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# Harbor Fact Book

# St. Joseph/Benton Harbor

**Data Arranged by Topic**

**Compiled September 17, 2015**

**Southwest Michigan Planning Commission**
**376 W. Main Street, Suite 130**
**Benton Harbor, MI 49022**
**www.swmpc.org**

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**Berrien County Jail & Courthouse**

Challenges associated with locating the spoils from annual dredging within the harbor have prompted the County to search for options beyond those used in the past (Southwest Michigan Airport runway extension). One option included a study on the potential terracing of the land between the County jail and courthouse. The resulting project would enlarge the parking lot. Additionally, the proximity of the project to the harbor means that it would substantially reduce the cost of transporting the dredge spoil. The volume of fill required for the project represents roughly three "cycles" of annual dredging within the harbor. The proposed cost of the project is approximately one million dollars. There is a remote possibility that the Army Corps of Engineers would construct the project. However, such projects are highly competitive and it is unlikely that the harbor would win such a competition between harbors in Cleveland, Chicago, or other major ports. (Source of information - Dan Fette Berrien County Community Development Director 2015).

**Community Special Events**

Tri State Regatta

Annually Labor Day Weekend - Sailboat competition Chicago-St. Joseph-Michigan City, IN

Sailboats moor along the arboretum side of the outer harbor (approximately 40-50 boats)

Lighted Boat Parade - Third Weekend of July

**Dredging**

US Army Corps of Engineers manages the dredging of the harbor.

Outer Harbor

Outer Harbor channel dredged material is used for *beach nourishment*.

Outer Harbor ten year averages: $415,000; 54,000 cubic yards of dredging material removed

Outer Harbor Dredging is relatively inexpensive: $6.00-7.50 per cubic yard (spoils can be used for beach nourishment)

2013 Hurricane Sandy Relief Funds used to dredge the outer harbor in 2013

2014 Harbor Dredging - Outer Harbor (Hydraulic Dredging)

- 53,843 cubic yards
- $8.22 per yard
- $442,589 total cost

Inner Harbor

Inner channel material is placed upland.

Inner Harbor ten year averages: $140,000; 31,000 cubic yards of dredging material removed

Inner Harbor Dredging is relatively expensive: $22.50 per cubic yard (spoils can only be used for some "fill" because of the nature of the materials that they contain)

2014 Harbor Dredging - Inner Harbor (Mechanical Dredging)

- 52,491 cubic yards
- $18.29 per yard
- $958,485 total cost

**Economic Impact/Projections**

Bulk commodities generate $12,200,000 annually in direct revenue (USACE)

324 direct, indirect, and induced jobs supported (USACE)

Over $21,000,000 per year in personal income (USACE)

"Waterborne commerce has always played a strong role in Berrien County, most particularly through the St. Joseph River Harbor. It's the only deep-draft commercial harbor between Burns Harbor in Indiana and Holland Michigan. (Berrien County Master Plan, P. 34)

The County's proposed plan for reconfiguration of the Harbor "would create greater isolation from the increasing recreational uses seen throughout the harbor, but primarily in the inner-harbor, including the realization of the first phase (i.e., hotel) of a major seasonal and permanent residential development project. This could increase safety, by minimizing interaction between recreational watercraft and the commercial freighters that are several hundred feet long. It would also make way for more extensive inner-harbor waterfront recreational development . The proposal is intended to allow both activities to maximize their economic advantage." (Berrien County Master Plan, P. 34)

GOAL: Use transportation investments to advance economic opportunities and equity in Berrien County. (Berrien County Master Plan, P. 38)

OBJECTIVES: Prioritize transportation investments that bring sustainable, emergent sector manufacturing jobs to Berrien County. (Berrien County Master Plan, P. 38)

Preserve and enhance commercial, industrial, and recreational use of the St. Joseph and New Buffalo harbors. In particular, work on the sustainability of the St. Joseph commercial harbor. (Berrien County Master Plan, P. 38)

**Environmental Stewardship**

The opportunity will be explored to extend the ship canal from the Paw Paw River and create waterways from the St. Joseph River along the riverfront. Improving and protecting wetland and other natural areas will help alleviate stormwater issues in the City. In all developments and redevelopments, the City should look for opportunities to improve infiltration, encourage the reuse of water, and reduce water runoff. (Benton Harbor Master Plan 2010, P. 20)

Natural Resources, Parks and Environmental Features Plan: Areas of Focus (d) maximize the benefit of the rivers as public amenities by improving public access to the riverfront and providing public open space adjacent to the waterways. (Benton Harbor Master Plan 2010, pp. 47, 49)

A graphic representation of the vision for a new community riverfront park is provided (Benton Harbor Master Plan 2010, P. 48)

Sustainability Framework Plan: Areas of Focus (c) identify and protect environmental and ecologically sensitive areas of the city from the impact of development or adjacent development to include but not be limited to wooded areas, ravines, and waterways. (d) use smart growth principles, green building techniques, LEED certification, and best management practices in new development. (g) lessen the amount of water used and wastewater generated through reuse and use reduction. (Benton Harbor Master Plan 2010, pp. 65-67)

"The following Principles of Green Infrastructure, borrowed from Southwest Michigan Planning Commission (SWMPC) publications on the topic, are a good guide to be considered by the County during land use decision making:

