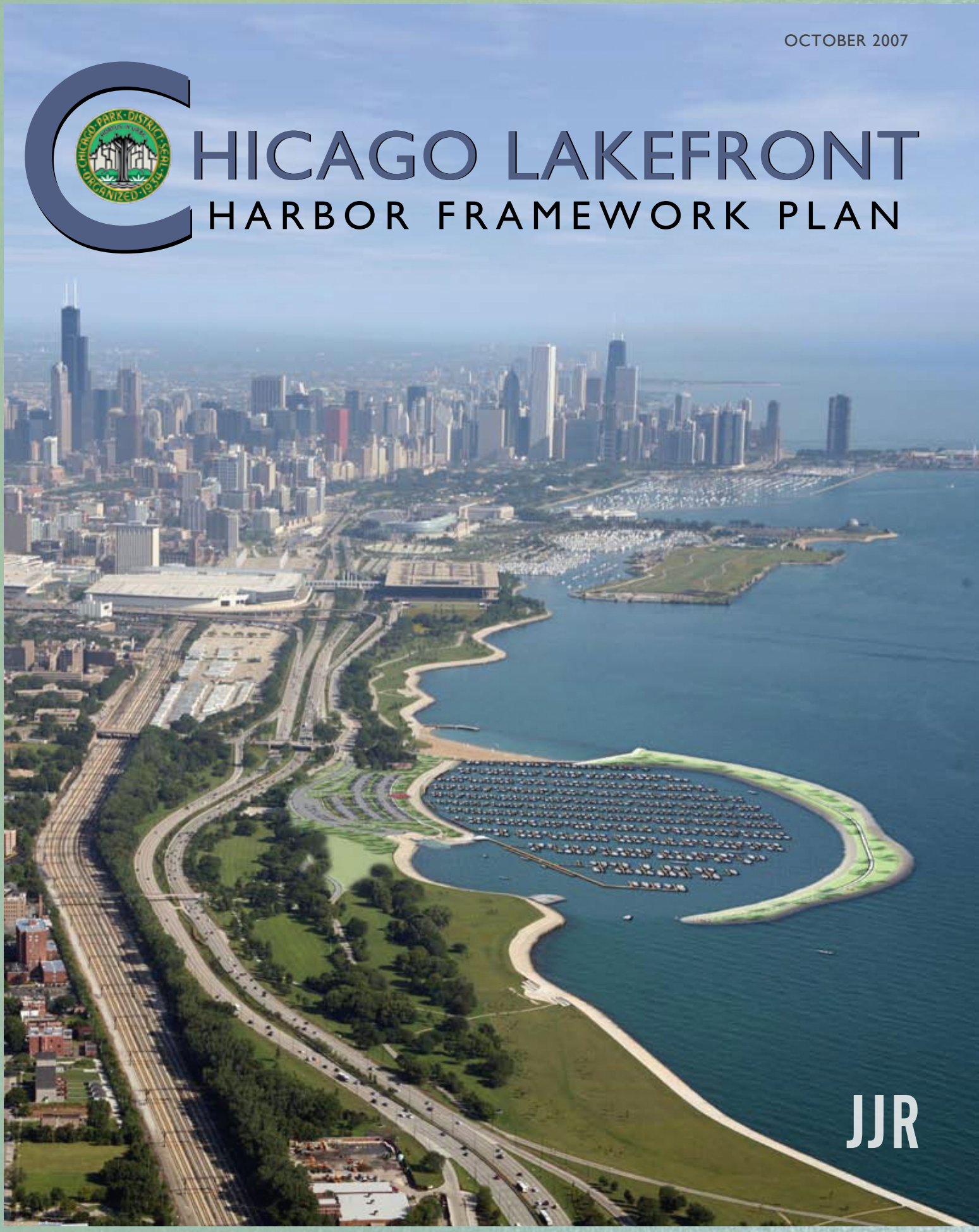
OCTOBER 2007

CHICAGO LAKEFRONT
HARBOR FRAMEWORK PLAN



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CHICAGO LAKEFRONT HARBOR FRAMEWORK PLAN

A Flexible 20-Year Plan for the Chicago Park District Harbor System
October 2007

Richard M. Daley
Mayor

Chicago Park District Board of Commissioners

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Dr. Margaret T. Burroughs
M. Laird Koldyke
Reverend Daniel Matos-Real
Cindy Mitchell
Rouhy J. Shalabi

Timothy J. Mitchell, General Superintendent & CEO

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1.1 INTRODUCTION

BY TIMOTHY J. MITCHELL, GENERAL SUPERINTENDENT & CEO

The mission of the Chicago Park District is:

- To enhance the quality of life throughout Chicago by becoming the leading provider of recreational and leisure opportunities;
- To provide safe, inviting and beautifully maintained parks and facilities, and
- To create a customer-focused and responsive park system

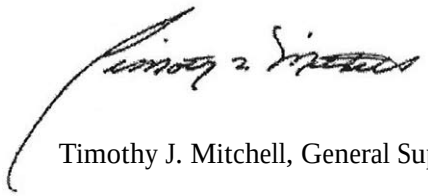
The Chicago Park District owns and operates the largest municipal harbor system in North America, consisting of 9 harbors with over 5,100 boat slips and moorings. These public harbors are vital to the character of Chicago's famous shoreline, attracting not only regional and international boaters, but also a larger public drawn to the beauty and activity of boats entering and leaving port. Harbors have appeared prominently in lakefront planning and development since the creation of Burnham and Bennett's plan of 1909. Today's harbor system, while not as extensive as originally envisioned by Chicago's founders, contributes significantly to our economy and our reputation as a world-class waterfront destination.

Chicago's harbors serve their host parks in several ways. They provide unique opportunities for persons of all ages and abilities to interact with Lake Michigan, with accessible promenades, great fishing, and sailing programs for children and adults. Like our beaches, ball fields, and nature areas, harbors are essential to the Park District's mission to provide a wide variety of recreational opportunities for everyone. In addition, harbors are an income producing asset, generating millions of dollars in annual revenue to the benefit of tax payers and their neighborhood parks.

The harbor system is now operating at capacity, with long waiting lists and demand rising. Given the desire for balanced growth of the system, the Chicago Park District retained a team of consultants led by JJR, LLC to assess the existing harbor system, conduct a market analysis, and create a 20-year harbor system framework plan through an inclusive public planning process. The team was instructed to take a holistic approach, focusing on the entire lakefront and considering several options for new harbor development. The resulting plan purposefully contains more concepts than are needed to satisfy projected demand, and serves as a valuable tool for discussion and prioritization.

A primary design criteria imposed by the Park District was that harbors should be self-funding, or in other words, produce enough income to pay for their construction and long-term operation. Most of the concepts in the framework plan appear to exceed this criteria. However, basic financial viability was not the only criteria and concepts with the potential to benefit developing areas have also been considered. Other design goals included beautification of host parks, increased public access and amenities, accessibility for persons of all levels of ability, increased safety, minimization of traffic and parking, creation of aquatic habitat, preserving water quality, and use of sustainable building practices. This broad range of goals, developed with community participation, has pointed to the collective benefits of balanced harbor development.

The Park District would like to thank the planning team and the many citizens and civic organizations who devoted their time to working groups and public meetings. The resulting plan creates a flexible vision for the future of Chicago's public harbors.



Timothy J. Mitchell, General Superintendent & CEO

The History of Chicago's Harbors

Nine harbors comprise the Chicago Harbor System. From south to north, they are: Jackson Park Outer Harbor, Jackson Park Inner Harbor, 59th Street Harbor, Burnham Harbor, Monroe Harbor, DuSable Harbor, Diversey Harbor, Belmont Harbor, and Montrose Harbor. The harbors were developed over a century's time, spanning from the boat basins that would eventually become Monroe and Burnham Harbors deriving directly from Burnham and Bennett's "Plan of Chicago" to the opening of DuSable Harbor in 2000.

Three harbors – Diversey Harbor, 59th Street Harbor, and Jackson Park Inner Harbor – are located west of Lake Shore Drive, and boats entering or exiting them must pass underneath Lake Shore Drive overpass bridges, limiting them to motorboats, as sailboat masts cannot pass beneath these bridges. The other six harbors house a combination of motorboats and sailboats.

In 1995, after years of managing the Harbor System internally, the Chicago Park District privatized their management, and in 1996 prepared a comprehensive plan for the renovation and modernization of the Harbor System. Over the past decade, almost all of that plan has been implemented, including the conversion of many existing multiple-boat "star docks" and mooring cans into floating slips on piers, the addition of a variety of boater amenities, and the development of DuSable Harbor.

A 1920s photo of Jackson Park Inner and Outer Harbors

The current Chicago Harbor System


Montrose Harbor

History of Chicago Lakefront Planning

Over time, there have been numerous thoughtful plans developed for Chicago's Lakefront, including:

- Burnham & Bennett's "Plan of Chicago" – 1909
- The Lakefront Plan of Chicago – 1972
- Lake Michigan and Chicago Lakefront Protection Ordinance – 1973
- The Lincoln Park Framework Plan – 1995
- The Chicago Park District's "Harbor Improvement Plan" – 1996
- The Burnham Park Framework Plan – 1999
- The South Lakefront Framework Plan – 2000
- The Calumet Area Land Use Plan – 2001
- The Grant Park Framework Plan – 2002
- The Chicago Central Area Plan – 2002
- South Lakefront Access Study – 2003
- The Chicago Shoreline Project – ongoing

In addition to the plans listed, numerous community-based plans have been developed. In 1973, the City of Chicago passed into law the "Lake Michigan and Chicago Lakefront Protection Ordinance" commonly known as the Lakefront Protection Ordinance. This ordinance reinforces the "Plan of Chicago" goals of a continuous and publicly accessible lakefront, prohibits private development east of Lake Shore Drive, encourages a diversity of lake-oriented leisure time activities, and calls for a harmonious relationship between the lakefront and the adjacent community.

Many lakefront plans focus on developing and maintaining public access to the lake, and providing a variety of recreational amenities along the lakefront. A number of these plans, including the Burnham and Bennett plan of 1909, specifically focused on improving and potentially expanding the harbors within the Harbor System. This project is intended to create a Chicago Lakefront Harbor Framework Plan that addresses these goals in a balanced and forward-thinking manner.

A Word about Definitions

In every day conversation, the terms "harbor" and "marina" are often used interchangeably. For those people involved in the planning, development or operation of such waterfront facilities, the terms have somewhat different meanings.

The Chicago Harbor System is technically comprised of "small craft harbors" that are not necessarily full service marinas. A small craft harbor is defined as a basin in a body of water that provides protection from the elements (waves, wind, tides, ice, currents, etc.) for a variety of watercraft. These facilities typically provide recreational boat berthing (docks and moorings), launching and retrieval capabilities, basic boater supplies, auto parking lots, walkways, and associated land-based support facilities and services.

Beyond satisfying the basic requirements of small craft harbors, full service marinas strive to meet the needs of an increasingly sophisticated boating community to remain competitive in the market place. Marina patrons are typically boat owners who desire safe, comfortable and attractive facilities that support recreational boating, including stable and aesthetically pleasing boat berths with utility service, restrooms and showers, fueling and sanitary pump-out stations, food service and other amenities. The boating public is generally willing to pay for the convenience of an easily accessible and properly appointed "second home" atmosphere, above and beyond the mere provision a safe place to store their boat.

Because of the Harbors' locations within the cherished lakefront parks, maintaining the public's visual and physical access to the water's edge is an important design, development and operational objective for these harbors. Finding ways to both maintain public access to the lakefront and provide the facilities and amenities of modern harbors is an achievable goal.

As the Chicago Lakefront Harbor Framework Plan focuses significant attention on the lakefront parks that house the harbors themselves, this document will use the term "harbors" rather than "marinas" when referring to the waterside boat basins themselves as well as the landside environment in which the boat basins are located. This document uses one term for purposes of consistency, and it should be understood that this term refers both to the boat basins as well as their surrounding environments.

1.2 GUIDING PRINCIPLES

All significant planning efforts are based upon a set of fundamental principles that help establish the project's context and provide the values under which it is performed. These principles also help frame the civic discussion that underpins the planning effort itself. The Chicago Lakefront Harbor Framework Plan is no exception. It builds upon the legacy of Chicago lakefront planning, and incorporates the values and principles that have grown over time in the stewardship of Chicago's lakefront.

The following Guiding Principles are behind the Chicago Lakefront Harbor Framework Plan:

- Chicago's Lakefront is a primary civic amenity, and it should be protected and enhanced for all types of users;
- The Chicago Park District's mission of offering a diverse range of recreational opportunities includes providing and operating a set of lakefront harbors;
- Chicago's magnificent lakefront parks and the Chicago Harbor System are interconnected, and what affects one affects both;
- Boaters comprise an important stakeholder group who help bring activity, vitality and interest to the lakefront;
- Thoughtful planning and design can develop lakefront harbors that mutually benefit boaters and non-boaters; and
- Significant civic benefits can be derived by identifying appropriate opportunities for improving and expanding the Chicago Harbor System.

1.3 GOALS AND OBJECTIVES

One of the key outcomes of the public planning process was confirmation of the project's Guiding Principles and identification of consensus Goals and Objectives. These Goals and Objectives expand upon the project's Guiding Principles and provide a means to evaluate lakefront and harbor planning options.

The consensus Goals and Objectives include:

- **Maintain public universal accessibility to the entire lakefront.** The City and the Park District are committed to providing water's edge access over the entire length of the lakefront for all members of the community, and this plan should contribute to this commitment.

- **Develop the harbors as a string of destinations along the lakefront.** The harbors should be a series of active nodes along the lakefront that can serve as linkage points.

- **Provide adequate security along the lakefront for boaters and non-boaters.** A wide range of programmed and informal activity enhances one's sense of security. The Plan should further lakefront security while at the same time recognizing the specific security needs of boaters in the harbors.

- **Increase the transient-friendliness of the Chicago Harbor System.** Boaters within and outside of the Chicago Harbor System have pointed out the lack of transient mooring opportunities along the lakefront, and have urged the Plan to address this insufficiency.

- **Better link Chicago's harbors to other area amenities.** The harbors should be more effectively linked to other area amenities. The harbors should be envisioned as a series of concierge-type stations that can help link the lakefront to the adjacent communities.

- **More fully recognize the economic development potential of the harbors.** Viewing the harbors in broad economic development terms, the Plan should emphasize the positive fiscal impact that they can have on the adjacent communities and the city in general.

- **Accommodate the sustainable use of the lakefront by a diverse range of users.** The Plan should seek balance between the many types of lake users, including recreational boaters of all types and sizes, personal water craft users, commercial boating users, recreational anglers, and beach users.

- **Leverage existing lakefront infrastructure wherever possible.** To plan for the lakefront harbors in a cost effective and environmentally responsible manner, the Plan should utilize existing infrastructure such as landside parking areas and waterside shore protection structures.

- **Link to available transportation resources and the general community.** The Plan should envision transportation, access and parking issues for the harbors as one element of an overall lakefront transportation plan. The Plan should leverage all available opportunities to connect the harbors to the community.

Navy Pier serves as one of the City's premier waterfront destinations

Example of public access walkway at DuSable Harbor

- **Support transit, pedestrian and other non-vehicular modes of lakefront transportation.** Recognizing the benefits of enhancing transit, pedestrian and non-vehicular transportation modes along the lakefront, the Plan should support and encourage all strategies to augment the lakefront harbors without adding to its vehicular traffic load.

- **Improve basic lakefront amenity opportunities for all users.** All lakefront users – boaters and non-boaters alike – desire convenient access to well-maintained restroom, shelter and concession amenity facilities. The Plan should promote their development where appropriate.

- **Maximize the social and educational benefits by accommodating boating and other water-based leisure activities.** By providing opportunities for the general community and non-traditional boaters to experience boating and other recreational activities along the lake, the Plan can support and further such existing programs and efforts.

- **Improve water quality along the lakefront.** The Plan should identify appropriate opportunities or solutions to mitigate existing water quality issues in the harbors and along the lakefront where possible.

- **Promote environmental sustainability along the lakefront.** The harbors should be conceived as part of a "green corridor" along the lakefront, and a variety of environmentally friendly techniques and practices should be adopted to promote the overall sustainability of the harbors and their operations.

- **Develop new harbors that support themselves and/or add money to the Park District.** The Plan should identify and promote for development new harbor opportunities that appear likely to support themselves and have potential to contribute additional revenues to the Park District for use throughout the community. Consideration should also be given to those harbors that can enhance local economic conditions.

- **Support other lakefront plans by reference in the Chicago Lakefront Harbor Framework Plan.** As each plan exists within the context of other existing plans, this Plan should further other lakefront plans by general support and by specific reference of their goals, principles, and uncompleted initiatives.

- **Coordinate long-term harbor improvements with the potential 2016 Summer Olympic Games.** Towards the latter part of the Chicago Lakefront Harbor Framework Plan process, Chicago successfully bid for the right to be named the U. S. Applicant City for the 2016 Summer Olympic Games. In October, 2009, Chicago will learn whether it will, in fact, be chosen to host the Olympic Games. A number of potential lakefront and harbor enhancements are contemplated as part of the Olympic Games. It is important that Olympic lakefront enhancements continue to be carefully coordinated with the Plan.

A combined security gate and accessible ramp at DuSable Harbor

A cross-section of the diverse range of water-based activity and tourism supported by Chicago's municipal harbor system

Jackson Park Inner and Outer Harbors

Belmont Harbor

Excursion boats docking at Navy Pier
(with dilapidated Dime Pier in foreground)

1.4 EXISTING HARBOR SYSTEM

Nine harbors comprise the Chicago Harbor System (see map on page 3). From south to north, they are: Jackson Park Outer Harbor, Jackson Park Inner Harbor, 59th Street Harbor, Burnham Harbor, Monroe Harbor, DuSable Harbor, Diversey Harbor, Belmont Harbor, and Montrose Harbor. The harbors were developed over time, from the boat basins that became Monroe and Burnham Harbors deriving directly from Burnham and Bennett's 1909 "Plan of Chicago" to the opening of DuSable Harbor in 2000.

The harbors do not all share a single design. For instance, three harbors – Diversey Harbor, 59th Street Harbor, and Jackson Park Inner Harbor – are located west of Lake Shore Drive, and boats entering or exiting them must pass underneath Lake Shore Drive overpass bridges, limiting them to motorboats, as sailboat masts cannot pass beneath these bridges. The other six harbors house a combination of motorboats and sailboats. Monroe Harbor and DuSable Harbor were built out into the lake off of the shoreline edge with constructed breakwaters providing protection from wave action. The other seven harbors are all substantially enwrapped by constructed landforms. Even among the seven enwrapped harbors, there are differences. Burnham Harbor is enwrapped to the east by Northerly Island, which was an island until it was connected to the mainland in 1938, resulting in the creation of the boat basin that became Burnham Harbor.

