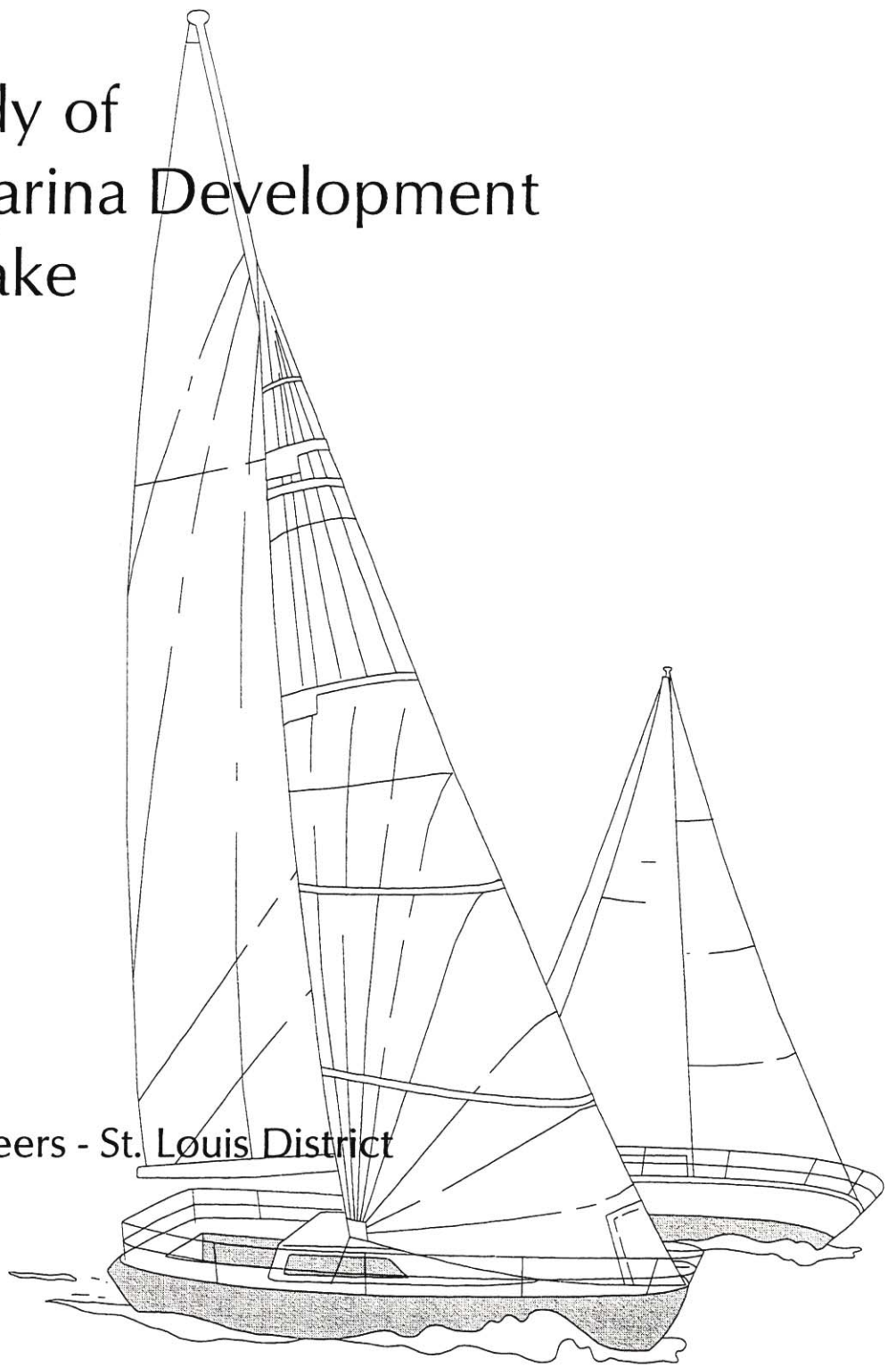


Appendix I
Marina Market Study

Market Study of Potential Marina Development at Carlyle Lake

Prepared for:
US Corps of Engineers - St. Louis District



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TABLE OF CONTENTS

INTRODUCTION	1
Summary of Findings	1
Assumptions	2
BACKGROUND	4
Regional Setting	4
Recreational Facilities	4
Marinas	7
COMPETITIVE LAKE DEVELOPMENTS	11
Alton Pool	11
Rend Lake	12
Lake Shelbyville	13
Other Competitive Lakes	14
Summary	15
MARKET AREA OF ATTRACTION	17
Delineation of Area	17
Socioeconomic Factors	17
SURVEY OF BOAT OWNERS	21
Survey Methodology	21
Survey Results	22
Characteristics of Potential Marina Slip Renters	27
MARKET DEMAND	29
Geographic Pattern	29
Existing and Projected Market Demand	29
Market Demand for a New Marina	30
Demand for Selected Facilities at Carlyle Lake	31
Summary and Recommendations	32
FINANCIAL ANALYSIS	35
Marina Development Costs	35
Revenues and Expenses	37
Cash Flow	38
Economic Consequences of Development	40
FINANCIAL EFFECT OF MARINA OPERATIONS	42
Appendix A - Survey Questionnaire	
Appendix B - Survey Results	

LIST OF TABLES

Table

1	Existing and Potential Marina Slips and Dry Storage at Carlyle Lake . .	10
2	Alton Pool Marinas	12
3	Comparison of Selected Marina Facilities at Competitive Lakes Within the Market Area	16
4	Population Trends	19
5	1990 Population and Income Characteristics	20
6	Frequency of Boat Types Surveyed	23
7	Incidence of Boating on Selected Lakes	24
8	Carlyle Lake Characteristic Ratings by User	25
9	Expressed Interest in Using Existing and Proposed Marinas at Carlyle Lake	26
10	Expressed Desire for Selected Facilities at Carlyle Lake	27
11	Projected Slip Rentals at Existing Marinas	30
12	Projected Slip Rentals at a New Marina	31
13	Infrastructure Costs of New Marina	34
14	Cost of Improvements, 400 Slip Marina	36
15	Projected Annual Revenue, 400 Slip Marina	38
16	Annual Cash Flow, 400 Slip Marina	39

LIST OF FIGURES

Figure

1	Regional Setting	5
2	Recreational Facilities	6
3	Market Area Map	18
4	Rental Slip Projections	41

INTRODUCTION

The purpose of this market study is to determine if sufficient demand exists for additional or expanded commercial marina development at Carlyle Lake, Illinois. This analysis includes the definition of the market area, a description of the socioeconomic characteristics of the persons within the market area, the identification of existing recreational facilities, including marinas, at Carlyle Lake and competitive marina developments, and the assessment of market potential through a survey of boat owners. Once market demand is established, the feasibility of the development of additional facilities is considered. The study concludes with an analysis of both the construction and operational costs and the projected revenues of a new marina. The financial impact of the development on existing facilities is also considered in the financial analysis.

Summary of Findings

Currently there are four marinas developed on Carlyle Lake. Three of the marinas have both in-water and dry storage, and one has only dry storage. Together, these marinas provide approximately 1,100 slips and are generally at 85 to 90 percent capacity every year. Most of the boats at these marinas are sailboats.

The market area is comprised of ten counties in southwest Illinois, the city of St. Louis and three counties in Missouri. The market is strongly oriented toward the densely populated St. Louis Metropolitan Area. The Illinois portion of the market area is limited to the north by Lake Shelbyville and to the south by Rend Lake. Carlyle Lake faces stiff competition for boaters in the western portion of the market area from the Lake of the Ozarks and Mark Twain Lake. The population of the market area is expected to remain stable with the total population increasing by less than one percent through the year 2010.

Market demand was assessed in part through a telephone survey of boat owners in the market area. Because smaller boats generally are not stored at a marina, only persons owning boats 16 feet or more in length were surveyed. Boat owners, on average, are older, have higher incomes and have slightly more education than the general population of the market area. The largest number of boats in the market area are fishing boats followed by open runabouts and sailboats. Fishing is the most popular boat activity followed by pleasure riding and sailing. Nearly two-thirds of boat owners in the study area trailer their boat.

The pattern of boating at selected lakes varies between the Illinois and Missouri portions of the market area. More than half (54%) of Illinois boaters have been to Carlyle Lake within the last year. The Lower Kaskaskia River (38%) and Rend Lake (34%) were also popular among Illinois boaters. The Missouri market area is dominated by Lake of the Ozarks (35%), Mark Twain Lake (34%) and other Missouri Lakes (27%). Twenty percent of boaters from the Missouri portion of the market area have been on Carlyle Lake within the last year.

The analysis of market demand is based upon survey data on boat owners, interviews with marina operators and previous studies. Market penetration, the portion of the market demand coming from the market area, is estimated at 100 percent. The capture rate, represented by the 972 boats renting at existing marinas at Carlyle Lake, is six percent. The expressed demand for rental slips is based upon the percentage of potential slip renters who would consider renting a slip at Carlyle Lake. For the purposes of this study, potential slip renters were defined as those boaters who have been on the lake within the last year. Approximately 30 percent of the potential slip renters expressed an interest in renting a slip at an existing marina and an even greater percentage (51%) were interested in a new marina.

Assuming that the existing slip rental trend continues, the projected demand for slips at the existing marinas is expected to exceed their potential capacity in approximately 10 years. The projection of demand for a new marina predicts a market demand of 1,647 marina slips by the year 2010. Thus, market demand will increase by 705 slips over the next 16 year period. These numbers indicate that there is a sufficient market available to justify the expansion of the existing marinas to capacity which could be followed by the construction of a new marina. The new marina should be designed to serve approximately 600 "customers" with 400 in-water slips and dry storage for a minimum of 200 boats. Approximately 110 of the slips should be covered.

Two potential marina sites were considered in the report, South Shore State Park and the Allen Branch area of Eldon Hazlet State Park. It is recommended that the marina be built at South Shore State Park as this area is currently under-utilized and development of a marina at this site will help to relieve the congestion experienced on the west side of the lake. In addition, the provision of infrastructure will open up this area to future development.

Assumptions

The market study and analysis for commercial marinas at Carlyle Lake is based on the following general assumptions.

- Federal, state and local governments will continue the high level of recreational services.
- Proponents for marina facilities will be available if the market demand exists.
- Commercial marina concessions will be operated by business people experienced in marina operations.
- Potential marina sites under consideration are South Shore State Park and Hazlet State Park (on Allen Branch).
- The level of recreational activity at Carlyle Lake is generally dependent on the economy of St. Louis and southwest Illinois.

- Population and employment trends are based upon projections by the East-West Gateway Coordinating Council and the State of Illinois.
- The profile of boat owners and boats identified in the telephone survey is accurate for the foreseeable future.
- Data gathered through the survey of a sample of boat owners in the market area is representative of all area boat owners.
- No major lake will be constructed in the Carlyle Lake market area during the time period considered by this study.

BACKGROUND

This chapter presents background information that will be helpful in understanding the market study. General information regarding the lakes's setting, existing recreational facilities and marinas is provided in this section.

Regional Setting

Carlyle Lake, built by the Corps of Engineers in 1967, is located in southwest Illinois in Clinton, Bond and Fayette Counties. The dam was constructed on the Kaskaskia River about one-half mile north of the city of Carlyle, Illinois. The lake extends 13 miles upstream from the dam, has a surface area of 26,000 acres and 87 miles of shoreline at normal pool elevation (445.0 ft.).

