

PHASE TWO: PLAN RECOMMENDATIONS AND CONSENSUS BUILDING

KALAMAZOO HARBOR MASTER PLAN
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The purpose of Phase Two was to utilize the data and analysis of Phase One, and create a set of recommendations for the future improvement and development of the Kalamazoo Harbor. These recommendations are divided into two primary categories: Harbor Improvement Plan and Sediment Management Plan, and are summarized below.

HARBOR IMPROVEMENT PLAN

Review of Marina and Boating Market

The Master Plan provides recommendations for the expansion of marina facilities within the harbor. These recommendations are made, in part, based on the market support for improved facilities in southwest Michigan as well as on the specific physical characteristics of the harbor. While the master planning study does not include a market analysis of Kalamazoo Harbor, the following observations can be drawn from recent market studies that evaluated marina services along southern Lake Michigan, and from the professional experiences of the master planning team and community members.

- Participation in boating grew 47% from 1994-2004, a national trend that is reflected in the Great Lakes.
- Demand for boating products is projected to grow at a rate of 6% annually.
- Power boats are the largest segment of the boating population, representing 80% of boat equipment sales.
- The growth in demand for higher end, large boats (i.e., boats that require slips) is outstripping the lower end due to demographics of baby boomers. This demographic group is entering the prime age bracket for boat ownership and wealth creation, and is driving the demand for large boats.
- Records of boat registrations from 1996-2002 indicate that the greatest growth in boat registration as a percentage of existing boats is for those over 26 feet in length.
- Smaller community harbors have farther market reach than larger harbors (which tend to attract nearby boaters).
- Wisconsin has captured the largest portion of southern Lake Michigan growth due to the rapid development of harbor dockage facilities over the last 20 years, including substantial new dock facilities in Racine, Milwaukee and Sheboygan. These facilities serve the boating public from Chicago as well as local markets, despite their distance from Chicago.
- There has been limited growth in southwest Michigan boating facilities, due in large part to the physical limitations of local harbors.
- Chicago has limited growth potential for docks, and demand is projected to outstrip supply by 3,000 slips between the years 2005 and 2015.
- Lack of berths in a given market can act as a constraint to boat ownership, making it appear that demand for slips is lower than it actually is.

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- The physical limitation of Kalamazoo Harbor in the form of extensive and growing shallow water areas has artificially constrained the demand for, and development of, new marina facilities.
- The number of marina slips in the harbor has only grown by about 5% over the last 10 years, significantly below the actual growth in boat ownership.

Boat registration trends in Michigan over the last five years have reflected many of the trends listed above (e.g., the growth in large boat registrations vs. small), but overall, the growth in boat registrations has lagged behind national and Great Lakes trends noted in other studies. Kalamazoo Harbor's proximity to the Chicago market, which has grown more aggressively than the Michigan market, will influence the market projections above the expectations of the Michigan-only market. Given the long term growth in boat ownership, a lack of competing opportunities in the region, the harbor's proximity to Chicago and southwest Michigan population centers, and the anticipated dredging of the harbor, allowing for a 50% growth in marina facilities over the next 10 to 20 years would be a reasonable projection to meet the market's needs.

It is estimated that the waterfront destination of Kalamazoo Harbor attracts from 1.5 to 2 million visitors annually. The impact of the failure to save Kalamazoo Harbor to local retailers, hoteliers, and restaurateurs, as well as to the state of Michigan is enormous. On the positive side, the potential to dredge the harbor and modestly expand water-based recreation facilities could provide a tremendous boost to the local and state economies that are currently struggling.

Potential Expansion and Improvement of Harbor Facilities

The following recommendations for harbor facilities are outlined on Diagram E: Harbor Improvement Plan (Appendix A), and include:

1. Identify Areas for Potential Private and Public Marina Facilities

Given the long term demand for new boating facilities in southwest Michigan, the Kalamazoo Harbor presents a significant opportunity to meet these needs. At the same time, the community recognizes that the harbor, particularly Kalamazoo Lake, must support a range of uses and environments if the harbor is to thrive.

