DELAWARE RIVER MARINA FEASIBILITY STUDY

DRAFT

Prepared for:

DELAWARE RIVER WATERFRONT CORPORATION

121 North Columbus Boulevard

Philadelphia, PA 19106

Prepared by:

MOFFATT & NICHOL

1509 W. Swann Ave, Ste 225

Tampa, FL 33626

M&N File: 7386

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1. EXECUTIVE SUMMARY

The Delaware River Waterfront Corporation (DRWC) is considering developing boat access facilities along the Delaware River to coincide and support proposed urban parks and recreational venues along the river corridor. This report has been prepared to assist DRWC in identifying and cataloging the existing marina market, analyzing projected demand for new boating facilities, and identifying potential locations for said facilities. Based on the existing market and projected demand, the five sites were identified and evaluated for boating access facility feasibility.

Existing Marina Market

The Philadelphia marina market is defined in this report as the area along the Delaware River in Chester, Philadelphia, Montgomery, and Bucks counties in Pennsylvania and Gloucester, Camden, and Burlington counties in New Jersey. Within the market area, 41 boating access facilities were identified of which 24 provide wet slips for the public to lease. Boat slips generally range in size from less than 20 feet up to 40 feet. Some marinas have slips larger than 40 feet available.

The marinas are mostly full during the peak of the boating season (April 15 through October 15) with some vacant slips available throughout the market area. Dockmasters report waiting lists for larger (>40 ft) slips in some marinas.

Daily (transient) slip lease rates range from $0.55 to $3.50 per foot per day depending on location. Higher rates are charged near downtown Philadelphia while lower rates are charged in marinas further away from downtown. Monthly recreational slip lease rates are similar to daily rates and range from $6.17 to $44.64 per foot per month with the seasonal range slightly discounted to $6.17 to $17.26 per foot per month.

Docks in the market area are typically floating docks with metal or wood frame construction. Many slips are reportedly too narrow to accommodate the designated boat length. Typical amenities available to boaters in the market include shore power and potable water. The majority of power available is at 30amps with limited 50amp and 100amp service available for larger boats throughout the market. Amenities for liveaboard boaters (showers, laundry) are offered at less than 20% of the marinas in the Philadelphia market.

Projected Market

The number of registered boats in the Philadelphia market is decreasing despite increasing regional population. The resulting decrease in boats per capita suggests limited demand for additional long-term boat slips. These projections suggest that new boating access facilities should focus on better serving the existing boats in the market and supporting additional transient boats.

Some demand exists in the Philadelphia market for slips to accommodate boats over 40 ft long. These slips may be realized through redevelopment of existing, underutilized marina facilities such as the Philadelphia Marine Center or development of new facilities for larger vessels.

Transient boat traffic from outside of the market area is drawn to the existing historical and tourism-based destinations near downtown Philadelphia. Market projections indicate that demand for transient docks near these destinations will increase.

Additional transient traffic may be generated from boats within the market by providing access to new areas along the waterfront. This includes access to parks and event venues or access for human powered craft and megayachts in areas near downtown.

Site Development Analysis

Washington Avenue - Analysis shows that the Washington Avenue site is best suited for day-docks for transient boat access and human powered vessels as it provides a departure point for visitors experiencing Pier 53 Park and the proposed environmental restoration of surrounding piers and slipways. The site may also include a water taxi stop to support tourism, retail, and hotel activities that have been identified for the upland parcels adjacent to the Washington Ave corridor. A boat ramp with associated parking may be supported at this location depending on the final type and configuration of proposed upland development. Access to the site from I-95 is supported by nearby access ramps.

Infrastructure improvements may included a floating or fixed breakwater to protect transient boaters (visiting or launching at potential launch facilities). A wave break will also provide a protected environment for human powered craft.

Penn's Landing (South Street) – A marina providing long-term slip leases may be constructed in the basin between the Chart House Restaurant and Dockside Condominiums. This location, at the terminus of the existing and proposed extension of the South Street I-95 crossover, provides long-term and transient boaters a direct link to the historical and entertainment districts of the City. The site lacks dedicated upland areas and therefore would require reprogramming a significant portion of the Chart House Restaurant parking lot to provide convenient restroom and other marina support facilities. The site would likely require a breakwater to provide protection against waves, currents, and debris and to minimize sediment infilling.

This facility may compete with the existing docks at Penn's Landing. If the existing basin at Penn's Landing is programmed for day-transient and human powered facilities, the addition of larger (>40 ft) long-term lease slips may be warranted. Market demand projections suggest that demand for smaller slips may not be sufficient to support both this facility and the existing facility at the Philadelphia Marine Center.

Penn's Landing Harbor (existing basin) - Penn's Landing Harbor is suitable for dock expansion to provide additional transient and long-term slips. The

Harbor is also suited as a harbor for human powered craft. The newly refurbished breakwater protects the harbor from waves, currents, and sediments. If retail, restaurant, and marina related facilities were expanded, this facility may be marketed as a primary destination for transient boaters as the massing of adjacent upland activities and direct access to the historic and entertainment districts of the City may identify this facility as a destination point.

Spring Garden (Festival Pier) - The Spring Garden site's proximity to the Philadelphia Marine Center suggests it would compete with the existing marina for long-term slip-takers. Unless significant upland development occurs at adjacent parcels, this location provides less access to the City's historic and cultural events compared to other potential locations. The physical constraints of site affects dock configuration and would require a breakwater to minimize waves and sedimentation, which significantly affects the functionality of the adjacent transient facility at the north side of Dave and Buster's Restaurant.

The upland area is sufficient to support a public boat ramp (with parking) and a limited boatyard and storage facility, which is unique north of Philadelphia on the Pennsylvania side of the river. This more commercial use may not be commensurate with proposed upland development goals.

Berks Street - The Berks Street site is identified as a potential site for a relocated event amphitheater. The amphitheater would generate demand for transient docking during events. Transient docks could also provide boat access to nearby Penn Treaty Park.

If the amphitheater is not relocated to the site, a smaller transient facility may support the existing parks, proposed commercial and residential developments, or future environmental restoration initiatives. The large mass of upland area is also suited for a boat launch and/or a full service boatyard facilities as access from major roads including I-95 will be enhanced by ongoing road improvements. The site is not suited for long term wet slips unless a protected basin was created from a portion of the uplands, several piers were removed, and a protective breakwater structure was added.

2. EXISTING MARINA MARKET

Cataloging the existing regional marina market provides insight into market capacity and local boating trends. The existing Philadelphia marina market consists of wet slip marinas in Pennsylvania and New Jersey along with numerous dry storage and launch facilities, yacht clubs, and private slips. The existing market analysis is used to evaluate the current marina wet slip demand and to project future demand in the market region.

2.1 MARKET AREA

The Philadelphia marina market encompasses marinas on the lower Delaware River and serves local boaters from the greater Philadelphia region as well as visiting, transient boaters. The Philadelphia marina market area may be defined using both geographic and demographic analyses.

Market areas are defined geographically by the expected distance that local boaters are willing to travel to use the marina facilities and include the competing marinas within that area. Studies suggest boaters are willing to travel by car up to one hour from home to reach their boat. Boater and dockmaster interviews support this limit, confirming the geographic marina market region for Philadelphia encompasses boaters and marinas in Delaware, Philadelphia, Montgomery, and Bucks Counties in Pennsylvania and Gloucester, Camden, and Burlington Counties in New Jersey (see Figure 2-1). Boaters living or working outside of a one hour driving radius are not expected to seek long-term berthing within the Philadelphia market; however, many transient boaters are expected to visit from outside of this market area.

Marina market areas based on demographics are often distinguished by the type of associated upland development and the targeted vessel size classes. Different demographic types include marinas supporting home porting boats, residential developments, clubs, or transient and tourism boaters. The Philadelphia market area can be separated into two geographic sub-markets; 1) marinas near downtown Philadelphia and 2) suburban marinas in Pennsylvania and New Jersey. These geographic sub-markets are also demographic sub-markets as boat usage in these two sub-regions differs. Marinas in both Philadelphia sub-markets provide long-term slips to local, day-use boaters; however the marinas near downtown are also destination marinas, providing short term berthing for visitors to restaurants, historical sites, shopping, and other nearby destinations as well as for transient boaters from outside of the region.

A third demographic sub-market includes private boat clubs. Boat clubs are supported by membership dues and focus on social events including boat races and regattas with other boat clubs.

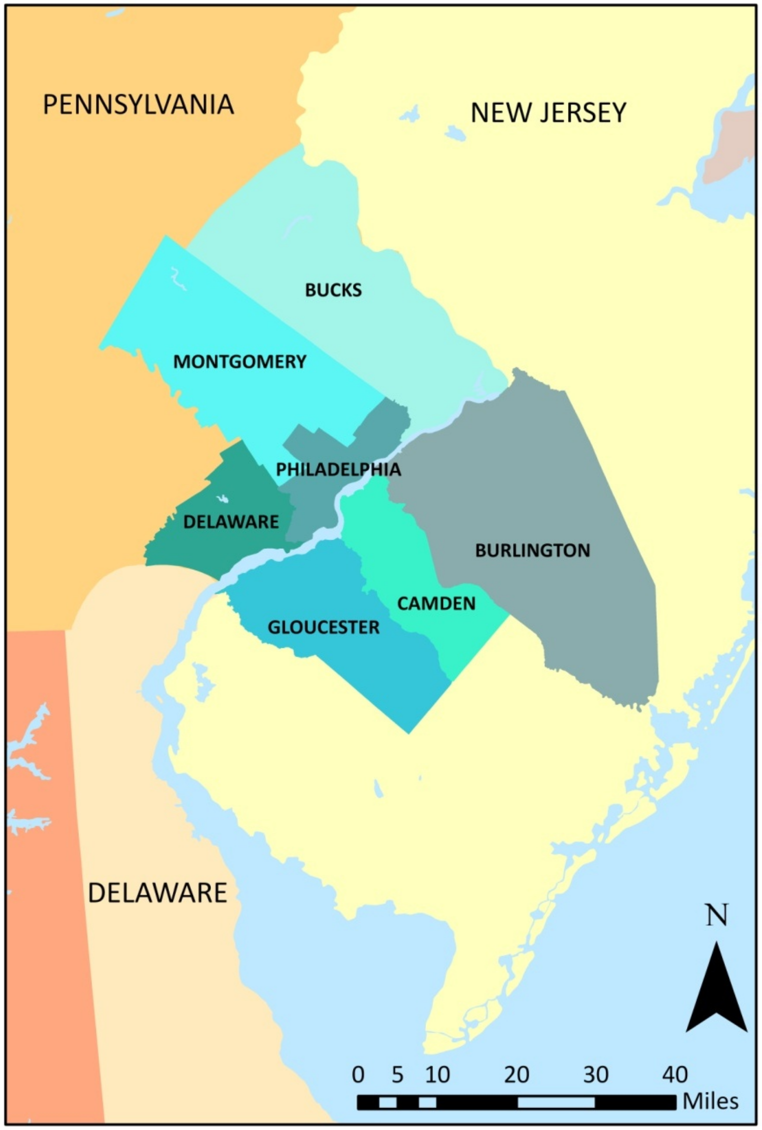


Figure 2-1: Philadelphia Marina Market Region

2.2 BOATING ACTIVITIES

Peak boating season in the Philadelphia market coincides with the warmer weather months, from mid-April to mid-October. Wet slips are generally leased from April 15 through October 15 for a seasonal rate. Marinas within the market reach peak occupancy between Memorial Day and Labor Day with the 4th of July period being the busiest weekend for boating. Ice on the river and cold weather limit recreational boating activities during the winter. Winter haul-out and dry boat storage is available at most marinas for an additional fee.