The lake is located approximately 50 miles east of St. Louis, Missouri on U.S. Highway 50. The lake area is well served by the existing highway system with U.S. 51 providing access from the east and Illinois 127 providing access from the west. Three major interstates, 70, 64 and 57 are within short driving distances from the lake (See Figure 1).

Recreational Facilities

Carlyle Lake is a heavily used recreation area consisting of 26,000 acres of water surface and 11,000 acres of public land. Facilities available at the lake include campgrounds, boat launching ramps, state parks, a visitor center, swimming beaches, picnic areas, marinas and a sailboat harbor. The two agencies actively involved in providing outdoor recreation at the lake are the Corps of Engineers (COE) and the Illinois Department of Conservation (IDOC).

The COE operates six public recreation areas and a visitor center at the lake. IDOC manages two state parks, Eldon Hazlet State Park on the west and South Shore State Park on the southeast portion of the lake; two boat access areas; and the Carlyle Lake Wildlife Area (See Figure 2). There are three marinas and a sailboat harbor at the lake. Each of these facilities is operated by a private concessionaire under a lease agreement with the Corps of Engineers.

REGIONAL SETTING

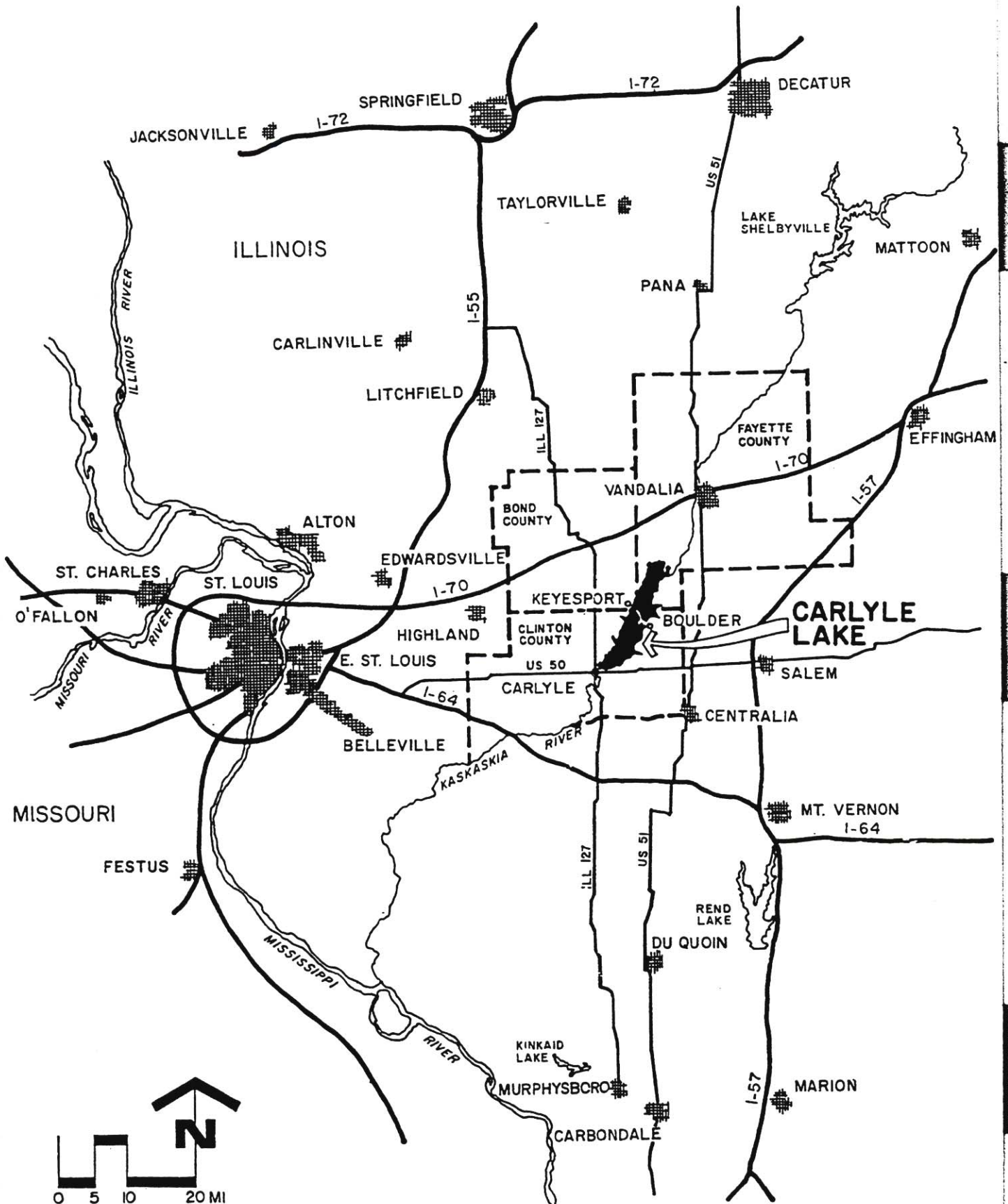


Figure 1

RECREATIONAL FACILITIES

- 1 Keyesport Recreation Area
- 2 Keyesport Marina
- 3 Eldon Hazlet State Park
- 4 Carlyle Sailing Association
- 5 West Access Marina
- 6 Spillway Recreation Area
- 7 Dam-East Recreation Area
- 8 South Shore State Park
- 9 Coles Creek Recreation Area
- 10 Boulder Marina
- 11 Boulder Recreation Area
- 12 Dam-West Recreation Area

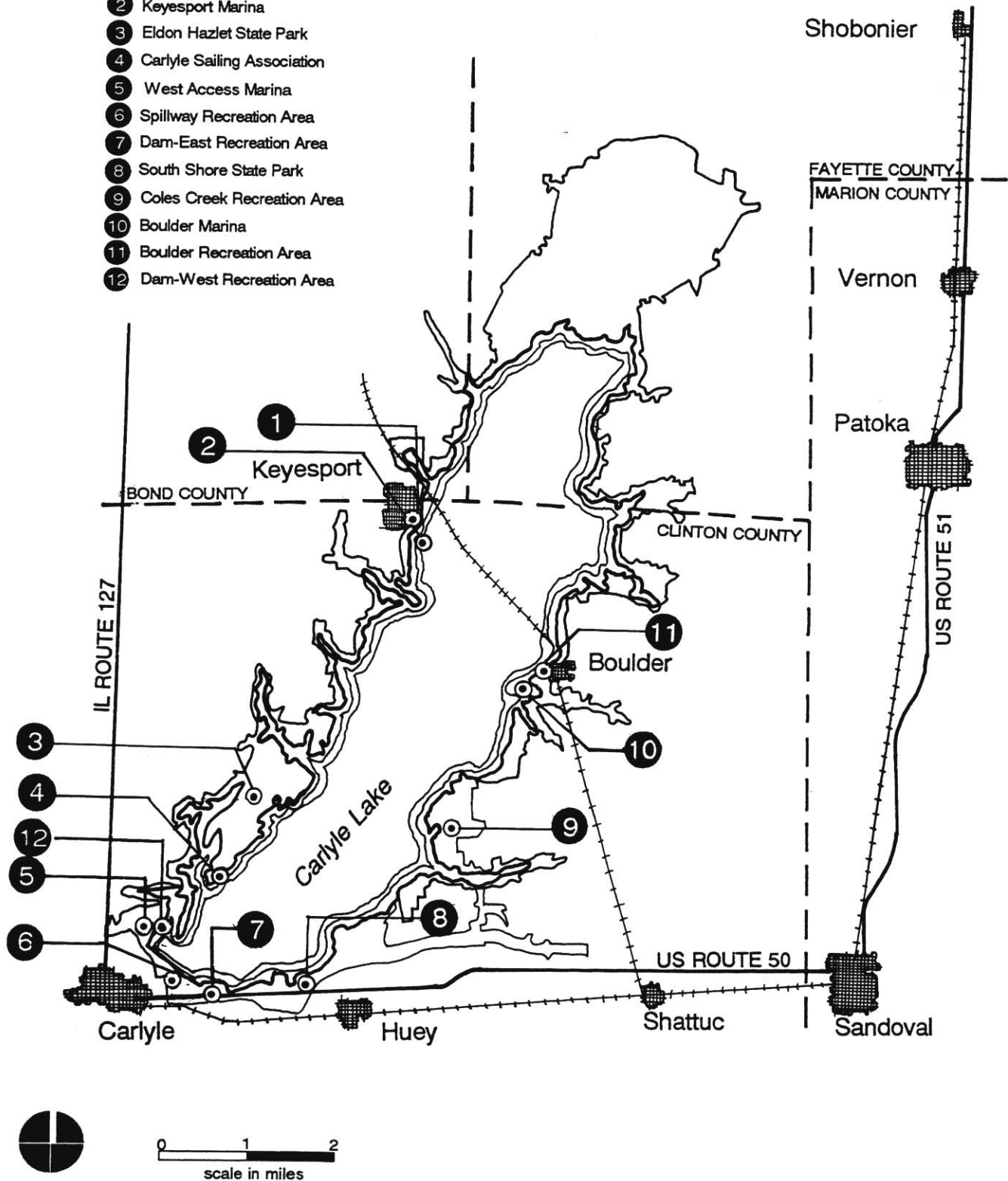


Figure 2

Marinas

Sailing and boating are popular attractions at Carlyle Lake. The lake has become one of the most popular sailing lakes in the Midwest and annually hosts regional, national, and international sailing regattas. In addition, sailing events associated with the 1994 Olympic Festival were held at Carlyle Lake.

The four existing public marinas are located in different areas of the lake. Boulder Access Marina is located on the east side of the lake adjacent to the town of Boulder and is approximately six miles north of U.S. 50. Keyesport Access Marina is located on the west side of the lake, adjacent to the city of Keyesport, and is approximately five miles east of Illinois 127. West Access Marina is located near the west abutment of the dam, approximately one mile north of the city limits of Carlyle. The sailing harbor, located at the extreme southern end of Hazlet State Park, is leased by the Carlyle Sailing Association.

Boulder Access Marina

This marina was rebuilt after a storm destroyed most of the existing dock facilities in July, 1993 and 274 slips are available. Approximately 88 percent of the slips are currently rented and there is sufficient space on site for dry storage for 30 boats.

Boulder Access Marina primarily serves sailboats. The marina operator estimates that 90 percent of slip renters have sailboats. Most slip renters tend to be from the St. Louis Metropolitan Area. The majority of the boats at the marina range from 27 to 35 feet in length and there is a tendency towards larger boats.

The marina has a snack bar and a small ship store. Other services include contract repairs, and gas and oil sales. Slip rental rates are \$3.50 per foot per month and slips must be rented for a minimum period of 9 months. Winter storage (in or out of the water) is \$75.00 per month, while dry storage is \$30.00 per month. Approximately 85 percent of the marina's revenue is derived from slip rental and storage fees, 10 percent from boat handling and 5 percent from gross sales.

There are no covered slips at the marina and there are no plans for the provision of such in the future. The marina operator is of the opinion that there is insufficient demand to justify the cost of providing covered slips at Carlyle Lake as it is primarily a sailing lake. Although a small percentage of his customers have expressed an interest in renting a covered slip, the marina operator estimates that 95 percent of power boaters using Carlyle Lake trailer their boats.

Although the marina operator expressed an interest in expanding, there is currently not enough space available for on-site expansion. It is estimated that an additional 26-to-30 slips, comparable in size to the existing slips, could be created within the harbor. This area would, however, need to be dredged before any additional slips could be constructed.

