday. Boca Del Mar had the highest counts on Wednesday, with the lowest count on Monday. When the daily total counts of all three study sites are combined, Monday had the highest count and Tuesday had the lowest count.

The ITE Trip Generation, 5th Edition indicates that the average daily volume for a shopping center between 100,000 and 300,000 square feet for Monday, Tuesday and Wednesday is 99.7% of the average

FDOT Trip Characteristics Study of Multi-Use

Developments Table III - 7 - Traffic Count Directional Comparison

Country Isles/Indian Trace

Station Number	Veh. Occ. Loc. No.	Dir. Split % In % Out		In	Out	In / Out Ratio	Total
Country Isles - Commercial / Office							
106				725	941	0.77	1666
107 (Non-Dir)	106	53	47	846	750	1.13	1596
108 (Non-Dir)	106	53	47	1213	1075	1.13	2288
109				2998	2910	1.03	5908
110				2225	2005	1.11	4230
111 (Non-Dir)	106	53	47	200	178	1.13	378
115				2054	2265	0.91	4319
Totals:				10261	10124	0.99	20385
Indian Trace - Commercial							
112				1494	1245	1.20	2739
118				1251	1476	0.85	2727
Totals:				2745	2721	1.01	5466
Fairlake of Weston - Residential							
102				578	653	0.89	1231
103				324	298	1.09	622
117				172	148	1.16	320
Totals:				1074	1099	0.98	2173

FDOT Trip Characteristics Study of Multi-Use

Developments Table III - 7 - Traffic Count Directional Comparison (cont.)

Country Isles/Indian Trace

Station Number	Veh. Occ. Loc. No.	Dir. Split % In % Out		In	Out	In/Out Ratio	Total
Bank/Office North of Main Entrance - Internal Counts							
119 (Non-Dir)	104	55	45	264	216	1.00	480
120 ⁽²⁾				156	280	0.25	436
121				158	104	1.52	262
Totals:				578	600	0.96	1178
Bank/Office South of Main Entrance - Internal Counts							
122 (Non-Dir)				183	183	1.00	366
123 (Non-Dir)				120	120	1.00	240
Totals:				303	303	1.00	606
Site Perimeter Counts							
101				8515	7451	1.14	15966
104				6846	8304	0.82	15150
105				1682	1695	0.99	3377
113				2529	2265	1.12	4794
114				5171	4861	1.06	10032
116				5356	5578	0.96	10934
Totals:				30099	30154	1.00	60253

⁽²⁾ In and out counts were adjusted due to counting of inbound vehicles by the outbound wireloop. Heavy shrubbery next to inbound lane caused incoming vehicles to swing wide over the outbound wireloop.

FDOT Trip Characteristics Study of Multi-Use Developments

Table III - 8 Traffic Count Directional Comparison

Village Commons/Brandywine

Station Number	Veh. Occ. Loc. No.	Dir. Split % In % Out	In	Out	In / Out Ratio	Total
Village Commons - Commercial						
202			839	1349	0.62	2188
205			3106	2531	1.23	5637
209			3122	2219	1.41	5341
211			324	1077	0.30	1401
Totals:			7391	7176	1.03	14567
Brandywine - Office / Restaurant						
208 (Non-Dir)			708	767	0.92	1475
213			1453	1436	1.01	2889
Totals:			2161	2203	0.92	4364
The Pointe - Residential						
204			494	419	1.18	913
206			519	674	0.77	1193
Totals:			1013	1093	0.93	2106
Office - West Side of Columbia						
216B (Non-Dir)			243	243	1.00	486
217 (Non-Dir)			26	26	1.00	52
Totals:			269	269	1.00	538
Office - East Side of Columbia						
218 (Non-Dir)			167	167	1.00	334
Totals:			167	167	1.00	334

FDOT Trip Characteristics Study of Multi-Use Developments

Table III - 8 Traffic Count Directional Comparison (cont.)

Village Commons/Brandywine

Station Number	Veh. Occ. Loc. No.	Dir. Split		In	Out	In/Out Ratio	Total
		% In	% Out				
Site Perimeter Counts							
201				13694	13276	1.03	26970
207				4263	4096	1.04	8359
215				11832	12318	0.96	24150
Totals:				29789	29690	1.00	59479
Columbia Drive							
212				529	919	0.58	1448
216A				784	733	1.07	1517
Totals:				1313	1652	0.79	2965
Olympic Place							
214				2665	2363	1.13	5028
219				743	1182	0.63	1925
Totals:				3408	3545	0.96	6953
Miscellaneous Internal Counts							
203 (Non-Dir)				921	921	1.00	1841
210				142	893	0.16	1035
Totals:				1063	1814	0.59	2876

FDOT Trip Characteristics Study of Multi-Use Developments

Table III - 9 Traffic Count Directional Comparison

Boca Del Mar

Station Number	Veh. Occ. Loc. No.	Dir. Split % In % Out		In	Out	In/Out Ratio	Total
Garden Shops - Commercial							
304 (Non-Dir)				97	96	1.01	193
305				140	150	0.93	290
308A (Non-Dir - One Way)				23	23	1.00	46
308B (Non-Dir - One Way)				6	6	1.00	12
309				3053	3227	0.95	6280
311				1719	856	2.01	2575
313 (Non-Dir)				115	115	1.00	230
314				1674	2426	0.69	4100
Totals:				6827	6899	0.99	13726
Palms Plaza - Commercial							
306				825	1045	0.79	1870
319				1646	1511	1.09	3157
321 (Non-Dir)	325a	55	45	573	573	1.00	1146
Totals:				3101	3072	0.97	6173
Office West of Site							
315				567	561	1.01	1128
Totals:				567	561	1.01	1128
Montoya Circle - Residential							
303				1371	1259	1.09	2630
318				1650	1777	0.93	3427
Totals				3021	3036	1.00	6057

FDOT Trip Characteristics Study of Multi-Use Developments

Table III - 9 Traffic Count Directional Comparison (cont.)

Boca Del Mar

Station Number	Veh. Occ. Loc. No	Dir. Split		In	Out	In/Out Ratio	Total
		% In	% Out				
Camden Court - Residential							
302				763	711	1.07	1474
Totals:				763	711	1.07	1474
Site Perimeter Counts							
301				2406	1825	1.32	4231
312				2711	2439	1.11	5150
316				1939	2656	0.73	4595
317				2323	2633	0.88	4956
320				4715	4134	1.14	8849
Totals:				14094	13687	1.03	27781
Barnett Bank - Office							
325 (W1, C2)				189	189	1.00	378
326 (E)				753	753	1.00	1506
Totals:				942	942	1.00	1884
World Bank - Office							
322 (Non-Dir)				68	68	1.00	136
323 (1-Way SB)				11	10	1.10	21
Totals:				79	78	1.01	157
Miscellaneous Internal Counts							
307				3303	3216	1.03	6519
310				1089	756	1.44	1845
Totals:				4392	3972	1.11	8364

FDOT Trip Characteristics Study of Multi-Use Developments

Table III - 10 - Daily Comparison of Traffic Counts

Country Isles	Monday	Tuesday	Wednesday
Country Isles Shopping Ctr.	20,370	19,666	19,882
Indian Trace Shopping Ctr.	5,590	5,379	5,432
Fairlake at Weston Res.	2,086	2,169	2,268
TOTAL	28,046	27,214	27,582
3 Day Average 27,617 Range of Daily Variation 832 Range as a percent of average 3.0%			
Village Commons			
Village Commons Shopping Ctr.	14,767	14,282	14,652
Brandywine Site	4,518	4,246	4,321
Columbia Office	529	552	537
The Pointe Res.	2,138	2,052	2,126
TOTAL	21,952	21,132	21,636
3 Day Average 21,573 Range of Daily Variation 820 Range as a percent of average 3.8%			
Boca Del Mar			
Garden Shops at Boca	14,093	13,497	13,592
Palms Plaza	5,609	6,644	6,267
West Site Office Bldg.	1,111	1,164	1,115
Camden Court Res.	1,495	1,419	1,504
Montoya Circle Res.	6,184	5,852	6,133
TOTAL	28,492	28,576	28,611
3 Day Average 28,560 Range of Daily Variation 119 Range as a percent of average 0.4%			
TOTAL ALL SITES	78,490	76,922	77,829
TOTAL ALL SITES			
3 Day Average 77,747 Range of Daily Variation 1,568 Range as a percent of average 2.0%			

weekday volume. Thus, the average Monday, Tuesday and Wednesday volumes closely approximates the Monday through Friday average.¹ Review of these tables indicates very reasonable results in regards to typical In/Out Ratios for each site. The reasonableness of the traffic count results is further substantiated by the small range of daily variation and the fact that the ITE Trip Generation indicates that the Monday through Wednesday average daily volume closely approximates the weekday average for a shopping center. This data was used in Task Five, Analysis of Results, to develop trip generation rates by site and individual land uses.

¹ Institute of Transportation Engineers. Trip Generation. 5th Edition, Institute of Transportation Engineers, January 1991, pp. 1233

TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

INTERVIEWS AND RESULTS

INTRODUCTION

As part of Task One of this project, and as described in Chapter 1, three multi-use sites were selected. Task Four of the Trip Characteristics Study of Multi-use Developments involved collecting the following three types of data to determine the trip-making characteristics of each site: (1) vehicle occupancy counts; 2) pedestrian counts; and 3) origin/destination surveys.

Vehicle occupancy surveys were conducted to assist in the analysis of traffic counts and pedestrian data. In the Analysis of Results task, vehicle occupancy data was used to calculate trip generation by the Site Area Boundaries illustrated in Figures II - 2, II - 5, II - 8a and II - 8b. Pedestrian counts were collected to review and verify sample size requirements for the origin/destination surveys. Additionally, in the Analysis of Results task, the pedestrian and vehicle occupancy counts were used to develop data expansion factors that allow population inferences to be made about the internal capture rates of the study sites. Origin/destination interviews were conducted to collect three different types of information about each site. These were: (1) "macro" trip-making characteristics; (2) "micro" trip-making characteristics; and (3) trip length. "Macro" trip-making characteristics pertain to the characteristics of a trip to and from the site. These characteristics were used to categorize the trip as captured, primary, diverted or secondary. "Micro" trip-making characteristics pertain only to the part of the trip within the site. This information was used to determine the number of internally captured trips, the number of the trip stops within the site and the interaction between land uses. The length of the trip made to and from the site was used to calculate the percentages of trips originating or ending at various distances from the site.

The primary purpose of this chapter is to present a summary of the pedestrian and vehicle occupancy counts, and the origin/destination interviews. Detailed analysis of the data and results is presented in the Analysis and Results chapter of this report.

SITE DATA COLLECTION LOCATIONS

Origin/destination surveys, pedestrian counts, and vehicle occupancy counts were gathered for each of the sites. Data collection locations for vehicle occupancy counts were developed by reviewing the major access points to the Site Area Boundaries illustrated in Figures II - 2, II - 5, II - 8a, and II - 8b. Data collection locations for the pedestrian surveys were established based on review of the estimated ITE Trip Generation for the land uses within the site area boundaries and by visual observation of the site building locations. Similarly, the origin/destination survey locations were established based on the estimated ITE Trip Generation for the land uses within the site area boundaries and the need to obtain adequate surveys required for a 90% confidence level at 15% accuracy. Table IV - 1, Number of Survey Locations for Each Site, summarizes the number of survey locations for each type of data at each site.

FDOT Trip Characteristics of Multi-Use Developments			
Table IV - 1 Number of Survey Locations for Each Site			
Site	Origin/Destination Locations	Pedestrian Count Locations	Vehicle Occupancy Locations
Country Isles - Site 1	18	10	9
Village Commons -Site 2	14	14	7
Boca Del Mar - Site 3	20	14	7
TOTAL	52	38	23

The numbers on the following maps reflect only the last two digits of the vehicle occupancy, pedestrian and origin/destination survey location number. The full location number includes a numerical prefix. For Country Isles, Site 1, a 1 was placed in front of all the location numbers (i.e. 101, 102, 103, etc.).

Correspondingly, a 2 was used for Site 2, Village Commons (i.e. 201, 202, 203, etc.) and a 3 for Site 3, Boca Del Mar (i.e. 302, 309, 314).

The first site, surveyed on June 30, 1993, is located in Broward County, Florida. The site map is shown in Figure IV - 1, Interview and Count Locations, Country Isles, Broward County. This site is generally divided into three land uses: Fairlake at Weston (Residential land use), Country Isles (Retail, Office and Service land uses), and Indian Trace (Retail and Service land uses). The locations of the origin/destination surveys, pedestrian counts and vehicle occupancy counts performed at this site are also illustrated by Figure IV - 1.

The second site, surveyed on July 14, 1993, is located in Palm Beach County, Florida. The site map is shown in Figure IV - 2, Interview and Count Locations, Village Commons, Palm Beach County. This site is divided into Residential, Retail and Office land uses. The Residential land use is located in the northeast corner of the site. However, permission to conduct origin/destination surveys was not granted for the residential area and, as a result, no interviews were performed for the Residential land uses. Therefore, information concerning residential trips will be estimated from the residential interviews conducted at the other study sites. The retail area, known as Village Commons Shopping Center, is located in the northwest corner of the site. The Office land uses are located in the southern areas of the site. The locations of the origin/destination surveys, pedestrian counts and vehicle occupancy counts performed at this site are also illustrated by Figure IV - 2.

The third site, surveyed on July 21, 1993, is also located in Palm Beach County, Florida. The site map is shown in Figure IV - 3, Interview and Count Locations, Boca Del Mar, Palm Beach County. The Residential land uses are located to the west and south of Boca Del Mar Drive. The Office land uses are located on the northeast and northwest sides of the site. However, permission was not granted to conduct surveys at the corporate center located on the northeast side of the site. The Retail land uses are located to the north of Boca Del Mar Drive and include the Garden Shops at Boca and Palms Plaza Shopping Centers. The locations of the origin/destination surveys, pedestrian counts and vehicle occupancy counts performed at this site are also illustrated by Figure IV - 3.

Figure IV - 1

Interview & Count Locations

Country Isles

Broward County

Orange: Vehicle Occupancy Count

Yellow: Pedestrian Counts

Blue: Origin-Destination Interviews



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Figure IV - 2
Interview & Count Locations
Village Commons
Palm Beach County

Orange: Vehicle Occupancy Count

Yellow: Pedestrian Counts

Blue: Origin-Destination Interviews





Figure IV - 3
Interview & Count Locations
Boca Del Mar
Palm Beach County
 Orange: Vehicle Occupancy Count ¹¹⁸
 Yellow: Pedestrian Counts
 Blue: Origin-Destination Interviews

TYPES OF DATA COLLECTION

Three types of data were collected at each site: 1) Vehicle Occupancy Counts, 2) Pedestrian Counts and 3) Origin/Destination Surveys. Below is a discussion of each type of data.

Vehicle Occupancy Counts

Vehicle occupancy data was collected at the major entrance/exit locations of each site. The purpose of this data was to determine the average vehicle occupancy rates at the entrance/exit locations, the overall vehicle occupancy rate of each site, and the combined vehicle occupancy rate of all the surveyed sites.

A copy of the Vehicle Occupancy survey form is included in Appendix B, Sample Survey Forms. On this form the number of people in a vehicle was recorded for both incoming and outgoing traffic in 15 minute intervals. General site data such as date, site number, location number, location description, and interviewer name were also recorded on the form.

Pedestrian Counts

Pedestrian count data was collected at most locations where origin/destination surveys were conducted. The purpose of the pedestrian data was to develop survey sample rates to verify the adequacy of the sample size from a statistical perspective.

A copy of the Pedestrian Count form is also included in Appendix B. On this form, the number of pedestrians entering and exiting each business was recorded. The areas of each site were sectioned off to establish areas of responsibility for each pedestrian counter. This data was collected in 15 minute intervals. Basic site data such as date, site number, location number, location description, and interviewer name were also recorded on the form.

Origin/Destination Surveys

Origin/Destination surveys were conducted at multiple locations within each site in order to collect information about the trip-making characteristics of the land uses within each site. As was discussed in the Introduction to this chapter, the survey was designed to collect three types of information: 1) "macro" trip characteristics, 2) "micro" trip characteristics, and 3) trip length. To accomplish the collection of the data needed for the analysis, three different origin/destination survey forms were designed. The office and retail/services forms are very similar, each containing fourteen questions. The residential survey forms are divided into two different categories: one for incoming surveys and one for outgoing surveys. The office and retail survey forms included both incoming and outgoing person trip information on one form. Copies of the forms are included in Appendix B.

The survey included several questions asked of the interviewee to ascertain information about the trip to and from the site. These included: (1) the purpose of the visit; (2) mode of transportation; (3) information about the last stop, next stop and their location; (4) information concerning internal stops within the site; (5) zip code; and (6) whether the interviewee would have driven by the site if he/she had not stopped at the interview location. Table IV - 2, Types of Survey Responses, summarizes the typical responses coded on the various survey forms.

Collection of the above types of data enable information about the number of internal trips, type of trips (primary, diverted, captured or secondary) and length of trips to be developed. The resulting analysis is presented in the Analysis of Results chapter.

SURVEY TRAINING

In order to accomplish the collection of the vehicle occupancy, pedestrian and origin/destination survey data, a temporary labor pool was created. Each site required between 33 and 40 persons to collect the required data.

FDOT Trip Characteristics of Multi-Use Developments

Table IV - 2 - Types of Survey Responses

Trip Purpose	Trip Mode	Last Stop/Next Stop
Work	Car - Driver	Home
Visitor	Car - Passenger	Friend's Home
Courier	Car - Drop Off	Office
Delivery	Walk	Restaurant
Banking	Bicycle	Day care/School
Medical	Taxi	Convenience Store/Gas Station
Shop/Retail	Bus	Bank
Eat	Motorcycle	Movie Theater
Other	Other	Shop Retail
		Other

To create the labor pool, over 100 prospective interviewer applicants were screened through a Coding Aptitude Test. This test was intended to determine how accurately the applicant could follow directions and record various types of data. The test had 150 questions and each applicant had one hour to complete the test. A copy of the Coding Aptitude Test is presented in Appendix C, Coding Aptitude Test.

Paramount to the success of the data collection effort was the provision of adequate training to the temporary staff. To this end, a training manual was developed and provided to each selected temporary staff person. A copy of the training manual is included in Appendix D, Survey Training Manual. The training manual provides a brief overview of the entire survey and several guidelines on dealing with the public. The vehicle occupancy counts, pedestrian counts, and origin/destination surveys were explained in detail along with examples of each.

A three-hour training session was provided to each selected temporary staff member. A total of five sessions were required to train all temporary labor. The training session consisted of a review of the

training manual and a role-playing period with the training coordinators and prospective interviewers acting out the interview process. Time was allocated at the end of the session to answer questions.

SUMMARY OF SURVEY RESULTS

Vehicle Occupancy Counts

Appendix E, Vehicle Occupancy Counts, presents the vehicle occupancy count data for each survey location within the three study sites. This data is grouped by 15 minute increments for inbound, outbound and total vehicles. Additionally, an hourly summary is included for each location. Table IV - 3, Vehicle Occupancy Summaries, summarizes the vehicle occupancy data for all three sites. The vehicle occupancy rate for all three sites was calculated to be 1.28 persons per vehicle. The Country Isles site had the highest vehicle occupancy rate of 1.44 persons per vehicle and the Village Commons site had the lowest vehicle occupancy rate of 1.21 persons per vehicle. The Boca Del Mar site fell in between with an occupancy rate of 1.24 persons per vehicle.

Pedestrian Counts

Appendix F, Pedestrian Counts, presents the pedestrian count data for each survey location within the three study sites. This data is grouped by 15 minute intervals for incoming and outgoing pedestrians. Additionally, an hourly summary is included for each location. The pedestrian counts are summarized in Table IV - 4, Pedestrian Count Summaries. The Country Isles and Village Commons sites had slightly more pedestrians exiting than entering. This was expected since the pedestrian surveys were started at 9:00 AM and most employees had already arrived. The surveys ended at 6:30 PM and included the employees who were not counted in the morning, thus causing pedestrians to be counted exiting but not entering. The site at Boca Del Mar had several restaurants that attracted a large number of people entering in the evening before the survey ended at 6:30 PM. Since the surveys were completed before people exited the restaurants, the survey results at Boca Del Mar indicated a greater number of people entering than exiting. Overall, the results of the pedestrian summaries were reasonable. The total in/out ratio for the three sites was 0.98.

**FDOT Trip Characteristics Study of Multi-Use Developments
Table IV-3 - Vehicle Occupancy Summaries**

**Vehicle Occupancy Summary
Country Isles**

Location Number	In			Out			Total		
	Number Of Cars	Number Of People	Average	Number Of Cars	Number Of People	Average	Number Of Cars	Number Of People	Average
101	197	280	1.42	284	400	1.41	481	680	1.41
102a	62	84	1.35	49	70	1.43	111	154	1.39
103	719	990	1.38	690	915	1.33	1409	1905	1.35
104	707	931	1.32	572	784	1.37	1279	1715	1.34
106	347	488	1.41	313	451	1.44	660	939	1.42
107	848	1266	1.49	685	1000	1.46	1533	2266	1.48
129	742	1053	1.42	826	1152	1.39	1568	2205	1.41
134	721	1149	1.59	746	1226	1.64	1467	2375	1.62
135a	26	37	1.42	24	32	1.33	50	69	1.38
Totals									
CI	4172	5998	1.44	3905	5630	1.44	8077	11628	1.44

**Vehicle Occupancy Summary
Village Commons**

Location Number	In			Out			Total		
	Number Of Cars	Number Of People	Average	Number Of Cars	Number Of People	Average	Number Of Cars	Number Of People	Average
206	1772	2429	1.37	1355	1854	1.37	3127	4283	1.37
207	204	256	1.25	184	238	1.29	388	494	1.27
214	1639	1765	1.08	2194	2549	1.16	3833	4314	1.13
215a	234	269	1.15	249	290	1.16	483	559	1.16
215b	492	654	1.33	531	646	1.22	1023	1300	1.27
219	900	1036	1.15	836	940	1.12	1736	1976	1.14
223b	487	592	1.22	434	540	1.24	921	1132	1.23
223c	659	757	1.15	551	632	1.15	1210	1389	1.15
232b	115	134	1.17	177	206	1.16	292	340	1.16
Totals									
VC	6502	7892	1.21	6511	7895	1.21	13013	15787	1.21

**Vehicle Occupancy Summary
Boca Del Mar**

Location Number	In			Out			Total		
	Number Of Cars	Number Of People	Average	Number Of Cars	Number Of People	Average	Number Of Cars	Number Of People	Average
304a	218	313	1.44	193	256	1.33	411	569	1.38
306	933	1250	1.34	1346	1739	1.29	2279	2989	1.31
317	1997	2374	1.19	1645	1880	1.14	3642	4254	1.17
321	592	779	1.32	574	760	1.32	1166	1539	1.32
322a	364	484	1.33	476	579	1.22	840	1063	1.27
323	324	372	1.15	382	467	1.22	706	839	1.19
325a	756	988	1.31	503	619	1.23	1259	1607	1.28
Totals									
BDM	4428	5572	1.26	4616	5681	1.23	9044	11253	1.24

Three Site Summary

Location Number	In			Out			Total		
	Number Of Cars	Number Of People	Average	Number Of Cars	Number Of People	Average	Number Of Cars	Number Of People	Average
ALL SITES	15102	19462	1.289	15032	19206	1.278	30134	38668	1.28

**FDOT Characteristics Study of Multi-Use Developments
Table IV-4 – Pedestrian Count Summaries**

**Pedestrian Count Summary
Country Isles**

Location Number	In	Out	Total	In/Out
108	1018	989	2007	1.03
109	1196	1341	2537	0.89
110	1377	1293	2670	1.06
111	287	313	600	0.92
112	574	605	1179	0.95
113	452	660	1112	0.68
130	456	572	1028	0.80
131	586	446	1032	1.31
132	524	529	1053	0.99
136	355	342	697	1.04
TOTALS				
CI	6825	7090	13915	0.96

**Pedestrian Count Summary
Village Commons**

Location Number	In	Out	Total	In/Out
202	559	571	1130	0.98
204	906	926	1832	0.98
209	944	936	1880	1.01
212	161	180	341	0.89
218	421	495	916	0.85
222	367	505	872	0.73
223a	8	4	12	2.00
225	95	139	234	0.68
228	96	98	194	0.98
229	841	826	1667	1.02
230	1931	1941	3872	0.99
231	780	1088	1868	0.72
232a	12	15	27	0.80
234	351	93	444	3.77
TOTALS				
VC	7472	7817	15289	0.96

**FDOT Characteristics Study of Multi-Use Developments
Table IV-4 – Pedestrian Count Summaries (cont.)**

**Pedestrian Count Summary
Boca Del Mar**

Number	In	Out	Total	In/Out
302	271	234	505	1.16
304b	82	68	150	1.21
305	350	391	741	0.90
308	1021	1051	2072	0.97
311	315	337	652	0.93
313	1455	1532	2987	0.95
316	243	265	508	0.92
319	648	630	1278	1.03
322b	407	364	771	1.12
325b	331	234	565	1.41
326	468	372	840	1.26
229	255	244	499	1.05
331	575	513	1088	1.12
335a	17	16	33	1.06

TOTALS

BDM	6438	6251	12689	1.03
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Three Site Summaries

Location Number	In	Out	Total	In/Out
ALL	20735	21158	41893	0.98

Origin/Destination Surveys

Appendix G, Origin/Destination Surveys, presents the origin/destination survey data for each location within the three study sites. The retail/office surveys are shown first, followed by the residential surveys. Tables IV - 5 through IV - 7, Origin/Destination Summary, Country Isles, Village Commons, and Boca Del Mar, respectively, summarize the origin/destination interviews. Overall, 4,816 surveys were attempted, with 903 of those surveys being refusals. This resulted in an origin/destination acceptance rate of 81%.