During the boating season, boaters fish, sail, cruise the river, and congregate at popular destinations such as “Pork Chop Island” and the coves along the river north of Philadelphia. Many local boaters visit Philadelphia by boat to frequent restaurants, bars, and to tour the many historic sites (see Figure 2-2).

Philadelphia attracts transient boaters from outside of the market seeking to enjoy the sites and activities of the city. Transient boaters often cruise to a specific destination, stopping at convenient locations along the way. Vessels traveling to Philadelphia may stay for a few days or the entire season and typically originate from the mid-Atlantic region or Florida. The majority of the marinas in the Philadelphia market do not specifically reserve transient slips but allow short term leasing if space is available.

Figure 2-2: Attractions

After the boating season most of the smaller boats (boats less than 40 feet) are moved from wet slips to dry storage to protect the boats from ice damage. Some marinas reduce ice at the docks with the use of bubblers or deicers placed throughout the marina basin. These ice prevention measures allow some owners to keep their boats in the marina during the winter for use during warmer periods.

2.3 MARKET SIZE

The Philadelphia marina market is comprised of more than 49 boating facilities. Nearly half of these facilities are boating clubs (15) and/or dry storage facilities (10) with docks for launching and staging only.

The remaining 24 facilities are wet slip marinas offering long term slip leases to the public. These marinas include 3,166 wet slips ranging in size from 20 ft to 55 ft in length. The location of the 24 wet slip marinas is shown in Figure 2-3 with the number of slips in each marina shown in Table 2-1.

The market also has 30 boat ramps (20 in Pennsylvania and 10 ramps in New Jersey) including 11 public ramps (see Figure 2-4 and Table 2-2). The remainder of the ramps are private – owned and used exclusively by boat clubs – and semi-public – ramps at marinas or boat storage facilities that may allow public launches for a fee. Many facilities also have boat hoists or travellifts for use in launching and retrieving boats, especially at the beginning and end of the season.

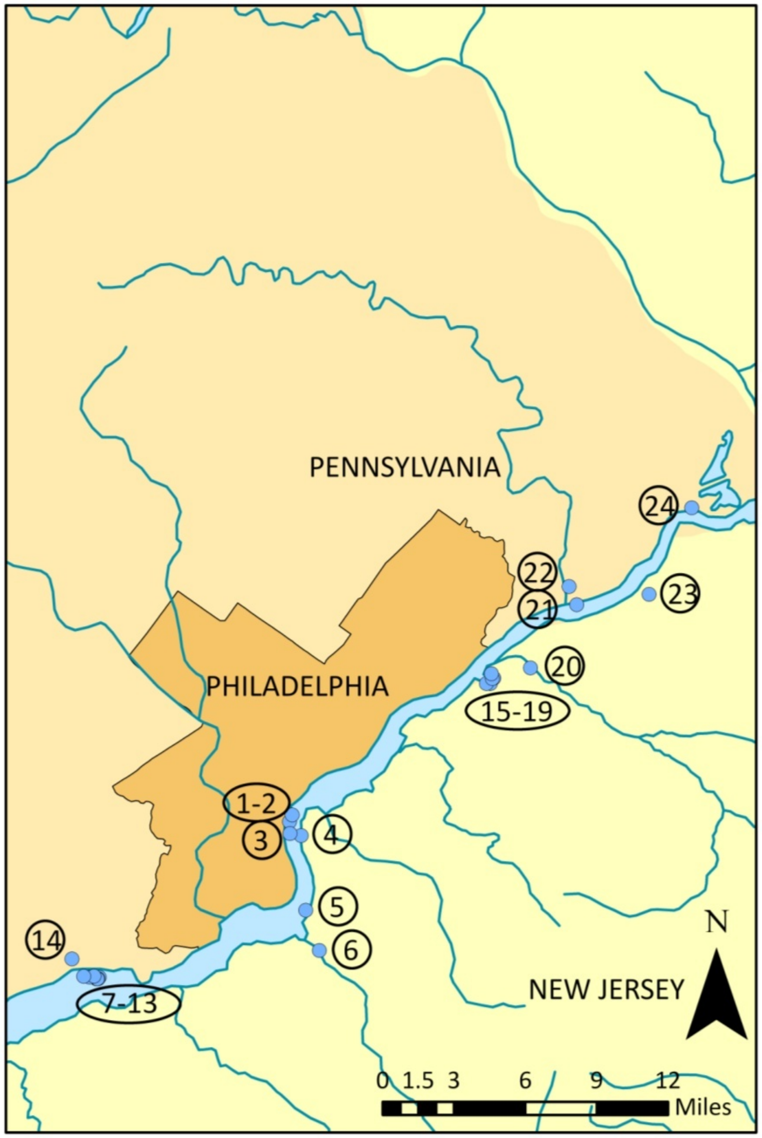


Figure 2-3: Existing Marinas

Table 2-1: Philadelphia Marina Market Slip Counts

	Marina	Slips
	Downtown Area	
1	Philadelphia Marine Center	**338**
2	The Piers Marina	**111**
3	Penn's Landing	**20**
4	Wiggins Park Marina	**55**
5	Gloucester City Marina	**27**
6	William Hargrove Marina	**50**
	South of Philadelphia (Essington)	
7	Anchorage Marina	**200**
8	Golden Point Marina	**40**
9	Harbor Light Yacht Club	**35**
10	Fox's Grove Marina	**56**
11	Riverside Yacht Club	**26**
12	Lagoon View Marina	**40**
13	West End Boat Club	**75**
14	Ridley Twp Municipal Marina	**96**
	North of Philadelphia	
15	Dredge Harbor Marina	**275**
16	Clarks Landing Marina	**278**
17	Hawk Island Marina	**50**
18	Winter's Sailing Center	**200**
19	Riverside Marina	**200**
20	Lightning Jack's Marina	**100**
21	Neshaminy State Park Marina	**370**
22	Snug Harbor Marina	**200**
23	Curtin Marina	**120**
24	Baum's Cove Marina	**204**
	Total	**3,166**

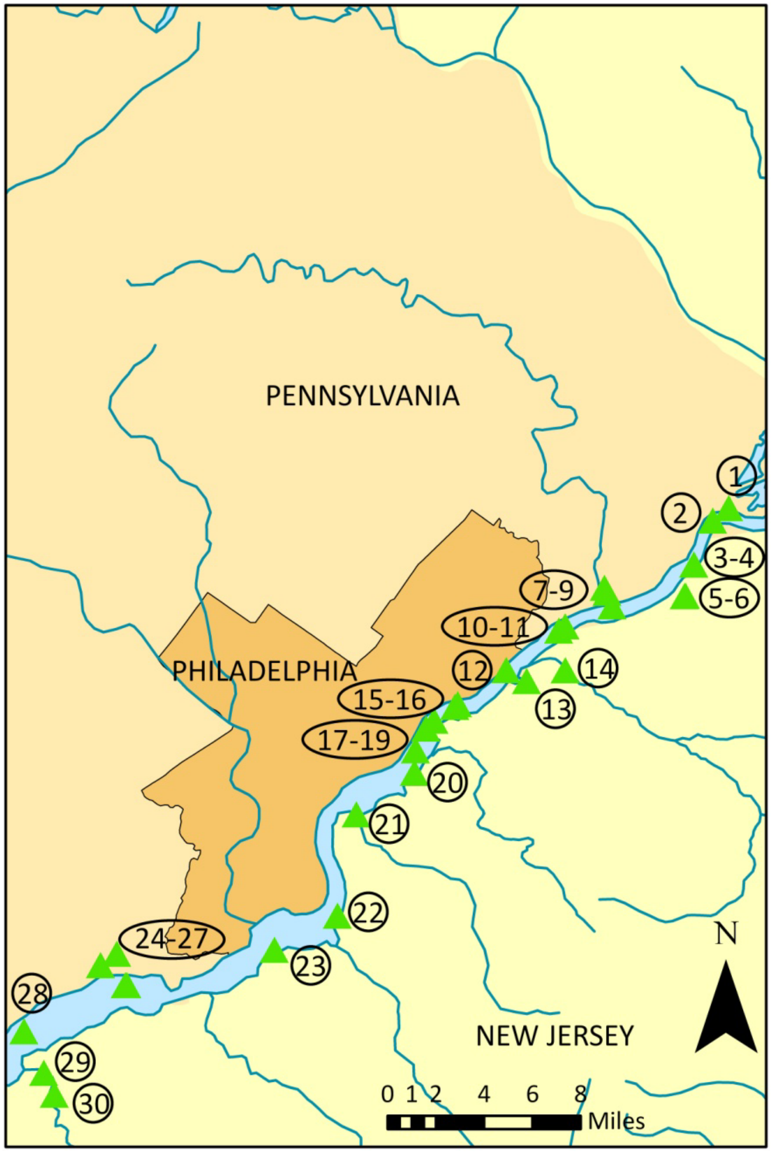


Figure 2-4: Existing Boat Ramps

Table 2-2: Philadelphia Boat Ramps

	Ramp Name	Type
1	Baum's Cove	Semi-Public
2	Bristol Yacht Club	Private
3	Edgely Boat Club	Private
4	Anchor Yacht Club	Private
5	Burlington City Boat Ramp	Public
6	Curtin Marina	Semi-Public
7	Eckart's Marine Service	Semi-Public
8	Snug Harbor Marina	Semi-Public
9	Neshaminy State Park	Public
10	Station Avenue Boat Ramp	Public
11	Pennsylvania Yacht Club	Private
12	City of Philadelphia Boat Ramp	Public
13	Hawk Island Marina	Semi-Public
14	Lightning Jack's Marina	Semi-Public
15	Tacony Access	Public
16	Quaker City Yacht Club	Private
17	Frankford Arsenal Access	Public
18	Bridesburg Outboard Club	Private
19	Wissinoming Yacht Club	Private
20	Delair (Pennsauken) Boat Ramp	Public
21	Pyne Point Marina	Semi-Public
22	Gloucester City Marina	Public
23	W. Deptford Municipal Ramp	Public
24	Frank's Marina	Semi-Public
25	Fox's Grove Marina	Semi-Public
26	Golden Point Marina	Semi-Public
27	Ridley Twp Municipal Marina	Public
28	City of Chester Boat Ramp	Public
29	Bridgeport Boat Yard	Semi-Public
30	Richard's Buttonwood Marina	Semi-Public

Bridges in a market area may inhibit the passage of boats, restricting access for some taller boat types. The majority of the vessels occupying slips in the Philadelphia market are power boats and small sailboats. The five bridges crossing the Delaware River in the Philadelphia area, listed in Table 2-3, have high clearance heights and do not impede passage by typical recreational and commercial boats in the market.