West Access Marina

Currently, there are 326 slips at the West Access Marina of which 315 or 96 percent are occupied. There were 12 covered slips at the marina, but these were removed in 1992 and there are no plans to provide covered slips in the future. Approximately 75 boats are stored on land in the summer and more are stored in the winter in the areas used for vehicle parking.

Most (87%) of the customers come from the St. Louis Metropolitan Area with the majority (approximately 60%) coming from west St. Louis County. Approximately 95% of the slips are occupied by sailboats. As is the case at the Boulder Access Marina, the operator has observed a trend towards larger boats.

Boat slips are rented at a rate of \$3.50 per foot per month and are rented on a 12 month basis (April 1-to-March 31). Dry storage is \$30.00 per month. West Access Marina is a full service marina providing brokerage and repair services. The marina also has a snack bar and sells boating supplies. Sailboat, pontoon and fishing boat rental are provided by separate subcontractors. Sailboats rent for \$25.00-to-\$60.00 for two hours, and pontoon and fishing boats are \$25.00 per hour. Approximately 69.5 percent of revenues are derived from dock rental and storage, 11 percent from repairs and labor, and 19.5 percent from other sales.

Although there are no current plans for expansion, the operator is of the opinion that 500 slips can be provided at West Access Marina, if needed, to meet the demand. The marina starts every season with a 10 percent surplus of slips with the goal of having all rented by the end of the season. It is estimated that dry storage facilities could be expanded to accommodate approximately 140 boats without disturbing traffic flow.

Considering its proximity to the Dam West Recreation Area and major highways, the West Access Marina is by far the most popular marina on the lake and can be crowded during summer weekends. The marina was sold to the current operators in 1990 and is currently in the fourth year of a five year rebuilding plan. The Army Corps of Engineers is planning on dredging the harbor and installing a new breakwater structure this year.

Keyesport Marina

Keyesport Marina contains 120 boat slips. Approximately equal numbers of sailboats and powerboats are docked at this marina. Most boat owners are from the St. Louis Metropolitan Area. Fourteen covered slips and seven transient slips are available at the marina. More than one-half (56 %) of the slips are currently vacant. The 1993 slip rental rate was \$600.00 per year with a dry storage rate of \$30.00 per month. Covered docks rent at the same rate as the uncovered and can accommodate boats up to 18 feet in length. All slips are rented for an eight month season, and boats must be taken out of the water by November 15.

The marina has a full service restaurant which is a principal generator of revenue. The restaurant has full occupancy on summer weekends, and is especially

popular with power boaters. Other services include fishing and pontoon boat rentals (\$35.00 per day plus gas and oil), and sales of fishing supplies, gas, oil and outboard motor parts.

It is estimated that an additional 30 slips could be provided in the existing harbor. Dry storage could be accommodated in the gravel area within the leased boundaries. Approximately 100 boats could be stored here.

Carlyle Sailing Association

The Carlyle Sailing Association (CSA), a non-profit corporation, operates the sailboat harbor at the extreme southern end of Hazlet State Park. The Illinois Department of conservation chose the association for a facility that was originally intended to be a marina concession. A board of directors and an operating staff are elected by the membership.

There is no in-water storage of boats, but rather boats are tied down in a parking lot and placed in the water via a ramp or one of three hoists on site. Storage for up to 365 boats is assigned as follows: 53 spaces available for cabin boats (up to 26 feet in length); 99 spaces for catamarans; and the remaining spaces (213) accommodate boats in the "ONE-Design" class (Snipe, Catalina 22, etc). There are no plans to expand the facility or provide in-water storage.

The CSA accepts new members throughout the season, and last year 90 percent of the spaces were rented. There is a waiting list for cabin boats every year with the current list comprised of 18 people. Fees for the six-month season (May 1-to-October 31) are \$333.00 which includes a \$108.00 maintenance fee. Members can offset the maintenance fee by working odd jobs around the facility. Most members are from the St. Louis area and about one-third of the members are involved in racing. Club races are held every Sunday. National and international regattas have been held at Carlyle Lake. Existing and potential marina slips, and other storage facilities at Carlyle Lake are summarized in Table 1.

Marina Revenues

Revenue information for fiscal year (FY) 1991 and FY 1992 for the West Access Marina, Keyesport Marina and Boulder Marina was provided by the Army Corps of Engineers. Financial information from the Carlyle Sailing Association (CSA) is not considered in this discussion because the CSA is a nonprofit organization. The combined gross sales of all three marinas exceeded \$700,000 for the last two years. Approximately 20 percent of total revenue was derived from sales while 80 percent was derived from rents and services. Revenues have remained relatively steady for the last two years. Expenses have remained below revenues and all three marinas are profitable.

A more detailed analysis of the financial status of the existing marinas would require data for a longer period of time than what is available. The marinas have survived the economic recession by focusing their operations on the more profitable rents and services business and away from gross sales.

Table 1
Existing and Potential Marina Slips and Dry Storage at Carlyle Lake

Marina	Rental Slips			Expansion Capacity	Potential Capacity	Dry Storage Current/Potential	Covered Slips
	Occupied	Vacant	Total				
Boulder Access Marina	240	34	274	26	300	30/60	0
West Access Marina	315	11	326	170	496	75/140	0
Keyesport Marina	53	67	120	30	150	0/100	14
Carlyle Sailing Association	334	28	362	150-200	512-562	All Dry	0
Total	942	140	1082	376-426	1458-1508	105/300	14

COMPETITIVE LAKE DEVELOPMENTS

Competitive marinas within the Carlyle Lake market area are those which could attract boaters who might rent a slip at Carlyle Lake. Two other lakes that are not within the boundaries of the Carlyle Lake market area, Mark Twain Lake and Lake of The Ozarks, are also included in this discussion as both of these lakes attract boaters from a portion of Carlyle Lake's market area. An understanding of the physical characteristics and existing marina facilities available at competitive lake developments is necessary to determine the potential marina market available to Carlyle Lake.

Alton Pool

The Alton Pool was formed by the construction of Lock and Dam No. 26 on the Mississippi River about 25 miles north of St. Louis. The 38-mile long lake has a water surface area of 40,000 acres. Access to Alton Pool is from state highways. Boating is the principal recreational activity on the pool although picnicking and camping facilities are also available. Boaters primarily have houseboats and large cruisers. Sailing is more popular near the Alton Dam where the lake is wider rather than on the upstream end of the pool where the lake has a five mile per hour current and, with the exception of the channel, is shallow. Most boaters on the Alton Pool are from the St. Louis Metropolitan Area.

There are 19 marinas on the Alton Pool which collectively provide approximately 2,500 wet boat slips. These marinas range in size from as few as 40 slips to as many as 300 slips. The seven marinas on the pool which were considered to be competitive with Carlyle Lake are summarized in Table 2.

Houseboats and large cruisers are the most common boats using the marinas and, consequently, several of the marinas on the pool have covered docks, lifts, yard trailers and repair facilities necessary for large boats. The predominance of large boats and cruisers on the Alton Pool is not typical of other lakes competing for boaters in the market area with the exception of the Lake of the Ozarks.

Development of additional marina facilities both on and in the vicinity of the Alton Pool is expected to occur in the future. Currently, at least two developments have been proposed. The city of Alton had a master plan completed in 1991 for a major marina/park development which will include a 300 slip full service marina. Preliminary plans call for the development of 150 slips in each of two separate phases. Twenty percent of the slips will be for sail boats, and 70 percent of the slips will be covered. Muscle Beach Harbor, a marina/restaurant facility is to be developed to the north of the city of Alton on the Missouri side of the Alton Pool. The opening date of these marinas could not be determined at the time of this report.

Table 2
Alton Pool Marinas

Marina	Wet Slips	Occu-pancy	1994 Slip Rental Rates	Boat Types	Market Area
Yacht Club of St. Louis	201 (most covered)	90%	\$1,550- \$3,350	Cabin Cruisers Houseboats Powerboats	St. Louis Metro Area
Lake Center Marina	272 (all covered)	90%	\$750- \$2,775	Cabin Cruisers Runabouts Houseboats	St. Louis Metro Area
Gibson Marina, Inc. dba Woodland Marina	300 (all covered)	100%	\$1,128- \$3,640	Cabin Cruisers Houseboats	St. Louis Metro Area
Anchor Marine	110 (all covered)	98%	\$855- \$2,916	Cabin Cruisers Houseboats	St. Louis St. Charles Belleville Collinsville
Venetian Harbor	165 (most covered)	85%	\$800- \$3,500	Cabin Cruisers Houseboats	St. Louis County and Metro Area
My River Home Boat Harbor	195 (all covered)	95%	\$1,400- \$2,600	Power and Sport Boats	St. Louis Metro Area
Harbor Point Yacht Club	226 (most covered)	90%	\$1,180- \$4,760	Cabin Cruisers Houseboats Sailboats	St. Louis Metro Area
Piasa Harbor (Western Boats and Motors)	216 (154 covered)	65%	\$779- \$2,262	Houseboats Sailboats	Alton, IL, St. Louis Metro Area

Source: "Marina Riverfront District Master Plan for the City of Alton, Illinois" Booker Associates, Inc. in association with Sheppard, Morgan & Schwaab, Inc. and MEECO Marinas, Inc. August, 1991. HBA, 1994.

Rend Lake

Rend Lake comprises 18,900 surface acres in Franklin and Jefferson Counties in southern Illinois. The lake has a shoreline of 162 miles and extends upstream from the dam for approximately 13 miles. Interstate 57, along with state highways 154 and 148, provide direct access to the lake from most of southern Illinois. Wayne Fitzgerald State Park, located on the eastern shoreline, provides a variety of recreational resources including boat launching ramps and related parking, a resort, two harbors, campgrounds, picnic shelters, hiking trails and a bridle trail.

The Rend Lake Marina, located on the southwest portion of the lake near the dam, has 242 dock spaces. Seventy-five of the docks are covered and approximately 42 are designated for houseboats. Occupancy at the marina normally approaches 85 percent. The operator plans on adding an additional 45 slips this year, and estimates that approximately 40 more spaces could be added before the harbor reaches maximum capacity.

The 1994 slip rental rates are \$495 per year for bank mooring, \$525 per year for a floating dock, \$625 to \$700 per year for a covered dock and \$800 per year for a houseboat slip. Most of the boats at the marina are pontoon boats. In addition to docking facilities, this full service marina provides boat service, gas and oil sales, a parts store, a convenience store, dry storage and boat rental.

The Rend Lake Marina is the primary marina at the lake and attracts most of its customers from the surrounding cities of Benton and Mount Vernon in Illinois and Cape Girardeau in Missouri. The Rend Lake Resort, does have a marina which provides some overnight docking and boat rental.

Lake Shelbyville

Lake Shelbyville is located 115 miles north of Carlyle Lake on the Kaskaskia River in central Illinois. At normal pool elevation the lake has a water surface area of 11,100 acres and a shoreline of 172 miles. The lake is fairly deep (53 feet at the dam) and long (17 miles), but only a mile wide at full pool. Highway and railroad bridge crossings divide the lake into five separate segments which cannot be traversed by sailboats. Wolf Creek State Park, on the eastern side of the lake, and Eagle Creek State Park, on the western side of the lake provide a variety of recreational resources including campgrounds, picnic shelters, hiking trails, boat launching ramps, a resort and golf course.