Potential areas of expanding harbor facilities have been identified on the Harbor Improvement Plan, based on the following conditions:

- Where existing natural and built features create a "shadow area" within the harbor that has limited value for open recreational use.
- Where existing upland exists adjacent to the harbor that can provide room for land-based marina support facilities.
- Where there is proximity to downtown Douglas and Saugatuck so that boating facilities can act as a direct economic stimulus to these commercial areas.
- Where negative impacts to the natural environment would be minimized.

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The Harbor Improvement Plan identifies zones within the harbor as potential areas for facilities expansion, while limiting the overall encroachment into the open waters of the harbor. Areas suitable for the expansion of marina facilities have been categorized into four types:

- a. Retrofit and Expansion – Areas with existing docks and space for expansion
- b. New Facilities and Marinas – Where limited or no docks currently exist
- c. Limited Expansion – Where expansion is suitable, but demand restricted
- d. Individual Docks – For riparian owners, typically at individual homes

Once the areas for expansion were identified, they were measured, and a marina planning standard of 20 slips per acre was applied to understand the approximate capacity of each area. Key areas for facility expansion include the area south of downtown Saugatuck that could be used for a small public marina and expansion of private facilities, the area west and east of Tower Marine that is suited for private marina facilities, and the area east and north of downtown Douglas that could include the renovation of an existing marina and the development of a public marina.

Both of the proposed marina facilities noted as potentially publicly owned (one each near Saugatuck and Douglas) are likely to be transient in nature and developed to accommodate day users and, in the future, overnight stays. These areas are more suited to transient use, since neither has sufficient land to support boater parking, but are adjacent to public parks that could be the site of modest boater bath facilities. Such improvements could be made in phases as funds become available, and specific needs are identified. The first phase in both cases should include a dinghy dock. A second phase could include dock slips for day visitors. A third phase could then include expanded docking for overnight or extended transient visitors, along with permanent boater shower and bath facilities. The current master plan for Wade's Bayou Memorial Park calls for bathroom facilities in this marina expansion area, and these bathrooms could be designed for potential expansion to include boater facilities in the future. Should a full-service transient marina be developed at Coughlin Park, the City of Saugatuck should consider working cooperatively with Sergeant Marina to share bathrooms and boater facilities, given its proximity to the park.

If boat slips are built within the marina expansion areas to the extent they are delineated on the Harbor Improvement Plan, there could be approximately 500-600 slips added to the harbor. This represents a 50% growth in boat slips that could occur over a 10- to 20-year timeframe given current market growth expectations.

Currently, plans are being prepared for consideration by Saugatuck Township that will outline a development and land use scenario for the McClendon parcel located in the northern area of the harbor. The plans may include boater facilities outside of the USACE Project Limits and within the development site. Given the site's location adjacent to the mouth of the river and USACE channel, it is unlikely that such boater facilities, if proposed, will affect the use and maintenance of the harbor area.

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The Harbor Improvement Plan also delineates two mooring areas within the harbor for transient boaters. These two areas would replace the informal mooring area that is currently used within the harbor. The current location has adequate water depths to accommodate sail craft, but is located within two identified travel corridors within the harbor. As a temporary measure, the current mooring area needs to be marked with buoys. Once dredging occurs, the existing mooring area needs to be moved to the proposed locations and re-marked.

2. Establish a Pier Head Line

A pier head line that restricts the overdevelopment of boating facilities should be established through the harbor. The Harbor Improvement Plan delineates the recommended line, and it follows the edge of the areas identified for future harbor expansions. Should the local communities adopt the pier head line as part of their respective zoning ordinances, the line would become the maximum limit of dock expansion allowed in the harbor.

The City of Douglas has recently adopted a pier head line that varies based on the use of the waterfront. The line recommended as part of this study is consistent with the City of Douglas guidelines.