1. Connectivity is key and context matters.
2. Green infrastructure should be grounded in sound science and land-use planning methods and practice.
3. Green infrastructure can and should function as the framework for conservation and development patterns, by planning for and protecting it prior to development requests.
4. Green infrastructure is a critical public investment that should be funded up front.
5. Green infrastructure benefits nature and people.
6. Green infrastructure respects the needs and desires of landowners and other stakeholders.
7. Green infrastructure requires making connections to activities within and beyond the community.
8. Green infrastructure requires long-term commitment." (Berrien County Master Plan, P. 13)

GOAL: Protect, preserve and restore the natural resources of Berrien County by creating a connected network of open spaces, recreational areas, nonmotorized paths & trails, and natural habitats. (Berrien County Master Plan, P. 17)

Objective: Protect and improve the quality of our water resources with a comprehensive program of planning, maintenance, and best management practices. (Berrien County Master Plan, P. 17)

"Preservation and protection efforts in the St. Joseph River watershed should focus first on the Paw Paw, Dowagiac, and Rocky River subwatersheds. These subwatersheds were designated and prioritized through a multi-layered evaluation process, rooted in a land cover analysis and refined through Steering Committee and Watershed Coordinator review of the scoring arising from that analysis as well as multiple other factors. The Paw Paw, Dowagiac, and Rocky River subwatersheds were identified as the highest priority areas for preservation efforts" (St. Joseph River Watershed Management Plan, P. 47)

"There are a variety of sound, proven preservation and protection strategies that communities across the United States have implemented (see particularly Protecting Water Resources with Smarth Growth and Building Sustainable Communities in the References section). Any preservation effort should seek to identify, prioritize, protect and connect natural areas, working lands, and open space in a proactive, comprehensive, and coordinated fashion. To be sure, land conservancies, conservation districts, drain commissions, and private property owners all have vital roles to play but local governments are responsible for most land use decisions and can have the most profound positive impact through coordinated planning and zoning." (St. Joseph River Watershed Management Plan, P. 48)

"Cities and towns in the St. Joseph River watershed continue to grow, and with growth comes economic development essential to enhancing the competitiveness and quality of life of communities. However, growth at the expense of natural resources is unwise."  " the NPDES Phase II communities of St. Joseph/Benton Harbor, Elkhart/Goshen, and South Bend/Mishawaka. These areas are characterized by extensive impervious surfaces. The displacement of cropland, open space, and forested areas by the impervious surfaces of driveways, streets, and buildings greatly intensifies the volume and velocity of stormwater runoff, exacerbates stream channel erosion, and diminishes groundwater recharge. Furthermore, the sediments, nutrients, toxins, and pathogens transported from impervious surfaces into surface water substantially degrades streams, rivers, wetlands, and lakes. Once the impervious area of a watershed exceeds 10 percent, aquatic ecosystem health tends to decline; at 30 percent impervious cover, the watershed becomes severely impaired. Urban land uses (residential and commercial/industrial/transportation) contribute disproportionately high loads of pollutants compared to the area they occupy in watersheds." (St. Joseph River Watershed Management Plan, pp. 48-49)

"The establishment and preservation of buffers and natural floodplains (by policy, code, or ordinance) may be the single most important component of any plan to mitigate the impacts of storm water runoff. Once these features are lost, mitigation of stormwater runoff becomes more complicated and costly. Where existing development precludes the use of effective nonstructural controls such as buffers or bio-retention cells, structural practices that control flooding and improve water quality might be the only suitable option to decrease the nonpoint source pollution loads generated from developed areas. Where and whenever possible, surface water treatment systems should be an integration of source, conveyance, and infiltrative controls — both

structural and nonstructural, natural and man-made." (St. Joseph River Watershed Management Plan, P. 50)  A discussion of design options, their effectiveness and return on investment follows on pages 50-51.

**Freight Commerce**

Commodities received include limestone, sand, gravel, limestone, armor stone, cement, slag, salt, and petroleum products. (USACE)

Five year average (2007-2011) tonnage is 388,575 tons of material shipped and received. (USACE)

Shipping traffic: 2004-2009: Averaged 34 ships annually. 2010-2014: Averaged 20 ships annually. (http://www.resilientmichigan.org/downloads/port_presentation6.pdf)

Primary commercial role of the port was as distribution point for sand, gravel, cement, liquid fuels. (River Action Plan)