There are three marinas at the Lake: Lithia Springs, located on the eastern shoreline; Findley Marina on the western shoreline; and the Fox Harbor Marina which is located at the northeast end of the lake. At the time of this report, the owner of the Fox Harbor Marina could not be interviewed, however, the Corps of Engineers did indicate that there were 150 slips at this marina.

The Lithia Springs and Findley Marina are fairly large, full service marinas which draw customers primarily from central Illinois to the northern suburbs of Chicago. The Lithia Springs Marina has 300 slips of which 133 are covered, and the Findley Marina contains 370 slips of which approximately 150 are covered. Occupancy rates at both marinas ranges from 85 to 100 percent. The owner of the Findley Marina plans on adding 26 slips this year and estimates that the harbor can accommodate an additional 50 slips. Expansion at the Lithia Springs Marina is expected to occur by 1995, however, the number of slips to be constructed has not yet been determined.

Slip rental rates for the 1994 boating season (May through October) ranged from \$39-to-\$57 per foot for a covered dock and \$22-to-\$39 per foot for an uncovered dock. Off season rates are much cheaper ranging from \$8-to-\$14 and \$5-to-\$10 per

foot for a covered and uncovered dock, respectively. Boats at these marinas are primarily houseboats, cruisers, and pontoon boats.

Other Competitive Lakes

Mark Twain Lake

Mark Twain Lake, located 25 miles west of the city of Hannibal, Missouri in Monroe and Ralls Counties, was built in 1984. This 18,600 acre lake can be accessed by U.S. 24 and several Missouri routes. Recreational resources at the lake include boat launching ramps, marinas, swimming beaches, picnic areas, campsites, playgrounds and a water amusement park.

Currently, there are two marinas at the lake which provide a total of approximately 470 slips. Both of the marinas are 100 percent occupied and have active waiting lists. Fees are based on boat size and generally range from \$900-to-\$2,000 per year. Runabouts, cruisers and fishing boats are the primary boats using this lake. Sailing is also possible at the lake with some sailboats stored at the marinas. According to a study conducted for the Corps of Engineers in 1988, a separate sailboat marina would not be feasible at the lake given the surrounding terrain and the configuration of the shoreline.

Lake of the Ozarks

The Lake of the Ozarks, created in 1931 for the generation of hydroelectric power, is 129 miles long, has a water surface area of 60,000 acres, and a cove-indented shoreline of 1,150 miles. The lake is located in central Missouri approximately 185 miles west of the St. Louis Metropolitan Area.

Development in and around the lake includes several full-scale resorts, condominiums, extensive commercial development and two state parks. There are numerous marinas at the lake. Boats utilizing the lake range from small fishing boats to houseboats and cruisers. The Lake of the Ozarks Council of Governments estimates that approximately 3 million people visit the lake each year.

Lower Kaskaskia River

There is a full service marina and a public boat ramp on the lower Kaskaskia River. The marina, the Kaskaskia River Marina and Campground, is located in New Athens, Illinois, on River Mile 28.2. There are 30 slips in the marina, 15 are covered. Generally all 30 slips are occupied. The existing harbor can be expanded to hold an additional 10 slips. Dry storage is not provided on-site. Facilities at the marina include a restaurant and bar, sales and service. Gasoline sales will be available in 1995. Most of the boats at the marina are houseboats and 24-to-48 foot cabin cruisers. Customers primarily reside within a 30-to-50 mile radius of the marina which includes the St. Louis Metropolitan Area. A public boat ramp is located approximately 10 miles up the Kaskaskia River in Evansville, Illinois. Gasoline is also available at the restaurant.

Summary

Three primary competitive lake developments were identified within the market area of Carlyle Lake. These lakes are considered to be competitive because of their size, location and existing marina facilities. The unique characteristics of each of these lakes attracts different segments of the population within the market area.

Visitors to both the Alton Pool and Carlyle Lake primarily reside in the St. Louis Metropolitan Area, while visitors to Rend Lake and Lake Shelbyville primarily reside in other geographic areas. Boaters from the St. Louis Metropolitan Area also use Mark Twain Lake and the Lake of the Ozarks. Existing marinas at these lakes are generally 85 to 90 percent occupied, which indicates that the market is not overdeveloped with respect to marinas.

Each of the lakes attracts a different mix of boats. Houseboats and cruisers are the predominate boats on the Alton pool. Most boaters at Rend Lake use pontoon boats while a mix of houseboats, cruisers and pontoon boats characterize Lake Shelbyville. Carlyle Lake is unique in that it is predominantly a sailing lake.

Table 3 provides a comparison of competitive marinas within the market area. Although attracting boaters from the St. Louis Metropolitan Area, Mark Twain Lake and the Lake of the Ozarks are not included in Table 3 because of their location outside the market area.

Table 3
Comparison of Selected Marina Facilities
at Competitive Lakes Within the Market Area

Lake	Size (Acres)	Access	Market Area	# of Slips	Slip Rental Rates	Percent Occupancy	Boat Types
Carlyle	26,000	U.S. 50, 51, IL 127	St. Louis Metro	1,099	\$600-\$2000	85%-100%	Sailing Fishing
Alton Pool	40,000	U.S. 67, IL 3, 140	St. Louis Metro	1,469	\$750-\$4760	85%-100%	Houseboats Cruisers Powerboats Sailboats
Rend Lake	18,900	I-57, 64 IL 154, 148	Mt. Vernon, Cape Girardeau	287	\$495-\$800	85%	Pontoon Houseboats Fishing
Lake Shelbyville	11,100	State	North Central Illinois	846	\$500-\$1400	85%-100%	Houseboats Cruisers Pontoon Sailboats Runabouts

Note: Rates based upon boat length are approximate.

MARKET AREA OF ATTRACTION

The definition of the primary area where most users of Carlyle Lake reside is a basic step toward determining the need for marina facilities. Relevant socioeconomic data for the market area was used to evaluate current needs and assess future demand and growth potential.

Delineation of Area

Carlyle Lake primarily serves weekend recreational boaters who prefer that their boats be located within an hour or less drive from their homes. Therefore, the primary service area for marina development at Carlyle Lake is based upon an approximate 50 mile radius of the lake. The shape of the market area is influenced by factors other than driving time, however, such as road patterns, population densities and competing facilities. Thus, some areas outside of the 50 mile radius may be included in the primary market while some areas inside the 50 mile radius may be excluded. The market area for Carlyle Lake is shown in Figure 3.

The strength of the Carlyle Lake market is stronger to the west towards the St. Louis Metropolitan Area and weaker towards the sparsely populated areas east and southeast of the lake. The market area is also limited, to a minor degree, to the north and south by the market areas for Lake Shelbyville and Rend Lake, respectively.

The Illinois market area consists of the following ten counties within approximately 50 miles of Carlyle Lake: Bond, Clinton, Fayette, Macoupin, Madison, Marion, Monroe, Montgomery, St. Clair and Washington. Metro-East communities such as Alton, Belleville, Collinsville, Edwardsville, Glen Carbon and Granite City, along with those closer to the lake such as Centralia and Salem, supply the majority of the Illinois market area boaters.

The Missouri market area consists of the city of St. Louis and the following counties from 40 to 70 miles west of the lake: St. Louis, Jefferson, and St. Charles. The numerous suburban communities within this area, such as Creve Coeur, Ferguson, Manchester, O'Fallon and St. Charles, supply the majority of Missouri market area boaters.

Socioeconomic Factors

An analysis of the demographics of the market area provides an understanding of existing socioeconomic conditions, and is essential to the projection of future trends. Demographic information from 1970 through 1990 as well as population projections to the year 2010 are examined in this section.

Population within the market area has remained relatively stable over the last 30 years (See Table 4). The market area population decreased slightly between 1970 and 1980. Between 1980 and 1990, however, population increased back to the levels realized in 1970. The population of the market area is expected to remain stable with the total population increasing by less than one percent by the year 2010.

MARKET AREA MAP

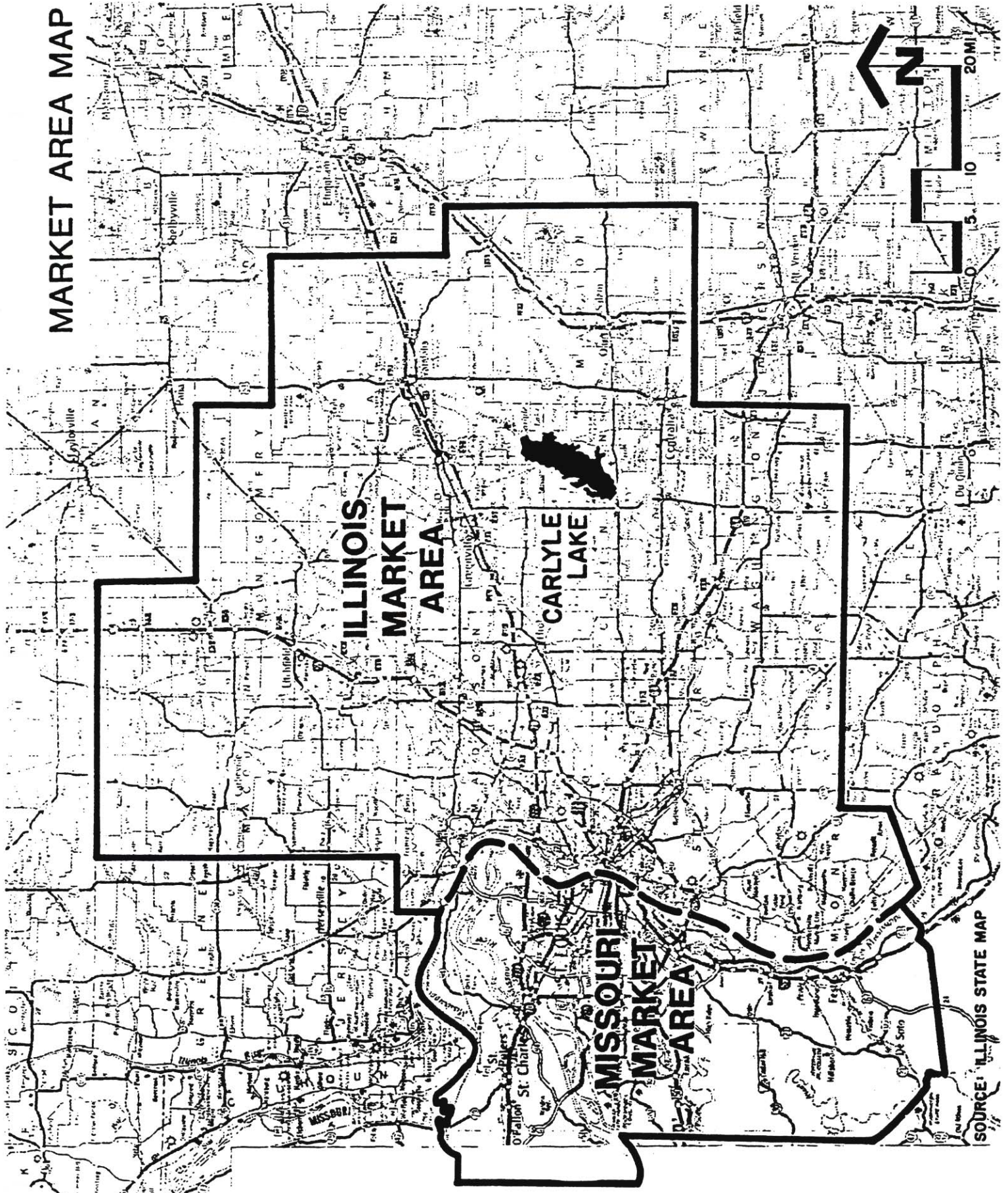


Figure 3

SOURCE: ILLINOIS STATE MAP

Selected population, income and housing characteristics of the market area are outlined in Table 5. Considering the trends experienced in the market area since 1970, growth rates are expected to remain similar to those experienced between 1980 and 1990. The total population of the market area in 1990 was over 2.5 million people with approximately 70 percent of the total population located in the Missouri portion of the market area. Approximately 952,633 households are contained within the primary market area, with the number of households expected to increase by 0.8 percent per year for the foreseeable future.