SURVEY SAMPLE RATES

Survey sample rates were determined by comparing the number of surveys, less refusals, conducted to the total number of pedestrians entering and exiting. Table IV - 8, Survey Sample Rates by Site, presents the sample survey rates for each site and all three sites combined. The total trip-ends from the retail/office interviews (one interview contains two "macro" trip-ends) was divided by the total person trips made to determine the sample rates of the Office and Retail land uses. The total trip-ends from the residential interviews (one interview contains one "macro" trip-end) was divided by the traffic counts to determine the sample rate for the Residential land uses. As can be seen from this table, the overall survey rate was 15.6%. The site at Boca Del Mar had the best sample rate of 16.9%. Country Isles had the second best sample rate of 15.9% and Village Commons had the lowest sample rate of 14.0%. Individual land use survey rates ranged from a low of 12.9% for Retail at Village Commons to a high of 26.9% for the Residential land use at Country Isles.

CONCLUSIONS

The goal of the data collection effort was to obtain enough origin/destination surveys of Residential, Office and Retail land uses to meet the required confidence level and degree of accuracy. The binary form of the data is distributed as a binomial distribution. The survey sample size required to meet a set

**FDOT Trip Characteristics Study of Multi-Use Developments
 Table IV-5 - Origin/Destination Summaries
 Country Isles**

General Information				Interview Statistics		
Site	Date	# Location	Type	# of Interviews	Refusals	Total
Country Isles	30-Jun-93	102b	Residential-in	25	5	30
Country Isles	30-Jun-93	102b	Residential-out	33	4	37
Country Isles	30-Jun-93	114	Retail/Services	120	0	120
Country Isles	30-Jun-93	115	Retail/Services	60	0	60
Country Isles	30-Jun-93	116	Retail/Services	22	0	22
Country Isles	30-Jun-93	117	Retail/Services	62	0	62
Country Isles	30-Jun-93	118	Retail/Services	122	0	122
Country Isles	30-Jun-93	119/120	Retail/Services	9	1	10
Country Isles	30-Jun-93	120	Retail/Services	207	6	213
Country Isles	30-Jun-93	121	Retail/Services	16	0	16
Country Isles	30-Jun-93	122	Retail/Services	46	23	69
Country Isles	30-Jun-93	123	Retail/Services	33	0	33
Country Isles	30-Jun-93	124	Retail/Services	103	0	103
Country Isles	30-Jun-93	125	Office/Bank	110	38	148
Country Isles	30-Jun-93	126	Retail/Services	33	1	34
Country Isles	30-Jun-93	127	Office/Bank	47	2	49
Country Isles	30-Jun-93	128	Office/Bank	52	1	53
Country Isles	30-Jun-93	133	Residential-out	111	33	144
Country Isles	30-Jun-93	133	Residential-in	90	31	121
Country Isles	30-Jun-93	135b	Residential-out	24	0	24
Country Isles	30-Jun-93	135b	Residential-in	23	1	24
Totals				1,348	146	1,494

**FDOT Trip Characteristics Study of Multi-Use Developments
Table IV-6 - Origin/Destination Summaries
Village Commons**

Site	General Information			Interview Statistics		
	Date	Location #	Type	# of Interviews	Refusals	Total
Village Commons	14-Jul-93	201	Retail/Services	40	8	48
Village Commons	14-Jul-93	203	Retail/Services	64	0	64
Village Commons	14-Jul-93	205	Retail/Services	47	4	51
Village Commons	14-Jul-93	208	Retail/Services	260	8	268
Village Commons	14-Jul-93	210	Retail/Services	48	4	52
Village Commons	14-Jul-93	211	Retail/Services	225	65	290
Village Commons	14-Jul-93	213	Retail/Services	31	20	51
Village Commons	14-Jul-93	216	Office	57	9	66
Village Commons	14-Jul-93	217	Retail/Services	89	6	95
Village Commons	14-Jul-93	220	Retail/Services	48	0	48
Village Commons	14-Jul-93	221	Office	32	14	46
Village Commons	14-Jul-93	224	Office	49	0	49
Village Commons	14-Jul-93	226	Office	43	10	53
Village Commons	14-Jul-93	233	Office	33	10	43
Totals				1,066	158	1,224

**FDOT Trip Characteristics Study of Multi-Use Developments
Table IV-7 - Origin/Destination Summaries
Boca Del Mar**

Site	General Information			Interview Statistics		
	Date	Location #	Type	# of Interviews	Refusals	Total
Boca Del Mar	21-Jul-93	303	Office	94	4	98
Boca Del Mar	21-Jul-93	307	Retail/Services	97	98	195
Boca Del Mar	21-Jul-93	309	Retail/Services	57	42	99
Boca Del Mar	21-Jul-93	310	Retail/Services	141	220	361
Boca Del Mar	21-Jul-93	312	Retail/Services	123	13	136
Boca Del Mar	21-Jul-93	314	Retail/Services	47	32	79
Boca Del Mar	21-Jul-93	315	Retail/Services	21	15	36
Boca Del Mar	21-Jul-93	318	Retail/Services	35	60	95
Boca Del Mar	21-Jul-93	320	Retail/Services	52	19	71
Boca Del Mar	21-Jul-93	324	Retail/Services	38	1	39
Boca Del Mar	21-Jul-93	327	Retail/Services	51	0	51
Boca Del Mar	21-Jul-93	328	Retail/Services	48	16	64
Boca Del Mar	21-Jul-93	330	Retail/Services	38	3	41
Boca Del Mar	21-Jul-93	332	Retail/Services	27	1	28
Boca Del Mar	21-Jul-93	333	Residential-out	94	0	94
Boca Del Mar	21-Jul-93	333	Residential-in	96	0	96
Boca Del Mar	21-Jul-93	334	Retail/Services	66	0	66
Boca Del Mar	21-Jul-93	335b	Residential-in	165	8	173
Boca Del Mar	21-Jul-93	335b	Residential-out	79	5	84
Boca Del Mar	21-Jul-93	336	Retail/Services	22	39	61
Boca Del Mar	21-Jul-93	337	Retail/Services	38	23	61
Boca Del Mar	21-Jul-93	338	Retail/Services	70	0	70
Totals				1,499	599	2,098

**FDOT Trip Characteristics Study of Multi-Use Developments
Table IV-8 – Survey Sample Rates by Site**

Country Isles

Land Use	Number of Acceptable O/D	Number of Pedestrians	Counts	Sample Rates
Residential (1)	306		1136	26.9%
Office (2)	418	2081		20.1%
Retail (2)	1666	11834		14.1%
TOTALS	2390	13915	1136	15.9%

Village Commons

Land Use	Number of Acceptable O/D	Number of Pedestrians	Counts	Sample Rates
Residential (1)	(3)	(3)	(3)	(3)
Office (2)	428	2022		21.2%
Retail (2)	1704	13254		12.9%
TOTALS (4)	2132	15276	0	14.0%

Boca Del Mar

Land Use	Number of Acceptable O/D	Number of Pedestrians	Counts	Sample Rates
Residential (1)	434		2481	17.5%
Office (2)	188	741		25.4%
Retail (2)	1942	11948		16.3%
TOTALS	2564	12689	2481	16.9%

Three Site Summary

Land Use	Number of Acceptable O/D	Number of Pedestrians	Counts	Sample Rates
All (4)	7086	41880	3617	15.6%

- (1) Includes both incoming and outgoing vehicle trip end surveys.
- (2) Includes two trip ends; 1) the origin to the site and 2) the site to next destination.
- (3) No residential origin / destination surveys were conducted at Village Commons.
- (4) Sample rates were determined from only office and retail at Village Commons.

of tolerances can be estimated using a standard binomial sample statistic:

$$n = [Z_{\alpha/2} / E]^2 \hat{p}(1 - \hat{p})$$

where: Z is distributed as N(0,1)
 $\alpha/2$ is the rejection region for the two-tailed test
E is the maximum allowable error
 \hat{p} is the estimated population proportion
n is the required sample size.

As part of this project, the FDOT required a 90% confidence level and a maximum allowable error of 15%. Using these parameters, and assuming the worst case scenario ($\hat{p} = .5$), the sample size was determined to be 31. At a 10% maximum allowable error, the sample size required for a 90% level of confidence increases to 69. One final test of the sample size was made using the normal distribution. Assuming that the variance equals the mean (a very wide range of variance considered to be the worst case), the minimum sample size required for a 90% confidence level with a maximum allowable error of 15% is 121. Table IV - 8 indicates that the Residential, Office and Retail land uses surveyed at each site all exceeded the minimum sample size necessary to achieve the required confidence level within the maximum allowable error. Thus, the sample size for all three sites indicates that enough surveys were obtained to represent the total population at the desired confidence level.

TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

ANALYSIS OF RESULTS

INTRODUCTION

Vehicle Counts and Trip Generation

This section presents the trip generation analysis of the three study sites. This analysis includes: 1) the observed trip generation and associated rates by study area for the daily, and a.m., mid-day and p.m. peak hour periods of the adjacent streets; 2) two estimates of ITE trip generation - one using different rates for the various shopping land uses and one using only the shopping center land use rate; 3) a comparison of the ITE rates versus the observed study rates for the daily, and a.m. and p.m. peak hour of the adjacent street; 4) a review of vehicle occupancy and pedestrian data related to the observed traffic counts; and 5) a summary of the total trip generating characteristics of the three study sites.

Observed traffic counts were obtained at the three study sites. Each study site included at least one shopping center. Within each shopping center there were multiple land uses. While it was possible to subdivide the shopping center by land use to calculate an estimated trip generation using ITE trip generation rates, driveway locations precluded the collection of traffic count data at the land use level for the shopping centers. Where driveways to outparcels within the shopping center area could be segregated, traffic counts were obtained. This included banks and office outparcel land uses at two of the three sites.

Care must be taken when making comparisons between the observed trip generation and the ITE calculated trip generation. For the purposes of this study, two methods to compute the ITE trip generation were used. First, individual land uses at the shopping center were subdivided by appropriate ITE Land Use Code (LUC) and their associated trip generation was calculated based on the actual building sizes. Second, the total square footage of the shopping center component was used with the ITE trip generation equation to estimate the total trip generation of the shopping center. This latter

method produced significantly lower trip generation estimates since the ITE trip generation rate per 1,000 square feet goes down as the shopping center size increases.

A comparison was then made between the two ITE trip generation estimates and the observed trip generation. Additionally, the land use square footage was reviewed and the corresponding trip generation rate was calculated.

In addition to using the pedestrian counts to verify sample survey rates, they were also used to calculate the estimated person trips at each site. This was accomplished by dividing the pedestrian counts by the corresponding vehicle occupancy rate observed at the various site entrances. While this sounds practical in theory, it did not produce expected results for this study. The pedestrian counts at all three study sites generally produced lower trip generation estimates than the actual counted traffic volumes. After much review, it was determined that there are three primary reasons for this occurrence. First, all sites have varying combinations of fast food restaurant with drive-through, bank with drive-through and convenience market with gas pump (with automated credit card transaction capability) land uses. These land uses all have high trip generation rates, but do not generate high levels of pedestrian traffic. Second, each site had service roads or collectors segregating the various components of the site. The opportunity for pedestrian movement between the major site areas was limited by these roads bisecting the site. Most of the movement between the major site components was observed to be by car. Third, pedestrian counts were made at all the shopping centers and office complexes. However, pedestrian counts were not made at the service entrances to the rear of the shopping centers. The result of not counting these pedestrians has the effect of underestimating the trip generation because the total pedestrian count is divided by vehicle occupancy rate to estimate vehicle trip ends.

Finally, a comparison is presented of the three study sites for the shopping center, office and residential land use categories. Included within this comparison is the daily, and a.m., mid-day and p.m. peak hour trip generation rates and the percentage of the peak hour periods to the counted daily total traffic.

Origin/Destination, Vehicle Occupancy and Pedestrian Data

Analysis of the survey data required extensive data manipulation. A custom computer program written in the C-language was developed to perform this task. The program screens survey data to exclude responses that fail to fall within specified ranges. The program then tabulates data satisfying specified criteria. Tabular output from the program was then exported to spreadsheets for comparative and statistical analyses. Because the surveys were designed to collect several types of data simultaneously, the survey data could be used directly to compute statistics. For example, the number of internal trips made by residents can be measured directly.

Much of the analysis, however, required further manipulation of the data. In order to compute a total internal capture rate, the data must be expanded to represent the entire population. The response rate varied from area to area, and especially varied between the different land uses (residential, office, and commercial). Even with the intensive survey effort, it was impossible to estimate expansion factors for all of the separate land uses of interest. In particular, it was impossible to separate pedestrians in mixed retail areas. Therefore, different expansion factors were developed for each site (residential, office, and commercial land use categories) based on pedestrian counts, vehicle counts, and vehicle occupancy counts.

The basis for the expansions are the pedestrian estimates and vehicle counts summarized in Table IV - 8 of Chapter 4. In order to compare persons to persons, the vehicle count data for the residential locations were expanded by auto occupancy rates for the residential areas. The observed residential vehicle occupancy rates were 1.41 persons per vehicle in Country Isles and 1.27 persons per vehicle in Boca Del Mar. A weighted average of these two rates, 1.35 persons per vehicle, was used for Village Commons. Multipliers were then developed to expand the number of usable surveys for each of the major land use categories - residential, office, and commercial, so as to represent the population for each land use category. Because internal trips are counted at both the origin and destination end, the expanded factors were developed in an iterative process.

The expansion to total population was particularly challenging within the Village Commons site because origin-destination surveys were not permitted at the residential area. Internal trips with residential trip ends could not be fully coded, based solely on the office and commercial surveys. Therefore, Village Commons residential internal trips were estimated using Village Commons vehicle count data and average residential internal trip rates observed at the other two sites.

Traffic count data were used to delimit peak traffic periods. Two two-hour periods were identified: 12 noon to 2 p.m. the mid-day peak period, and 4 to 6 p.m. for the p.m. peak period. The noon time peak hour of traffic for all three sites was noon to 1 p.m., with a second highest hour of 1 - 2 p.m. for two of the three sites. The period from 4 - 6 p.m. was generally the highest for all sites, except that Boca Del Mar traffic was slightly higher from 2 - 3 p.m. and 3 - 4 p.m. than from 4 - 5 p.m..

Any variable that has a binary "yes" or "no" form is distributed as the binomial distribution. In this project, the variable "internal capture" is such a variable. Either a trip is pass-by capture or it is not. The survey sample size required to meet a set of tolerances can be estimated, for a binary response scale, using a standard binomial sample statistic. As discussed in Chapter 4, for a 90 percent confidence level ($\alpha/2 = 0.05$) with a maximum allowed error of 15 percent, the minimum sample size is 31. For a maximum allowed error of 10 percent, the minimum sample size is 69. These calculations assume that the response to the binary question is close to 0.5 (the "population proportion"), which is the worst-case for estimation error.

Variables that take on a continuous range of values generally are distributed close enough to the normal distribution for analytical purposes. Determination of a minimum sample size for determining a confidence interval for the mean (m) of a normally distributed variable depends on the variance (s). For a variable with a very wide variance equal to the mean (m), the minimum sample sizes would be 121 and 272 for the 15 percent and 10 percent maximum error cases at the 90 percent confidence level.

The larger sample sizes achieved in this project allow estimation of population means for many important subpopulations, and at a smaller level of error.

Trip Length and Pass-by Capture

The last chapter of this section discusses the analysis on trip length and pass-by capture. The trip length analysis involved classifying the trip into one of eight different categories: primary, secondary, diverted, pass-by capture, terminated, non-external, refusals and incompletes. Most of these categories are defined in the article "Measuring Travel Characteristics for Transportation Impact Fees"² and the remainder of the categories are defined in the last section of this chapter. Trip lengths were also recorded for each type of trip as defined in the above references. From the trip lengths, zones of influence were determined by showing the percentage of origins and destinations at certain radii from the site. Also, from this data, the percentage of all trips at the retail and office locations originating from within the sites were determined. In addition to trip length information, this chapter presents the findings related to pass-by capture.

VEHICLE COUNTS AND TRIP GENERATION RATES

Observed Site Trip Generation

ITE Trip Generation was reviewed to determine if an adjustment to the observed counts for seasonal variation should be made. The trip generation studies of the three survey sites occurred between June 29 and July 22, 1993. In the ITE Trip Generation, Table V, Monthly Variation in Shopping Center Traffic Percentage of Average Month³, indicates that July is 100.8 percent of the average month. Thus, for the shopping center land use, July is an average typical month for over 70 of the ITE shopping center studies. Since the shopping center land use accounted for a significant majority of the trip generation at all three of the study sites, no adjustment was determined to be necessary to the observed traffic counts.

² Tindale-Oliver and Associates, Inc. Measuring Travel Characteristics for Transportation Impact Fees. *Institute of Transportation Engineers Journal*. Institute of Transportation Engineers, April 1991, pps. 11-15.

³ Institute of Transportation Engineers. Trip Generation. 5th Edition, Institute of Transportation Engineers, January 1991, pp. 1233.

Table V - 1, Observed Daily, A.M., Mid-Day, and P.M. Peak Hour Trip Generation presents the observed traffic counts for all three study sites. This table illustrates the total square footage by study area location, the associated daily, and a.m., mid-day and p.m. peak hour trip generation and trip generation rates, the percentage of the total square footage of each study location and trip generation, and the total site trip generation for each site. Internal access traffic counts (for the two Bank/Office land uses of Country Isles and the two Bank land uses at Garden Shops at Boca) were subtracted from the external driveway traffic counts so as to avoid double counting. Table V - 1 indicates that in all sites, the shopping center land uses generate the greatest number of trips. Bank land uses also have high generation rates. Residential multi-family trip generation rates were consistent between all the sites, ranging from 5.9 to 7.8 trips per dwelling unit. The office trip generation rate at the Brandywine Center is high because, while the majority of the site land use is office, there is a sit-down restaurant and a drive-through bank contained within the site. These developments increased the Brandywine Center trip generation and associated generation rate. All observed trip generation rates generally fall within ITE study ranges except for the Country Isles Shopping Center (higher than ITE), the bank north of the main entrance at Country Isles (a.m. and p.m. peak hours lower than ITE), the Brandywine Center office complex (daily higher than ITE), and the bank on the west side of the Boca Del Mar site (lower than ITE).

ITE Estimated Trip Generation

Two estimates of trip generation and trip generation rates were developed using the ITE Trip Generation manual. One approach used the individual land uses and associated trip generation rates, while the second approach used an aggregated total of the shopping center square footage and the corresponding ITE trip generation equation to estimate trip generation. The total trip generation derived for each approach was adjusted based on the observed occupancy rates as discussed in Chapter Two. This adjustment allows a more accurate comparison to be made between the ITE estimated trip generation and the observed trip generation at each of the study sites.

FDOT Trip Characteristics Study of Multi-Use Developments

Table V-1 - Observed Daily, AM, Mid-day, and PM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	Daily			AM			Mid Day			PM		
			Observed Daily TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed AM Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed Mid Day Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed PM Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate
Country Isles	A-K	130,349	18,601	66.4%	142.7	1,028	61.6%	7.9	1,119	61.3%	8.6	1,373	63.1%	10.5
Bank/Office - North	L	9,999	1,178	4.2%	117.8	69	4.1%	6.9	139	7.6%	13.9	75	3.4%	7.5
Bank/Office - South	M	28,234	606	2.2%	21.5	45	2.7%	1.6	71	3.0%	2.5	44	2.0%	1.0
Indian Trace	O-S	64,096	5,466	19.5%	65.0	279	16.7%	3.3	395	21.6%	4.7	489	22.5%	5.6
Fairlake at Weston (1)	N	368	2,173	7.8%	5.9	248	14.9%	0.7	102	5.6%	0.3	194	6.9%	0.5
Total All			28,024	100.0%		1,669	100.0%		1,826	100.0%		2,175	100.0%	

Village Commons														
Study Area Description	Study Area Location (3)	Total Square Footage	Daily			AM			Mid Day			PM		
			Observed Daily TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed AM Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed Mid Day Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed PM Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate
Village Commons	A-H	170,740	14,567	66.5%	85.3	539	50.5%	3.2	1,298	64.0%	7.8	1,225	70.6%	7.2
Brandywine Center	M	131,970	4,364	19.9%	33.1	276	26.0%	2.1	529	26.1%	4.0	199	11.5%	1.5
Office, W. of Columbia	I	96,270	538	2.5%	5.6	66	6.2%	0.7	57	2.8%	0.6	82	4.7%	0.9
Office, E. of Columbia	K	27,314	334	1.5%	12.2	34	3.2%	1.2	32	1.6%	1.2	40	2.7%	1.7
Residential, The Pointe (1)	N	317	2,106	9.6%	6.6	151	14.1%	0.5	112	5.5%	0.4	163	10.5%	0.6
Total All			21,909	100.0%		1,068	100.0%		2,028	100.0%		1,735	100.0%	

Boca Del Mar														
Study Area Description	Study Area Location (4)	Total Square Footage	Daily			AM			Mid Day			PM		
			Observed Daily TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed AM Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed Mid Day Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate	Observed PM Pk Hr TG	Percent TG by Land Use of Total	Trip Generation Rate
Garden Shops at Boca	F-K	134,225	11,885	40.9%	87.1	502	34.5%	3.7	971	40.1%	7.2	965	45.0%	7.2
Bank - Northwest	B	2,201	157	0.5%	71.3	7	0.5%	3.2	21	0.9%	9.5	3	0.1%	1.4
Bank - Northeast	C	4,260	1,864	6.6%	442.3	102	7.0%	23.9	205	8.5%	48.1	71	3.9%	16.7
Palms Plaza	M-O	63,070	6,173	21.6%	97.0	214	14.7%	3.4	619	25.5%	9.8	403	18.8%	6.4
Office Building - West	A	114,881	1,128	3.9%	9.8	61	4.2%	0.5	127	5.2%	1.1	68	3.2%	0.6
Residential - Camden Court (1)	P	190	1,474	5.2%	7.8	83	5.7%	0.4	85	3.5%	0.4	122	5.7%	0.6
Residential - Monbaya Circle (1)	Q	954	6,057	21.2%	6.3	486	33.4%	0.5	395	16.3%	0.4	512	23.9%	0.5
Total All			28,558	100.0%		1,455	100.0%		2,423	100.0%		2,144	100.0%	

(1) Residential is measured by development units
 (2) From Figure II-3
 (3) From Figure II-6
 (4) From Figure II-9
 TTL TGCP WK3

Normally, ITE treats all uses within a shopping center as one shopping center land use. This may underestimate trip generation because many shopping centers include high generation land uses, such as restaurants, banks and supermarkets. Table V - 2, Individual Trip Generation Using ITE Land Uses - All Sites, treats the land uses separately to estimate the trip generation and rates for the three study sites. The ITE LUCs used to estimate trip generation include: restaurant, supermarket, office and shopping center. The total site daily trip generation ranges from 26,196 to 32,642. Ranges for the a.m. and p.m. peak hour time periods are 1,542 to 1,679 and 2,782 to 3,165 trips, respectively. All ITE trip generation estimates represents the number of trips expected at the external driveways.

