

**GRAND HAVEN CHARTER TOWNSHIP BOARD**  
**MONDAY, APRIL 25, 2016**

**WORK SESSION – 6:00 P.M.**

1. Discussion of Policy for Certain Non-Profits and Building Fees
2. Questions or Comments on the Master Plan

**REGULAR MEETING – 7:00 P.M.**

- I. CALL TO ORDER
- II. PLEDGE TO THE FLAG
- III. ROLL CALL
- IV. APPROVAL OF MEETING AGENDA
- V. CONSENT AGENDA
  1. Approve April 11, 2016 Board Minutes
  2. Approve Payment of Invoices in the amount of \$443,011.78 (*A/P checks of \$330,525.22 and payroll of \$112,486.56*)
  3. Health Pointe PUD Agreement
  4. Piper Lakes Apartments – PUD Extension
- VI. OLD BUSINESS
  1. None
- VII. NEW BUSINESS
  1. Resolution 16-04-01 – Administrative Policy on Single Family Building Fees for Non-Profits (*Low Income, Handicapped and Funding Raising Events*)
  2. Resolution 16-04-02 – Accepting Witteveen Farm and Wolfe Property into the Township’s Park System
  3. Resolution 16-04-03 – Approve MERS Health Care Savings Plan
  4. Resolution 16-04-04 – Approve MERS Retiree Health Funding Vehicle
  5. Resolution 16-04-05 – Approve MERS CLS Trust Transfer and MERS Health Care Savings Agreement
  6. Resolution 16-04-06 – Approve 2016 Resilient Grand Haven Master Plan
- VIII. REPORTS AND CORRESPONDENCE
  1. Correspondence
  2. Committee Reports
  3. Manager’s Report
    - a. March Economic Development Report (Chamber)
    - b. March Legal Review
  4. Others
- IX. EXTENDED PUBLIC COMMENTS/QUESTIONS ON NON-AGENDA ITEMS ONLY (*LIMITED TO THREE MINUTES, PLEASE.*)
- X. ADJOURNMENT

**NOTE:** The public will be given an opportunity to comment on any agenda item when the item is brought up for discussion. The supervisor will initiate comment time.

**GRAND HAVEN CHARTER TOWNSHIP BOARD  
MONDAY, APRIL 11, 2016**

**WORKSESSION – 6:00 p.m.**

1. Public Services Director VerBerkmoes provided information on proposed security improvements to the Township lobby/entrance area. The Board instructed staff to complete the following security items contained within the Crime Prevention report from the Ottawa County Sheriff's Department:
  - a. Staff will complete landscaping changes around the entrance to the administrative building to improve natural surveillance.
  - b. Staff will receive a quote for an ornate six foot high fence to be placed between the DPW building and administrative building to limit open access to the back property or DPW garage. This will require Board approval before installation.
  - c. Staff will work with a consultant to prepare an LED lighting design/cost estimate that will include the parking lots for the administrative building and fire/rescue station and improve the exterior lighting on the South, west and north facades of for both buildings. This will require Board approval before installation.
  - d. Staff will complete the lobby lighting plan by installing the remaining 16 canned LED lights.
  - e. Staff will have a covert "pinhole" installed in a door jam of the lobby to record the faces of people leaving and/or entering the administrative building.
  - f. Staff will work with a consultant to prepare an option(s) for an "alarm" button that can notify staff of any dangerous situation occurring in the Administrative Building lobby area. This will require Board approval before installation.
2. Finance Director Sandoval provided information on the daily fees for boat launches and the use of credit cards. The Board instructed staff to prepare a resolution for the April 25<sup>th</sup> Board meeting that would increase the daily boat launch fee to \$6.00.
3. Laird Schaefer (12543 Wilderness Trail) expressed opposition to the draft NORA Recreation Plan and requested that the Board adopted a resolution in opposition to the NORA five-year Recreation Plan.

**REGULAR MEETING**

I. CALL TO ORDER

Supervisor French called the regular meeting of the Grand Haven Charter Township Board to order at 7:00 p.m.

II. PLEDGE TO THE FLAG

III. ROLL CALL

**Board members present:** French, Meeusen, Behm, Hutchins, Redick, Larsen and Kieft.

**Board members absent:**

Also present was Manager Cargo.

IV. APPROVAL OF MEETING AGENDA

**Motion** by Clerk Larsen and seconded by Trustee Hutchins to approve the meeting agenda with the addition of Discussion of proposed Zoning Amendment formalizing an administrative procedure addressing razed residential structures that create non-conforming accessory structures. **Which motion carried.**

V. APPROVAL OF CONSENT AGENDA

1. Approve March 28, 2016 Board Minutes
2. Approve Payment of Invoices in the amount of \$376,867.96 (*A/P checks of \$274,787.62 and payroll of \$102,080.34*)

**Motion** by Treasurer Kieft and seconded by Trustee Hutchins to approve the items listed on the Consent Agenda. **Which motion carried.**

VI. OLD BUSINESS

None

VII. NEW BUSINESS

Manager Cargo provided information on a proposed Zoning Ordinance amendment that would formalize an administrative procedure allowing residential structures to be razed that create non-conforming accessory buildings. **Without objection**, the Board instructed staff to proceed with drafting an amendment.

IX. REPORTS AND CORESPONDENCE

- a. Correspondence was reviewed
- b. Committee Reports
  - i. Clerk Larsen noted that the Personnel Committee would be meeting on Tuesday April 12<sup>th</sup> at 12:00 noon.
- c. Managers Report, which included:
  - i. March Building Report
  - ii. March Ordinance Enforcement Report
  - iii. March DPW Report
- d. Others
  - i. **Without objection**, the Board instructed staff to purchase a banner on behalf of Grand Haven Charter Township for the Main Street Banner Program at an estimated price of \$250.
  - ii. Trustee Meeusen noted that the 2016 Chamber Annual Dinner was scheduled for Thursday, May 5<sup>th</sup> at the Spring Lake Country Club. Manager Cargo will receive a final count and forward the RSVPs to the Chamber by April 18<sup>th</sup>.

X. PUBLIC COMMENTS

Vern Helder (1989 Tiffany Court, Park Township) announced his intentions to run for the

position of District Court Judge.

XI. ADJOURNMENT

**Motion** by Clerk Larsen and seconded by Trustee Behm to adjourn the meeting at 7:20 p.m. **Which motion carried.**

Respectfully Submitted,

Laurie Larsen  
Grand Haven Charter Township Clerk

Karl French  
Grand Haven Charter Township Supervisor



GRAND HAVEN CHARTER TOWNSHIP

## Community Development Memo

DATE: April 21, 2016  
TO: Township Board  
FROM: Stacey Fedewa, Planning & Zoning Official  
RE: Health Pointe PUD Contract

### BACKGROUND

On March 28<sup>th</sup> the Township Board formally approved the Health Pointe PUD Amendment project. One of the conditions of approval was to execute a PUD Contract.

### PUD CONTRACT

Pursuant to the written report of findings that was adopted through a motion on March 28<sup>th</sup> enclosed is the Health Pointe PUD Contract, which must be executed by the Township and developer.

### RECOMMENDATION

Based on the information provided, staff recommends the Township Board grant authorization to execute the Health Pointe PUD Contract, pursuant to the written report and conditions of approval that were adopted at the March 28<sup>th</sup> Board meeting. If the Board agrees with the aforementioned recommendation, the following motion can be offered:

**Motion** to authorize the Township Supervisor and Township Clerk to execute the Health Pointe PUD Contract, and direct staff to record the Contract with the Ottawa County Register of Deeds.

Please contact me prior to the meeting with questions or concerns.

## HEALTH POINTE PUD CONTRACT

THIS HEALTH POINTE PUD CONTRACT (the "**Contract**") is made by and between the Charter Township of Grand Haven, a Michigan charter township, whose address is 13300 - 168<sup>th</sup> Avenue, Grand Haven, Michigan 49417 (the "**Township**"), and Health Pointe, a Michigan nonprofit corporation, whose address is 100 Michigan Street, N.E., MC 60, Grand Rapids, Michigan 49503 (the "**Health Pointe**"), with reference to the following facts and circumstances.

- A. Health Pointe has applied to the Township for planned unit development approval under the Township's Zoning Ordinance (the "**Ordinance**"), for an amendment to an existing planned unit development (the "**PUD Amendment**") to allow the construction of a 120,026 square foot three story medical office building and related improvements (the "**Project**").
- B. The Project will be constructed on property in the Township legally described in Exhibit A (the "**Property**").
- C. The Township has given Health Pointe approval of the PUD Amendment, contingent upon this Contract being executed by the Township and Health Pointe.

THEREFORE, in consideration of the Township's approval of the PUD Amendment, and pursuant to the condition of approval that the Township and Health Pointe enter into this Contract, the parties agree as follows.

1. Health Pointe shall comply with all of the documentation identified on attached Exhibit D (the "**Documentation**") to the extent that the documentation is consistent with any other conditions placed upon the PUD Amendment as set forth in this Contract. The Documentation is incorporated by reference into this Contract.

2. The Project shall comply with all of the conditions set forth in the Township Board Motion adopted by the Township Board at its meeting on March 28, 2016, which incorporated the Board Report. The Board Report sets forth in Paragraph 8 (incorporated as Paragraph 15 in the March 28, 2016 Board minutes) all of the conditions of approval attached to this PUD Amendment, and they are also listed below (the terms used in these conditions of approval shall have the definitions assigned to them in the Board Report):

- A. Outlot development was subjected to site plan review.
- B. Parking lots are setback a minimum of 25 feet.

- C. Outlot has architectural materials and landscaping compatible with that of the principal Meijer facility and site.
- D. Location of monument (ground) signs have been approved.
- E. Monument (ground) signs do not exceed 52 square feet.
- F. Monument (ground) signs have a maximum height of 6 feet as permitted by Section 24.13 of the current Zoning Ordinance.
- G. Revisions or changes to the conditions are made by the Township Board after a public hearing. These conditions are binding upon Health Pointe and all successor owners or parties in interest in the Project.
- H. Drainage for the Project is approved by the Ottawa County Water Resources Commissioner ("OCWRC").
- I. Any violation of the conditions constitute a violation of the Zoning Ordinance, and in addition to the remedies provided therein, shall be cause for the Township Board to suspend or revoke any zoning or building permit applicable to the Project.
- J. The right is reserved by the Township to impose additional conditions if reasonably necessary to achieve the purposes of the Zoning Ordinance.
- K. The PUD Amendment approval is personal to Health Pointe and shall not be transferred by Health Pointe to a third party without the prior written consent of the Township.
- L. Except as expressly modified, revised or altered by these conditions the Project shall be acquired, developed, and completed in conformance with the Zoning Ordinance, as amended, and all other applicable Township ordinances.
- M. Approval and compliance with all requirements set forth by the OCRC, and if applicable the OCWRC. No building permits shall be issued until all necessary OCRC and OCWRC permits have been obtained.
- N. Health Pointe shall enter into this Contract with the Township. The Contract shall be reviewed and approved by the Township Board prior to the issuance of building permits.
- O. Health Pointe shall agree to an access easement to the Township for the purpose of realigning the north end of Whittaker Way directly with DeSpelder Street pursuant to the Robbins Road Sub-Area Plan, and an additional internal access easement for connection to the adjacent parcel at the corner of Robbins Road and 172<sup>nd</sup> Avenue. Health Pointe shall preliminarily identify the easement areas on the Final Site Plan, and the

easements shall be drafted by the Township Attorney and approved by the Township Board prior to the issuance of certificates of occupancy.

- P. This approval is also conditioned upon Health Pointe meeting all applicable Federal, State, County and Township laws, rules and ordinances.
- Q. Health Pointe shall comply with all of the requirements of the Documentation, specifically including all of the notes contained thereon.
- R. The parking areas in the Project are "backloaded," which means that the Final Site Plan has been revised to allow vehicles to enter or leave the parking areas as far from the building in the Project as possible.
- S. In the event of a conflict between the Documentation and these conditions, these conditions shall control.
- T. The Township understands it could not require this condition. However, Health Pointe has voluntarily made an offer, and the Township has relied upon the offer in considering this application. Specifically, Health Pointe offered to pay 15% of the cost of restriping Robbins Road, based on finalized scope and pricing, not to exceed \$7,000.00; and 50% of the cost of Box Span type traffic signal upgrades at the Robbins Road and Ferry Street/172<sup>nd</sup> Avenue intersection, based on finalized scope and pricing, not to exceed \$125,000.00. The Township and Health Pointe shall enter into a contract for these payments by Health Pointe.
- U. Health Pointe shall enter into the Payment in Lieu of Taxes Agreement (attached hereto as Exhibit C) with the Township prior to the issuance of any building permits. This Agreement is contingent upon the Project, in whole or in part, being deemed to be exempt from *ad valorem* real property taxes under the General Property Tax Act, Act 206 of 1893, as amended, and/or any other applicable law.
- V. Health Pointe is prohibited from using the Project, or any part of the Project, as a hospital. Under the Michigan Health Code, referencing Article 17 of the Public Health Code, under the standards for hospitals according to the Department of Licensing and Regulatory Affairs, and under the Building Code, as enforced by the Township, a hospital offers inpatient care for one or more overnight periods, or one or more periods of more than 24 hours. The Project may not provide that type of care.
- W. Health Pointe has submitted a full set of Documentation which includes all changes that have been required by the Board.

3. This Contract runs with the Property and is assignable to any purchaser of the Property; any such purchaser shall be bound by the terms of this Contract. Any such assignment is subject to Condition K of the conditions of approval in the Board Report, as quoted above.

4. Condition T of the conditions of approval in the Board Report, as quoted above, pertains to payments Health Pointe will make for Robbins Road improvements, as offered by Health Pointe in an e-mail dated February 23, 2016 and attached as Exhibit B (the "**Offer**"). By means of this Contract, the Township accepts the Offer. Contingent upon the City of Grand Haven constructing or installing the improvements described in the Offer, and then within 30 days of being billed by the Township to pay the amounts described in the Offer, Health Pointe shall pay the amounts described in the Offer to the Township. If the amounts due from Health Pointe are not paid within 30 days, they shall be a lien on the Property, collected and enforced, together with interest, in the same manner *ad valorem* real property taxes are collected by the Township with accrued interest under the General Property Tax Act, Act 206 of 1893, as amended, or any other applicable law.

5. If Health Pointe fails to comply with all of the conditions established for the PUD Amendment, the Township shall have the option to withdraw its PUD Amendment approval, to withdraw any building or other permits issued for the Project or any buildings or structures within the Project, to pursue all of its legal remedies provided under the Zoning Ordinance, and to pursue all other legal options available to the Township under the laws of the State of Michigan. Notwithstanding anything to the contrary contained in this Contract, Health Pointe is not obligated to construct the Project.

6. This Contract shall inure to the benefit of and be binding upon the parties and their respective successors and permitted assigns. All notices and other documents to be served or transmitted shall be in writing and addressed to the parties at the addresses stated on page 1 of this Contract, or such other address or addresses as shall be specified by the parties from time to time and may be served or transmitted in person or by ordinary mail properly addressed and with sufficient postage. This Contract has been executed in the State of Michigan and shall be governed by Michigan law. The waiver by any party of a breach or violation of any provision of this Contract shall not be a waiver of any subsequent breach of the same or any other provision of this Contract. If any section or provision of this Contract is unenforceable for any reason and the unenforceability of such section or provision does not materially impair the remainder of this Contract, then the remainder of this Contract shall remain in full force and effect. It is contemplated that this Contract will be executed in multiple counterparts, all of which together shall be deemed to be one contract. Any captions in this Contract are for convenience only and shall not be considered as part of this Contract or in any way to amplify or modify its terms and provisions. All attached exhibits are incorporated by reference as though fully stated in the Contract. This Contract may not be amended other than by a written document signed by both parties.

The parties have executed this Contract as of the dates noted below.

**GRAND HAVEN CHARTER TOWNSHIP,**  
a Michigan charter township

**HEALTH POINTE,**  
a Michigan nonprofit corporation

By: \_\_\_\_\_  
Karl French, Supervisor

By: \_\_\_\_\_

Name: \_\_\_\_\_

Its: President

By: \_\_\_\_\_  
Laurie Larsen, Clerk

Dated: \_\_\_\_\_, 2016

Dated: \_\_\_\_\_, 2016

STATE OF MICHIGAN     )  
  )ss.  
COUNTY OF OTTAWA     )

The foregoing Contract was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 2016, by Karl French and Laurie Larsen, the Supervisor and the Clerk of Grand Haven Charter Township, a Michigan charter township, on behalf of the Township.

\_\_\_\_\_  
Signature: \_\_\_\_\_  
Printed Name: \_\_\_\_\_  
Notary Public, \_\_\_\_\_ County, MI  
Acting in \_\_\_\_\_ County, MI  
My commission expires: \_\_\_\_\_

STATE OF MICHIGAN     )  
  )ss.  
COUNTY OF \_\_\_\_\_ )

The foregoing Contract was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 2016, by \_\_\_\_\_, President of Health Pointe, a Michigan nonprofit corporation, on behalf of the Corporation.

Prepared by:  
Ronald A. Bultje (P29851)  
Scholten and Fant, P.C.  
100 North Third Street  
P.O. Box 454  
Grand Haven, MI 49417  
(616) 842-3030

\_\_\_\_\_  
Signature: \_\_\_\_\_  
Printed Name: \_\_\_\_\_  
Notary Public, \_\_\_\_\_ County, MI  
Acting in \_\_\_\_\_ County, MI  
My commission expires: \_\_\_\_\_

## EXHIBIT A

### From C-201 Existing Conditions Plan 10/27/15

Part of the Northwest 1/4 of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan, described as: Commencing at the North 1/4 corner of said section; thence S01°13'43"E 653.23 feet along the North-South 1/4 line of said section to the Point of Beginning; thence continuing S01°13'43"E 336.27 feet along said 1/4 line; thence S89°43'31"W 53.74 feet parallel with the North line of the South 3/4 of the Northwest 1/4 of said section; thence S01°12'05"E 25.63 feet; thence S89°43'31"W 47.88 feet; thence S01°12'05"E 30.79 feet; thence Southwesterly 117.48 feet along a 200.00 foot radius curve to the left, said curve having a central angle of 33°39'22", and a chord that bears S61°16'06"W 115.80 feet; thence S44°26'25"W 162.16 feet; thence Southwesterly 153.82 feet along a 200.00 foot radius curve to the right, said curve having a central angle of 44°03'55", and a chord that bears S66°28'23"W 150.05 feet; thence S88°30'20"W 386.19 feet; thence Northwesterly 62.90 feet along a 40.00 foot radius curve to the right, said curve having a central angle of 90°05'36", and a chord bearing N46°26'52"W 56.61 feet; thence N01°24'04"W 367.19 feet; thence Northeasterly 253.22 feet along a 881.00 foot radius curve to the right, said curve having a central angle of 16°28'05", and a chord that bears N06°49'59"E 252.35 feet; thence N15°04'02"E 115.89 feet; thence Northeasterly 146.64 feet along a 748.52 foot radius curve to the left, said curve having a central angle of 11°13'27", and a chord that bears N11°24'41"E 146.40 feet; thence S89°40'56"E 102.72 feet; thence S00°18'11"W 280.30 feet; thence N89°43'31"E 691.62 feet along the North line of the South 3/4 of the Northwest 1/4 of said section to the Point of Beginning. Containing 12.00 acres (11.74 Acres excluding R.O.W.). Subject to highway right-of-way for 172nd Avenue over the Easterly most 33 feet thereof. Also subject to easements, restrictions, and rights-of-way of record.

Draft Date  
04/15/16

## EXHIBIT B

**From:** [Jeff.Meyers@spectrumhealth.org](mailto:Jeff.Meyers@spectrumhealth.org)  
**To:** [Stacey Fedewa](mailto:Stacey.Fedewa)  
**Cc:** [Bill Cargo](mailto:Bill.Cargo); [Rick.Redetzke@spectrumhealth.org](mailto:Rick.Redetzke@spectrumhealth.org); [Kyle.Prochaska@spectrumhealth.org](mailto:Kyle.Prochaska@spectrumhealth.org)  
**Subject:** Health Pointe - Voluntary Contribution to Traffic Control Improvements along Robbins Rd  
**Date:** Tuesday, February 23, 2016 8:54:57 AM

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Hi Stacey,

Subject to the approval of the Health Pointe PUD Amendment, Health Pointe is willing to participate in a share of the costs for traffic control improvements now being considered along Robbins Road. As you are aware, the Traffic Impact Study conducted by AECOM/URS concluded that the added traffic from the proposed Health Pointe development will have "little or no additional impact on traffic operations" on Robbins Road or 172<sup>nd</sup> Avenue. However, Health Pointe does see a benefit to our project with the proposed traffic signal and pavement marking improvements contemplated by the City and the County Road Commission.