**1970-2000**
**St.Joseph River Harbor Activity**
**Import Commodity in Tons**

| Year | Petro | LimeStone Sand, Gravel Stone, Aggregate | Lime and Fertilizer | Cement | Salt | Lumber | Miscellaneous | Total |
|---|---|---|---|---|---|---|---|---|
| 1970 | 80,696 | 281,716 | - | 109,515 | 45,879 | - | 15,000 | 532,806 |
| 1971 | 80,459 | 282,682 | - | 134,230 | 50,000 | - | - | 547,371 |
| 1972 | 71,250 | 287,931 | - | 85,983 | 6,500 | - | - | 451,664 |
| 1973 | 26,510 | 308,889 | - | 75,822 | 22,973 | - | - | 434,194 |
| 1974 | 14,501 | 226,222 | - | 92,802 | 42,130 | - | - | 375,655 |
| 1975 | 6,923 | 168,028 | - | 72,728 | - | - | 4,000 | 251,679 |
| 1976 | 20,338 | 110,066 | 23,063 | 70,978 | 29,199 | - | - | 253,644 |
| 1977 | 53,161 | 183,593 | - | 69,159 | 28,691 | - | - | 334,604 |
| 1978 | 50,000 | 205,956 | 17,727 | 77,186 | 105,901 | - | - | 456,770 |
| 1979 | 29,102 | 264,155 | 30,428 | 97,797 | 32,613 | - | - | 454,095 |
| 1980 | 19,893 | 236,547 | 10,633 | 92,816 | 68,488 | - | 7,924 | 436,301 |
| 1981 | 48,292 | 111,295 | 12,400 | 96,061 | 130,700 | - | - | 398,748 |
| 1982 | 12,938 | 138,003 | 16,700 | 98,782 | 97,460 | - | - | 363,883 |
| 1983 | 16,104 | 128,496 | 14,460 | 98,528 | 40,000 | - | - | 297,588 |
| 1984 | - | 192,595 | 17,000 | 117,860 | 81,457 | - | - | 408,912 |
| 1985 | - | 155,926 | 12,761 | 113,970 | 91,100 | 16,900 | - | 390,657 |
| 1986 | - | 216,040 | - | 152,000 | 86,000 | 23,192 | 30,474 | 507,706 |
| 1987 | - | 322,477 | - | 122,186 | 55,340 | - | - | 500,003 |
| 1988 | - | 284,606 | - | 132,884 | 91,217 | - | 9,054 | 517,761 |
| 1989 | - | 238,226 | - | 143,000 | 68,998 | - | 10,992 | 461,216 |
| 1990 | - | 247,255 | - | 170,000 | 64,713 | - | 32,595 | 514,563 |
| 1991 | - | 187,727 | - | 220,717 | 61,809 | - | - | 470,253 |
| 1992 | - | 305,038 | - | 222,115 | 43,541 | - | - | 570,694 |
| 1993 | - | 253,283 | - | 227,208 | - | - | - | 480,491 |
| 1994 | - | 364,390 | - | 270,700 | 59,404 | - | - | 694,494 |
| 1995 | - | 302,813 | - | 243,239 | 14,565 | - | - | 560,617 |
| 1996 | - | 269,847 | - | 233,430 | 66,677 | - | - | 569,954 |
| 1997 | - | 391,154 | - | 232,090 | 58,527 | - | - | 681,771 |
| 1998 | - | 471,070 | - | 263,677 | 24,684 | - | - | 759,431 |
| 1999 | - | 289,491 | - | 228,197 | 35,331 | - | - | 553,019 |
| 2000 | - | 523,394 | - | 212,344 | 34,451 | - | - | 770,189 |

Details of the three docks providing commercial service are available as table 5.3 (pp. 33-39). Includes: owner, operator, exact location, cargo, length of dock wall, construction of wall, depth, height above water, land area, depth in channel... (River Action Plan)

Ships currently using the port are up to 650 feet in length and only marginal increases to that could be reasonably considered even if fully dredged (assuming the turning basin could not exceed 740 feet in diameter). (River Action Plan)

If the channel can be guaranteed at a consistent 21 feet depth, the competitive situation for the port would improve. Deepening enables cargo to be delivered at a cost advantage to users. (An exploration of harbor depth and the impact on freight costs is included (pp. 46-47)). A move from a 21 to 23 foot draft improves cargo capacity by 18 percent. These savings apply to stone, sand, gravel, and salt. Army Corps estimates show that a 3 foot channel deepening would yield 76,000 yards of material to be moved (46,000 from outer harbor, 30,000 from inner, turning basin, & canal). (River Action Plan)

The Study includes a fairly deep exploration of the prospects of expanding the material handled through the harbor as well as passenger movement (River Action Plan, pp. 49-63)

Possible scenarios are included (River Action Plan, pp. 65-71).

Economic impact of commercial operations: example given of dockside operations in the three commercial terminals employ no more than 10 people. But one of them employs two to run their dock. The dependant employment at the associated plant (Consumers Asphalt) is more than 20 times that number. This important multiplier is highlighted as well as the statement; "the port brings not just jobs, but improved quality of life by using the least polluting and safest mode of transportation - ships." (River Action Plan)

In 2000, 523,000 tons of stone and sand were imported. If the port was not available, the products might have been shipped through Holland and trucked at an additional cost of $6.00/ton. (River Action Plan)

Cement - In 2000, 232,000 tons were handled. The least cost of transportation from an outside source would have been on the order of $10.00/ton. (River Action Plan)

Salt - In 2000, 34,000 tons handled. A cost savings of $3.00/ton for distribution over the road. (River Action Plan)

**Funding**

US Harbor Maintenance Trust Fund established in 1986 to fund the operation and maintenance of ports and harbors and is funded by the Harbor Maintenance Tax (HMT). Appropriations from the HMTF, which are primarily used by the Army Corps of Engineers for maintenance dredging, dredged material disposal areas, jetties, and breakwaters, have lagged behind revenues collected into the HMTF for several years. The resulting HMTF surplus was approximately $7 billion at the end of FY12 and continues to grow by hundreds of millions of dollars each year.

HMTF funds more accessible if harbor imports more than 1 Million tons of material; HMTF funds more accessible if harbor has plans and processes to reduce maintenance costs.