Traffic impact analyses generally aggregate the individual shopping center land use square footage and use the ITE shopping center trip generation equation. The ITE Trip Generation manual discusses this methodology to estimate trip generation⁴. Table V - 3, Aggregated Trip Generation Using ITE Shopping Center Land Uses - All Sites, illustrates the aggregated method of calculating trip generation using the single shopping center land use code. Other ITE land use codes were used as appropriate for the office and outparcel buildings. The total site daily trip generation ranges from 16,997 to 23,263. This is significantly less than the total trips indicated in Table V - 2. Ranges for the a.m. and p.m. peak hours were also significantly lower.

Comparison of Observed to ITE Trip Generation Rates

Using the information contained in Tables V - 1, V - 2 and V - 3, a comparison was made between the observed and estimated ITE daily, and a.m. and p.m. peak hour trip generation and trip generation rates. Each of the three study sites has two comparison tables; one using individual ITE trip generation rates and one using the aggregated shopping center land use trip generation rate. Table V - 4, Comparison of Individual ITE Land Uses versus Observed Trip Generation Rates for Country Isles, and Table V - 5, Comparison of ITE Shopping Center Land Uses versus Observed Trip Generation Rates for Country Isles, presents the comparison of trip generation and trip generation rates for the Country Isles site. These tables indicate that the total observed daily, and a.m. and p.m. peak hour trip

⁴ Institute of Transportation Engineers. Trip Generation. 5th Edition, Institute of Transportation Engineers, January 1991, pps. 1230 and 1231.

FDOT Trip Characteristics Study of Multi-Use Developments

Table V-2 - Individual Trip Generation Using ITE Land Uses - All Sites

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	Daily			AM Peak Period			PM Peak Period		
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate
Country Isles	A-K	130,349	51.0%	16,593	57.3%	127.3	762	53.9%	6.0	1,649	55.9%	12.3
Bank/Office - North	L	9,999	4.0%	1,114	3.0%	111.4	53	3.7%	5.3	168	5.7%	76.3
Bank/Office - South	M	26,234	11.2%	1,534	5.3%	54.3	117	8.1%	4.1	249	8.4%	56.5
Indian Trace	O-S	64,066	33.3%	9,717	33.0%	115.5	499	34.4%	5.9	907	30.5%	14.4
Falllake at Weston (1)	N	366	N/A	2,110	N/A	5.7	166	N/A	0.5	162	N/A	0.5
Total - Residential		252,678	100.0%	28,958	100.0%		1,451	100.0%		2,973	100.0%	
Total All				31,068			1,617			3,165		

Village Commons												
Study Area Description	Study Area Location (3)	Total Square Footage	% Square Footage Land Use	Daily			AM Peak Period			PM Peak Period		
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated AM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated PM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate
Village Commons	A-H	170,740	40.1%	18,282	75.1%	107.1	788	58.4%	4.6	1,832	70.2%	10.7
Brandywine Center	M	131,970	31.0%	4,325	17.6%	32.8	373	26.7%	2.8	547	20.9%	4.1
Office, W. of Columbia	I	98,270	22.6%	1,254	5.2%	13.0	171	12.2%	1.8	168	6.4%	1.7
Office, E. of Columbia	K	27,314	6.4%	484	2.0%	17.7	64	4.0%	2.3	66	2.5%	2.4
Residential, The Points (1)	N	317	N/A	1,851	N/A	5.8	146	N/A	0.5	171	N/A	0.5
Total - Residential		426,294	100.0%	24,345	100.0%		1,396	100.0%		2,611	100.0%	
Total All				26,196			1,542			2,762		

Boca Del Mar												
Study Area Description	Study Area Location (4)	Total Square Footage	% Square Footage Land Use	Daily			AM Peak Period			PM Peak Period		
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated AM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated PM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate
Garden Shops at Boca	F-K	134,225	65.9%	13,535	55.0%	100.8	470	43.7%	3.5	1,190	50.6%	6.8
Bank - Northwest	B	2,201	1.1%	753	3.1%	342.1	23	2.1%	10.4	96	4.1%	43.6
Bank - Northeast	C	4,260	2.1%	1,062	4.4%	256.3	39	3.6%	9.2	166	6.0%	43.7
Palms Plaza	M-O	63,070	31.0%	6,153	33.1%	129.3	394	36.7%	6.2	725	31.1%	11.5
Office Building - West	A	114,861	56.4%	1,091	4.4%	9.5	149	13.9%	1.3	144	6.2%	1.3
Residential - Camden Court (1)	P	190	N/A	1,156	N/A	6.1	94	N/A	0.5	112	N/A	0.6
Residential - Montoya Circle (1)	Q	954	N/A	6,862	N/A	7.2	510	N/A	0.5	674	N/A	0.7
Total - Residential		316,837	156.4%	24,824	100.0%		1,075	100.0%		2,931	100.0%	
Total All				32,642			1,679			3,117		

(1) Residential is measured by development units
 (2) From Figure II-3
 (3) From Figure II-6
 (4) From Figure II-9
 ITEALLWK3

FDOT Trip Characteristics Study of Multi-Use Developments

Table V-3 - Aggregated Trip Generation Using ITE Shopping Center Land Uses - All Sites

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	Daily			AM Peak Period			PM Peak Period		
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated AM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated PM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate
Country Isles	A-K	130,349	51.6%	10,031	51.6%	77.0	477	45.6%	3.7	865	46.4%	6.4
Bank/Office - North	L	9,990	4.0%	221	1.1%	22.1	20	2.6%	2.0	31	1.7%	14.1
Bank/Office - South	M	28,234	11.2%	485	2.5%	17.2	64	6.1%	2.3	66	3.5%	15.5
Indian Tract	O-S	84,006	33.3%	6,711	44.8%	103.6	477	45.6%	5.7	903	48.4%	14.3
Fairlake at Weston (1)	N	368	N/A	2,110	N/A	5.7	166	N/A	0.5	192	N/A	0.0
Total - Residential		252,678	100.0%	19,448	100.0%		1,047	100.0%		1,865	100.0%	
Total All				21,558			1,213			2,057		

Country Isles

Village Commons

Study Area Description	Study Area Location (3)	Total Square Footage	% Square Footage Land Use	Daily			AM Peak Period			PM Peak Period		
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated AM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated PM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate
Village Commons	A-H	170,740	40.1%	9,083	60.0%	53.2	205	25.2%	1.2	849	52.1%	5.0
Brandywine Center	M	131,970	31.0%	4,325	28.6%	32.8	373	45.9%	2.8	547	33.6%	4.1
Office, W. of Columbia	I	96,270	22.6%	1,254	6.3%	13.0	171	21.0%	1.8	160	10.2%	1.7
Office, E. of Columbia	K	27,314	6.4%	484	3.2%	17.7	64	7.9%	2.3	66	4.1%	2.4
Residential, The Pointe (1)	N	317	N/A	1,851	N/A	5.8	148	N/A	0.5	171	N/A	0.5
Total - Residential		426,294	100.0%	15,146	100.0%		813	100.0%		1,628	100.0%	
Total All				16,997			959			1,798		

Boca Del Mar

Study Area Description	Study Area Location (4)	Total Square Footage	% Square Footage Land Use	Daily			AM Peak Period			PM Peak Period		
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated AM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated PM Pk Hr TG	% Daily TG by Land Use of Total	Trip Generation Rate
Garden Shops at Boca	F-K	134,225	65.9%	8,070	52.9%	60.1	184	37.2%	1.4	752	47.9%	5.6
Bank - Northwest	B	2,201	1.1%	753	4.9%	342.1	23	4.7%	10.4	96	6.1%	43.0
Bank - Northeast	C	4,260	2.1%	1,092	7.2%	256.3	39	7.9%	9.2	186	11.9%	43.7
Palms Plaza	M-O	63,070	31.0%	4,239	27.8%	67.2	96	20.0%	1.6	391	24.9%	6.2
Office Building - West	A	114,881	56.4%	1,091	7.2%	9.5	149	30.2%	1.3	144	9.2%	1.3
Residential - Camden Court (1)	P	190	N/A	1,156	N/A	6.1	94	N/A	0.5	112	N/A	0.6
Residential - Montoya Circle (1)	Q	954	N/A	6,802	N/A	7.2	510	N/A	0.5	674	N/A	0.7
Total - Residential		318,637	156.4%	15,245	100.0%		494	100.0%		1,569	100.0%	
Total All				23,263			1,098			2,355		

(1) Residential is measured by development units
 (2) From Figure II-3
 (3) From Figure II-6
 (4) From Figure II-9
 ITEALL WK3

FDOT Trip Characteristics Study of Multi-Use Developments

**Table V-5 - Comparison of Aggregated ITE Shopping Center Land Uses
versus Observed Trip Generation for Country Isles**

Comparison of Daily Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Observed Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate		
Country Isles	A-K	130,349	51.6%	10,031	51.6%	77.0	18601	72.0%	142.7	(8,570)	-85.4%
Bank/Office - North	L	9,999	4.0%	221	1.1%	22.1	1178	4.6%	117.8	(957)	-433.0%
Bank/Office - South	M	28,234	11.2%	485	2.5%	17.2	608	2.3%	21.5	(121)	-24.9%
Indian Trace	O-S	84,096	33.3%	8,711	44.8%	103.6	5466	21.1%	65.0	3,245	37.3%
Fairlake at Weston (1)	N	368	N/A	2,110	N/A	5.7	2173	N/A	5.9	(63)	-3.0%
Total - Residential		252,678	100.0%	19,448	100.0%		25,854	100.0%		(6,403)	-32.9%
Total All				21,558			28,024			(6,466)	-30.0%

Comparison of AM Peak Hour Trip Generation ↑

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated AM Pk Hr TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate	Observed AM Pk Hr TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Country Isles	A-K	130,349	51.6%	477	45.6%	3.7	1028	72.3%	7.9	(551)	-115.5%
Bank/Office - North	L	9,999	4.0%	29	2.8%	2.9	69	4.9%	6.9	(40)	-137.9%
Bank/Office - South	M	28,234	11.2%	64	6.1%	2.3	45	3.2%	1.6	19	29.7%
Indian Trace	O-S	84,096	33.3%	477	45.6%	5.7	279	19.6%	3.3	198	41.5%
Fairlake at Weston (1)	N	368	N/A	166	N/A	0.5	248	N/A	0.7	(82)	-49.4%
Total - Residential		252,678	100.0%	1,047	100.0%		1,421	100.0%		(456)	-43.6%
Total All				1,213			1,660			(538)	-44.4%

Comparison of PM Peak Hour Trip Generation ↑

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated PM Pk Hr TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate	Observed PM Pk Hr TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Country Isles	A-K	130,349	51.6%	865	46.4%	6.6	1373	69.3%	10.5	(508)	-58.7%
Bank/Office - North	L	9,999	4.0%	31	1.7%	3.1	75	3.8%	7.5	(44)	-141.9%
Bank/Office - South	M	28,234	11.2%	66	3.5%	2.3	44	2.2%	1.6	22	33.3%
Indian Trace	O-S	84,096	33.3%	903	48.4%	10.7	489	24.7%	5.8	414	45.8%
Fairlake at Weston (1)	N	368	N/A	192	N/A	0.5	194	N/A	0.5	(2)	-1.0%
Total - Residential		252,678	100.0%	1,865	100.0%		1,981	100.0%		(118)	-6.3%
Total All				2,057			2,175			(120)	-5.8%

(1) Residential is measured by development units
 (2) From Figure II-3
 citgcomp.wk3

FDOT Trip Characteristics Study of Multi-Use Developments

Table V-4 - Comparison of Individual ITE Land Uses versus Observed Trip Generation for Country Isles

Comparison of Daily Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Observed Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate		
Country Isles	A-K	130,349	51.6%	16,593	57.3%	127.3	18601	72.0%	142.7	(2,008)	-12.1%
Bank/Office - North	L	9,999	4.0%	1,114	3.8%	111.4	1178	4.6%	117.8	(64)	-5.7%
Bank/Office - South	M	28,234	11.2%	1,534	5.3%	54.3	606	2.3%	21.5	928	60.5%
Indian Trace	O-S	84,096	33.3%	9,717	33.6%	115.5	5466	21.1%	65.0	4,251	43.7%
Fairlake at Weston (1)	N	368	N/A	2,110	N/A	5.7	2173	N/A	5.9	(63)	-3.0%
Total - Residential		252,678	100.0%	28,958	100.0%		25,851	100.0%		3,107	10.7%
Total All				31,068			28,024			3,044	9.8%

Comparison of AM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated AM TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate	Observed AM TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Country Isles	A-K	130,349	51.6%	782	53.9%	6.0	1028	72.3%	7.9	(246)	-31.5%
Bank/Office - North	L	9,999	4.0%	53	3.7%	5.3	69	4.0%	6.9	(16)	-30.2%
Bank/Office - South	M	28,234	11.2%	117	8.1%	4.1	45	3.2%	1.6	72	61.5%
Indian Trace	O-S	84,096	33.3%	499	34.4%	5.9	279	19.6%	3.3	220	44.1%
Fairlake at Weston (1)	N	368	N/A	166	N/A	0.5	248	N/A	0.7	(82)	-49.4%
Total - Residential		252,678	100.0%	1,451	100.0%		1,421	100.0%		(52)	-3.6%
Total All				1,617			1,600			(134)	-8.3%

Comparison of PM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated PM TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate	Observed PM TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Country Isles	A-K	130,349	51.6%	1,649	55.5%	12.7	1373	69.3%	10.5	276	16.7%
Bank/Office - North	L	9,999	4.0%	168	5.7%	16.8	75	3.8%	7.5	93	55.4%
Bank/Office - South	M	28,234	11.2%	249	8.4%	8.8	44	2.2%	1.6	205	82.3%
Indian Trace	O-S	84,096	33.3%	907	30.5%	10.8	489	24.7%	5.8	418	46.1%
Fairlake at Weston (1)	N	368	N/A	192	N/A	0.5	194	N/A	0.5	(2)	-1.0%
Total - Residential		252,678	100.0%	2,973	100.0%		1,981	100.0%		990	33.3%
Total All				3,165			2,175			988	31.2%

(1) Residential is measured by development units

(2) From Figure II-3
citgcomp wk3

generation at Country Isles is higher than the corresponding trip generation estimates using the aggregated ITE trip generation rates. Only the total observed trip generation during the a.m. peak hour exceeds the ITE estimated trip generation using the individual ITE trip generation rates.

Table V - 6, Comparison of Individual ITE Land Uses versus Observed Trip Generation for Village Commons, and Table V - 7, Comparison of Aggregated ITE Shopping Center Land Uses versus Observed Trip Generation for Village Commons presents the comparison for the Village Commons site. These tables indicate that the total observed trip generation for daily, and a.m. and p.m. peak hours is less than the individual ITE estimated trip generation and higher than the ITE aggregated shopping center land use trip generation for the daily and a.m. peak hour.

Table V - 8, Comparison of Individual ITE Land Uses versus Observed Trip Generation for Boca Del Mar and Table V - 9, Comparison of Aggregated ITE Shopping Center Land Uses versus Observed Trip Generation for Boca Del Mar, indicate similar results as found at the Village Commons site. The total trip generation at the Boca Del Mar site is less than that calculated from the individual ITE land use rates and higher than the ITE aggregated shopping center land use trip generation for the daily and a.m. peak hour.

Analysis of Pedestrian Counts to Observed Traffic Counts

As stated in the introduction section of this chapter, pedestrian counts were contemplated to be used to estimate trip generation. The pedestrian count estimated trip generation was to be compared to actual observed traffic counts. However, once the pedestrian count data was reviewed, the generation of vehicle trips from the pedestrian data generally resulted in a lower trip generation than was actually observed. The only exception to this was the Village Commons Shopping Center p.m. peak period between 4 to 6 p.m. At this location, pedestrian generated vehicle counts were 104.6 percent of the actual observed vehicle counts. Table V - 10, Mid-Day Comparison of Observed Traffic versus Estimated Traffic Based on Person Trips - All Sites, and Table V - 11, P.M. Peak Period Comparison of Observed Traffic versus Estimated Traffic Based on Person Trips - All Sites, compares the observed vehicle counts to the estimated vehicle counts using the pedestrian counts divided by the observed

FDOT Trip Characteristics Study of Multi-Use Developments

Table V-6 - Comparison of Individual ITE Land Uses

versus Observed Trip Generation for Village Commons

Comparison of Daily Trip Generation

Study Area	Description (2)	Total Square Footage	% Square Footage Land Use	ITE		Study		Trip Generation Rate	% Daily TG by Land Use of Total	Trip Generation Rate	% Daily TG by Land Use of Total	Difference (ITE - Study) TG / ITE TG
				Estimated Daily TG	% Daily TG by Land Use of Total	Observed Daily TG	% Daily TG by Land Use of Total					
Village Commons	A-H	170,740	40.1%	18,282	75.1%	14,567	73.6%	85.3	73.6%	32.8	22.0%	33.1 (39)
Brandywine Center	M	131,970	31.0%	4,325	17.8%	4,364	22.0%	-0.9%	22.0%	71.0	57.1%	-0.9%
Office, W. of Columbia	I	96,270	22.6%	1,254	5.2%	538	2.7%	5.6	2.7%	150	31.0%	-13.8%
Office, E. of Columbia	K	27,314	6.4%	484	2.0%	334	1.7%	12.2	1.7%	4,542	18.7%	16.4%
Residential, The Pointe (1)	N	317	N/A	1,851	N/A	2108	N/A	6.6	N/A	21,909	100.0%	4,287
Total All		426,294	100.0%	24,345	100.0%	19,803	100.0%					

Comparison of AM Peak Hour Trip Generation

Study Area	Description (2)	Total Square Footage	% Square Footage Land Use	ITE		Study		Trip Generation Rate	% AM Peak Hr TG by Land Use of Total	Trip Generation Rate	% AM Peak Hr TG by Land Use of Total	Difference (ITE - Study) TG / ITE TG
				Estimated AM Peak Hr TG	% AM Peak Hr TG by Land Use of Total	Estimated AM Peak Hr TG	% AM Peak Hr TG by Land Use of Total					
Village Commons	A-H	170,740	40.1%	788	56.4%	539	58.8%	3.2	58.8%	2.8	30.3%	2.1
Brandywine Center	M	131,970	31.0%	373	26.7%	278	30.3%	2.1	30.3%	105	25.5%	0.7
Office, W. of Columbia	I	96,270	22.6%	171	12.2%	66	7.2%	0.7	7.2%	30	46.0%	1.2
Office, E. of Columbia	K	27,314	6.4%	64	4.6%	34	3.7%	1.2	3.7%	469	34.0%	0.5
Residential, The Pointe (1)	N	317	N/A	146	N/A	151	N/A	0.5	N/A	1,068	100.0%	0.5
Total All		426,294	100.0%	1,396	100.0%	817	100.0%					

Comparison of PM Peak Hour Trip Generation

Study Area	Description (2)	Total Square Footage	% Square Footage Land Use	ITE		Study		Trip Generation Rate	% PM Peak Hr TG by Land Use of Total	Trip Generation Rate	% PM Peak Hr TG by Land Use of Total	Difference (ITE - Study) TG / ITE TG
				Estimated PM Peak Hr TG	% PM Peak Hr TG by Land Use of Total	Estimated PM Peak Hr TG	% PM Peak Hr TG by Land Use of Total					
Village Commons	A-H	170,740	40.1%	1,832	70.2%	1,225	78.9%	7.2	78.9%	607	33.1%	3.9%
Brandywine Center	M	131,970	31.0%	547	20.9%	199	12.8%	1.5	12.8%	348	63.6%	0.9
Office, W. of Columbia	I	96,270	22.6%	166	6.4%	82	5.3%	0.9	5.3%	84	50.6%	0.9
Office, E. of Columbia	K	27,314	6.4%	66	2.5%	46	3.0%	1.7	3.0%	20	30.3%	0.6
Residential, The Pointe (1)	N	317	N/A	171	N/A	183	N/A	0.6	N/A	1,047	49.1%	0.6
Total All		426,294	100.0%	2,611	100.0%	1,552	100.0%					

(1) Residential is measured by development units

(2) From Figure II-6

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FDOT Trip Characteristics Study of Multi-Use Developments
Table V-7 - Comparison of Aggregated ITE Shopping Center Land Uses
verses Observed Trip Generation for Village Commons

Comparison of Daily Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate		
Village Commons	A-H	170,740	40.1%	9,083	60.0%	53.2	14567	73.6%	85.3	(5,484)	-60.4%
Brandywine Center	M	131,970	31.0%	4,325	28.6%	32.8	4364	22.0%	33.1	(39)	-0.9%
Office, W. of Columbia	I	96,270	22.6%	1,254	8.3%	13.0	538	2.7%	5.6	716	57.1%
Office, E. of Columbia	K	27,314	6.4%	484	3.2%	17.7	334	1.7%	12.2	150	31.0%
Residential, The Pointe (1)	N	317	N/A	1,851	N/A	5.8	2106	N/A	6.6	(266)	-13.8%
Total - Residential		426,294	100.0%	15,146	100.0%		19,803	100.0%		(4,657)	-30.7%
Total All				16,997			21,909			(4,912)	-28.9%

Comparison of AM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated AM Pk Hr TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate	Estimated AM Pk Hr TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Village Commons	A-H	170,740	40.1%	205	25.2%	1.2	539	58.8%	3.2	(334)	-162.9%
Brandywine Center	M	131,970	31.0%	373	45.9%	2.8	278	30.3%	2.1	95	25.5%
Office, W. of Columbia	I	96,270	22.6%	171	21.0%	1.8	66	7.2%	0.7	105	61.4%
Office, E. of Columbia	K	27,314	6.4%	64	7.9%	2.3	34	3.7%	1.2	30	46.9%
Residential, The Pointe (1)	N	317	N/A	146	N/A	0.5	151	N/A	0.5	(5)	-3.4%
Total - Residential		426,294	100.0%	813	100.0%		917	100.0%		(109)	-13.4%
Total All				959			1,068			(114)	-11.9%

Comparison of PM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated PM Pk Hr TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate	Estimated PM Pk Hr TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Village Commons	A-H	170,740	40.1%	849	52.1%	5.0	1225	78.9%	7.2	(376)	-44.3%
Brandywine Center	M	131,970	31.0%	547	33.6%	4.1	199	12.8%	1.5	348	63.6%
Office, W. of Columbia	I	96,270	22.6%	166	10.2%	1.7	82	5.3%	0.9	84	50.6%
Office, E. of Columbia	K	27,314	6.4%	66	4.1%	2.4	46	3.0%	1.7	20	30.3%
Residential, The Pointe (1)	N	317	N/A	171	N/A	0.5	183	N/A	0.6	(12)	-7.0%
Total - Residential		426,294	100.0%	1,628	100.0%		1,552	100.0%		64	3.9%
Total All				1,799			1,735			52	2.9%

(1) Residential is measured by development units
(2) From Figure II-6
vctgcomp.wk3

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FDOT Trip Characteristics Study of Multi-Use Developments

Table V-8 - Comparison of Individual ITE Land Uses versus Observed Trip Generation for Boca Del Mar

Comparison of Daily Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Observed Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate		
Garden Shops at Boca	F-K	134,225	42.1%	13,535	55.0%	100.8	11685	55.0%	87.1	1,850	13.7%
Bank - Northwest	B	2,201	0.7%	753	3.1%	342.1	157	0.7%	71.3	596	79.2%
Bank - Northeast	C	4,260	1.3%	1,092	4.4%	256.3	1884	9.0%	442.3	(792)	-72.5%
Palms Plaza	M-O	63,070	19.8%	8,153	33.1%	129.3	6173	29.4%	97.9	1,980	24.3%
Office Building - West	A	114,881	36.1%	1,091	4.4%	9.5	1128	5.4%	9.8	(37)	-3.4%
Residential - Camden Court (1)	P	190	N/A	1,156	N/A	6.1	1474	N/A	7.8	(318)	-27.5%
Residential - Montoya Circle (1)	Q	954	N/A	6,802	N/A	7.2	6057	N/A	6.3	805	11.7%
Total - Residential		318,637	100.0%	24,624	100.0%		21,927	100.0%		3,597	14.6%
Total All				32,642			28,558			4,084	12.5%

Comparison of AM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated AM Pk Hr TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate	Observed AM Pk Hr TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Garden Shops at Boca	F-K	134,225	42.1%	470	43.7%	3.5	502	56.7%	3.7	(32)	-6.8%
Bank - Northwest	B	2,201	0.7%	23	2.1%	10.4	7	0.8%	3.2	16	69.0%
Bank - Northeast	C	4,260	1.3%	39	3.6%	9.2	102	11.5%	23.9	(63)	-161.6%
Palms Plaza	M-O	63,070	19.8%	394	36.7%	6.2	214	24.2%	3.4	180	45.7%
Office Building - West	A	114,881	36.1%	149	13.9%	1.3	61	6.9%	0.5	88	59.1%
Residential - Camden Court (1)	P	190	N/A	94	N/A	0.5	83	N/A	0.4	11	11.7%
Residential - Montoya Circle (1)	Q	954	N/A	510	N/A	0.5	486	N/A	0.5	24	4.7%
Total - Residential		318,637	100.0%	1,075	100.0%		886	100.0%		189	17.6%
Total All				1,679			1,455			224	13.3%