There is one additional small harbor along the lakefront. The Calumet Yacht Club was privately developed and owned on property that only recently came under Chicago Park District ownership. This small harbor is not officially part of the Chicago Harbor System, and its operation and management is not included under the harbor management contract. Its capacity is quite limited, and its shore protection structures and facilities were not designed to Chicago Park District standards. For purposes of the Chicago Lakefront Harbor Framework Plan project, the Calumet Yacht Club was assessed more on the potential of its location than on the nature of its current infrastructure, and its capacity has not been included in the calculation of the total capacity of the Chicago Harbor System.

Burnham Harbor

DuSable Harbor

Lake Michigan Technical Considerations

A number of considerations provide the technical underpinning for harbor design, engineering and construction, regardless of the specific location or body of water for which planning harbors or shore protection structures. The specific technical conditions affecting the Chicago Lakefront Harbor Framework Plan are discussed briefly below.

Water Levels/Fluctuation

Lake Michigan water levels have fluctuated continuously since the Great Lakes were formed at the end of the Ice Age. Monthly average lake levels have been recorded since 1918, and typically are stated in feet above sea level. The lowest recorded monthly average lake level was 576.05 feet in March, 1964. The highest recorded monthly average lake level was 582.35 feet in October, 1986. This equals a recorded fluctuation of 6.30 feet.

For general discussion purposes, one could state that the "average" Lake Michigan water level historically is approximately around the mid-point between the lowest and highest recorded monthly average lake levels, or in the 579+ foot range. At the present time, Lake Michigan is approximately one foot below its average water level, at approximately 578.5 feet.

Water Depths

The "bathymetry" or water depth to the bottom of Lake Michigan is fairly consistent along the Chicago shoreline, and slopes gradually further offshore. The actual water depths along the shoreline vary depending upon the extent of fill material used over the last century to create much of the current shoreline. From a harbor planning perspective, costs increase as a function of the depth of the water in which a harbor is built.

Shoreline Protection Structures

Chicago's lakefront, including the harbor system, Lake Shore Drive, and other infrastructure, is protected from high lake water levels and wave action by a hybrid system of shoreline protection structures. The function of these structures, which includes both shoreline edge and offshore breakwater structures, is to withstand and dissipate the incoming wave energy rather than allow it to cause shoreline or inland damage. Chicago's shoreline protection system is primarily a combination of different types of large confined stones, either capped with concrete or uncapped, and steel-edged concrete stepped structures.

Wave Climate

The primary factor affecting the design and cost of harbor and shoreline protection is wave action. The size, force and direction of waves is a function of lake levels, bathymetry (lake bottom shape and depth), prevailing wind direction, and the distance over open water that wind blows (fetch). Lake Michigan is typically characterized by a steadily rolling low level wave climate, with occasional stormy weather periods of higher choppy waves. Shoreline protection structures must be engineered to withstand these higher wave heights, which in the case of Chicago's lakeshore can range from 10 to 15 feet.

Water Quality

Water quality within a harbor basin is a concern for boaters, the marina operator, environmentalists, and regulatory agencies. The water quality within a given harbor is related to a combination of considerations, including hydrological factors, discharges into the harbor, and user impacts. Harbors throughout the world are working to improve operational, technical and other practices to address water quality challenges.

This existing offshore structure is designed to minimize the littoral transport of beach sand into the entrance to Jackson Park Harbor

Littoral Transport

Wave action is the predominant cause of most shoreline erosion, and the resulting sediment transport and deposition of littoral materials. This general movement of sediment, also known as littoral transport, is an important consideration in the planning of harbors, and harbor entrances in particular. In any given location, the volume of littoral transport and its mitigation by shore protection structures will dictate the frequency and amount of dredging that could be required to maintain harbor access.

Winter and Ice Conditions

Winter and ice conditions often pose significant challenges to harbor infrastructure that is left in place over the winter. Wind, waves, swell and seiche action can move ice, both horizontally and vertically, which in turn can cause a great deal of damage during the winter months. There are a number of emergent technologies being employed elsewhere on the Great Lakes to mitigate the damaging effects of winter and ice.

Ice damage to dockage at Burnham Harbor

Navy Pier

Planning and Design Guidelines

In their work on the Chicago Lakefront Harbor Framework Plan, the planning team utilized several of the most widely-used published guidelines for harbor and marina planning, design and development that provide "industry standards" for such technical elements as boat slips, dockage, fairway, and entry channel dimensions and design. The planning team also referenced the general standard ratios that help determine the number of restrooms, showers, laundry facilities, and pump-outs for new harbors depending upon their size.

Parking, access and drop-off standards are somewhat more difficult to prescribe. Harbors in dense urban areas with existing transportation infrastructure have different requirements and opportunities than do harbors in more remote locations. A range of ratios of parking stalls per boat slip from 0.5 to 1.0 parking stalls per slip is typically cited. Harbors in urban locations with nearby parking, public transportation and taxi service generally provide less parking than do harbors in remote locations.

Universal accessibility at all harbor facilities is a goal of the Chicago Park District for the Chicago Harbor System, and the planning team respected that goal in its work.

1.5 ECONOMIC IMPACTS OF CHICAGO'S HARBORS

As a component of the Chicago Lakefront Harbor Framework Plan, Applied Real Estate Analysis (AREA) and the project team studied the existing and potential contributions of the Chicago Harbor system to the local economy. Putting the harbors into their fiscal context helps to frame discussions of potential future system expansion. As the analysis shows, the full economic impact of the harbor system extends far beyond the boating community.

Direct Craft-Related Expenditures

Of the more than $24 billion in direct expenditures by visitors to Illinois, almost two-thirds is spent in Cook County. The overall economic impact of the lakefront parks and harbors is essentially incalculable, but we can estimate at least a portion of the economic impact that the harbors have on Chicago's economy. The Recreation Marine Research Center (RMRC) at Michigan State University conducted a survey of more than 6,000 boaters nationwide in 2004 and followed it in 2005 with a national survey of more than 12,500 boaters. Using figures derived from these surveys and combined with estimated slip revenues in Chicago harbors, RMRC developed estimates of the average annual expenditures of Chicago boaters on year-around storage, maintenance, fuel, and supplies.

In 2005, RMRC estimated that Chicago had 4,647 boats at slips and moorings in its harbors. There are at least 300 persons on a waiting list for space. The waiting list includes requests for specific harbors in addition to persons willing to accept space in any harbor. In addition, almost all of the waiting list is for slips and only a small percentage of persons on the waiting list are willing to accept a mooring. However, moorings constitute 24% of the docking potential in Chicago's Harbors. Discussions with harbor management, confirmed by casual observation, indicated that the district's slips and star docks were more than 99% occupied. However, almost a third of the moorings may have been vacant. Most of the vacant moorings were in the south end of Monroe Harbor and in Jackson Harbor, where wave action makes these moorings less desirable.

Even allowing for the vacancy in moorings, the estimated occupancy rate may be low. The following report is based on RMRC's analysis, with adjustments made to reflect the higher rate of occupancy cited by harbor management. This analysis is based on 4,986 boats, or an occupancy just shy of 98%.

It is estimated that the boats in the Chicago Harbors are each operated an average of 41 days each year. The owners of these boats spend about $69 million annually on their craft. This includes $13.6 million for seasonal and non-seasonal storage, $7.1 million for fuel, $10.7 million on repairs and servicing, and $8.9 million on accessories. Other expense categories included boat payments, taxes, insurance, new outboard motors, and new trailers. Average annual spending varies by the size and type of boat. In general, power boat owners spend more per boat than owners of sail boats and larger boats cost more to store and operate than small boats.

Monroe Harbor

Entrance to 59th Street Harbor

The average amount spent on storing and operating boats each year also varies by the type of berth the boat occupies in a Chicago harbor. As indicated in the discussion of vacancy in the system, there is less demand for moorings and the rates charged are considerably lower. Thus, the amount spent for seasonal storage is lower. Estimates of annual average spending by boat type and size are shown in Table 1.

Table I
Total Average Annual Expenditures All Boats in Chicago Harbors

Sail Boats	Number of Boats	Average Spending per Boat	Total Craft Expenditures
16 to 24 feet	92	$2,276	$210,469
25 to 39 feet	771	$6,893	$5,313,351
40 feet and larger	450	$18,927	$8,516,716
Power Boats			
16 to 24 feet	259	$3,957	$1,024,708
25 to 39 feet	2,033	$10,396	$21,132,799
40 feet and larger	1,381	$24,048	$33,212,615
Totals	4,986		$69,410,657

Sources: Recreation Marine Research Center, Applied Real Estate Analysis, Inc.

Of the $69 million spent by boat owners in Chicago harbors, approximately 45% is spent on trips. Not all of this is spent in the Chicago area; a portion of it is spent in other harbors around Lake Michigan. This includes money spent on restaurants, hotels, entertainment and retail goods. There is not yet enough data to accurately measure what portion of the trip spending remains in the Chicago area but RMRC is conducting a survey of Great Lakes boaters this year that should enable more accurate estimating of this amount. Because these figures will not be available for several months, the team has estimated that about 20% of trip expenditures are made outside of Chicago. Whatever the final percentage proves to be, there is likely a very real opportunity to capture more transient boater expenditures by providing transient slips.

The Museum Campus, with Burnham Harbor to the left and Monroe Harbor to the right

Job and Dollar Impacts of Chicago Harbors

As shown in Table 2, the direct and indirect sales impact of craft-related spending from the boats in Chicago's harbors amounts to approximately $87.8 million each year and generates more than 900 jobs. The total economic impact, or Value Added, to the local economy is approximately $49 million. This is the net value added to the economy after the cost of producing the goods and services is subtracted.

Table 2
Direct and Indirect Economic Impacts of Annual Craft-Related Spending for Boats in Chicago Harbors

	Sales ($000s)	Jobs	Value Added ($000s)
Total Direct Effects	$53,789	603	$32,673
Indirect (secondary) effects	$34,026	299	$16,299
Multiplier	1.6	1.5	1.5
Total Effects	$87,815	902	$48,972

Sources: Recreation Marine Research Center, Applied Real Estate Analysis, Inc.

The direct impact of the spending by boat owners creates about 603 jobs. However, impact of the harbors is larger. The direct expenditures circulate through the economy and generate additional jobs. For example, the workers in Chicago's harbors spend their pay checks on housing, clothes and groceries at local stores. These expenditures support additional jobs and those employees also spend their paychecks locally. This "multiplier" effect can be calculated for different categories of economic activity through input-out analysis. When the multipliers for the Chicago region are applied to the expenditures generated by boats in Chicago's harbors, they generate an additional 299 indirect jobs.

The jobs created by the spending of boat owners creates jobs in the marine industry; management and maintenance of the harbors, boat repairs, fuel and marine equipment and accessories. The indirect jobs are in retail trade, restaurants, and entertainment.

Economic Impacts of Transient Boaters in Chicago Harbors

One of the major complaints among boaters in Chicago is that there are essentially no transient slips. Local boaters, especially boaters from the more distant harbors such as Montrose, Belmont and Jackson Park, would like to be able to dock downtown, have dinner and visit downtown attractions. This would keep more of the trip-related expenditures in the Chicago area. Even more important, however, for the local economy, is the need for transient slips to accommodate boaters from other Lake Michigan harbors. Estimating the potential impacts of transient slips on Chicago's economy is extremely difficult because without available slips, boaters from other harbors do not make trips to Chicago and certainly do not make extended stays in Chicago. Thus, one must make numerous assumptions to estimate what the impacts might be if slips were readily available.

Table 3 shows the impacts of 300 new slips in Chicago's Downtown Area at an occupancy rate of 50% for a five month season. The estimate allows for low occupancy of 15% to 25% during the first and last months of the season but assumes 75% to 80% occupancy during the peak months of the season. Total expenditure estimates include expenditures for slip revenues and an average of $95 per day per occupied slip for other expenditures. This number assumes that boating visitors will have spending patterns for food, entertainment, and shopping that reflect the general tourist population. Since a boater, on average, may be more affluent than the average tourist, this may be a conservative estimate. Because tourist expenditures cycle through the local economy differently from boat-related expenditures, the multipliers are different.

The team conservatively estimates that 300 downtown transient slips could create at least 85 new jobs and add more than $3 million in economic value to Chicago's economy. This is a conservative estimate because the team believes that actual spending by visiting boaters would be higher and, with cooperative weather, the occupancy rate for the slips could be higher than 50%.

Table 4 on the opposite page presents a very simplified estimate of the potential economic impacts from a new 830-slip harbor at 31st Street. Without knowing the mix of sail and power boats that would be docked in the harbor, the team used a combined average expenditure per boat rate based on the current estimated mix of boats in Chicago harbors. The team thus estimates that a new, 830-slip harbor would create approximately 150 jobs and add more than $8.1 million in value to the local economy.

Table 3
Estimated Economic Impacts of 300 New Transient Slips Downtown

	Sales ($000s)	Jobs	Value Added ($000s)
Total Direct Effects	$4,165	61	$2,389
Indirect (secondary) effects	$2,916	24	$716
Multiplier	1.7	1.4	1.3
Total Effects	$7,081	85	$3,016

Sources: Applied Real Estate Analysis, Inc., Recreation Marine Research Center

Conclusions

The analysis indicates that although Chicago effectively has only a five to six month boating season, Chicago's harbors have a significant impact on the local economy. The estimated impacts include more than 900 jobs and approximately $49 million in economic value added to the economy. The addition of new harbors to the system would add to this impact. The team estimates that at least one new job would be created by every six new slips added to the system. Assuming that the mix of new slips would include a higher percentage of larger boats that the current mix, the impact could be one new job for every five new slips. Each new slip would also add at least $9,800 in new economic activity. Estimates show that the impact from slips reserved for transient boaters could be even greater: one new job for every four slips and more than $10,000 in new economic value added.

Montrose Harbor

An important aspect of this analysis of economic impact is that the harbors currently pay for themselves and provide additional revenues for the Park District to use in developing and maintaining neighborhood parks throughout the city. In addition, many of the new harbors evaluated in this study would also pay for themselves. Thus the economic impacts of new harbors can be generated either without public funds, or with only minor public expenditure.

DuSable Harbor

However, the total economic impact of Chicago's Harbors is essentially incalculable. The harbors reinforce the development of land side activities and are an integral part of the city's ambiance that attracts millions of visitors each year. As an example, looking to the future, a new harbor at 87th Street could reinforce and benefit from the creation of a new neighborhood on the former site of U.S. Steel's Southworks.

Table 4
Estimated Economic Impacts of a Proposed 830-Slip Harbor at 31st Street

	Sales ($000s)	Jobs	Value Added ($000s)
Total Direct Effects	$8,954	100	$5,439
Indirect (secondary) effects	$5,664	50	$2,713
Total Effects	$14,618	150	$8,152

Sources: Applied Real Estate Analysis, Inc., Recreation Marine Research Center

1.6 MARKET DEMAND ANALYSIS

To determine the degree of potential additional demand for boat berthing space within the Chicago Harbor system, the project team performed a market demand analysis.

Market Trends

A review of national and regional boating industry trends and statistics indicated that boating continues to be a growing pastime, with national participation growing by almost 47% over a recent ten-year period. Boat registrations totaled nearly 12.8 million in 2003, with the Great Lakes region contributing the largest amount, or 3.4 million boats. The demand for boats and boating related products has been forecasted to grow by more than 6% annually.

Recent boat purchasing trends indicate a move towards larger and more powerful boats, with boats in the 26 to 40 foot range and the 40 foot and over range showing the highest sales figure increases.

Demand Analysis

The Chicago harbor system is one of the largest municipally-owned system in North America with space for approximately 5,100 boats. Currently and historically, the system has a waiting list of boat owners wishing to get into the system, and a transfer list of boat owners already in the system who wish to relocate to a different size or type of anchorage, or to a different harbor.

Over 80% of the boaters who currently lease or in the recent past have leased space in the Chicago harbor system reside in Cook County. About 10% reside in DuPage County, with the bulk of the rest split between Lake, Will and Kane Counties. It is notable that during the 1990s, when the supply of Chicago boat slips remained level while the supply in Lake County and in Wisconsin and Indiana grew, these percentages remained constant. The fact that many of the boaters leasing space in harbors in these other areas reside in metropolitan Chicago leads many to believe that a significant number of them might prefer a slip within the Chicago harbor system were one made available.

The analysis identified several market components that are likely to contribute to the overall demand for additional boat slips within the Chicago harbor system. They include national trends such as the increases in boat ownership among non-traditional boat owner groups such as African-Americans, Hispanics, Asians, and women, regional factors such as potential demand among boaters who currently dock in newer Wisconsin and Indiana harbors, and local considerations such as the burgeoning downtown family and empty-nester residential population, and the recent explosive growth of market-rate developments in several south lakefront neighborhoods.

Market Demand Analysis - Key Points

- There is demand for over 1,000 new boat slips over the next 10 years
- There is demand for over 2,500 new boat slips over the next 20 years
- There is a strong demand for transient boat slips downtown
- Future slip demand will be strong for boats 40 feet and larger

The possibility of Chicago hosting the 2016 Summer Olympic Games would very likely have a positive effect on the demand for new boat slips along the lakefront. This demand analysis, however, does not presume a 2016 Chicago Summer Olympic Games.

Demand Projection

Factoring together the different components of likely future demand, in addition to the existing demand as represented by the waiting and transfer lists, The team estimated potential demand for up to 2,500 new boat slips – or an additional 50% above and beyond the current system-wide capacity of approximately 5,100 boats -- over the next twenty years. This demand would likely absorb well over 1,000 new slips over the coming decade, were those new slips able to be provided within that timeframe, with the rest able to be absorbed in the following decade.

Reflecting recent leasing trends, the team recommended that all future boat space added to the Chicago harbor system be in the form of slips, rather than moorings or star docks. Also, specific new harbor slip layouts should reflect the trends towards larger boat sizes.

Demand will likely vary for different potential new harbor locations. The strong demand for downtown and central lakefront boat slips will likely continue. Ease of access and recent improvements to the South Lakefront are likely to help stimulate demand for potential new harbor opportunities. Detailed absorption scenarios should be

Belmont Harbor

Montrose Harbor

investigated for each proposed new harbor, recognizing the possibility of phased implementation of certain harbors, particularly larger ones in locations further from downtown.