Table 2-3: Delaware River Bridge Clearances

	High Tide (ft)	Low Tide (ft)
Ben Franklin	129'	135'
Betsy Ross	129'	135'
Commodore Barry	181'	192'
Delaware Memorial	175'	186'
Walt Whitman	139'	145'

2.4 SLIP SIZE

The number and size of slips for marinas in the market area, grouped by sub-area, is shown in Table 2-4. Slips in the market are generally less than 40 ft with the highest percentage of slips in the 20 to 29 ft range (39%) followed by the 30 to 39 ft range (27%). In the downtown area, there are fewer small docks (docks less than 20 ft) – 8% vs. 19% for the market area. This may be attributed to the vessels sizes targeted by the downtown area marinas as well as providing greater flexibility for berthing boats of varying sizes as smaller boats can be berthed in larger slips.

Table 2-4: Marina Slip Size by Sub-Area

Submarket	Total Slips	Percentage of Slips by Length (feet)						
		< 20	20-29	30-39	40-49	50-59	60+	Other
Downtown Area								
Philadelphia Marine Center	338	0	212	78	28	0	0	20
Penn's Landing	20	0	0	0	20	0	0	0
The Piers	111	0	26	52	29	0	0	4
Gloucester City	27	0	24	0	0	0	0	3
Wiggins Park	55	27	16	6	0	0	0	6
William Hargrove	50	20	0	0	0	0	0	30
Downtown Area	**601**	**8%**	**46%**	**23%**	**13%**	**<1%**	**<1%**	**10%**
North of Philadelphia								
Clarks Landing	278	82	100	80	0	0	0	16
Dredge Harbor	275	0	50	170	12	12	0	31
Riverside	200	0	64	100	30	0	1	5
Winter's Sailing Center	200	0	0	134	66	0	0	0
Lightning Jack's	100	70	30	0	0	0	0	0
Hawk Island	50	50	0	0	0	0	0	0
Curtin	120	4	84	20	0	0	0	12
Neshaminy State Park	370	60	148	32	52	0	0	78
Snug Harbor	200	80	100	0	0	0	0	20
Baum's Cove	204	54	58	92	0	0	0	0
North of Philadelphia	**1919**	**21%**	**33%**	**33%**	**8%**	**<1%**	**<1%**	**5%**

Submarket	Total Slips	Percentage of Slips by Length (feet)						
		< 20	20-29	30-39	40-49	50-59	60+	Other
South of Philadelphia								
Anchorage	200	59	110	20	0	0	0	11
Fox's Grove	91	0	77	14	0	0	0	0
Golden Point	40	0	14	26	0	0	0	0
Harbor Light YC	35	0	23	12	0	0	0	0
Lagoon View	40	0	0	40	0	0	0	0
Ridley Twp Municipal	96	40	36	10	10	0	0	0
Riverside YC	26	0	0	11	10	0	0	0
West End Boat Club	67	28	39	0	0	0	0	0
South of Philadelphia	**555**	**23%**	**54%**	**13%**	**7%**	**<1%**	**<1%**	**3%**
Total*	**3,075**	**19%**	**39%**	**27%**	**9%**	**<1%**	**<1%**	**5%**

*Total reflects marinas where slips cataloged by size. Not all marinas included.

The majority of vessels in the Philadelphia market are in the range of 16 feet through 40 feet. There is an increasing number of vessels over 40 feet. Most of these larger vessels are currently accommodated on "T" head docks and side-tie areas.

2.5 DOCK STYLE

Marina docks may be either fixed or floating structures and can be constructed of a variety of materials including wood, concrete, metal, and composite materials. The type of dock is selected based on environmental conditions and owner preferences. Environmental factors that influence dock type include tide range, water depth, wave climate, and currents. Boater preferences, cost, and durability also may be considered

The tide range at the project site is on the order of 6 feet as reported at the tide gauge located at the Philadelphia Coast Guard station. In areas of tidal fluctuation exceeding 2-3 feet, floating docks are more prevalent as they provide a constant 1 to 2 foot deck elevation above the water surface, facilitating boat access.

All docks in the Philadelphia market are floating and are generally wood or metal frame construction with timber decking. The slips are either configured as side-tie docks, common for staging at ramps or dry storage facilities, or "double loaded" slips with two boats between each set of finger piers. The majority of slips in the market have full length finger docks. Shorter fingers save construction cost but many boaters prefer the full length finger for easier boat access and docking. Table 2-5 summarizes the frequency of docks by type, material, and style in the market.

Table 2-5: Dock Types

Dock Type	
Fixed	0
Floating	24
Deck Material	
Wood	24
Concrete	0
Composite	0
Aluminum	0
Dock Style	
Single	0
Double	24

Current yacht construction trends show that many vessels are being built with wider beams. Yacht builders are increasing the usable square footage on vessels by increasing widths up to 25% without increasing the length proportionally. Many of the existing slips in the market are too narrow for the vessels using the slips, resulting in smaller vessels being forced to use longer slips to accommodate wider boats.

2.6 AMENITIES

Typical marina amenities include shore power, potable water, sewage pump-out, and communications connections located at the slips. Amenities may also include landside facilities such as parking, restrooms, showers, and laundry services. Seasonal, live-aboard and transient boaters require different amenities and the amenities that marinas provide influences the type of boater that frequents the facility.

Table 2-6 shows the amenities available in the market. Potable water and shore power are used by seasonal and transient boaters. These are the two most common amenities in the Philadelphia market. The predominant marina slip in the market area is for boats less than 40 ft, and power is provided accordingly with 30 amp power available at most slips with some marinas offering 50 amp power and only one or two marinas offering 100 amps. The 50 and 100 amp services are offered only at a few slips.

Dockmasters in the market reported increased power as the most necessary amenity upgrade at existing facilities. This increased demand is due to increased standard amenities offered on vessels, such as air conditioning, television and audio systems.

Table 2-6: Available Amenities

Amenity	% of Marinas
Potable Water	91%
Electric	85%
Ice Machine	75%
Sanitary Pump-out	47%
Gas	33%
Internet	33%
Restaurant	33%
Satellite TV/Cable	29%
Bar	21%
Laundry Facilities	16%
Telephone	15%
Swimming Pool	13%
Shower	11%
Diesel	9%

In addition to water and power, sanitary pump-outs are available at an increasing number of the facilities. Sanitary pump-outs are becoming a more prevalent amenity at marinas as the regulatory agencies promote “Green Marinas” and the use of pump-outs to create a cleaner marina environment by decreasing the number of vessels that illegally empty waste into the marina basins.

Fuel for smaller boats (<40 ft) is generally gas while larger vessels require diesel. Gas is available at one-third of the marinas in the Philadelphia market while diesel was listed as available at only 2 marinas in the market.

Boaters using a marina only as a place to park their boats do not require comfort amenities such as laundry, showers, satellite TV/cable, and telephone. Conversely, marinas that serve transient and liveaboard boaters include these amenities. Liveaboard amenities are offered at less than 20% of the marinas in the Philadelphia market.

Marinas in the Philadelphia market also do not generally include destination amenities such as hotels, restaurants, or bars attached to the marina. These amenities are available in the marina vicinity in the downtown area.

Parking in close proximity to the marina is important for loading and unloading. Marinas located outside of the downtown Philadelphia area have ample room for parking at their facilities. Dockmasters in downtown Philadelphia indicated that insufficient parking is problematic for their marinas. Generally marinas have sufficient parking if there is one space available for every two boat slips.

2.7 PRICING

Slip lease rates in the Philadelphia market vary and are influenced somewhat by marina location and slip size. Table 2-7 shows published maximum rates for the Philadelphia market marinas.

The existing wet slip lease range for a transient vessel is generally $1.00 to $3.50 per foot per day with only the Neshaminy State Park offering lower transient rates at $0.55 per foot per day. Wiggins Park, the Philadelphia Marine Center, and Penn's Landing charge the highest lease prices due to the their proximity to the downtown Philadelphia attractions. These pricing trends carry into the monthly and seasonal recreational lease slip rates.

Monthly recreational slip lease rates generally range from $6.17 to $18.00 per foot per month. However, the Philadelphia Marine Center and Penn's Landing charge significantly higher rates of $44.64 and $26.11 per foot per month for monthly leases due to higher demand for these marinas located near downtown. The seasonal ranges are slightly discounted from the monthly rates ranging from $6.17 to $17.26 per foot per month.

Table 2-7: Recreational Marina Slip Lease Rates

Marina	Rate per Foot		
	Daily/day	Monthly/mo	Seasonal/mo
Downtown Area			
Philadelphia Marine Center	$2.75	$44.64	$17.26
Penn's Landing	$2.25	$26.11	$16.67
The Piers Marina	$1.50	$17.00	$9.17
Wiggins Park Marina	$3.50	$18.00	$18.00
Gloucester City Marina	$1.00	$7.00	$7.00
South of Philadelphia			
Ridley Twp Municipal Marina		$7.88	$7.88
North of Philadelphia			
Neshaminy State Park	$0.55	$6.17	$6.17
Snug Harbor Marina	$1.00	$8.83	$8.83
Lightning Jack's Marina		$7.50	$7.50
Riverside Marina	$2.00	$15.00	$13.17
Winter's Sailing Center		$8.95	$11.50

3. PROJECTED MARINA MARKET

The projected marina market describes the number and size of slips expected to be supported by the market in the future. The projected market capacity also influences the rate at which slips are absorbed (occupied) and the lease price supported by the market.

The market capacity is determined by evaluating the number of slip takers projected to use boat slips. Projected slip takers for a new marina in the Philadelphia market are expected to include:

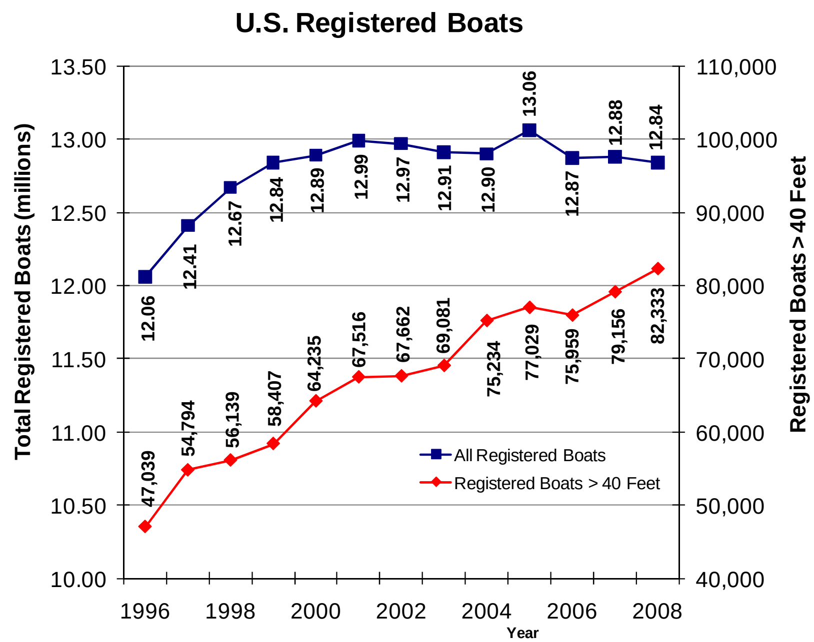
- Long-term recreational boaters
- Transient recreational boaters
- Commercial boaters

In addition to identifying projected slip takers, trends in boat registrations and uses are also analyzed.

3.1 Boating Trends

Boats in the U.S. are registered and licensed by the U.S. Coast Guard or the state of residence. The number of registered boats directly relates to boat ownership and boat use which affects marina slip demand.

Analysis of U.S. boat registration statistics, shown in Figure 3-1, indicates that steady growth of registrations in the 1990's was followed by a declining trend through the 2000's. This decline is attributed to economic instability in the U.S. combined with rising fuel prices.