**Table 4
Population Trends**

Population	Illinois Market Area	Missouri Market Area	Total Market Area
1970	745,166 (0.2%)	1,771,791 (-3.1%)	2,516,957 (-2.1%)
1980	746,412 (-1.0%)	1,717,271 (3.2%)	2,463,683 (+2.0%)
1990	739,273 (2.4%)	1,774,501 (3.2%)	2,513,774 (+2.0%)
2000 Projection	757,671 (-0.8%)	1,800,422 (0.9%)	2,558,093 (+0.4%)
2010 Projection	751,339	1,816,145	2,567,484

Sources: U.S. Census of Population and Housing, 1990. Illinois Population Trends 1980 to 2025, State of Illinois, Bureau of the Budget, 1990 Edition. Population Projections, East-West Gateway Coordinating Council, (Missouri Counties).

Household incomes in the market area are also expected to increase in the future. The median household income of the counties in the market area range from a low of \$19,500 to a high of \$40,000, with the market area median household income estimated to be approximately \$28,000 in 1990. This represented an increase of 3.5 percent per year between 1980 and 1990. In 1990, 576,666 households, or 60 percent, had a median annual income in excess of \$25,000. More than 34 percent of the households in the market area had annual incomes in excess of \$35,000. The high median income of the market area is reflected in the employment levels which increased by 1 percent annually between 1980 and 1990. The other measure of income shown in Table 5, the number of persons below poverty level, has remained fairly constant since 1980.

The median age of persons within the market area was 33.9 years in 1990. The median age of Illinois residents is slightly higher than Missouri residents. The

increase in median age experienced between 1980 and 1990 is reflective of the stable population of the market area.

Table 5					
1990 Population and Income Characteristics					
	Illinois Market Area	Missouri Market Area	Market Area	Market Area Change 1980-90	Annual Growth
Population	739,273	1,774,501	2,513,774	50,091	0.2%
Households	274,618	678,015	952,633	72,528	0.8%
Population/ Household	2.6	2.7	2.6	-0.19	-0.7%
Median Household Income	\$26,343	\$32,543	\$28,114	\$9,889	3.5%
% Below Poverty Level	11.7	10.6	11	0.31	0.3%
Median Age	34.6	32.3	33.9	3.3	0.1%
Total Employed	316,348	863,697	1,180,045	119,741	1.0%
Source: U.S. Census of Population and Housing, 1990. Harland Bartholomew and Associates, Inc. "Market Study and Analysis for Commercial Marinas at Carlyle Lake," May 1986.					

SURVEY OF BOAT OWNERS

Survey Methodology

A telephone survey of 200 persons owning boats 16 feet or more in length and residing in the market area was conducted. Respondents were considered to be representative of all boat owners within the market area. Considering the number of boats in the study area, the existing population distribution and the need to include sailboat owners in the survey, it was determined that a minimum of 25 percent of survey respondents be sailboat owners and 25 percent be residents of the Illinois market area. The percentage of Illinois market area respondents was set at 25 percent to be consistent with the previous market area study prepared for Carlyle Lake. The objectives of this survey were:

1. To obtain general information regarding boat owners and the types of boats in the market area;
2. To determine boat owners habits in the usage of large lakes and related facilities; and,
3. To measure the attitudes of boat owners regarding facilities at Carlyle Lake.

The survey results are a primary source of data utilized in the assessment of market demand. General information pertaining to boat owners in the market area was obtained through survey questions concerning age, income, and education. Questions regarding the type, length, and primary use of the boat (skiing, fishing, hunting, pleasure rides, sailing etc.) were designed to provide general information regarding the nature of boats and boating activity in the market area. The habits of boat owners in the market area are recorded in questions concerning the lakes or rivers used within the past year, the number of days per year the boat was used, and whether or not the boat owner currently rents a marina slip. If the respondent did not use a slip they were asked to give a reason(s) why a slip was not used.

The survey also focused on specific questions relating to Carlyle Lake. First, boat owners were asked if they had ever visited Carlyle Lake, if not, for what reasons? Next, respondents who had visited the lake were asked to rate selected characteristics of Carlyle Lake. This question provided an assessment of the overall level of satisfaction with the features of the lake among the population of the market area.

Finally, respondents were asked questions which pertained directly to the potential market for marina development at Carlyle Lake. Boat owners were asked if they would consider renting a slip at an existing marina at Carlyle Lake, or at a new marina at either South Shore State Park or Eldon Hazlet State Park. Questions regarding the desire for dry storage and a covered slip were also included to assess the demand for these facilities. If respondents indicated that they would be interested in either of these facilities, they were asked about their willingness to pay. A copy of

the survey questionnaire is provided in Appendix A, with the survey results and cross tabulations in Appendix B.

Survey Results

Boat Owners and Their Boats

Boat owners surveyed are older, have higher incomes and slightly more education than the general population of the market area. The median age of the population in the market area was 34 years. Most of the survey respondents are between 35 and 64 years of age. Over half (53%) of the boat owners who have used Carlyle Lake within the past year are between the ages of 35 and 54. Incomes of boat owners also exceed those of the general population. Nearly 30 percent of the boat owners surveyed reported an annual income ranging between \$50,000 and \$75,000. This is significantly higher than the average household income (\$33,000) and estimated median household income (\$28,000) of the market area.

A total of 38 percent of the survey respondents are high school graduates, while 26 percent have had some college and 18 percent are college graduates. Education levels in the Missouri portion of the market area are generally higher than those in the Illinois portion of the market area. The percentage of respondents who are college graduates is slightly higher than for the general population in the market area.

Because most boat owners with smaller boats tend to trailer their boat, the survey was limited to owners of boats 16 feet or more in length. Nearly 60 percent of boats surveyed are between 16 and 18 feet in length, with the median length estimated at 18 feet. A total of 26 percent have boats which are over 20 feet in length, with most ranging from 20 to 25 feet in length.

Nearly half of all boats in the market area are fishing boats, with open runabouts and sailboats being the next most popular boat types. The percentage of sailboats in both the Illinois and Missouri portions of the market area are approximately equal. Missouri boat owners are more likely to own cabin cruisers and runabouts than Illinois boaters, while Illinois boaters are more likely to own boats not specifically mentioned in the questionnaire such as houseboats and pontoon boats. The results of boat types surveyed are provided in Table 6.

Considering the distribution of boat types in the market area, it is not surprising that fishing is the most popular form of boat use in the study area. Sailing and pleasure rides are the next most popular uses. Less than 10 percent of the boats in the market area are used for waterskiing, and an even smaller percent (1.5%) are used for hunting. Boat use is similar in both the Missouri and Illinois portions of the market area.

Over half (58%) of boat owners use their boats between 10 and 49 days per year. Twenty percent use their boats between 41 and 100 days, while 13 percent use their boat less than 10 days in a year. Only 9 percent of boat owners use their boats more than 100 days in a given year, the majority of which use their boat between 100 and 150 days per year.

The four primary reasons cited by those surveyed for not using Carlyle Lake were: (1) preference for other lakes, (2) they were not familiar with the lake, (3) the lake was too far from home, and (4) Carlyle Lake was not a good lake for their type of boat. The first three reasons would be common for any lake. The last reason reflects Carlyle Lake's reputation as a sailboat-oriented lake. Only one to three percent of respondents cited the lack of covered slips, insufficient summer and winter boat storage, and crowded marinas as reasons why they did not use Carlyle Lake.

	Market Area	Illinois Market	Missouri Market
Fishing Boat	48.5%	56.0%	46.0%
Open Runabout	28.0%	18.0%	31.3%
Sailboat	25.0%	24.0%	25.3%
Other (Houseboat, Pontoon etc.)	6.5%	10.0%	5.3%
Cabin Cruiser	2.5%	4.0%	2.0%

Boat Owners Habits

Boat owners were asked where they had been boating in the last 12 months (see Table 7). Three lakes, including the Lake of the Ozarks, Carlyle Lake and Mark Twain Lake were used by nearly 30 percent of the survey respondents at some time during the last 12 months. The secondary tier lakes include Table Rock Lake and the Alton Pool. The pattern of boating at selected lakes varies between the Illinois and Missouri market areas. Carlyle Lake, the lower Kaskaskia River and Rend Lake were popular among Illinois boaters. The market for Kincaid Lake, Lake Shelbyville and the Illinois River is dominated by Illinois boaters. More than one-third of Missouri boaters used Lake of the Ozarks and Mark Twain Lake. Lakes that attract 18 to 20 percent of Missouri boaters include Carlyle Lake, Table Rock Lake and the Alton Pool.

Boat owners were also asked about their use of marina slips. Nearly two-thirds (60%) of boat owners always trailer their boats. The majority (76%) of Illinois boaters always trailer their boat while the majority (85%) of Missouri boaters keep their boat at a marina. Over half (58%) of Illinois boaters who keep their boat at a lake, use a marina on Carlyle Lake, while only 7 percent of Missouri boaters surveyed keep their boat at Carlyle Lake. When asked why they do not use a marina, most boat owners responded that they prefer to go to many lakes and that keeping their boat at a marina is too expensive. These answers may reflect the high proportion of respondents who own fishing boats. Approximately 13 percent of those responding to this question did not use a marina because existing marinas were not close enough to their home.

Carlyle Lake

Most of the boat owners surveyed were familiar with Carlyle Lake as more than half (58.5%) had used Carlyle Lake in the past. Nearly 80 percent of Illinois boaters and 52 percent of Missouri boaters have boated on Carlyle Lake.

The four primary reason cited by those surveyed for not using Carlyle Lake were: (1) preference for other lakes, (2) they were not familiar with the lake, (3) the lake was too far from home, and (4) Carlyle Lake was not a good lake for their type of boat. The first three reasons would be common for any lake. The last reason reflects Carlyle Lake's reputation as a sailboat-oriented lake. Only one to three percent of respondents cited the lack of covered slips, insufficient summer and winter boat storage, and crowded marinas as reasons why they did not use Carlyle Lake.

	Market Area	Illinois Market	Missouri Market
Lake of the Ozarks	29.5	12.0	35.3
Carlyle Lake	28.5	54.0	20.0
Mark Twain Lake	28.0	10.0	34.0
Other Missouri Lakes	23.5	12.0	27.0
Other River	17.5	18.0	17.3
Table Rock Lake	14.0	2.0	18.0
Alton Pool	13.0	8.0	14.7
Lower Kaskaskia River	12.0	38.0	3.3
Rend Lake	11.5	34.0	4.0
Other Illinois Lakes	11.0	20.0	8.0
Illinois River	10.0	16.0	8.0
Kincaid Lake	8.5	24.0	3.3
Wappapello	7.0	4.0	8.0
Shelbyville	6.0	16.0	2.7

Boat owners who had been to Carlyle Lake were asked to rate selected characteristics of the lake (see Table 8). The ratings indicated that there was an overall positive attitude toward the lake as most of the characteristics rated received average or above average rankings. Water depth, hotels/motels, restaurants, and shopping were all rated below average. Some of these ratings should improve as more

facilities are provided at the lake. For example, construction of the new golf course and the possible hotel and restaurant should serve to improve user attitudes toward Carlyle Lake.