1.7 FINANCING "HARBORS IN PARKS"

The Chicago Park District is not unlike most private sector businesses in that it has both an Operating Budget that covers the costs and revenues of running its everyday business, and a Capital Development Budget that provides for the construction of new facilities and the renovation of existing ones. The primary business of the Chicago Park District is that of building, maintaining and operating parks and many of the programs that run within the parks. Even though the Chicago Harbor System is the largest municipal system in North America, it is a relatively small component within the overall Park District operation and budget.

Within the Park District's Operating Budget, the harbor system is isolated as its own cost and revenue center. This makes it relatively easy to track the harbor system's financial performance, and determine whether or not harbor system revenues cover harbor system costs. In recent years, the operation of the harbor system has been profitable, not only covering the costs of improvements and operations, but also contributing a significant sum of money into Park District coffers from which the rest of its citywide facilities are operated and maintained. This positive revenue scenario has become a requirement for the harbor system, and will continue to be so in the future.

Items identified within the Park District's Capital Development Budget are typically financed through the sale proceeds from General Obligation bonds. The harbor system plays a slightly different role than do most of the components that are funded by the Capital Development Budget, however. Harbors have an easily identified and recoverable income stream.

Therefore it is possible to isolate costs and develop boat slip and other revenue pricing so that the harbors can meet established cost recovery criteria. While the cost of offshore wave protection structures, docks, and other infrastructure basic to new harbors is substantial, the potential revenues from most new harbors are capable of covering the basic costs associated with the harbor's development.

New parks often get financed by grants and other financing mechanisms in place of or in addition to bond revenues. These grants often write down the costs of providing specific environmental, recreational or other features of new parks. This is the case whether or not these new parks are being developed in concert with new harbors. In cases where new "harbors in parks" are being developed in which the basic harbor infrastructure is being incorporated into significant new accessible public open spaces along the lakefront, the financing package should consist of a combination of elements. While it is often realistic to require harbor revenues to cover the basic costs of developing the new harbor, it is unreasonable to expect these revenues to also cover the costs of the community amenities that are not specific to the harbor. In such instances, it is reasonable to apply traditional park funding sources to these park elements.

1.8 THE PUBLIC PLANNING PROCESS

The Chicago Lakefront Harbor Framework Plan team was committed to an open community planning process. The many stakeholders and the general community had an open invitation to provide input throughout the project, and the project benefited from the many individuals and groups who participated.

There were four primary means of stakeholder and community input during the planning process:

- The Project Working Group
- Large Public Meetings
- Smaller Topical Stakeholder Meetings
- The Project Website

Working Group

Preparation of the Chicago Lakefront Harbor Framework Plan began in April of 2005. At the very beginning of the planning process, a Project Working Group was assembled to play three important functions:

- to help inform and guide the planning team in its work;
- to articulate the issues and priorities of key stakeholder and community groups; and
- to help provide a conduit of information both from the community into the planning process, and from the planning team back to the community

The small Working Group was carefully assembled to provide a balance of several key perspectives that were critical to developing a balanced plan:

- Boating interests
- Park Advisory Council
- General Community interests
- Environmental interests
- Civic interests

The Working Group met periodically throughout the planning project to review, challenge and advise the planning team specifically on the market demand analysis, technical and environmental issues, various potential new harbor location alternatives, and conceptual design development, and more generally on what their constituencies were saying about the planning process as it progressed.

Large Public Meetings

Early on in the planning process, several large open public meetings were convened. In order to facilitate community input all along the 24 miles of Chicago lakefront that comprise the project area, public meetings were held in central lakefront, south lakefront and north lakefront locations. In each instance, the meetings were held in accessible Chicago Park District facilities. These early public meetings served several primary functions: to introduce the project and the planning team; to gain initial input as to issues, opportunities or concerns; to share the conclusions of market demand analysis; and to vet preliminary new harbor location concept alternatives.

One project component was the identification of a limited number of potential new harbor opportunities for further conceptual design development. As the locations of any new harbors will be determined by a combination of adequate market demand, a technically and financially feasible opportunity, and community and stakeholder support, these public meetings were valuable to helping sort through the early planning concepts and potential new harbor locations. The public meetings generated much interest in the project, as evidenced by the attendance of approximately 400 people at one meeting.

Topical Stakeholder Meetings

At appropriate times throughout the planning process, small topic-specific stakeholder meetings were convened to focus on general issues of interest to specific groups such as boating, open space, fishing, or economic development business organizations. Similarly, a number of location-specific stakeholder meetings were convened to discuss issues or impacts related to specific potential new harbor location alternatives. In addition, there were several briefings of key leaders and public officials at appropriate times throughout the planning process in order to facilitate a good flow of information.

Project Website

In order to make the project even more accessible to the community, the Chicago Park District established an interactive project web page on its website that both served as a repository of evolving project information and plans, and facilitated direct e-mail correspondence with the project managers from both the Park District and the planning team. Presentations from the public meetings were placed on the web page and made easily downloadable.

What Themes Were Heard During the Public Process

Over the course of the public planning process, stakeholder comments began to form consistent themes that would receive balanced consideration in the planning team's work. The themes may be characterized as:

- The harbor system contributes significantly to the character of Chicago it's shoreline. Harbors should be designed to create a strong sense of place, appropriate to each location, and strengthen Chicago's reputation as a world-class waterfront destination.
- Provide a competitive level of services and amenities in attractive and secure harbor settings.
- Maximize general public access along harbor basins, at accessible piers, and everywhere along the lakefront.
- Harbors should be self-supporting, with new revenues covering the cost of harbor infrastructure and operation. Harbors that benefit the local economy should also be strongly considered.
- Plan for the entire park, not an individual marina. Supplemental funding sources should be considered where there are opportunities to create park land, public amenities, habitat enhancements, or other park improvements that maximize public benefit.
- Use planning that's already been completed. Build upon existing park framework plans and consider recommendations from neighborhood, civic, and environmental groups.
- Use infrastructure that's already in place. Where possible, take advantage of existing breakwaters, parking areas, and transportation routes to minimize development cost and impact on the environment.
- Build where demand exists, but also give priority to harbors that can serve as economic development engines for revitalization of nearby neighborhoods.
- Use best environmental practices and create harbors that contribute to Chicago's green reputation. Pay close attention to water quality, geophysical factors, and habitat. Design according to U.S. EPA recommendations for healthy marinas, consider lake bottom sediment dynamics, and pursue habitat restoration opportunities wherever possible.
- Consider creative financial partnerships, including public/private partnerships for new harbor development.

1.9 PHYSICAL PLANNING PROCESS

The physical harbor planning approach utilized by the consultant team forms the basis for the recommendations, associated costs, and financial projections outlined in this report. The planning team worked to balance the demands of boaters and non-boaters while providing a detailed technical analysis of each harbor site to guide the final design concepts.

Since every harbor has specific issues related to its development or refinement, each project received site specific evaluation to understand the physical environment and regulatory climate in addition to determining public needs and private demand for facilities. Once the constraints and opportunities were understood, alternative concept plans were developed and appropriate construction methodology and materials were explored.

Design solutions were informed by the consultant team's extensive work on recently completed and similar projects. This has provided a wealth of information on construction materials, cost saving methods for building coastal structures, and current bid prices.

The recommended Chicago harbor system improvements have been designed to provide a safe, secure environment for boaters and efficiently serve the harbor's operational requirements, while meeting the broader needs of the general community. The harbors have been designed to reflect an understanding of current market conditions, physical conditions at the sites, and each harbor's role in the context of long term plans for the lakefront.

Boater Benefits

The physical design process was based on the understanding that in order to maintain and enhance the image of the Chicago harbor facilities in the eyes of the boating community, the harbor must provide:

- Convenience and accessibility;
- Levels of service and amenities preferred by the boating community;
- Safety, security and privacy; and
- A park-like atmosphere (exceeding the standards of other competing regional marinas)

The improvements required to produce these boater benefits have been designed to maximize revenue potential and minimize installation and operating costs.

Technical Approach

The framework planning process has required a careful blending of engineering analyses and creative design ideas within the constraints of fiscal and regulatory realities. A number of general principles and structural design components were utilized to plan for optimal harbor development.

For example, breakwaters (or a new land mass) are typically required to provide the desired level of protection from wind and waves for boats entering and mooring in the harbor. The harbor needs be deep enough to provide safe anchorage, while minimizing the need for expensive harbor/shore protection structures and dredging/disposal. For the Chicago Harbors boat mix, this suggested that breakwaters ideally be placed at a water depth in the range of ten to fifteen feet and that the harbor depths be maintained at about a ten foot depth.

Any harbor improvements proposed at locations that are open to the full expanse of Lake Michigan are subject to much larger waves than those that reside within existing harbor protection structures. Generally speaking, the

proposed harbor site that requires the least amount of excavation, dredging, filling, breakwater construction, disturbance of sensitive environmental resources, and clean up of contamination will be the most cost effective site to develop as a harbor. Straying too far from these simple guidelines can cause development costs to sky rocket. These important considerations were at the forefront of the design team's efforts.

Careful attention to these physical design issues and impacts will not end with the framework planning phase. Prior to beginning the next stage of implementation, each site and project will require a more intensive level of physical investigation, analysis and modelling to ensure optimal and cost effective design solutions.

59th Street Harbor

Dockage Layout and Design

The design of a dockage system must address convenience to the boater and benefits to the harbor operator. Layout and system utilization must be properly addressed to maximize revenues and minimize annual maintenance costs of the harbor.

The design team has extensively researched slip layout design standards to safely provide for the greatest number of boats within a given protected water space. This space is expensive to create, making close coordination between revetment/breakwater configuration and dockage layout essential. Boater safety and maneuverability have also been given careful consideration in the design process.

Belmont Harbor

Harbor Infrastructure

Infrastructure for a harbor facility is very specialized. Although many of the elements involve standard civil engineering, their function is much different than most site development projects. The manner in which the infrastructure is designed can significantly affect the construction cost and will be important in determining the continued success of the Chicago Harbor System.

Entrance to Diversey Harbor

II. THE CHICAGO LAKEFRONT HARBOR FRAMEWORK PLAN

THE CHICAGO LAKEFRONT HARBOR FRAMEWORK PLAN

The Chicago Lakefront Harbor Framework Plan provides a flexible vision for growth of the Chicago Harbor System over the next two decades. Although focusing specifically on harbors, this plan was developed with the belief that public access to our lakefront should be preserved and expanded, and that harbors should be planned to integrate with and benefit their host parks and surrounding communities.

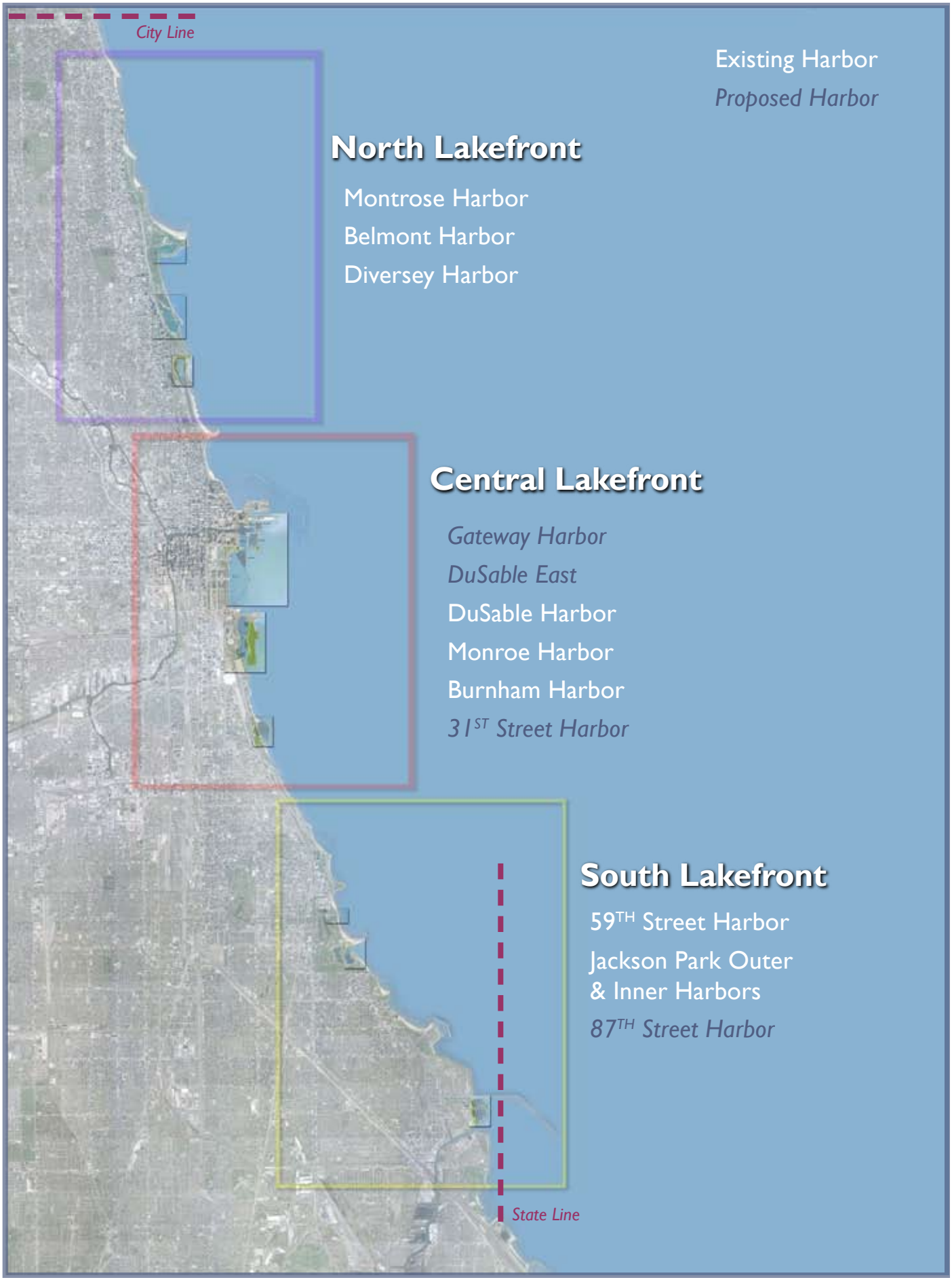
During the planning process, the planning team evaluated several locations along the lakefront for potential harbor development. These locations surfaced from historical plans, community input, and recommendations of the team. A variety of logistical, social, and financial considerations were assessed and discussed with numerous stakeholders. The Harbor Framework Plan presents concepts for some of the most compelling locations. The number of locations selected for concept development somewhat exceeds the overall growth target established by market analysis to provide flexibility, generate discussion, and serve as a tool for prioritization. As with all planning efforts, it is understood that future developments in Chicago and the region could diminish the feasibility of various concepts, or lead to possibilities not yet considered.

As stated earlier in this report, during the latter portion of the planning process, Chicago became the US Applicant City for the 2016 Summer Olympic Games, with the final decision due in October, 2009. The Chicago Park District and members of the JJR planning team have been very actively involved in the preliminary planning effort for the Olympic Games. They continue to work to ensure that the goals of this Plan and legacy components of the potential Olympic Games are internally consistent, and both contribute to an enhanced lakefront experience for all.

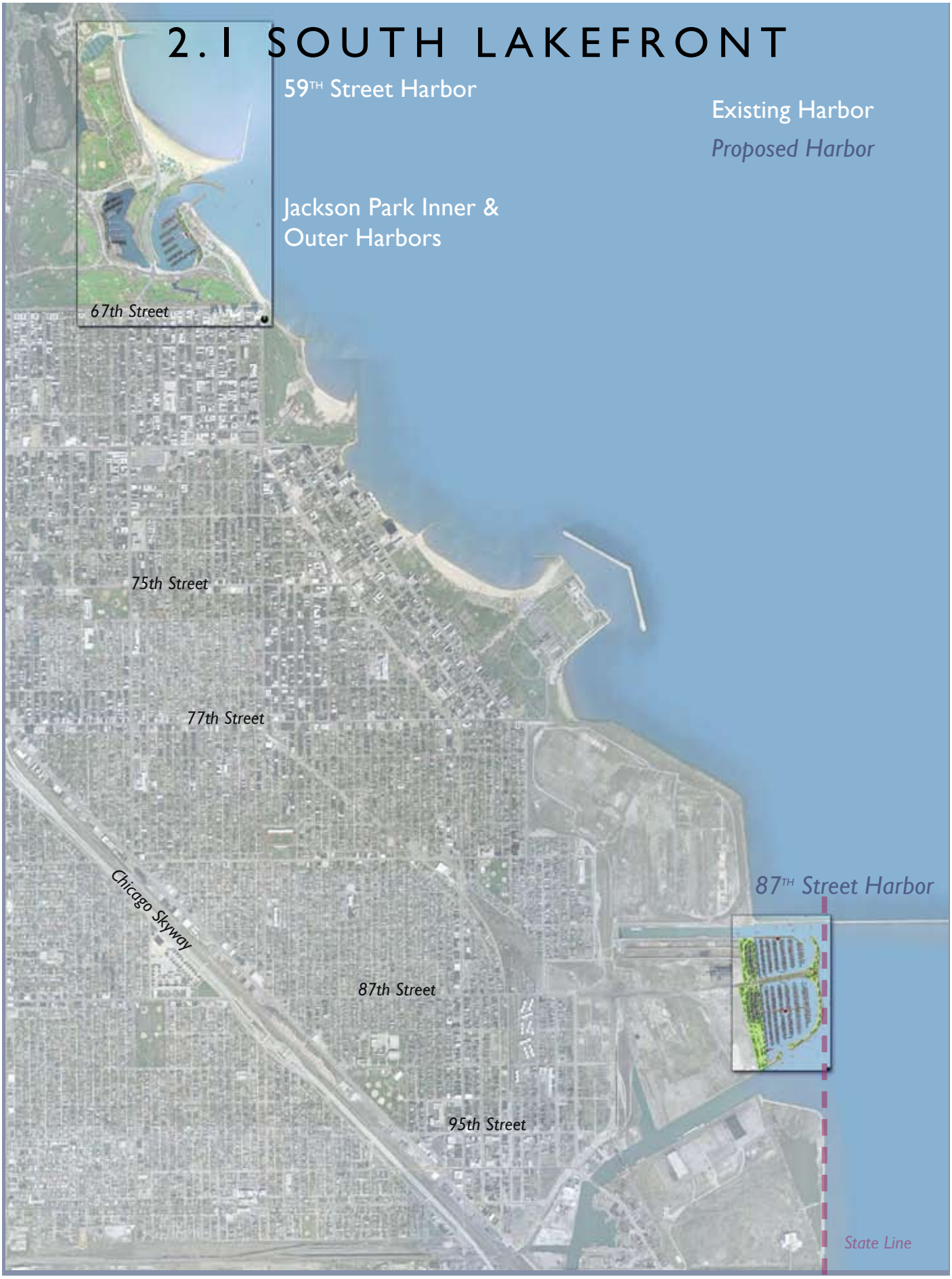
In general terms, the Plan has identified and developed preliminary concepts for two new harbors along the lakefront south of the downtown. One concept is located alongside the single largest lakefront open space and potential redevelopment site in all of Chicago: the former US Steel production facility on the Southeast Side. The other concept is located alongside an area that has seen much redevelopment activity in the recent decade: the Near South Side portion of Chicago's expanding downtown, at the southern edge of the Central Lakefront.