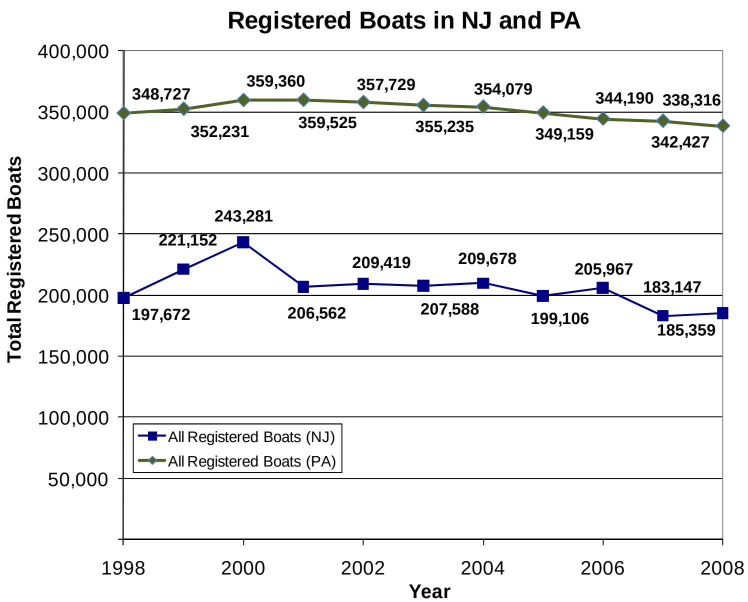


Source: U.S. Coast Guard/NMMA

Figure 3-1: U.S. Boat Registration Trends

In contrast to the relatively flat trend in overall boat registrations, the data also shows steady growth (2-3% per year) in the number of boats greater than 40 ft. These trends are consistent with boat slip demand throughout the U.S. as reported by dockmasters and industry analysts who indicate that smaller slips are currently vacant or are last to be filled while wait lists exist in many marinas for larger (>40 ft) slips.

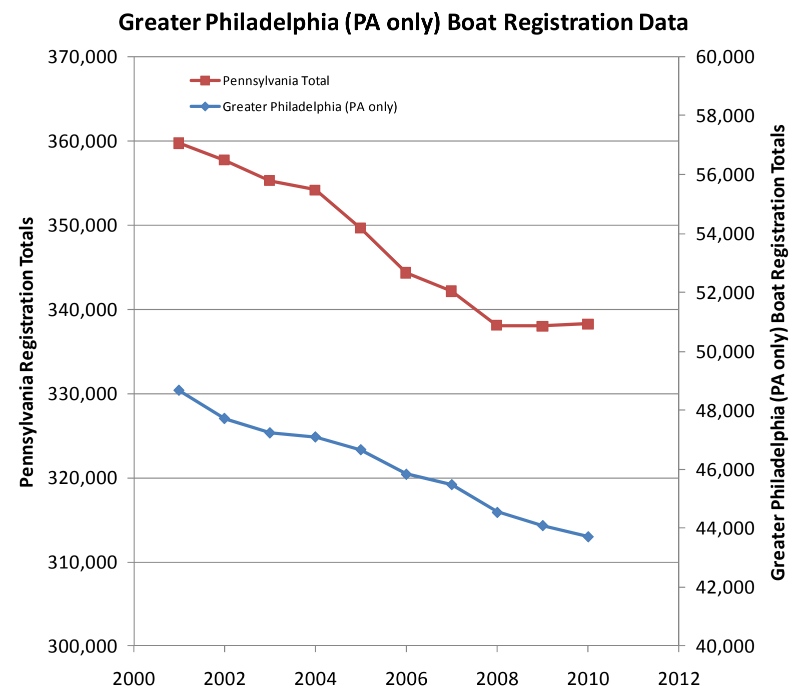
Boat registrations in Pennsylvania and New Jersey followed trends similar to the national trends with total boat registrations in 2008 (most recent year with available data) below registration totals from 1998 in both states (Figure 3-2).



Source: U.S. Coast Guard/NMMA

Figure 3-2: U.S. Boat Registration Trends

The number of registered boats in each state categorized by size is unavailable; however, interviews with local dockmasters suggest that the number of boats larger than 40 ft is increasing while the number of smaller boats in marinas is decreasing. Local boat registration trends in Pennsylvania counties near Philadelphia are consistent with state-wide trends. The number of registered boats declined steadily 1-2% per year from 2001 through 2010 (see Figure 3-3)

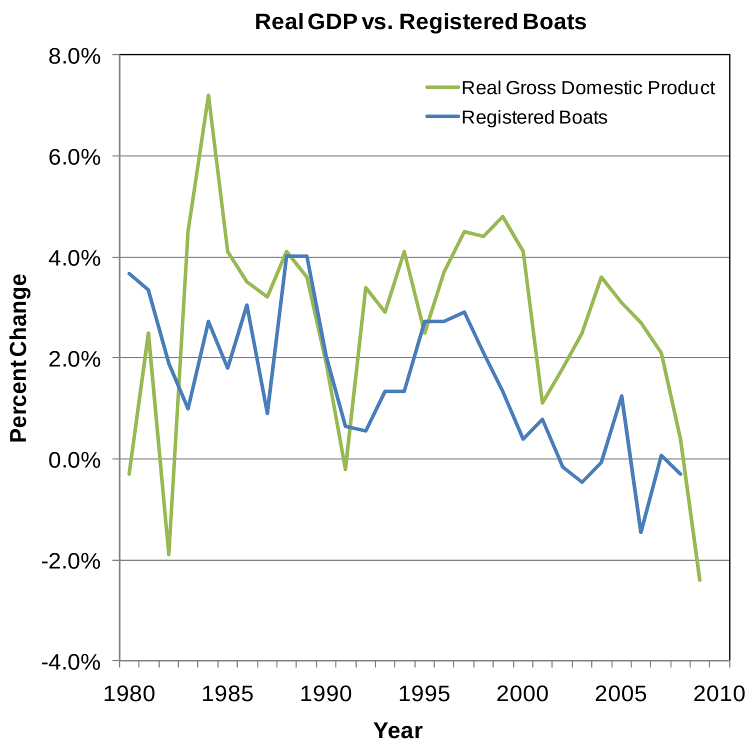


Source: PFBC, Moffatt & Nichol

Figure 3-3: Greater Philadelphia Boat Registration Trends

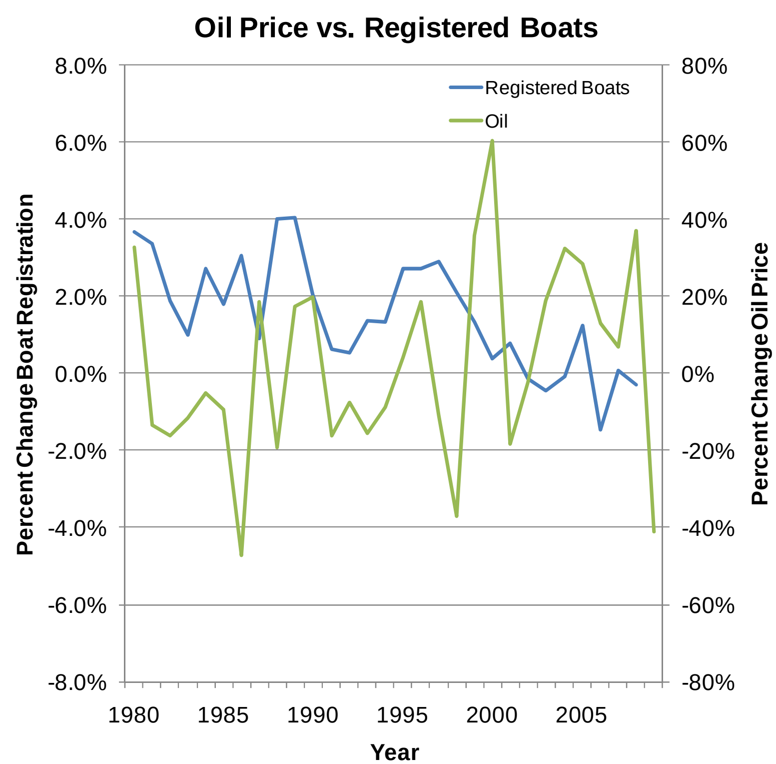
The cyclicality in boat registration rates of change is related to the overall economy and corresponds to some extent to real gross domestic product growth. Figure 3-4 shows the rate of change in boat registrations vs. the rate of change in GDP. Analysis shows that boat registrations slowed significantly during and immediately following recessions or steep declines in GDP (1982, 1991, 2001).

In addition to following GDP economic trends, boat registrations trends are also related to fuel prices. Boat registration data analysis indicates that greater than 90% of boats in the United States are motorized and that significant fluctuations in oil prices may also affect boat sales. Figure 3-5 shows that registered boat growth slowed following sharp oil price rises (1987, 1989-1990, 1996, 1999-2000).



Source: USCG, Department of Commerce (BEA), Moffatt & Nichol

Figure 3-4: Real GDP Growth and U.S. Registered Boat % Growth



Source: USCG, Moffatt & Nichol

Figure 3-5: Oil Price Fluctuations and U.S. Registered Boat Growth

The National Marine Manufacturers Association's (NMMA's) boating abstract for 2009 reports the following survey results related to fuel prices:

- Gas prices rose from approximate $2.70 in 2007 to over $4.00 in the summer of 2008. Nearly 85 percent of current boat owners used their watercraft in 2008, a three percent increase from 2007. In 2009, 95 percent reported using their boat.
- Time constraints were cited as the primary reason for not boating by active boat owners (44 percent) followed by the cost of fuel for the boat (32 percent) and reduced income (26 percent).

Marinas are generally the last sector in the boating industry to see effects from economic volatility and are typically the first to recover. During recent economic slow-downs, many boats remained in use, although they exhibited a decrease in duration and frequency of boating trips during this time (Ross, 2008).

> *"…the last four recessions suggest that marinas are the last sector in the boating business to go into recession and the first to come out. … in the first year of a recession a marina operator typically sees few changes - maybe shorter boat trips and owners staying on their boats at the docks more; in the second year, a 10 to 15 percent slip vacancy occurs, along with a decline in fuel sales, more repair work, fewer boats to fill slips that become vacant, staff reductions and shorter work weeks; in Years 2 to 3, boats move to better marinas because they no longer have a waiting list and the better marinas fill their slips and upgrade their facilities; and in Years 3 to 4, almost all marinas recover, with more than 95 percent of them surviving without a change of ownership and waiting lists fill up again." (Ross, 2011)*

Most boats are trailerable, the majority of which are not stored in marina wet slips. Wet slips are typically occupied by larger vessels that are not as easily trailered and are limited in landside storage options. These vessels typically remain in a wet slip during the boating season regardless of the amount of use.