	Above Average	Average	Below Average	Don't Know
Marinas	22	49	7	22
Boat Ramps	35	52	4	9
Boat Storage	7	15	5	74
Repair Services	4	15	5	76
Water Depth	8	29	52	11
Wind Conditions	58	11	25	6
Fishing	14	38	11	38
Scenic Quality	20	57	19	4
Campgrounds	27	27	2	43
Hotels/Motels	2	11	19	68
Restaurants	5	36	19	40
Shopping	1	19	17	63
Beaches	14	42	11	34

Survey respondents were asked whether they would consider renting a slip for a boat at: (1) one of the existing marinas at Carlyle Lake, or (2) a new, full-service marina on Carlyle Lake at either South Shore State Park or the Allen Branch area of Hazlet State Park. Thirteen percent of boat owners in the market area who had boated on Carlyle Lake within the last year expressed interest in renting a slip at one of the existing marinas at Carlyle Lake. Twenty-three percent of those surveyed indicated that they would be interested in renting a slip at a new marina. Boaters who have been to Carlyle Lake within the last year are more likely to rent a slip at Carlyle Lake than those boaters who do not frequent the lake. Therefore, a more realistic assessment of demand for marina slips is obtained by analyzing interests of boaters who have visited Carlyle Lake in the last year. Thirty percent of those respondents who visited Carlyle Lake within last year would consider renting a slip at an existing marina. An even greater percentage (51%) of the boat owners who had been on Carlyle Lake within the past year would consider renting a slip at a new

marina. The degree of expressed interest in using existing and proposed marinas at Carlyle Lake is portrayed in Table 9.

	- Market Area	Illinois Market	Missouri Market
Existing Marinas	30	14	16
Boulder	5	2	4
Carlyle Sailing Association	10	5	5
Keyesport	5	3	2
West Access	7	3	3
No Preference	2	0	2
New Marina	51	23	28
South Shore State Park	25	12	12
Hazlet State Park (Allen Branch)	26	11	16
Note: Percentages are based upon data from survey respondents who have boated on Carlyle Lake within the past year.			

The demand for covered slips and dry storage was assessed with a series of questions regarding interest in these facilities. Once interest was established, respondents were asked a follow-up question dealing with their willingness to pay. Approximately one-half (46%) of boat owners surveyed who boated on Carlyle Lake within the last year were interested in a slip, and one-half (50%) preferred dry storage. About 38 percent of boaters expressed a desire for a covered slip, while 62 percent were interested in an open slip. Interest in a slip versus dry storage was similar for boaters who had been on Carlyle Lake within the past year. A slightly smaller percentage of these boaters were interested in a covered slip (27%) while 73 percent were interested in an open slip. Most boaters (38%) in the market area are willing to pay for a slip for a period of six months or less while 24 percent would pay for 10 to 12 months. Exactly one-half of the respondents who expressed desire for a covered slip were willing to pay more than they would for an open slip. More than one-half (54%) of the boaters in the market area preferred to pay for dry storage for 6 months or less. A similar pattern of willingness to pay was observed among boat owners who have boated on Carlyle Lake in the last year, with the exception that all

of these boaters would be willing to pay a higher price for a covered slip (see Table 10).

Table 10			
Expressed Desire for Selected Facilities at Carlyle Lake			
	Market Area	Illinois Market	Missouri Market
Expressed Desire for Slips			
Prefer Dry Storage	50	25	25
Prefer Slip	46	21	25
Prefer Covered Slip	12	8	4
Prefer Open Slip	34	13	21
Pay More for Covered	100	66	33
Number of Months Willing to pay for a Slip			
6 or less	36	20	50
7 to 9	27	20	33
10 to 12	27	40	17
Number of Months Willing to Pay for Dry Storage			
6 or less	54	46	38
7 to 9	31	23	8
10 to 12	0	0	0
Note: Percentages are based upon responses from survey respondents who have boated on Carlyle Lake within the past year.			

Characteristics of Potential Marina Slip Renters

Boat owners who have been to Carlyle Lake within the past year and expressed an interest in renting a slip at Carlyle Lake are generally sailboat owners and

currently trailer their boat. Approximately one-half will have incomes greater than \$50,000 per year, and most are between the ages of 35 and 54.

Most potential slip renters would prefer to rent at a new marina with approximately one-half of those surveyed interested in dry storage and one-half in a "wet" slip. Although most of those persons interested in an in-water slip desired an open slip, a significant percentage would like to store their boat in a covered slip. The majority of potential slip renters at Carlyle Lake would prefer to pay for a slip (wet or dry) for a period of 6 months or less.

MARKET DEMAND

This chapter presents an analysis of the geographic pattern of the market, existing and projected market demand for existing facilities, and potential market demand for the development of new facilities at Carlyle Lake.

Geographic Pattern

As previously discussed, the market area is comprised of an approximate one hour driving distance from the Carlyle Lake. This market area was established based upon previous studies, interviews with marina operators and information from persons familiar with Carlyle Lake. Therefore, it is assumed that 100 percent of slip renters at the lake live within the market area.

The survey of boat owners provides a detailed perspective of the pattern of demand in the market area. Carlyle Lake is the most popular lake among boaters from the Illinois market and is more of a second tier competitor in the Missouri market area. Over one-half (54 %) of the boaters within the Illinois market have been to Carlyle Lake within the past year. Rend Lake and the Lower Kaskaskia River are also popular among Illinois boaters, attracting 34 and 38 percent respectively of the boaters within the past 12 months. Approximately two-thirds of the boat owners in the Missouri market area visited the Lake of the Ozarks and Mark Twain Lake within the past year. Carlyle Lake, Table Rock Lake and the Alton Pool attract smaller numbers (18 to 20 %) of Missouri boaters.

A total of 15 percent of boat owners in the market area who keep their boat at a lake use the existing marinas at Carlyle Lake. Almost 60 percent of Illinois boat owners who keep their boat at a lake use Carlyle Lake while less than 10 percent of Missouri boaters who rent slips at a marina use the marinas on Carlyle Lake. This distribution frequency indicates that a marina at Carlyle Lake must compete with the Lake of the Ozarks and Mark Twain Lake for boaters from the Missouri market area, while the lake is utilized by the majority of boaters from the Illinois market.

Existing and Projected Market Demand

The methodology used to project future demand involves the determination of market penetration and capture rate. Demographic trends, data from the survey of boat owners, and information obtained from marina operators provides the basis by which these factors are determined.

Market penetration is the measure of the percent of the total demand that is being captured within the market area. It was previously indicated that 100 percent of the market demand comes from within the market area. Capture rate provides a measure of the percentage of boats in the market area that rent marina slips at Carlyle Lake. Currently, two percent of the 60,287 boats in the study area rent a slip at Carlyle Lake. A more realistic estimate of market capture is obtained by discounting boat owners who have not been to Carlyle Lake within the last year as these boaters are likely to use other lakes in the market area. According to the survey, 29.5 percent of the boat owners in the market area have been to Carlyle Lake

within the last 12 months. Thus, the 942 boats from the study area renting at existing marinas represent approximately 5.5 percent of the 17,182 boats in the market area which have been on Carlyle Lake within the past year.

The estimate of projected slip renters is shown on Table 11. The number of boats indicated in Table 11 represents boats 16 feet or greater in length that have been to Carlyle Lake within the last 12 months. Population trends predicted for the market area (indicated in Table 4) were used to predict the number of boats in the study area through the year 2010. The existing slip rental trend is 35 additional renters annually. Expressed demand for rental slips represents the proportion of the survey respondents that would consider renting a slip at an existing marina after those that have not been to Carlyle Lake within the past year are discounted. The projection of slip renters is based upon the assumption that the existing slip rental trend will continue, and as such is a conservative estimate.

Table 11				
Projected Slip Rentals at Existing Marinas				
Year	Boats	Existing Slip Renters	Projected Slip Renters	Expressed Demand
1993	17,182	942	942	5,120
1995	17,264	1,012	1,012	5,145
2000	17,471	1,187	1,187	5,206
2010	17,540	1,537	1,537	5,165

Currently, less than 20 percent of those expressing demand for a marina slip actually follow through and rent a slip which represents a capture rate of approximately six percent of the boats in the market area. As the number of boats in the study area increases, an increase in the expressed demand for rental slips will follow. The upper limit of 1,537 slips represents 30 percent of those expressing an interest in renting a slip at an existing marina, which translates into a capture rate of nine percent. The projected trend results in an increase of 595 slips by the year 2010. Together Boulder Marina, Dam West Marina and Keyesport Marina have a potential capacity of 950 slips. Although additional storage space could be provided at CSA, it is not included in this analysis because this marina serves a limited market and the Association has indicated that they do not wish to expand. Therefore, the market available to the existing marinas is strong.

Market Demand for a New Marina

The previous section analyzed the market demand for the existing marinas. The market demand for new marinas must be calculated since a high percentage of survey respondents expressed an interest in a new marina.

The expressed demand for slips at a new marina is 170 percent higher than expressed demand for slips at an existing marina. Therefore, the projected slip renters exceed those projected for existing marinas. Assuming that the capture rate for slip renters at a new marina will increase in accordance with the proportional increase in expressed demand for slips at an existing marina, the projected number of slip renters will be as indicated in Table 12.

Table 12				
Projected Slip Rentals at a New Marina				
Year	Boats	Existing Slip Renters	Projected Slip Renters	Expressed Demand
1993	17,182	942	942	8,742
1995	17,264	1,012	1,054	8,783
2000	17,471	1,187	1,508	8,889
2010	17,540	1,537	1,647	8,818

By the year 2010 approximately 20 percent of those persons expressing a demand for a slip at a new marina at Carlyle Lake will actually follow through and rent a slip, which represents a capture rate of 9.5 percent after boaters who have not been on Carlyle Lake within the last year are discounted. The 1,647 slips projected for the year 2010 translates into a demand for 705 slips at a new marina. This is a conservative estimate as it is based upon the premise that past trends will continue in the future. However, slip renters may increase over past levels as development around the lake continues and the overall population ages and is able to spend more money on recreational pursuits such as boating.

Demand for Selected Facilities at Carlyle Lake

Boaters expressing a demand to rent a slip at either an existing or new marina at Carlyle Lake were asked about their interest in dry storage and covered slips. Year round dry storage is only available at the West Access and Boulder Marinas. With the exception of 14 slips at Keyesport Marina, covered wet slips are not available elsewhere at the lake. Therefore, an accurate estimate of the capture rate is not possible. Consequently, the projection of the demand for these facilities is based upon the assumption that all of the persons expressing an interest in these facilities who are willing to pay to utilize them will do so.

Almost one-half (46%) of the survey respondents expressing a desire to rent a slip at an existing or new marina on Carlyle Lake prefer a "dry" slip after discounting those boaters who have not been to the lake within the last 12 months. Only 31 percent of these persons would be willing to pay for a period of 7 to 9 months. Therefore, approximately 30 percent of the total slips provided at a new marina should be designated for dry storage.

The demand for covered wet slips can be assessed utilizing this same methodology. A total of 46 percent of boaters who have been on Carlyle Lake within the last year, and who expressed an interest in renting a slip at either an existing or new facility at Carlyle Lake, prefer a covered slip. Approximately 27 percent of those interested in a covered slip would be willing to pay more for a covered slip for a period of 10-12 months. Therefore, 27 percent of the slips at the lake should be covered. Currently only one percent of the available slips at Carlyle Lake are covered and as such, there does appear to be a demand for additional covered slips.