Comparison of PM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated PM Pk Hr TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate	Observed PM Pk Hr TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Garden Shops at Boca	F-K	134,225	42.1%	1,180	50.6%	8.8	965	63.9%	7.2	215	18.2%
Bank - Northwest	B	2,201	0.7%	96	4.1%	43.6	3	0.2%	1.4	93	96.9%
Bank - Northeast	C	4,260	1.3%	186	8.0%	43.7	71	4.7%	16.7	115	61.8%
Palms Plaza	M-O	63,070	19.8%	725	31.1%	11.5	403	26.7%	6.4	322	44.4%
Office Building - West	A	114,881	36.1%	144	6.2%	1.3	68	4.5%	0.6	76	52.8%
Residential - Camden Court (1)	P	190	N/A	112	N/A	0.6	122	N/A	0.6	(10)	-8.9%
Residential - Montoya Circle (1)	Q	954	N/A	674	N/A	0.7	512	N/A	0.5	162	24.0%
Total - Residential		318,637	100.0%	2,331	100.0%		1,610	100.0%		821	35.2%
Total All				3,117			2,144			973	31.2%

(1) Residential is measured by development units
 (2) From Figure II-9
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FDOT Trip Characteristics Study of Multi-Use Developments

Table V-9 - Comparison of Aggregated ITE Shopping Center Land Uses
versus Observed Trip Generation for Boca Del Mar

Comparison of Daily Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate	Observed Daily TG	% Daily TG by Land Use of Total	Trip Generation Rate		
Garden Shops at Boca	F-K	134,225	42.1%	8,070	52.9%	60.1	11,685	55.6%	87.1	(3,615)	-44.8%
Bank - Northwest	B	2,201	0.7%	753	4.9%	342.1	157	0.7%	71.3	596	79.2%
Bank - Northeast	C	4,260	1.3%	1,092	7.2%	256.3	1,884	9.0%	442.3	(792)	-72.5%
Palms Plaza	M-O	63,070	19.8%	4,239	27.8%	67.2	6,173	29.4%	97.9	(1,934)	-45.6%
Office Building - West	A	114,881	36.1%	1,091	7.2%	9.5	1,128	5.4%	9.8	(37)	-3.4%
Residential - Camden Court (1)	P	190	N/A	1,156	N/A	6.1	1,474	N/A	7.8	(318)	-27.5%
Residential - Montoya Circle (1)	Q	954	N/A	6,862	N/A	7.2	6,057	N/A	6.3	805	11.7%
Total - Residential		318,637	100.0%	15,245	100.0%		21,027	100.0%		(5,782)	-37.9%
Total All				23,263			28,558			(5,295)	-22.8%

Comparison of AM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated AM Pk Hr TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate	Observed AM Pk Hr TG	% AM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Garden Shops at Boca	F-K	134,225	42.1%	184	37.2%	1.4	502	56.7%	3.7	(318)	-172.8%
Bank - Northwest	B	2,201	0.7%	23	4.7%	10.4	7	0.8%	3.2	16	69.6%
Bank - Northeast	C	4,260	1.3%	39	7.9%	9.2	102	11.5%	23.9	(63)	-161.5%
Palms Plaza	M-O	63,070	19.8%	99	20.0%	1.6	214	24.2%	3.4	(115)	-116.2%
Office Building - West	A	114,881	36.1%	149	30.2%	1.3	61	6.9%	0.5	88	59.1%
Residential - Camden Court (1)	P	190	N/A	94	N/A	0.5	83	N/A	0.4	11	11.7%
Residential - Montoya Circle (1)	Q	954	N/A	510	N/A	0.5	486	N/A	0.5	24	4.7%
Total - Residential		318,637	100.0%	494	100.0%		886	100.0%		(392)	-79.4%
Total All				1,098			1,455			(357)	-32.5%

Comparison of PM Peak Hour Trip Generation

Study Area Description	Study Area Location (2)	Total Square Footage	% Square Footage Land Use	ITE			Study			Difference ITE - Study TG	% Difference (ITE - Study) TG / ITE TG
				Estimated PM Pk Hr TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate	Observed PM Pk Hr TG	% PM Pk Hr TG by Land Use of Total	Trip Generation Rate		
Garden Shops at Boca	F-K	134,225	42.1%	752	47.9%	5.6	965	63.0%	7.2	(213)	-28.3%
Bank - Northwest	B	2,201	0.7%	96	6.1%	43.6	3	0.2%	1.4	93	96.9%
Bank - Northeast	C	4,260	1.3%	186	11.9%	43.7	71	4.7%	16.7	115	61.8%
Palms Plaza	M-O	63,070	19.8%	391	24.9%	6.2	403	26.7%	6.4	(12)	-3.1%
Office Building - West	A	114,881	36.1%	144	9.2%	1.3	68	4.5%	0.6	76	52.8%
Residential - Camden Court (1)	P	190	N/A	112	N/A	0.6	122	N/A	0.6	(10)	-8.9%
Residential - Montoya Circle (1)	Q	954	N/A	674	N/A	0.7	512	N/A	0.5	162	24.0%
Total - Residential		318,637	100.0%	1,569	100.0%		1,510	100.0%		59	3.8%
Total All				2,355			2,144			211	9.0%

(1) Residential is measured by development units

(2) From Figure II-9

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Table V-10 – Mid-day Comparison of Observed Traffic verses Estimated Traffic Based on Person Trips – All Sites

Country Isles

Study Area Description	Study Area Location (2)	Observed Traffic Count	Vehicle Occupancy Survey Results			Observed Pedestrian Count	Estimated Traffic Count (Ped Count / Veh Occ Rate)	Percent Estimated Count to Obser'd Count
			Counted Cars	Counted People	Vehicle Occupancy Rate			
Country Isles	A-K	2,850	1,657	2,168	1.31	2,417	1,847	64.8%
Bank/Office – North	L	271	N/A	N/A	N/A	195	149	55.0%
Bank/Office – South	M	130	N/A	N/A	N/A	93	71	54.7%
Indian Trace	O-R	733	676	1,023	1.51	877	580	79.1%
Fairlake at Weston (1)	N	211	192	276	1.44	N/A	N/A	N/A
Total Less Residential		3,984	2,333	3,191	1.37	3,582	2,647	66.4%

Village Commons

Study Area Description	Study Area Location (3)	Observed Traffic Count	Vehicle Occupancy Survey Results			Observed Pedestrian Count	Estimated Traffic Count (Ped Count / Veh Occ Rate)	Percent Estimated Count to Obser'd Count
			Counted Cars	Counted People	Vehicle Occupancy Rate			
Village Commons	A-H	2,485	1,524	2,001	1.31	3,039	2,315	93.1%
Brandywine Center	M	1,036	991	1,207	1.22	1,157	881	85.1%
Office, W. of Columbia	I	120	N/A	N/A	N/A	N/A	N/A	0.0%
Office, E. of Columbia	K	59	N/A	N/A	1.17	53	45	76.8%
Residential, The Pointe (1)	N	212	81	112	1.38	N/A	N/A	N/A
Total Less Residential		3,700	2,515	3,208	1.28	4,249	3,241	87.6%

Boca Del Mar

Study Area Description	Study Area Location (4)	Observed Traffic Count	Vehicle Occupancy Survey Results			Observed Pedestrian Count	Estimated Traffic Count (Ped Count / Veh Occ Rate)	Percent Estimated Count to Obser'd Count
			Counted Cars	Counted People	Vehicle Occupancy Rate			
Garden Shops at Boca	F-L	1,909	1,662	2,068	1.24	2,312	1,858	97.3%
Bank – Northwest	B	42	N/A	N/A	N/A	N/A	N/A	N/A
Bank – Northeast	C	435	N/A	N/A	N/A	N/A	N/A	N/A
Palms Plaza	M-O	1,170	339	440	1.17	895	765	55.4%
Office Building – West	A	230	155	212	1.37	241	176	76.6%
Residential – Camden Court (1)	P	168	N/A	N/A	1.24	10	8	4.8%
Residential – Montoya Circle (1)	Q	771	N/A	N/A	N/A	N/A	N/A	N/A
Total Less Residential and Banks		3,309	2,156	2,720	1.26	3,448	2,799	84.6%

- (1) Residential is measured by development units
- (2) From Figure II – 3
- (3) From Figure II – 6
- (4) From Figure II – 9

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FDOT Trip Characteristics Study of Multi-Use Developments

Table V-11 – PM Peak Period Comparison of Observed Traffic verses Estimated Traffic Based on Person Trips – All Sites

Country Isles

Study Area Description	Study Area Location (2)	Observed Traffic Count	Vehicle Occupancy Survey Results			Observed Pedestrian Count	Estimated Traffic Count (Ped Count / Veh Occ Rate)	Percent Estimated Count to Obser'd Count
			Counted Cars	Counted People	Vehicle Occupancy Rate			
Country Isles	A-K	2,708	N/A	N/A	1.40	2,131	1,522	56.2%
Bank/Office – North	L	160	N/A	N/A	N/A	107	76	47.8%
Bank/Office – South	M	80	N/A	N/A	N/A	54	39	48.2%
Indian Trace	O-R	911	899	1,386	1.54	1,025	665	73.0%
Fairlake at Weston (1)	N	338	172	224	1.30	N/A	N/A	N/A
Total Less Residential		3,859	899	1,386	1.54	3,317	2,302	59.7%

Village Commons

Study Area Description	Study Area Location (3)	Observed Traffic Count	Vehicle Occupancy Survey Results			Observed Pedestrian Count	Estimated Traffic Count (Ped Count / Veh Occ Rate)	Percent Estimated Count to Obser'd Count
			Counted Cars	Counted People	Vehicle Occupancy Rate			
Village Commons	A-H	2,298	1,638	2,040	1.25	2,994	2,404	104.6%
Brandywine Center	M	587	700	844	1.21	598	480	81.8%
Office, W. of Columbia	I	212	N/A	N/A	N/A	N/A	N/A	0.0%
Office, E. of Columbia	K	71	N/A	N/A	1.17	60	51	72.2%
Residential, The Pointe (1)	N	353	125	150	1.20	N/A	N/A	N/A
Total Less Residential		3,168	2,338	2,884	1.23	3,652	2,935	92.7%

Boca Del Mar

Study Area Description	Study Area Location (4)	Observed Traffic Count	Vehicle Occupancy Survey Results			Observed Pedestrian Count	Estimated Traffic Count (Ped Count / Veh Occ Rate)	Percent Estimated Count to Obser'd Count
			Counted Cars	Counted People	Vehicle Occupancy Rate			
Garden Shops at Boca	F-L	1,803	1,796	2,116	1.18	1,954	1,658	92.0%
Bank – Northwest	B	9	N/A	N/A	N/A	N/A	N/A	N/A
Bank – Northeast	C	177	N/A	N/A	N/A	N/A	N/A	N/A
Palms Plaza	M-O	734	327	415	1.17	620	530	72.2%
Office Building – West	A	162	155	212	1.37	114	83	51.5%
Residential – Camden Court (1)	P	206	N/A	N/A	1.24	4	3	1.6%
Residential – Montoya Circle (1)	Q	917	N/A	N/A	N/A	N/A	N/A	N/A
Total Less Residential and Banks		2,699	2,278	2,743	1.20	2,688	2,272	84.2%

(1) Residential is measured by development units

(2) From Figure II – 3

(3) From Figure II – 6

(4) From Figure II – 9

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vehicle occupancy rate. These tables indicate that when the pedestrian counts are used to estimate trip generation, 59.7 to 92.7 percent of the actual observed traffic at each site was estimated (excluding the p.m. peak hour for the Village Commons site mentioned above). The reasons that trip generation based on pedestrian counts generates less vehicle traffic than actual counted traffic is that most of the sites have land uses (drive-through banks, fast food restaurants with drive-through and convenience markets with gas pumps that have automated credit card payment processing) that do not generate pedestrian traffic from each vehicle and service roads and collectors that reduce the opportunity for pedestrian movement between sites. For example, a trip could include making a deposit through a bank drive-through window and proceed to a fast food drive-through without ever being counted as a pedestrian. The traffic counter could count up to four vehicle trip ends which would produce 5.6 person trips (assuming a vehicle occupancy of 1.4). Additionally, pedestrian counts were not obtained at delivery and rear entrances to the shopping centers and office complexes.

Comparison of Trip Generation By Land Use Category

Table V - 12, Trip Generation Comparison by Land Use Category - All Sites, presents a summary of the trip generating characteristics of all three sites by shopping center, office and residential land use categories. Included within Table V - 12 is the total square footage of the land use category, the daily and a.m. and p.m. peak hour trip generation, and trip generation rates. This table indicates that the observed trip generation rates generally fall within the ITE Trip Generation ranges.

ORIGIN DESTINATION SURVEY ANALYSIS

Pedestrian Counts

The minimum sample sizes would be 121 and 272 for the 15 percent and 10 percent maximum error cases at the 90 percent confidence level. The number of surveys performed is much higher, ranging from 2,132 to 2,564 across the three sites. These minimum sample sizes are met for the three major land use categories for the three sites.

FDOT Trip Characteristics Study of Multi-Use Developments

Table V-12 - Trip Generation Comparison by Land Use Category - All Sites

Shopping Center

Study Area Description	Total Square Footage	Daily		AM		Mid Day		PM	
		Observed Daily TG	Trip Generation Rate	Observed AM Pk Hr TG	Trip Generation Rate	Observed Mid Day Pk Hr TG	Trip Generation Rate	Observed PM Pk Hr TG	Trip Generation Rate
Country Isles	214445	24067	112.2	1307	6.1	1514	7.1	1862	8.7
Village Commons	170,740	14,567	85.3	539	3.2	1,298	7.6	1,225	7.2
Boca Del Mar	203756	19899	97.7	825	4.0	1816	8.9	1442	7.1
Average Shopping Center	196,314	19,511	99.4	890	4.5	1,543	7.9	1,510	7.7

Office

Study Area Description	Total Square Footage	Daily		AM		Mid Day		PM	
		Observed Daily TG	Trip Generation Rate	Observed AM Pk Hr TG	Trip Generation Rate	Observed Mid Day Pk Hr TG	Trip Generation Rate	Observed PM Pk Hr TG	Trip Generation Rate
Country Isles	38,233	1,784	46.7	114	3.0	210	5.5	119	3.1
Village Commons	255,554	5,236	20.5	378	1.5	618	2.4	327	1.3
Boca Del Mar	114,881	1,128	9.8	61	0.5	127	1.1	68	0.6
Average Office	136,223	2,716	13.8	184	0.9	318	1.6	171	0.9

Residential

Study Area Description	Total Square Footage	Daily		AM		Mid Day		PM	
		Observed Daily TG	Trip Generation Rate	Observed AM Pk Hr TG	Trip Generation Rate	Observed Mid Day Pk Hr TG	Trip Generation Rate	Observed PM Pk Hr TG	Trip Generation Rate
Country Isles	368	2,173	5.9	248	0.7	102	0.3	194	0.5
Village Commons	317	2,106	6.6	151	0.5	112	0.4	183	0.6
Boca Del Mar	1,144	7,531	6.6	569	0.5	0.0	0.0	634	0.6
Average Residential	610	3,937	6.5	323	0.5	71	0.1	337	0.6

(1) Residential is measured by development units

(2) Refer to Tables V-4 through V-5 for comparison of observed trip generation rates to estimated ITE trip generation rates.

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Cross Matrices

Cross Matrices were developed by expanding the survey results to represent the entire population. These expansions are useful in communicating results and are essential for computing statistics that relate to the entire site.

The expansion methodology is based on sampling rates. The sampling rate is the ratio of the number sampled to the number of the whole. If the entire population is 1000 and 200 are sampled, the sampling rate is 20 percent. If 20 of the 200 persons surveyed made one internal trip, we would estimate that 100 of the entire population made one internal trip. The expansion factor is the inverse of the sampling rate. For a sampling rate of 20 percent, the expansion factor is 5.

The sampling rate varied from area to area, and especially varied between the different land uses (residential, office, and commercial). Therefore, different sampling rates and expansion factors must be calculated and used. Even with the intensive survey effort, it was impossible to separate pedestrians in mixed retail areas. Therefore, different expansion factors were developed for each site, for residential, office, and commercial categories, based on pedestrian counts, vehicle counts, and vehicle occupancy counts. Coefficients that depend on population expansions are estimated only at this level of detail.

Because internal trips are counted at both the origin and destination end, a trip table calculated from the simple expansion factors described below would not have exactly correct row and column totals. Here, a row total represents all trips from a particular land use type, and a column total represents all trips to a particular land use type. A Fratar process was used to iteratively adjust the expansion factors such that row and column totals were correct. Fratar developed this process for a similar problem, adjusting highway network trip tables with different growth factors for traffic on the roadway links.⁵

Cross matrices of person trips between internal residential, office, and commercial, plus external land uses, for the mid-day peak period (12 noon - 2 p.m.), the afternoon peak period (4 - 6 p.m.), and the

⁵ Fratar, T.J. Vehicular Trip Distribution by Successive Approximations, *Traffic Quarterly*, 1954.

entire sample period are provided in the following tables: Table V - 13, Mid-Day (12 Noon - 2 P.M.) Population Person Trip Ends Cross Matrix; Table V - 14, Afternoon Peak (4 P.M. - 6 P.M.) Population Person Trip Ends Cross Matrix; and Table V - 15, Entire Survey Period Population Person Trip-Ends Cross Matrix.

As illustrated in Table V - 13, mid-day traffic is estimated to be predominantly associated with

FDOT Trip Characteristics Study of Multi-Use Developments					
Table V - 13 - Mid-Day (12 Noon - 2 P.M.) Population Person Trip-Ends Cross Matrix					
Country Isles					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	18	76	95
Office	0	0	52	272	324
Commercial	24	40	418	1003	1486
External	76	239	868	0	1183
Total	100	279	1356	1351	3088
Village Commons					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	78	220	298
Office	0	5 ^{5/103} _{2/2/0}	58	230	293
Commercial	108	30	626	1669	2433
External	242	45	1709	0	1996
Total	350	80	2471	2119	5020
Note: Village Commons residential trips were estimated.					
Boca Del Mar					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	97	188	285
Office	0	0	18	94	112
Commercial	137	9	536	1148	1830
External	234	86	1184	0	1505
Total	371	95	1835	1430	3731

commercial land use in all three sites. While Country Isles has the least total office space of the three sites, it has the highest number of commercial to office trips. This may be explained by the fact that some of the Country Isles office space is medical office, which has a relatively high trip rate and a higher

FDOT Trip Characteristics Study of Multi-Use Developments					
Table V - 14 - Afternoon Peak (4 P.M - 6 P.M.) Population Person Trip-Ends Cross Matrix					
Country Isles					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	3	58	61
Office	3	0	46 (22%)	155	205
Commercial	40	(31%) 51 (3%)	476	1241	1808
External	104	111	1479	N/A	1694
Total	146	162	2005	1455	3768
Village Commons					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	68	166	234
Office	6	5 (1.5%)	17 (5%)	310	338
Commercial	164	10 (1%)	424	1265	1863
External	393	70	1363	N/A	1826
Total	563	85	1871	1741	4261
Note: Village Commons residential trips were estimated.					
Boca Del Mar					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	137	120	257
Office	0	0	5 (5%)	90	95
Commercial	194	0 (0%)	360	1097	1651
External	428	71	1102	N/A	1601
Total	621	71	1604	1307	3604

capture rate than General Office. The trip generation rates for medical and dental offices per 1000 square feet of floor area are about twice as high as those for general offices, both for an entire weekday

FDOT Trip Characteristics Study of Multi-Use Developments

Table V - 15 - Entire Survey Period Population Person Trip-Ends Cross Matrix

Country Isles					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	219	614	833
Office	21	17	218	749	1005
Commercial	206	160	1717	3698	5782
External	541	899	3898	N/A	5338
Total	769	1076	6052	5062	12958
Village Commons					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	216	471	688
Office	10	15	166	831	1022
Commercial	241	85	1572	4506	6403
External	549	901	4897	N/A	6347
Total	799	1001	6851	5808	14459
Note: Village Commons residential trips were estimated.					
Boca Del Mar					
From\To	Residential	Office	Commercial	External	Total
Residential	0	0	516	839	1355
Office	0	0	38	338	377
Commercial	654	18	1401	3908	5981
External	1340	346	4022	N/A	5707
Total	1944	364	5976	5086	13420

and for the afternoon peak hour.⁶ These higher trip rates are comprised of a higher proportion of non-employee traffic than for general office. The data from this study suggest that occasional office visitors, such as those patronizing medical offices, may be more likely to make internal trips than office workers

⁶ Institute of Transportation Engineers. Trip Generation, 5th Edition, Institute of Transportation Engineers, pps. 942, 985, and 987.

who are present every day. Additionally, pass-by capture rates resulting from trip characteristic studies of general and medical offices studied as part of the Pinellas County Transportation Impact Fee, illustrated in Table II - 4, Weighted Average Origin Destination Survey Results by Land Development Activity,⁷ indicate that medical offices have a higher pass-by capture rate than general offices (23 percent versus 8 percent).

Results for the afternoon peak period are similar to those for the mid-day peak period. Again, commercial trips are dominant. As was found in the mid-day peak period, residential trips are a higher proportion, and office trips are a smaller proportion of the total trips.

As indicated in the summary table of the entire study period (Table V - 15), commercial trips form the majority of all trips at all three sites. Residential trips comprise a significant portion of all trips at Boca Del Mar. At the other sites, office trips comprise a large portion of the total person trip ends. The total number of office trips is similar at Country Isles and Village Commons. However, the number of internal trips with an office end is much higher at Country Isles. As previously discussed, it appears that office visitors, such as those patronizing medical offices, may be more likely to make internal trips than office workers who are present every day. This result may also be due to the fact that the Country Isles offices are more integrated with retail land uses than office land uses at the other two sites.

Employees Who Are Residents

Only a very small percent of employees appeared to be residents. The estimated percentage for each site is given in Table V - 16, Percent Employee Residents by Site. The higher rate of resident employees at Country Isles could be because Country Isles is the only major employer in the area. In contrast, there are many other major employers in the area surrounding Boca Del Mar.

⁷ Tindale-Oliver and Associates, Inc. Pinellas County Transportation Impact Fee, February 1990, pp. II-19.

FDOT Trip Characteristics Study of Multi-Use Developments			
Table V - 16 - Percent Employee Residents by Site			
	Country Isles	Village Commons	Boca Del Mar
Residents As a Percent of Employment	3.9%	N/A	0.9%
Note: Village Commons residents were not surveyed.			

Users Who Are Employees

A fairly large proportion of internal trips reported were made by known employees at all three sites. These proportions, given in Table V - 17, Percent Users Who Are Employees, range from 16 to 19 percent. These proportions were obtained from the survey response of "work", to the origin purpose and the purpose of the next stop questions. Workers interviewed away from their work place within the site would not have responded to the question with "work". Therefore, because the survey did not ask the direct question "Do you work within this site?", the percentages indicated in Table V - 17 could understate the number of users who are employees. The number of questions and duration of the survey precluded this question from being asked.

FDOT Trip Characteristics Study of Multi-Use Developments			
Table V - 17 - Percent Users Who Are Employees			
	Country Isles	Village Commons	Boca Del Mar
Employees As a Percent of Internal Trips Surveyed	16.1%	16.8%	18.9%

The percent of total internal trips made by employees ranged from 16.1 percent to 18.9 percent across the three sites. This range is quite small, and indicates that the sites are not statistically different.

Percent of Trips to Commercial Components

As described above, it was impossible to allocate pedestrians in mixed retail areas to a particular retail

activity. Therefore, the percentage of all trips can only be calculated for the breakdown: residential, office, and commercial. These results are given for the mid-day peak, afternoon peak, and full survey periods in the following tables: Table V - 18, Mid-Day Percent Person Trip Ends by Land Use; Table V - 19, Afternoon Peak Percent Person Trip Ends by Land Use; and Table V - 20, Entire Survey Period Percent Person Trip Ends by Land Use. The statistics are given in terms of person trip ends so that one internal person trip includes two person trip ends. Tables V - 18, V - 19 and V - 20 used the data in Tables V - 13, V - 14 and V - 15 to present the person trip ends by percent of land use. The conclusions that can be drawn from these two sets of tables are the same. Commercial trips are the majority of all trips. In the mid-day peak period, commercial trip ends comprise from 78.1 to 82.8 percent of all person trip ends at the three sites.