**Harbor Dimensions**

Deep Draft Commercial Harbor

Project depths of 21 feet in the entrance and inner channel: 18 feet in the inner river channel and turning basin (USACE)

1.5 miles of maintained channel

Outer Harbor: beyond end of pier to M-63 Bridge

Authorized depth: 21 feet

US Army Corps of Engineers Recommended Depth: 21 feet

Authorized Width: 190-645 feet

US Army Corps of Engineers Recommended Width: 190-645 feet

Inner Harbor: from M-63 bridge east from turning basin to mouth of Paw Paw River

Authorized depth: 21 feet

US Army Corps of Engineers Recommended Depth: 21 feet

Authorized Width: 230-700 feet

US Army Corps of Engineers Recommended Width: 230 feet

The north pier is 160 feet longer than the south pier (presumably to limit the littoral drift of beach sand from north to south). (River Action Plan)

Entrance channel between the piers narrows from 265 feet at the entrance to 200 feet with a course change needed of around 20 degrees on entering the narrow section. (River Action Plan)

The CSX railroad swing bridge has a reported 94 foot opening on the north side (the preferred channel for ships). (River Action Plan)

The M-63 bridge has a reported 100 foot clear opening. (River Action Plan)

An Ameritech fiber optic cable is located "15-20 feet below the river bottom" (River Action Plan)

High pressure gas line resides at "549.6 feet when laid in 1957". (The IGLD datum for the Lakes has changed since 1955 and the 1985 low water datum is 577.5 versus 576.8. The datum change is due to continued structural changes in the Great Lakes basin.) (River Action Plan)

City of St. Joseph - 12 inch force main sanitary sewer, 12 inch water main, 20 inch water main. These water mains may only have been associated with a water tower that was located on the north side until its remove in approximately 2006. Burial depths are not known but assumed to be at least as deep as earlier lines laid in the 1930s at a 547 foot datum. (River Action Plan)

**Industrial Land Use**

Industrial Framework Plan: Areas of Focus (j) maintain existing commercial shipping dock operations. (Benton Harbor Master Plan 2010, P. 39)

Port: This land use designation reflects the location of the Central Dock and is intended to accommodate its existing commercial shipping dock operations. If redevelopment of the port area occurs in the future, a river-oriented commercial/recreation/mixed-use development would be most appropriate. (Benton Harbor Master Plan 2010, P 39)

**Legislative Foundation**

Authorization: River & Harbor Acts of 3 Mar 1875, 14 Jun 1880, 3 Mar 1899, 30 Aug 1935, 2 June 1937, Mar 1945, 3 Jul 1958

LEGISLATION PERTINENT TO THE WATER RESOURCES PROGRAM OF THE CORPS OF ENGINEERS

http://planning.usace.army.mil/toolbox/library/EPs/digest_appendixb.pdf

B-11. 3 March 1875, River and Harbor Act of 1875. Work by Contract. Section 1 directed that Secretary of the Army apply funds as far as may be advantageous by contract, after public advertisement, with the lowest responsible bidders.

B-22. 3 March 1899, River and Harbor Act. Permits. Section 9 requires approval of the Chief of Engineers, the Secretary of the Army and the consent of Congress for the construction of bridges, dams, dike, etc., across any navigable water of the U.S. Structures built under state authority in a single state require approval of the Chief of Engineers and the Secretary of the Army (33 U.S.C. 401). Section 10 prohibited placing obstructions to navigation outside established Federal lines and excavating from or depositing material in such waters, unless a permit for the works has been authorized by the Secretary of the Army (30 Stat. 1151, 33 U.S.C. 403). Harbor Lines. Section 11 authorized the Secretary of the Army to establish harbor lines beyond which no piers, wharves, etc., shall be extended without a permit (30 Stat. 1151, 33 U.S.C. 404). Refuse. Section 13 prohibited depositing refuse, except that flowing from streets and sewers in a liquid state, into any navigable water (30 Stat. 1152, 33 U.S.C. 407). Obstructions. Section 15 prohibited obstructions by anchoring vessels and outlines the duties of an owner of a sunken vessel (30 Stat. 1152, 33 U.S.C. 409). Sunken Vessels. Section 19 authorized removal of sunken vessels or other obstructions to navigation, if not removed by owner. (33 U.S.C. 414). Vessel Grounding. Section 20 authorized removal or destruction of sunken or grounded vessels in emergencies endangering navigation. (33 U.S.C. 415).

B-52. 30 August 1935, Public Law 409, 74th Congress--River and Harbor Act. Content of Survey Reports. Section 5 required that studies of the improvement of the entrance of the mouth of any river or of any inlet contain information concerning the possible accretion/erosion effects of the improvements on the shoreline for at least 10 miles on either side (49 Stat. 1048, 33 U.S.C. 546a).

B-64. 2 March 1945, Public Law 14, 79th Congress--River and Harbor Act of 1945. Clearing and Snagging. Section 3 authorized small clearing and snagging projects for navigation or flood control. Annual expenditure for Nation limited to $300,000 (59 Stat. 23, 33 U.S.C. 603a). This