Summary and Recommendations

Analysis of the market demand indicates that boaters residing in the market area comprise 100 percent of the demand for marina facilities at Carlyle Lake. The projection of marina slips and associated facilities at both the existing marinas and at a new marina at Carlyle Lake was calculated because a high percentage of boaters in the market area expressed an interest in renting a slip at a new marina.

A total of 1,537 slips should be provided at the existing marinas by the year 2010. According to the marina operators the potential capacity of the existing marinas is 950 slips. This results in a projected deficit of 587 slips by the year 2010, which indicates that there is a healthy market available to the existing marinas.

The market for a new marina is also strong. The expressed demand for a new marina is 170 percent higher than the expressed demand for existing marina slips. Thus, it is assumed that the capture rate for a new marina will be 170 percent higher than the capture rate projected for the existing marinas. This methodology results in the projection of a need for an additional 705 slips. Approximately 30 percent of these slips should be "dry" and 27 percent should be covered "wet" slips.

The results of the analysis of market demand indicates that there is a sufficient market available to justify the expansion of the existing marinas to capacity which could be followed by the construction of a new marina. The marina should be designed to serve approximately 600 customers with 400 wet slips and space for 200 dry slips. Approximately 110 of the in-water slips should be covered. Considering the sizes of the boats currently using the marinas at Carlyle Lake, approximately 25 percent of the slips should be designed to accommodate boats less than 30 feet long with the remaining slips designed to accommodate boats greater than 30 feet in length.

Expansion of Existing Marinas

Expansion of the existing marinas should occur before construction of a new facility. Assuming the current slip rental demand increases by 35 slips per year, the existing 140 vacant slips could meet the demand through 1998. The expansion potential at West Access and Boulder Marina would be filled in a six year period beginning in 1998. Thus, the projected increase in slips of 35 per year could fill all expansion capacity by the year 2004. If dredging did not occur at Boulder Marina or the marina could not otherwise be expanded, the total capacity of all existing marinas would be filled in a five year period (beginning in 1998) and a new marina would be

needed by 2003. The decision to add additional slips will be made by the existing marina operators, with the approval of the Corps of Engineers.

Expansion of the existing sailboat harbor at the Carlyle Sailing Association is not considered in this analysis as the CSA serves a limited market and an interview with the harbor master indicated that the association is not interested in expansion. However, if additional capacity is needed, expansion of the Carlyle Sailing Association could be accomplished.

The expansion of Keyesport marina is also not considered in this analysis. Keyesport is a small marina which, at its current configuration is not conducive to sailing. The harbor is shallow with a narrow mouth and in order to sail into the marina, sailboats must sail directly into the prevailing summer winds which are from the south-southwest. Given these conditions, the marina is not as popular with boaters on the lake.

Although not popular with sailboats, the marina does serve the majority of fishing and powerboats stored at the lake. The marina is located near an area that is frequented by fisherman which are currently under-served at Carlyle Lake. Although the majority of boats stored at the marinas at Carlyle Lake are sailboats, 60 percent of the boats in the market area are fishing boats and open runabouts, some of which could potentially rent a slip at Carlyle Lake.

Positive aspects of Keyesport Marina are that it is the only marina on the lake with covered docks and a restaurant. In addition, access from St. Louis and the northern portion of the Illinois portion of the metropolitan area is good. Traffic from those areas to Keyesport could avoid the congestion near the Dam West area. The marina is also located near good fishing and hunting areas. The negative aspects of the Keyesport Marina are that it does not provide services, there is no dry storage, some of the docks are in disrepair, and the marina has a reputation as a bar rather than a marina. Based on these negative aspects, it may not be reasonable to expect that a major expansion of this marina would serve future marina needs on the lake. It is desirable to keep the restaurant at the marina since it is a unique feature, however, placing more emphasis on marina facilities such as maintaining dock facilities and providing additional services to boaters is recommended to sustain this marina operation.

Potential Marina Sites

Two sites were evaluated as to their potential for marina development, South Shore State Park and the Allen Branch area of Eldon Hazlet State Park. It is recommended that the new marina be built at South Shore State Park. The enclosed site plan portrays a conceptual design of a new 400-slip marina at South Shore State Park.

There are several site-related and general locational reasons for recommending South Shore as the site for a new marina. First, this site offers existing ramps, parking facilities, and scenic views of Carlyle Lake and the east side of the cove. Secondly, available on-site fill will offer the opportunity to raise the existing grade at

the proposed clubhouse site above flood level. This elevation will offer dramatic views of the lake and marina from the clubhouse. Thirdly, South Shore State Park is located on the east side of the lake where there is little development.

Conversely, the Allen Branch area is located on the west side of the lake which is more congested and as such a new marina at this site would serve to increase existing traffic problems both in the water and on land. In addition, many sailboats currently anchor near Allen Branch and the area is also frequented by hunters and fisherman. Construction of a marina in that area would disrupt these uses. Finally, Allen Branch is a somewhat sensitive environmental area because it contains known archeological sites and the upper portions of Allen Branch contain fish spawning areas. Construction at this site could disrupt these resources. Another problem at Allen Branch is that the road that provides access to this area is located within the 100-year floodplain and occasionally floods. The road would have to be elevated above the 100-year flood elevation in order to provide adequate access to a new marina.

The negative aspects of South Shore are its lack of utilities, the need for significant dredging and excavation of the harbor, and the current roadway system which includes a poor access point from U.S. Highway 50. Although the provision of these items will require a substantial capital investment, once installed they will open up the area for future development. South Shore State Park is currently under-utilized and future development may increase the use of the area which would help to relieve some of the congestion currently experienced in the vicinity of the Dam West Recreation Area.

The approximate infrastructure development costs of the two potential marina sites are outlined in Table 13.

	South Shore	Eldon Hazlet
1. Roadway Improvements	\$240,000	\$710,000
2. Dredging	430,000	180,000
3. Excavation & Grading	420,000	240,000
4. Slope Stabilization	290,000	60,000
5. Breakwater	60,000	170,000
6. Utilities	420,000	120,000
Subtotal	1,860,000	1,480,000
Total With 20% Contingency	\$2,230,000	\$1,780,000

FINANCIAL ANALYSIS

A financial analysis was completed for a new 400-slip marina which included an itemization and estimation of cost of improvements, projected annual revenue, and annual cash flow before taxes. The market analysis indicates a potential market which would allow for both expansion of the existing marinas to their capacity, and the construction of a new 400-slip marina. The size, type and nature of the facilities identified for the new marina were determined based on the market analysis previously described. It is proposed that the new marina be developed in phases to reflect the market demand, and to allow the existing marinas to also develop to their potential capacity.

The analysis also examines the economic consequences of development of a new marina in respect to both the feasibility of the new marina and its effect on the existing marinas. The basis for this analysis is the assumptions regarding total market size, the degree of market capture by the existing and new facilities, and projected income and expense data of marina operations. The economic effect of a new marina on existing marina concessions cannot be completely ascertained due to the unavailability or inability to obtain complete financial data regarding the operations of the existing marinas. In addition, the uncertainties of market demand make it difficult to accurately assess the potential impact of a new marina on existing marina operations at Carlyle Lake.

Marina Development Costs

The cost of developing and equipping a new 400-slip marina at Carlyle Lake is estimated at \$5,541,250, including a 10 percent contingency factor (see Table 14). Included in these costs are major infrastructure costs for roadway improvements, dredging, excavation and grading, utilities, and a floating breakwater. These infrastructure related development costs total \$1,860,000, or almost one-third of total development costs. The overall per slip cost is \$13,853 considering the total costs of development, or \$9,203 per slip excluding infrastructure costs. The marina as conceptually designed includes 400 wet slips of which 110 will be covered. Uncovered dry storage space will be provided for 200 boats. In addition, the marina facility will include a lounge/concession building, boat service and sales building, fueling station, marine sanitation station, and parking area. Costs for fixtures and equipment is included in the estimated square foot costs for the lounge/concession and service/sales buildings.

The development cost estimates reflect new construction costs based on the 1994 Means costs data. It is assumed that a private developer, rather than a public agency, will undertake the project as operator of the marina under a lease arrangement with the U.S. Corps of Engineers. It is also assumed that all infrastructure development costs will be absorbed by a public agency, such as the U.S. Army Corps of Engineers and/or Illinois Department of Conservation, or a consortium of public agencies. Considering the magnitude of the infrastructure costs, developer/operator responsibility of such costs would preclude a financially feasible development and operation.

Table 14
Cost of Improvements, 400-Slip Marina (1994 Dollars)

Item	Unit Cost	Total Cost
400 Wet Rental Slips		
290 open	\$5,000	\$1,450,000
110 covered	\$7,700	847,000
Concession Bldg. (4,500 SF)	\$85/SF	382,500
Service Bldg. & Maintenance Area (4,000 SF)	\$77/SF	308,000
Fueling Station		30,000
Marine Sanitation Pump Out		15,000
Paved Areas (parking lots, roadways)		80,000
Dry Storage Area (200 spaces, gravel surface)		40,000
Landscaping		25,000
Infrastructure		
Roadway Improvements		240,000
Dredging		430,000
Excavation/Grading		420,000
Slope Stabilization		290,000
Breakwater (Floating)		60,000
Utilities		420,000
Subtotal		\$5,037,500
10% Contingency		503,750
Total		\$5,541,250
Sources: <i>Means</i> Building Construction Cost Data; Square Foot Costs; Site Work and Landscape Cost Data, 1994; and, U. S. Army Corps of Engineers, St. Louis District.		

In addition to the proposed public agency funding of infrastructure related costs, the private sector (developer/operator) would finance the costs related to certain site improvements, fixed assets, other facilities necessary for marina operations, and miscellaneous development related costs. These costs are estimated at \$3,495,250, including a 10 percent contingency factor. Considering current commercial development loan practices and financing costs, it is assumed that an 80 percent loan (loan to value ratio) can be obtained at an interest rate of 8 1/2 percent amortized over a period of fifteen years. It is also assumed that the developer/operator will require an annual cash return of 12 percent on equity invested (20% of \$3,495,250) in the development considering current alternative investment rates of return and the element of investment risk. Loan origination and short-term construction interest costs are included in the estimated development costs and annual debt service necessary for debt retirement.

Revenues and Expenses

Sales, slip rentals, boat storage, and boat repairs and services comprise the components of revenue derived from a new 400-slip marina. Income from boat rental operations was not identified as a separate source of revenue, but rather included in the slip rental revenue. It is assumed that some boat rental operations will occur at the new marina, but will comprise a relatively small portion of total marina revenues. This assumption is based on current operations of the existing marinas which indicate that revenues from boat rentals is generally less than two-to-three percent of total revenues, therein reflecting a relatively weak market for these operations. In addition, a significant initial capital investment is required for full-scale boat rental operations, which could require a number of years just to recapture the investment in assets.

Total annual revenues generated by a new 400-slip marina is estimated at \$750,000 based on a 10 percent vacancy factor. As indicated in Table 15, it is estimated that approximately 60 percent of marina revenues will be generated by slip rentals. This is considered to be a desirable benchmark for a financially successful marina reflective of operations based on a diversity of revenue sources, rather than being overly dependent on a single revenue generating activity. Boat brokering and sales; and, sales of gasoline, oil, food and supplies comprise approximately 16 percent of total estimated revenue. The remainder of the generated revenue (24 %) is estimated to be derived from boat storage rental fees, and boat/motor repairs and services. The projected revenue from slip rental is based upon 90 percent occupancy and application of slip rental rates currently in use at existing marinas at Carlyle Lake and competitive lake developments.