The Plan has also identified and developed alternatives for new harbors within the heart of downtown, where existing demand for new Central Lakefront boat slips continues to be strong. Located at Chicago's urban heart, each of these potential new harbors offers an exciting setting, a unique set of logistical considerations, and complex urban design challenges and opportunities. The Plan has clarified many of the issues involved in order to facilitate the process of evaluating and deciding between the alternatives for implementation.

Along the North Lakefront, there are different challenges inherent to identifying potential new harbor locations. Along the Near North and Mid-North Lakefront, with its density of development, the three existing harbors, and intensive public use of existing lakefront amenities, ideal settings for new harbors are not apparent. Along the Far North Lakefront, the issues involved in potential new harbor development are similar to many of the needs expressed within the community, including the shortage of open space, the lack of access to and connectivity along the lakefront, and traffic concerns. While there may be feasible locations for harbor development on the Far North Lakefront, any development of potential new harbor opportunities is better considered as a part of a comprehensive plan that addresses these larger scale issues.


City Line
Existing Harbor
Proposed Harbor
North Lakefront
Montrose Harbor
Belmont Harbor
Diversey Harbor
Central Lakefront
Gateway Harbor
DuSable East
DuSable Harbor
Monroe Harbor
Burnham Harbor
31ST Street Harbor
South Lakefront
59TH Street Harbor
Jackson Park Outer & Inner Harbors
87TH Street Harbor
State Line

2.1 SOUTH LAKEFRONT



87TH STREET HARBOR — A NEW OPPORTUNITY

The project team has developed an exciting opportunity for a new harbor along the south lakefront, a harbor that could provide an economic generator for the long-anticipated rejuvenation of one of Chicago's largest and most significant redevelopment sites: the 573 acre former USX steel property. An 87th Street Harbor and potential nearby Marina Services Area could provide considerable energy to further fuel the area's renaissance.

The 87th Street Harbor – which could develop incrementally in pace with the growing demand for the first large new harbor in this area -- will eventually provide significant revenue that will benefit the community well beyond the harbor's boaters. Continuing the uniquely Chicago relationship between its lakefront harbors and the gracious parks that nestle them, this harbor could include a sizable, accessible landscaped breakwater connected to the land's edge via a formal boulevard.

The planning team explored two alternative scenarios for this new harbor. In addition to the full harbor scenario that would include the accessible landscaped breakwater, a reduced harbor scenario was explored that included an offshore breakwater structure that would protect a slightly reduced harbor basin without providing public access.

As redevelopment plans for the former USX site begin to be realized, they should be coordinated with those of the new harbor, in order to leverage the benefits of needed infrastructure improvements such as the Park District's new land at the water's edge, parking areas and pedestrian trails. The new harbor has been planned to accommodate the area's most current redevelopment plans.

Existing site of proposed 87th Street Harbor

Harbor Components

- Full build-out at approximately 1,016 new 30 to 60-foot boat slips
- A fuel dock easily accessed by resident and passing lake boaters
- Secure boater parking convenient to the harbor
- As redevelopment continues, a variety of harbor-edge amenities and attractions
- Convenient access to the nearby Metra station and parking lot

Community Benefits

- Over 3,000 feet of fully accessible and landscaped offshore breakwaters
- A formal landscaped boulevard taking visitors over 1,000 feet from the shoreline
- A fully accessible offshore public facility with unique and breathtaking views
- Provision of additional activities to help energize the new lakefront park
- Future potential location for water shuttles and water taxis

Implementation Considerations

- Harbor can be planned to facilitate incremental development over time.
- Harbor slip revenues appear likely to support much, but not all of the basic harbor development costs. Additional financing would probably be required.
- Additional funding sources would be needed for community amenity options, including an accessible and landscaped breakwater.
- Harbor parking area could be reduced through shared parking arrangements with neighboring developments.

87TH STREET HARBOR

Plan of proposed 87th Street Harbor

Overlay of proposed plan for 87th Street Harbor showing reduced harbor scenario

Proposed Infrastructure Improvements

The proposed harbor will provide two new protected boat berthing areas for over one thousand boats varying in length from 30 feet to 60 feet, along with a separate area for a fuel dock and boater service facility. The water depths located approximately 1,000 feet offshore drop off rather dramatically from 15 feet to 24 feet deep. Harbor protection will be provided by a new 3,000 foot long landfill area that runs parallel to the shoreline. Public access to this new parkland will be provided by a causeway that supports a new landscaped boulevard, complete with parking, walkways and appropriate landscape amenities. A quarry stone revetment was chosen from the shore protection alternatives that were considered because of its superior wave attenuation properties and relative cost advantages. The sloped sides of this type of coastal structure limit wave run-up and reflection; and it can be designed so that it has less height than a vertical steel or concrete stepped structure and therefore be less visually obtrusive.

It is recommended that quarry stone reinforcement also be placed along the north side of the existing east-west breakwater located north of this site as shown on the plan. In addition, a floating breakwater structure will probably be required to provide wave protection along the boundary of the north berthing area. Although this type of breakwater system is typically less effective at attenuating long period waves, it can handle shorter period and length wave conditions that might be expected to develop west of the proposed harbor entrance. The advantage of floating breakwaters is that they are very cost-effective in the relatively deep water conditions similar to those that exist at this location of the site. The south entrance will be defined by two bioengineered rubble mound structures.

Both boat berthing areas were laid out using accepted guidelines for small craft harbors. The main channel width has at least 100 feet of usable protected navigable water depth along the back of the proposed new landfills out to the harbor entrances. Secured access is provided to each headwalk from the floating breakwater in the north basin. The south basin provides a main floating walkway out to a new boater services building centrally located in the center of the new boat basin. Headwalks run in a north-south direction from this main walkway. These main access routes will be designed to accommodate motorized shuttles that will provide continuous access from parking areas to the slips. A double slip side-by-side layout arrangement is recommended to maximize the slip rental revenue capacity of the harbor.

A separate maneuvering basin is reserved for the fuel and boat service dock (including fuel, supplies, sanitary pump-out facilities, berthing for water shuttles and taxis, etc.) is located along the existing shoreline near the south harbor entrance.

The land based facilities have been designed to optimize the park and harbor experience for both boaters and non-boaters. The roadway system will provide access for those who visit the new parkland as well as those who permanently moor their boats in the harbor. Roadways have been laid out to serve each type of parking, taking into account safety, security and convenience concerns. Harbor parking needs should be coordinated with the overall USX site redevelopment plans. A publicly accessible facility would be located on the newly built park land and reached by the causeway. This building could provide restrooms, concessions and meeting facilities. Boater's needs would be provided by the facilities located on the walkways servicing the boat slips. These buildings could include secured restrooms and showers, a marina office and possibly a ship's store. The nearby area adjacent to the existing south slip could be developed to offer boat services, repair and winter storage. Additional study of the demand for such services would be necessary.

Aerial oblique illustration of proposed 87th Street Harbor

JACKSON PARK OUTER AND INNER HARBORS — A SIGNIFICANT REFINEMENT OPPORTUNITY

The project team has identified a circumstance where crafting a creative solution to a long-standing technical problem at Jackson Park Outer Harbor has led to an opportunity to improve and expand both Jackson Park Harbors. The current configuration of the harbor mouth has left Jackson Park Outer Harbor susceptible to several foot high waves rolling into the harbor and requiring periodic dredging of accumulated sand at the entrance channel.

In response to this technical challenge, the project team has designed a new harbor entrance comprised of a set of quarry stone breakwaters that will calm the waters within the harbor basin, allow for the expansion of its boat slip capacity, and create a much safer harbor entrance. In addition, the frequency of maintenance dredging should be reduced since the new entrance would be located in nine feet of water. Depths at the entrance are currently in the four to six foot range, causing problems for sailboats and deep draft power boats. These enhancements will also benefit Jackson Park Inner Harbor, and should generate additional demand for slip expansion there as well.

The goal of the proposed harbor refinements is to raise the level of attractiveness and visibility of the Jackson Park Harbors and the nearby recreational and cultural amenities, and transform them into the "center of gravity" of the South Lakefront. Better physical and institutional linkages should be established to connect the harbor and its visitors with area amenities. Few other harbors in the world offer access to such diverse activities as a round of golf, museums like the Museum of Science and Industry or the DuSable Museum, or a visit to Wright's Robie House or other University of Chicago attractions.

Existing Jackson Park Harbors

Harbor Components

- Approximately 369 new boat slips, giving an increased total of over 700 boats
- New offshore breakwaters
- A calm water harbor entry built adjacent to the existing Rainbow Beach pier
- Easy signalized access from South Lake Shore Drive at 67th Street
- Convenient dockside parking, with nearby additional secured parking

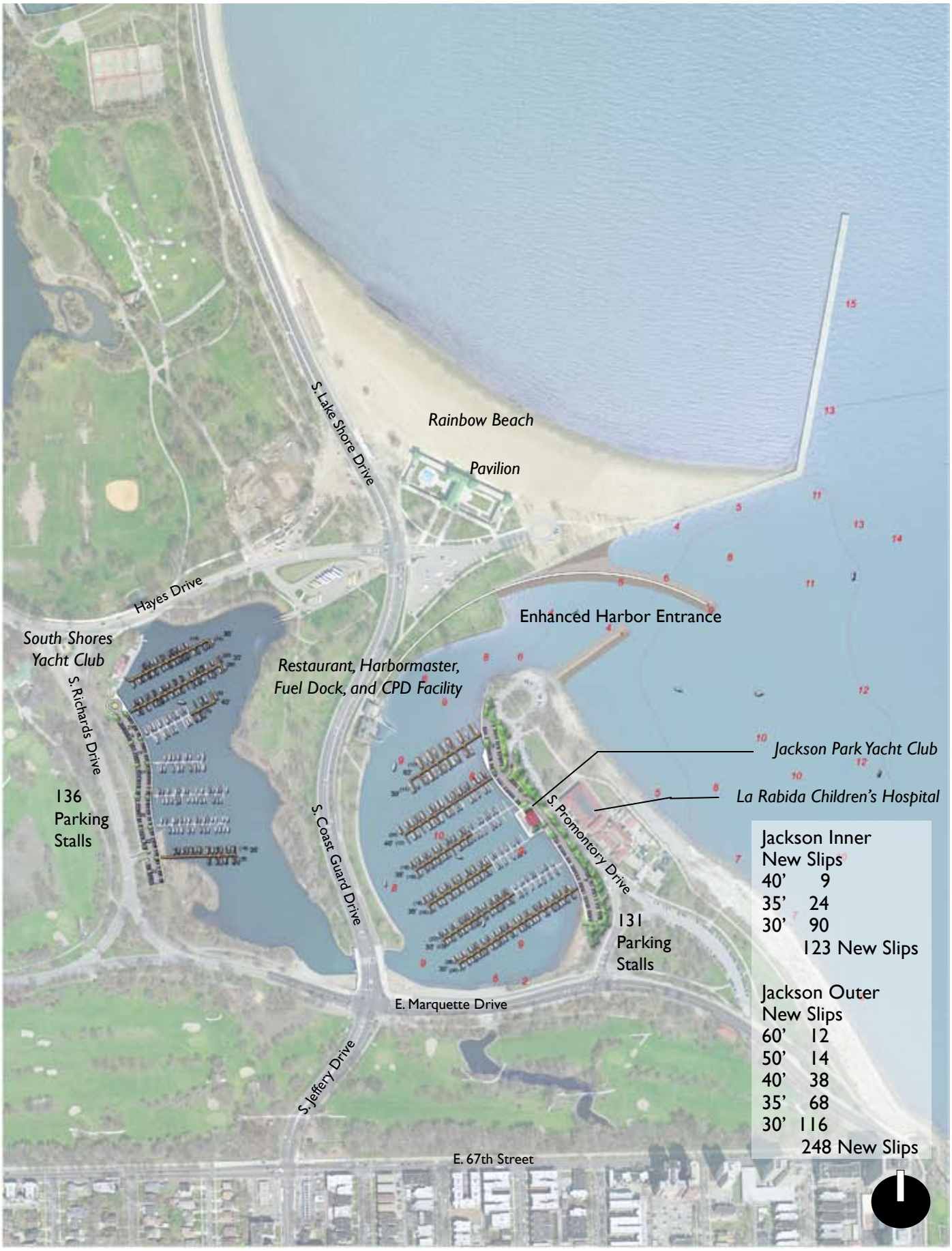
Community Benefits

- A new curving 900 foot-long fully accessible bioengineered breakwater
- Economic benefits accruing from linking the Harbors to other area amenities
- Maintaining the unique character of the Jackson Park Harbors

Implementation Considerations

- Harbor slip revenues appear likely to support the project development costs.
- Additional funding sources may be sought for the community amenity costs.
- Additional dockside parking will need to be provided to support the new slips. A comprehensive traffic, parking and access study should be undertaken to coordinate the needs of the harbor and La Rabida Children's Hospital.

JACKSON PARK HARBORS



Plan of proposed Jackson Park Harbors

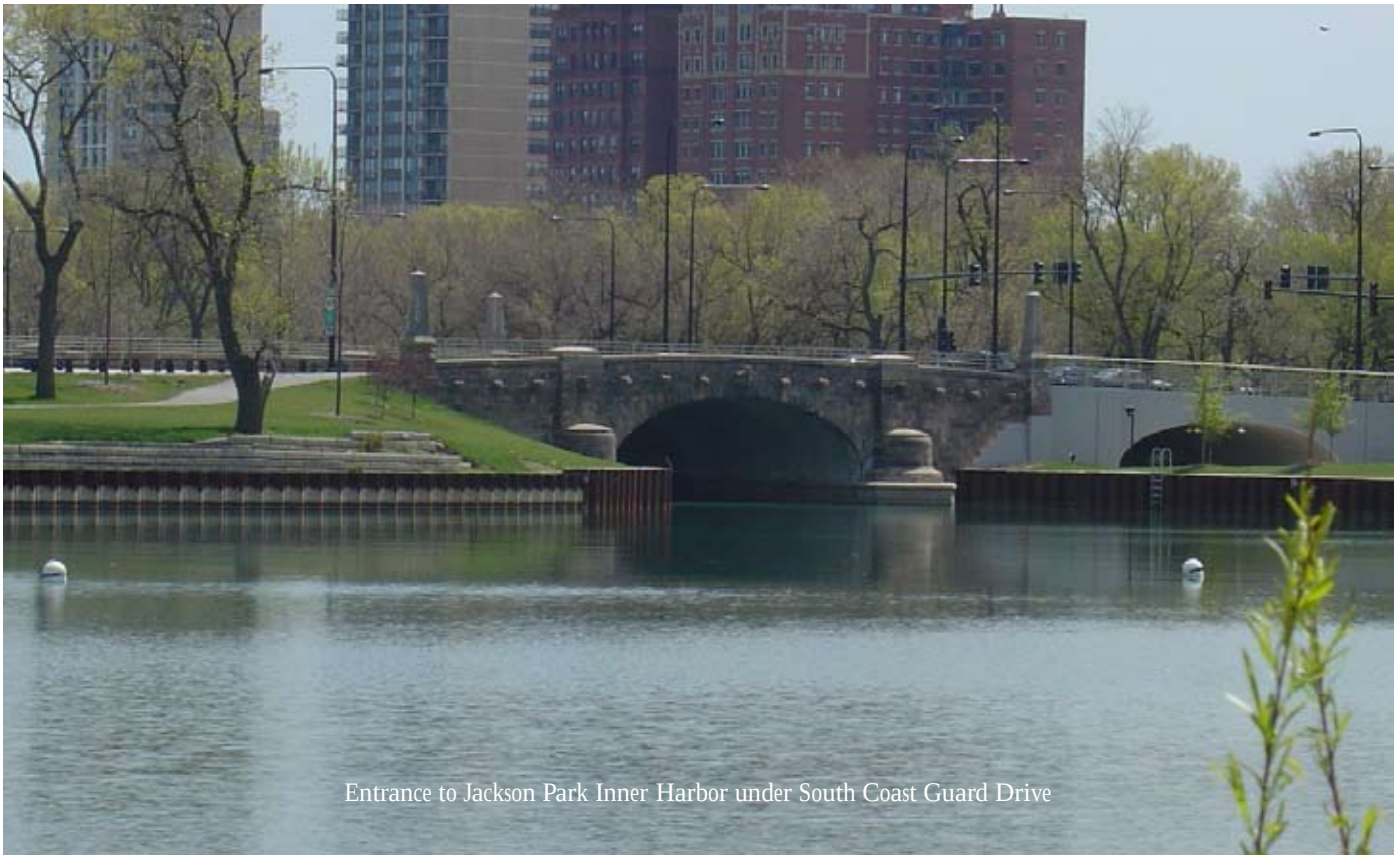
Proposed Infrastructure Improvements

The project team evaluated the performance of several alternative reconfigurations for the harbor entrance with respect to various storm wave conditions. A new rubble mound breakwater is recommended, extending the curvilinear line of a proposed concrete walkway along the north side of the harbor entrance out into the lake. This breakwater structure would transition into a quarry stone revetment lining the vertical bulkhead structure in an effort to control waves traveling along this wall and/or reflecting off this vertical surface back into the entrance. A long shore tied breakwater on the south side of the harbor entrance extending perpendicular to the existing shoreline provides protection for the harbor entrance from waves generated by winds from the southeast. This breakwater will also help maintain a relatively deep water channel from the berthing area to the lake. Although periodic dredging will be required to maintain the channel, this should be required on a much less frequent basis than today's situation.

The capacity of the protected boat berthing area in the outer harbor will be greatly increased because of the proposed harbor entrance improvements. The additional boat slips were laid out using accepted guidelines for small craft harbors. The main channel will be at least 100 feet wide and is located along the west end of the outer basin from the harbor entrance to the bridge and channel to the Jackson Park Inner Harbor. In general, the larger slips are located nearer the harbor entrance, and only power boats will be able to dock in the Inner Harbor. A double slip side-by-side boat layout arrangement is recommended to maximizing slip rental revenue vs. cost.