We understand the improvements under consideration are currently proposed to include:

- i) Restriping of Robbins Road from US-31 to Beechtree/168<sup>th</sup> Avenue, currently estimated at \$54,350.00.
- ii) Box Span type traffic signal upgrades at the Robbins Rd. and S. Ferry Street/172<sup>nd</sup> Ave intersection, currently estimated at \$223,768.00.

With the above understanding, we offer to contribute the following:

- i) For the restriping of Robbins Road, 15% of the costs based on finalized scope and pricing, not to exceed \$7,000.
- ii) For the Box Span type traffic signal upgrades at the Robbins Road and Ferry St/172nd Ave intersection, 50% of the costs based on finalized scope and pricing, not to exceed \$125,000.

As stated above, the Traffic Impact Study conducted by AECOM/URS showed little or no impact on the Robbins Road or 172<sup>nd</sup> Avenue operations as a result of the Health Pointe project. However, we are happy to step up and make a commitment to contribute in this way as these improvements will further enhance the safety of township residents and visitors, as well as our own patients, employees and visitors.

Should our project be approved by the Township, and should the Township and the City Council agree to move forward with the proposed traffic improvements above, we would be happy to move forward to draft a formal agreement.

Sincerely,

Jeff

Jeff A. Meyers, CCIM, LEED-AP  
Director, Real Estate Development  
Associate Broker

Spectrum Health System

Draft Date  
04/15/16

Exhibit C

Payment in Lieu of Taxes Agreement

Draft Date  
04/15/16

Exhibit D

Documentation

1. Final Site Plan, last revised 4/25/2016
2. Final Landscape Plan, last revised 4/25/2016
3. Final Building Elevation Renderings, last revised 4/25/2016
4. Civil Plans, including the following Sheets:
  - a. Index/Cover Sheet
  - b. Existing Site Conditions
  - c. Surrounding Zoning and Use Map
  - d. Overlay Plan
  - e. Demolition Plan – Surface
  - f. Demolition Plan – Subsurface
  - g. Tree Survey
  - h. Site Grading
  - i. Soil Erosion Sedimentation Control
  - j. Utility
  - k. Watermain
  - l. Details & Specs (C-500)
  - m. Details & Specs (C-501)
  - n. 172nd Ave Intersection Detail
5. Project Narrative
6. Declaration of Restrictions
7. Perspective Drawings from Five Locations
  - a. One on 172<sup>nd</sup> Avenue
  - b. Two on Robbins Road
  - c. Three on US-31
8. Signage Plan
9. Electrical Site Lighting Plan/Photometric Plan
10. Traffic Impact Study
11. Parking Study



GRAND HAVEN CHARTER TOWNSHIP

## Community Development Memo

DATE: April 20, 2016  
TO: Township Board  
FROM: Stacey Fedewa, Planning & Zoning Official  
RE: Piper Lakes PUD – Request for a Second Extension

### BACKGROUND

1. 9/22/2014 – Board granted final approval for the Piper Lakes Apartments PUD.
2. 8/10/2015 – Board granted an 8 month extension, which is set to expire on May 22, 2016.
3. 4/18/2016 – PC recommended the Board grant a second **extension for 1 year** (*i.e.*, 4/17/17).

### EXTENSION REQUEST

The formal request is included at the end of this memo. In brief, the developer has continued to make minor adjustments to the construction materials and interior finishes, which have caused delays. That said, the developer does anticipate that site grading and installation of silt fencing will begin in mid-May.

Although the developer fully intends to begin construction of the apartment buildings this year a 1 year extension has been requested to ensure there is ample time to work through unforeseen “bumps in the road” and still meet the threshold of substantial construction before the extension expires.

### RECOMMENDATION

On April 18<sup>th</sup> the Planning Commission adopted a motion to recommend the Township Board approve the Piper Lakes PUD Request for Extension. If the Township Board agrees the following motion can be offered:

**Motion to approve** the requested 1 year extension (*i.e.*, April 17, 2017) for the Piper Lakes Apartments PUD based on the request meeting the applicable requirements of Section 17.04.7.A of the Grand Haven Charter Township Zoning Ordinance.

Please contact me prior to the meeting with questions or concerns.

**From:** [Denny Churette](#)  
**To:** [Bill Cargo](#)  
**Cc:** [Stacey Fedewa](#)  
**Subject:** Piper Lakes PUD  
**Date:** Tuesday, March 22, 2016 4:27:39 PM

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Hi Bill,

As I mentioned a bit ago, we are asking the Township for an extension of the commencement date for Piper Lakes Apartment Homes specified in our PUD approval. I also spoke with Stacey this morning, who continues to be extremely helpful in working with our team, and we are grateful for her continued guidance and support. As I mentioned separately to both you and Stacey, we have continued to put a great deal of thought and consideration into the design features of the project as well as enhancements to our construction material choices and interior finishes. Initially, I had hoped to begin our major site work effort during the winter when the ground was frozen. However, due to continued consultation with our contractor and design team to identify the optimal mix of choices for Piper Lakes, time has passed for a “frozen ground” start.

Accordingly, I have been advised by our site contractor that it is best to wait until the spring rains have completed and the water table is lower. Not only does this decrease dewatering time and expense, it also facilitates the underground work. As a result, installation of the major underground improvements could be pushed to mid-late summer, allowing for delivery of the first apartment units in Spring 2017 – ideal timing just ahead of the peak summer leasing season.

Since we last spoke we have spent an additional several hundred thousand dollars on these items, so in no way should the extension request suggest that we are anything less than 100% committed to making Piper Lakes the premier apartment community in and around Grand Haven. To the contrary, this project is *in my hometown and I want it to be as beautiful and have the highest quality that we can provide*. We remain deeply thoughtful and discerning about what the ultimate amenity package should include and continue to

research the best-in-practice trends in multifamily construction and design as well as the preferences for our target resident demographics. Further please know we have selected our contractor and the majority of our subcontractors, so we are poised to go. ( Frankly they are waiting for me to give the green light on some of these exterior and interior finishes.. but I want this to be as perfect as I can make it).

As I mentioned to Stacy, we are hopeful that in the next 45 days, we will begin site balancing and obtain our soil erosion permit, allowing us to be ready for underground work when the site dries out. I thought that this work may constitute “substantial construction,” but Stacy thinks this may not be the case, hence the need for the extension request.

Bill, it is our hope to be going vertical by mid-summer, but perhaps we are best to request an extension for one year as we discussed. Please assure the PC and the Township Board of our 100% commitment to what we will be a shining project when we move forward.

I trust our history of other projects lends credence to that goal. I am very excited about what we are going to do at Piper Lakes and really want it to be something we can all be proud of.

Please let me know if you or Stacy have any questions. We appreciate the Township’s cooperation and support.

Best,  
Denny

**Denny Cherette**  
**C H E R E T T E | G R O U P**  
**Investment Real Estate**  
**Development, Consulting, Brokerage, Management**  
**Main: 616-842-6300**  
**Cell: 616-638-9099**  
[www.cherettegroup.com](http://www.cherettegroup.com)  
[dc@cherettegroup.com](mailto:dc@cherettegroup.com)

## SUPERINTENDENT'S MEMO

DATE: April 18, 2016

TO: Township Board

FROM: Bill

SUBJECT: Policy to Waive Building Fees for Single Family Dwellings / Non-Profits

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Pursuant to an email from April 12<sup>th</sup>, Habitat for Humanity is building another home in GHT. (*There have been a total of four Habitat for Humanity Homes and one Music Home constructed within the Township since 2004.*)

As you may recall, the Township Board authorized staff to waive the building permit fees for the previous Habitat for Humanity home (*e.g., June of 2015*). In addition, “Walk the Beat” will be constructing a home in the coming months with the proceeds being donated to their non-profit charity and have requested that the building fees be waived. And, there are other charities that construct handicapped ramps, etc. and make similar requests.

Rather than address these matters on a case-by-case basis, I would propose an Administrative policy for these situations. Specifically, the policy is drafted to accomplish the following:

- Waive all or a portion of the building permit fees for non-profit charities that construct single family residential homes or appurtenances for single family homes (*i.e., ramps, doors, windows roofing, etc.*) – either for low income housing or for fundraising purposes; and,
- Allow the contract inspectors (*i.e., plumbing, mechanical, electrical*) the option of waiving all or a portion of their fees.

Please review the proposed Section 9.4 for the Administrative Policies and Procedures Manual and be prepared to discuss the proposal at Monday’s Board meeting. Specifically, assuming that the Board agrees with this approval, staff need to have a percentage number determined with regard to what would be waived (*i.e., 100% of the fees, 50% of the fees, etc.*).

If the Board agrees with the proposal, the following motion can be offered:

**Move to approve Resolution 16-04-01 that creates a Section 9.4 to the Administrative Policies and Procedures Manual and waives certain fees for single family residential construction for non-profits under specific situations.**

At a regular meeting of the Township Board of Trustees of the Charter Township of Grand Haven, Ottawa County, Michigan, held on the 25<sup>th</sup> day of April, 2016, at 7:00 p.m. The meeting was held at the Township of Grand Haven, 13300 168th Avenue, Grand Haven, Michigan.

PRESENT:

ABSENT:

After certain matters of business had been discussed, Supervisor French announced that the next order of business was the consideration of a resolution to add Section 9.4 of the Grand Haven Township Administrative Policies and Procedures Manual, which allows for the Township to waive certain building permit fees for non-profit organizations constructing or renovating single family homes. Following discussion, the following resolution was offered by \_\_\_\_\_ and supported by \_\_\_\_\_:

### **RESOLUTION NO. 16-04-01**

**WHEREAS**, Grand Haven Charter Township has adopted an Administrative Policies and Procedures Manual; and,

**WHEREAS**, the Board of Trustees of Grand Haven Charter Township believes that it is in the best interest of the Township to include Section 9.4 of the Administrative Policies and Procedures Manual.

**NOW, THEREFORE**, be it resolved that the attached Section 9.4 is hereby added and adopted as part of the Grand Haven Charter Township's Administrative Policies and Procedures Manual, to become effective immediately and which shall read as follows:

#### **9.4 WAIVER OF ZONING/BUILDING FEES**

- A. If a non-profit charity seeks to either construct or improve a single family residential structure for the purposes of providing housing for low or moderate income families; to rehabilitate or renovate a single family residential structure for low or moderate income families; or, to raise funds for a charitable event through the sale of the single family residential structure, the Township shall waive \_\_\_\_\_% of the zoning and building permit fees.
- B. If the Township waives a portion or all of the zoning and building permit fees pursuant to the aforementioned Section A, the Township shall inquire with the contract inspectors for electrical, mechanical and plumbing who – solely based upon their discretion – may agree to waive a maximum of \_\_\_\_\_% of the fees associated with their respective inspections.

**BE IT FURTHER RESOLVED**, that all policies, procedures, resolutions in conflict with this resolution and the addendum to the Personnel Policies and Procedures Manual are hereby repealed to the extent of any such conflict.

Ayes:

Nays:

Absent:

RESOLUTION DECLARED:

ADOPTED ON:

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Laurie Larsen, Township Clerk

**CERTIFICATE**

I, the undersigned, the duly qualified Township Clerk of the Charter Township of Grand Haven, Ottawa County, Michigan, certify that the foregoing is a true and complete copy of the resolution adopted by the Township Board at a regular meeting of the Township Board held on the 25<sup>th</sup> day of April, 2016. I further certify that public notice of the meeting was given pursuant to and in full compliance with Michigan Act 267 of 1976, as amended, and that the minutes of the meeting were kept and will be or have been made available as required by the Act.

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Laurie Larsen, Township Clerk



# SUPERINTENDENT'S MEMO

DATE: April 18, 2016

TO: Township Board

FROM: Bill Cargo

SUBJECT: Resolution to Accept Park Lands

Attached, please find a copy of Resolution 16-04-02, which allocates the **138 acres** of the so-called Witteveen Farm and the **40 acres** of the so-called Wolfe property into the Township's park system. (*See attached aerial map.*)

In brief, in order to ensure that the rules and regulations that govern the Township's park lands are fully applicable to the recently acquired aforementioned acreage, staff are requesting that the Board approve the attached resolution.

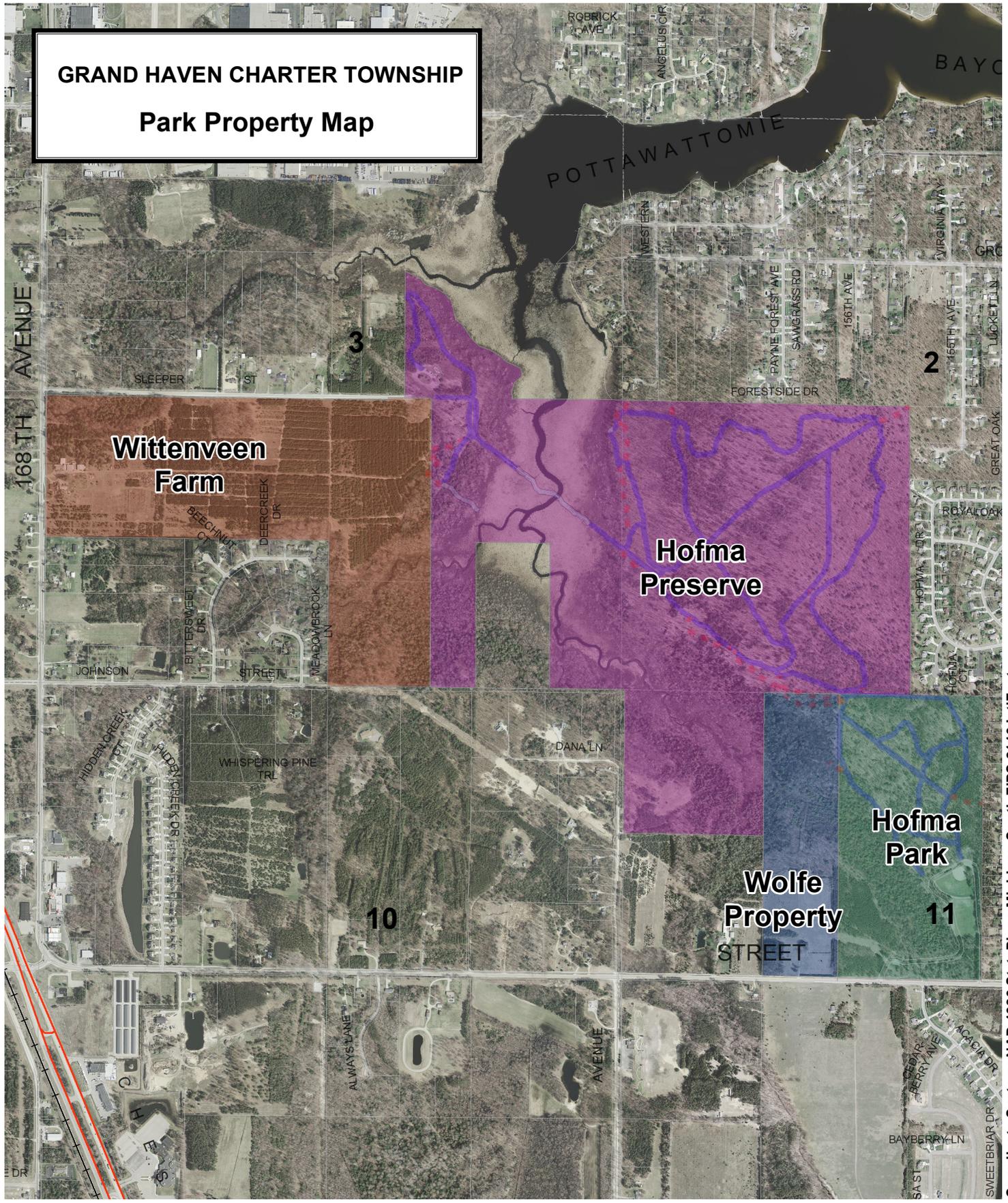
There are some violations that are occurring on the Witteveen property (*e.g., ATV activity*) that may require enforcement action. In order to ensure that the Park rules and regulations will apply to this additional land, Cargo is recommending that the properties be formally placed by the Township Board into the Park's system.

To proceed with this recommendation, the following motion can be offered:

**Move to approve and adopt Resolution 16-04-02 that assigns approximately 178 acres of public land into the Township's park system.**

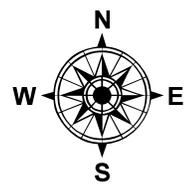
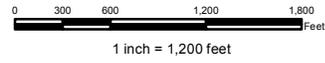
Please contact me if there are any question or comments.

# GRAND HAVEN CHARTER TOWNSHIP Park Property Map



Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Int'l Feet

Sources:  
Grand Haven Township Community Development Dept.  
Ottawa County GIS - 2014  
Revision Date: 4/18/2016 5:06:32 PM  
Printed: 4/18/2016  
File Path Name: G:\Internal\_GIS\1-Ver\Berkmoos\2015\2015-02-12\_Wittenveen Property\Wittenveen Property w Parks\_B Size.mxd  
Note: Data is subject to change. GHT does not guarantee the accuracy of this map.



At a regular meeting of the Township Board of Trustees of the Charter Township of Grand Haven, Ottawa County, Michigan, held on the 25<sup>th</sup> day of April, 2016, at 7:00 p.m. The meeting was held at the Township of Grand Haven, 13300 168th Avenue, Grand Haven, Michigan.

PRESENT:

ABSENT:

After certain matters of business had been discussed, Supervisor French announced that the next order of business was the consideration of a resolution to formally accept both the so-called Witteveen Farm and the so-called Wolfe Property into the Township's Parks system. Following discussion, the following resolution was offered by \_\_\_\_\_ and supported by \_\_\_\_\_:

### **RESOLUTION NO. 16-04-02**

**WHEREAS**, Grand Haven Charter Township recently received additional properties (*i.e., the so-called Witteveen Farm and the so-called Wolfe property*);

**WHEREAS**, these properties are intended to enlarge Hofma Park and Preserve; and,

**WHEREAS**, the Board of Trustees of Grand Haven Charter Township believes that it is in the best interest of the Township to formally accept these parcels into the Township's Parks System to ensure that all existing parks rules and regulations are made applicable to these public lands.

**NOW, THEREFORE, BE IT RESOLVED** that the following parcels are accepted into and made part of the Township's parks system, specifically as part of Hofma Park and Preserve:

1. The so-called "Witteveen Farm", that includes the following parcels:
  - 70-07-03-300-015
  - 70-07-03-400-010
  - 70-07-03-400-011
2. The so-called "Wolfe Property", that includes the following parcel:
  - 70-07-11-100-002

**BE IT FURTHER RESOLVED**, that all Parks Rules and Regulations are fully applicable to these aforementioned lands

**BE IT FURTHER RESOLVED**, that all policies, procedures, or resolutions in conflict with this resolution are hereby repealed to the extent of any such conflict.

Ayes:

Nays:

Absent:

RESOLUTION DECLARED:  
ADOPTED ON:

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Laurie Larsen, Township Clerk

**CERTIFICATE**

I, the undersigned, the duly qualified Township Clerk of the Charter Township of Grand Haven, Ottawa County, Michigan, certify that the foregoing is a true and complete copy of the resolution adopted by the Township Board at a regular meeting of the Township Board held on the 25<sup>th</sup> day of April, 2016. I further certify that public notice of the meeting was given pursuant to and in full compliance with Michigan Act 267 of 1976, as amended, and that the minutes of the meeting were kept and will be or have been made available as required by the Act.

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Laurie Larsen, Township Clerk



## Administrative Services Memo

DATE: April 19, 2016  
TO: Township Board  
FROM: Suzanne Proksa / Andrea Sandoval  
RE: OPEB Account Selection

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### OVERVIEW

As you may recall, the Township placed OPEB monies for the employee buyout into retiree health savings accounts through Burnham and Flower in April 2015. In addition, the Board requested that employer monies be placed in a trust. We have completed our review of options for the employer monies and in that process looked at other possible options for employees to resolve some issues with the current account setup.

The Personnel Committee has reviewed the options and recommends moving to a MERS program based upon the benefits of moving to MERS and employee interest in moving over to a MERS program.

#### **Moving to MERS will solve current issues for employees.**

Improvements would include the ability to visit an online site to review account balances, ability to direct and move funds, ability to make changes online, debit card availability, and a non-dependent beneficiary provision.

#### **MERS provides additional benefits for the employer monies.**

Using MERS for the employer monies will provide lower fees, online access, the ability to choose our own investment funds, more user friendly options for removing money from the fund when needed to pay insurance premiums, and the ability to transfer funds between programs down the road if needed.