3. Modify Public Boat Launch Facilities

The Harbor Analysis Plan identifies a deficiency in parking at all three of the boat launches used for power boats. The plan recommends that the parking facility at Schultz Park be expanded to accommodate an additional 40 to 80 parking spaces in the area south and west of the existing lot. The actual location and design of the lot expansion will require additional site planning, and will need to balance the demands of multiple park user groups while considering the value of the existing wooded areas on site. The Schultz Park launch is the primary launch for the harbor in terms of number of launch lanes, but the other launches also serve a vital purpose for the harbor.

While the Spears Street ramp in downtown Saugatuck does not have any dedicated parking, there is a shuttle program in place that encourages use of the parking lot at the high school. Use of the shuttle has been growing in recent years as boaters are becoming aware of the program. In addition to local recreational boaters, many local marine related businesses rely on the ramp for water access. In addition, the launch helps facilitate emergency response and special event needs. The single-lane ramp is in poor condition, and the City of Saugatuck is currently pursuing funding to improve the facility.

The single-lane launch at the end of Union Street in Douglas primarily serves local boaters with little or no need for parking. As private land development occurs on adjacent properties, there may be less area available for parking, which could diminish the ramp's value. The community should work with local property owners to determine if cooperative arrangements can be made to maintain parking at this facility, or seek the purchase of currently vacant property for long term parking needs. The site has adequate width to expand the ramp to two lanes, and given the demand for local water access, such an expansion should be pursued.

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An improved kayak launch is included in the master plan for Wade's Bayou Memorial Park. This ramp is in an excellent location to take advantage of the growing demand for kayak boating, as it has great access to the natural, braided channels of the Kalamazoo River immediately upstream.

4. Designate Key Environmental Preservation Areas

The Harbor Improvement Plan identifies key areas within the harbor in which the value of the natural systems outweighs the potential demand for new facilities. These areas are found primarily within Douglas Harbor and are privately held.

The plan encourages maintaining a natural river edge where it currently exists, particularly in Douglas Harbor, and between downtown Saugatuck and the mouth of the river. The natural edge provides important wildlife and fisheries habitat, and helps filter stormwater before it discharges into the river.

Regulated and otherwise valuable "green" resources of the harbor are identified on the Harbor Improvement Plan as either "Preservation Area" or "Maintain Naturalized Edge." Methods for implementing these recommendations include wetland/waterfront protection ordinances at the municipal level, building and paving setback requirements, covenants and deed restrictions for new developments, donation of land to local conservancies, conservation easements, and purchase of property development rights.

All new upland development within the harbor basin should be required by ordinance to treat stormwater prior to release into the river or municipal system. This approach would encourage filtering of sediments and contaminants, and promote stormwater infiltration. Reconstruction of existing streets and parking lots in the basin should also include an update of stormwater management. Stormwater management techniques that could be considered include infiltration basins (e.g., rain gardens), vegetated drainage swales and oil/grit separators incorporated into stormwater structures.

5. Stabilize the Breakwaters at the Mouth of the Harbor

Current low water conditions and ongoing wear and tear have contributed to a degradation of the condition of the breakwater piers that extend into Lake Michigan at the mouth of the river. A thorough analysis of their condition, including an underwater survey, should be conducted to fully assess the need for maintenance and/or reconstruction, and to determine potential costs and funding sources.

6. Improve Public Access to the Water from the Land Side

Visual and physical access to the waterfront by non-boating visitors is critical to the success of the waterfront communities. While this study focuses on the future of the river itself, the need for shore area improvements must also be noted.

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A number of land side improvements have been proposed in other sections of this report for local waterfront parks. These improvements, such as new boater/bathroom facilities at Coughlin Park, are linked directly to the use of the water. In addition to these types of improvements, there are opportunities to enhance other points of access such as public street ends.