The harbor management team has made ongoing improvements to the bulkheads, sidewalks, fencing, lighting, landscaping, roadways and parking lots over the past ten years. Progress has been made with the harbor rehabilitation and maintenance program, but services and aesthetics still need improvement to bring this harbor up to the standards set by the newer harbors.

Harbor greening refinements that could be made include: naturalized edge treatments, bio-swales and buffer plantings, habitat creation opportunities, greenway connections, natural areas, native plantings, and sustainable parking lot design. For example, parking lots could be reconstructed with a landscaped bio-swale buffer strip between autos and the new pedestrian promenade along the water's edge.



Entrance to Jackson Park Inner Harbor under South Coast Guard Drive

Aerial oblique illustration of proposed refinements to the Jackson Park Harbors

59TH STREET HARBOR — REFINEMENTS TO EXISTING HARBOR

59th Street Harbor, located at the north end of Jackson Park, and nestled behind the Museum of Science and Industry, is the smallest of the Chicago harbors, and was originally a component of the Jackson Park lagoon system. As it is immediately west of South Lake Shore Drive and has vertical clearance restrictions under the roadway viaduct, it is limited to powerboats.

The harbor has been renovated over the past decade, retaining its small private marina feeling with its enclosure fencing and its 125 boat capacity. The harbor's limited amenity facilities are located in a converted utility building that also houses the Museum Shores Yacht Club.

Potential harbor refinements include: improving the Museum Shores Yacht Club and opening it up to use by boaters and non-boaters, and making security adjustments that will allow the removal of the enclosure fencing in order to improve the harbor's links with the nearby community amenities.

Better physical and institutional linkages should be established to connect the harbor and potential harbor visitors with area cultural, commercial and recreational amenities.

Harbor greening refinements that could be made include: naturalized edge treatments, bio-swales and buffer plantings, habitat creation opportunities, greenway connections, natural areas, native plantings, and a sustainable parking lot.

View of 59th Street Harbor with entrance under the South Lake Shore Drive roadway viaduct visible in the background

Potential Future Harbor Refinements

- Providing improved restroom and food service amenities in a multi-use facility
- Removing the enclosure fencing to enhance the linkages with the community

Community Benefits

- Providing improved restroom and food service amenities in a multi-use facility
- Better linkages between the harbor and other area amenities

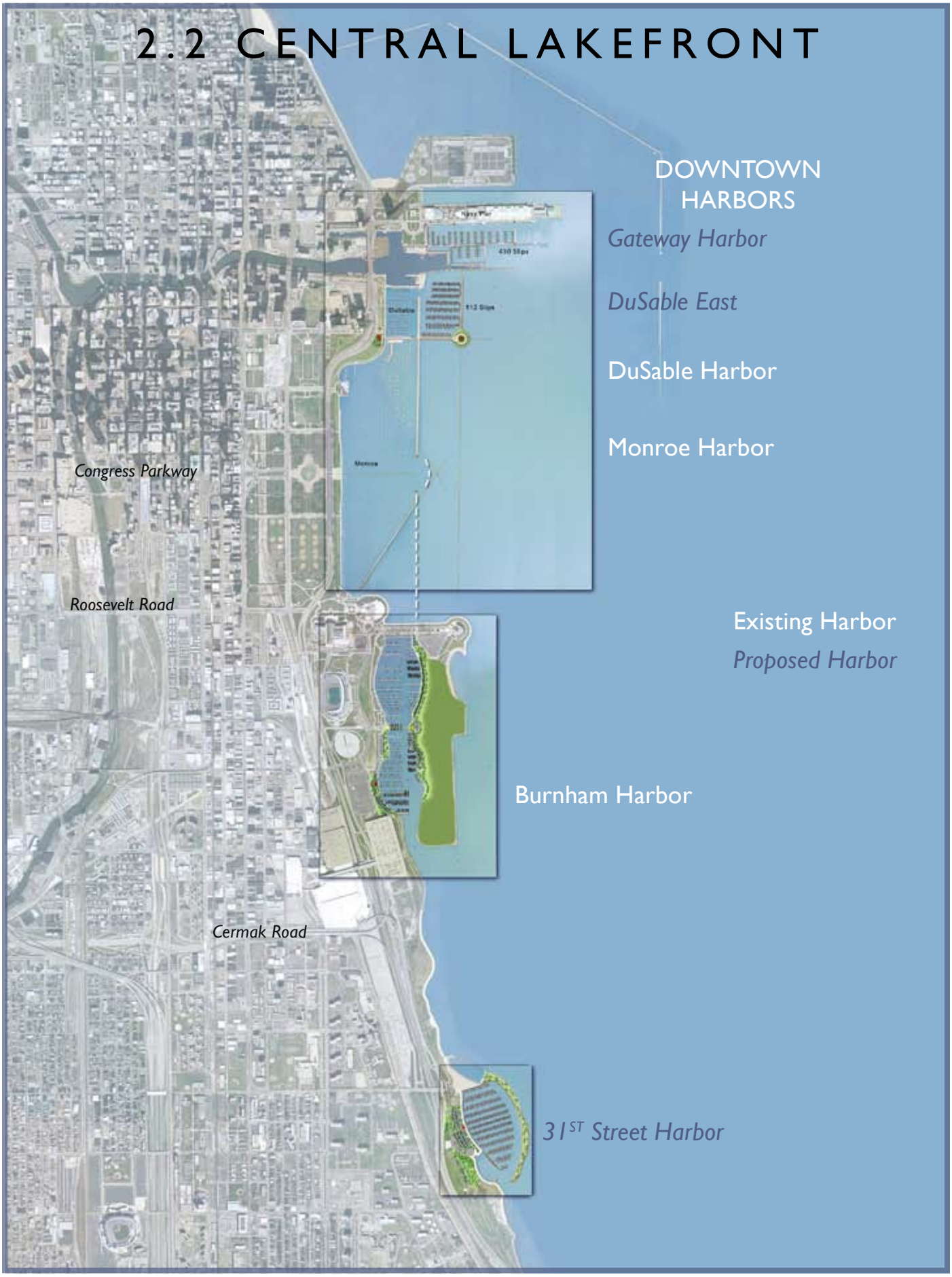
Implementation Considerations

- The refinements can be made incrementally, and could be funded with revenues
- Additional funding sources may be sought for the costs of the greening elements

59TH STREET HARBOR

Photo showing the cultural and open space/recreational context of the 59th Street Harbor

2.2 CENTRAL LAKEFRONT



31ST STREET HARBOR AND BOAT LAUNCH — A NEW OPPORTUNITY

The project team has identified a rare and excellent opportunity for developing a new harbor along the central lakefront, where the demand for new boat slips is unquestionably very high. The proposed 31st Street Harbor and Boat Launch would draw upon the same energy that has fueled the exciting rejuvenation of the South Loop and the Near South Side in recent years. The 31st Street Harbor would be located adjacent to the Olympic Village proposed for the 2016 Summer Olympic Games.

The development of the 31st Street Harbor and Boat Launch will provide additional amenities to the existing recreational activity node that consists of the 31st Street Beach, the Beach House, playground, and the skate park. It will also help to further activate this recently expanded stretch of shoreline.

A proposed harbor with an approximately 2,600 foot long breakwater will provide a new protected boat berthing area for 830 boats varying from 30 to 60+ feet along with a separate boat basin for a new boat launch ramp facility. The water depths in the area located approximately 300 feet offshore are much deeper than are typically found along the City's shoreline (24 feet deep in some areas), making it an ideal location for new harbor development.

Site of proposed 31st Street Harbor, south of Burnham Harbor

Harbor Components

- Approximately 830 new boat slips, ranging from 30 to 60 feet long
- A new boat launch for trailer-mounted boats (already partly in place)
- A new bio-engineered breakwater creating a calm water basin immediately offshore of the existing 31st Street Beach pier
- Easy access from the 31st Street/Lake Shore Drive interchange
- Adjacent parking, with nearby additional shuttle-accessed parking west of Lake Shore Drive
- Potential for a multi-purpose amenity building
- Protected space for community boating and sailing programming

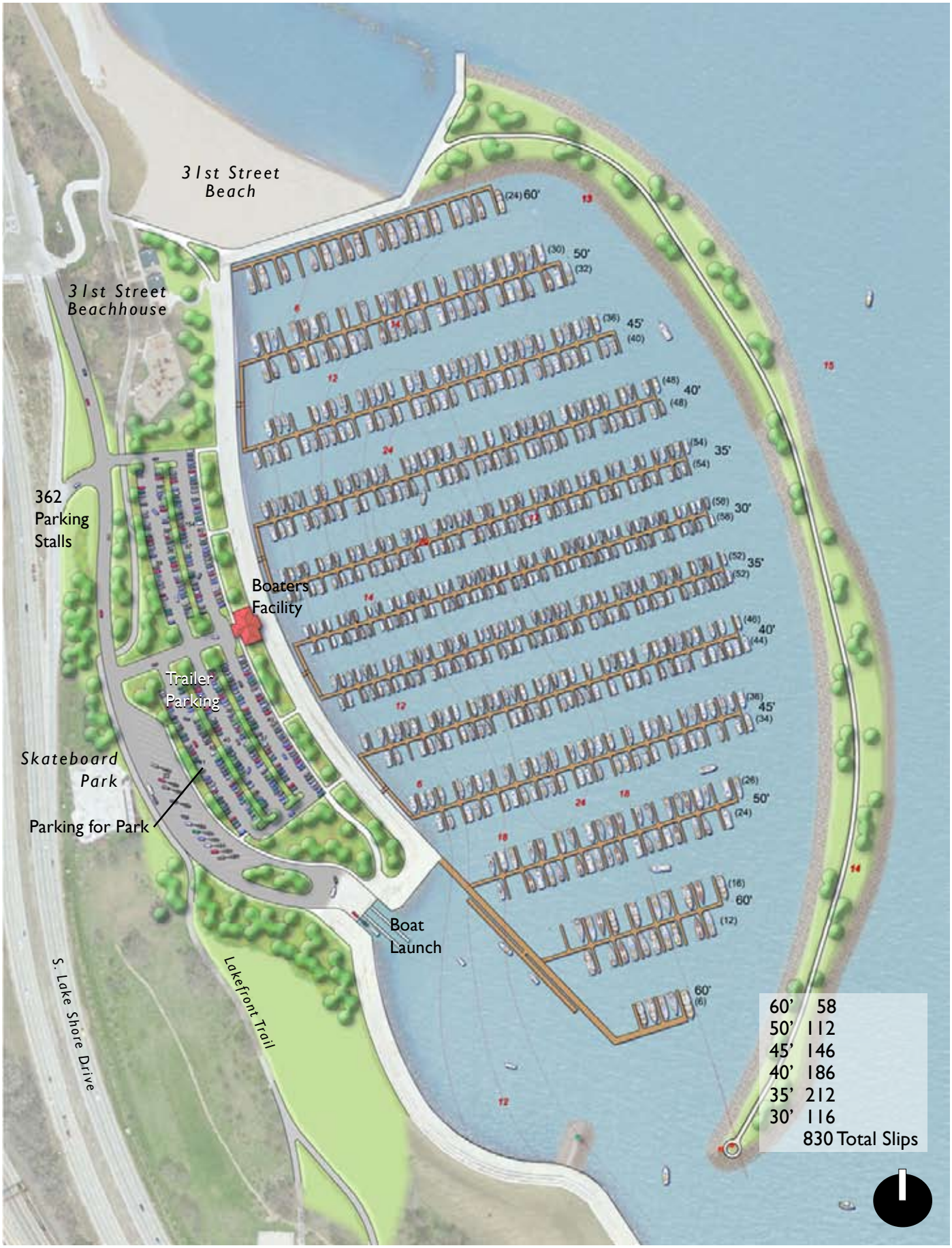
Community Benefits

- An accessible new public green space off of the 31st Street Beach pier
- Augmenting the existing 31st Street central lakefront recreational activity node
- Opportunity to improve the 31st Street Beach House with a complimentary multi-use facility
- Consolidation of all site parking from 31st to 33rd Streets/Eliminating the inefficient parking from 33rd to 34th Streets
- Dedicated space and pier access for community boating and sailing programs
- Providing new fish habitat and shore fishing opportunities
- Future potential location for water shuttles and water taxis
- Reduces parking on the lakefront by possible remote, spillover parking west of Lake Shore Drive

Implementation Considerations

- Harbor slip revenues appear likely to support the harbor infrastructure costs
- Additional funding sources will be sought for the community amenity costs
- Harbor implementation should be coordinated with the planning for the 2016 Summer Olympic games.

31ST STREET HARBOR



Plan of proposed 31st Street Harbor

Proposed Infrastructure Improvements

The proposed appproximately 2,600 foot long breakwater was sited further offshore where depths actually decrease to 14 or 15 feet. A rubble mound breakwater was considered because of its superior wave attenuation properties and relative cost advantages. The sloped sides of this type of coastal structure limit wave run-up and reflection; it can also be designed so that it has less height than a vertical structural and therefore be less visually obtrusive. A bio-engineered breakwater could add a community parkland amenity for incremental costs that might be funded separately. A floating breakwater structure may be considered inside the harbor entrance, delineating the boat berthing area from the boat launch basin. Although less effective at attenuating long period waves, this type of system can handle steeper, short period "chop" conditions that might develop at the harbor entrance. The advantage of floating breakwaters is that they are very cost-effective in relatively deep water conditions similar to those that exist at this site.

The boat berthing area was laid out using accepted guidelines for small craft harbors. The main channel width has at least 100 feet of usable protected navigable water depth along the back of the proposed breakwater out to the harbor entrance. In general, the larger slips are located closer to the harbor entrance. A double slip side-by-side layout arrangement is recommended to maximize the slip rental revenue capacity of the harbor.

A separate maneuvering basin is reserved for the boat launching and retrieval operation of the new six lane boat launch ramp. Much of the infrastructure for this facility was previously put in place during construction of a recently completed shoreline protection project. A service pier, including fuel, supplies, sanitary pump-out facilities and a potential berth for water taxis, would be located along the proposed floating breakwater near the harbor entrance. Developing the Boat Launch will provide small boat and personal watercraft users an improved opportunity to access the central lakefront, and will allow for the elimination of the existing Boat Launch in Burnham Harbor, which causes operational conflicts at the harbor and congestion at a highly trafficked area of the Lakefront Trail.

The land-based facilities have been designed to minimize the impact on park users while adequately serving the needs of the slip renters and launch ramp users. The roadway provides access for those who permanently moor their boats in this harbor; for boat launch ramp patrons, and for the general public. Roadways have been laid out to serve each type of parking, taking into account safety, security and convenience. Remote parking lots that can be served by shuttles will take care of overflow parking needs. A harbormaster building could be centrally located to service the needs of boaters and non-boaters alike. Functionally, the building would include secured restrooms and showers for boaters, public restrooms, a marina office, ship's store, and concession area. The costs for landscaping and amenities (lighting, benches, security gates, etc.) have been included in the cost estimates.

Alternative off-site parking locations for 31st Street Harbor

The planning of the 31st Street Harbor is compatible with its potential use as the Sailing Venue for the 2016 Summer Olympic Games

Aerial oblique illustration of proposed 31st Street Harbor

BURNHAM HARBOR — REFINEMENTS TO A DOWNTOWN HARBOR

Burnham Harbor is nestled between Northerly Island and the shoreline it shares with Soldier Field and McCormick Place at the south edge of the Museum Campus. It is surrounded by lots of activities including concerts and sporting events, with the predictable traffic and noise impacts.

The harbor has been renovated over the past decade, retaining its double-sided configuration with slips divided into those accessed from the land side and those accessed from Northerly Island. With the future redevelopment of Northerly Island as an environmental park, the impacts on the harbor will need to be carefully coordinated. There should be coordination of traffic, parking, and amenity facilities among the many entities and users of this intensely programmed stretch of shoreline, including the harbor.

Potential harbor refinements include: replacing or improving the Burnham Park Yacht Club and opening it up to use by boaters and non-boaters, constructing a breakwater and revetment at the harbor entry to attenuate wave action, increasing berthing capacity by replacing the remaining Star Docks with slips, adding transient boat slips, and removing the boat launch and replacing it with a launch at the less congested 31st Street Harbor location.

View of northern end of Burnham Harbor looking onto Soldier Field and McCormick Place

Potential Future Harbor Refinements

- Improved restroom and food service amenities in multi-use facilities
- Improvements to the wave climate at the harbor entry
- Replacing the Star Docks with boat slips

Community Benefits

- Coordination between the traffic, parking, amenity, and programming needs of the various area entities and institutions
- Coordination with the redevelopment of Northerly Island
- Better linkages between the harbor and other area amenities

Implementation Considerations

- The refinements can be made incrementally, and could be funded with revenues
- Additional funding sources may be sought for the costs of the greening elements

BURNHAM HARBOR

Plan of potential refinements to Burnham Harbor

View of walkway along Burnham Harbor

Proposed Infrastructure Improvements

The project team evaluated several alternative configurations for attenuating high wave conditions at the existing harbor entrance. A new rubble-mound breakwater is recommended, in combination with a quarry stone revetment lining the existing vertical steel bulkhead immediately south of the harbor entry, in an effort to control waves traveling along the wall and/or reflecting off of the vertical surface back into the harbor entrance. Mitigating the waves at the harbor entrance will support moving community sailing programs closer to the entrance, keeping users from having to traverse the entire harbor.

The harbor capacity would be somewhat increased by the proposed harbor entrance improvements and the removal of the existing boat launch. Additional berthing slips would be designed using accepted guidelines for small craft harbors. In general, the larger new boat slips would be located nearer to the harbor entrance. Double side-by-side new slip layout arrangements are recommended to maximize slip rental revenue vs. cost.

Better physical and institutional linkages should be established via shuttles, information kiosks, etc., to connect the harbor and potential harbor visitors with area cultural, commercial and recreational amenities.

Harbor greening refinements that could be made in conjunction with the redevelopment of Northerly Island include: naturalized edge treatments, bio-swales and buffer plantings, habitat creation opportunities, greenway connections, natural areas, native plantings, and sustainable parking lot design. For example, the existing parking lots could be reconstructed with a bio-swale buffer strip between the vehicles and the water's edge.