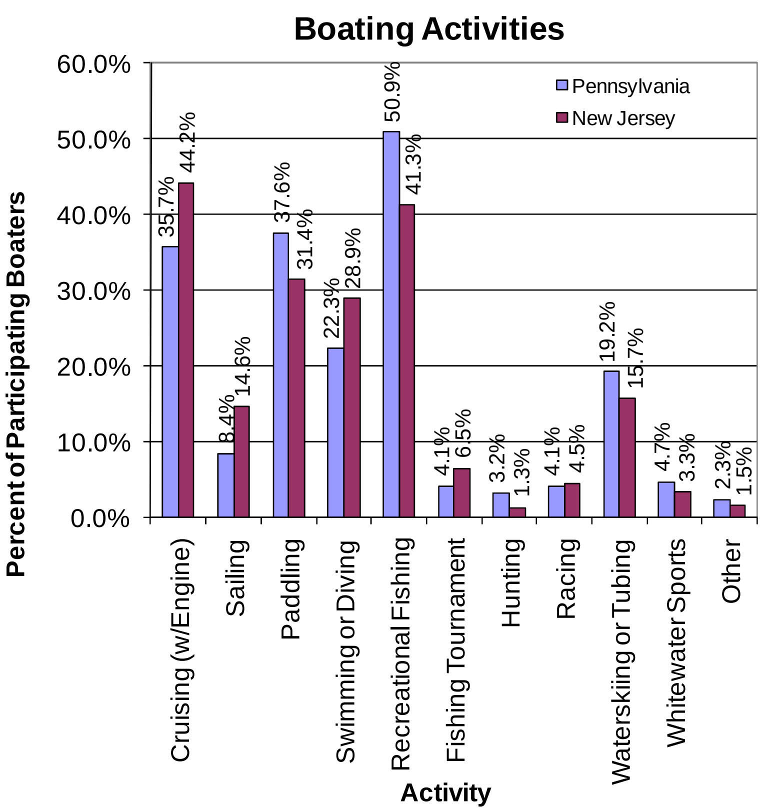
3.2 BOATING DEMOGRAPHICS

NMMA demographics data shows American boat owners are largely "middle-class".

- Nearly 95 percent of registered mechanically propelled boats on the water in 2008 were 26 feet or less, meaning they were affordable, entry-level, trailerable boats, not large yachts.
- Three out of four current boat owners have an average household income under $100,000.
- More than 69 percent of boat owners are married.
- Boat owners spent an average of 30 days on the water in 2009, up from 25 days on the water in 2008 but not yet back to 2007 levels of 32 days.

Boating use as reported by a USCG boater survey (USCG, 2002) is shown in Figure 3-6 - note that more than one activity may be reported by each user resulting in a cumulative that exceeds 100%. The data shows that boats in

Pennsylvania and New Jersey are mainly used for fishing and cruising with additional activities that include water sports – swimming, waterskiing, tubing – and sailing.



Source: USCG, Moffatt & Nichol

Figure 3-6: Boating Activities – PA and NJ

In the United States, the age of the average boater has continued to increase over the last decade. This trend is expected to continue with "baby boomers" purchasing newer and larger vessels as they become active retired seniors. In 2004, the median age of new boat buyers was 48, with an annual income of $71,000. Within the new boat buyer sector, the median age of cruising yacht owners was 50, with an annual income of $134,000, and the median fiberglass sportfishing boat owner was 46, with an annual income of $64,000 (NMMA, 2004).

Table 3-1 shows the length of boat operated (owned) by age group for the U.S. The percentage of boats larger than 25 feet – boats generally requiring a wet slip - increases for each increasing age group up to age 60.

Table 3-1: Length of Boat Operated Most Often by Age – U.S.

	Age of Operator					
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 +
Under 16 feet	64.4%	49.1%	39.9%	32.0%	29.5%	34.2%
16 to 20 feet	23.7%	33.2%	37.7%	40.2%	41.3%	43.3%
20 to 25 feet	7.0%	10.6%	13.3%	14.8%	15.3%	11.8%
26 to 39 feet	3.3%	5.1%	6.9%	9.4%	9.2%	8.2%
40 to 65 feet	1.3%	1.5%	1.8%	3.3%	3.6%	2.2%
Over 65 feet	0.3%	0.4	0.4%	0.3%	1.1%	0.3%
Total	100%	100%	100%	100%	100%	100%

These demographic data support the conclusion that the primary age group for larger boats and wet slip demand is 40 to 70 years old. Boating and slip demand are projected to grow in popularity as the "baby boom" generation ages.

Age demographics for the greater Philadelphia area from 2008, shown in Table 3-2, indicate 47% of the population is in the primary boating demographic between ages 35 and 74.

Table 3-2: Philadelphia Age Demographics

Age	Total	%
Under 5 years	400,983	6.40%
5 to 9 years	387,371	6.20%
10 to 14 years	409,081	6.60%
15 to 19 years	448,342	7.20%
20 to 24 years	417,007	6.70%
25 to 34 years	828,787	13.30%
35 to 44 years	855,990	13.70%
45 to 54 years	952,178	15.30%
55 to 59 years	391,991	6.30%
60 to 64 years	317,206	5.10%
65 to 74 years	413,762	6.60%
75 to 84 years	277,876	4.50%
85 years and over	133,104	2.10%

3.3 PROJECTED SLIP DEMAND

The projected demand for wet slips is evaluated by identifying and analyzing potential slip takers. Identified slip takers for the Philadelphia marina market include

- Underserved Existing Boaters
- Population Growth
- Upland Development
- Tourism
- Commercial

Growth or decline these factors are correlated to demand for additional wet slips in the market.

3.3.1 UNDERSERVED EXISTING POPULATION

Marina markets that have already reached a saturation point leave a portion of the existing boating population underserved. There are boaters that seek a slip but an insufficient number of slips are available. An underserved market results in boaters trailering their boat, keeping their boat further outside of the region, or prevents a potential boater from purchasing a boat. The extent of the underserved population may be evaluated by evaluating marina slip wait lists and evaluating trends in regional boats per capita.

Marina Slip Wait List

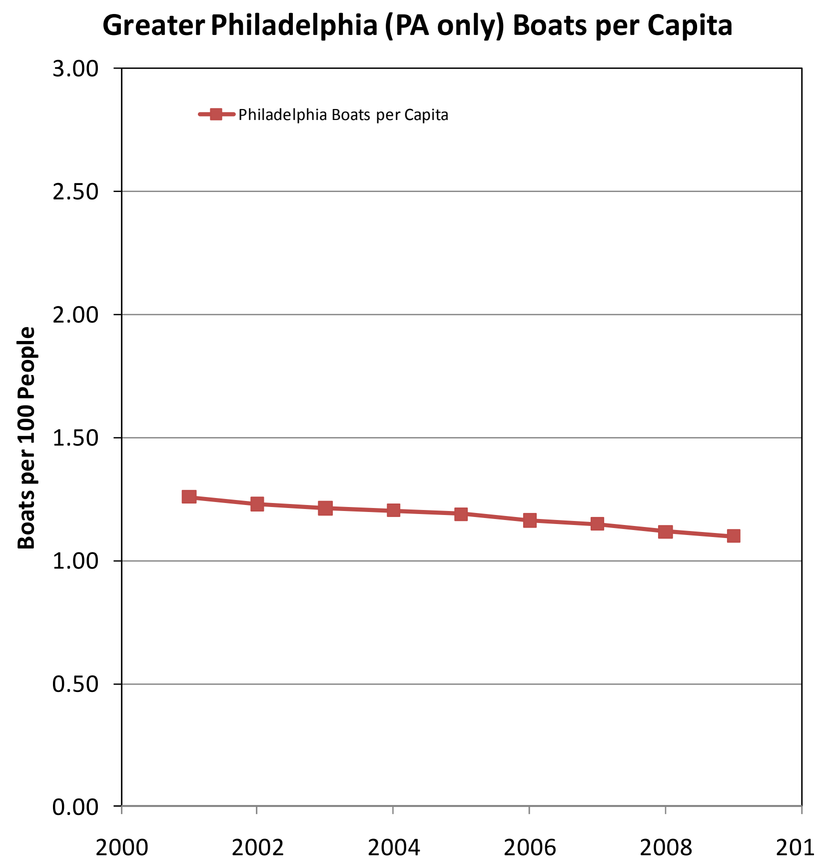
Dockmasters in the Philadelphia market report that their marinas generally maintain wait lists only for larger slips. Marinas in the Philadelphia market have slips available in the 20-foot and 30-foot range. Wait lists exist for wet slips in the 40-foot and 50-foot range. This aspect of the market currently comprises less than 1% of the available slips.

Recent economic activity has influenced slip leasing and boating in general. The increase in fuel prices has decreased the number of trips boaters have taken this year. Boaters in the 20-foot to 40-foot range are either switching from wet slip storage to dry storage for their vessels or not using them at all.

Dockmaster report that larger wet slips have not seen a change in occupancy rates. However, they also indicate that owner of these boats are not utilizing their vessels as frequently and are staying closer to the marina during boating trips.

Boats Per Capita

An alternative method to evaluate market saturation and underserved boating population is by analyzing trends in registered boats per capita in the market. The existing Pennsylvania marina market number of boats per capita is 1 boat for every 91 people (1.1 boats per 100 people), as shown in Figure 3-7. The number of boats per capita steadily decreased from 1 boat for every 80 people (1.26 boats per 100 people) in 2001. This decrease is due to a steady decline in the number of registered boats in the region (see Figure 3-3) combined with increasing population (see Figure 3-8). This suggests that the marina market is not saturated and there are a minimum number of underserved boaters.



Source: U.S. Census, Google, Moffatt & Nichol

Figure 3-7: Greater Philadelphia Boats per Capita

Summary

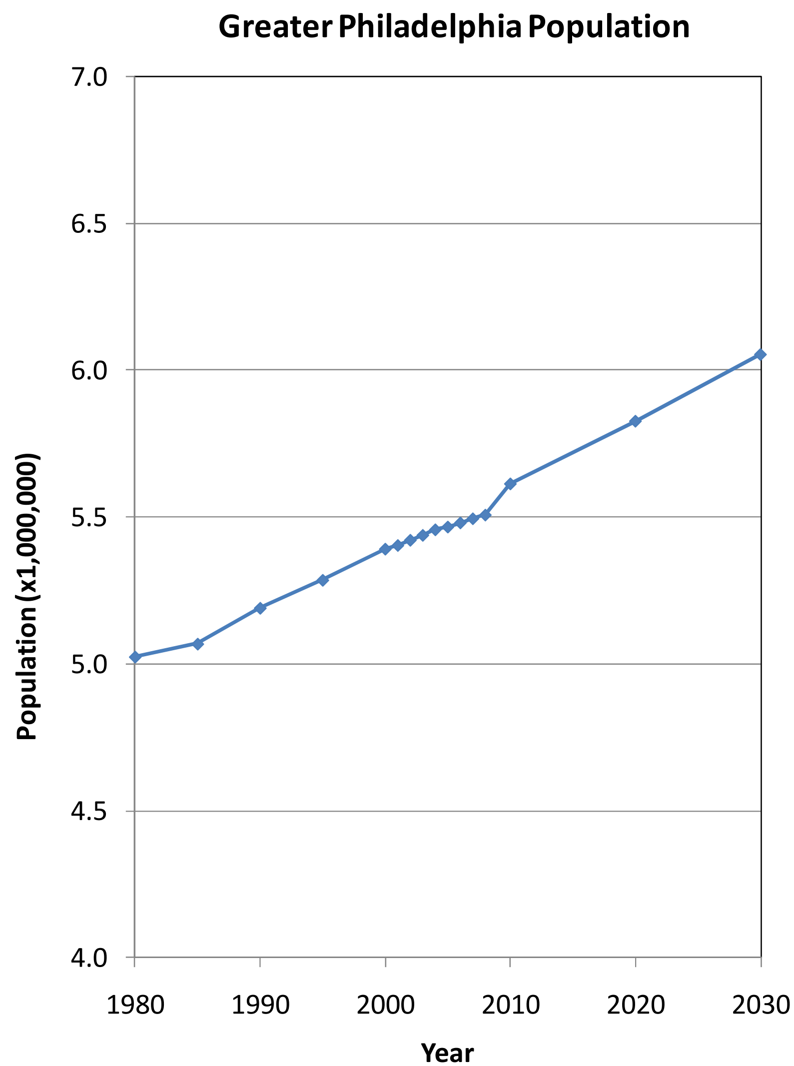
Analysis of underserved existing population data suggests there are a sufficient number of total slips in the market. Some marina growth potential exists for larger slips (>40ft).