In downtown Saugatuck, there are a number of street ends that terminate at the water. At the water's edge, these areas provide space for dockage, a boat launch at Spears Street, and the chain ferry at Mary Street. These water-based uses provide an important function and a revenue source for the City of Saugatuck, and add to the diverse activity of the waterfront. On the land side, the street ends provide space for parking, green space parks and pedestrian overlooks of the water. The Master Plan advocates the continuation of these existing uses, but with physical improvements to enhance their appearance and accessibility. The street ends that include parking could be improved to allow more landscaping and a more pedestrian inviting design, similar to the street end at Mason Street. Special street paving could allow automobile parking while giving a clear indication that the pedestrian is also welcome, particularly at the water's edge. The street ends that are green space should remain as such, but some, including the one at Lucy Street, are beginning to deteriorate and should be renovated.

The street ends outside of downtown Saugatuck should provide public access and be designed to reflect the more residential character of the adjacent lands. Parking should be provided where feasible and where demand exists, but not in a way that paves the right-of-way from edge to edge. Low-level activities could be encouraged at these street ends, such as shore fishing and bird watching.

As a matter of long term policy, the City of Saugatuck has leased the boat slips that exist on public lands and street ends to the adjacent land owners. There are a number of reasons why this policy supports the overall interests of the community, including (a) the protection of privacy and quiet enjoyment of the adjacent owners, (b) the provision of necessary support to the success of adjacent businesses that use them, (c) the increased ability of the City of Saugatuck to manage the use of the facilities, and (d) the increased "eyes on the street" surveillance of the facilities by adjacent owners who have a direct interest. In addition, in downtown Saugatuck, public access agreements along private waterfront property have been provided in exchange for the lease of street ends.

In addition to street ends and parks, the local community would be well served to work with private property owners and the USACE to provide safe access to at least one of the breakwaters at the mouth of the harbor.

The next critical step in land side improvements will be to connect the public access points together as a string of experiences that can be accessed by pedestrians and cyclists. This conscious effort to establish a walking route around the harbor would connect the communities to each other and to the many public assets that exist. Many times these connections are as simple as adding sidewalks to select streets and an easy to read sign system.

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SEDIMENT MANAGEMENT PLAN

To support the existing use of the harbor and realize the opportunities to improve the harbor, the management and removal of sediments is critical. Without a plan to dredge the harbor, sedimentation will continue to expand the existing unusable portions of the harbor and choke off the economic vitality of Saugatuck and Douglas.

Sediment Disposal Options

A technical report detailing the characterization of the sediments, disposal options, costs and funding opportunities was prepared by RMT (refer to appendices). The results of this work are summarized here.

The sediments in the harbor contain contaminants that are the result of pollution that occurred at the paper mill previously located upstream in Plainwell. The primary contaminant of concern is PCB, and sediment samples taken as part of previous studies indicate elevated levels of PCB in the Kalamazoo Harbor sediments. The levels of PCB in the sediment are high enough to characterize the sediments as "Special" materials, but below the levels required to designate the material as "Hazardous."

The physical properties of the sediments can also be estimated from the previous studies. About half of the sediments can be categorized as silts and half as fine sands. The silts are more likely to hold the PCB contaminants than the fine sands.

Disposal options for any dredged sediments include:

1. Upland Disposal on Non-Riparian Property – This property could include the City of Saugatuck-owned parcels known as the "airport" site, the adjacent lands previously utilized as a landfill, the adjacent lands owned by the sewer authority, or other upland lands within a reasonable trucking distance of the site (approximately 15 miles). If disposal at the airport site is determined to be the best solution, the design of the fill should consider the potential for future use of the land (e.g., recreation, heliport, etc.).
2. Upland Licensed Landfills – Two of these landfills have been identified as suitable for this material.
3. In-Water CDF – The CDF approach was discussed at some length at workshop #1, and the resource and regulatory officials in attendance did not support this approach due to the potential loss of habitat and related impacts.

The first option is the most likely solution for disposal, based on the anticipated levels of contamination and the lower costs as compared to landfill disposal.