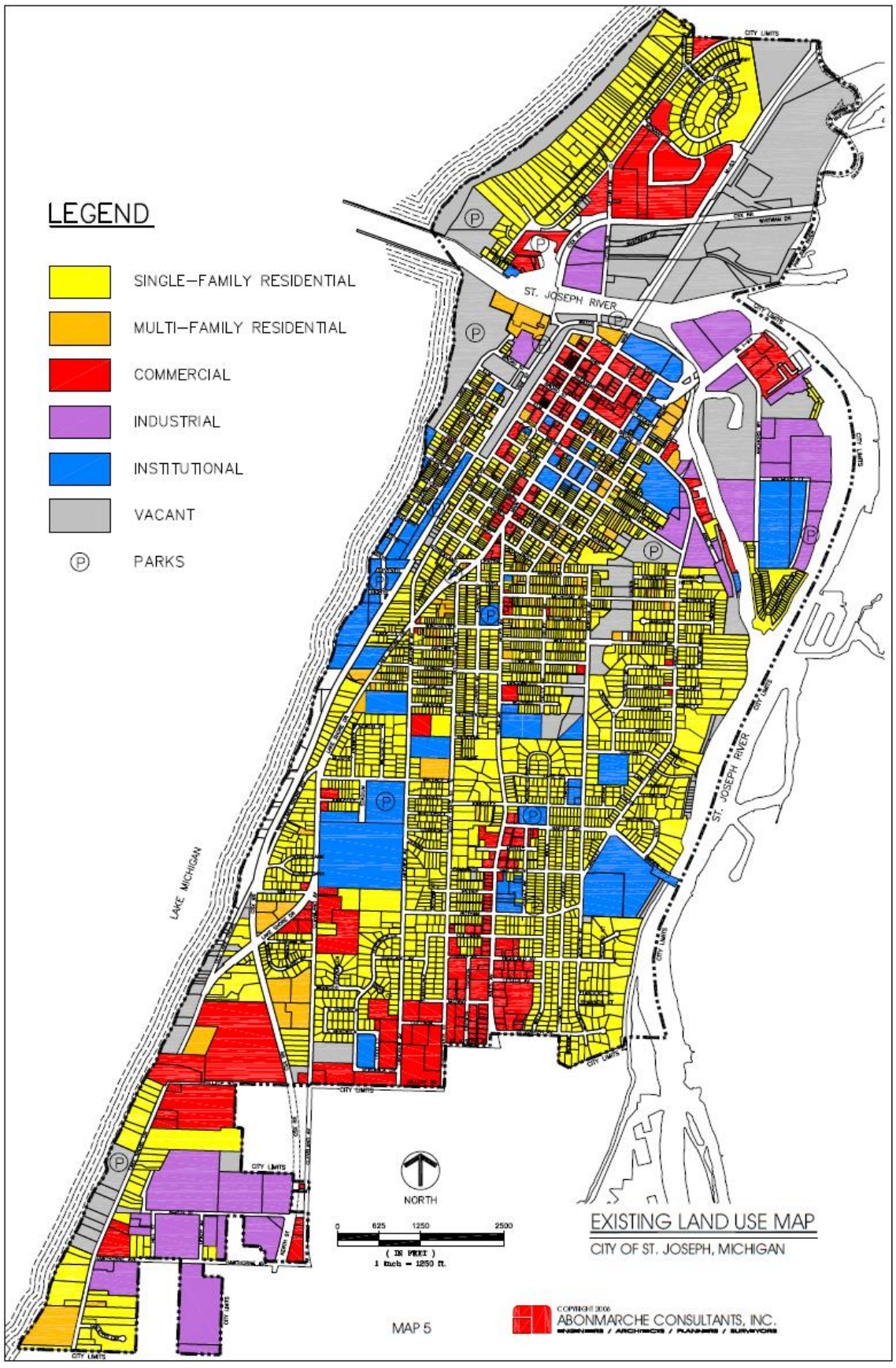
limit was raised to $1 million per year, 17 November 1986, by Section 915(g), Public Law 99-662.

B-80. 3 July 1958 Public Law 85-500,--River and Harbor and Flood Control Act of 1958. Relocation of Governmental Structures. Section 111 authorizes the Chief of Engineers to protect, alter, reconstruct, relocate, or replace any governmental structure or facility to meet a navigation or flood control purpose; or preserve the facility when it is determined that the safety or usefulness will be adversely affected or threatened by the project. (72 Stat. 303) NOTE: Amended by Section 309, Public Law 89-298. Hurricane Projects. Section 203 added provisions of local cooperation on three hurricane flood protection projects which established an administrative precedent for cost sharing in hurricane projects. Non-Federal interests were required to assume 30 percent of total first costs, including the value of land, easements and rights of way, and operate and maintain the project. (72 Stat. 297). NOTE: Section 103 of Public Law 99-662 now prescribes hurricane and storm damage reduction project cost sharing. Water Supply. Section 301 (Water Supply Act of 1958) provided that storage may be included for present and future municipal or industrial water supply in Corps or Bureau of Reclamation projects; the costs plus interest to be repaid by non-Federal entities within the life of the project but not to exceed 50 years after first use for water supply. No more than 30 percent of total project costs may be allocated to future demands. An interest-free period, until supply is first used, but not to exceed ten years, was permitted. (72 Stat. 319, 43 U.S.C. 390b). NOTE: These provisions were modified by Public Law 99-662. Aquatic Plant Control Program. Section 104 authorized a comprehensive project for control and progressive eradication of water-hyacinth, alligator weed, and other obnoxious aquatic plant growths in eight southern states. (72 Stat. 297, 300).