Following is a brief comparison between what Burnham and Flower offers and what MERS offers:

Feature	Employee Accounts		Employer Accounts	
	Burnham & Flower	MERS	Burnham & Flower	MERS
Online Access	No	Yes	Limited	Yes
Debit Cards	No	Yes	N/A	N/A
Manage Funds	No	Yes	No	Yes
Distribution Options	N/A	N/A	No	Yes
Beneficiary – Non-Dependent	No	Yes	N/A	N/A
Transfer Funds Between Programs	Yes – with Board Action	Yes	Yes – with Board Action	Yes
<u>Fees</u>				
Advisory Fees	.50%	N/A	.50%	N/A
Average % on Funds	.87%	.72%	.87%	.37%
Administrative Fee	N/A	\$24 per Year	N/A	.25%
Custodian Fees*	Custodian Fees	N/A	Custodian Fees	N/A
~Savings in fees means a higher trust balance.				

\*Custodian fees include overnight to address of record (\$16.50), wire fee (\$12.50), other non-managed assets (\$85.00), and transfer out fees (greater of \$100.00 or \$25.00 per position).

## MOTION

Based on the accessibility, functionality, cost savings, and service that MERS can provide, we recommend using MERS for both the employee accounts and employer account.

If the Board agrees, the following motions can be offered:

**Motion to approve adoption of Resolution 16-04-03 MERS Health Care Savings Plan Uniform Resolution.**

**Motion to approve adoption of Resolution 16-04-04 MERS Retiree Health Funding Vehicle.**

**Motion to approve adoption of Resolution 16-04-05 CLS Trust Transfer Resolution.**

**Motion to approve adoption of the MERS Health Care Savings Program Participation Agreement.**

If you have any questions, please do not hesitate to contact us.

## MERS Health Care Savings Program Uniform Resolution



1134 Municipal Way Lansing, MI 48917 | 800.767.2308 | Fax 517.703.9711

[www.mersofmich.com](http://www.mersofmich.com)

**WHEREAS**, the Municipal Employees' Retirement System ("MERS") Plan Document of 1996, effective October 1, 1996, authorized the Municipal Employees' Retirement Board ("Board") to establish additional programs including but not limited to defined benefit and defined contribution program (MERS Plan Document Section 36(2)(a)); MCL 38.1536(2)(a)).

**WHEREAS**, the Board has authorized MERS' establishment of the health care savings program ("HCSP" or "Program"), which a participating municipality or court, or another eligible public employer that is a political subdivision of the State which constitutes a "municipality" under MERS Plan Document Section 2B(4); MCL 38.1502b(2) ("Eligible Employer"), may adopt for its Eligible Employees.

**WHEREAS**, MERS has been determined by the Internal Revenue Service to be a taxqualified "governmental plan" and trust under section 401(a) of the Internal Revenue Code of 1986, and all trust assets within MERS reserves are therefore exempt from taxation under Code section 501(a) (IRS Letter of Favorable Determination dated June 15, 2005).

**WHEREAS**, the Board has established a governmental trust (the "Trust Fund") to hold the assets of the HCSP, which Trust Fund shall be administered under the discretion of the Board as fiduciary, directly by (or through a combination of) MERS or MERS' duly-appointed Program Administrator.

**WHEREAS**, 1999 PA 149, the Public Employee Health Care Fund Investment Act, MCL 38.1211 et seq. ("PA 149") provides for the creation by a public corporation of a public employee health care fund, and its administration, investment, and management, in order to accumulate funds to provide for the funding of health benefits for retirees and beneficiaries.

**WHEREAS**, a separate MERS health care trust fund created under PA 149 also constitutes a governmental trust established by a public corporation ("municipality") as an Eligible Employer, provided that all such employers shall be the State of Michigan, its political subdivisions, and any public entity the income of which is excluded from gross income under Section 115 of the Internal Revenue Code; provided further, that the PA 149 trust shall not accept assets from any defined benefit health account established under Section 401(h) of the Internal Revenue Code.

**WHEREAS**, the Board acts as investment fiduciary for the pooled assets of each MERS participating municipality and court enrolled in MERS Defined Benefit Plan, Health Care Savings Program, the Retiree Health Funding Vehicle, and the Investment Services Pool Program, on whose behalf MERS performs all plan administration and investment functions, and such participating municipalities and courts have full membership, representation and voting rights at the Annual Meeting as provided under Plan Section 45; MCL 38.1545.

**WHEREAS**, the Board also acts as investment fiduciary for those participating employers who are non-MERS participating municipalities and courts that have adopted the MERS Health Care Savings Program, Retiree Health Funding Vehicle, or Investment Service Pool Program, and such entities are not accorded membership, representation or voting rights provided to MERS participating municipalities and courts at the Annual meeting under Plan Section 45; MCL 38.1545.

# MERS Health Care Savings Program Uniform Resolution

**WHEREAS**, adoption of this Uniform Resolution and Participation Agreement (the “Uniform Resolution”) by each Eligible Employer is necessary and required in order that the benefits available under the MERS HCSP may be extended.

- It is expressly agreed and understood as an integral and nonseverable part of extension or continuation of coverage under this HCSP Resolution that Section 43B of the MERS Plan Document shall not apply to this Uniform Resolution Adopting MERS HCSP, the Participation Agreement, the Trust Plan Document, the Trust Agreement, and their administration or interpretation.
- In the event any alteration of the language, terms or conditions stated in this Uniform Resolution Adopting MERS HCSP is made or occurs, under MERS Plan Document Section 43B or other plan provision or other law, it is expressly recognized that MERS and the Board, as fiduciary of the MERS Plan and its trust reserves, and whose authority is nondelegable, shall have no obligation or duty: to administer (or to have administered) the Trust; or to continue administration by the Program Administrator or by MERS directly.

**WHEREAS**, concurrent with this HCSP Uniform Resolution, and as a continuing obligation, this governing body has completed, approved, and submitted to MERS documents necessary for participation in and implementation of the HCSP. This obligation applies to any documents deemed necessary to the operation of the Trust by the Program Administrator.

**NOW, THEREFORE, BE IT RESOLVED** that the governing body adopts (or readopts) the MERS HCSP as provided below.

## SECTION 1. HCSP PARTICIPATION

**EFFECTIVE** \_\_\_\_\_, 20\_\_\_\_, (to be known as the ADOPTION DATE) the

MERS HCSP is hereby adopted by the \_\_\_\_\_  
(MERS municipality or court or other eligible employer)

- (A) **CONTRIBUTIONS** shall be as allowed and specified in the MERS Health Care Savings Program Adoption Agreement. Basic Employer Contributions, Mandatory Salary Reduction Contributions, Mandatory Leave Conversion Contributions, and Post-Tax Employee Contributions, shall be remitted pursuant to MERS by the Eligible Employer, and credited to the Eligible Employer’s separate fund within the MERS Trust Fund.
- (B) **INVESTMENT** of funds accumulated and held in the Health Care Savings Program Trust Fund shall be held in a separate reserve and invested on a pooled basis by MERS subject to the Public Employee Retirement System Investment Act (“PERSIA”), 1965 PA 314, as provided by MERS Plan Document Section 39; MCL 38.1539, and PA 149.
- (C) **THE ELIGIBLE EMPLOYER** shall abide by the terms of the HCSP, including all investment, administration, and service agreements, and all applicable provisions of the Code and other law. It is affirmed that no assets from any defined benefit health account established under Section 401(h) of the Internal Revenue Code shall be transferred to, or accepted by, MERS.

# MERS Health Care Savings Program Uniform Resolution

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## SECTION 2. IMPLEMENTATION DIRECTIONS FOR MERS

- (A) The governing body of this Eligible Employer desires that all assets placed in its MERS HCSP Trust Fund (as a sub-fund within all pooled HCSP trust funds with MERS) be administered by MERS, which shall act as investment fiduciary with all powers provided under Public Employee Retirement System Investment Act, pursuant to PA 149, all applicable provisions of the Internal Revenue Code and other relevant law.
- (B) The governing body desires, and MERS upon its approval of this Resolution agrees, that all funds accumulated and held in the MERS HCSP Trust Fund shall be invested and managed by MERS within the collective and commingled investment of all HCSP funds held in trust for all Eligible Employers.
- (C) All monies in the MERS HCSP Trust Fund (and any earnings thereon, positive or negative) shall be held and invested for the sole purpose of paying health care benefits for the exclusive benefit of “Eligible Employees” who shall constitute “qualified persons” who have retired or separated from employment with the Eligible Employer, and for any expenses of administration, and shall not be used for any other purpose, and shall not be distributed to the State.
- (D) The Eligible Employer will fund on a defined contribution, individual account, basis its MERS HCSP Trust sub-fund to provide funds for health care benefits for “Eligible Employees” who shall constitute “qualified persons.” Participation in and any coverage under HCSP shall not constitute nor be construed to constitute an “accrued financial benefit” under Article 9 Section 24 of the Michigan Constitution of 1963.
- (E) The Eligible Employer designates and incorporates as “Eligible Employees” who shall constitute “qualified persons” under this HCSP Resolution those who are “Eligible Employees as defined in the HCSP Participation Agreement under this HCSP.
- (F) The Eligible Employer may designate the appropriate employer contacts who shall receive necessary reports, notices, etc.; shall act on behalf of the Eligible Employer; and may delegate any administrative duties relating to the Fund to appropriate departments.

## SECTION 3. EFFECTIVENESS OF THIS HCSP UNIFORM RESOLUTION

This Resolution shall have no legal effect until a certified copy of this adopting Resolution is filed with MERS, and MERS determines that all necessary requirements under MERS Plan Document Section 36(2)(a), 1999 PA 149 and other relevant laws, and this Resolution have been met. Upon MERS’ determination that all necessary documents have been submitted, MERS shall record its formal approval upon this Resolution, and return a copy to the Eligible Employer’s designated primary contact.

In the event an amendatory resolution or other action by the Eligible Employer is required by MERS, such Resolution or action shall be deemed effective as of the date of the initial Resolution or action where concurred in by this governing body and MERS (and the Program Administrator if necessary). Section 54 of the MERS Plan Document shall apply to this Resolution and all acts performed under its authority. The terms and conditions of this Resolution supersede and stand in place of any prior resolution, and its terms are controlling.

## MERS Health Care Savings Program Uniform Resolution

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**I hereby certify that the above is a true copy of the Uniform Resolution Adopting The MERS Health Care Savings Program, adopted at the official meeting held by the governing body of this municipality:**

On \_\_\_\_\_, 20\_\_\_\_  
(Signature of authorized official)

**Received and Approved by the Municipal Employees' Retirement System of Michigan**

Dated: \_\_\_\_\_, 20\_\_\_\_  
(Authorized MERS signatory)

## MERS Retiree Health Funding Vehicle Uniform Resolution



1134 Municipal Way Lansing, MI 48917 | 800.767.6377 | Fax 517.703.9707

[www.mersofmich.com](http://www.mersofmich.com)

**WHEREAS**, the Municipal Employees' Retirement System ("MERS") Plan Document of 1996, effective October 1, 1996, authorized the Municipal Employees' Retirement Board ("Board") to establish additional programs including but not limited to Defined Benefit and Defined Contribution programs (MERS Plan Document Section 36(2)(a)); and the Municipal Employees Retirement Act of 1984, Section 36(2)(a) as amended by 1996 PA 220, MCL 38.1536(2)(a);

**WHEREAS**, the Board has previously authorized MERS establishment of a retiree health funding vehicle ("RHFV" or "Program"), which a participating municipality or court, or another eligible public employer that is a political subdivision of the State which constitutes a "municipality" under MERS Plan Document Section 2B(4); MCL 38.1502b(2) ("Eligible Employer"), may adopt for its Eligible Employees;

**WHEREAS**, MERS has been determined by the Internal Revenue Service to be a tax qualified "governmental plan" and trust under Section 401(a) of the Internal Revenue Code of 1986, and all trust assets within MERS reserves are therefore exempt from taxation under Code Section 501(a) (IRS Letter of Favorable Determination dated June 15, 2005).

**WHEREAS**, the Board has established a governmental trust under Section 115 of the Internal Revenue Code (the "Trust Fund") to hold the assets of the RHFV, which Trust Fund shall be administered under the discretion of the Board as fiduciary, directly by (or through a combination of) MERS or MERS duly-appointed Program Administrator;

**WHEREAS**, 1999 PA 149, the Public Employee Health Care Fund Investment Act, MCL 38.1211 et seq. ("PA 149") provides for the creation by a public corporation of a public employee health care fund, and its administration, investment, and management, in order to accumulate funds to provide for the funding of health benefits for retirees and beneficiaries;

**WHEREAS**, a MERS health care trust fund constitutes a governmental trust established by a public corporation ("municipality") as an Eligible Employer, provided that all such employers shall be the State of Michigan, its political subdivisions, and any public entity the income of which is excluded from gross income under Section 115 of the Internal Revenue Code; provided further, that the health care trust shall not accept assets from any defined benefit health account established under Section 401(h) of the Internal Revenue Code;

**WHEREAS**, the Board acts as investment fiduciary for the pooled assets of each MERS participating municipality and court enrolled in MERS Defined Benefit Plan, Defined Contribution Plan, and Hybrid Plan, on whose behalf MERS performs all plan administration and investment functions, and such participating municipalities and courts have full membership, representation and voting rights at the MERS Annual Meeting as provided under Plan Section 45; MCL 38.1545.

**WHEREAS**, the Board also acts as investment fiduciary for those participating employers who are non-MERS participating municipalities and courts that have adopted the MERS Health Care Savings Program, Retiree Health Funding Vehicle, 457, or Investment Services Program, and such entities are not accorded membership, representation or voting rights provided to MERS participating municipalities and courts at the MERS Annual Meeting under Plan Section 45; MCL 38.1545.

# MERS Retiree Health Funding Vehicle Uniform Resolution

**WHEREAS**, adoption of this Uniform Resolution (the “Uniform Resolution”) by the Eligible Employer is necessary and required in order that the benefits available under the MERS Retiree Health Funding Vehicle may be extended;

**WHEREAS**, this Uniform Resolution has been approved by the Board under the authority of 1996 PA 220, MERS Plan Document Section 36(2)(a), MCL 38.1536(2)(a), declaring that the Board “shall determine . . . and establish” all provisions of the Retirement System. The MERS RHFV shall not be implemented with respect to any Eligible Employer unless in strict compliance with the terms and conditions of this Resolution, the Trust Document, and Trust Agreement.

- It is expressly agreed and understood as an integral and nonseverable part of extension or continuation of coverage under this Uniform Resolution Adopting MERS Retiree Health Funding Vehicle, that Section 43B of the MERS Plan Document shall not apply to this Uniform Resolution, its administration or interpretation.
- In the event any alteration of the language, terms or conditions stated in this Uniform Resolution Adopting MERS Retiree Health Funding Vehicle is made or occurs under MERS Plan Document Section 43B or other plan provision or other law, it is expressly recognized that MERS and the Board, as fiduciary of the MERS Plan and its trust reserves, and whose authority is nondelegable, shall have no obligation or duty: to administer (or to have administered) the MERS RHFV or its Trust Fund; or to continue administration.

**NOW, THEREFORE, BE IT RESOLVED** that the governing body adopts the MERS PA 149 Health Care Trust Fund as provided below.

## I. MERS RETIREE HEALTH FUNDING VEHICLE

**EFFECTIVE** \_\_\_\_\_, 20\_\_\_\_, the MERS Retiree Health Funding

Vehicle is hereby adopted by the \_\_\_\_\_  
(MERS municipality or court or other eligible employer)

**CONTRIBUTIONS** shall be made only by the Eligible Employer, remitted to MERS by the Eligible Employer, and credited to the Eligible Employer’s separate fund within the trust sub-fund for MERS RHFV. As this Plan is funded solely by employer, on a cash or actuarial basis as determined by the employer, there is no requirement for a Participation Agreement establishing the schedule of contributions.

**INVESTMENT** of funds accumulated and held in the Fund shall be held in a separate reserve and invested on a pooled basis by MERS subject to the Public Employee Retirement System Investment Act (“PERSIA”), 1965 PA 314, as provided by MERS Plan Document Section 39; MCL 38.1539, and PA 149.

**THE ELIGIBLE EMPLOYER** shall abide by the terms of MERS RHFV, including all investment, administration, and service agreements, and all applicable provisions of the Code and other law. It is affirmed that no assets from any defined benefit health account established under Section 401(h) of the Internal Revenue Code shall be transferred to, or accepted by, MERS.

# MERS Retiree Health Funding Vehicle Uniform Resolution

## II. IMPLEMENTATION DIRECTIONS FOR MERS AS RHFV INVESTMENT FIDUCIARY AND TRUSTEE

- (A) The governing body of this Eligible Employer desires that all assets placed in its MERS RHFV (as a sub-fund within all pooled Trust Funds with MERS) be administered by MERS, which shall act as investment fiduciary with all powers provided under Public Employee Retirement System Investment Act, PA 149, all applicable provisions of the Internal Revenue Code and other relevant law.
- (B) The governing body desires, and MERS upon its approval of this Resolution agrees, that all funds accumulated and held in the MERS RHFV Trust Fund shall be invested and managed by MERS within the collective and commingled investment of all funds held in trust for all Eligible Employers.
- (C) The RHFV is designed as a PA 149 compliant trust. All assumptions, including the rate of investment return used in any OPEB valuation, are the responsibility of the employer in conjunction with any advice they may obtain from their health care actuary and/or auditor, if any. The Employer acknowledges and affirms the responsibility for selecting the investment option(s) from the MERS investment funds for their RHFV account.

The Participating Employer makes the following initial fund election (subsequent changes may be made by the RHFV Investment Change Form #RH-602). Percentage of assets to be invested in Fund selected:

Portfolios Built for You (Stocks/Bonds)		Funds to Build Your Own Portfolio	
MERS Total Market Portfolio	%	Large Cap Stock Index	%
MERS Global Stock Portfolio (100/0)	%	Mid Cap Stock Index	%
MERS Capital Appreciation Portfolio (80/20)	%	Small Cap Stock Index	%
MERS Established Market Portfolio (60/40)	%	International Stock Index	%
MERS Balanced Income Portfolio (40/60)	%	Emerging Market Stock	%
MERS Capital Preservation Portfolio (20/80)	%	Short-Term Income	%
MERS Diversified Bond Portfolio (0/100)	%		

All allocations must use a whole percentage, and the total percentage of amount allocated must equal 100%.

*Please refer to the Fund Summary Sheets for information regarding each investment option, including potential redemption fees, and restrictions ([www.mersofmich.com](http://www.mersofmich.com)).*

- (D) Changes in the fund choices or allocations made in paragraph (C) may be made in writing using the designated MERS form addressed to the MERS RHFV Program Administrator and shall be made by (select one):
  - the Governing Body only (ongoing fund elections may be made only by the RHFV Investment Change Form #RH-602 and supporting certified minutes stating Governing Body approval).
  - the designated employer contacts (ongoing fund elections may be made either through your online account or by the RHFV Investment Change Form #RH-602).

## MERS Retiree Health Funding Vehicle Uniform Resolution

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- (E) All monies in the MERS RHFV Trust Fund (and any earnings thereon, positive or negative) shall be held and invested for the sole purpose of paying health care benefits for the exclusive benefit of “Eligible Employees” who shall constitute “qualified persons” who have retired or separated from employment with the Eligible Employer, and for any expenses of administration, and shall not be used for any other purpose, and shall not be distributed to the State.
- (F) The Eligible Employer will fund its MERS RHFV Trust sub-fund to provide funds for health care benefits for “Eligible Employees” who shall constitute “qualified persons.” Participation in and any coverage under RHFV shall not constitute nor be construed to constitute an “accrued financial benefit” under Article 9 Section 24 of the Michigan Constitution of 1963, nor shall any contribution method for Eligible Employer funding other than “pay as you go” cash funding be required or imposed, and all benefits, rights, and obligations conferred by or arising under RHFV shall be as provided under the RHFV documents.
- (G) The Eligible Employer generically designates the following groups of persons as “Eligible Employees” who shall constitute “qualified persons,” to receive retiree health care benefits subsidized under the MERS RHFV trust sub-fund. Groups may include any dependent(s) as specified in your bargaining agreement and/or personnel policy (provide copies of any governing agreement or other policy): For example “non-union employees.”
- (H) The Eligible Employer may designate the appropriate employer contacts who shall direct payment of fund monies for the benefit of the Eligible Employees identified in paragraph (G) under any retiree health care benefit program, including, but not limited to, MERS HCSP; make investment allocations of the Employer’s fund assets within MERS-approved funds to the extent authorized in paragraph (C); receive necessary reports, notices, etc.; shall act on behalf of the Eligible Employer; and may delegate any administrative duties relating to the Fund to appropriate departments.