As key CPD staff and members of the JJR team will be involved in planning the redevelopment of Northerly Island, there can be a seamless integration of these harbor greening refinements into the Northerly Island Framework Plan. Similarly, the continuous involvement of key CPD staff and members of the JJR team will be able to ensure the integration of infrastructure improvements between the Plan and the potential 2016 Summer Olympic Games.

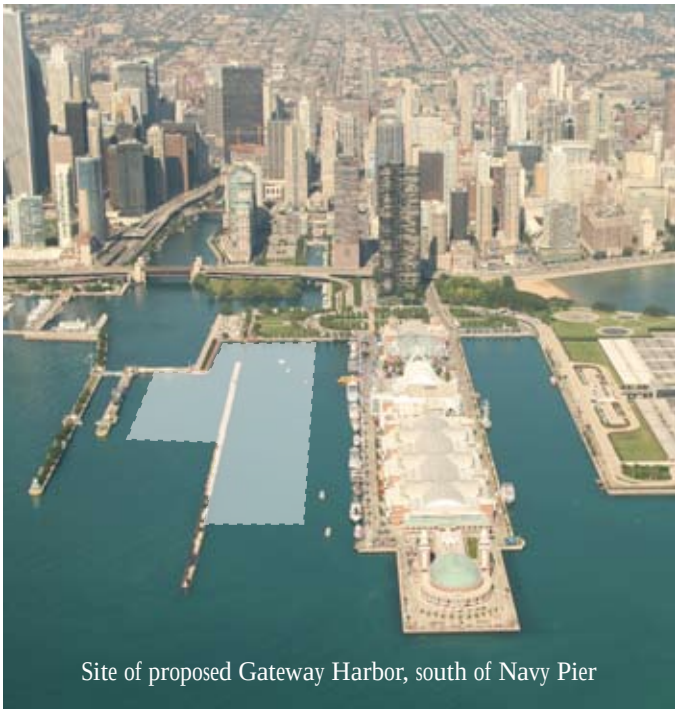
Aerial oblique illustration of potential refinements to Burnham Harbor

GATEWAY HARBOR — A UNIQUE NEW TRANSIENT HARBOR OPPORTUNITY

Many individuals—boaters and non-boaters—have long bemoaned the lack of transient docking opportunities within the Chicago Harbor System. This is not only a dent to Chicago's world class lakefront status, but also represents a loss in revenue and related economic impact potential. The project team has developed a wonderful opportunity for a new transient harbor where it will be most beneficial—along the central lakefront—where the attractions and the necessary supporting infrastructure are plentiful.

The Metropolitan Pier and Exposition Authority (MPEA) – the owner/operator of Navy Pier – has also recently determined that a new marina would be a complement to their anticipated next generation of Navy Pier attractions. The planning team coordinated closely with MPEA in the development of this plan, and incorporated much of their design direction. Reflecting its role as a waterside gateway to Chicago, we refer to this potential project as Gateway Harbor.

Envisioning this harbor as primarily a transient boater facility, it would likely attract somewhat larger boat sizes than do the leased harbors. In addition, by their very nature transient harbors do not contribute nearly the automobile traffic load or parking requirements as do seasonal leased harbors, an additional benefit in this congested area.



Site of proposed Gateway Harbor, south of Navy Pier

Harbor Components

- Approximately 430 new transient boat slips, ranging from 30 to 100+ feet long
- A renovated and publicly accessible Dime Pier and attached breakwater structures
- Maintained mooring and turnaround space for excursion boats along Navy Pier
- A new multi-use facility with showers, restrooms for boaters and non-boaters, and a ship's store

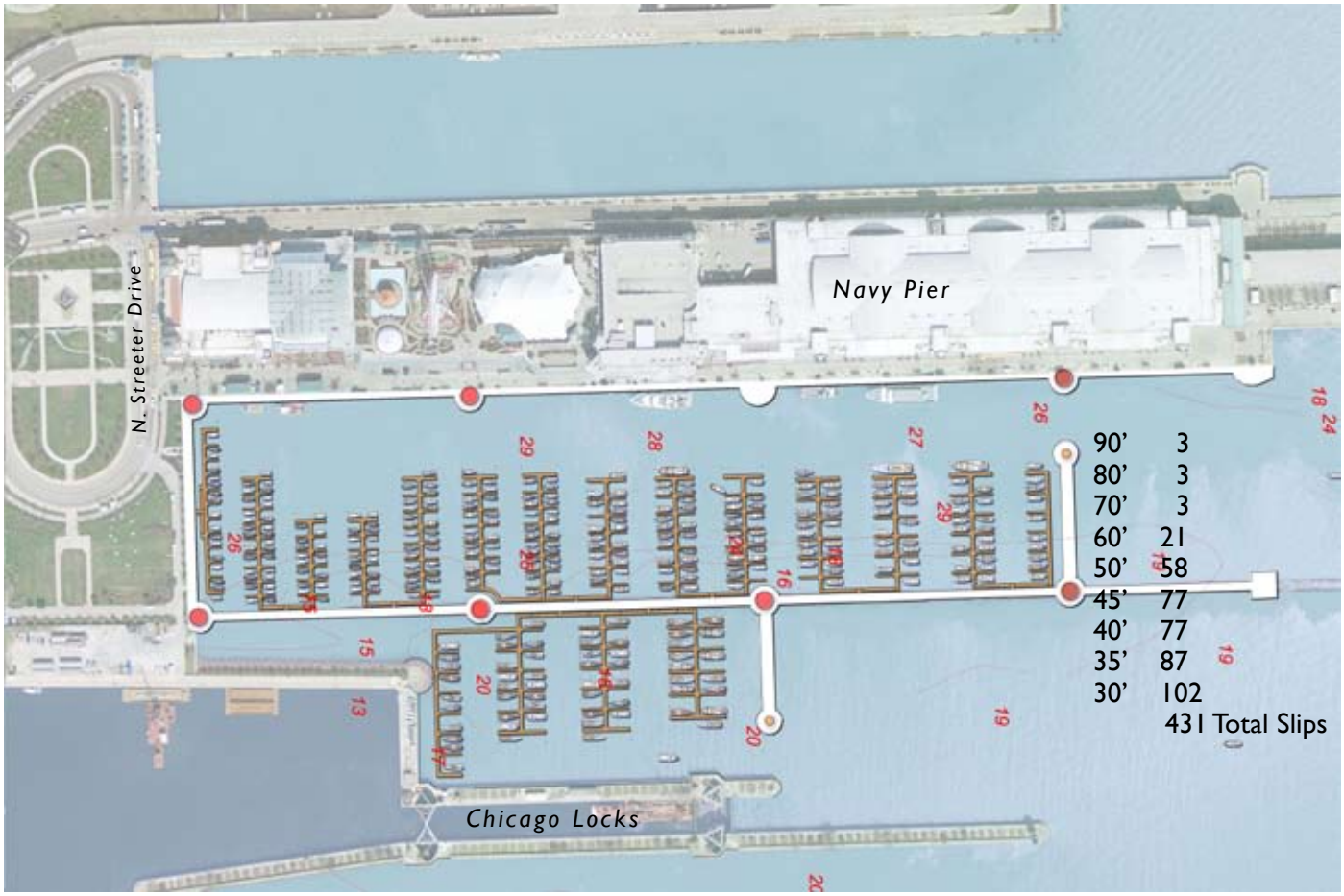
Community Benefits

- A series of new publicly accessible design elements along Dime Pier
- Significant area and city-wide economic benefit potential from transient boaters
- Limited area traffic impacts contributed by transient boaters
- Future potential location for water shuttles and water taxis

Implementation Considerations

- Harbor slip revenues appear likely to support the project development costs.
- The multi-use facility will need to include showers and other select amenities for transient boaters in order to realize the full economic potential they can bring to the city.
- This new harbor can help accommodate transient boater demand and be a component of an overall temporary boat relocation strategy if Chicago wins the 2016 Summer Olympic Games.

GATEWAY HARBOR



Plan of proposed Gateway Harbor

Proposed Infrastructure Improvements

Gateway Harbor would be built in the water space on each side of the dilapidated Dime Pier structure located between Navy Pier and the Chicago Locks. A new breakwater, built perpendicular to the alignment of Dime Pier, would be required to provide wave protection for the berthing of small craft in the proposed boat basins. Previous coastal engineering analyses performed for the rehabilitation of Navy Pier indicate that this harbor site is exposed to five to seven foot high waves. Rubblemound breakwaters are recommended to minimize reflected wave energy in the basins and surrounding areas. A floating breakwater is not recommended at this location because of the relatively long period incident waves that would probably travel through a floating structure and into the berthing basin.

Both the new quarry stone breakwater and the reinforced Dime Pier structure would probably be capped with a new pile supported concrete deck providing pedestrian and emergency vehicular access out to the boat slips. With proper stabilization, the Dime Pier structure could possibly be used as the core for the new Gateway Harbor promenade.

The proposed harbor will provide a new protected boat berthing area for 430 boats varying in length from 30 feet to 100. The water depths along Dime Pier and the existing proposed breakwater are in the 16 to 24 foot range. The boat berthing area was laid out using accepted guidelines for small craft harbors. In general, larger boats would be located nearer the harbor entrance and the smaller, more maneuverable boats nearer the shoreline. The main channel will run along Navy Pier to the harbor entrance. In addition, a 200-foot-diameter turning basin would be provided to accommodate the variety of charter cruise and sight seeing boats operating from Navy Pier.

A harbormaster building that would house an office, restrooms for boaters and non-boaters, showers and a ship’s store for visiting boaters would be centrally located on the Dime Pier promenade between the shoreline and the harbor entrance.

Current view of Dime Pier and Navy Pier

Aerial oblique illustration of proposed Gateway Harbor

DuSABLE EAST HARBOR — A PROPOSED NEW DOWNTOWN HARBOR

In addition to the new Gateway Harbor alongside Navy Pier, the project team explored new harbor opportunities in the heart of the central lakefront, where the demand for new boat slips is strong.

The DuSable East Harbor would be built due east of the existing DuSable Harbor, immediately south of the Chicago Lock that regulates water levels in the channel entering the Chicago River. Access to DuSable East would be provided by extending the pier that forms the southern edge of DuSable Harbor, thereby closing the channel connecting DuSable Harbor to Monroe Harbor. A new harbor entrance for the existing boat basin would be created at the north end of DuSable Harbor next to the Coast Guard Station.

Photo showing proposed site of new DuSable East Harbor, adjacent to existing DuSable Harbor

Harbor Components

- Approximately 516 new boat slips, ranging from 30 to 60+ feet long
- Access to the existing drop-off at Lower Randolph Street
- Abundant existing nearby structured and shuttle-accessed parking
- New rubblemound breakwaters totaling over 1,100 feet in length
- Direct lake access from the harbor

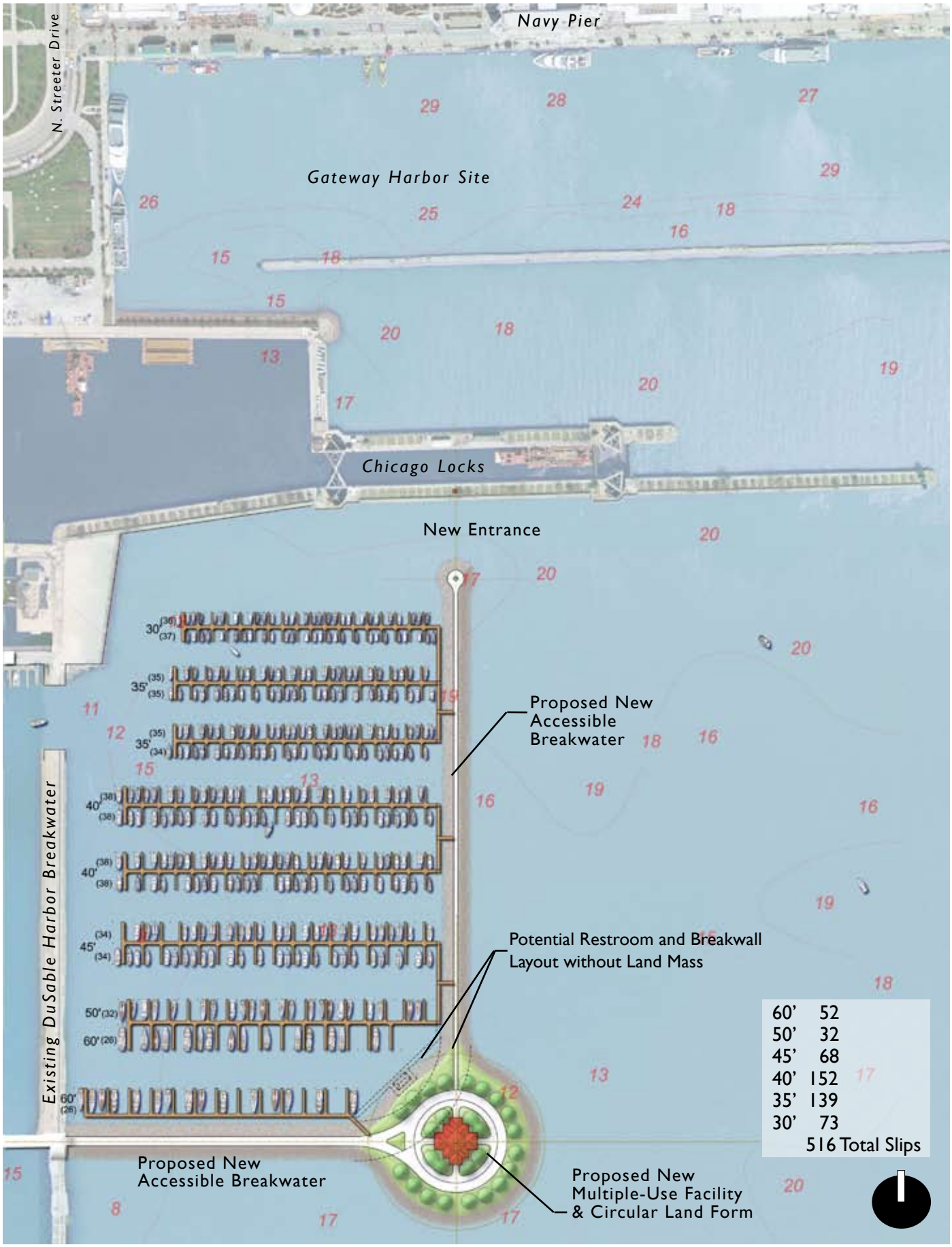
Community Benefits

- An accessible new public green space & view opportunity in Lake Michigan
- A multiple-use amenity facility, convenient for all lakefront users
- Augmenting the urban design symmetry along the central axis through Grant Park

Implementation Considerations

- Harbor slip revenues appear likely to support the project development costs
- Additional funding sources will be sought for the community amenity options, including accessible public green space.
- Harbor parking would utilize existing downtown parking garages
- Shuttle service will likely be required to allow convenient use of existing area parking garages

DuSABLE EAST HARBOR



Plan of proposed DuSable East Harbor, to the south of the proposed Gateway Harbor

Proposed Infrastructure Improvements

The proposed harbor will provide a new protected boat berthing area for 516 boats varying in length from 30 feet to 60 feet. The water is fairly deep in this area (15 to 19 feet), resulting in relatively high breakwater costs. Wave protection for DuSable East Harbor would be provided by a rubblemound breakwater designed to accommodate pedestrians and emergency vehicular access along its crest with a concrete roadway; this roadway would be designed to look and function as a pedestrian promenade. A quarry stone breakwater structure was chosen from the alternatives that were considered because of its superior wave attenuation properties and relative cost advantages.

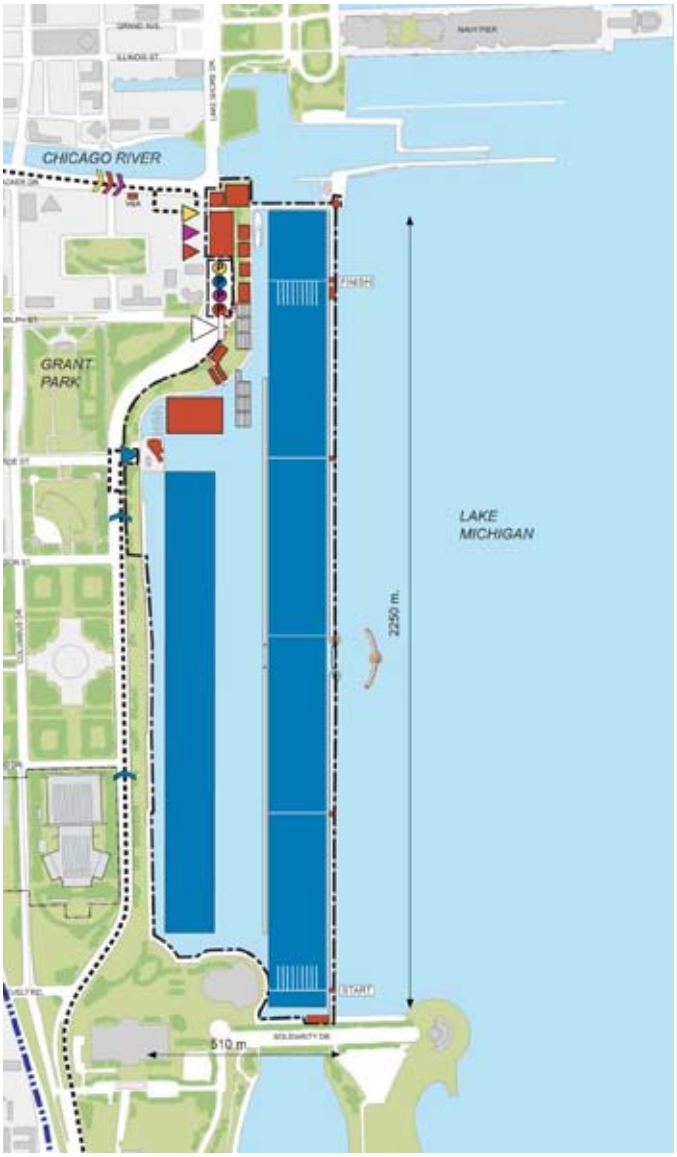
The harbor entrance for the new DuSable East Harbor would also be located at the north end of the harbor adjacent to the Chicago Lock. A new publicly accessible circular landform reminiscent of the land at the south end of the central lakefront occupied by the Adler Planetarium would be created at the intersection of the new south and east breakwaters. This reconfiguration would simplify lake access for boaters in the existing DuSable Harbor.