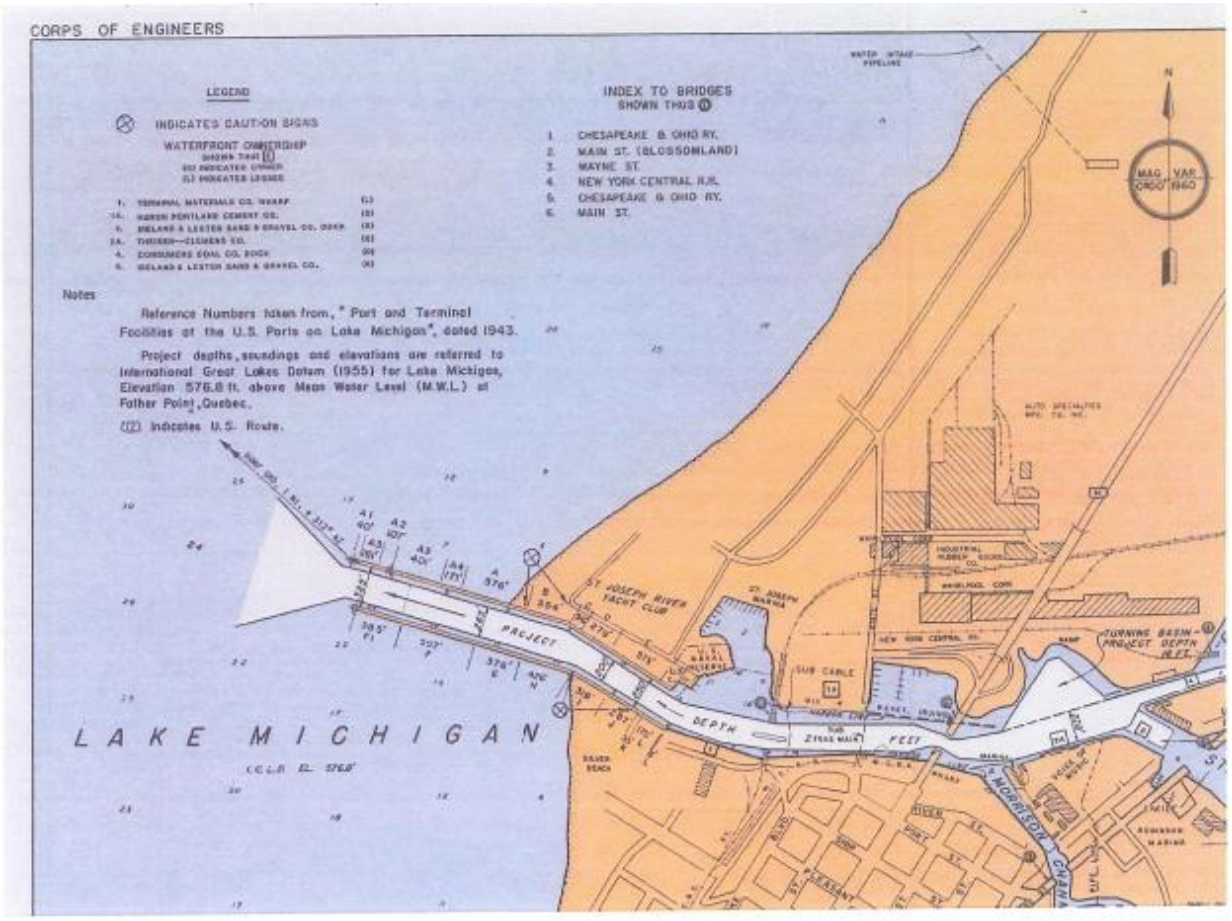
## Major Stakeholders

Major stakeholders include U.S. Coast Guard Station St. Joseph (maritime safety & search and rescue), Lake Carriers' Association, Lafarge North America, Dock 63, and Central Dock Company. Two of the commercial docks are located in the Inner Harbor.

## Map Resources


LEGEND
SINGLE–FAMILY RESIDENTIAL
MULTI–FAMILY RESIDENTIAL
COMMERCIAL
INDUSTRIAL
INSTITUTIONAL
VACANT
PARKS
ST. JOSEPH RIVER
LAKE MICHIGAN
CITY LIMITS
NORTH
0 625 1250 2500
( IN FEET )
1 inch = 1250 ft.
EXISTING LAND USE MAP
CITY OF ST. JOSEPH, MICHIGAN
MAP 5
COPYRIGHT 2006
ABONMARCHE CONSULTANTS, INC.
ENGINEERS / ARCHITECTS / PLANNERS / SURVEYORS

Map of public property identified as "city", "county", "federal", and "state". (http://www.resilientmichigan.org/downloads/port_presentation6.pdf)




http://www.lre.usace.army.mil/Portals/69/docs/Operations/ProjectMaps/LRE_N006.JPG 1/22/2015

**Mixed Use Development**

Land Use and Development, Areas of Focus: (g) Support new mixed-use developments along the riverfronts, and within the Arts District, to include an appropriate mix of residential, retail, office, and entertainment activity. (Benton Harbor Master Plan 2010, P. 26)

These areas should be designed to encourage walkability. Buildings along the riverfronts should be designed to incorporate the water as a true amenity, maintaining views, and providing outdoor seating overlooking the water and designed to reduce runoff to the waterways. (Benton Harbor Master Plan 2010, P. 27)

An "illustrative riverfront concept" is provided within the Plan to help clarify the vision. (Benton Harbor Master Plan 2010, pp. 28-29)

Commercial Development: Riverfront/Mixed-Use/Recreation designation. Similar to the mixed-use classification, this area can also include open space, recreation, and residential uses. Te overall emphasis for all development in this classification is to ensure the riverfront is an amenity for the community. This can be achieved by improving public access to the river, maintaining views of the water, and utilizing green building techniques. (Benton Harbor Master Plan 2010, P. 35)

Toledo attempted and failed to successfully revitalize its downtown waterfront through non-cargo related enterprise in the mid-1980s. Apparently a lack of urban density nearby caused the area to be "dead" after 5:00 pm. (River Action Plan)

**Navigation**

High open water waves can travel directly up the entrance channel into the outer harbor. Waves within the harbor channel are a serious and potentially dangerous problem for small craft and large commercial vessels. Predicted wave heights by season are available in the Study (River Action Plan, P. 17)

Navigation when waves exceed 3.0 feet will be a challenge for small vessels. When over 4.0 feet commercial bulk cargo vessels will experience difficulties. (River Action Plan)