### SECTION 3. EFFECTIVENESS OF THIS RESOLUTION

This Resolution shall have no legal effect until a certified copy of this adopting Resolution shall be filed with MERS, and MERS determines that all necessary requirements under MERS Plan Document Section 36(2)(a), 1999 PA 149 and other relevant laws, and this Resolution have been met. Upon MERS determination that all necessary documents have been submitted, MERS shall record its formal approval upon this Resolution, and return a copy to the Eligible Employer’s designated primary contact.

In the event an amendatory resolution or other action by the Eligible Employer is required by MERS, such Resolution or action shall be deemed effective as of the date of the initial Resolution or action where concurred in by this governing body and MERS (and the Program Administrator if necessary). Section 54 of the MERS Plan Document shall apply to this Resolution and all acts performed under its authority. The terms and conditions of this Resolution supersede and stand in place of any prior resolution, and its terms are controlling.

# MERS Retiree Health Funding Vehicle Uniform Resolution

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I hereby certify this above is a true copy of the Resolution Adopting the MERS Retiree Health Funding Vehicle adopted and approved on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ at the official meeting held by \_\_\_\_\_.  
(Name of approving employer)

Authorized Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Witness Signature: \_\_\_\_\_

**Received and Approved by the Municipal Employees' Retirement System of Michigan**

Dated: \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_  
(Authorized MERS signatory)

At a regular meeting of the Township Board of Trustees of the Charter Township of Grand Haven, Ottawa County, Michigan, held on the 25<sup>th</sup> day of April, 2016, at 7:00 p.m. The meeting was held at the Township of Grand Haven, 13300 168th Avenue, Grand Haven, Michigan.

PRESENT:

ABSENT:

After certain matters of business had been discussed, Supervisor French announced that the next order of business was the consideration of a resolution to transfer Post Employment Medical Expense Reimbursement Section 115 Trust assets to Municipal Employees' Retirement System. Following discussion, the following resolution was offered by \_\_\_\_\_ and supported by \_\_\_\_\_:

**RESOLUTION NO. 16-04-05**

**WHEREAS**, the Board of Grand Haven Charter Township, Michigan ("Board"), a Michigan public corporation, desires to transfer the Post Employment Medical Expense Reimbursement Section 115 Trust ("Trust") that was established, provided for under the Public Employee Health Care Fund Investment Act, 1999 PA 149, MCL 38.1211 to 38.1216, for the accumulation and investment of funds for the purpose of funding health care benefits to the retirees and the beneficiaries of retirees of the Board; and

**WHEREAS**, the Board wishes to transfer assets held in the Trust to another investment and service provider;

**WHEREAS**, the named trustee, the Township Superintendent is authorized to direct Trust assets to the new investment and service provider;

**NOW THEREFORE BE IT RESOLVED**, pursuant to section 5.3 of the Trust dated 03/01/2015 by and between Grand Haven Charter Township, the employer, and the Township Superintendent, the trustee, the Board hereby terminates the Trust and TPA relationship with Burnham & Flower Group, Inc., the Investment Management Services through CLS Investments, LLC and the Custodian Services through Constellation Trust Company and approves the transfer of Trust assets to a new Section 115 Trust, service and investment provider with the Municipal Employees' Retirement System.

Ayes:

Nays:

Absent:

RESOLUTION DECLARED:

ADOPTED ON:

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Laurie Larsen, Township Clerk

**CERTIFICATE**

I, the undersigned, the duly qualified Township Clerk of the Charter Township of Grand Haven, Ottawa County, Michigan, certify that the foregoing is a true and complete copy of the resolution adopted by the Township Board at a regular meeting of the Township Board held on the 25<sup>th</sup> day of April, 2016. I further certify that public notice of the meeting was given pursuant to and in full compliance with Michigan Act 267 of 1976, as amended, and that the minutes of the meeting were kept and will be or have been made available as required by the Act.

\_\_\_\_\_  
Laurie Larsen, Township Clerk

# MERS Health Care Savings Program Participation Agreement



1134 Municipal Way Lansing, MI 48917 | 800.767.2308 | Fax 517.703.9711

www.mersofmich.com

## I. PARTICIPATING EMPLOYER

**Employer Name:** \_\_\_\_\_  
(Name of municipality or court)

**Municipality Number:** \_\_\_\_\_ **Division Number:** \_\_\_\_\_

## II. EFFECTIVE DATE

1. If this is the initial Participation Agreement relating to the MERS Health Care Savings Program for this covered group, the effective date of the program here adopted shall be:

\_\_\_\_\_  
(Date)

2. If this is an amendment and restatement of an existing Participation Agreement relating to the MERS Health Care Savings Program for this covered group, the effective date of this amendment and restatement shall be effective: \_\_\_\_\_.

(Date)

## III. COVERED EMPLOYEE GROUPS

A participating Employer may cover all of its employee groups, bargaining units or personnel/ employee classifications (“Covered Group”), in Health Care Savings Program. **Contributions shall be made on the same basis within each Covered Group identified by this agreement, and remitted as directed by the Program Administrator.** If the Employer has varying coverage or contribution structures between groups, a separate agreement will need to be completed for each covered group. This agreement encompasses the following group(s):

\_\_\_\_\_  
(Name/s of HCSP covered group/s)

## IV. ELIGIBLE EMPLOYEES

Only Employees of a “municipality” may be covered by the Health Care Savings Program Participation Agreement. Independent contractors may not participate in the Health Care Savings Program.

The Employer shall provide MERS with the name, address, Social Security Number, and date of birth for each Eligible Employee, as defined by the Participation Agreement.

# MERS Health Care Savings Program Participation Agreement

## V. EMPLOYER CONTRIBUTIONS TO THE HEALTH CARE SAVINGS PROGRAM

The Participating Employer hereby elects to make contributions to the Trust. Contributions shall be made on the same basis within each Covered Group specified in this agreement, and remitted to MERS as directed by the Employer, to be credited to the individual accounts of Eligible Employees as follows:

**Check one or more (A, B, and/or C):**

**A.  Basic Employer (Before-Tax) Contributions.** Before-tax employer contributions may be made as a percentage of salary and/or by a specified dollar amount. Identify below the basic employer contribution formula to be applied to the covered groups within the Health Care Savings Program identified in this agreement.

Contribution structure (specify):

**Vesting Cycle For Basic Employer Contributions Only.** The employer contributions identified in this Participation Agreement are subject to the following vesting cycle.

- Immediate Vesting upon Participation
- Cliff Vesting: The participant is 100% vested upon \_\_\_\_\_ year(s).  
(Stated years)
- Graded Vesting Percentage per year of service: Employers can select the percentage of vesting with the corresponding years of service:

Years of Service	Percent Vested
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
	100%

**FORFEITURE PROVISION.** Upon separation from service with the Employer prior to meeting the required vesting schedule set out above or in the event a Participant dies without Dependent(s) and/or a named Beneficiary, a Participant's account assets shall:

**Check only one:**

- Remain in the HCSP sub-trust to be reallocated among all Plan participants equally
- Remain in the HCSP sub-trust to be used to offset future Employer Contributions
- Be transferred to the Retiree Health Funding Vehicle ("RHFV")

# MERS Health Care Savings Program Participation Agreement

- B.  Mandatory Salary Reduction (Before-Tax) Contributions.** Before-tax Employer Contributions to the Health Care Savings Program Sub-Trust shall be made that represent a mandatory salary reduction resulting from collective bargaining or the establishment of a personnel policy. These reductions may be made as a percentage of salary or a specific dollar amount.

Contribution structure (specify):

- C.  Mandatory Leave Conversion (Before-Tax) Contributions.** Before-tax Employer Contributions to the Health Care Savings Program Sub-Trust shall be made that represent a mandatory conversion of accrued leave including, but not limited to vacation, holiday, sick leave, or severance amounts otherwise paid out, to a cash contribution. These contributions may be calculated as a percentage of accrued leave or a specific dollar amount representing the accrued leave. Leave conversions may be made on an annual basis or at separation from service, or at such other time as the Employer indicates. *(Note: The leave conversion program shall not permit employees the option of receiving cash in lieu of the employer contribution.)*

**Check one or more:**

- As of \_\_\_\_\_, \_\_\_\_\_% of \_\_\_\_\_  
Annual date or X weeks before termination    Percentage    Type of Leave Conversion (sick, vacation, etc.)  
must be contributed to the HCSP.
- As of \_\_\_\_\_, \_\_\_\_\_% of \_\_\_\_\_  
Annual date or X weeks before termination    Percentage    Type of Leave Conversion (sick, vacation, etc.)  
must be contributed to the HCSP.
- As of \_\_\_\_\_, \_\_\_\_\_% of \_\_\_\_\_  
Annual date or X weeks before termination    Percentage    Type of Leave Conversion (sick, vacation, etc.)  
must be contributed to the HCSP.
- As of \_\_\_\_\_, \_\_\_\_\_% of \_\_\_\_\_  
Annual date or X weeks before termination    Percentage    Type of Leave Conversion (sick, vacation, etc.)  
must be contributed to the HCSP.

# MERS Health Care Savings Program Participation Agreement

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**Post-Tax Employee Contributions.** Post-tax Employee Contributions made by Eligible Employees within the Covered Group(s) shall be remitted as directed by the Program Administrator, to be credited to the individual accounts of Eligible Employees. All Employee Contributions must be remitted to MERS along with the Participation Report.

**VI. MODIFICATION OF THE TERMS OF THE PARTICIPATION AGREEMENT**

If a Participating Employer desires to amend any of its previous elections contained in this Participation Agreement, including attachments, the Governing Body by official action must adopt a new Participation Agreement and forward it to the Board for approval. The amendment of the new Participation Agreement is not effective until approved by the Board and other procedures required by the Trust Agreement and Plan Document have been implemented.

**VII. STATE LAW**

To the extent not preempted by federal law, this agreement shall be interpreted in accordance with Michigan law.

**VIII. TERMINATION OF THE PARTICIPATION AGREEMENT**

This Participation Agreement may be terminated only in accordance with the Trust Agreement.

**IX. EXECUTION BY GOVERNING BODY OF MUNICIPALITY**

The foregoing Participation Agreement is hereby adopted and approved on the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ at the official meeting held by \_\_\_\_\_.  
(Name of approving employer)

Authorized Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Witness Signature: \_\_\_\_\_

**Received and Approved by the Municipal Employees' Retirement System of Michigan**

Dated: \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_  
(Authorized MERS signatory)



GRAND HAVEN CHARTER TOWNSHIP

## Community Development Memo

DATE: April 20, 2016  
TO: Township Board  
FROM: Stacey Fedewa, Planning & Zoning Official  
RE: 2016 Resilient Grand Haven Master Plan (Draft)

### BACKGROUND

The Resilient Grand Haven Master Planning process began two years ago, in April 2014. The next step is to have the Board adopt a resolution to formally approve the Master Plan.

If the Board does not approve the resolution, the Michigan Planning Enabling Act requires the Board to submit a Statement of Objection to the Planning Commission.

### WHAT HAS CHANGED?

### BOARD & PLANNING COMMISSION FEEDBACK

Since October 2015 (*the last time the Board received a draft of the Plan*), the following changes have been made based on the feedback that was received from the Board and Planning Commission:

- **Executive Summary** of the Plan has been created (*see pages vii – xii*).
  - It is a stand-alone document and is also within the Master Plan.
- The **Coastal Report** and **Vulnerability Report** have been removed from the Plan and added to the website as an individual document (*see Chapters 12 and 13*).
  - The Plan still has a summary of each report, and within this summary are links that direct the reader to the Township website in order to view the full report.
- The **maps** have been incorporated into the document, so the reader does not have to flip back-and-forth between the chapter and appendix.

- More information has been added on the **non-motorized pathways** (*see pages 40 – 41*).
- The “**Missing Middle Housing**” concept has been included, so the Township can research the topic more and determine if it should be implemented into the zoning ordinance at a later date (*see page 18*).
- The **Economy Chapter** has been revised. It now utilizes local data in addition to Census data to provide a clearer picture of the local and regional economy (*see Chapter 6*).
  - More emphasis was provided for the manufacturing industry.
  - More emphasis was provided for the agricultural industry.
- Information on the **Orphan Drain Project** and **Water System Reliability Study** were added (*see page 25*).
- All data has been updated to reflect the most current information that is available.

## PUBLIC HEARING

The Planning Commission held the public hearing for the Plan on April 18<sup>th</sup>. This hearing resulted in the following revisions being made:

- New Future Land Use category: Medium-High Density Residential PUD
  - This new category is for the OCRC land, and would allow for senior housing, assisted living facility, adult day care, family foster care etc.
  - These uses act as a transition between a single-family neighborhood and more intense land uses such as an apartment complex, commercial, or industrial use.
  - Furthermore, these uses generate less traffic than high density residential, commercial, and industrial.
- Two properties near Lake Michigan Drive and 168<sup>th</sup> Avenue are now master-planned for Rural Residential instead of Ag Preserve.
  - This will allow long-time property owners to rezone the land and allow their children to build a home.
- A portion of land on the SE corner of US-31 and Lincoln is master-planned for Commercial instead of Ag Preserve.
  - This same portion was master-planned commercial during 1990 – 2005, and only changed in 2009.
- Information on the West Michigan Shoreline Regional Development Commission (WMSRDC) and Michigan Planning Organization (MPO) has been added to page 21 of Chapter 4. Built Systems.

## RESILIENT MASTER PLAN FINAL DRAFT

The final draft of the Master Plan includes:

- Executive Summary (*stand-alone + in Master Plan*)
- Master Plan
- Coastal Report (*stand-alone document*)
- Vulnerability Report (*stand-alone document*)

## SAMPLE MOTIONS

If the Township Board finds the 2016 Resilient Grand Haven Master Plan meets the applicable standards, the following motions can be offered:

**Motion to approve** and adopt Resolution 16-04-06 that formally adopts the 2016 Resilient Grand Haven Master Plan pursuant to the Michigan Planning Enabling Act of 2008, as amended (*roll call vote is required*).

If the Township Board finds the 2016 Resilient Grand Haven Master Plan does not meet the applicable standards, the following motion can be offered:

**Motion to direct staff to draft a Statement of Objection which will reject** the 2016 Resilient Grand Haven Master Plan. The Statement of Objection shall include those discussion points being reflected in the meeting minutes. This will be reviewed and considered for adoption at the next meeting.

If the Township Board finds that more time is needed to consider the 2016 Resilient Grand Haven Master Plan, the following motion can be offered:

**Motion to table** the 2016 Resilient Grand Haven Master Plan until (insert date) .

Please contact me prior to the meeting with questions or concerns.

At a regular meeting of the Township Board of Trustees of the Charter Township of Grand Haven, Ottawa County, Michigan, held on the 25<sup>th</sup> day of April, 2016, at 7:00 p.m. The meeting was held at the Township of Grand Haven, 13300 168th Avenue, Grand Haven, Michigan.

PRESENT:

ABSENT:

After certain matters of business had been discussed, Supervisor French announced that the next order of business was the consideration of a resolution to formally approve the 2016 Resilient Grand Haven Master Plan. Following discussion, the following resolution was offered by \_\_\_\_\_ and supported by \_\_\_\_\_:

### **RESOLUTION NO. 16-04-06**

**WHEREAS**, Grand Haven Charter Township, Ottawa County, Michigan has a duly constituted Planning Commission whose responsibilities under the Michigan Planning Enabling Act, Public 33 or 2008, as amended, include the preparation of a Master Plan to guide future land use development in the community; and,

**WHEREAS**, the Township Planning Commission did issue its notice of intent to prepare a plan in accordance with Section 39, (2) of Public Act 33; and,

**WHEREAS**, the Township Planning Commission has worked with the consultants at Land Information Access Association to oversee a planning process that included significant public input, as well as investigations and surveys of existing resources; and,

**WHEREAS**, the Township Planning Commission prepared a proposed new Master Plan and submitted the plan to the Township Board for review and comment on October 19, 2015 and authorized distribution of the Master Plan to the entities that received the notice of intent to prepare the plan; and,

**WHEREAS**, after expiration of a 63 day review and comment period, the Township Planning Commission did give notice of a public hearing on the draft plan in accordance with Section 43, (1) of Public Act 33, with such public hearing being held on April 18, 2016; and,

**WHEREAS**, the Planning Commission did revise the draft plan to address comments received at the public hearing, with such changes to the text and maps being recorded in the minutes of this meeting;

**NOW, THEREFORE, BE IT RESOLVED**, that contents of the draft plan dated April 20, 2016, together with all the maps attached thereto and contained therein, are hereby adopted by the Grand Haven Charter Township Board in accordance with Section 43, (2)(3) of Public Act 33 by not less than a majority of its membership.

AYES:

NAYS:

ABSENT:

RESOLUTION DECLARED:

ADOPTED ON:

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Laurie Larsen, Township Clerk

#### **CERTIFICATE**

I, the undersigned, the duly qualified Township Clerk of the Charter Township of Grand Haven, Ottawa County, Michigan, certify that the foregoing is a true and complete copy of the resolution adopted by the Township Board at a regular meeting of the Township Board held on the 25<sup>th</sup> day of April, 2016. I further certify that public notice of the meeting was given pursuant to and in full compliance with Michigan Act 267 of 1976, as amended, and that the minutes of the meeting were kept and will be or have been made available as required by the Act.

---

Laurie Larsen, Township Clerk

# RESILIENT GRAND HAVEN CHARTER TOWNSHIP

Grand Haven Charter Township 2016 Master Plan



## EXECUTIVE SUMMARY

# DRAFT

This plan was prepared by the Land Information Access Association (LIAA) as part of the Resilient Grand Haven project. Support for the project came from the Michigan Municipal League (MML), Michigan Association of Planning (MAP), and the University of Michigan's Taubman College of Architecture and Urban Planning. A special thank you is owed to the many organizations and individuals that contributed to the planning process.

This project was funded in part by Grand Haven Charter Township, the City of Grand Haven, the Michigan Coastal Zone Management Program, Department of Environmental Quality, Office of the Great Lakes; and the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.



## EXECUTIVE SUMMARY

### WHAT IS A MASTER PLAN?

A Master Plan creates a blueprint for the preservation of a community. It is the essential foundation upon which communities are built and guides not only the physical and economic development, but also accommodates social, environmental, and regional concerns. The planning process offers an opportunity to look broadly at local programs such as economic development, public infrastructure and services, environmental protection, and how they relate to one another by presenting a “big picture” look at the community today and articulating goals for the future. The land use plan resembles a series of goals and policies that are then used to guide future land use regulations and decisions, including zoning. A good plan clearly articulates the desires and aspirations of a community.

The Master Plan is intended to take a long-range view of the Township, guiding growth and development for the next twenty years and beyond, while also providing flexibility to respond to changing conditions, innovations, new concepts and available resources.

### USES OF A MASTER PLAN

- Gives guidance to property owners, developers, neighboring jurisdictions, and county and state entities about expectations and standards for public investment and future development.
- Establishes the basis for the zoning ordinance, capital improvements, land use policies, and other implementation tools and programs.
- Provides the framework for day-to-day planning decisions by staff and land use policy decisions by the Planning Commission and Township Board.
- Identifies and evaluates existing conditions and characteristics, community values, trends, issues and opportunities.

### WHAT IS THE RESILIENT GRAND HAVEN CHARTER TOWNSHIP MASTER PLAN?

The Master Plan was developed with a specific focus on resiliency. By their very nature, communities are continually complex and dynamic. People move and populations shift, industries go out of business and new industries emerge, natural areas are converted to neighborhoods, housing values fluctuate, and shorelines shift and change. Sometimes these changes emerge over a long period of time whereas some changes can be quite sudden. Community resilience, then, is a measure of the sustained ability of a community to utilize available resources to withstand and/or recover from adverse situations.<sup>1,2</sup>

#### Build Community Resilience

According to the Resilient Framework established by the Rockefeller Foundation, a resilient community is:

1. Reflective
2. Robust
3. Redundant
4. Flexible
5. Resourceful
6. Inclusive
7. Integrated

<sup>1</sup> Rand Corporation, 2015. Community Resiliency Featured. <http://www.rand.org/topics/community-resilience.html>

<sup>2</sup> Rockefeller Foundation, 2014. Resilience Framework. <https://www.rockefellerfoundation.org/our-work/topics/resilience/>

**A Resilient Community Often Has:**

1. Minimal human vulnerability
2. Diverse livelihoods and employment
3. Adequate safeguards to human life and health
4. Collective identity and mutual support
5. Social stability and security
6. Availability of financial resources and contingency funds
7. Reduced physical exposure and vulnerability
8. Continuity of critical services
9. Effective leadership and management
10. Empowered stakeholders
11. Integrated development planning

Source: Rockefeller Foundation

**The Master Plan Process**

A Joint Planning Committee, consisting of the full planning commissions of the Township and the City helped to plan, participate in and oversee the master planning process.