3.3.2 POPULATION GROWTH

As population grows, one can assume that the boating population will grow at a similar rate. However, there are other influences, such as demographic changes in population, that affect the growth of the boating market. As Figure 3-7 shows, the number of boats per capita is decreasing as population increases.

Historical population trends and future projections for the market area show an overall population increase over the period 1980-2030. The overall regional growth in the market is expected to increase 7.8% between 2010 and 2030, which equates to approximately 440,000 people.

Boating is a luxury expense and an increase in median household income suggests a greater possibility of disposable income being spent on boating. A demographic shift in income levels can increase the per capita boat ownership above the current level. As shown in Table 3-3, the household income has moderately increased and does not support a signification change in boat ownership.



Source: U.S. Census, Google, Moffatt & Nichol

Figure 3-8: Greater Philadelphia Population Growth

Table 3-3: Philadelphia Market Income Demographic Trends

	Median Household Income	
	2000	**2009**
Philadelphia	$30,746	$37,045
Pennsylvania	$40,106	$49,520

Summary

Growth in the market region population is not expected to significantly increase the number of vessels in the market. The area population is expected to increase by approximately 440,000 people by 2030. Assuming a per capita boat ownership of approximately 1 boat per 91-100 people, an additional 4,400 to 4,800 vessels are expected in the market region by 2030 or an average of 220 to 240 boats per year. According to boat registration data, over 90% of vessels are trailerable; as such, approximately 400 to 500 additional wet slips will be needed to meet the demand from population growth. These slips are expected to be absorbed throughout the population growth period at prevailing market rates.

3.3.3 UPLAND DEVELOPMENT

The type of upland development associated with a marina can attract different types of boaters to the project. Residential components of upland developments typically draw long-term boaters and absorption of slips is in line with the upland absorption. Conversely a commercial development will generally attract more transient boaters seeking a temporary stop.

The proposed upland components of the project vary by site and range from commercial/tourism based development to a potential amphitheater or parkland/green space. Marina slip demand for these sites is expected to be tourism driven (see following section).

3.3.4 TOURISM

In addition to the transient boating market, boating tourism includes fishing charters and cruises. The transient boating market is comprised of seasonal boaters from out of state and local residents traveling between marinas in the region. These vessels are sufficiently accommodated at the existing marinas.

Transient boaters may travel to Philadelphia to see the historic and cultural sites such shown in Figure 2-2. Entertainment venues such as Dave and Busters also attract visitors to the area. Restaurant, shop, and walkway development in the downtown Philadelphia area will provide upland amenities that transient boaters typically desire. These amenities offer an advantage over most other marinas outside of downtown Philadelphia and will attract transient boaters to the downtown area. In addition, the presence of foot traffic is appealing to those boaters wishing to display their vessels in an “ego alley” type of venue.

Barriers exist to transient vessels visiting the Philadelphia market. Transient boaters are expected to approach the market area from the north by traveling to marinas along the New Jersey shoreline or from the south via the Delaware coast or the Chesapeake Bay and C&D Canal where there are numerous marinas to visit along the way. Philadelphia is a day-long cruise from the C&D Canal and Cape May with limited intermediate marinas or tourism locations. This is a deterrent for the transient boater that is passing through the mid-Atlantic region that may stop at marinas along the route that are convenient but are unlikely to spend a day cruising to and from a Philadelphia unless planning specifically to visit the area. Philadelphia will not attract transient boaters merely passing through the mid-Atlantic region.

Megayachts, generally defined as boats greater than 80 feet long piloted by professional crews, occasionally visit Philadelphia. These vessels may visit the market on a transient basis similar to other boats passing through the area. Megayachts also may visit during a special event (Fourth of July, sporting events, etc). The Philadelphia market is not a recognized homeport location for megayachts and lacks many of the necessary maintenance services required by these vessels.

Boats may also travel to downtown Philadelphia marinas from neighboring marinas for events. Demand for slips may be driven by events coordinated by area yacht clubs or other waterfront events including concerts, parades, etc.

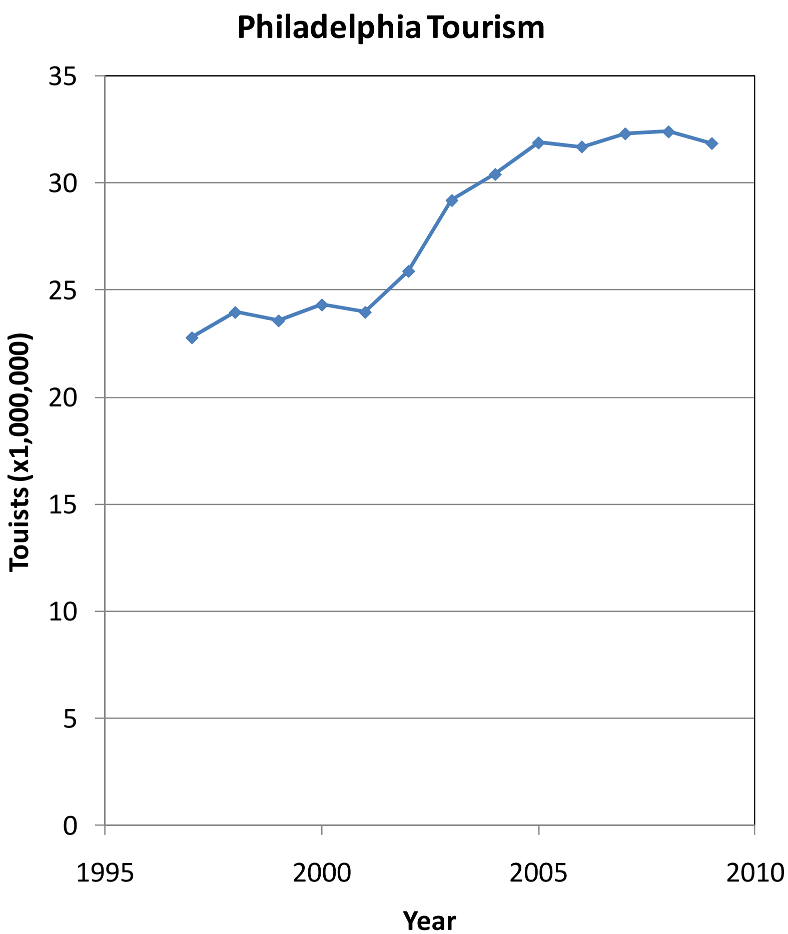
Eco-tourism involving kayaks, canoes, and other human powered craft along with day-use of slips with access to parks and green space may also generate demand for marina facilities. Additional access points may be desirable to facilitate human powered craft to access the river.

Figure 3-9 shows the number of leisure tourists visiting Philadelphia from 1997 through 2009. Analysis of the data shows a long term trend of 1% increase in tourism per year. Boating tourism is expected to follow a similar trend.

The number of tourists visiting by boat will be further influenced by marketing efforts in the boating community. Marketing of available access specifically to the boating population in the larger region, including the Chesapeake through New England, is expected to increase visits by boat.

Summary

Slip demand generated by boating tourism, both from local residents and transient boaters, is site dependent and is projected to grow consistent with overall tourism rates. Downtown marinas are most likely to appeal to transient boaters with marinas further from downtown appealing to day-users and human powered craft.



Source: GPTMC, Moffatt & Nichol

Figure 3-9: Greater Philadelphia Tourism Growth

3.3.5 COMMERCIAL

Tourism influences the commercial and charter boat industry through the use of tour boats, water taxis and fishing vessels. Commercial boat use is expected to increase at a rate proportional to tourism rates.

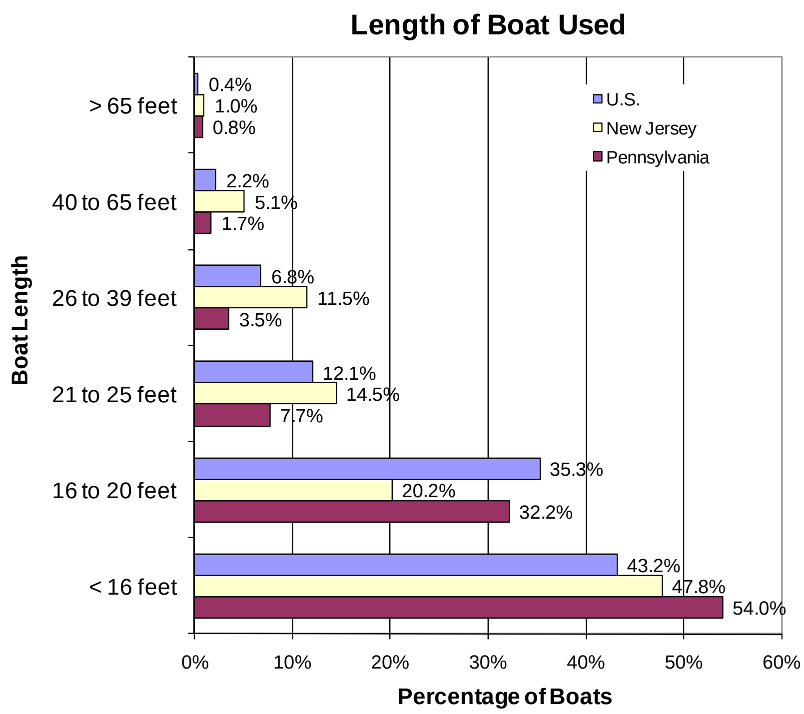
Philadelphia's waterfront does not provide views of historic sites. However, existing river tours providing dinner and event cruises may expand as tourism increases.

Summary

Additional demand for charter boats and charter boat slips is expected as tourism increases. However, existing marinas and pier facilities appear to be sufficient to accommodate additional demand.

3.4 PROJECTED SLIP SIZE DEMAND

Surveys of boaters by the U.S. Coast Guard suggest that boats used most often in the Philadelphia market are generally smaller than those used throughout the U.S. on average. Figure 3-10 shows that there are more boats less than 16 feet used in Pennsylvania and New Jersey and less boats greater than 16 feet used when compared to the rest of the U.S.



Source: USCG, Moffatt & Nichol

Figure 3-10: Length of Boat Used Most Often

Figure 3-10 suggests that demand for marina slips in the Philadelphia market may be low for large slips and high for smaller slips. The number and size of existing slips in the market area, grouped by sub-area, is shown in Table 3-4.