Ideally, navigation channels should be 4-5 times the width of the largest vessel's beam. Because the harbor entrance channel narrows to 200 feet the maximum beam of self unloading ships that generally access the harbor is 76 feet 8 inches, therefore the ratio is less than 3:1. (River Action Plan)

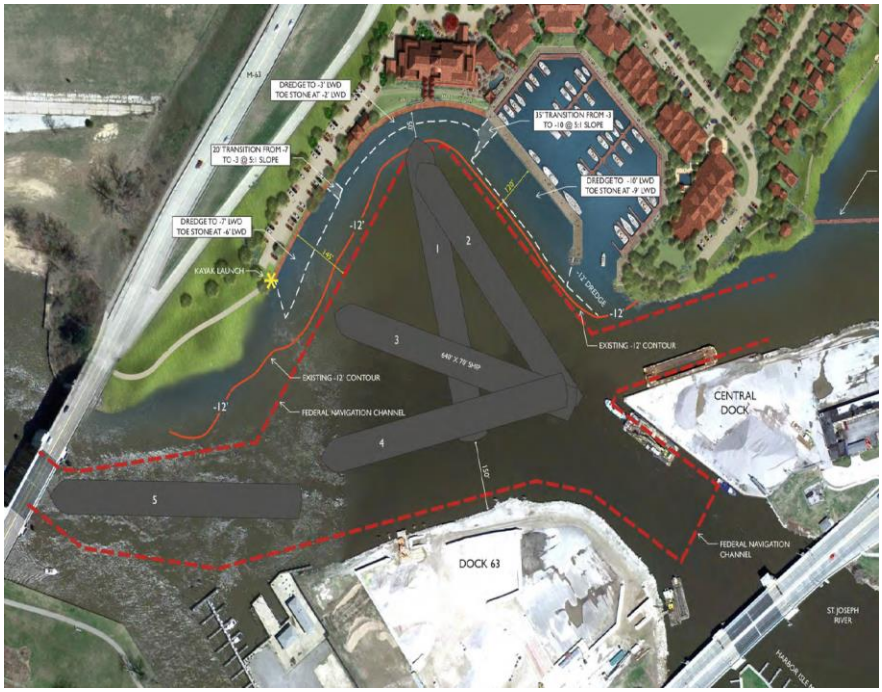
Periods of high wind in combination with waves will make the harbor inaccessible 11 percent of the time during March to November shipping season. (River Action Plan)

Wave Data for the Chicago to St. Joseph/Benton Harbor Shipping Corridor (Ferry Study pp. 11-16)

**Photography Aerial, etc.**

A slide deck was created for the St. Joseph Master Plan that includes historic photos of the harbor from 1896, 1930, 1970, 1990, current.
http://www.resilientmichigan.org/downloads/port_presentation6.pdf

Aerial photograph with the two bridges around the Harbor as gateways between Benton Harbor and St. Joseph. (http://www.resilientmichigan.org/downloads/port_presentation6.pdf)




Historical maps and aerial photos of the harbor with the orientation of prior commercial docks are available (River Action Plan, pp. 23-29).

**Public Opinion**

A survey was developed and distributed to St. Joseph residents in association with the Resilient St. Joseph Plan to help answer questions regarding "Developing a Future Vision for the St. Joseph Harbor." http://www.resilientmichigan.org/downloads/compiled_results.pdf

Which issues regarding the Harbor are most important to you? #1 Land Use; #2 (tie) Economics; #2 (tie) Dredging; #3 Recreation/Recreational Boating.

Do you think the commercial harbor should remain in operation? Yes (84%), No (7%)

Do you support the realignment of the commercial harbor to consolidate all industrial land uses west of M-63? No (36%), Yes (35%), No Answer (29%)

A summary of a panel discussion surrounding the Harbor has been provided in association with the St. Joseph Resiliency Plan. The notes focus on eight topic areas: Land Use, Traffic, Visibility, Grants, Other Funding, Dredging, Planning (visions). http://www.resilientmichigan.org/downloads/transcribed_notes_1_22.pdf

**Recreational Harbor Data**

Recreational harbor dredging is usually done in the areas of greatest need. The perceived rationale is that commercial navigation is clearly in the federal interest, while recreational boating activities are lower priority. (Great Lakes Recreational Boating Economic Benefits Study, P.12)

An average Great Lakes boat owner spends about $3,600 per year on their boat including $1,400 on craft-related expenses (e.g., equipment, repairs, insurance, slip fees) and $2,200 on boating trips (e.g., gas and oil, food, lodging) involving an average of 23 boat days. (Great Lakes Recreational Boating Economic Benefits Study, P. 5)

Average spending per boat day on trips varies from $76 for boats less than 16 feet in length to $275 per day for boats larger than 40 feet. (Great Lakes Recreational Boating Economic Benefits Study, P. 5)

The greatest trip expenses are for boat fuel (22%), restaurants and bars (17%) and groceries (14%). (Great Lakes Recreational Boating Economic Benefits Study, P. 5)

The majority of annual craft expenses are for equipment (39%), maintenance and repair (29%) and insurance (14%). (Great Lakes Recreational Boating Economic Benefits Study, P. 5)

The most prevalent size boat on the Great Lakes is between 16 and 20 feet in length, which covers about 28 percent of the Lakes' recreational fleet. (Great Lakes Recreational Boating Economic Benefits Study, P. 6)

The most popular type of boat on the Lakes is the 16 to 24-foot fiberglass runabout. (Great Lakes Recreational Boating Economic Benefits Study, P. 6)