**PUBLIC PARTICIPATION OVERVIEW**

Over 200 members of the public directly contributed to the Master Plan by participating in the Leadership Summit, Community Action Team Meetings, and a Public Open House. In addition the planning process was documented through the Project Website at [www.resilientmichigan.org/grand\\_haven.asp](http://www.resilientmichigan.org/grand_haven.asp) and the Township Facebook Page at [www.facebook.com/GHTownship](http://www.facebook.com/GHTownship). Lastly, the Township engaged the Grand Haven Area Community Foundation’s Youth Advisory Committee (YAC) through an exercise to illustrate their vision for the community. Subsequently the YAC drafted A Youth Perspective chapter that has been included in the Master Plan.

**HOW IS A MASTER PLAN IMPLEMENTED INTO THE ZONING ORDINANCE?**

A Zoning Ordinance cannot exist without an adopted Master Plan. The Master Plan forms the legal basis for the existence of the Zoning Ordinance. After each document has been adopted by the Township Board the Master Plan then functions as a guide for zoning ordinance amendments.

As amendments are made to the zoning ordinance the Township must ensure they align with the vision, goals, and objectives found in the Master Plan. In essence, the two must have a symbiotic relationship and be able to support amendments and revisions to each document.

For example, if the Master Plan encourages taller buildings the Township can amend the Zoning Ordinance to allow taller buildings. Conversely, if the Master Plan discourages taller buildings the Township should not attempt to amend the Zoning Ordinance. Rather, the Master Plan must be amended first, and the Zoning Ordinance could be revised afterwards.

Master Plans and Zoning Ordinances are “living documents.” Meaning, they each respond to changing conditions. As social norms shift over time each document should be updated to reflect the new changes. That is why the Michigan Planning Enabling Act requires municipalities to review their Master Plan every 5 years. If this review finds the Plan does not align with current trends then it should be updated. This allows the Zoning Ordinance to effectively respond to the needs of Township residents.

**DEMOGRAPHIC AND HOUSING TRENDS**

**PEOPLE**

- The Township’s population continues to grow, and is projected to reach more than 22,000 residents by 2030, which equates to a 46% growth rate over a 20 year period.
- The number and proportion of people aged 50+ increased more than any other group.
- The median household income is \$69,850, which is a 12% increase between 2000 and 2014.
- Residents with at least a Bachelor’s degree is increasing.
- The number of two-parent households with children continues to decrease, whereas the proportion of married couples without children, single-parent households, and householders living alone has increased.

## HOUSING

- The Township gained an additional 1,200 housing units between 2000 and 2014.
- More residents live in multi-family buildings, especially structures with 3+ units.
- The average household size has decreased from 2.9 to 2.7 people per home.
- The median value of a home is \$176,900 which is a 15% increase between 2000 and 2014.
- Median rents were higher in 2014 than in Michigan or Ottawa County overall.
- Taxable value increased by nearly 3.5% between 2014 and 2015.

## FUTURE LAND USE PLAN

The Future Land Use Plan is the general framework upon which land use and policy decisions for Grand Haven Charter Township will be guided for the next 20 to 25 years. The Future Land Use Plan was developed after careful consideration of several dynamic factors, including: existing land use, future development plans, community services, environmental features and a build-out analysis.

### FUTURE LAND USE DESCRIPTIONS

The Township, in conjunction with guidelines established by Ottawa County, has established 11 future land use classifications. The classifications listed below include a brief description on the land uses and identifies the corresponding zoning district(s) that equate to the current districts found in the Zoning Ordinance.

#### AGRICULTURAL PRESERVATION (AP)

- Agricultural and agri-business uses.
- Corresponding Zoning District: Agricultural (AG)

#### RURAL RESIDENTIAL (RR)

- Single family homes on lots that range from 1 – 10 acres.
- Corresponding Zoning Districts: Rural Preserve (RP) and Rural Residential (RR)

#### LOW DENSITY RESIDENTIAL (LDR)

- Single family homes on lots approximately ½ acre in size, and may or may not be located in a platted subdivision.
- Corresponding Zoning District: Low Density Residential (LDR)

#### MEDIUM DENSITY RESIDENTIAL (MDR)

- Single family, and limited two-family, homes on lot sizes ranging from 13,000 – 15,000 square feet and are typically located in a platted subdivision.
- Corresponding Zoning Districts: R-1 and R-2 Single Family Residential

## The Master Plan

It is important to understand the Master Plan is a guide for growth and development within the Township. Local officials and planning staff will continually need to develop and adapt new land use policies that respond to changing conditions, innovations and new concepts.



## Agricultural Land Uses

Agricultural land currently makes up 23% of the Township's total land area.



### Commercial/Horticultural Ag. Land Uses

Commercial/Horticultural Ag. land makes up 2.9% of the Township's total land area.



### Parks, Recreation, and Natural Area Land Uses

Land devoted to parks and recreation (including natural areas) make up 7.6% of the Township's total land area.



### MEDIUM-HIGH DENSITY RESIDENTIAL

- Includes a variety of housing types that act as a transition between a traditional single-family neighborhood to higher densities and more intense land uses. Examples include senior housing and assisted living facilities.
- Corresponding Zoning Districts: Residential PUD

### HIGH DENSITY RESIDENTIAL (HDR)

- Multi-family homes including duplexes, apartments, senior housing, townhomes, etc.
- Corresponding Zoning Districts: R-3 Two Family Residential, R-3.5 Restricted Multiple Family Residential, and R-4 Multiple Family Residential

### MANUFACTURED HOME PARK (MHP)

- Manufactured homes located in a designated park on 144th Avenue.
- Corresponding Zoning District: R-5 Manufactured Home Park

### OFFICE/SERVICE (OS)

- Low-intensity commercial uses such as office buildings
- Corresponding Zoning District: Service Professional (SP)

### COMMERCIAL (C)

- Traditional commercial uses such as retail, restaurants, shopping centers, office buildings, etc.
- Corresponding Zoning Districts: Commercial (C-1) and Service Professional (SP)

### GENERAL INDUSTRIAL (GI)

- Majority of industrial-related operations such as manufacturing, assembly, and warehousing.
- Corresponding Zoning Districts: Industrial (I-1) and Corridor Industrial (I-1A)

### EXTRACTION (E)

- Solely related to a sand mining operation that is currently in existence.
- Corresponding Zoning Districts: includes any district that permits the Removal and Processing of Natural Resources as a special land use.

### PUBLIC/QUASI-PUBLIC (PQP)

- Schools, government facilities, parks, natural areas, recognized churches, etc.
- Corresponding Zoning Districts: includes any district that permits Public/Quasi-Public land uses.

### FUTURE LAND USE MAP

The Future Land Use Map can be found in the Chapter 9 of the Master Plan, and on the Township website at: [www.ghet.org/about/map](http://www.ghet.org/about/map).

### GOALS AND OBJECTIVES

The Master Plan identifies a vision for the future of the Township and sets a series of goals and objectives to guide the decision-making process. Below are the 8 goals that have been established, and the objectives can be found in Chapter 7 of the Master Plan.

#### GOAL 1

The Township will preserve valuable natural resources, and the shorelines along Lake Michigan and the Grand River. These natural assets provide a cultural identity and add economic value to the community.

#### GOAL 2

The preservation and enhancement of natural features of the community will be a central consideration in all civic decisions in Grand Haven Township. Buildings and infrastructure will be planned, constructed and maintained to protect and improve the quality of the natural environment while serving the needs of the population and allowing residents and visitors appropriate access to enjoy natural features.

#### GOAL 3

Discourage the inappropriate and unplanned use of land through sporadic and isolated land divisions. Encourage carefully planned developments that are responsive to market demands.

#### GOAL 4

Support multiple housing options and mixed-use developments for all segments of the population that place users near daily services.

#### GOAL 5

Grand Haven's public facilities, including its roads, utilities, parks, and public buildings will be carefully planned, constructed and maintained to efficiently serve the needs of current and future generations.

#### GOAL 6

Residents and visitors to the greater Grand Haven community will have safe and convenient access by way of non-motorized pathway system, private automobiles, and public transportation.

#### GOAL 7

Grand Haven Township will continue to be a vital economic center that includes a balance of clean manufacturing, professional and personal service, the arts, hospitality, retail, commercial, and institutional employment.

### Coastal Processes

Chapter 12 summarizes a coastal study conducted by the University of Michigan as part of the Resilient Grand Haven Charter Township planning process.



### Manufacturing in Grand Haven Township

The Township is home to a number of manufacturing business, that provide vital jobs to residents throughout the Township and region.



**GOAL 8**

Grand Haven Township will be a leader in working with other units of government, state agencies, schools, and special authorities to manage growth and service delivery to the residents and businesses of the area in the most efficient and transparent manner possible.

# RESILIENT GRAND HAVEN CHARTER TOWNSHIP

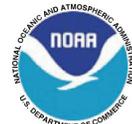
Grand Haven Charter Township 2016 Master Plan



# DRAFT

This plan was prepared by the Land Information Access Association (LIAA) as part of the Resilient Grand Haven project. Support for the project came from the Michigan Municipal League (MML), Michigan Association of Planning (MAP), and the University of Michigan's Taubman College of Architecture and Urban Planning. A special thank you is owed to the many organizations and individuals that contributed to the planning process.

This project was funded in part by Grand Haven Charter Township, the City of Grand Haven, the Michigan Coastal Zone Management Program, Department of Environmental Quality, Office of the Great Lakes; and the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.



## ACKNOWLEDGMENTS

### GRAND HAVEN CHARTER TOWNSHIP TRUSTEES

Karl French, Supervisor	Howard Behm
Laurie Larsen, Clerk	Mike Hutchins
William Kieft III, Treasurer	Cal Meeusen
Ron Redick	

### MASTER PLAN JOINT PLANNING COMMITTEE

#### GRAND HAVEN CHARTER TOWNSHIP PLANNING COMMISSION

Adam Kantrovich Ph.D, Chair  
Pete LaMourie  
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**PLACEHOLDER FOR ADOPTION RESOLUTION**

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## EXECUTIVE SUMMARY

### WHAT IS A MASTER PLAN?

A Master Plan creates a blueprint for the preservation of a community. It is the essential foundation upon which communities are built and guides not only the physical and economic development, but also accommodates social, environmental, and regional concerns. The planning process offers an opportunity to look broadly at local programs such as economic development, public infrastructure and services, environmental protection, and how they relate to one another by presenting a “big picture” look at the community today and articulating goals for the future. The land use plan resembles a series of goals and policies that are then used to guide future land use regulations and decisions, including zoning. A good plan clearly articulates the desires and aspirations of a community.

The Master Plan is intended to take a long-range view of the Township, guiding growth and development for the next twenty years and beyond, while also providing flexibility to respond to changing conditions, innovations, new concepts and available resources.

### USES OF A MASTER PLAN

- Gives guidance to property owners, developers, neighboring jurisdictions, and county and state entities about expectations and standards for public investment and future development.
- Establishes the basis for the zoning ordinance, capital improvements, land use policies, and other implementation tools and programs.
- Provides the framework for day-to-day planning decisions by staff and land use policy decisions by the Planning Commission and Township Board.
- Identifies and evaluates existing conditions and characteristics, community values, trends, issues and opportunities.

### WHAT IS THE RESILIENT GRAND HAVEN CHARTER TOWNSHIP MASTER PLAN?

The Master Plan was developed with a specific focus on resiliency. By their very nature, communities are continually complex and dynamic. People move and populations shift, industries go out of business and new industries emerge, natural areas are converted to neighborhoods, housing values fluctuate, and shorelines shift and change. Sometimes these changes emerge over a long period of time whereas some changes can be quite sudden. Community resilience, then, is a measure of the sustained ability of a community to utilize available resources to withstand and/or recover from adverse situations.<sup>1,2</sup>

#### Build Community Resilience

According to the Resilient Framework established by the Rockefeller Foundation, a resilient community is:

1. Reflective
2. Robust
3. Redundant
4. Flexible
5. Resourceful
6. Inclusive
7. Integrated

<sup>1</sup> Rand Corporation, 2015. Community Resiliency Featured. <http://www.rand.org/topics/community-resilience.html>

<sup>2</sup> Rockefeller Foundation, 2014. Resilience Framework. <https://www.rockefellerfoundation.org/our-work/topics/resilience/>

**A Resilient Community Often Has:**

1. Minimal human vulnerability
2. Diverse livelihoods and employment
3. Adequate safeguards to human life and health
4. Collective identity and mutual support
5. Social stability and security
6. Availability of financial resources and contingency funds
7. Reduced physical exposure and vulnerability
8. Continuity of critical services
9. Effective leadership and management
10. Empowered stakeholders
11. Integrated development planning

Source: Rockefeller Foundation

**The Master Plan Process**

A Joint Planning Committee, consisting of the full planning commissions of the Township and the City helped to plan, participate in and oversee the master planning process.



**PUBLIC PARTICIPATION OVERVIEW**

Over 200 members of the public directly contributed to the Master Plan by participating in the Leadership Summit, Community Action Team Meetings, and a Public Open House. In addition the planning process was documented through the Project Website at [www.resilientmichigan.org/grand\\_haven.asp](http://www.resilientmichigan.org/grand_haven.asp) and the Township Facebook Page at [www.facebook.com/GHTownship](http://www.facebook.com/GHTownship). Lastly, the Township engaged the Grand Haven Area Community Foundation’s Youth Advisory Committee (YAC) through an exercise to illustrate their vision for the community. Subsequently the YAC drafted A Youth Perspective chapter that has been included in the Master Plan.

**HOW IS A MASTER PLAN IMPLEMENTED INTO THE ZONING ORDINANCE?**

A Zoning Ordinance cannot exist without an adopted Master Plan. The Master Plan forms the legal basis for the existence of the Zoning Ordinance. After each document has been adopted by the Township Board the Master Plan then functions as a guide for zoning ordinance amendments.

As amendments are made to the zoning ordinance the Township must ensure they align with the vision, goals, and objectives found in the Master Plan. In essence, the two must have a symbiotic relationship and be able to support amendments and revisions to each document.

For example, if the Master Plan encourages taller buildings the Township can amend the Zoning Ordinance to allow taller buildings. Conversely, if the Master Plan discourages taller buildings the Township should not attempt to amend the Zoning Ordinance. Rather, the Master Plan must be amended first, and the Zoning Ordinance could be revised afterwards.

Master Plans and Zoning Ordinances are “living documents.” Meaning, they each respond to changing conditions. As social norms shift over time each document should be updated to reflect the new changes. That is why the Michigan Planning Enabling Act requires municipalities to review their Master Plan every 5 years. If this review finds the Plan does not align with current trends then it should be updated. This allows the Zoning Ordinance to effectively respond to the needs of Township residents.

**DEMOGRAPHIC AND HOUSING TRENDS**

**PEOPLE**

- The Township’s population continues to grow, and is projected to reach more than 22,000 residents by 2030, which equates to a 46% growth rate over a 20 year period.
- The number and proportion of people aged 50+ increased more than any other group.
- The median household income is \$69,850, which is a 12% increase between 2000 and 2014.
- Residents with at least a Bachelor’s degree is increasing.
- The number of two-parent households with children continues to decrease, whereas the proportion of married couples without children, single-parent households, and householders living alone has increased.

## HOUSING

- The Township gained an additional 1,200 housing units between 2000 and 2014.
- More residents live in multi-family buildings, especially structures with 3+ units.
- The average household size has decreased from 2.9 to 2.7 people per home.
- The median value of a home is \$176,900 which is a 15% increase between 2000 and 2014.
- Median rents were higher in 2014 than in Michigan or Ottawa County overall.
- Taxable value increased by nearly 3.5% between 2014 and 2015.

## FUTURE LAND USE PLAN

The Future Land Use Plan is the general framework upon which land use and policy decisions for Grand Haven Charter Township will be guided for the next 20 to 25 years. The Future Land Use Plan was developed after careful consideration of several dynamic factors, including: existing land use, future development plans, community services, environmental features and a build-out analysis.

### FUTURE LAND USE DESCRIPTIONS

The Township, in conjunction with guidelines established by Ottawa County, has established 11 future land use classifications. The classifications listed below include a brief description on the land uses and identifies the corresponding zoning district(s) that equate to the current districts found in the Zoning Ordinance.

#### AGRICULTURAL PRESERVATION (AP)

- Agricultural and agri-business uses.
- Corresponding Zoning District: Agricultural (AG)

#### RURAL RESIDENTIAL (RR)

- Single family homes on lots that range from 1 – 10 acres.
- Corresponding Zoning Districts: Rural Preserve (RP) and Rural Residential (RR)

#### LOW DENSITY RESIDENTIAL (LDR)

- Single family homes on lots approximately ½ acre in size, and may or may not be located in a platted subdivision.
- Corresponding Zoning District: Low Density Residential (LDR)

#### MEDIUM DENSITY RESIDENTIAL (MDR)

- Single family, and limited two-family, homes on lot sizes ranging from 13,000 – 15,000 square feet and are typically located in a platted subdivision.
- Corresponding Zoning Districts: R-1 and R-2 Single Family Residential

### The Master Plan

It is important to understand the Master Plan is a guide for growth and development within the Township. Local officials and planning staff will continually need to develop and adapt new land use policies that respond to changing conditions, innovations and new concepts.



### Agricultural Land Uses

Agricultural land currently makes up 23% of the Township's total land area.



### Commercial/Horticultural Ag. Land Uses

Commercial/Horticultural Ag. land makes up 2.9% of the Township's total land area.



### Parks, Recreation, and Natural Area Land Uses

Land devoted to parks and recreation (including natural areas) make up 7.6% of the Township's total land area.



### MEDIUM-HIGH DENSITY RESIDENTIAL

- Includes a variety of housing types that act as a transition between a traditional single-family neighborhood to higher densities and more intense land uses. Examples include senior housing and assisted living facilities.
- Corresponding Zoning Districts: Residential PUD

### HIGH DENSITY RESIDENTIAL (HDR)

- Multi-family homes including duplexes, apartments, senior housing, townhomes, etc.
- Corresponding Zoning Districts: R-3 Two Family Residential, R-3.5 Restricted Multiple Family Residential, and R-4 Multiple Family Residential

### MANUFACTURED HOME PARK (MHP)

- Manufactured homes located in a designated park on 144th Avenue.
- Corresponding Zoning District: R-5 Manufactured Home Park

### OFFICE/SERVICE (OS)

- Low-intensity commercial uses such as office buildings
- Corresponding Zoning District: Service Professional (SP)

### COMMERCIAL (C)

- Traditional commercial uses such as retail, restaurants, shopping centers, office buildings, etc.
- Corresponding Zoning Districts: Commercial (C-1) and Service Professional (SP)

### GENERAL INDUSTRIAL (GI)

- Majority of industrial-related operations such as manufacturing, assembly, and warehousing.
- Corresponding Zoning Districts: Industrial (I-1) and Corridor Industrial (I-1A)

### EXTRACTION (E)

- Solely related to a sand mining operation that is currently in existence.
- Corresponding Zoning Districts: includes any district that permits the Removal and Processing of Natural Resources as a special land use.

### PUBLIC/QUASI-PUBLIC (PQP)

- Schools, government facilities, parks, natural areas, recognized churches, etc.
- Corresponding Zoning Districts: includes any district that permits Public/Quasi-Public land uses.

## FUTURE LAND USE MAP

The Future Land Use Map can be found in the Chapter 9 of the Master Plan, and on the Township website at: [www.ghet.org/about/map](http://www.ghet.org/about/map).

## GOALS AND OBJECTIVES

The Master Plan identifies a vision for the future of the Township and sets a series of goals and objectives to guide the decision-making process. Below are the 8 goals that have been established, and the objectives can be found in Chapter 7 of the Master Plan.

### GOAL 1

The Township will preserve valuable natural resources, and the shorelines along Lake Michigan and the Grand River. These natural assets provide a cultural identity and add economic value to the community.

### GOAL 2

The preservation and enhancement of natural features of the community will be a central consideration in all civic decisions in Grand Haven Township. Buildings and infrastructure will be planned, constructed and maintained to protect and improve the quality of the natural environment while serving the needs of the population and allowing residents and visitors appropriate access to enjoy natural features.

### GOAL 3

Discourage the inappropriate and unplanned use of land through sporadic and isolated land divisions. Encourage carefully planned developments that are responsive to market demands.

### GOAL 4

Support multiple housing options and mixed-use developments for all segments of the population that place users near daily services.

### GOAL 5

Grand Haven's public facilities, including its roads, utilities, parks, and public buildings will be carefully planned, constructed and maintained to efficiently serve the needs of current and future generations.

### GOAL 6

Residents and visitors to the greater Grand Haven community will have safe and convenient access by way of non-motorized pathway system, private automobiles, and public transportation.