FDOT Trip Characteristics Study of Multi-Use Developments			
Table V - 18 - Mid-Day (12 Noon - 2 P.M.) Percent Person Trip Ends by Land Use			
	Country Isles	Village Commons	Boca Del Mar
Residential	5.4%	10.9%	14.5%
Office	16.5%	6.3%	4.6%
Commercial	78.1%	82.8%	80.9%
Total	100.0%	100.0%	100.0%

FDOT Trip Characteristics Study of Multi-Use Developments			
Table V - 19 - Afternoon Peak (4 P.M. - 6 P.M.) Percent Person Trip Ends by Land Use			
	Country Isles	Village Commons	Boca Del Mar
Residential	4.7%	16.1%	20.4%
Office	8.4%	8.5%	3.9%
Commercial	86.9%	75.4%	75.7%
Total	100.0%	100.0%	100.0%

FDOT Trip Characteristics Study of Multi-Use Developments

Table V - 20 - Entire Survey Period Percent Person Trip Ends by Land Use

	Country Isles	Village Commons	Boca Del Mar
Residential	10.3%	8.9%	20.9%
Office	13.4%	12.1%	4.6%
Commercial	76.3%	79.1%	74.5%
Total	100.0%	100.0%	100.0%

At Country Isles, office trips make-up next greatest portion of the trips, with 16.5 percent. At the other two sites, there are more residential trip ends than office trip ends.

In the afternoon peak period, commercial trip ends again are most significant, comprising between 75.4 and 86.9 percent of all person trip ends at the three sites. Residential trip ends are more prevalent in the afternoon peak period than the mid-day peak period, comprising from 4.7 to 20.4 percent of all trips.

Including all data collected throughout the day, commercial trip ends comprise from 74.5 to 79.1 percent of all trips at the three sites. At Boca Del Mar, residential trip ends are next greatest, with 20.9 percent. At the other two sites, there are more office trip ends than residential trip ends.

Number of Stops

Table V - 21, Entire Survey Percent Number of Stops of Primary Person Trips, illustrates the percentage of site visitors making 1 stop, 2 stops, 3 stops, and 4 or more stops.

FDOT Trip Characteristics Study of Multi-Use Developments

Table V - 21 - Entire Survey Percent Number of Stops of Primary Person Trips

	Country Isles	Village Commons	Boca Del Mar
1 Stop	81%	86%	80%
2 Stops	16%	12%	16%
3 Stops	3%	2%	4%
4 or More Stops	0%	0%	0%
Total	100%	100%	100%

The great majority of all site users, 81 to 86 percent, made only a single stop. Approximately 80 percent of those who made two or more stops made exactly two stops. Only a small percentage of people made three stops. The distribution of the number of stops made for the primary trip (one stop) was very consistent for the three sites.

Summary Narrative

The three sites exhibit significant similarities. They all have similar numbers of trips during the peak and entire survey periods. In each case, the majority of trips are commercial. In the afternoon peak, the residential percent of trips are higher than in the mid-day. At all three sites, 80 percent or more of trips entering the site make only one stop, while approximately 16 percent of the remaining trips entering the site make only two stops.

The only significant difference among the three sites is in the estimated number of office-related trips. Boca Del Mar has a much lower percentage than either of the other two sites.

INTERNAL CAPTURE ANALYSIS

Internal Capture Rates by Land Use

A large portion of residential trips were internal trips for Country Isles and Boca Del Mar. A summary for these sites is given in Table V - 22, Percent Internal Trips in Residential Surveys. No residential surveys were done at Village Commons because permission could not be obtained. The calculated internal trip percentages were 27.9 percent of Country Isles and 34.9 percent for Boca Del Mar.

FDOT Trip Characteristics Study of Multi-Use Developments			
Table V - 22 - Percent Internal Trips in Residential Surveys			
	Country Isles	Village Commons	Boca Del Mar
Residential	27.9%	N/A	34.9%

N/A - No surveys done.

While generally lower than the residential percentages indicated above, significant percentages of internal trips were calculated for the office and commercial land uses. These results, shown in Table V - 23, Percent Internal Trips from Office and Commercial Surveys, exclude trips made to internal residences because it could not be consistently determined if the residences were actually internal within the site. This is because exact addresses were not obtained and zip code information included areas outside of the study boundaries. Table V - 23 summarizes the percent of internal trips for the office and commercial land uses for the three sites based on the survey data. These data are representative of the survey sample only and do not reflect the entire population of all site land uses. Residential trip ends are not included because office and commercial surveys could not be used as a sole basis for determining whether the residential population lies within the site.

The estimated percent internal capture by land use type varies considerably by site and land use. The highest estimated rate is 27.6 percent for Country Isles restaurant with drive-through. Other high internal capture rates were observed at retail and supermarket land uses. Restaurants without drive-throughs and office land uses had relatively low internal capture rates. The only exception to this was the office land use at the Country Isles site which included banks in the first floor. A detailed description of land uses for the three sites is included in Section 2, Site Documentation.

FDOT Trip Characteristics Study of Multi-Use Developments			
Table V - 23 - Percent Internal Trips from Office and Commercial Surveys			
	Country Isles	Village Commons	Boca Del Mar
Supermarket	18.5%	10.8%	8.4%
Office	15.9%	10.4%	2.1%
Restaurant w/ Drive-through	27.6%	11.5%	10.9%
Restaurant w/o Drive-through		7.8%	2.0%
Retail	18.8%	22.7%	18.7%
Gas/Convenience	12.4%		
Bank w/ Drive-through		9.2%	3.6%
Other	17.3%		
Note: Results exclude residential trip ends.			

Comparison to Square Footage

In this section, trip rates are compared to the square footage of the different land uses. This analysis requires that the survey data be expanded to represent the entire population. Because this analysis involves all trips, it was performed by Residential, Office, and Commercial land uses. Table V - 24, Land Use Summary for the Three Sites, summarizes the site data contained in Table II - 4.

FDOT Trip Characteristics Study of Multi-Use Developments			
Table V - 24 - Land Use Summary for the Three Sites			
	Country Isles	Village Commons	Boca Del Mar
Residential (units)	368	317	1144
Office (1000 sq ft)	59	293	303
Commercial (1000 sq ft)	193	231	198

Internal trips between land uses result from the presence of both land uses. A trip from an office to a supermarket requires the presence of both the office and the supermarket. Consider a case where 10 out of 100 office employees make internal stops at a shopping center on their way home. Suppose that

an additional 100 employees were added to the same office building. A working hypothesis would be that 10 of these employees would also stop and shop on their way home, for a total of 20 out of 200. Thus, the number of internal trips is proportional to office employment.

Another case is where the office employment stays the same, but the size of the shopping center doubles. This larger shopping center probably has about twice as many customers measured at the store entrances and roughly twice the sales volume. Even if the increase is in a single store such as a large supermarket, the growth indicates a significant increase in shopping opportunities including the addition of new merchandise categories. As a working hypothesis it can be assumed that the expanded retail opportunities are twice as attractive to the office workers, and that the number of internal shopping stops by office workers on their way home will double.

The working hypotheses in the examples above can be stated generally that the number of internal trips from one land use type (A) to another land use (B) is proportional to the size of land use type (A) and also proportional to the size of land use type (B). This suggests a functional relationship of the form:

$$Person\ Trips(AB) = Constant * Land\ Use(A) * Land\ Use(B)$$

where: *Person Trips(AB)* = trips between land use type A and land use type B,
Land Use(A) = total site land use of type A in residential units or
 1000 square feet,
Land Use(B) = total site land use of type B in residential units or
 1000 square feet,
Constant = an estimated constant

In the equation shown above, Person Trips (AB) is known (Tables V - 13, V - 14, and V - 15), and the land use of each type is known (Table V - 24), so that the single unknown constant can be estimated from the data. The following example illustrates the methodology for estimating the constants. Using the Country Isles interactions between residential and commercial land uses as an example, the following equation results:

$$425\ trips = X * 368\ units * 193\ thousand\ square\ feet$$

$$Solving\ for\ X, X = 0.00597$$

This functional form was tested against the data from the three sites, first using data from the entire survey period, and then for the mid-day and afternoon peak periods. For the six possible land use type pairs, significant numbers of trips were estimated for: residential/commercial, office/commercial, and commercial/commercial. These three paired land use types make-up about 99 percent of all estimated internal trips; therefore, a model which estimates internal trips related to these three relationships adequately estimates total internal trips. The calculation of constants for all three sites for the mid-day peak period, the afternoon peak period and the entire survey period are summarized in the following tables: Table V - 25, Internal Trip Coefficients for Paired Land Use Types Mid-Day Peak Period (12 Noon - 2 P.M.); Table V - 26, Internal Trip Coefficients for Paired Land Use Types Afternoon Peak Period (4 P.M. - 6 P.M.); and Table V - 27, Internal Trip Coefficients for Paired Land Use Types Entire Survey Period. In each case the constants are estimated using the equation above where residential land use is measured in dwelling units and office and commercial land uses are measured in units of 1000 square feet.

For the entire survey period, two of the relationships appear similar (of the same magnitude): the relationship between residential and commercial, and the relationship between commercial and itself. In these two relationships, very similar coefficients are estimated among the three sites.

The results are also reasonable for the third category: office/commercial, if Country Isles data are excluded. The high coefficient for Country Isles office probably results from the land use and location qualities previously discussed in this chapter.

The results for the two peak time periods are similar. The relationships are best for residential/commercial and commercial/commercial. The variation is a little wider, but this wider variation could result from a smaller sample during the peak periods.

FDOT Trip Characteristics Study of Multi-Use Developments				
Table V - 25 - Internal Trip Coefficients for Paired Land Use Types Mid-Day Peak Period (12 noon - 2 P.M.)				
	Country Isles	Village Commons	Boca Del Mar	Average
Residential/ Commercial	0.00060	N/A	0.00103	0.00082
Office/ Commercial	0.00798	0.00129	0.00045	0.00087
Commercial/ Commercial	0.01117	0.01175	0.01366	0.01219

FDOT Trip Characteristics Study of Multi-Use Developments				
Table V - 26 - Internal Trip Coefficients for Paired Land Use Types Afternoon Peak Period (4 P.M. - 6 P.M.)				
	Country Isles	Village Commons	Boca Del Mar	Average
Residential/ Commercial	0.00060	N/A	0.00146	0.00103
Office/ Commercial	0.00846	0.00039	0.00009	0.00024
Commercial/ Commercial	0.01272	0.00795	0.00919	0.00995

FDOT Trip Characteristics Study of Multi-Use Developments				
Table V - 27 - Internal Trip Coefficients for Paired Land Use Types Entire Survey Period				
	Country Isles	Village Commons	Boca Del Mar	Average
Residential/ Commercial	0.00597	N/A	0.00517	0.00557
Office/ Commercial	0.03296	0.00370	0.00094	0.00232
Commercial/ Commercial	0.09180	0.05897	0.07144	0.07407

An example of how to apply the coefficients for the Boca Del Mar site is provided for entire daily survey period. The total calculated internal person trip ends are comprised on three components: 1) residential/commercial, 2) office/commercial trip ends, and 3) commercial/commercial trip ends.

The residential/commercial trip ends are calculated as follows:

$$0.00557 * 1,144 \text{ (residential units)} * 198 \text{ (1000 commercial sq. ft.)} = 1,262 \text{ trip ends}$$

This compares to 1,170 estimated from the survey (Table V - 15).

The office/commercial trip ends are calculated as follows:

$$0.00232 * 303 \text{ (office 1,000 sq. ft.)} * 198 \text{ (1,000 commercial sq. ft.)} = 139 \text{ trip ends}$$

This compares to 56 estimated from the survey (Table V - 15).

The residential/commercial trip ends are calculated:

$$0.07407 * 198 \text{ (1,000 commercial sq. ft.)} * 198 \text{ (1,000 commercial sq. ft.)} = 2,904 \text{ trip ends}$$

This compares to 2,802 estimated from the survey (Table V - 15).

The total internal trip ends using the equation is 4,305 trip ends. This compares very favorably to 4,029 trip ends computed directly from the survey.

The commercial-to-commercial relationship is another way of viewing the well documented curves in ITE Trip Generation where a shopping center trip rates per 1000 square feet decline as the shopping center size increases. This relationship is largely caused by internalization of linked commercial trips. Each additional increment of floor space gets pedestrian traffic and achieves sales revenues similar to earlier increments. Thus, as the size of the shopping center increases, multiple trips become prevalent and an increasing number of trips are "captured", leading to smaller increases in driveway counts.

so, internalization is already part of the equation

A comparison was made between the estimated coefficient for commercial-to-commercial and the data summarized in ITE Trip Generation. This comparison depends on the total potential vehicle trips

(without internalization) for an entire day. This can be measured only through pedestrian counts, and the pedestrian counts did not extend throughout the entire day. Therefore, this value was estimated.

As shown in ITE Trip Generation, trip generation from individual shopping centers vary considerable around the estimated curve. A linear value of 65 potential vehicle trips per 1000 square feet was chosen for illustrative purposes. This value is reasonable and is close to ITE Trip Generation rate for 100,000 square feet shopping centers and therefore facilitates the comparison.

Figure V - 1, Comparison of Internal Capture for Commercial Uses to ITE Trip Generation Equation compares the shapes of curves for shopping centers ranging in size from 100,000 square feet to 400,000 square feet. The "Constant Linear Trip Rate" illustrates the potential vehicle trips (without internalization). The "Study Internal Capture" curve uses the internal capture equation and estimated coefficients resulting from the study data presented earlier in this chapter. The "ITE Equation" curve graphs the ITE Trip Generation equation for less than 570,000 square feet. The reduced trip rate as the shopping center size increases would be viewed as the effect of internal capture since larger shopping centers create more opportunity for increased person trips between the individual stores.

The "Study Internal Capture" and "ITE Equation" curves match fairly well. In calculating trip reductions, it is important to remember that some conventional methods of estimating trip generation do make allowances for some types of internal trips. Application of the shopping center equation in Trip Generation implies internal capture of commercial-to-commercial trips. However, it does not provide for other types of internal capture such as residential/commercial and office/commercial.

Total internal capture for a site can be calculated by adding up the separate components: residential/commercial, office/commercial, and commercial/commercial. If the Trip Generation shopping center equation is being used, the commercial/commercial components should be excluded. The internal capture calculation gives person trips. In order to calculate a percent reduction in vehicle trips, the person trip estimates must be converted to vehicle trips using average vehicle occupancy rates.

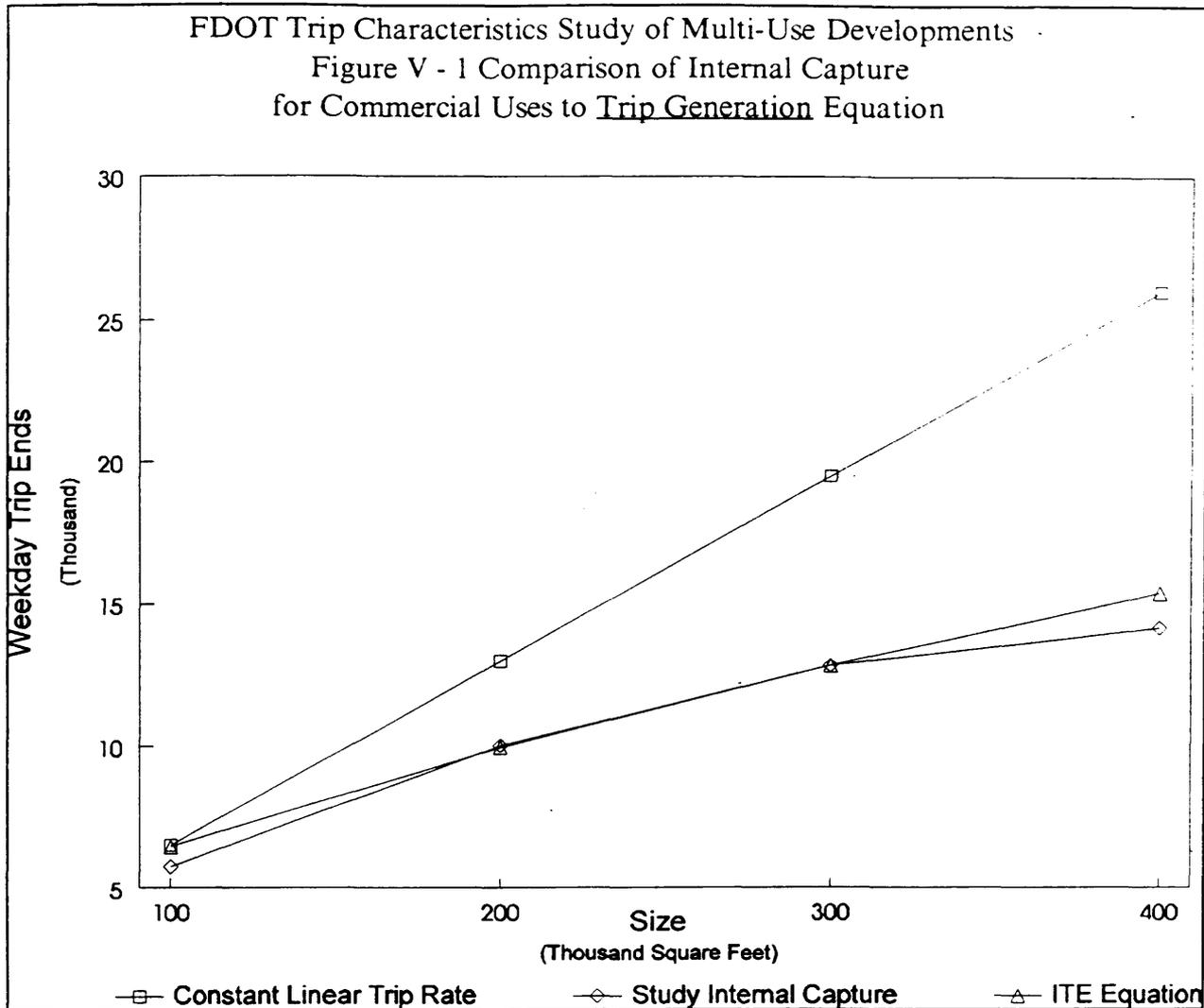
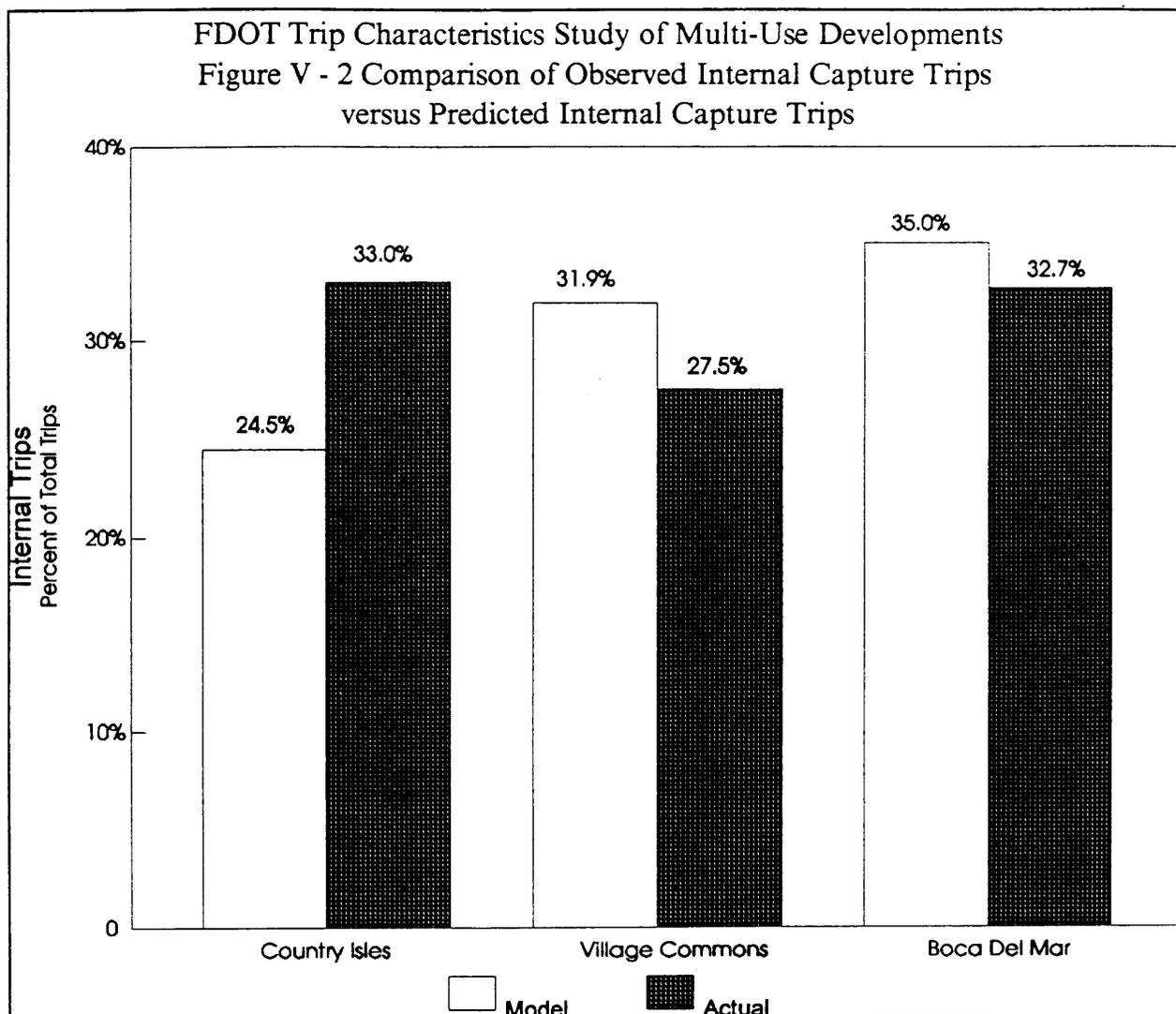


Figure V - 2, Comparison of Observed Internal Capture Trips versus Predicted Internal Capture Trips, illustrates the results of applying the coefficients to the following equation:

$$\begin{aligned}
 \text{Total Number of Person Trips} = & \\
 & (0.00557) * (\# \text{ of Residential Units}) * (\# \text{ Commercial Units}/1000\text{sq. ft.}) + \\
 & (0.00232) * (\# \text{ of Office Units}/1000\text{sq. ft.}) * (\# \text{ of Commercial Units}/1000\text{sq. ft.}) + \\
 & (0.07407) * (\# \text{ of Commercial Units}/1000\text{sq. ft.}) * (\# \text{ of Commercial Units}/1000\text{sq. ft.}).
 \end{aligned}$$

For the purpose of this comparison, the constants used were the average values indicated in Table V - 25, with the exception of the office/commercial constant which was calculated excluding the Country

Isles data, for the reason discussed earlier. As shown, the model fit is quite reasonable, except for a shortfall in Country Isles.



Site Internal Capture Rates

Total internal capture rates for the mid-day peak period are given in Table V - 28, Percent Internal Person Trip Ends for the Three Sites (Noon - 2 P.M.). The total rate for each site is similar to the daily rate. There is somewhat more variability among the land use classes. For example, the Village Commons office capture rate of 26.2 percent is higher than the other sites, and also higher than the Village Commons daily capture rate. However, this total number of office trips is fairly small during

FDOT Trip Characteristics Study of Multi-Use Developments

**Table V - 28 Mid-Day Period (Noon - 2 P.M.)
Percent Internal Person Trip Ends for the Three Sites**

	Country Isles	Village Commons	Boca Del Mar
Residential	21.9%	28.8%	35.7%
Office	15.2%	26.2%	12.9%
Commercial	34.1%	31.1%	36.3%
Total	30.3%	30.6%	35.2%

Note: Village Commons residential trips were estimated as an average of the other two sites.

this time period. It is possible a relatively high proportion of mid-day office trips at Village Commons are made by employees doing quick errands.

Total internal capture rates for the afternoon peak period are given in Table V - 29, Afternoon Peak Period (4 P.M. - 6 P.M.) Percent Internal Person Trip Ends for the Three Sites. Again, the total rate for each site is similar to the daily rate. For Village Commons and Boca Del Mar, the internal capture rate for the office category is considerably lower than the rest of the day. In contrast, Country Isles data indicates a high internal capture rate for office during the afternoon peak period. This high rate may be related to the importance of banking and medical offices in Country Isles.