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Alternative strategies should be considered for the handling of the sediments to reduce project costs. These strategies include:

- Separating contaminated silts from clean fine sands. This approach could reduce the amount of material that requires special storage and make the remaining fill sand available for productive use in construction (e.g., as fill at city parks). Additional data on the sediment profile and contamination levels will be required before this analysis can occur.
- Pumping material to the airport site rather than trucking. A preliminary analysis of the costs of this approach indicates that there may be little or no savings; however, the investment in developing a dredge pipe system may be beneficial in the long term given the likelihood of phasing the dredge activity, and this option should remain under consideration.

Sediment Management Alternative Plans

Two alternative plans for dredging and sediment management have been prepared for consideration.

Alternative One (refer to Appendix A, Diagram F) proposes to dredge out a river channel up to the I-196 bridge as a public project, while leaving the dredging required to access the river channel as a responsibility of the local marina and property owners. Also proposed in this alternative is a set of linear stone structures that could channel the river flow and reduce the future deposition of sediments. This alternative would require the dredging of 350,000 cubic yards of sediments and the installation of 6,600 linear feet of stone structures. Key characteristics of this alternative include:

- Provides no open water recreation opportunities or anchorage area.
- Structures inhibit open use of water.
- Sedimentation will continue, but less than without structures.
- Structures may result in increased sedimentation at the “Cove” and mouth of the river.
- INITIAL COST.....\$20-\$30 MILLION.
- Payback period for structures – 15-30 years.

Alternative Two (refer to Appendix A, Diagram G) proposes a more comprehensive dredging program to open up more recreational use of Kalamazoo Lake and provide boater access to the Douglas Harbor waterfront. This plan reflects the historic limits of dredging that has occurred in the harbor over the past 140 years. This alternative would result in the dredging of about 1,000,000 cubic yards of material. Private dredging to gain access to the public dredging area is assumed. Key characteristics of this alternative include:

- Alters the disposal site to a greater degree to allow 1,000,000 cubic yards of storage.
- More substantial recreational use of the public waters.
- More incentive for private development, day use of the harbor and economic stimulus for the local economy.
- INITIAL COST.....\$35-\$45 MILLION.
- Dredging could be completed in phases.

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Both alternatives assume that a program for ongoing maintenance dredging will be required. Sedimentation is a naturally occurring process, and it is assumed that the rate of sedimentation experienced over the last 20 years will continue. Alternative One will limit sedimentation, but without the benefit of a comprehensive sedimentation model, the effectiveness of the channeling structures is difficult to predict. The river's median flow rate has a velocity that is unable to stop the deposition of sediments in the river channel, even with the channelization of the river as proposed in Alternative One. Removal of the sediments would be dependant on the increase in velocity accompanying storm events, which are infrequent and unpredictable. Based on the evidence known, we estimate, conceptually, that the rate of sedimentation would be cut in half if the river channel structures were installed. The potential developments of this property will require that the community identify another property for sediment staging or opportunities for pumping sediments directly to the disposal site east of I-196.

Based on this analysis of the two alternatives and community input, **the preferred plan is Alternative Two.**

Both alternatives anticipate the need for a lakeshore staging area for sediment management. The plans identify an area of about 14 acres for this purpose, in and around the area currently used by Tower Marine for sediment dewatering and storage. Although the 14-acre site is significantly smaller than a desirable 40-acre site that could maximize the efficiency of the operation, it is believed to be large enough to work. The use of this site for sediment management may be necessary over the long term, but the community should look at alternatives in the future that could return the land to a higher and better use, and return more tax dollars to the local community.

Many dredging scenarios and sediment management techniques were developed and evaluated as part of the planning process. The Sediment Management Plan that resulted from this process considers costs, market demand for new facilities, the current and projected use of the harbor, fisheries habitat, and the role the harbor plays in the economic viability of the surrounding communities and the state of Michigan.