### GOAL 7

Grand Haven Township will continue to be a vital economic center that includes a balance of clean manufacturing, professional and personal service, the arts, hospitality, retail, commercial, and institutional employment.

## Coastal Processes

Chapter 12 summarizes a coastal study conducted by the University of Michigan as part of the Resilient Grand Haven Charter Township planning process.



## Manufacturing in Grand Haven Township

The Township is home to a number of manufacturing business, that provide vital jobs to residents throughout the Township and region.



**GOAL 8**

Grand Haven Township will be a leader in working with other units of government, state agencies, schools, and special authorities to manage growth and service delivery to the residents and businesses of the area in the most efficient and transparent manner possible.

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## CHAPTER 1. INTRODUCTION

The *Resilient Grand Haven Charter Township Master Plan* serves as the official policy guide for Grand Haven Charter Township’s future development and growth, including the management of its assets and resources. Organized through a series of relevant topics, goals, and objectives, the Master Plan provides the framework and basis for sound community development and land use decision making. The *Resilient Grand Haven Charter Township Master Plan* also establishes clear direction and expectations for the Township.

### PURPOSES AND USE OF THE MASTER PLAN

- Solidifies the vision for the Township.
- Identifies and evaluates existing conditions and characteristics, community values, trends, issues and opportunities.
- Gives guidance to property owners, developers, neighboring jurisdictions, and county and state entities about expectations and standards for public investment and future development.
- Provides support for the allocation and spending of funds.
- Establishes the basis for the zoning ordinance, capital improvements, land use policies, and other implementation tools and programs.
- Provides the framework for day-to-day planning decisions by staff and land use policy decisions by the Planning Commission and Township Board.
- Provides the framework and foundation for creative problem solving and adapting to change – in other words, becoming a resilient community.
- Builds partnerships between informed citizens, community stakeholder groups, non-profit organizations and county and regional entities that help support and participate in plan implementation.

The Master Plan is intended to take a long-range view of the Township, guiding growth and development for the next twenty years and beyond, while also providing flexibility to respond to changing conditions, innovations, new concepts and available resources.

The Master Plan identifies and discusses important community trends like climate variability, which is redefining the Township’s natural environment. The Master Plan also highlights resources that help increase quality of place through better design and projects that consider placemaking. The Master Plan describes where new development should be directed and the character and standards to which new homes and buildings should

### The Master Plan

It is important to understand the Master Plan is a guide for growth and development within the Township. Local officials and planning staff will continually need to develop and adapt new land use policies that respond to changing conditions, innovations and new concepts.



### The Master Plan Process

A Joint Planning Committee, consisting of the full planning commissions of the Township and the City helped to plan, participate in and oversee the master planning process.



adhere. In addition, the Master Plan identifies the preferred characteristics of neighborhoods, ways to support healthy lifestyles, and improvements to the transportation system. The Master Plan also identifies how the Township can better respond and adapt to unanticipated events and adverse situations.

## A COLLABORATIVE PLANNING PROCESS

The Master Plan was developed with unique collaboration between public officials from Grand Haven Charter Township and the City of Grand Haven. While local officials from the Township and City have collaborated on joint planning issues before (e.g., Robbins Road Corridor), this marked the first time they collaborated in the development of their Master Plans. This collaborative planning effort also resulted in an updated Master Plan for the City of Grand Haven.

A *Joint Planning Committee*, consisting of the full planning commissions of both the Township and the City, the respective community development staff, and the consultant helped oversee and facilitate the planning process. In addition, the *Joint Planning Committee* provided a sounding board for new ideas, information, a venue for the review, and consideration of new materials. This planning process also involved public input and civic engagement throughout, as discussed further in Chapter 10.

Although the Master Plan was developed under this collaborative approach, ultimately, the final components and content of this Master Plan were established and approved by the Grand Haven Charter Township Board, the Planning Commission, and staff members.

This collaborative planning process should set the groundwork for continued dialogue between local officials from the Township and the City on community-wide land use issues, planning policies, community development, zoning matters and future Master Plan amendments.

## PLANNING FOR A UNIQUE FOCUS

Because the Township and the City were willing to discuss and consider how climate variability might impact their community and how they might respond to those impacts, portions of the Master Planning Process were funded through a grant from Michigan's Coastal Zone Management (CZM) Program. In addition, under a grant of services from the *University of Michigan Water Center*, Township and City staff members and the *Joint Planning Committee* worked with a team of professors and researchers from the University of Michigan's Taubman College of Architecture and Urban Planning to study and determine the potential physical and environmental impacts of dynamic coastline processes. More information about their activities and conclusions, and how these impact the Master Plan is described in more detail in Chapter 12.

## MASTER PLAN FRAMEWORK: GUIDING PRINCIPLES OF THE MASTER PLAN

The planning process fostered many ideas and conversations about the past, present, and future of Grand Haven Charter Township. During the planning process, these ideas coalesced into *Ten Guiding Principles* for the creation of the plan and the direction of the Township going forward.

The *Ten Guiding Principles* came from an iterative planning process that involved Grand Haven Charter Township

and City of Grand Haven staff members, the *Joint Planning Committee*, the consultant team, and the public. The following *Ten Guiding Principles* are organized by past, present, and future.

## BUILD ON OUR PAST

### 1) BUILD ON WHAT'S WORKING

Grand Haven Charter Township's last master plan was developed and adopted in 2009. The master plan was a thorough and well-written document, describing the current conditions of the community and identifying key community goals and action statements. In the seven years since the plan was adopted, several of these goals and actions have been realized. At the same time, Grand Haven Charter Township continues to address many new challenges.

While the conditions and challenges of the Township have changed, many of the overarching goals and policies discussed in the 2009 Master Plan remain applicable. In addition to incorporating language from the 2009 Master Plan, the Resilient Grand Haven Charter Township Master Plan builds upon existing goals and strategies, as discussed in Chapter 7.

## SHAPE THE PRESENT

### 2) UNDERSTAND COASTAL PROCESSES

Grand Haven Charter Township has seven miles of Great Lakes shoreline and is framed by the Grand River. Many residents live along shorelines, enjoying scenic views and recreational opportunities.

For this planning process, a specialized team of researchers from the University of Michigan's Taubman College of Architecture and Urban Planning worked to determine the physical and environmental impacts of possible climate scenarios throughout the Township, including the coastal areas. Their research and recommendations influenced the planning process in a number of ways. More information on University of Michigan's involvement can be found in Chapter 12.

### 3) SUPPORT SMART GROWTH

Smart Growth is a national movement with a strong presence in Michigan. According to the Smart Growth Network, growing is smart when it gives us great communities with more choices, greater return on public investment, a thriving natural environment, and a legacy we can be proud to leave our children.<sup>1</sup> There are 10 key tenets of Smart Growth worth noting, as each of these are addressed to some degree in planning efforts across the State and in this Master Plan:

1. Mix land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable neighborhoods

<sup>1</sup> The Smart Growth Network, 2014. This is Smart Growth. <http://www2.epa.gov/sites/production/files/2014-04/documents/this-is-smart-growth.pdf>

### Build On What's Working

Many of the goals and action statements identified in the 2009 Master Plan are still applicable today and have been included in the new Master Plan. For example, the Township will continue to expand the system of non-motorized trails and pathways.



### Coastal Processes

Coastal processes are influenced by natural systems such as wind, waves, lake levels, sediment and weather. Understanding coastal processes can help jurisdictions plan for naturally-occurring changes and activities along the shoreline.



### Plan for Place

Even small amenities like this neighborhood library can help promote social interaction and contribute to a sense of place.



5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland and critical environmental areas
7. Strengthen and direct development toward existing communities
8. Provide a variety of transportation choices
9. Make development decisions predictable, fair and cost-effective
10. Encourage community and stakeholder collaboration

### 4) PLAN FOR PLACE

Where location refers to a particular geography, “place” refers to the physical components that make a location recognizable. Placemaking, then, is the act of designing and managing elements of the public realm to create places that are exciting, accessible, and comfortable. The State of Michigan has promoted and supported placemaking efforts in various communities and has provided a guidebook for communities looking to bring vibrancy back to neighborhoods and downtowns.

Although a majority of the Township is rural, placemaking will be a key strategy to help protect and increase vibrancy of commercial corridors (and centers) and new residential developments.

### 5) COLLABORATE REGIONALLY

Many elements of a community, from economic health to air and water quality, are not defined by a municipal boundary. Decisions regarding land use, infrastructure and natural resource protection have an impact on surrounding jurisdictions and vice versa.

Local officials in the greater Grand Haven Community recognize that ongoing collaboration is essential. There are many tie-ins to regional efforts throughout the plan. For examples, see Chapters 10 through 13.

## PLAN FOR THE FUTURE

### 6) BUILD COMMUNITY RESILIENCE

By their very nature, communities are continually complex and dynamic. People move and populations shift, industries go out of business and new industries emerge, natural areas are converted to neighborhoods, housing values fluctuate, and shorelines shift and change. Sometimes these changes emerge over a long period of time whereas some changes can be quite sudden. Community resilience, then, is a measure of the sustained ability of a community to utilize available resources to withstand and/or recover from adverse situations.<sup>2</sup>

### 7) PREPARE FOR CLIMATE VARIABILITY

A changing climate will mean variable temperatures, increased rains, and more severe storms in the Great Lakes region. For Grand Haven Charter Township, responding to climate variability is a challenge in the short- and long-term. It requires Township officials and community stakeholders to consider how they plan for new development, transportation, infrastructure, natural resource preservation, energy

### Build Community Resilience<sup>3</sup>

According to the Resilient Framework established by the Rockefeller Foundation, a resilient community is:

1. Reflective
2. Robust
3. Redundant
4. Flexible
5. Resourceful
6. Inclusive
7. Integrated

<sup>2</sup> Rand Corporation, 2015. Community Resiliency Featured. <http://www.rand.org/topics/community-resilience.html>

<sup>3</sup> Rockefeller Foundation, 2014. Resilience Framework. <https://www.rockefellerfoundation.org/our-work/topics/resilience/>

production, and community health. For a summary of climate research globally, regionally, and statewide, see Chapters 12 and 13. A number of goals and implementation strategies are intended to address climate concerns, as seen in Chapter 7.

### 8) COMPETE IN THE NEW ECONOMY

The economic drivers of Michigan's economy have changed. While the recovering manufacturing sector will continue to remain a key component of Michigan's economy, future economic growth in Michigan will come from a variety of industries, most of which are high technology and service oriented. According to Michigan State University's Land Policy Institute (LPI), sectors like health care, financial management, highly-skilled manufacturing, human service sectors, and the food industry will become the backbone of what is called the "New Economy."

Although the manufacturing sector continues to thrive in Grand Haven Charter Township and further investment in manufacturing should be made, it will be important for local officials to consider ways to attract a variety of jobs and industries. Investing in various sectors will increase economic resiliency and proactively attract growing industries. In fact, economic diversity is shown to spur overall economic growth more efficiently than an economy based solely on a small number of sectors.<sup>4</sup>

### 9) PROTECT AGRICULTURE

As discussed in the 2009 Master Plan, at one time, most of the Township was used for agricultural purposes. Today, as the population of the Township continues to grow, local officials may be presented with proposals to convert agricultural areas into other uses. In the future, existing agricultural lands may also be subject to changes in the region's climate. For example, although the region is expected to receive increased precipitation, it will likely come in short but heavy rain events, followed by long periods of dry conditions. In order to protect this vital use of land, local officials and area farmers will need to consider new ways to capture, retain, and distribute water.

### 10) ENHANCE WALKABILITY

A place is walkable when its transportation infrastructure provides multiple ways for people to travel to a variety of locations. Connected pathways, sidewalks, and bike lanes all serve to make a community healthier and more accessible for all incomes and ages. A walkable community can also benefit residents in terms of personal satisfaction, health, recreation, and economic benefits such as increased revenues from tourism, business activity, and employment.

There are currently many initiatives across the State to increase awareness about walkability in all types of communities. Although Grand Haven Charter Township is predominately rural and suburban, residents are able to freely move throughout the Township on an inter-connected system of bike paths. In addition, many neighborhoods and commercial corridors are connected by sidewalks. Emphasizing pedestrian connectivity in land use decisions is an important component of any walkability effort.

### The Difference Between Climate and Weather

**Weather** reflects the short-term conditions of the atmosphere while **climate** is the average daily weather for an extended period of time. This difference was very evident in Michigan over the last two years. Although the winters of 2014 and 2015 were two of the coldest winters on record, average temperatures in Michigan have increased by 2.5 degrees Fahrenheit since 1950.

### Walkability

According to walkability expert and noted author Jeff Speck, the General Theory of Walkability explains that to be favored (above driving), a walk has to satisfy four main conditions. It must be:

1. **Useful.** Most aspects of daily life are located close at hand and organized in a way that walking serves them well.
2. **Safe.** The street has been designed to give pedestrians a fighting chance against being hit by automobiles; they must not only be safe but feel safe.
3. **Comfortable.** Building and landscape shape streets into "outdoor living rooms."
4. **Interesting.** Sidewalks are lined by unique buildings and friendly faces.



<sup>4</sup> Ashraf, Quamrul and Oded Galor (2011). Cultural Diversity, Geographical Isolation, and the Origin of the Wealth of the Nations. Working Paper 17640. JEL No. NO1,O1,O4. Web. Accessed September 2015. <http://www.nber.org/papers/w17640.pdf>

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## CHAPTER 2. PEOPLE AND SOCIAL SYSTEMS

The following chapter uses data from various sources to describe the Township's population. In many cases, recent Census data was compared to the Census data from 1990 and 2000 to identify demographic trends. Beyond the Census, this analysis also uses other data sources, like population projections from the West Michigan Regional Planning Commission.

### SUMMARY OF DEMOGRAPHIC TRENDS

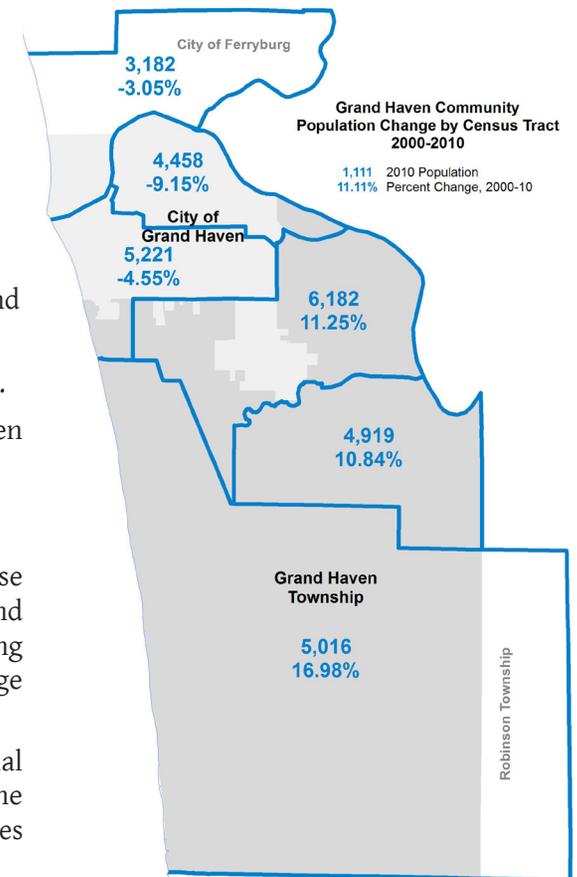
- Grand Haven Charter Township's population continues to grow.
- The pace of growth in Grand Haven Charter Township has slowed, but is faster than Ottawa county overall.
- Between 2000 and 2014, the number and proportion of people 50+ years old in the Township increased more than any other age group.
- The number of two-parent households with children continues decreased from 2009 and 2014, whereas the proportion of married couples without children, single-parent households, and householders living alone has increased.
- The proportion of residents with a Bachelor's degree or higher increased between 2009 and 2014.
- Poverty rates are increasing in the Township and Ottawa County overall, especially young children under 5 years old and residents aged 18 to 34.

### POPULATION CHANGE

The overall population in Grand Haven Charter Township in 2014 was estimated to be 15,553, a 17.1% increase in total population since 2000. Figure 2.1 and Table 2.1 on the next page show that a number of cities and villages in the Tri-Cities area lost population in recent years, where Grand Haven Charter Township, Spring Lake Township, and Ottawa County overall gained population. Grand Haven Charter Township's percentage of population increase was higher than nearby communities.

Grand Haven Charter Township, like many communities along the Lake Michigan coastline, has a substantial seasonal population in addition to the year-round residents. This seasonal population is not counted in the total population figures. In 2014, 4.5% of the Township's housing units were designated as seasonal properties that are used for part of the year. This is discussed more in Chapter 3.

Figure 2.1 Regional Population Change



**Population Projections**

A growing population could increase demand for public services, infrastructure, and utilities. Additionally, it may increase pressure for the conversion of agricultural land into other uses.

Table 2.1 Population Change, 1970 to 2010

	Population						Change (2000 to 2014)	
	1970	1980	1990	2000	2010	2014	#	%
Grand Haven Township	5,489	7,238	9,710	13,278	15,178	15,553	2,275	17.1
City of Grand Haven	11,844	11,763	11,951	11,168	10,412	10,687	-481	-4.3
Village of Spring Lake	3,034	2,731	2,537	2,514	2,323	2,413	-101	-4.0
Spring Lake Township	8,013	9,588	10,751	13,140	14,300	14,555	1,415	10.8
City of Ferrysburg	2,196	2,440	2,919	3,040	2,892	2,936	-104	-3.4
Ottawa County	128,181	157,174	187,768	238,314	263,801	269,795	31,481	13.2

Source: US Census Bureau 1970 to 2010 (Northwest Michigan Council of Governments), American Community Survey 2010-2014

Table 2.2 Projected Population, 2015 to 2030

	Actual Population		Projected Population		% Change (2014 to 2030)
	2014	2020	2025	2030	
Grand Haven Township	15,553	18,728	20,502	22,277	43.2
City of Grand Haven	10,687	9,859	9,583	9,306	-12.9
Ottawa County	269,795	316,671	343,106	369,541	37.0

Source: American Community Survey 2010-2014, West Michigan Regional Planning Commission Population Projections

**POPULATION PROJECTIONS**

According to West Michigan Regional Planning Commission, it is likely the overall population in the Township will continue to increase, at a faster pace than in the last decade, through 2030. Table 2.2 shows the Township is expected to gain an additional 43.2%, or about 6,700 residents, between 2014 and 2030. This projection has important implications for redevelopment, housing, service delivery, and the Township’s operating budget.

**AGE DISTRIBUTION**

Age distribution is an important factor in identifying social, economic, and public service needs. Using U.S. Census Bureau statistics, the Township’s population is characterized into eight life stages, as shown on Table 2.3. The column on the far right of Table 2.3 shows whether the population in that life stage increased or decreased from 2000 to 2014. Overall, the Mature Family Group is the largest in the Township, both in number of residents (3,748) and share of the total population (24.1%). In 2000, the Established Family Group and was the most predominate. Between 2000 and 2014, the Township gained population in six out of eight life stages, with the Mature Family and Retired life stages growing the most dramatically. This trend suggests that residents nearing, or in retirement, are staying in or relocating to the Township.

Table 2.3 Change in Population by Life Stage, 2000 to 2010

Life Stage	Age Range	2000		2014		Change (2000 to 2014)	
		#	% of total	#	% of total		
Preschool	4 and Under	977	7.4	840	5.4	↓	-137
Elementary	5 to 14	2,373	17.9	2,379	15.3	↑	6
Secondary	15 to 19	1,009	7.6	1,213	7.8	↑	204
College	20 to 24	560	4.2	949	6.1	↑	389
Young Family	25 to 34	1,483	11.2	1,773	11.4	↑	290
Established Family	35 to 49	3,620	27.3	2,706	17.9	↓	-914
Mature Family	50 to 64	2,163	16.3	3,748	24.1	↑	1585
Retired	65 and Over	1,093	8.2	1,929	12.4	↑	836

Source: US Census 2000, American Community Survey 2010-2014.