The boat berthing area was planned using accepted guidelines for small craft harbors. The rectangular boat basin results in an extremely efficient layout, maximizing revenues and profitability. The main channel will be at least 100 feet wide and is located next to the existing DuSable Harbor breakwater. In general, the larger slips are located closer to the harbormaster building, minimizing the need to extend utility lines long distances. A double slip side-by-side boat layout arrangement is recommended to maximizing slip rental revenue vs. cost for the harbor.

Access to the boats docked in the harbor would be via shuttles from the existing DuSable Harbor shoreline drop-off point and harbor parking areas that would be designated for boaters. An accessible, multiple-use facility, convenient for all different types of lakefront users, should be developed.

Left and above: existing urban design elements at DuSable Harbor

Aerial oblique illustration showing proposed DuSable East Harbor adjacent to existing DuSable Harbor



Layout of the Central Lakefront Rowing Venue proposed for the 2016 Summer Olympic Games.

Existing DuSable Harbor and Monroe Harbor

DuSABLE HARBOR & MONROE HARBOR

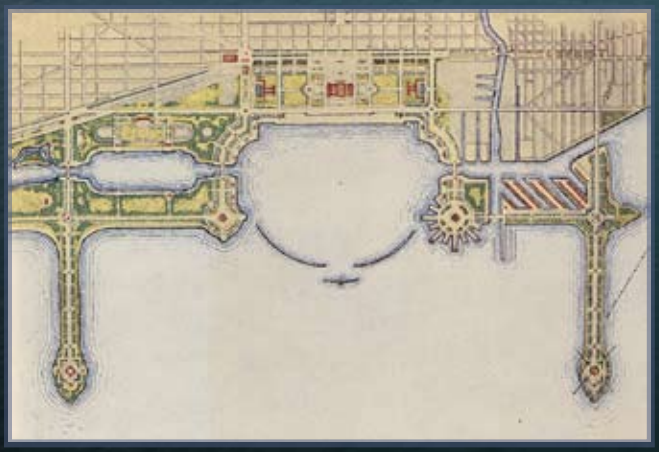
The Central Lakefront has been proposed as the Rowing Venue for the 2016 Summer Olympics. To facilitate the logistical needs of the sport – most notably the 2,250 meter long event course – would require significant modification to Monroe and DuSable Harbors. Modifications would include removal of the existing concrete pier that separates Monroe and DuSable Harbors, the replacement of the existing angled breakwater at the south end of Monroe Harbor with a new rubble-mound breakwater and a new crescent-shaped breakwater at the reconfigured entry to Monroe Harbor.

The 2016 Summer Olympics would be an exciting opportunity to bring the world to Chicago. An image taken from the Olympic Bid illustrates the general proposed layout of the Rowing Venue in the Central Lakefront. Should Chicago be successful in its bid to host the 2016 Summer Olympics, Monroe and DuSable Harbors would need to be reconstructed immediately following the Olympic Games. The exact details of the reconfiguration plan will need to be determined once the details of the Rowing Venue have been solidified, but it is very likely that several important infrastructure improvements would be legacy enhancements that would come in part due to the Olympics. These Central lakefront legacy enhancements could include an expanded and calmed Monroe Harbor, a new crescent breakwater, and a reconfigured DuSable Harbor with a relocated Columbia Yacht Club.

DuSABLE HARBOR & MONROE HARBOR

Layout of Proposed Rowing Venue from the Chicago 2016 Summer Olympic Bid

Monroe Harbor



Some of the urban design elements proposed in the Chicago Lakefront Harbor Framework Plan – notably the second circular landform referencing Solidarity Drive and the Shedd Aquarium at the south end of Monroe Harbor, the crescent-shaped outer breakwater structure, and the strong symmetry centered along the axis through Buckingham Fountain in Grant Park – are intended to recall elements first proposed in Burnham & Bennett's 1909 "Plan of Chicago".

CHICAGO DOWNTOWN HARBORS

2.3 NORTH LAKEFRONT

DIVERSEY HARBOR — REFINEMENTS TO AN EXISTING HARBOR

Diversey Harbor is located in the heart of Lincoln Park in an intensely visited portion of the park for which the community is named. Because the harbor is located west of Lake Shore Drive, vertical clearance restrictions limit it to powerboats.

As part of the ongoing Shoreline Protection Project, the reach of shoreline on each side of the harbor entrance has recently been or is in the process of being rebuilt. During public meetings, boaters voiced their concern about the difficulty of negotiating the harbor entrance during bad weather. The project team evaluated the performance of alternative reconfigurations for the Diversey Harbor entrance with respect to various storm wave conditions.

In an acknowledgment of the City's greening agenda and the adjacent Peggy Notebaert Nature Museum, the planning team used Diversey Harbor as a test case for a potential application of environmental best practices to green the harbor area. The possible refinements that could be made over time include: naturalized edge treatments, bio-swales and buffer plantings, habitat creation, greenway connections, natural areas, native plantings, and sustainable parking lot design (see pages 73-74 for a more detailed description of these sustainable practices). It can be assumed that environmental advances for Diversey Harbor are applicable in varying degrees to all harbors proposed in the Chicago Lakefront Harbor Framework Plan.

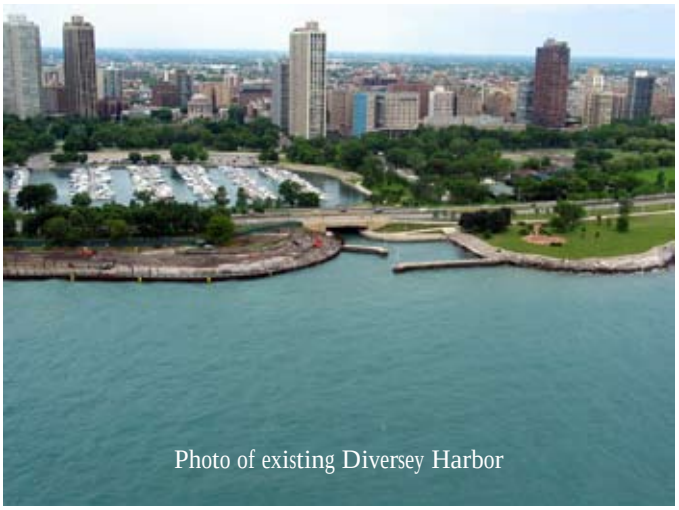


Photo of existing Diversey Harbor

Potential Future Harbor Refinements

- Expanding harbor entry area with additional calm water boat staging area
- A series of greening elements softening the harbor's hard spaces and edges
- Improved restrooms, showers and food service amenities in a centrally located multi-use LEED-certified facility that will house the harbormaster

Community Benefits

- A series of greening elements softening the harbor's hard spaces and edges
- Improved restroom and food service amenities in a multi-use facility
- Better linkages between the harbor and other area attractions

Implementation Considerations

- The proposed park and harbor refinements can be made incrementally over time
- Harbor slip revenues can help support the costs of these refinements
- Additional funding sources may be sought for the costs of the greening elements

DIVERSEY HARBOR

Proposed plan for refinements to Diversey Harbor

Proposed Infrastructure Improvements

A new rubble mound breakwater is recommended, extending the line of the proposed concrete stepped stone revetment from the north to form a larger protected staging area for boats preparing to come into the harbor from the lake. The vertical bulkhead structures near the entrance should be lined with quarried stone revetments in an effort to control waves traveling along the wall and reflecting off these vertical surfaces back into the entrance.

The existing yacht club building and temporary restrooms should be replaced with a multiple-use facility that would provide better restroom and food service amenities for both boaters and non-boaters. This new harbormaster building should include a marina office, restrooms (for boaters and non-boaters), showers, ship's store and concessions. It should be centrally located just south of the boat launch.

The harbor management team has made significant progress with an ongoing rehabilitation and maintenance program, but the overall harbor still need to be generally upgraded to reach the standards set by the newer harbors. Improvements and repairs have been made to bulkheads, boat launch ramps, sidewalks, fencing, lighting, landscaping, roadways and parking lots over the past decade. Harbor aesthetics need attention here, such as the landscape screening of utility boxes and garbage dumpsters.

Better physical and institutional linkages should be established in order to connect the harbor and potential harbor visitors with area cultural, commercial and recreational amenities. Transient dockage facilities and water taxi service could be provided at this harbor in the future.

Parking lots should be reconstructed with a landscaped bio-swale buffer strip between autos and the new pedestrian promenade along the water's edge. There should also be appropriately designed landscaped areas adjacent to the new building and the auto-trailer parking lot servicing the boat launch ramp. Roadways should be designed to accommodate both boaters' security needs and the need for public parking. The park walkways should be designed in such a way as to reflect the naturalized environment of the Peggy Notebaert Nature Museum. Extensive use could be made of various natural landscape treatments along the eastern edge of the harbor and along the Lake Shore Drive underpass to provide a stronger and more aesthetic lakefront connection.

Example of unscreened utilities and dumpsters at Diversey Harbor


Entrance to Diversey Harbor under Lake Shore Drive

Aerial oblique illustration of proposed refinements to Diversey Harbor

The Great Lakes Ecosystem and the Chicago Harbor System

The poor ecological health of the Great Lakes ecosystem has received much recent attention. In addition to numerous remediation activities that have been proposed, additional action is needed to restore system elements, particularly in coastal zones such as Chicago's Lake Michigan shoreline.

Opportunities to provide native plants and aquatic habitats are rare along Chicago's engineered shoreline, as there are few protected environments at which they can be developed and maintained. The Chicago Harbor System – with its calm water basins and breakwaters that can be designed to provide protected habitat opportunities – could be enhanced into a series of habitats that could attract fish and birds. A set of harbor environmental management best practices -- such as building only LEED-certified new harbor buildings -- can be developed and implemented over time to establish Chicago as America's greenest harbor system in America's greenest city.

BELMONT HARBOR – REFINEMENTS TO AN EXISTING HARBOR

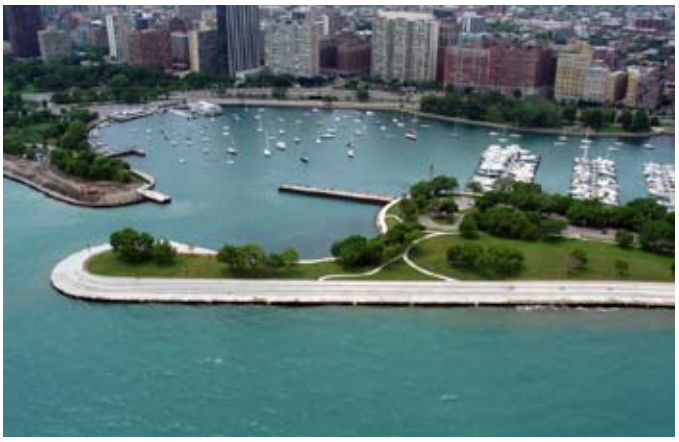
Belmont Harbor is located in the middle of Lincoln Park in an intensely frequented portion of the lakefront on the North Side. Belmont Harbor is surrounded by active recreational uses ranging from a golf course to an archery range, and from the lakefront trail to all types of athletic fields, including Wrigley Field a half-mile away.

The harbor has been significantly renovated and improved over the past decade. Major changes include the relocation of a private yacht club, building a new multi-use restroom facility that serves both boaters and non-boaters, and expanding the width of the Lakefront Trail that passes by the harbor. Belmont Harbor is one of four Chicago harbors (the others are Diversey, Burnham, and Jackson Park Outer) that sell boat fuel.

Additional potential refinements might include opening up the Belmont Yacht Club to offer food service and other use by both boaters and non-boaters, and upgrading or replacing the existing harbormaster building to provide better services to both boaters and non-boaters.

Better physical and institutional linkages should be established to connect the harbor and potential harbor visitors with area cultural, commercial and recreational amenities.

Possible harbor greening refinements that could be made over time include: naturalized edge treatments, bio-swales and buffer plantings, habitat creation opportunities, greenway connections, natural areas, native plantings, and sustainable parking lots.



Potential Future Harbor Refinements

- A series of greening elements softening the harbor's hard spaces and edges
- Improved restroom and food service amenities in a multi-use facility
- Improved harbormaster and other boater service facilities

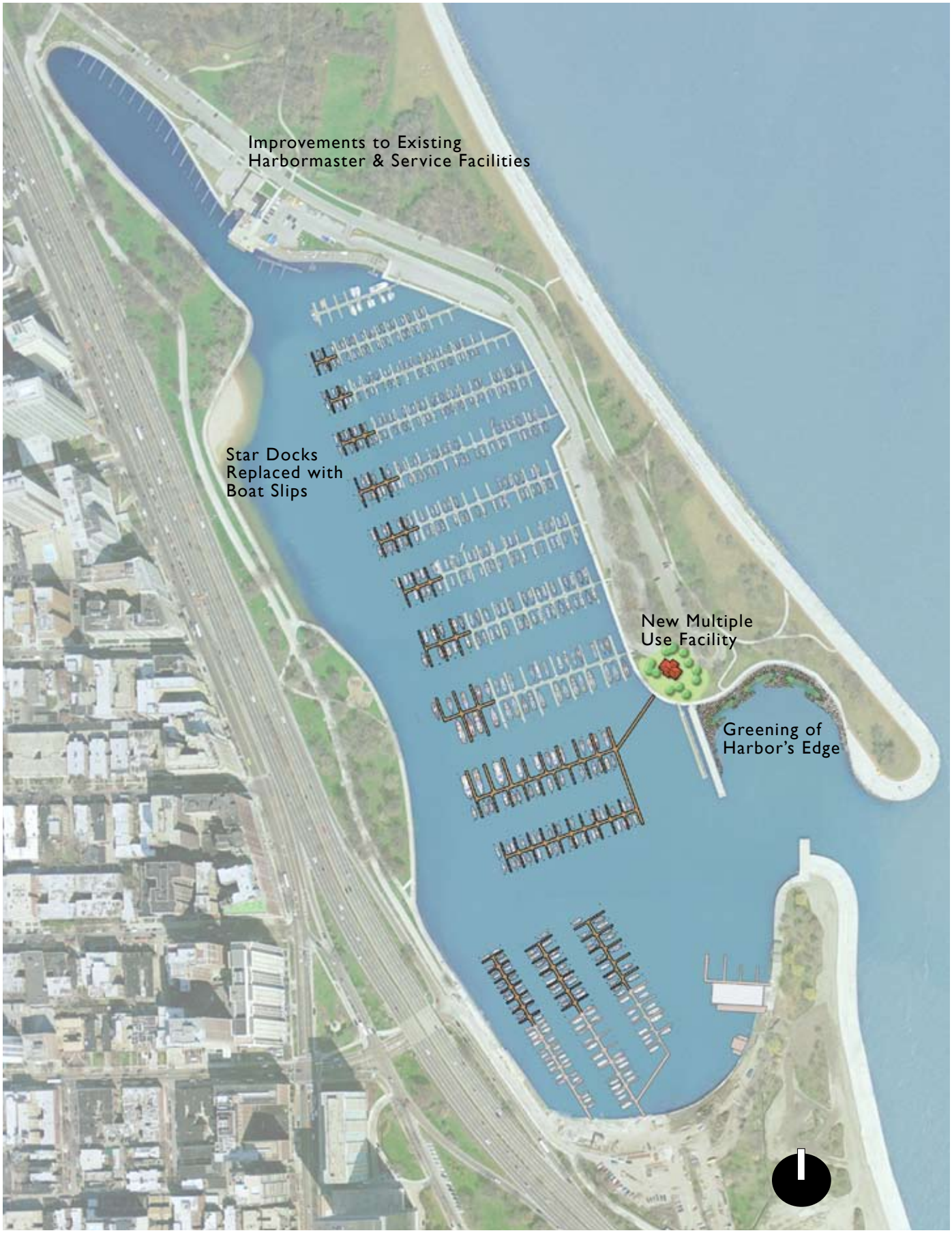
Community Benefits

- A series of greening elements softening the harbor's hard spaces and edges
- Improved restroom and food service amenities in a multi-use facility
- Better linkages between the harbor and other area amenities

Implementation Considerations

- The proposed refinements can be made incrementally over time
- Harbor slip revenues can help support the costs of the refinements
- Additional funding sources may be sought for the costs of the greening elements

BELMONT HARBOR



Proposed plan for refinements to Belmont Harbor

MONTROSE HARBOR – REFINEMENTS TO AN EXISTING HARBOR

Montrose Harbor is located at the north end of Lincoln Park in a very active portion of the lakefront on the North Side. It is surrounded by a variety of uses ranging from active recreational ones such as soccer, baseball and golf, to passive ones including enjoying the great view downtown, bird-watching and relaxing at the beach. The Lakefront Trail is convenient to the harbor without it being so close as to cause traffic conflicts. Montrose Avenue and Simonds Drive provide convenient vehicular access to the harbor.

The harbor has been significantly renovated over the past decade. Major changes include the addition of slips to replace the majority of the Star Docks and moorings that once filled the harbor, and the Shoreline Protection Project's rebuilding of the stretch of shoreline that forms the "hook" of land that envelopes the harbor.

Potential future refinements include: replacing or improving the Corinthian Yacht Club and opening it up to use by both boaters and non-boaters, adding a quarry stone revetment along the shoreline inside the harbor entry to attenuate wave action, and increasing berthing capacity by phasing out and replacing some or all of the Star Docks with slips. The small single-purpose structures (bait shop, snack bar, and restrooms) along the harbor's edge should be consolidated into a single multiple-purpose facility to serve boaters and non-boaters.

Better physical and institutional linkages should be established to connect the harbor and potential harbor visitors with area cultural, commercial and recreational amenities.

Possible harbor greening refinements that could be made over time include: naturalized edge treatments, bio-swales and buffer plantings, habitat creation opportunities, greenway connections, natural areas, native plantings, and sustainable parking lots.