Annual cash expenses of a new marina operation consists of costs of goods sold; operating expenses; and cost of capital. The projected annual expenses of the new 400-slip marina are indicated in Table 15. The cost of goods sold varies with sales, with an expected gross profit margin on sales of goods ranging from 30-to-40 percent. Operating expenses consist of both variable and fixed expenses, with the latter comprised of insurance, taxes, maintenance, and basic utility and salary costs. Fixed operating expenses are estimated at approximately \$200,000 annually. Total annual

operating expenses are projected at \$285,500, or approximately 40 percent of gross profit.

The cost of capital, or debt service, comprises an annual cost of \$333,725, or 44 percent of total annual expense. Associated with this cost of capital is an anticipated 12 percent annual return, or \$83,885, on equity invested in the marina operation. However, the desired rate of return on equity can vary dependent upon the operator/investor's objective and rates of return on competing investment instruments or alternatives at a particular point in time.

A final cost of marina operations consists of the establishment of a replacement reserve on an annual basis. This reserve fund is intended to be established and subsequently disbursed for the eventual replacement of equipment which is used to conduct business operations (e.g. fixtures, service and repair equipment, rental boats, etc.). This periodic replacement of equipment will occur at various intervals, but is estimated to average five-year intervals. In this regard, an annual reserve fund in the amount of \$30,000 is estimated to be the minimum amount necessary for equipment replacement purposes.

Sales	
Gasoline and Oil	\$27,800
Boat Brokering, Sales	70,450
Food, Supplies, etc.	24,000
Slips (includes service/boat rental slips and revenues)	
290 Open @\$1100/slip w/10% vacancy	287,100
110 Covered @\$1650/slip w/10% vacancy	163,350
Storage	
200 boats @\$30/mo. w/10% vacancy	64,800
Boat, Motor Repair, Other Services	112,500
Total Annual Gross Income	\$750,000
Source: Based on Harland Bartholomew & Associates, Inc. estimates.	

Cash Flow

The projection for cash flow after return on equity and replacement reserve have been deducted results in a negative annual cash flow of \$21,610 for the new

marina operations (see Table 16). This projection is based on 90 percent occupancy of the marina slips. If the slips were 100 percent occupied, however, the annual income from slip rental would increase by approximately \$50,000 resulting in annual gross revenues of \$800,000. An increase in variable operating expenses would be expected to increase with the increase in slip occupancy. However, the extra income from full slip occupancy would result in an additional annual net operating income of a minimum \$30-35,000, resulting in a "positive" cash flow after reserve of \$8,000-13,000.

Gross Revenue		\$750,000
Cost of Goods		
Gasoline and Oil	\$21,000	
Food, Supplies, etc.	18,000	
Gross Profit		711,000
Operating Expenses		
Wages, Management	142,000	
Utilities	16,000	
Maintenance, Repairs	45,000	
Insurance, Taxes	45,000	
Rent (lease)	17,500	
Miscellaneous	20,000	
Net Operating Income		426,000
Cost of Capital		
Debt Service	333,725	
Return on Equity (12%)	83,885	
Cash Flow		8,390
Replacement Reserve		30,000
Cash Flow After Reserve		(\$21,610)
Source: Estimates by Harland Bartholomew & Associates, Inc.		

The above cash flow projections are also based on a certain anticipated rate of return on equity which is deducted prior to final determination of cash flow. If this return on equity is initially discounted, the annual cash flow after replacement reserve is \$62,275, or a rate of return on equity of nine percent. Thus, a zero rather than a negative cash flow balance after reserve is achieved by a maximum return on equity of nine percent.

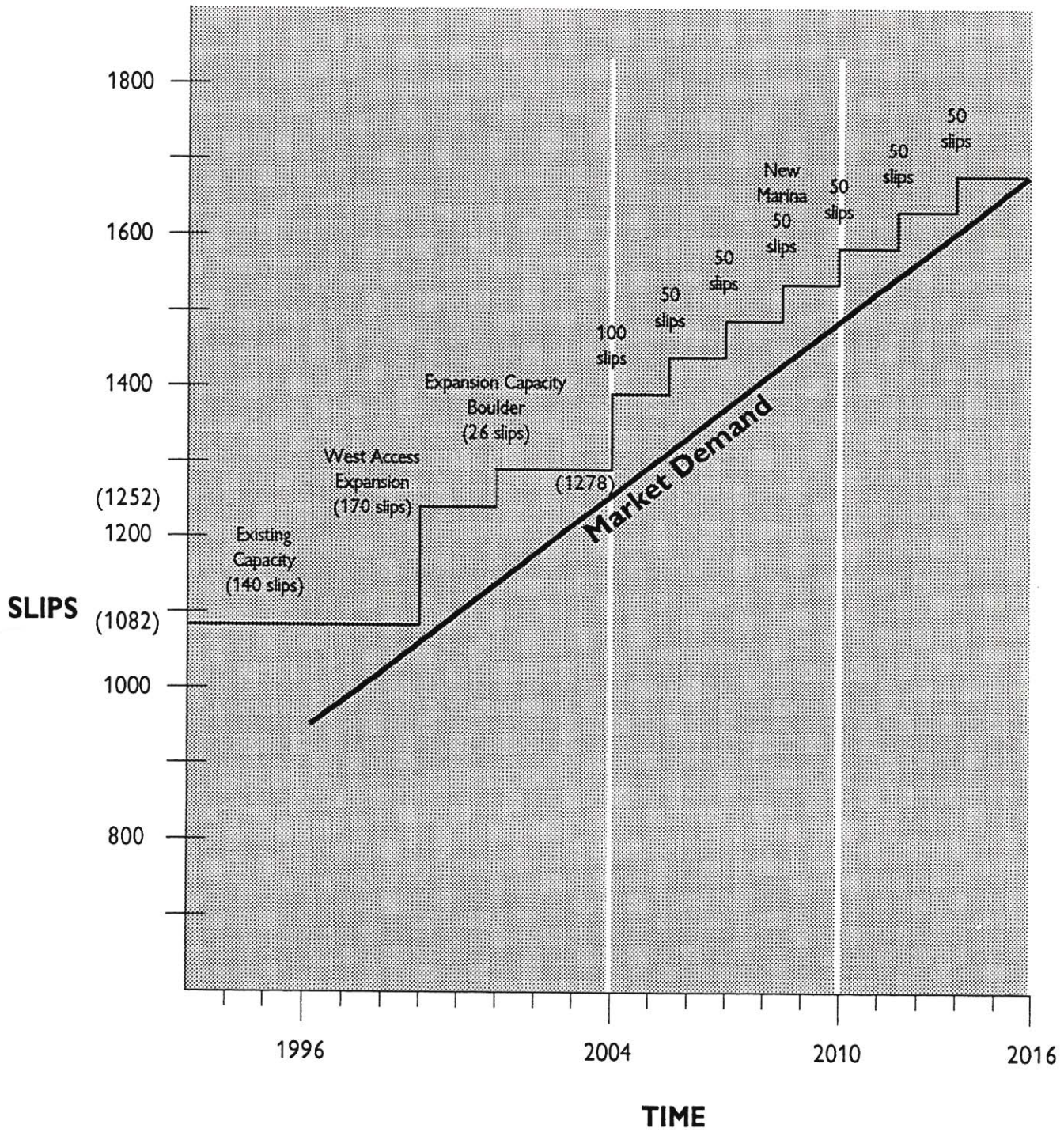
Whether the projected annual cash flows and returns on equity are financially attractive to a potential developer(s) is dependent upon many factors. An initial conclusion may be that a new 400-slip marina at Carlyle Lake would be a financially marginal operation based upon the above projections of annual revenue, expenses and cash flow. The above analysis does not include, however, certain business expense write-offs, such as depreciation and amortization which are non-cash expenses that are pre-tax deductions. Thus, considering the scale of the new marina development in addition to the financial feasibility of the operations, it may be desirable that this development be approached by a limited partnership or another investment entity which can utilize the various tax deductions to the maximum advantage. In addition, initial losses or small net cash flows on annual operations can be more easily absorbed by such development/investment entities.

Economic Consequences of Development

The preceding market analysis indicates that, based upon the trend in the annual increase in slip rental at Carlyle Lake, the capacity of the existing marinas will be reached by the year 2004. This includes absorption of both the currently vacant slips (140) and the expansion capacity of 196 slips at West Access and Boulder Access Marinas. Thus, by the year 2004 it is projected that 1,282 slips will be occupied at Carlyle Lake. A further projection of market demand indicates a need for 1,537 slips by the year 2010. Therefore, there will be a deficit of approximately 315 slips by the year 2010 based upon an annual increase of 35 slip rentals. Thus, the market analysis suggests that there is a sufficient market to justify both the expansion of existing marinas and the construction of a new marina. Figure 4 illustrates the benchmark years in which the vacancies and potential capacity of the existing marinas would be absorbed, and the subsequent need for a new marina.

The previous cash flow and revenue analysis assumes that the new marina will operate at a 90 percent occupancy rate. Under this assumption, each rented slip will produce annual revenue of \$2,083. Assuming this level of per slip revenue contribution, a total of 316 slips will be required to pay annual fixed and variable operating expenses, and debt service. Thus, the new marina would require an absorption period of nine years to cover operating expenses and debt service before beginning to realize a small profit. Alternatively, the new marina could penetrate the market of the existing marinas rather than solely depend upon the market after the existing marinas are filled to capacity. Consequently, pre-mature development of a new 400-slip marina at Carlyle Lake could impact the potential of the existing marinas to fulfill their development capacity.

**Figure 4:
RENTAL SLIP PROJECTIONS**



FINANCIAL EFFECT OF MARINA OPERATIONS

The previous sections of this study have described the existing marina operations at Carlyle Lake; analyzed the existing and potential marina market; and, projected the financial operations of a potential new marina. The existing marinas have experienced steady growth since their development in the 1970's, with improvements and expansion capabilities added during the 1980's and early 1990's. The marinas at Carlyle Lake have generally been successful and profitable, with one or two short-term exceptions. The existing market for Carlyle Lake exceeds the potential capacity of the existing marinas, therein, reflecting a very favorable market for ongoing operations and future expansion of the existing facilities. The expansion capabilities of West Access and Boulder Access marinas should be fully realized within the next seven to eight years based on the current trend of the annual increase in slip rentals.

Therefore, in consideration of the existing marina operations and market absorption rates, it is recommended that the new 400-slip marina be developed during the latter stages of realization of the existing marina capacity. This strategy should be followed to avoid a significant invasion of the market by a new marina before the existing marina potential capacity has been fulfilled. Thus, expansion of the existing marinas to their ultimate capacity is granted first priority.

In addition, the proposed new 400-slip marina should be phased in stages of possibly 50-100 slips. This strategy is recommended in order to avoid placing a large number of vacant slips on the market within a short period of time, in addition to financing and economic reasons. Partial construction and development loans for each phase of development may be more practical and feasible than a single large loan. Under this scenario, the individual components of the development could be carefully planned and phased to guarantee some degree of annual profit from the beginning of operations.

In summary, the objective of future marina operations at Carlyle Lake should be that of preserving and realizing the potential of the existing facilities while addressing future market needs through new marina facilities.