At a typical Great Lakes marina, Tower Marine in Saugatuck, Michigan, the 395 boats renting slips spent $2.85 million on annual craft expenses and another $2.85 million on boating trips, accounting for 15,000 days of boating in 2004. The direct economic impacts of trip spending was $1.8 million in sales, $661,00 in wages and salaries and $952,000 in value added to the local economy, supporting 37 jobs. Annual craft expenses directly supported an additional 44 jobs from $2.6 million in direct sales, $834.000 in wages and salaries and $1.5 million in value added. (Great Lakes Recreational Boating Economic Benefits Study, P. 6)

The average cost of the half-day lake trout and salmon charter, the most popular trip, is $328 per boat. This cost ranges from $25 to $560 across the region. (Great Lakes Recreational Boating Economic Benefits Study, P. 7)

Estimated annual revenues for charter boat operators are $19,782, with a net positive cash flow of $4,298 for firms making boat loan payments and a net positive cash flow of $8,339 for firms

not making boat loan payments. (Great Lakes Recreational Boating Economic Benefits Study, P. 7)

Depending on the depreciation situation, the average Great Lakes charter firm operated at a net return of either negative (-$791) or a positive $4,078 for the owner's time and labor. (Great Lakes Recreational Boating Economic Benefits Study, P. 7)

Average trip spending by recreational boat size provided (Great Lakes Recreational Boating Economic Benefits Study, pp. 13-14).

Table E16 Direct Economic Impacts of Registered Boats on State Economies. Of the eight great lakes states, expenditures were the highest in Michigan for: trip spending, annual craft spending. (Great Lakes Recreational Boating Economic Benefits Study, pp. 25-28)

Table R1 Watercraft Registration Trends in Great Lakes States. Michigan showed a 6.6% increase in registered boats from 1999-2003. A larger number of boats than any other state and the second largest increase since 1999 to Wisconsin. (Great Lakes Recreational Boating Economic Benefits Study, P. 34)

Figure CF2 Number of Charter Fishing Trips by State in 2002. Shows Michigan with the most trips (27,715) of any Great Lakes State. (Great Lakes Recreational Boating Economic Benefits Study, P. 67)

Table CF6 and accompanying text data - Economic Impacts of Charter Fishing in Michigan. (Great Lakes Recreational Boating Economic Benefits Study, P. 71)

Of the reported 1,600 slips, 600 are occupied by out of state boaters. It is estimated that spending per boater is $50 per head per day. (River Action Plan)

A 1995 American Travel survey for Illinois indicated 5.3 million person trips in 1995 from Michigan, which was the highest of all states. (Ferry Study P. 2)

St. Joseph has 2,600 boat slips of which some 35% are seasonally rented by small boat owners from Illinois. We have assumed that half of the Illinois ships are Chicago owners they would make at least monthly visits during the period, with a typical party of 2.4 persons, for a total trip activity of 6,500. (Ferry Study)

There is a separate market for winter boat storage, and Chicago owners will sail their boats to St. Joseph at the end of the season, and then re-commission them in May the following year. (Ferry Study P.9)

Potential Ferry Terminal Sites within the harbor were analyzed (Ferry Study pp. 23-27).

**Transportation & Circulation**

Transportation and Circulation Plan: Areas of Focus (g) support existing boat slips and attract/construct new slips and marinas to increase boating opportunities in the city. (b) construct an interconnected trails and sidewalk system throughout the city that links residential neighborhoods to community facilities (Benton Harbor Master Plan 2010, pp 53, 54, 58)

Average daily road traffic in the Harbor area: Upton Drive near RR tracks - 2 axel trucks 1,177, 3+ axel trucks 21. Total vehicles = 1,230. Upton Drive between Momany and M-63: 2 axel trucks 623, 3+ axel trucks 485. Total vehicles = 1,404. Other traffic trends: ADT at M-63 and Klock Road (June 2013) 4,562. M-63 and Port Street (June 2013) 7,192. Ship Street and Lake Blvd (Nov. 2012) 1,384. (http://www.resilientmichigan.org/downloads/port_presentation6.pdf)

Berrien County Master Plan - "this update promotes the development of walkable communities, trail networks and interconnected communities." (Berrien County Master Plan, P. 4)

**Value of Harbor to Community**

Further detail on this goal and objective is provided (Berrien County Master Plan, P. 17)

"Waterborne commerce has always played a strong role in Berrien County, most particularly through the St. Joseph River Harbor. It's the only deep-draft commercial harbor between Burns Harbor in Indiana and Holland Michigan. (Berrien County Master Plan, P. 34)

The County's proposed plan for reconfiguration of the Harbor "would create greater isolation from the increasing recreational uses seen throughout the harbor, but primarily in the inner-harbor, including the realization of the first phase (i.e., hotel) of a major seasonal and permanent residential development project. This could increase safety, by minimizing interaction between recreational watercraft and the commercial freighters that are several hundred feet long. It would also make way for more extensive inner-harbor waterfront recreational development . The proposal is intended to allow both activities to maximize their economic advantage." (Berrien County Master Plan, P. 34)

GOAL: Use transportation investments to advance economic opportunities and equity in Berrien County. (Berrien County Master Plan, P. 38)

OBJECTIVES: Prioritize transportation investments that bring sustainable, emergent sector manufacturing jobs to Berrien County. (Berrien County Master Plan, P. 38)

Preserve and enhance commercial, industrial, and recreational use of the St. Joseph and New Buffalo harbors. In particular, work on the sustainability of the St. Joseph commercial harbor. (Berrien County Master Plan, P. 38)