FDOT Trip Characteristics Study of Multi-Use Developments

**Table V - 29 Afternoon Peak Period (4 P.M. - 6 P.M.)
Percent Internal Person Trip Ends for the Three Sites**

	Country Isles	Village Commons	Boca Del Mar
Residential	22.1%	29.9%	37.7%
Office	27.3%	10.0%	3.1%
Commercial	28.6%	29.6%	32.5%
Total	28.2%	28.0%	32.4%

Note: Village Commons residential trips were estimated as an average of the other two sites.

The residential and office/commercial survey data were combined in order to estimate total internal capture rates. As discussed above, the required expansion factors could be estimated only for residential, office, and combined commercial. These estimates are given in Table V - 30, Entire Survey Percent Internal Person Trip Ends for the Three Sites.

FDOT Trip Characteristics Study of Multi-Use Developments			
Table V - 30 - Entire Survey Period Percent Internal Person Trip Ends for the Three Sites			
	Country Isles	Village Commons	Boca Del Mar
Residential	27.9%	31.4%	34.9%
Office	20.8%	14.4%	7.6%
Commercial	35.8%	29.1%	33.6%
Total	33.0%	27.5%	32.7%

Note: Village Commons residential trips were estimated as an average of the other two sites.

On the basis of these three site studies, there is not a consistent and significant difference between the daily capture rates and the peak period rates. The daily capture rates have been emphasized in the examples because they are based on the greatest amount of data.

Narrative on Internal Capture

The estimated internal capture rates for the entire survey period are fairly similar, ranging from 27.5 to 33.0 (Table V - 30) percent for the three sites. When linked residential to commercial trips are included, the commercial land use category exhibits the highest internal capture rate, with 29.1 to 35.8 percent. Residential internal trip rates were estimated to range from 27.9 to 34.9 percent. Office internal trip rates were lower, ranging from 7.6 percent at Boca Del Mar to 14.4 percent at Village Commons to a high 20.8 percent at Country Isles. The Mid-day Peak Period and Afternoon Peak Period produced similar ranges for the three sites, 30.3 to 35.2 percent (Table V - 28) and 28.0 to 32.4 percent (Table V - 29), respectively.

Statistical Analysis of Internal Capture

The mean values tabulated in Table V - 30, Entire Survey Period Percent Internal Person Trip Ends for the Three Sites, have a high degree of statistical validity. Maximum two-tailed errors calculated using the binomial distribution, with 90 percent confidence level methodology, are all less than 5 percent. This significantly exceeds the stated confidence level of 90 percent with maximum error of 15 percent.

Summary of Analyses

Statistically significant estimates of internal capture rates have been presented for nine land use types for the three sites (Table V - 23). The survey data were expanded in order to compute capture rates for Residential, Office, Commercial land uses and total site internal capture rates for all sites. The site internal capture rates for the entire survey period ranged from 27.5 to 33.0 percent (Table V - 30).

Relationships were developed for estimating internal trips as a function of the combination of two land use types in terms of residential units or office/commercial square footage. Good relationships were seen for two internal type categories: residential/commercial and commercial/commercial. The office/commercial relationship was less definitive. However, the example presented illustrating the calculation of the internal person trips for the Boca Del Mar site and the corresponding equation can be applied to future development projects in order to estimate the number of internal person trip ends.

Data from other sites would help to further define these relationships. Also, additional data concerning office and commercial interactions could help to refine coefficients for this case. Finally, data can be collected that allows expansion to the entire population while maintaining the more detailed land use breakdown, similar coefficients could be developed for these detailed interactions.

TRIP LENGTH AND PASS-BY CAPTURE ANALYSIS

Measurement of Trip Lengths

The "macro" trip characteristic data from the retail/office origin/destination surveys were analyzed to determine whether a trip was primary, pass-by capture, diverted, secondary, terminated or non-external.

Primary trips are trips made from an origin (e.g. home, work, etc.) to the survey location and then back to the same origin. The length of a primary trip is measured along the shortest, most reasonable route from the origin to the survey location. This length is recorded twice to represent both the origin side and destination side of the trip.

The pass-by capture trip occurs when the survey location lies in an ideal grid rectangle (commonly called a primary trip rectangle) whose opposite corners are formed by the origin and destination locations. A pass-by capture trip has no measurement since it is considered not to contribute additional travel to the road network.

Diverted trips are similar to pass-by capture trips except that the site lies outside of the primary trip rectangle (as defined before). These trips add travel to the network to the extent that the site is located outside of the rectangle. The length of the diverted trip is taken to be the distance of travel outside of the rectangle and is recorded twice.

The secondary trip is like that of a diverted trip except that the length of the diversion (distance from rectangle boundary to the site) is greater than one-half the travel distance from the origin to the final destination. The length of the secondary trip is taken to be the distance from the origin to the site and the distance from the site to the new destination.

Terminated trips have either an origin or destination located within the site. The length of a terminated trip is determined by measuring the side of the trip that is outside of the site. This length is only recorded once. These trips are usually work and/or residential trips. Finally, a non-external trip is a special type of internal trip in which the final origin and final destination are within the site. This trip never reaches the adjacent arterial network. The non-external trip is not measured for the same reason as the pass-by capture trip. For a more detailed look on how primary, pass-by capture, diverted and

secondary trips are measured please refer to "Measuring Travel Characteristics for Transportation Impact Fees"⁸.

Due to the nature of the residential surveys, the trip types were determined differently than the retail/office surveys. There were only two kinds of trip types in the residential survey analysis; terminated and non-external. A terminated residential survey trip has either the origin or destination located outside the site. At least one side of the residential trip will always be tied to the residential portion of the site since that is where the survey was conducted. The end that leaves the site is measured to determine the trip length. A non-external residential trip is similar to the retail/commercial non-external trip in that the trip never reaches the adjacent road system and, as a consequence, no trip length is recorded.

Methodology of Measurements

As mentioned in Chapter 4, origin/destination interviews were conducted to collect data on trip type and trip length. The origin of the trip was found by asking the interviewee what was the nearest major intersection that he or she came from. The destination of the trip was determined the same way (see Chapter 4 for complete discussion on the origin/destination survey process). The major intersections were found on a road map, and the trip was classified by trip type and measured for trip length, as appropriate. These results were entered into a spreadsheet for further analysis.

Some of the data that was obtained was rejected for one or more of the following reasons: (1) the data record was incomplete, (2) the intersection was not found or did not exist, and (3) a location other than an intersection (landmark, subdivision, area name, etc.) was recorded and was not found. Table V - 31, Survey Accept/Reject Rates for Macro Trip Analysis, summarizes the percentage of surveys that were accepted and rejected (for all sites). This table does not include refused interviews. Several assumptions

⁸ Tindale-Oliver and Associates, Inc. Measuring Travel Characteristics for Transportation Impact Fees. *Institute of Transportation Engineers Journal*, April 1991, pps. 11 - 15.

FDOT Trip Characteristics Study of Multi-Use Developments

Table V - 31 - Survey Accept/Reject Rates for Macro Trip Analysis ⁽¹⁾

Office/Retail						
	Country Isles		Village Commons		Boca Del Mar	
	No. of Surveys	Percent	No. of Surveys	Percent	No. of Surveys	Percent
Accept	519	56.4	628	58.9	683	65.1
Reject	401	43.6	438	41.1	366	34.9
Residential						
	Country Isles		Village Commons		Boca Del Mar	
	No. of Surveys	Percent	No. of Surveys	Percent	No. of Surveys	Percent
Accept	229	61.4	N/A	N/A	341	78.4
Reject	144	38.6	N/A	N/A	94	21.6

N/A - Land Use Not Available

(1) Table does not include interview refusals.

were made in order to maximize the validity of the data. For example, if a location other than an intersection was recorded (e.g. hospital, court house, school, etc.) and found, then the nearest major intersection to the location was used as the reference point.

A road map was used to identify the origin and destinations, and also to determine the trip lengths. The trip length were measured first in inches by a hand held measuring wheel. The length in inches was then converted to feet using a conversion factor determined by the map scale. The final trip length was entered in the spreadsheets included in Appendix G.

Trip Length and Pass-by Capture Results

Country Isles

The percentage of Retail/Office trips by trip type are shown in Table V - 32, Trip Type Summary for Country Isles, Retail/Office. Primary trips were the most frequently made trips occurring 49.6 percent

FDOT Trip Characteristics Study of Multi-Use Developments

**Table V - 32 - Trip Type Summary for Country Isles
Retail/Office**

Trip Type	Percent
Primary	49.6
Secondary	7.4
Diversion	10.1
Pass-by Capture	27.6
Non-External	2.7
Terminated	2.5

of the time. Pass-by capture trips were the second most frequently made trips occurring 27.6 percent of the time.

The percentage of trips by trip length for retail/office are shown in Figures V - 3 and V - 4, Distribution of Total Trip Lengths, for Country Isles Site, Non-Residential, and Cumulative Distribution of Total Trip Lengths, for Country Isles Site, Non-Residential, respectively. As can be seen from these figures, 71.5 percent of the trip lengths are less than three miles from the site. This is most likely due to the fact that Country Isles is the primary shopping center site serving the Weston and Bonaventure areas, thus having a highly captive market. From the data, it was concluded that most of the longer trips (greater than 5 miles) originated from the Davie area. There is not a comparable site in terms of land use in the western portion of Davie, thus the site at Country Isles is used. Figure V - 5, Trip Length Distribution For Country Isles, Office and Retail, also shows a map of the distribution of trip lengths from the site. The concentric circles show each range in miles from the site.

Figures V - 6 and V - 7, Distribution of Total Trip Lengths, For Country Isles, Residential, and Cumulative Distribution of Total Trip Lengths, For Country Isles, Residential, respectively, summarize the trip distribution of total trip lengths for the residential portion of the site at Country Isles. As can be seen by these figures, the majority of the trips (79.3 percent) occur over 7 miles from the site. This abnormal distribution of trip lengths in excess of 7 miles is most likely caused by the fact that this site

FDOT TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS.

Figure V – 3

Distribution of Total Trip Lengths
For Country Isles Site, Non-Residential

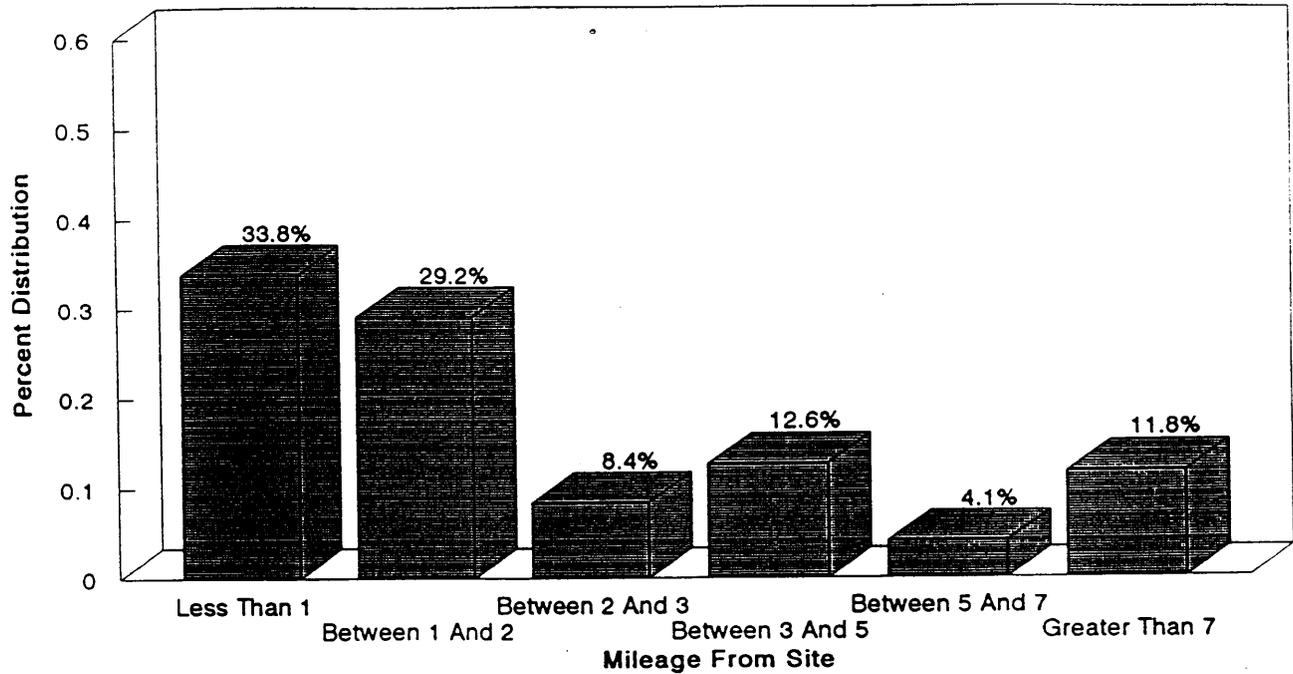


Figure V – 4

Cumulative Distribution of Total Trip Lengths
For Country Isles Site, Non-Residential

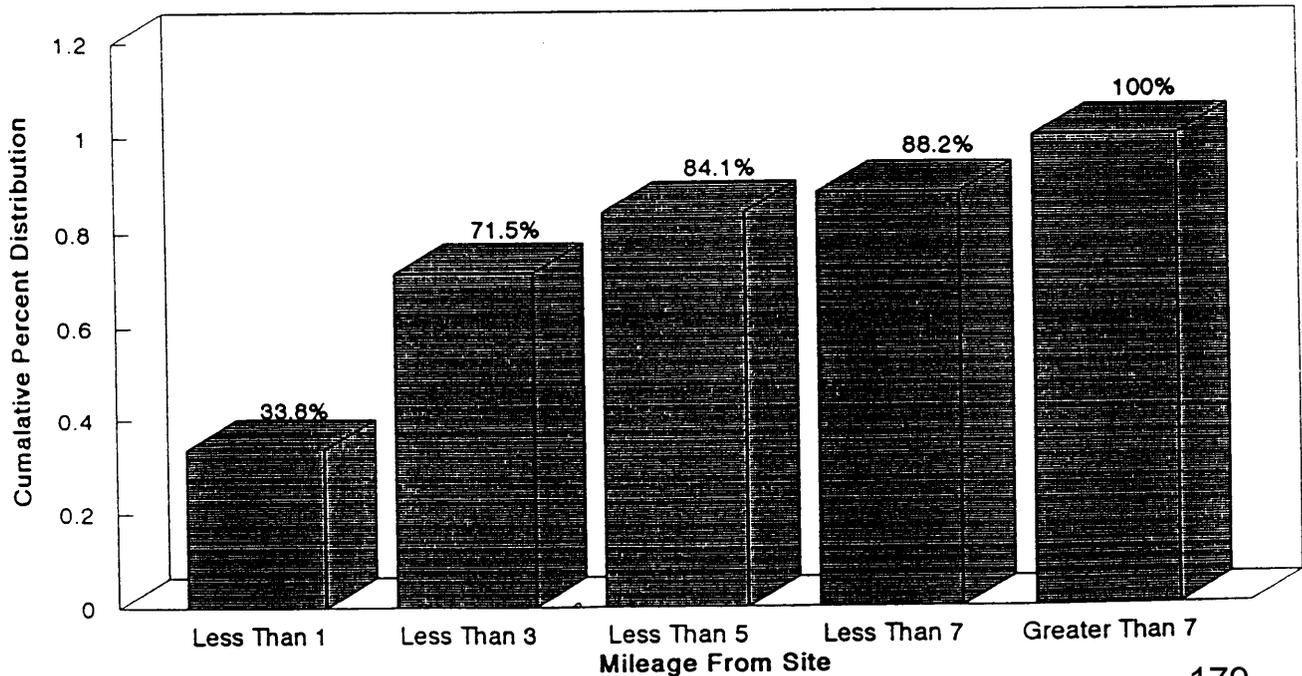
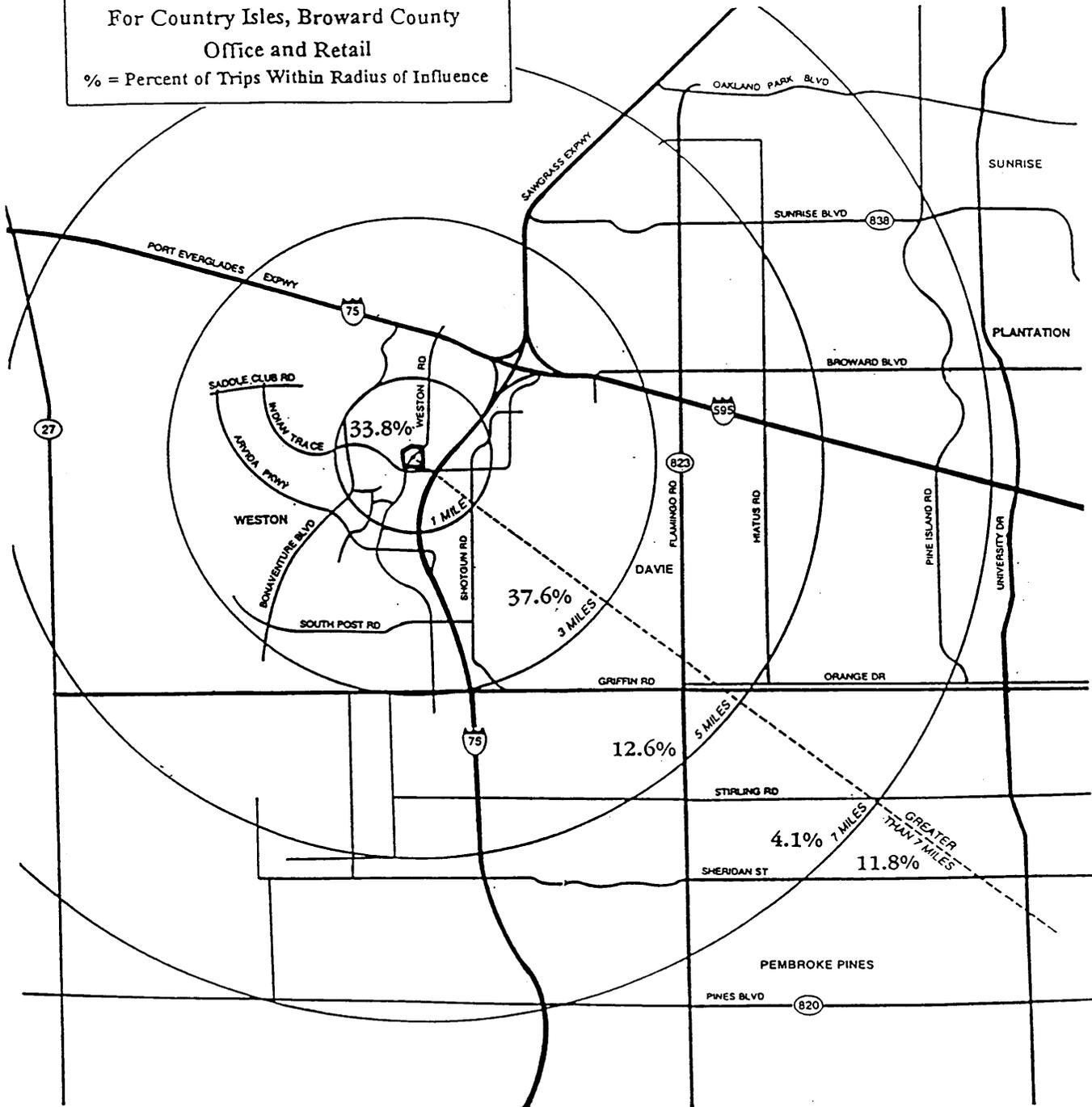


Figure V-5
Trip Length Distribution
For Country Isles, Broward County
Office and Retail
 % = Percent of Trips Within Radius of Influence



FDOT TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

Figure V – 6
Distribution of Total Trip Lengths
For Country Isles, Residential

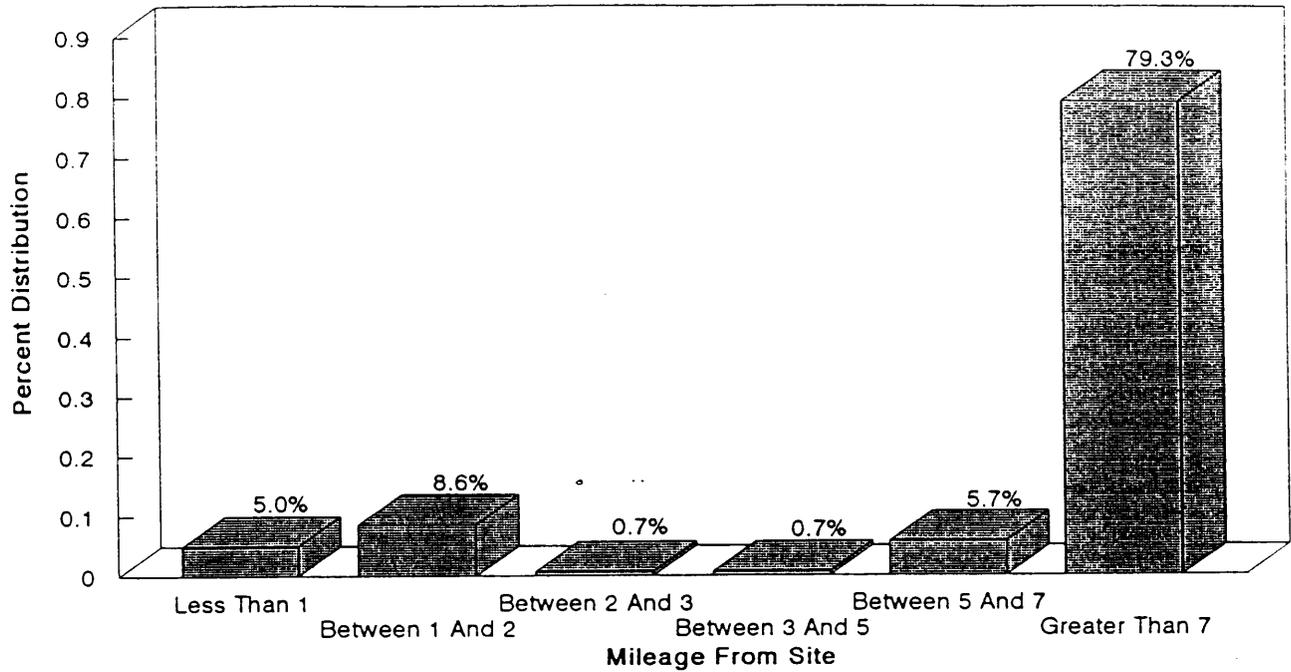
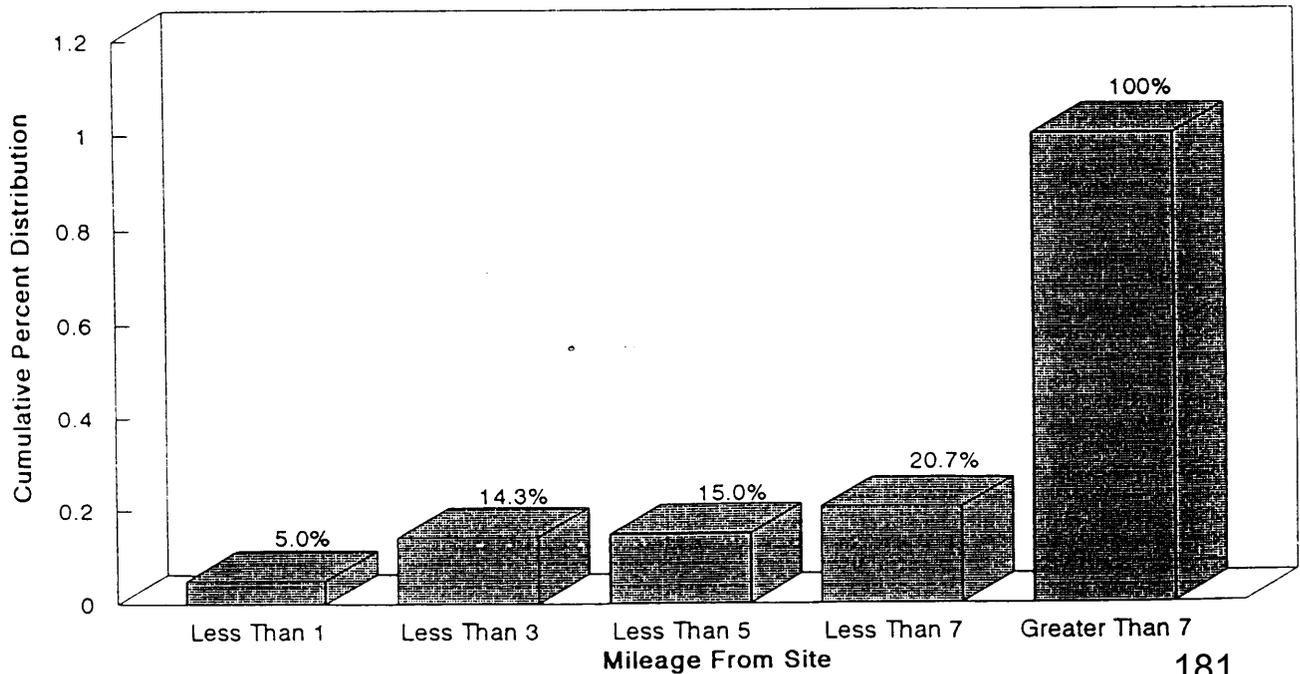


Figure V – 7
Cumulative Distribution of Total Trip Lengths
For Country Isles, Residential



is located in the western area of Broward County resulting in large trip lengths from residents who work in the downtown Ft. Lauderdale or Miami areas. Additionally, responses with inadequate intersection descriptions, such as Country Isles/Indian Trace, were considered incomplete for the "Macro" analysis and not used to calculate trip length. This may have caused an increase in the proportion of trip lengths in excess of 7 miles. Figure V - 8, Trip Length Distribution, Residential, Country Isles, shows a map of the trip lengths from the site for the residential uses.