Table 3-4: Marina Slip Size by Sub-Area

Submarket	Total Slips	Percentage of Slips by Length (feet)						
		< 20	20-29	30-39	40-49	50-59	60+	Other
North of Philadelphia	**1919**	21%	33%	33%	8%	<1%	<1%	5%
Downtown Area	**601**	8%	46%	23%	13%	<1%	<1%	10%
South of Philadelphia	**555**	23%	54%	13%	7%	<1%	<1%	3%
Total*	**3,075**	**19%**	**39%**	**27%**	**9%**	**<1%**	**<1%**	**5%**

*Total reflects marinas where slips cataloged by size. Not all marinas included.

While the majority of vessels in this market are less than 20 feet, most of these boats are trailered and are not kept in a marina wet slip. Marina wet slips demand ranges from 20 to 40 feet in length although there is some demand for slips over 40 feet.

New marinas in the downtown area serving transient boats should include 35 to 50 ft slips with berthing for some larger vessels, including transient vessels, available on T-heads or bulkheads.

3.5 SUMMARY

The number of registered boats in the Philadelphia market is decreasing despite increasing population. The resulting decrease in boats per capita suggests limited demand for additional long-term boat slips. Therefore, new boat slips should focus on better serving the existing boats in the market and transient boats.

Transient boat traffic from outside of the market area is draw to the existing historical and tourism based destinations near downtown Philadelphia. Marinas in this area should focus on providing access to these destinations.

Additional transient traffic may be generated from boats within the market by providing access to new areas along the waterfront. This includes access to parks and event venues or access for human powered craft in areas near downtown.

Based on dockmaster observations, marina slips where demand is greater than supply include slips from 30 to 50 ft and many of the existing slips in this size range are too narrow to accommodate the design boat length. Slips less than 30 ft are available in the market.

4. MARINA SITING MATRIX

The DRWC is considering developing up to 5 sites in the vicinity of Philadelphia from Washington Avenue to Berks Street for boating access. The five sites are defined as follows:

- Washington Avenue
- Penn's Landing (South Street)
- Penn's Landing Harbor (existing basin)
- Spring Garden (Festival Pier)
- Berks Street

These sites are assessed for physical site features as well as for potential boating market demand.

4.1 SITING FACTORS

The following siting factors are considered when evaluating potential marina sites.

Breakwaters/Protection

Sites along the river are subject to river currents, waves from passing ships and wind, and sedimentation. Construction of a fixed breakwater may be required to reduce waves and to divert currents and sediments.

Existing Infrastructure

Existing docks or breakwaters and previous dredging make permitting easier and may reduce development cost.

Access to Destinations / Opportunity to Create a Destination

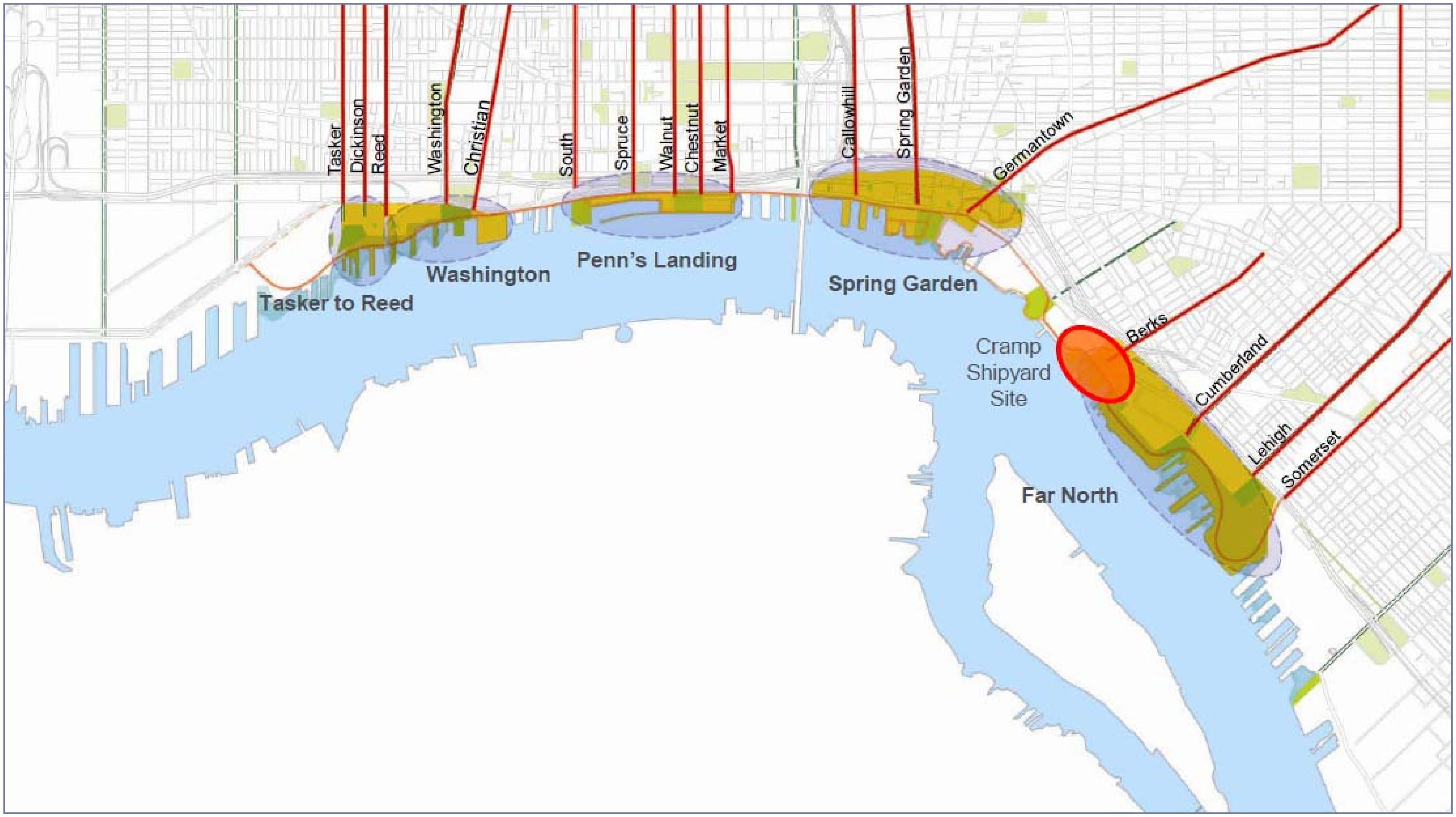
Access to tourist destinations attracts boaters to marinas. Marinas with special features, access to unique locations, or that provide special services may be a destination unto itself. Access to nearby upland destinations may include walkways, public transportation, and rental vehicles (bikes, cars, etc).

Parking

Parking is necessary for marinas acting as home ports and serving local boaters that come to the marina via car. Facilities with boat ramps require additional space to accommodate the trailers. Industry standards for parking suggest 1 parking spot for every 2 boat slips plus trailer parking commensurate with the projected boat ramp usage.

4.2 SITE DESCRIPTIONS

Figure 4-1 shows the potential waterfront development sites.



Source: Cooper, Robertson & Partners

Figure 4-1: Potential Development Sites

4.2.1 WASHINGTON AVENUE

The Washington Avenue site, the southernmost site being considered for development, is adjacent to and encompasses the existing Coast Guard Station and docks. This site is adjacent to the Pier 53 Park and environmental restoration area, less than a mile south of Penn's Landing and less than a half mile north of Pier 70 which includes several "big box" retail stores.

The site is located on a north-south oriented segment of the Delaware River and does not include a breakwater or seawall along the river. The uplands include surface parking immediately adjacent to the site.

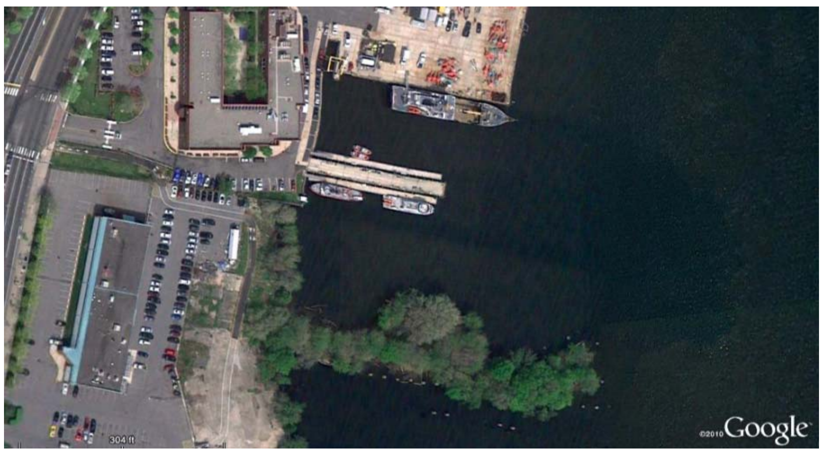


Figure 4-2: Washington Avenue

4.2.2 PENN'S LANDING – SOUTH STREET

The Penn's Landing – South Street site is immediately south of the existing Penn's Landing Harbor located in the water area defined by Dockside Condominiums and Chart House Restaurant pier . The river is oriented north-south at this site and the waterside area is currently undeveloped. A remnant pile field evenly splits the open water area.

The site is bordered to the west by S. Columbus Blvd, with limited upland area between the water and the street.

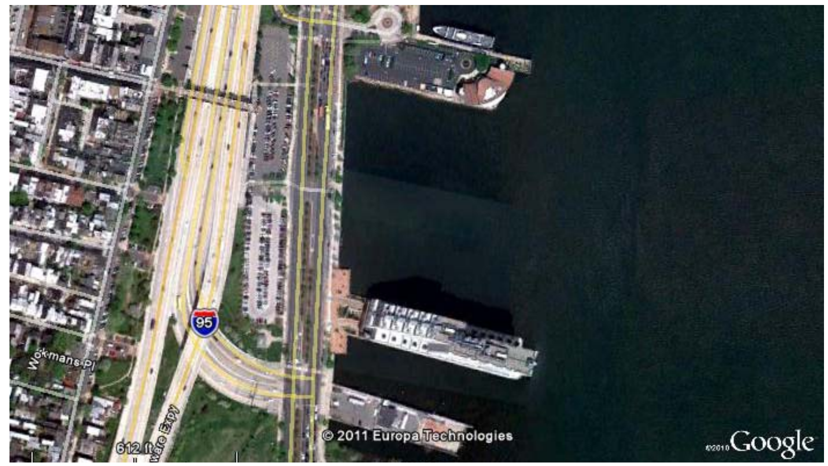


Figure 4-3: Penn's Landing – South Street

4.2.3 PENN'S LANDING HARBOR

The existing Penn's Landing Harbor currently provides boaters access to popular Philadelphia tourist destinations and historic sites. The harbor currently has 20 transient boat slips.

The harbor is protected by a newly refurbished breakwater to the east. The adjacent upland to the west and north includes parking and marina building that includes the dockmaster's office, security, grounds maintenance and limited restroom facilities. The location of docks on the outer breakwater results in a long walk by marina patrons to access facilities and nearby attractions.