Based on an analysis of the costs of dredging, use of the harbor and potential market demand for new facilities, the Sediment Management Plan indicates large areas of Douglas Harbor and some areas of Kalamazoo Lake that may not be dredged to navigable depths, and will be left undisturbed in the short term. As sedimentation continues in the harbor, and if low water levels persist, there is a possibility that islands may form within the harbor. The community may need to decide in the future if limited dredging should be advocated in these areas to maintain open, albeit shallow, water. Such a proposal will need to take into account the concerns expressed by the MDNR regarding the preservation of fisheries habitat. Dredging to maintain open water would be consistent with the community's desire for maintaining open water in the harbor and the historic harbor maintenance patterns.

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Dredge Phasing

Even with the potential to reduce costs below the estimates described above through separation of fine sands and silts, the high costs of dredging the harbor will likely dictate that the work will have to occur in phases as funds are made available. A Dredging Phasing Plan (refer to Appendix A, Diagram H) was prepared with community input and quantities of sediment removal estimated for each phase. The phases reflect the relative priority and need for dredging, and not the actual chronological order that the dredging may occur in. The community recognizes that funds may not be available to complete all of the dredging outlined on the plan, but believe that the full dredging plan must be accomplished if the harbor is to fully function as the lifeblood of the community.

Previously mentioned in this report is the idea of separating silts (which are more likely to hold contaminants) from the fine sands. The soils profile in the lake seems to indicate that the fine sands underlay the silts, such that it may be possible to excavate the upper layer of silt and leave the fine sands for a later phase of removal. In this manner, the phasing of the harbor could vary based on depth of excavation as well as geographic area. Further testing, referenced later in this report, will determine if this idea is feasible.

Dredging of the USACE Project Limits

The Master Plan assumes that the USACE will remain a part of maintaining an active, functioning harbor through regular efforts to dredge the entrance channel and river corridor within their Project Limits. Efforts of the local Lake Michigan lakeshore communities to work together to ensure the adequacy of USACE efforts and supplement this work with local dredging initiatives should be encouraged. Douglas and Saugatuck should continue to participate in this regional, cooperative coalition.

Dredging and the Natural Environment

Throughout the planning process, the MDNR Fisheries Division has consistently raised concerns over the effects of dredging on fisheries habitat, particularly related to the spawning of lake sturgeon. These concerns were expressed during the planning workshops, as referenced earlier in this report, and in a review of the final draft of this report.

In their response to the final draft, the Fisheries Division issued some general guidelines for scaling back dredging activities (refer to Appendix D). These concerns were shared with the community, and the plans included in this report reflect the community's consensus and response. The phasing of proposed dredging in Kalamazoo Lake puts a large part of the existing shallow water area as a last phase and priority for dredging, acknowledging the difficulty in funding the work and the concerns raised by the Fisheries Division. In the Douglas Lake area east of the Blue Star Highway bridge, the plan proposed dredging only along the existing river channel, which provides critical access to the existing boat launch ramps at Schultz Park, and along the shoreline adjacent to Douglas.

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Following the first issue of this report, the Fisheries Division issued a more specific response as to the extent of dredging they would support within the project area. This response is included in this report in Appendix D. The primary practical difference between the Fisheries Division's plan and the plan the community supported is the dredging of the existing river channel between the Blue Star Highway bridge and the boat launch ramps at Schultz Park. This potential conflict will need to be resolved as harbor plans are refined beyond the scope of this study and specific proposals are submitted for permit consideration.

WORKSHOP #3 AND FINAL PUBLIC PRESENTATION

On January 23, 2007, a community workshop was held at Saugatuck High School to present and discuss the preliminary recommendations for harbor improvements and sediment management. Members of the Harbor Committee, the general public, and representatives of the MDEQ and MDNR attended and provided feedback to the master planning team.

Copies of the preliminary recommendations were distributed to the Harbor Committee and regulatory and resource agencies for more detailed review and comment. These comments were considered carefully and addressed in the final Master Plan as appropriate.

A final public presentation was held on April 10, 2007, to communicate to the community the final Master Plan, as recorded in this report.