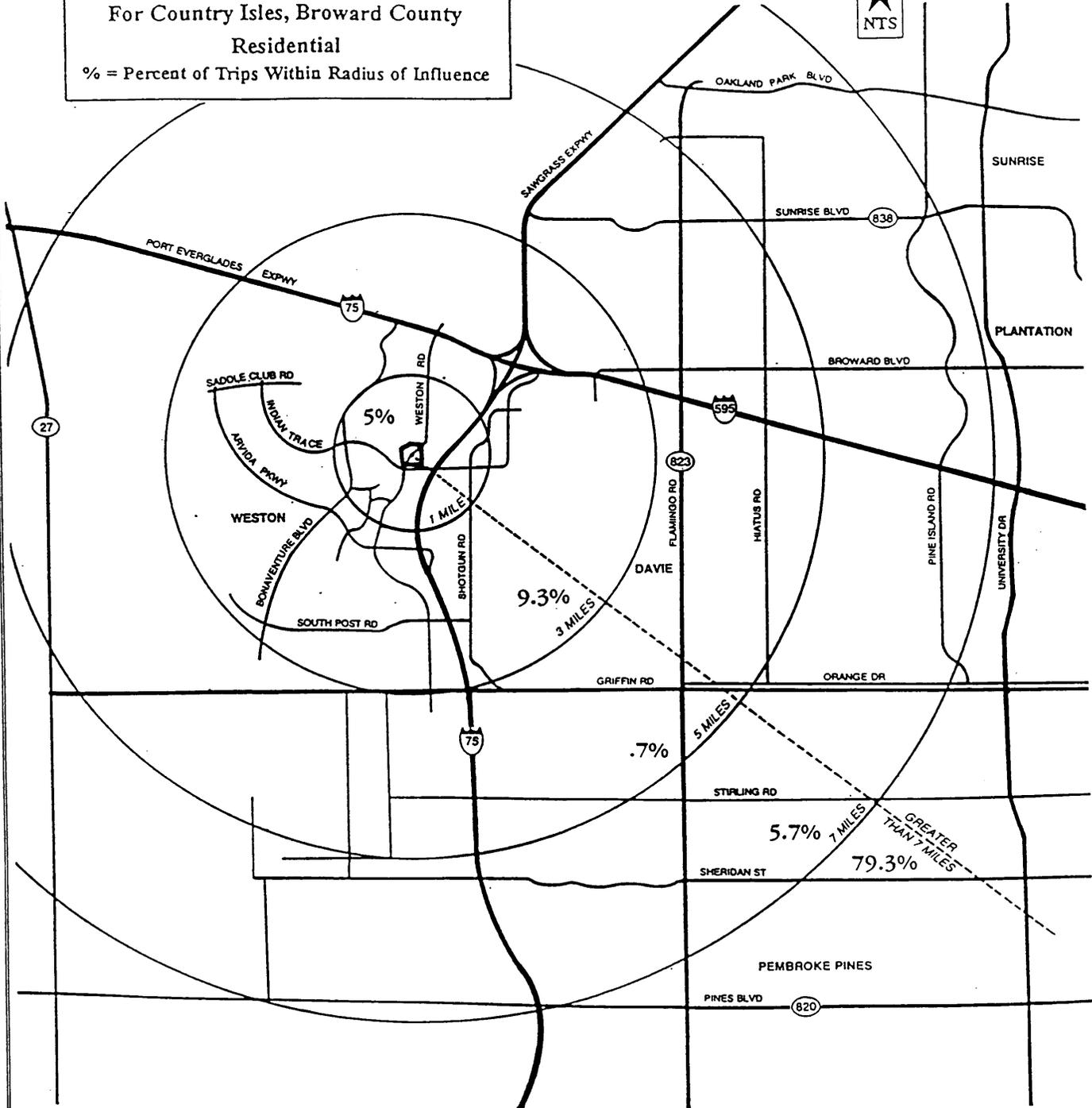
The terminated trips and the non-external trips (trips that have both the final origin and destination within the site) combined to represent 5.3 percent of the trip types within Country Isles (see Table V - 32). It should be noted that non-external trips were difficult to determine unless the interviewee gave a specific office location or stated that they lived in the apartment complex within the site. Due to this difficulty, it is possible that not all non-external trips were counted. The percentage of all trips at the retail and office locations originating from within the site was determined to be 6.4 percent.

Table V - 33, Percent Pass-by Capture by Land Use (Retail/Office trips) for Country Isles, shows the

FDOT Trip Characteristics Study of Multi-Use Developments	
Table V - 33 - Percent Pass-by Capture By Land Use (Retail/Office Trips) for Country Isles	
Land Use	Percent Capture By Land Use
Supermarket	11.1
Office	16.0
Restaurant with drive-through	37.5
Restaurant without drive-through	N/A
Retail	21.5
Convenience store with gas pumps	42.8
Bank with drive-through	27.3
Bank without drive-through	N/A
Other	26.4
Total Pass-By Capture	27.6

N/A - Land Use not available at this site

Figure V-8
Trip Length Distribution
For Country Isles, Broward County
Residential
 % = Percent of Trips Within Radius of Influence



percent of pass-by capture by land use for the Country Isles site. Convenience markets with gas pumps and drive-through restaurants have the largest pass-by capture rates of 42.8 percent and 37.5 percent, respectively.

This is typical of these type of land uses since they have a greater propensity to capture trips. Banks with drive-throughs have the third highest capture rate of 27.3 percent. The Office pass-by capture rate was measured at 16.0 percent. The high rate of pass-by capture (16.0 percent) at the Country Isles site is probably due to the presence of medical offices within the site. The Pinellas County Impact Fee Study, Table II - 4, Weighted Average Origin/Destination Survey Results by Land Development Activity⁹, indicates that surveyed medical offices had a higher pass-by capture rate than general offices (23 percent vs. 8 percent). Thus, given the presence of medical offices at the Country Isles site, the 16 percent pass-by capture rate is reasonable. The site as a whole had a pass-by capture rate of 27.6 percent.

Village Commons

The percentage of trips by trip type for Retail/Office uses are shown in Table V - 34, Trip Type Summary for Village Commons, Retail/Office. Primary trips were the most frequently made trip type occurring 52.6 percent of the time. Diverted trips occurred 22.9 percent and pass-by capture trips occurred 13.5 percent. The location of the site most likely caused the number of diverted trips to increase while decreasing the pass-by capture trips. The road system around Village Commons is such that a trip that causes the site to fall within the primary trip rectangle may not be a pass-by capture trip. There were no logical routes to the site without diverting off the original trip path. This was mainly due to the location of I-95 and the orientation of Palm Beach Lakes Blvd. Most of these trips were classified as a diverted trip, thus decreasing the percentage of pass-by capture trips. Another possible explanation for the low capture rate is the absence of high pass-by capture rate land uses such as convenience stores with gas pumps and drive-through restaurants. The site at Village Commons does not contain either

⁹ Tindale-Oliver and Associates, Inc. Pinellas County Transportation Impact Fees, February 1990, pp. II - 19.

of these land uses, causing the overall capture rate to be lower than the other two sites which contain a combination of the above mentioned land uses.

The percentage of trips by trip length are shown in Figures V - 9 and V - 10, Distribution of Total Trip Lengths, For Village Commons, and Cumulative Distribution of Total Trip Lengths, For Village Commons, respectively. The majority of the trips occur within three miles of the site (72.2 percent).

FDOT Trip Characteristics Study of Multi-Use Developments	
Table V - 34 - Trip Type Summary for Village Commons, Retail/Office ⁽¹⁾	
Trip Type	Percent
Primary	52.6
Secondary	6.9
Diversion	22.9
Pass-by Capture	13.5
Non-External	2.4
Terminated	1.8

(1) Excludes Residential trips.

This is mainly due to the large residential area which extends approximately four miles north of the site. The "greater than seven" category includes trips from Jupiter, Palm Beach Gardens and Boca Raton.

Figure V - 11, Trip Length Distribution For Village Commons, Office and Retail, also shows a map of the distribution of trip lengths from the site.

The terminated and non-external trips make-up 4.2 percent of the total trips. The percentage of all trips at the retail and office locations originating from within the site was determined to be 5.5 percent. The residential contribution was determined by taking the weighted average of the residential surveys at the Country Isles and Boca Del Mar sites.

Table V - 35, Percent Pass-By Capture By Land Use (Retail/Office Trips) for Village Commons,

FDOT TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

Figure V – 9

Distribution of Total Trip Lengths For Village Commons Site, Non-Residential

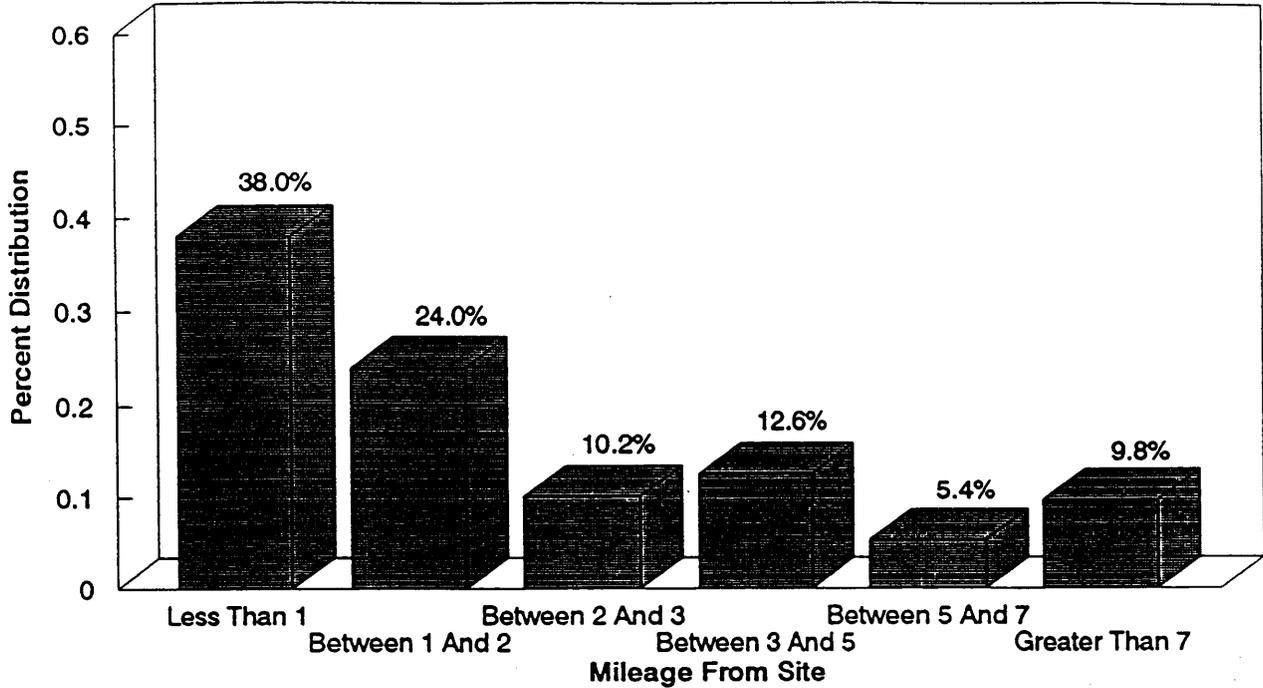


Figure V – 10

Cumulative Distribution of Total Trip Lengths For Village Commons Site, Non-Residential

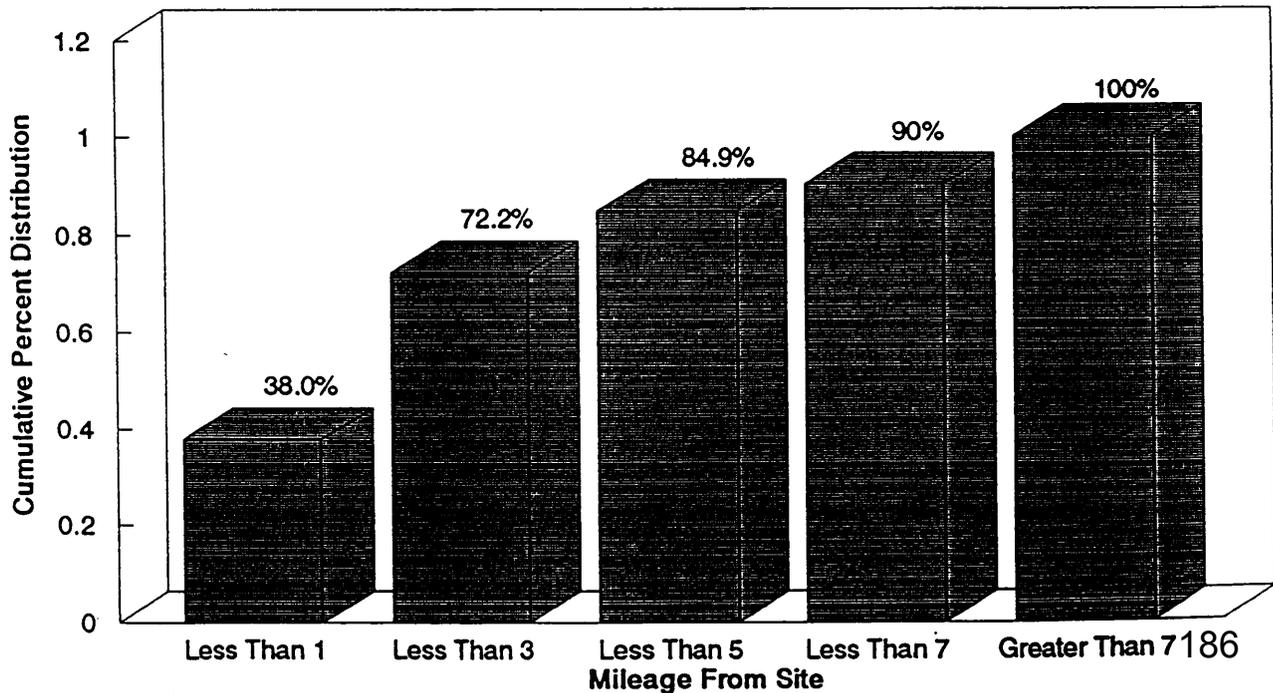
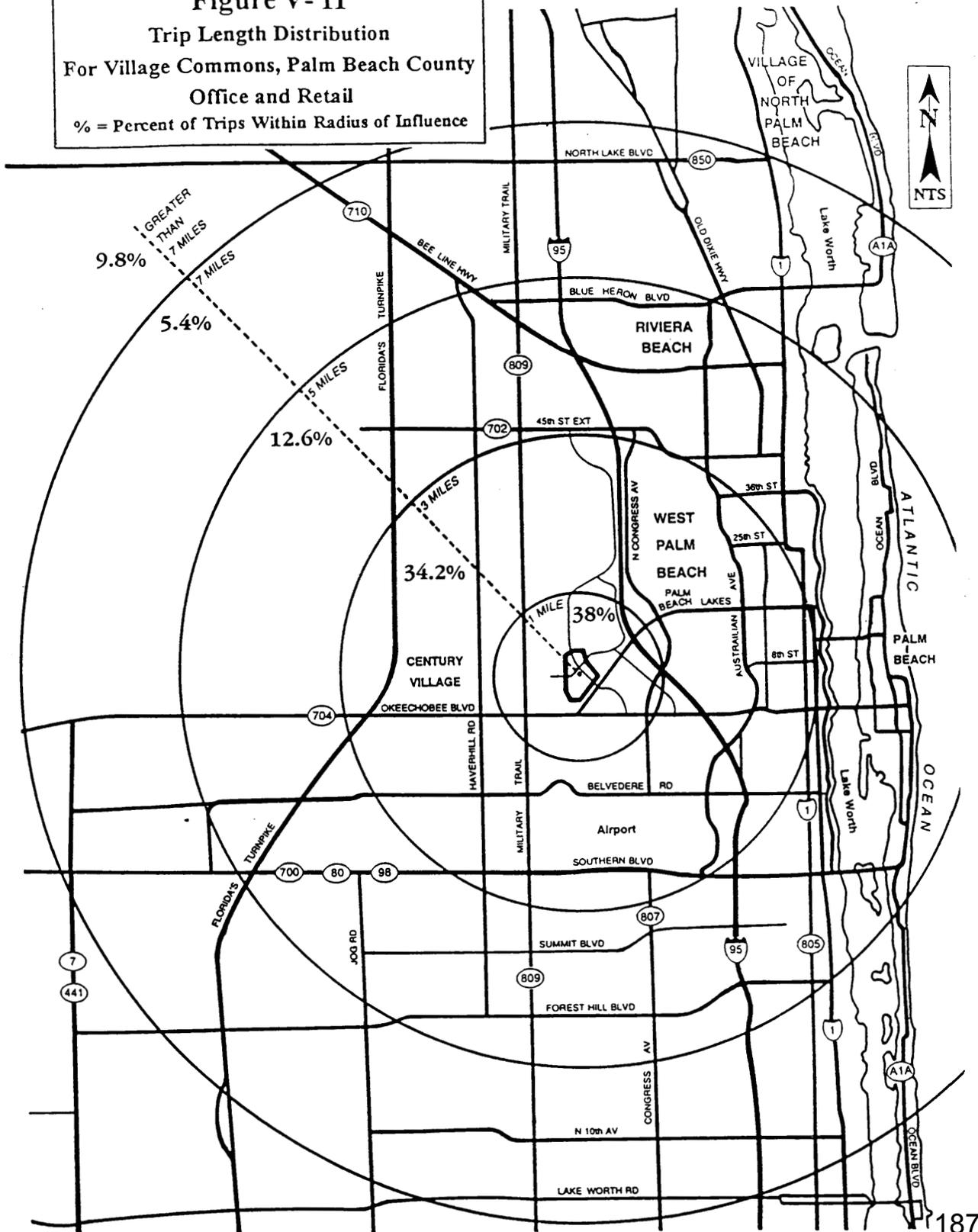


Figure V-11
Trip Length Distribution
For Village Commons, Palm Beach County
Office and Retail
 % = Percent of Trips Within Radius of Influence



summarizes the pass-by capture rate by land use for the Village Commons site. Banks with drive-throughs have the largest pass-by capture rate of 18.2 percent. Drive-through uses such as restaurants and banks typically have a high pass-by capture rate. Supermarket and retail uses have the second and

FDOT Trip Characteristics Study of Multi-Use Developments	
Table V - 35 - Percent Pass-by Capture By Land Use (Retail/Office Trips) for Village Commons	
Land Use	Percent Capture by Land Use
Supermarket	14.1
Office	10.6
Restaurant with drive-through	N/A
Restaurant without drive-through	12.4
Retail	13.5
Convenient Store with gas pumps	N/A
Bank with drive-through	18.2
Bank without drive-through	N/A
Other	N/A
Total Pass-By Capture	13.5

N/A - Land Use not available at this site.

third highest pass-by capture rates of 14.1 percent and 13.5 percent, respectively. The Office land use had the lowest pass-by capture rate (10.6 percent). The total pass-by capture rate for the site is 13.5 percent.

Boca Del Mar

The percentage of trips by trip type are shown in Table V - 36, Trip Type Summary for Boca Del Mar. Primary trips were the most frequent type of trip occurring 55.5 percent of the time. The second most frequent trip type was the pass-by capture trip occurring 28.6 percent of the time.

FDOT Trip Characteristics Study of Multi-Use Developments

Table V - 36 - Trip Type Summary for Boca Del Mar, Retail/Office (1)

Trip Type	Percent
Primary	55.5
Secondary	5.2
Diversion	7.6
Pass-by Capture	28.6
Non-External	2.1
Terminated	1.0

(1) Excludes Residential trips.

The percentage of trips by trip length are shown in Figures V - 12 and V - 13, Distribution of Total Trip Lengths, For Boca Del Mar Site, Non-Residential, and Cumulative Distribution of Total Trip Lengths, For Boca Del Mar Site, Non-Residential, respectively. From the figures, it is seen that over seventy-five percent of all the trip lengths occur within three miles or less of the site. This site is completely surrounded by several residential enclaves. When trip lengths become greater than three or four miles, residents have other shopping centers to choose from. For example, if a resident lives two miles north of the site, they may choose from two other large malls which are just as close as the study site. Also, if a resident lived three miles west of the site, they may choose from three medium size shopping centers that will be as close as the study site. Figure V - 14, Trip Length Distribution, Office and Retail, Boca Del Mar, also shows a map of the distribution of the trip lengths from the site. Figure V - 15, Distribution of Total Trip Lengths, For Boca Del Mar, Residential, and Figure V - 16, Cumulative Distribution of Total Trip Lengths, For Boca Del Mar, Residential summarize the distribution of the trip lengths for the residential land use. As can be seen from these figures, the trip lengths were distributed fairly evenly among the mileage categories. This is a function of the location at Boca Del Mar. This site is closer to several pockets of employment such as the Towne Center, downtown Boca Raton, and Florida Atlantic University. Also, a trip to Ft. Lauderdale is still possible and most likely accounts for the "Greater than 7" category trips. Figure V - 17, Trip Length Distribution, For Boca Del Mar, Residential, shows a map of the distribution of residential trip lengths from the site.