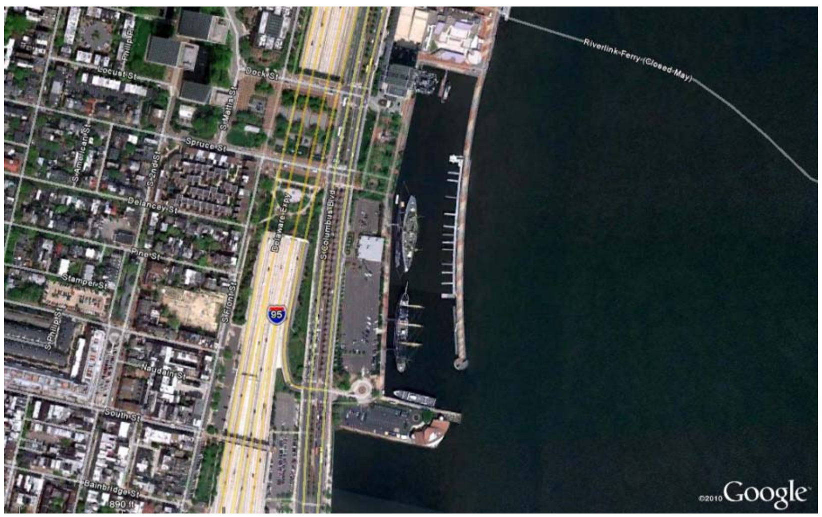


Figure 4-4: Penn's Landing Harbor

4.2.4 SPRING GARDEN

The Spring Garden site is currently being used a temporary festival area, and vendor operated parking facility. The site is located on an outer bend in the Delaware River with limited water area. The existing pier centered on the site interrupts the water area, further limiting the waterside development opportunities.

The site is bordered to the west by N. Delaware Ave. with nearby access to I-95. The upland area is larger than most of the other sites under consideration.

Figure 4-5: Spring Garden

4.2.5 BERKS STREET

The Berks Street site is similar to the Spring Garden site in that it has piers protruding into the water area, creating several smaller basin areas. The site features extensive undeveloped uplands with nearby access to I-95 and Penn Treaty Park.

Of the sites under consideration, Berks Street is the farthest to the north and provides a good midway point between downtown and the marinas at Riverside, NJ.

Figure 4-6: Berks Street

4.3 DOCK TYPES

The tidal range is a factor when considering fixed and floating docks. As a general rule, a tidal range between 0 to 3 feet is suitable for either fixed or floating docks; although cost associated with the anchoring/pile support system relative to the water depth should also be considered. In areas where the tidal range is between 3 to 7 feet, floating docks are generally preferred. Fixed docks may be suitable for larger boats with higher freeboards, multiple boarding levels, or passerelles, though boaters typically prefer not to climb up and down between the boat and the dock. For tides greater than 7 feet, floating docks are required. Based on the average tidal variations in the Philadelphia region that are on the order of 6 feet, floating docks are recommended.

4.4 AMENITIES

Boaters moored at any marina will expect amenities and services commensurate with their needs. Basic amenities include those that are typically found at the marina for use by each vessel, either freely or for a fee.

Potable Water - In addition to washdowns at the docks, many larger boats include onboard water tanks for restrooms and kitchen use that require replenishment while at berth. All dockside water should be a regulated, potable system capable of filling storage tanks without damage to boat plumbing. If the marina hosts liveaboard vessels during winter months, the potable water lines should be freeze resistant. Water demand is estimated to be approximately 25 gallons of water per slip per day during peak demand (Tobiasson, 2000) for vessels less than 100 feet.

Electric - Onboard amenities have increased the electrical demands of many boats. Electric services should range from 30 to 50 amps for slips up to 60 ft and 100 amp service for larger slips and T-heads to offer increased power for the occasional larger vessel.

Dock Lighting - Lighting along the dock is provided for safety and security reasons. This amenity can be provided as either independent lighting fixtures along the dock or as part of the power pedestal configuration.

Sanitary - Sanitary systems are designed to be either centralized or located at each slip. A centralized system is less expensive to install, can be easily staffed with marina employees and is less prone to maintenance issues caused by improper use by boat owners. Service at each slip facilitates proper disposal of wastes by eliminating waiting lines. Some owners will discharge out at sea or in the marina rather than wait in line or return at a later time to a pump-out facility. Consequently, the provision of clean, well-outfitted, well lighted, and accessible shore-side sanitary facilities reduces the stress on the onboard systems and discourages the use of on-board sewage flow through devices.

The number of pump-outs should conveniently serve the target market. Long waits tend to discourage users. The sewage may be pumped into an on-site holding tank from which it is discharged into the municipal sanitary sewer system. The pump-out should be centrally located and easily accessible and also located nearby to fuel dispensing operations. In-slip pump-out facilities provide an added level of service that may support higher lease rates.

To prevent accidental discharges, trained staff should be available to assist boaters with pump-out operations.

Parking - Sufficient parking should be provided in close proximity to the slips to facilitate loading/unloading of passengers and cargo. Guidelines recommend a ratio of 0.50 parking spaces per slip.

Solid Waste Collection - Trash floating in the marina is unsightly and must be removed by staff and it remains an ongoing (but necessary) maintenance issue. Consequently, all boaters should be encouraged to properly dispose of trash by providing multiple large, covered, convenient trash receptacles. In addition, covered receptacles prevent birds and rodents from accessing and spreading collected trash.

Fire Protection - Modern marinas require that fire-fighting equipment be capable of combating fires quickly and effectively, while preventing the fire from spreading to other vessels within the marina. The most common types of fires in marinas are those fueled by flammable liquids, such as diesel, oil, or gasoline.

The possibility of the fire spreading to other vessels along the water surface must be

considered, especially when combating such a fire with water, which may push the fire along the water's surface. For this reason, large dry chemical fire extinguishers to suppress Class B (fuel), as well as Class A (wood/paper) and C (electrical) fire, should be readily available at key locations throughout the marina. This equipment should be provided in tandem with a centralized high volume water system.

Service Distribution - Marina utility power pedestals may be used to provide yachts with a single source for utility hookups while also providing low-glare lighting and racks for cables and hoses. These units are also designed for easy accessibility to wires and connections while being serviced or repaired. These units may be provided at each individual dock or shared between two adjacent docks. Low-glare / low-level lighting should be provided throughout the marina to provide an atmosphere of safety as well as increase the aesthetic appeal of the marina.

Dock Boxes - Dock boxes are available either rectangular in shape or triangular to fit on the corner supports of docks. Rectangular boxes generally provide more efficient storage for typical boaters than corner boxes.

Security - Boat owners seek a sense of security from thievery and vandalism while their boat is in the marina. Security measures implemented for the marina should be visible to act as a deterrent while not being intimidating or obtrusive to marina patrons. Such examples may include security staff augmented by video surveillance, monitored vessel access alarm systems, and the creation of secure areas using physical barriers such as fences and gates. Marina security should also include the use of appropriate lighting along walkways and public areas throughout the marina, which also acts to help ensure safe access by all users of the facilities.

Limited access docking configurations provide a means to limit access to berthing areas through the installation of a security gate at each access point that may be controlled with access codes or key cards combined with the physical separation of a marginal dock from the bulkhead.

4.5 RECOMMENDED SITE DEVELOPMENT

This section outlines the recommended development at each site based on the existing and projected marina market and the stated DRWC development goals.

4.5.1 WASHINGTON AVENUE

Analysis shows that the Washington Avenue site is best suited for day-docks for transient boat access and human powered vessels as it provides a departure point for visitors experiencing Pier 53 Park and the proposed environmental restoration of surrounding piers and slipways. The site may also include a water taxi stop to support tourism, retail, and hotel activities that have identified for the upland parcels adjacent to Washington Ave corridor. A boat ramp with associated parking may be supported at this location depending on the final type and configuration of proposed upland development. Access to the site from I-95 is supported by nearby access ramps.

Infrastructure improvements may included a breakwater to protect transient boaters (visiting or launching at potential launch facilities). A wave break will also provide a protected environment for human powered craft.

4.5.2 PENN'S LANDING (SOUTH STREET)

A marina providing long term slip leasing may be constructed in the basin between the Chart House Restaurant and Dockside Condominiums. This site is situated at the terminus of the existing and proposed extension of the South Street I-95 crossover, providing long-term and transient boaters a direct link to the historical and entertainment districts of the City. The site lacks dedicated upland areas and therefore would require reprogramming a significant portion of the Chart House Restaurant parking lot to provide convenient restroom and other marina support facilities. The site would likely require a breakwater to provide protection against waves, currents, and debris and to minimize sediment infilling. This facility may compete with the existing docks at Penn's Landing. If the existing basin at Penn's Landing is programmed for day-transient and human powered facilities, the addition of long-term lease slips for boats larger than 40 feet may be warranted. Market demand projections suggest that demand for smaller slips may not be sufficient to support both this facility and the existing facility at the Philadelphia Marine Center.

4.5.3 PENN'S LANDING HARBOR (EXISTING BASIN)

Penn's Landing Harbor is suitable for dock expansion to provide additional transient and long-term slips. The Harbor is also suited as a harbor for human powered craft. The newly refurbished breakwater protects the harbor from waves, currents, and sediments. If retail, restaurant, and marina related facilities were expanded, this facility may be marketed as a primary destination for transient boaters as the massing of adjacent upland activities and direct access to the historic and entertainment districts of the City may identify this facility as a destination point.

4.5.4 SPRING GARDEN (FESTIVAL PIER)

The Spring Garden site proximity to the Philadelphia Marine Center suggests it would compete with the existing marina for long-term slip-takers. Unless significant upland development occurs at adjacent parcels, this location provides less access to the City's historic and cultural events. The physical constraints of site affects dock configuration and would require a breakwater to minimize waves and sedimentation, which significant affect the functionality of the adjacent transient facility at the north side of Dave and Buster's Restaurant. The upland area is sufficient to support a public boat ramp (with parking) and a limited boatyard and storage facility, which is unique north of Philadelphia on the Pennsylvania side of the river. This more commercial use may not be commensurate with proposed upland development goals.

4.5.5 BERKS STREET

The Berks Street site is identified as a potential site for a relocated event amphitheater. The amphitheater would generate demand for transient docking during events. Transient docks could also provide boat access to nearby Penn Treaty Park.

If the amphitheater is not relocated to the site, a smaller transient facility may support the existing parks, proposed commercial and residential developments, or future environmental restoration initiatives. The large mass of upland area is also suited for a boat launch and/or a full service boatyard facilities as access from major roads including I-95 will be enhanced by ongoing road improvements. The site is not suited for long term wet slips unless a protected basin was created from a portion of the uplands, several piers were removed, and a protective breakwater structure was added.

5. SUMMARY

The following bullets summarize the Philadelphia marina market and development opportunities at the five identified sites.

- Overall boat ownership in the Philadelphia market is decreasing
- Long term population growth may increase demand for boat slips by 200 to 400 slips over 15 to 20 years.
- Transient boating and tourism boating can increase.
- Better access to historic and tourism destinations from the waterfront could increase transient slip demand from both local and out of town boaters.
- The existing marinas are adequately serving most of the existing marina market.
- Some demand exists for larger (>40 ft) slips, especially in downtown Philadelphia marinas.
- Downtown marinas can charge significantly higher rates for long term boaters than marinas outside of downtown.
- The existing Penn's Landing Harbor site provides the best opportunity for additional docks to support transient traffic.
- The Penn's Landing – South Street site could provide long-term and transient docking but would compete with existing docks at Penn's Landing Harbor and would require significant infrastructure (breakwater, parking, management office).
- The Washington Ave site could support a boat ramp and some day-docks.
- The Spring Garden site is the best site for a full service boatyard and repair facility due to the available upland.
- Berks Street is suitable for transient and day-docks.

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