Potential Future Harbor Refinements

- Improved restroom and food service amenities in multi-use facilities
- Improvements to the wave climate at the harbor entry
- Replacing some or all of the Star Docks with boat slips

Community Benefits

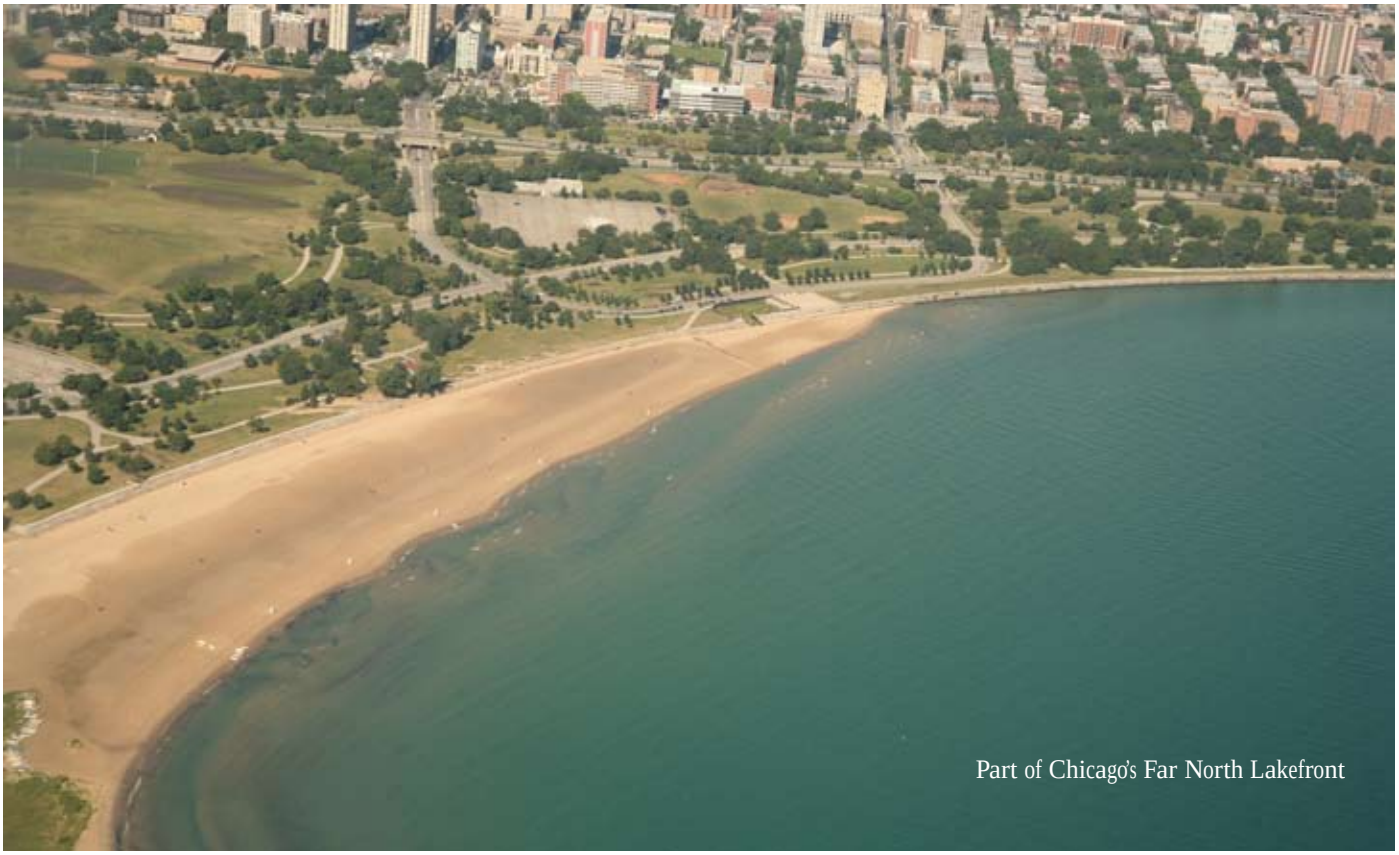
- A series of greening elements softening the harbor's hard spaces and edges
- Improved restroom and food service amenities in multi-use facilities
- Enhanced connections between the harbor and other area amenities

Implementation Considerations

- The proposed refinements can be made incrementally over time, and can be funded with revenues
- Additional funding sources may be sought for the costs of the greening elements

MONTROSE HARBOR

Proposed plan for refinements to Montrose Harbor



Part of Chicago's Far North Lakefront

THE FAR NORTH LAKEFRONT

The far north portion of Chicago's lakefront is unlike any other. Immediately north of the intensely activated and programmed Lincoln Park – which houses three harbors among its many amenities including the Lincoln Park Zoo and Conservatory, several museums, and playing fields for sports such as soccer, baseball, football, tennis, golf and archery – the Far North Lakefront is characterized by its lack of large publicly accessible lakefront open spaces. Several studies have indicated that the Far North Lakefront communities suffer from a shortage of parks and open spaces on a per capita basis.

The 1909 Burnham Plan's lakefront vision of monumental public open spaces linked together by a continuous green parkway is celebrated along much of Chicago's lakefront. Other cities envy the foresight of Chicago's early leaders in maintaining such a continuous open public lakefront. But this bold vision did not get completed along the Far North Lakefront. The Far North Lakefront includes significant stretches that are in private ownership, and many other spaces where public access is limited to street-end rights-of-way and small discontinuous parks and beaches. Lake Shore Drive abruptly terminates at the north end of Lincoln Park, causing significant vehicular and non-vehicular traffic and access problems within the Far North Lakefront communities and along the Far North Lakefront.

The Chicago Lakefront Harbor Framework Plan project team investigated the Far North Lakefront for potential new harbor locations, and identified one preliminary concept at an early point in the planning process. During the public planning process it became clear, however, that it was premature to discuss the potential development of a new harbor along the Far North Lakefront before the larger lakefront public access, transportation, and open space development issues were addressed.

While the Chicago Lakefront Harbor Framework Plan does not contain any specific proposals for new harbors along the Far North Lakefront, its recommendations include addressing in a timely manner these larger issues that need to be resolved before new parks and open spaces in general – and new harbors in specific – can reasonably be contemplated for development, and the Burnham Plan's bold lakefront vision can be completed along the Far North Lakefront.

2.4 HARBOR SYSTEM-WIDE & LAKEFRONT RECOMMENDATIONS

Many harbor system-wide and lakefront recommendations are within the specific purview of this plan, while others are beyond its scope. As each lakefront plan exists in conjunction with other lakefront plans—past, current and future—this Plan seeks to further other lakefront goals and visions by offering a series of specific harbor system recommendations and general lakefront recommendations. These recommendations are offered in the spirit of the Lakefront Protection Ordinance, and towards the goal of a system of "Harbors in Parks."

Technical

- Improve harbor protection structures and navigational aids as needed. Regular maintenance and periodic upgrades are needed at all harbors.
- Monitor and periodically modify the boat berthing and mooring options. As trends and preferences evolve over time, so should the Harbor System's offerings in the competitive marketplace.
- Establish a reserve fund with adequate resources to perform maintenance and repair of harbor and lakefront infrastructure. This fund could cover shore protection structures, regular harbor and shoreline dredging, dockage, buildings, roadways, and utilities.
- Investigate in-water winter boat storage where appropriate. New technologies exist that make this currently feasible in other Great Lakes harbors, and a test may be feasible within certain Chicago harbor locations.

Amenities

- Upgrade restroom and shower facilities at the harbors. The current harbor facilities are below industry standards. The Belmont Harbor shared facility is a good prototype of a harbor facility that serves both boaters and non-boaters.

Shared restroom facility at Belmont Harbor

- Provide an increased range of boater services. Simple boater needs such as a ship store, maintenance, repair and other marine services are scarce within the harbor system.
- Develop facilities that meet boaters' security needs while providing for public access. Both are legitimate needs and important elements of a vibrant lakefront, and can be creatively accommodated by providing limited keyed access to certain core harbor areas, designated parking zones and times, etc.
- Systematically consolidate and upgrade lakefront support facilities on a "zero net" basis. Single function, obsolete or difficult to maintain facilities should be consolidated and replaced so as to reduce visual clutter and increase user utility.
- Expand the amenity offerings at the harbors and along the lakefront. Food service, convenience store, and other amenities that can serve boater and general park user needs are inadequate at many harbors and along the lakefront.
- Envision the lakefront as a string of differing types of destination nodes – active, passive, environmental, cultural, or various combinations thereof. An overall plan for the lakefront addressing the many different types of user desires will be a valuable decision-making tool.

Environmental

- Move systematically towards the goal of making the CPD harbor system, one of North America's largest municipally-owned systems, also its "Greenest Harbor System". The harbor system should be a proud component of Chicago's Green Agenda.
- Provide sanitary pump-outs and other environment-friendly technologies as appropriate to improve the harbors' water quality and overall sustainability. New technologies continue to be developed that can contribute to harbor system environmental goals.
- Mandate that any new harbor and lakefront facilities be LEED-certified structures. This will continue Chicago's leadership in this realm. Typically the savings in energy and water usage allow the additional building costs to be recouped in 5 to 10 years.
- Encourage natural stormwater treatments practices along the lakefront to minimize the dumping of untreated runoff into the lake and to make the lakefront an exemplary component of Chicago's Green Agenda.
- Encourage the use of sustainable non-polluting technologies for any new lakefront transit or shuttle services. Developers of such technologies should relish the visible implementation opportunity that the lakefront would provide.

Transportation and Access

- Mitigate congestion and inter-modal transportation conflicts at harbors and along the lakefront. Existing harbor refinements, new harbor development, and other lakefront development should all net positive with respect to mitigating existing traffic issues.
- Improve transit, pedestrian and non-vehicular access between the lakefront and the adjacent communities. Any available strategy to facilitate all Chicagoans' link with their lakefront should be strongly considered.
- Make new parking and other infrastructure improvements multiple use whenever possible. In cases where separation is required for boaters, provide multi-use overflow parking. Plan holistically in order to leverage existing parking opportunities and avoid building new whenever possible.
- Support the development of water taxis and other lake-based transit systems. Diversify the palette of water-based transit options in order to help mitigate vehicular use where possible.

Fiscal/Economic Development

- Improve transient-friendliness of the harbors. This is potentially a significant financial opportunity available for the city to tap.
- Provide better information about and linkages to area amenities at harbors. The harbor system needs to adopt a "concierge" mentality and facilitate better connectivity between harbor users and nearby amenities.
- Continue to explore potential opportunities for further expanding the harbor system in the future. The Market Demand study ought to be updated within the next decade in order to help determine whether additional expansion opportunities should be explored.
- Consider all reasonable harbor system financial and management structures so as to best contribute to the Park District and the City in a positive fiscal manner. The harbor system should be seen as a marvelous lakefront amenity that is able to pay for its upkeep and maintenance in addition to any new harbor construction.
- Continue to explore potential opportunities for adding new public open space and other appropriate infrastructure along the lakefront in the future. This may apply specifically to the northern and southern portions of the lakefront where public lakefront access and open space is deficient.
- Seek appropriate revenue-generating opportunities that will add to the lakefront amenity mix and contribute financially to the Park District and the City. The Park District and the City should maintain the perspective that it is the primary landlord of Chicago's chief civic amenity.
- Develop appropriate physical and other linkages between the lakefront and the Chicago River. The City's lakefront and riverfront agendas should blend as seamlessly as does the water that flows from one into the other.

DuSable Harbor

2.5 GREENING AND SUSTAINABILITY

As a city, Chicago has built a national reputation for its commitment to the environment. The city issues an annual Environmental Action Agenda that catalogues the many accomplishments over the past year by the various city departments and sister agencies such as the Chicago Park District, and lays out the environmental goals for the following year.

Perhaps no city department or sister agency is as intimately connected as the Park District with the imperative of environmental sustainability. As the City's slogan is "Urbs in Horto" or "City in a Garden," the Chicago Park District may be thought of as its primary gardener. The Park District is keenly attuned to environmental issues, and the harbor system presents another big opportunity to demonstrate environmental leadership.

The greening of the harbor system will consist of determining appropriate environmental techniques, applying them to all new harbors, and applying them over time to the existing harbors in conjunction with their maintenance and renovation schedules. There are a number of environmental best practices that can be analyzed for their potential application to the lakefront harbors, and added to a collection of recommended techniques and approaches for inclusion within Chicago harbor designs.

There are a number of grant programs and other financial mechanisms that can help support environmental sustainability initiatives. The City and Park District should continue to monitor and take advantage of such potential financial support for enhancing the green nature of the Chicago Harbor System.

Some environmental techniques that could be applied to the Chicago harbor system include:

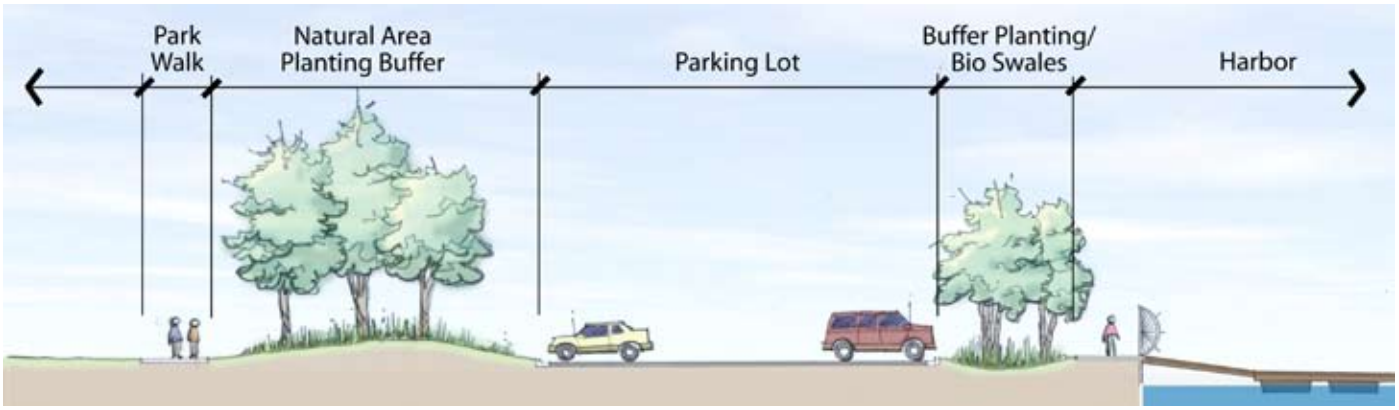
- Naturalized edge treatments
- Bio-swales and buffer planting
- Edge filtering
- Habitat creation opportunities
- Greenway connections
- Natural areas
- Native plantings
- Sustainable parking lots
- "Clean Marina" designation
- Sanitary pump-out systems
- LEED-certified buildings

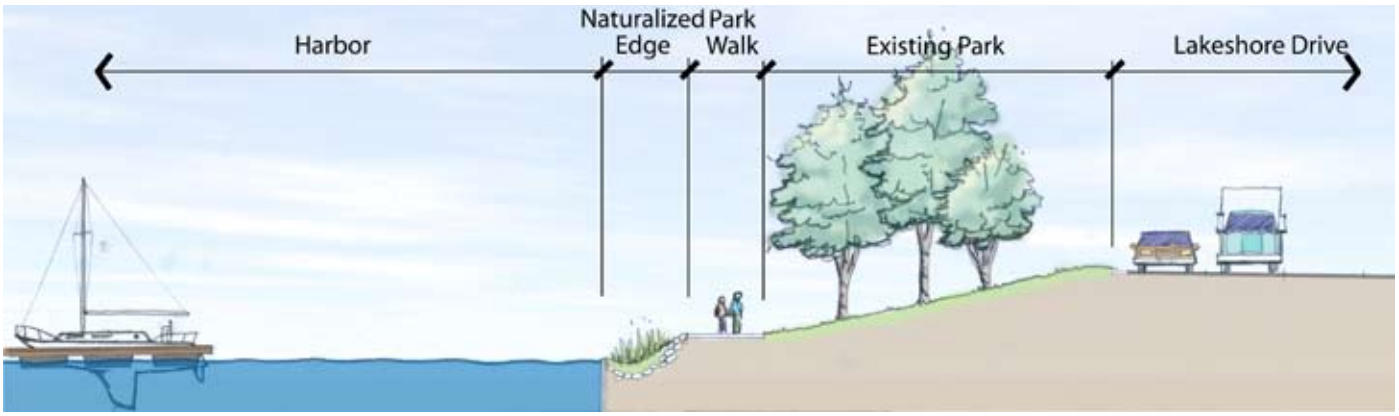
As one component of this project, the planning team used Diversey Harbor as a test case of an existing harbor in order to determine which of the identified environmental greening techniques might apply. Given its proximity to the Peggy Notebaert Nature Museum, Diversey is a particularly appropriate choice as a demonstration site for environmental design. As shown on the following page, many of the major identified potential interventions would be through using natural plantings and bio-swales to treat rainwater runoff from paved parking and drive areas before it entered the harbor untreated. In addition, adding trees and plantings in relatively unplanted areas would serve to add shade, diminish the urban heat island effect, and further integrate the harbors into their host parks. Creating naturalized edge conditions would add new habitat creation opportunities both within the harbor waters and along the harbor edge.

LEED

The LEED (Leadership in Energy and Environmental Design) Green Building Rating System, developed by the U.S. Green Building Council, is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. There are different standards that apply to different types of construction, including LEED-ND, which is currently under development to incorporate smart growth, urbanism, and green building principles to neighborhood design. It will focus on sustainable water and energy use, efficient use of existing infrastructure, and reduction of vehicular travel. A 2008 launch date is anticipated for the LEED-ND standard. While existing LEED standards apply to individual buildings, and should certainly be set as a standard for any new construction along the lakefront, it is a reasonable goal for all new harbor developments to achieve LEED-ND certification as truly green harbor developments.

View of the parking area at Diversey Harbor.





Cross-sections showing potential environmental buffering and naturalized edge treatments for Diversey Harbor

PARTICIPANTS

The Chicago Lakefront Harbor Framework Plan is the product of many contributors. The Park District extends special thanks to the Working Group, whose members attended design meetings and served as a conduit to the larger community. Our appreciation also extends to the many civic organizations, governmental agencies, elected officials, and waterfront cities who hosted or attended presentations and provided guidance. Other important contributors cannot be listed by name, as they were the community members who filled the rooms at public meetings, and the various stakeholders who articulated their own viewpoints in smaller meetings or private conversations, or whose interests were represented by the members of the Working Group. Their contribution – challenging and encouraging the project team – deserves recognition as well.

WORKING GROUP MEMBERS

Alliance for the Great Lakes
Chicago Yachting Association
Friends of the Parks
Friends of the Marine Community
Grant Park Conservancy
Jackson Park Advisory Council
Lincoln Park Advisory Council
Metropolitan Pier and Exposition Authority
U.S. Coast Guard, Division 2 Chicago
Westrec Marinas

OTHER PARTICIPANTS

American Planning Association
American Institute of Architects, Chicago Chapter
Chicago Development Council
Chicago Loop Alliance
City of Chicago
Illinois Department of Natural Resources
Mayor Daley's Fishing Committee
Metropolitan Planning Council
U.S. Army Corps of Engineers

CONSULTING TEAM

JJR, LLC
Applied Real Estate Analysis (AREA)

JJR

landscape architecture
planning
urban design
civil engineering
environmental science

35 East Wacker Drive
Suite 2200
Chicago, Illinois 60601
312-641-0510
www.jjr-us.com