### RACE AND ETHNICITY

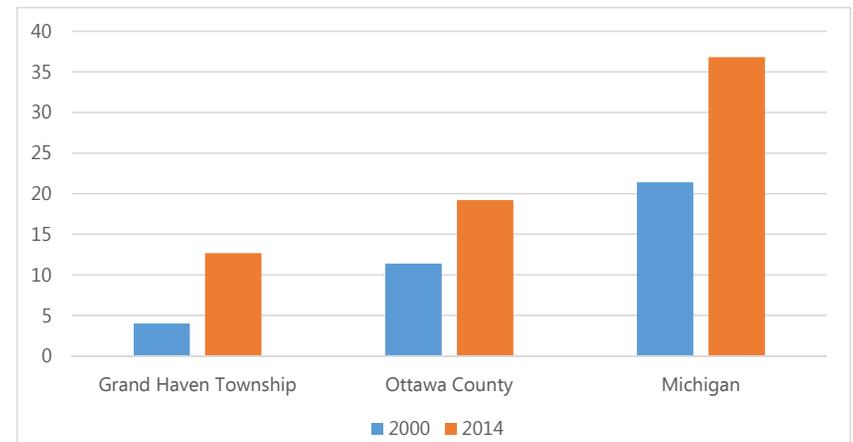
The population of Grand Haven Charter Township was predominately white (92.6%) in 2014. Just over 5% of the population identified as Hispanic or Latino in the 2014 American Community Survey (see Table 2.4). The Hispanic and Latino population grew faster than the Township overall, increasing in population by 219%. Asian, American Indian, and Black populations also grew between 2000 and 2014. In the Township, minorities make up about 12% of the total population. Figure 2.2 shows the Township has a lower percentage of non-white residents than Michigan and Ottawa County overall.

Table 2.4 Racial Composition, 2000 to 2014

Race/Ethnicity	2000		2014	
	#	% of total	#	% of total
White	12,900	97.2	14,400	92.6
Hispanic or Latino	252	1.9	805	5.2
Asian	74	0.6	323	2.1
American Indian	47	0.4	93	0.6
Black	16	0.1	26	0.2
Other, More than One Race	129	1	711	4.6

Source: US Census 2000, American Community Survey 2010-2014.

Figure 2.2 Percentage of Non-White Residents, 2000 and 2014



Source: US Census 2000, American Community Survey 2010-2014.

## HOUSEHOLD STRUCTURE

The number and types of households helps characterize the social and economic forces at work in the Township. Table 2.5 compares data from 2005-2009 to data collected in 2010-2014 to show the proportions of single-parent households and married couples without children has increased. In general, changes in the Township’s overall household structure are consistent with reported national increases in non-traditional and single-person households.

### Young Professionals

According to a 2013 report from the Detroit Regional Chamber, only about 63% of recent college graduates from Michigan public universities stay in Michigan after they graduate. Of the graduates who stayed, just over 6% moved to the greater Grand Rapids region (including the greater Grand Haven Community).

Of the graduates that stayed, 43% said it was because of Michigan’s recreational activities and 37% said it was because of Michigan’s physical attributes.

The City of Grand Haven, in partnership with Grand Haven Charter Township and other neighboring communities, should continue to invest in projects that support and expand recreational opportunities and projects that protect the community’s natural resources. In doing so, the community can better position itself to compete for young professionals.

Table 2.5 Types of Households

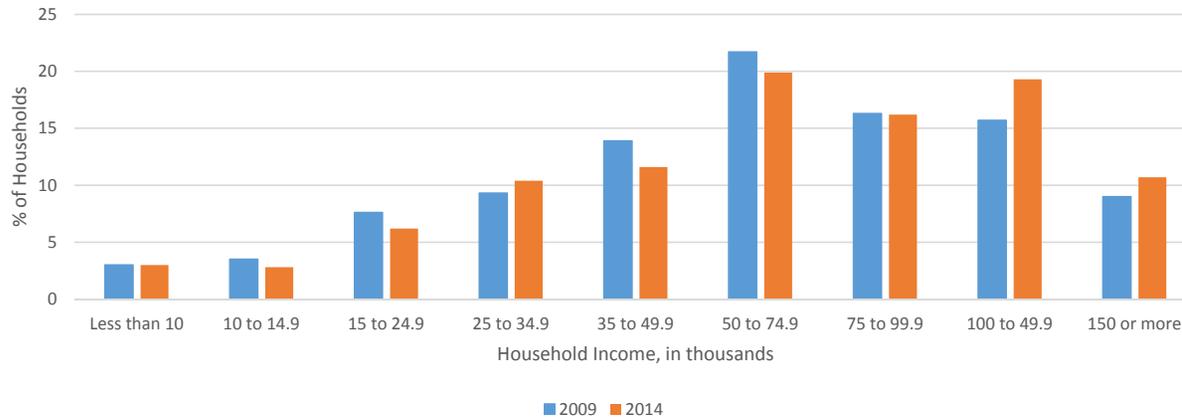
	2009		2014	
	#	% of total households	#	% of total households
Unmarried male, with children	162	2.8	282	5.0
Unmarried female, with children	154	2.7	238	4.2
Married couple, with children	1,757	30.7	1,522	26.9
Married couple, no children	2,064	36.1	2,183	38.6
Persons Living Alone Under 65	798	14.0	580	10.3
Persons Living Alone Over 65	299	5.2	307	5.4
<b>Total Number of Households</b>	<b>5,716</b>	<b>100</b>	<b>5,655</b>	<b>100</b>

Source: American Community Survey, 2005-2009, 2010-2014

## HOUSEHOLD INCOME

Household income is a key measure of the economic condition of a community. Income helps determine how much a household can spend on housing, retail, and local investments. These expenditures and investments directly and indirectly determine the amount of money available for public facilities and services, primarily through property tax revenue collected by Township agencies. Using data collected from 2005-2009 and 2010-2014, the median household income in Grand Haven Charter Township increased 3.5% to \$67,513. The percentage of households with annual incomes under \$25,000 and between \$35,000 and \$49,999 decreased, while the percentage of households with annual incomes over \$100,000 increased (see Figure 2.3 on the next page). In other words, households making incomes over \$100,000 make up a greater share of the population in 2014 than in 2009. The cause of these changes are unknown, but may be a result of the Great Recession.

Figure 2.3 Percentage of Households, By Income, 2009 to 2014



Source: American Community Survey 5-year estimates 2005-2009, 2010-2014.

## EDUCATIONAL ATTAINMENT

Numerous studies have shown that educational attainment is related to an individual’s earning capacity.<sup>1</sup> In other words, people with more education tend to make higher total incomes over their lifetime. A community’s average educational achievement, therefore, can be an indicator of its economic capacity. Table 2.6 shows that, in general, over 70% of the Township’s adult population has at least some college education. It also shows that median earnings increase as educational attainment rises. However, in recent years, median earnings decreased for those over 25 years old with less than a high school diploma, with only a high school diploma, and a graduate degree or higher.

Table 2.6 Educational Attainment by Percent of Population Aged 25 and Over and Median Earnings

	2009		2014	
	% of Population Aged 25+	Median Earnings	% of Population Aged 25+	Median Earnings
Less than High School Diploma	6.4	26,417	5.5	17,788
High School Diploma	27.3	26,797	24.2	25,621
Some College or Associate's Degree	30.7	34,315	28.9	35,849
Bachelor's Degree	24.9	54,847	27.9	56,191
Graduate Degree or Higher	10.6	68,264	13.6	63,950

Source: American Community Survey 2005-2009, 2010-2014

<sup>1</sup> United States Census Bureau, American Community Survey Reports, Education and Synthetic Work-Life Earning Estimates. 2011. <<https://www.census.gov/prod/2011pubs/acs-14.pdf>>

## POVERTY

In general, poverty rates in Ottawa County are increasing. According to the 2012 Ottawa County Community Assessment from the United Way of Ottawa County, poverty rates are growing significantly throughout the county, especially among children. This holds true in Grand Haven Charter Township, where the American Community Survey measured the total poverty rate at 6.1% from 2005 to 2009 and 9.5% from 2010 to 2014.

In the Township, poverty rates are growing the fastest among those aged 18 to 24, those aged 25 to 34, and those under 5 years old. Table 2.7 shows that the number of residents in multiple age ranges has grown significantly in recent years, while Figure 2.4 shows the percentage increase of families living in poverty by Census Block Group. The majority of the Township is in a Census Block Group with a moderate increase in percentage of families living in poverty. Compared to other nearby communities, the Township has a moderate to low poverty rate among families.

Figure 2.4 Percent Increase in Families in Poverty

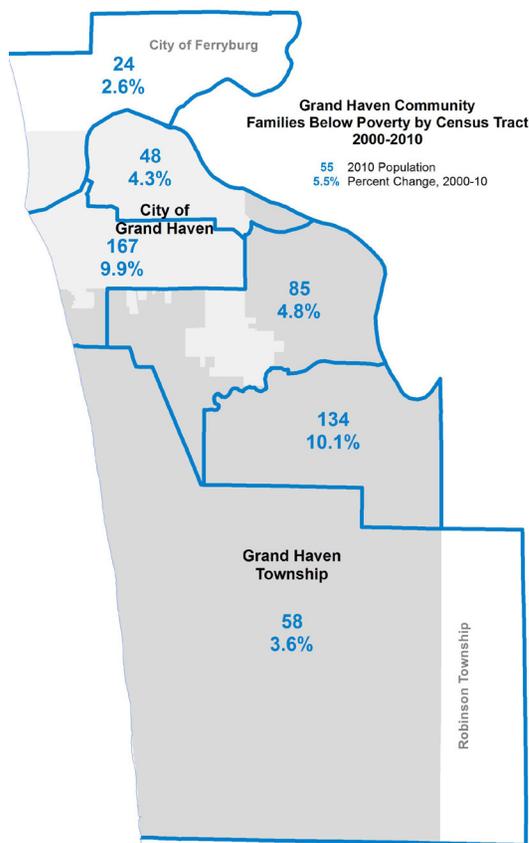


Table 2.7 Population in Poverty Comparison

Age Range	2009	2014	% Change
Under 5	17	108	535.3
5 to 14	286	197	-31.1
15 to 17	58	154	165.5
18 to 24	37	352	851.4
25 to 34	48	314	554.2
35 to 44	69	38	-44.9
45 to 54	156	171	9.6
55 to 64	140	47	-66.4
65 to 74	17	63	270.6
75 and Over	122	12	-90.2
<b>Total Population</b>	<b>950</b>	<b>1,456</b>	<b>53.3</b>

Source: American Community Survey, 2005-2009, 2010-2014.

## CHAPTER 3. HOUSING

Understanding the types and number of households, the choices householders make to own or rent, and the condition of the housing stock are all important elements of a master planning process. The information in this chapter draws from decennial U.S. Census data, American Community Survey 5-year estimates from 2010 to 2014, and building permit data from Grand Haven Charter Township. As much as possible, the data is selected to show the most recent information available.

### SUMMARY OF HOUSING TRENDS

- The Township gained an additional 1,200 housing units between 2000 and 2014.
- More Township residents live in multi-unit units, especially structures with 3 or more units.
- The number of vacant, non-seasonal properties has increased by 90 units from 2000 to 2014.
- The average household size in the Township decreased between 2000 and 2014, from 2.9 to 2.7.
- The median value of a home grew by 15% between 2000 and 2014.
- Median rents in the Township were higher in 2014 than in Michigan or Ottawa County overall.
- Taxable value in the Township increased by nearly 3.5% between 2014 and 2015.

### HOUSING UNITS AND TENURE

In 2014, there were 6,194 housing units in Grand Haven Charter Township, an increase of nearly 1,200 units from 2000. This boost in housing stock included over 550 additional rental units, causing a 149% increase in residents choosing to rent. From 2000 to 2014, owner-occupied housing units also grew. Table 3.1 also shows in 2014, about 76% of units were occupied by owners and 15% of units were rented. Nationally, more residents are choosing to rent. A recent report from Harvard's Joint Center for Housing Studies have determined that a nationwide surge in rentership is due both to changing consumer preferences and to economic impacts of the Great Recession.<sup>1</sup>

Table 3.1 Occupancy and Tenure, 1990 to 2010

	1990		2000		2014	
	#	% of total units	#	% of total units	#	% of total units
Owner-occupied	2,936	89	4,235	91.9	4,724	76.3
Renter-occupied	364	11	374	81.1	931	15.0
Non-seasonal vacant	100	2.7	191	3.7	280	4.5

Source: US Census 1990, 2000. American Community Survey, 2010-2014.

<sup>1</sup> Joint Center for Housing Studies, "America's Rental Housing: Evolving Market and Needs". Cambridge, President and Fellows of Harvard College, 2013. [http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/jchs\\_americas\\_rental\\_housing\\_2013\\_1\\_0.pdf](http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/jchs_americas_rental_housing_2013_1_0.pdf)

Table 3.2 Housing Types 2000 to 2014

	2000				2014				% Change, 2000 to 2014	
	Grand Haven Township		Michigan		Grand Haven Township		Michigan		Grand Haven Township	Michigan
	#	%	#	%	#	%	#	%		
1 unit	4,216	83.2	3,153,728	74.5	4,863	78.5	3,473,344	76.6	15.3	10.1
2 Unit	112	2.2	146,414	3.4	68	1.1	116,964	2.6	-39.3	-20.1
3 or More Units	136	2.6	649,434	15.3	792	12.8	695,573	15.3	482.4	7.1
Mobile Home	557	10.9	277,158	6.5	471	7.6	245,882	5.4	-15.4	-11.3
<b>Total Housing Units</b>	<b>5,066</b>	<b>100</b>	<b>4,234,279</b>	<b>100</b>	<b>6,194</b>	<b>100</b>	<b>4,532,719</b>	<b>100</b>	<b>22.3</b>	<b>7.0</b>

Source: U.S. Census Bureau 2000, American Community Survey, 2010-2014.

### HOUSING VACANCY AND SEASONAL HOUSING

From 2000 to 2014, the number of seasonal units, which are considered vacant by the United States Census Bureau, increased by just 17 units, or 4.1% of the total housing stock in the Township. The number of non-seasonal, vacant units increased dramatically. Perhaps due to the Great Recession, nearly 90 additional non-seasonal units were counted as vacant between the 2000 and the 2014 census. This change is summarized in Table 3.1.

### HOUSING TYPES

Between 2000 and data collected from 2010-2014, the housing stock gained many multi-unit structures. Table 3.2 shows the percentage of housing structures with more than 3 units grew by 656 units to comprise 15% of the housing stock in the Township. This increase is concentrated in buildings with 5 to 9 units per structure. Single-unit structures, most likely single family homes, grew relatively proportionate to the Township overall.

### HOUSEHOLD SIZE

Table 3.3 on the next page shows the average household size decreased in Grand Haven Charter Township, Ottawa County, and the State of Michigan from 2000 to 2014. This reduction in average household size follows a national trend in which choices like marrying later in life and having fewer children increases the prevalence of smaller households. Average household sizes have decreased despite a national increase in multi-generational households.<sup>2</sup> In 2014, the average household in Grand Haven Charter Township had 2.7 persons.

### HOUSING VALUE AND GROWTH

The value of housing in Grand Haven Charter Township continues to rise. Table 3.4 shows the median value of an owner-occupied home has risen substantially in the Township since 1990. Home values in Ottawa County grew by 19.2% from 2000 to 2014, while Grand Haven Charter Township values grew slightly less at 14.8%. The values of owner-occupied housing in the Township and Ottawa County increased more than the State overall. If value is a measure of demand, building permits issued are a measure of supply. Grand Haven Charter Township records the number of permits issued for rehabilitation and construction of housing and commercial units, and the cost of each project. Though an issued permit may not mean the project was complete, building permit records measure much of the investment occurring in residential and commercial properties. Total building permits issued for new construction in 2015 are summarized in Table 3.5.

<sup>2</sup> Missing Middle Housing, "Leveraging the Needs of the Market". <http://missingmiddlehousing.com/about/demand-market/>

Table 3.3 Average Household Size

	1990	2000	2014
Grand Haven Township	2.9	2.7	2.7
Ottawa County	2.8	2.7	2.7
State of Michigan	2.6	2.5	2.5

Source: U.S. Census Bureau (1990, 2000) and American Community Survey (2010-2014).

Table 3.4 Median Value of Owner-Occupied Homes

	1990	2000	2014	% Increase (2000 to 2014)
Grand Haven Township	77,600	149,900	172,100	14.8
Ottawa County	74,600	128,800	153,500	19.2
State of Michigan	60,600	110,300	120,200	9.0

Source: U.S. Census Bureau (1990, 2000) and American Community Survey 5-year estimates (2010-2014)

Table 3.5 Total Permits Issued for New Construction, 2008-2015

	2008	2009	2010	2011	2012	2013	2014	2015
Commercial Building	7	3	0	2	5	0	0	2
Single Family Dwelling	32	11	16	37	51	68	68	76
Multi Family Dwelling	1	0	0	0	2	0	0	0

Source: Grand Haven Charter Township

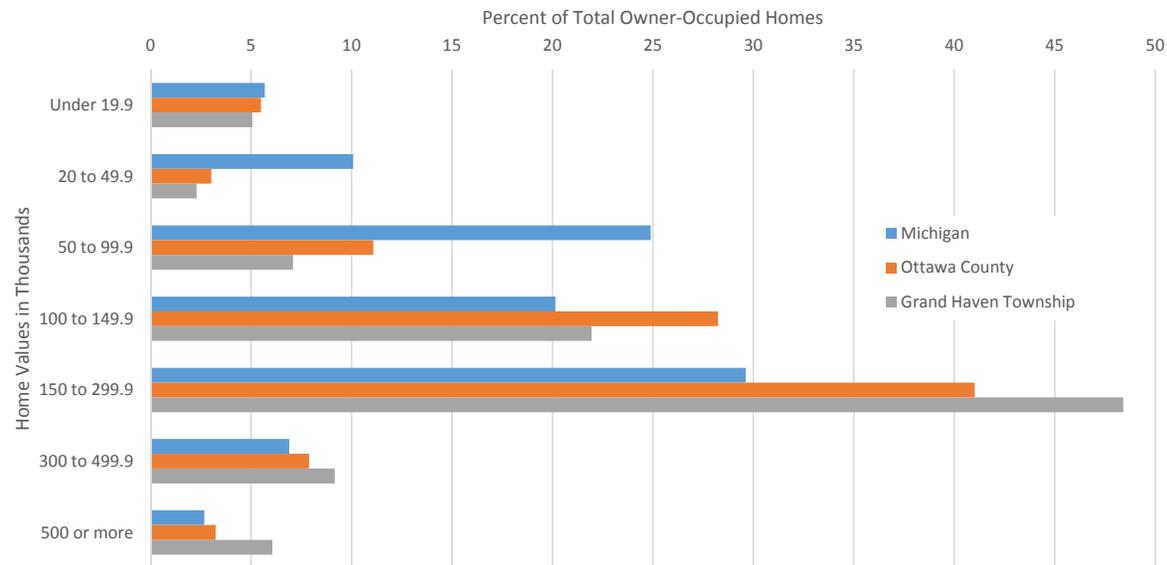
From 2008 to September 2015, 365 building permits for new construction were issued. Nearly 95% of permits were for single family homes. The years 2013 and 2014 are tied for the years with the most permits issued (68 each year), and 2015 may end up being higher (62 permits issued between January and September of 2015).

The cost associated with the construction projects averaged 689,400 dollars for a commercial building, 229,850 dollars for a single family dwelling, and 468,000 dollars for a multi family dwelling. Projects in 2015 tend to have a higher value than they have since 2008. The average value for single family dwellings in 2015 is \$251,750.

## HOUSING AFFORDABILITY

Housing affordability is important for both owners and renters. The Department of Housing and Urban Development suggests that no more than 30% of a household's income should be spent on housing. For homeowners, this generally means that a homeowner should pay

Figure 3.1. Owner-occupied housing value, by percentage of total occupied units in each value range, 2010-2014.



Source: American Community Survey 5 -Year Estimates 2010-2014

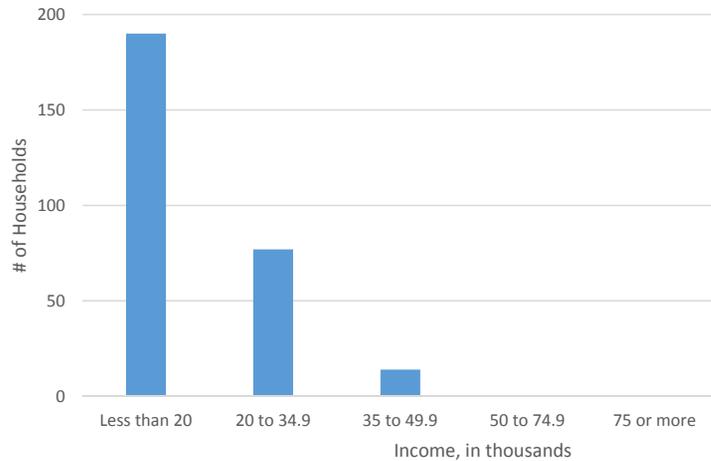
no more than 2.5 times their annual income on a home. In Grand Haven Charter Township, the median household income is \$67,513 and the median value of an owner-occupied home is \$172,100. This suggests that a household making the median income can afford a home at median value, given national standards that a household should spend no more than 30% of their income on housing costs.