FDOT TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

Figure V – 12

Distribution of Total Trip Lengths For Boca Del Mar Site, Non-Residential

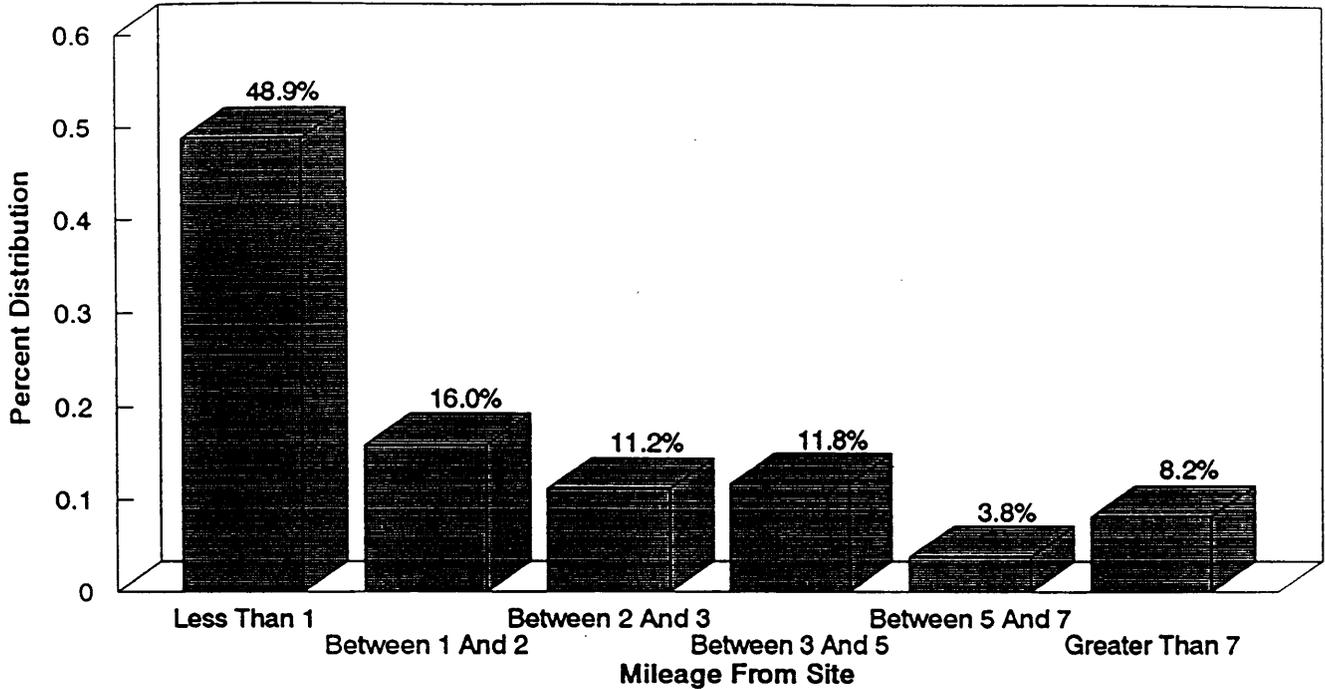


Figure V – 13

Cumulative Distribution of Total Trip Lengths For Boca Del Mar Site, Non-Residential

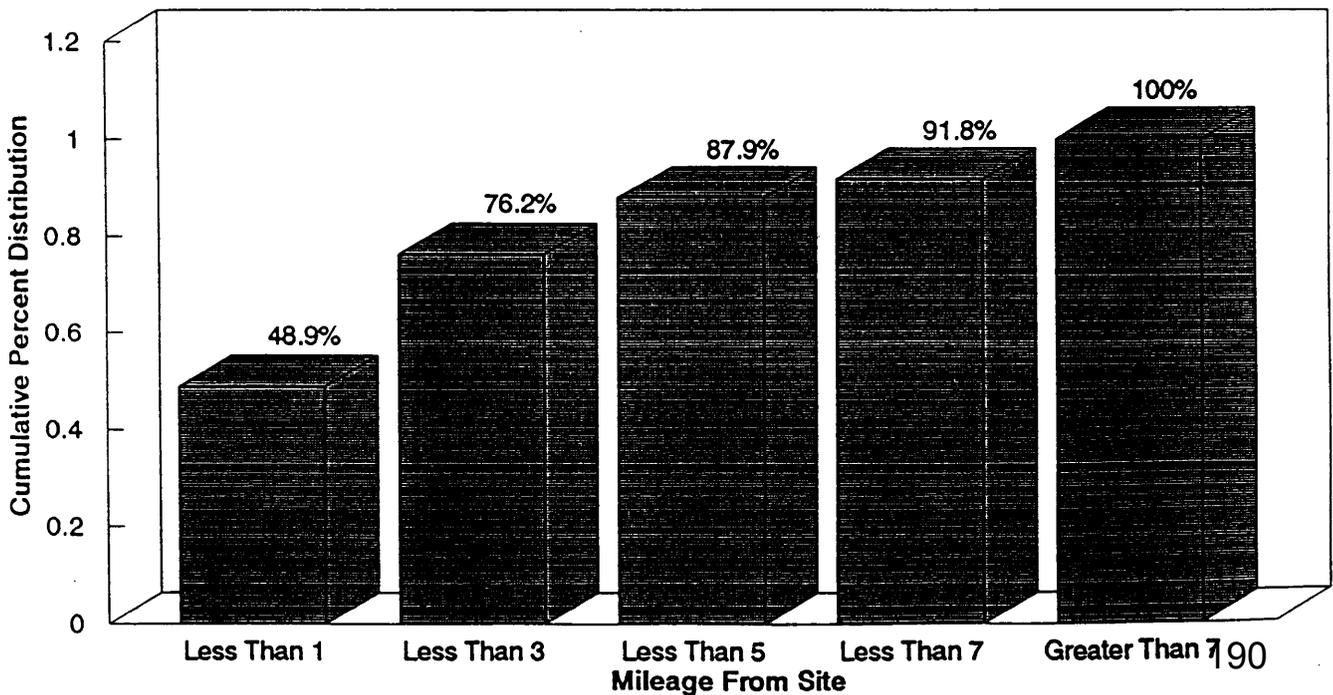
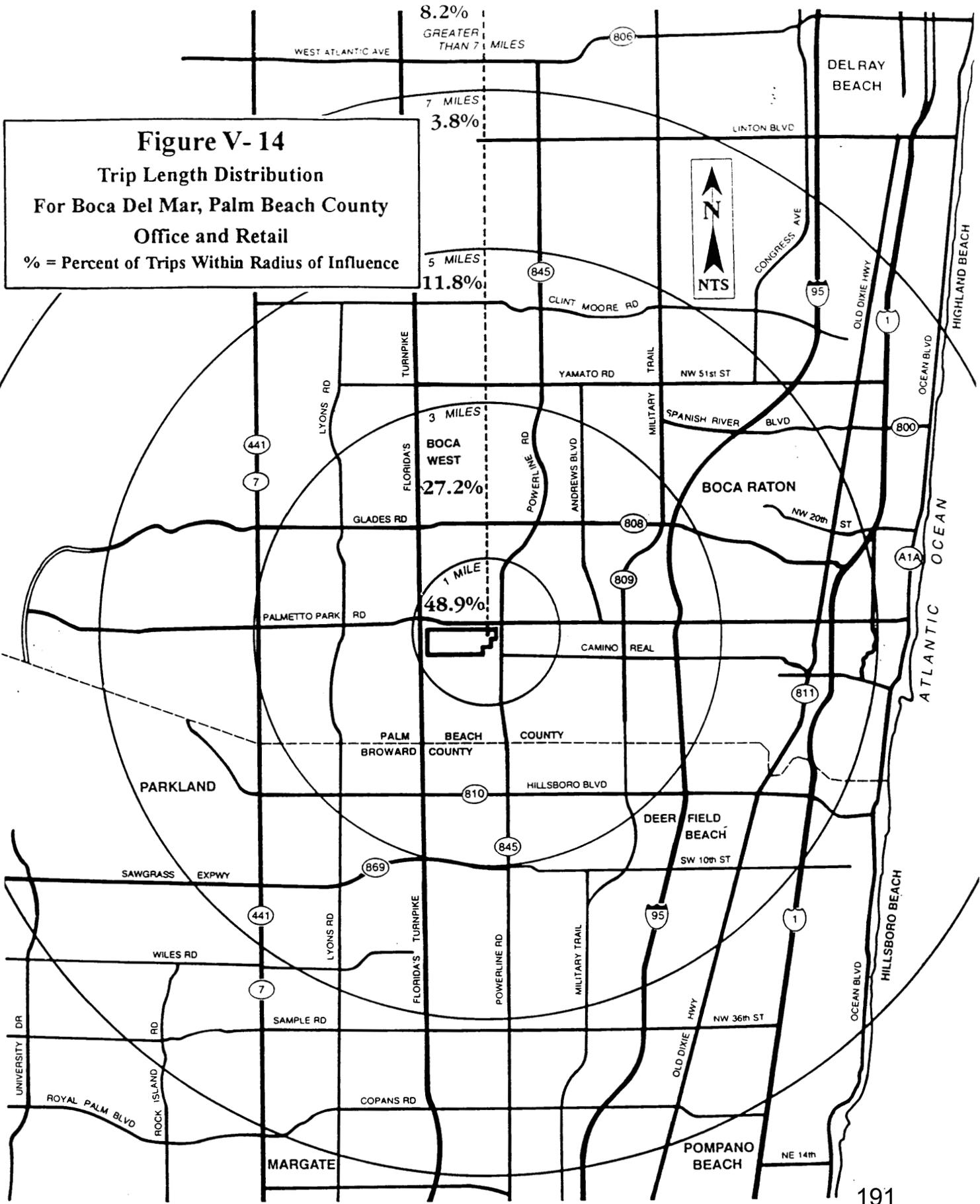


Figure V-14
Trip Length Distribution
For Boca Del Mar, Palm Beach County
Office and Retail
 % = Percent of Trips Within Radius of Influence



FDOT TRIP CHARACTERISTICS STUDY OF MULTI-USE DEVELOPMENTS

Figure V – 15

Distribution of Total Trip Lengths
For Boca Del Mar, Residential

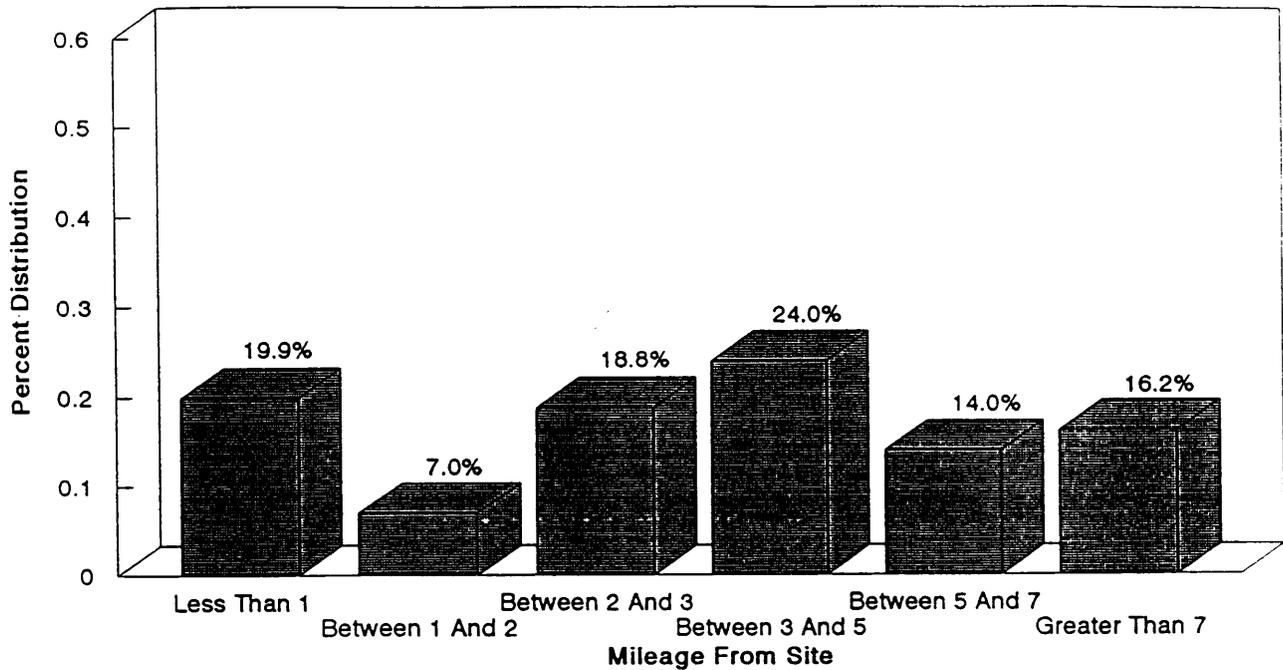


Figure V – 16

Cumulative Distribution of Total Trip Lengths
For Boca Del Mar, Residential

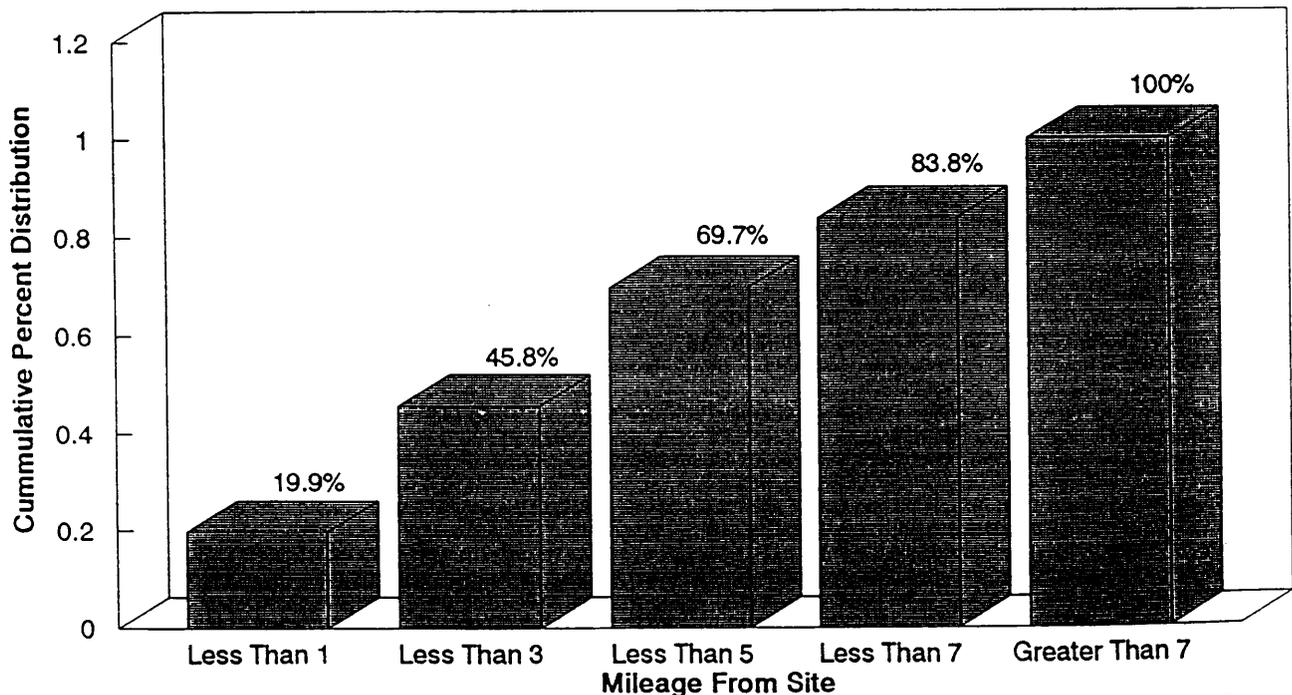
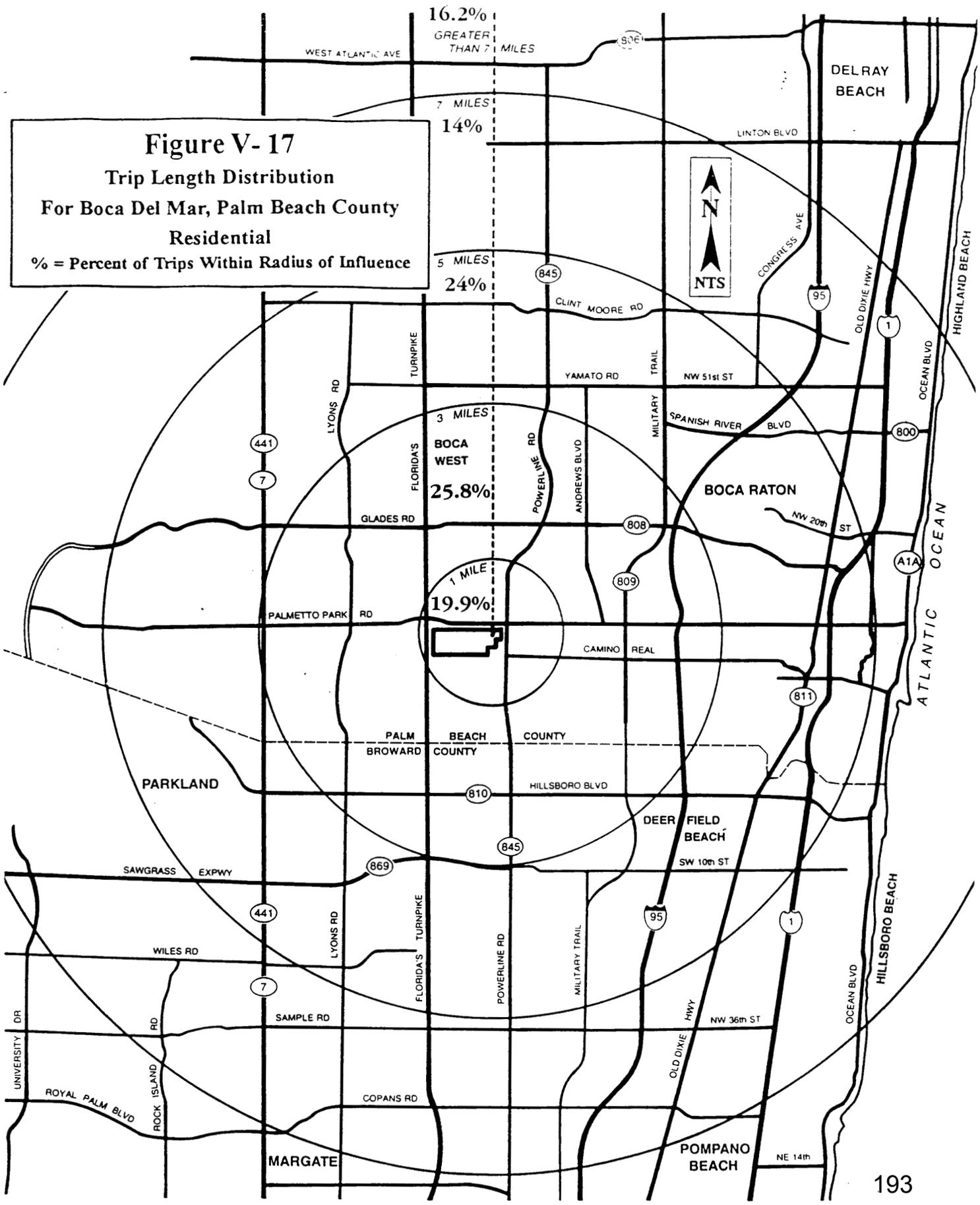


Figure V-17
Trip Length Distribution
For Boca Del Mar, Palm Beach County
Residential
 % = Percent of Trips Within Radius of Influence



The terminated and non-external trips make-up 3.1 percent of the total trips. The percentage of all trips at the retail and office locations originating from within the site was determined to be 5.3 percent. Table V - 37, Percent Pass-by Capture by Land Use for Boca Del Mar, shows the pass-by capture rates by land use for the retail/office trips at Boca Del mar. Restaurant with drive-throughs, banks with drive-throughs and retail have the first, second, and third highest pass-by capture rates by land use of 39.0

FDOT Trip Characteristics of Multi-Use Developments	
Table V - 37 - Percent Pass-by Capture by Land Use (Retail/Office Trips) for Boca Del Mar	
Land Use	Percent Capture by Land Use
Supermarket	24.2
Office	13.3
Restaurant w/ drive-through	39.0
Restaurant w/o drive-through	11.4
Retail	31.6
Conv. Station w/ gas pumps	N/A
Bank w/ drive-through	35.4
Bank w/o drive-through	N/A
Other	N/A
TOTAL	28.6

N/A - Survey locations not available at this site.

percent, 35.4 percent and 31.6 percent, respectively. Once again, these are typical pass-by capture rates for these types of land uses. The Office land use pass-by capture rate of 13.3 percent was influenced by the presence of medical office suites in the surveyed office building. The total pass-by capture rate for the site is 28.6 percent.

Conclusion

Table V - 38, Summary of Trip Types for All Sites (Retail/Office), illustrates that the distribution of trip type is similar for all three sites. The notable difference is the diverted and pass-by capture trips at Village Commons. As described earlier, this is due to the road network around Village Commons and

FDOT Trip Characteristics of Multi-Use Developments

Table V - 38 - Summary of Trip Types for all Sites (Retail/Office)

Trip Type	Percent		
	Country Isles	Village Commons	Boca Del Mar
Primary	49.6	52.6	55.5
Secondary	7.4	6.9	5.2
Diversion	10.1	22.9	7.6
Pass-by Capture	27.6	13.5	28.6
Non-External	2.7	2.4	2.1
Terminated	2.5	1.8	1.0

the lack of high pass-by capture rate land uses within the site. This network is not a perfect grid system, causing trips that would normally be pass-by capture to be classified as diverted trips. Even though the site fell within the primary trip rectangle, there was no logical route to the site without performing some diversion. Therefore, many trips that would have been classified as pass-by capture were classified as diverted causing the percentage difference. If all of the trips having the above characteristics that fell into the diverted category were classified as pass-by capture, the pass-by capture percentage would increase to 28.5 percent, and the diverted trips would decrease to 7.9 percent, thus being comparable to the other sites.

Table V - 39, Comparison of Trip Length Distributions, summarizes the trip length distributions for the three sites. As can be seen from this table, the three sites were very similar in retail/office trip length distributions. The site at Boca Del Mar had the largest percentage of trips occur less than one mile from the site, thus producing the lowest average trip length of 2.62 miles (see Table V - 39). As mentioned earlier, the Boca Del Mar site is completely surrounded by residential enclaves, causing trips to originate or terminate from all directions surrounding the site. Also, the trip maker may choose an alternative competing shopping center located in the vicinity for any trip that is greater than approximately three miles. Country Isles, due to its more "suburban" location, has the largest average trip length of 4.87

FDOT Trip Characteristics Study of Multi-Use Development

Table V - 39 - Comparison of Trip Length Distributions

Distance from Site (miles)	Retail/Office			Residential	
	CI (%) ⁽¹⁾	VC (%) ⁽¹⁾	BDM (%) ⁽¹⁾	CI (%) ⁽¹⁾	BDM (%) ⁽¹⁾
Less than 1	33.8	38.0	48.9	5.0	19.9
Between 1 and 2	29.2	24.0	16.0	8.6	7.0
Between 2 and 3	8.4	10.2	11.2	0.7	18.8
Between 3 and 5	12.6	12.6	11.8	0.7	24.0
Between 5 and 7	4.1	5.4	3.8	5.7	14.0
Greater than 7	11.8	9.8	8.2	79.3	16.2
Average Trip Length² (mi)	4.87	3.06	2.62	20.33³	8.00

¹ CI = Country Isles, VC = Village Commons and BDM = Boca Del Mar

² Does not include non-external trips.

³ Includes trips to Dade County, Ft. Lauderdale.

miles. This is due in part to the large number of trips originating in western Davie coming to the site. There is no competing shopping center located in western Davie.

Distribution of residential trip lengths varies between Country Isles and Boca Del Mar. The site at Boca Del Mar has a more even distribution ranging from 7 percent (between 1 and 2 miles) to 24 percent (between 3 and 5 miles). The site at Country Isles has 79.3 percent home-based trips greater than 7 miles away from the site. The majority of Fairlakes at Weston residents must travel long distances (greater than 7 miles) to get to their place of employment. Of all the home-based trips, approximately 40 percent are home-base work trips. A very small percentage of residents, less than 4 percent, work at Country Isles. A number of the responses said they worked in downtown Ft. Lauderdale and locations in Dade County. Thus, the abnormal distribution is most likely caused by residents who work in locations that are over seven miles away from the site. This is represented in the

greater average trip length of 20.33 miles (Table V - 39). On the other hand, the site at Boca Del Mar is located closer to areas of employment, thus giving a more even distribution and a lower average trip rate.

The percentage of all trips at the retail and office locations originating from within the site for all three sites were very similar. Country Isles had the largest percent of 6.4 percent and Boca Del Mar had the lowest of 5.3 percent.

Table V - 40, Comparison of Pass-By Capture by Land Use, summarizes the pass-by capture distribution by land use for all three sites. The site at Boca Del Mar had the largest pass-by capture rate of 28.6 percent. Village Commons had the smallest pass-by capture rate of 13.5. Once again, this is due to large percentages of diverted trips which would normally be classified as pass-by capture, but were not due to the site location and orientation of the surrounding road systems.

FDOT Trip Characteristics Study of Multi-Use Developments				
Table V - 40 - Comparison of Pass-by Capture by Land Use for Retail/Office				
Land Use	CI (%) ⁽¹⁾	VC (%) ⁽¹⁾	BDM (%) ⁽¹⁾	Avg (%)
Supermarket	11.1	14.1	24.2	16.5
Office	16.0	10.6	13.3	13.3
Restaurant w/ Drive Through	37.5	N/A	39.0	38.3
Restaurant w/o Drive Through	N/A	12.4	11.4	11.9
Retail	21.5	13.5	31.6	22.2
Convenient Store w/ Gas Pumps	42.8	N/A	N/A	42.8
Bank w/ Drive-Through	27.3	18.2	35.4	26.9
Bank w/o Drive-Through	N/A	N/A	N/A	N/A
Other	26.4	N/A	N/A	23.2
TOTAL Capture for Site	27.6	13.5	28.6	23.2

¹ CI = Country Isles, VC = Village Commons and BDM = Boca Del Mar
 N/A - Land Use not available at this site.

The land uses with the highest pass-by capture rates were Convenience Stores with Gas Pumps, Restaurants with Drive-through, and Banks with Drive-through with rates of 42.8 percent, 38.3 percent, and 26.9 percent, respectively. The restaurant without drive-through land use had the smallest pass-by capture rate of 11.9 percent.