The blue bars in Figure 3.1 show the percentage of owner-occupied units in each value range in Grand Haven Charter Township, as indicated by the U.S. Census American Community Survey 5-year estimates from 2009 to 2013. When compared to Ottawa County (in orange) and Michigan (in blue), it is clear the values of owner-occupied homes in Grand Haven Charter Township are less evenly distributed, with the bulk of homes valued in the middle ranges.

Rental affordability is frequently measured by the percentage of income spent on housing. In 2014, 281 renting households, or about 4.9% of all households, paid greater than or equal to 30% of their income on rent. Figure 3.2 on the following page shows that most of these households made between under \$34,999 dollars in 2014. Of the renting households that spend more than 30% of their income on rent:

- 21 are headed by a resident between 15 to 24 years old
- 104 are headed by a resident between 25 and 34 years old
- 117 are headed by a resident between 35 and 64 years old
- 39 are headed by a resident over 65 years old

Figure 3.2 Number of cost-burdened renting households, by income range



Source: American Community Survey 5 -Year Estimates 2010-2014

Table 3.6 Median Gross Rent

	1990	2000	2014
Grand Haven Township	473	573	817
Ottawa County	454	579	782
State of Michigan	423	546	780

Source: U.S. Census Bureau (1990, 2000) and American Community Survey (2010-2014)

In 1990, the median gross rent was just 19.6% of household income in Grand Haven Charter Township. In 2000, median gross rent as a percentage of household income grew to 19.9%, just a 1.5% increase. By 2014, this number had grown to 25.5%, a 28.1% increase in about 15 just over a decade. Rising rents and housing costs are a national and statewide trend, and Grand Haven Charter Township’s median rent grew slightly less than the State of Michigan and Ottawa County overall in the last 25 years. Table 3.6 shows the median gross rent from 1990 to 2014.

### MISSING MIDDLE HOUSING CONCEPT

One of the goals established in this Master Plan is to support multiple housing options and mixed-use developments for all segments of the population that place users near daily services. The Missing Middle Housing concept is one method that may be utilized to achieve this goal.<sup>1</sup>

The term Missing Middle is defined as a range of multi-unit or clustered housing types compatible in scale with single family homes that help meet the growing demand for walkable urban living. The defining characteristics are walkability; medium density, but lower perceived densities; small footprint and blended densities; and smaller, well-designed units. Examples of these housing types are carriage houses, duplexes, courtyard apartments, bungalow courts, townhomes, fourplexes, mansion apartments, mixed-use live/work developments, etc.

These housing types are classified as “missing” because very few have been built since the early 1940’s due to regulatory constraints and auto-dependence patterns that lead to a suburban lifestyle. The Missing Middle Housing types are attractive to singles, childless couples, and empty nesters.

The buildings easily integrated into the existing landscape because the Missing Middle homes typically have the same footprint as a large single family home. Furthermore, if properly distributed the housing types act as a density stepping-stone between the traditional single family subdivisions and the downtown environment. Meaning, carriage houses and duplexes would be located closer to the single family neighborhoods and the multiplexes and townhomes are nearer to the downtown.

The Missing Middle Housing experts state that a Form Based Code (FBC) zoning ordinance is the most effective method of integrating, and regulating, these housing types. Therefore, in order to most effectively plan for the Missing Middle housing typologies explained in this section, the Township should consider using either a Form Based Code overlay zone or a full Form Based Code ordinance in the future.



MissingMiddleHousing.com is powered by Opticos Design. Illustration © 2015 Opticos Design, Inc. 

Image Source: Opticos Design, Inc. MissingMiddleHousing.com

<sup>1</sup> The source of all information for this section comes from MissingMiddleHousing.com

## CHAPTER 4. BUILT SYSTEMS

This chapter provides an overview of the roads and infrastructure, utilities, and public services in Grand Haven Charter Township. Each of these areas are vital to the overall operation of the Township and its provision of services for residents, workers, and visitors.

### TRANSPORTATION NETWORK

A good transportation network provides multiple ways for people to move around the Township and connect to surrounding communities and the larger region. A transportation network with a variety of transportation options has a number of community benefits. For example, a well designed system of streets can help disperse traffic congestion and ease the load of higher capacity streets. Trails, pathways and sidewalks can support active and healthier lifestyles. Public transit provides people without the ability or means to drive an environmentally friendly and affordable option to access work, school and other community amenities. The transportation network also plays a critical role in determining the nature and intensities of land uses that occur throughout the Township.

### ROADS

The road network in Grand Haven Charter Township consists of about 145 miles of paved and unpaved roads that link the outlying areas of the Township (see Table 4.1). The primary and most central thoroughfare is US-31, which runs north and south through the Township. M-45, in the southern portion of the Township, is the primary east and west thoroughfare, connecting the Township with Grand Rapids. The Michigan Department of Transportation recently built a two-lane limited-access roadway (often referred to as “the bypass”) just west of 120th Avenue that will connect M-45 north to the I-96/M-104/112th Avenue interchange near Nunica in Ottawa County. The new 7-mile roadway is designated as “M-231.” The roadway opened in October 2015. Due to the anticipated increase in traffic along this new corridor, it is very likely that areas near the intersections of M-45 and Lincoln Street will face development pressure. In fact, the Planning Commission likely will have an impact study performed on the Lincoln Street area in the coming years.

### TRANSPORTATION NETWORK ROAD CLASSIFICATIONS

The Federal Highway Administration classifies roads based on the function they serve using the National Functional Classification system. Map 4.1 on the next page indicates classifications for all public and private roadways in the Township. The following are examples and definitions of those road classifications:

#### PRINCIPAL ARTERIALS

Principle arterial roads are often state and interstate highway corridors, carrying high traffic volume.

### Transportation Network

Public roadways, bridges and other transportation infrastructure are extremely expensive to build and properly maintain. As a result, Township officials (working with the Ottawa County Road Commission, neighboring jurisdictions and MDOT) need to plan investments carefully and in advance of need. On the other hand, unexpected development can place unplanned and uneven demand on road networks. Therefore, it will be important for Township officials to consider the existing condition and capacity of roads as community development projects materialize and land use decisions are made.



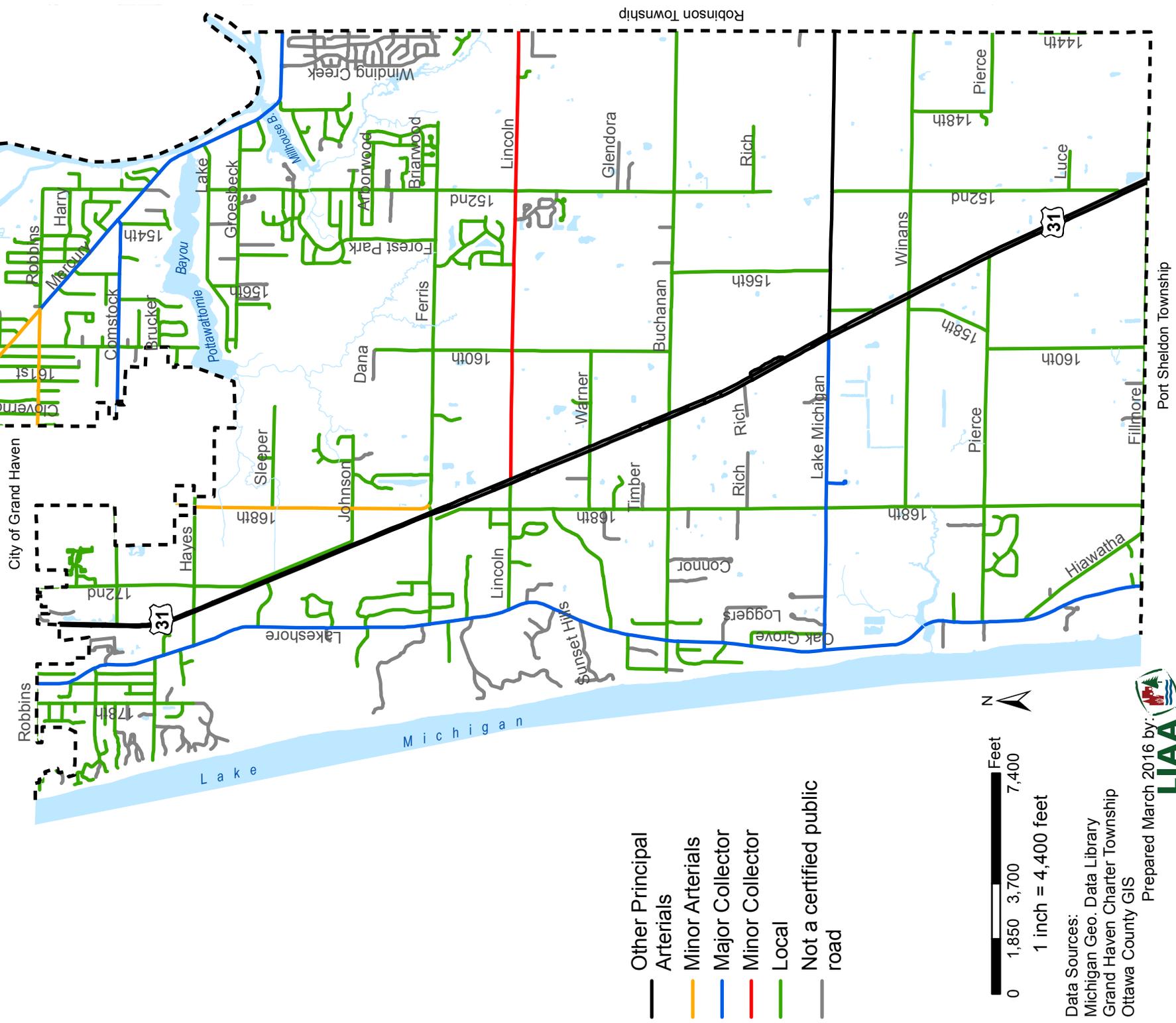
Table 4.1 Miles of Roads, by Type

	Miles
Private Roads (Paved)	24
Private Roads (Unpaved)	4
County Primary Roads (Paved)	23
County Local Roads (Paved)	24
County Local Roads (Unpaved)	19
Public Subdivision Roads (Paved)	40
State Highways	9
<b>Total</b>	<b>143</b>

Source: Grand Haven Charter Township



# Grand Haven Charter Township Road Classifications Map #4.1



- Other Principal Arterials
- Minor Arterials
- Major Collector
- Minor Collector
- Local
- Not a certified public road



Data Sources:  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS



Prepared March 2016 by:

### MINOR ARTERIALS

Minor arterial roads link cities and towns, carrying moderate traffic and providing access to adjacent development.

### MAJOR AND MINOR COLLECTORS

Collector roads are designed for short trips, serving developed areas and “collecting” traffic from local roads.

### LOCAL ROADS

Local roads include all other public streets. Their function is to provide access to adjacent homes and development and they carry traffic making relatively short trips.

### PRIVATE ROADS

Private roads are developed and owned by individuals, developers or home-owner associations; however, their design is regulated by a Township ordinance. Private roads are generally constructed to serve small scale residential developments, and owners and users of these roads must pay for maintenance. Although Grand Haven Charter Township generally discourages the construction of private roads due to high infrastructure costs, private roads have been useful in reducing curb-cuts on major thoroughfares as a means to improve safety.

## NON-MOTORIZED TRANSPORTATION

Grand Haven Charter Township is home to over 26 miles of non-motorized pathways and trails that serve as non-motorized transportation routes in the Township. Please see Chapter 5 for a detailed discussion of this Township asset.

## PUBLIC TRANSPORTATION

Public transportation needs in Grand Haven Township are met by Harbor Transit. Harbor Transit is a public demand-response transportation system that serves Grand Haven Charter Township, the City of Ferrysburg, the Village of Spring Lake, Spring Lake Township, and the City of Grand Haven. In total, Harbor Transit covers a 55 square-mile service area. In 2015, Harbor Transit operated a fleet of 22 buses, two mini-vans, and two seasonal trolleys. Grand Haven Charter Township contributes the largest share - roughly 32% of the millage monies for the 2016/2017 budget - of the five jurisdictions serviced by Harbor Transit.

Since Harbor Transit’s first full year of service in 2012, ridership within the Township has increased nearly 62%. In addition, the 54,780 rides originating in Grand Haven Charter Township in 2015 accounted for nearly 24% of the total number of rides provided by Harbor Transit. According to Harbor’s Transit’s most recent *Annual Report*, overall ridership was up in all major categories, with the most significant increases coming from those riders 50+ years of age and students.

### West Michigan Shoreline Regional Development Commission (WMSRDC)

WMSRDC is the planning agency for the metropolitan transportation planning (MPO) organization for Muskegon and Northern Ottawa Counties. The mission of WMSRDC is to promote and foster regional development through cooperation amongst local governments and other regional partners. They provide services, manage, and administer programs in homeland security, transportation planning, economic development, environmental planning, community development, local government services, and other special projects.

Specifically, WMSRDC and the MPO assist with developing, programming, and implementing transportation projects in the area. The Transportation Improvement Program (TIP) plans for major infrastructure improvements for the next 20 to 25 years. The TIP includes general road improvements, safety, maintenance, transit and non-motorized projects.

### Road Conditions

Since 2012, Grand Haven Charter Township has supplemented the work of the Ottawa County Road Commission by resurfacing almost 16 miles of streets, re-graveling about 4 miles of rural roads, and crack sealing 29.5 miles of roadways. Currently, Grand Haven Charter Township has the highest average rating of roadways within Ottawa County.

### Resilient Activities - Harbor Transit

In an effort to move toward more environmentally friendly and sustainable practices Harbor Transit has purchased six liquefied petroleum buses and an on-site L.P. fueling station. Harbor Transit also has two L.P. powered trolleys. These help reduce emissions by generating 12% less carbon dioxide, 75% less nitrogen oxide and 42% less carbon monoxide than gasoline buses.



### Harbor Transit

According to a recent Harbor Transit user survey, 37.9% of survey responders used Harbor Transit on a daily basis and 22% used Harbor Transit to get to work.

### Water Distribution

According to the EPA, the average American family uses 320 gallons of water per day, about 30 percent of which is devoted to outdoor uses. More than half of that outdoor water is used for watering lawns and gardens. Nationwide, landscape irrigation is estimated to account for nearly one-third of all residential water use, totaling nearly 9 billion gallons per day.



## UTILITIES AND PUBLIC SERVICES

### WATER DISTRIBUTION

All municipal water in the Township is obtained from Lake Michigan and provided by two sources, the North Ottawa Water System (NOWS) and the water treatment plant run by the City of Grand Rapids. All but the lower third of the Township receives their water from the NOWS, which is a joint municipal water system run by the municipalities in the Northwest Ottawa area. The Township has five direct connections to the NOWS water distribution system which can deliver up to 11 million gallons of water per day to the Township.

Water from Lake Michigan is obtained through two submerged intakes. The capacity of the two NOWS intakes is 28 million gallons of water a day while the NOWS water treatment plant has a capacity of about 23.5 million gallons of water a day. In 2015, the system has an average daily use of about 6.5 million gallons of water per day with a maximum daily use of about 16.8 million gallons of water per day. The maximum daily use of water typically occurs in the summer months, as approximately 34 percent of water is used for outdoor uses.

Even at these peak times, the water treatment plant uses only about 71.5 percent of its total capacity. In fact, based on very conservative numbers, local officials believe an additional 6,250 household could be added to the NOWS system before the plant would need to be expanded. The Township's system of water collection lines is shown on Map 4.2 on the next page.

### WASTEWATER COLLECTION

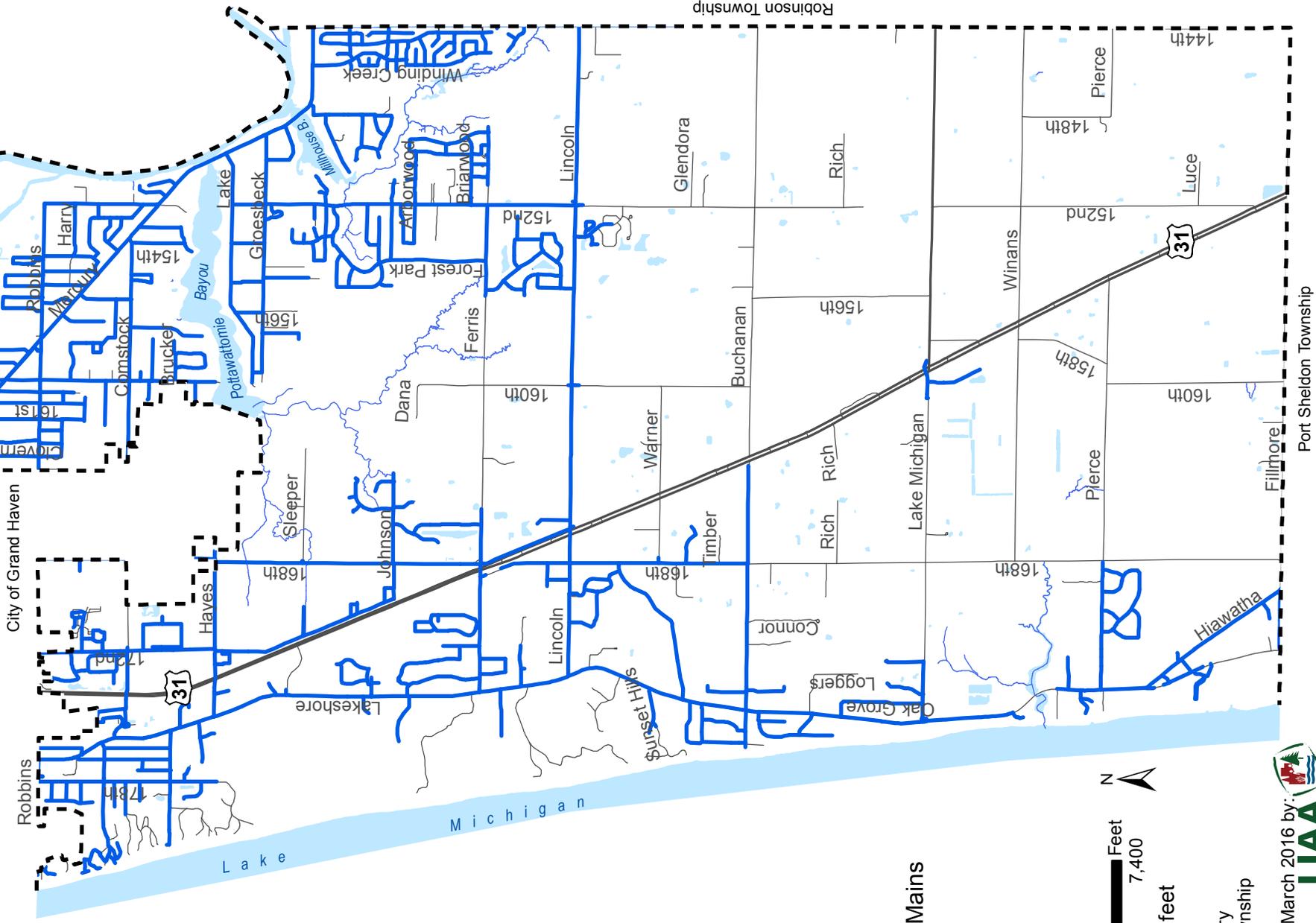
Grand Haven Charter Township's wastewater collection system connects to over 600 homes and businesses. The system includes nearly 26.5 miles of sewer lines, several pumping stations, and 11 lift stations. The total capacity of the wastewater treatment plant that services the Grand Haven and Spring Lake area is 10 million gallons per day. However, the monthly average capacity is about 6.8 million gallons per day.

Although more households and businesses have connected to the system in recent years, because of conservation efforts like installing low-flow fixtures and efforts by the Township to separate their storm-water and sanitary sewer systems, the flow rate per customer has gone down. The sanitary sewer plant is utilizing only about 59 percent of the hydraulic capacity of the plant. Local officials believe the treatment plant could accommodate an additional 1.1 million gallons of waste per day before expansion of the wastewater treatment plant would need to be considered. This equates to roughly 5,500 new households.

In regards to overall capacity issues of the waste water system within the Township, local officials concluded the ability to move waste water from areas within the Township that are growing (e.g., the Lincoln Street and Ferris Street corridors) to the 168th Avenue lift station was limited by capacity of the Hidden Creek lift station. As a result, the Township initiated work on a new Hidden Creek lift station in 2015, which will more efficiently move the current flow (and additional flow from over 200 residential units) to the 168th Avenue lift station. Eventually, the Hidden Creek lift station may be bypassed when the discharge from Hofma Park lift station is pumped to the west side of US-31 and into an existing gravity sewer line in fiscal year 2017 or 2018. The Township's system of wastewater collection lines is shown on Map 4.3.



# Grand Haven Charter Township Water Distribution Map #4.2



— Existing Water Mains



1 inch = 4,400 feet

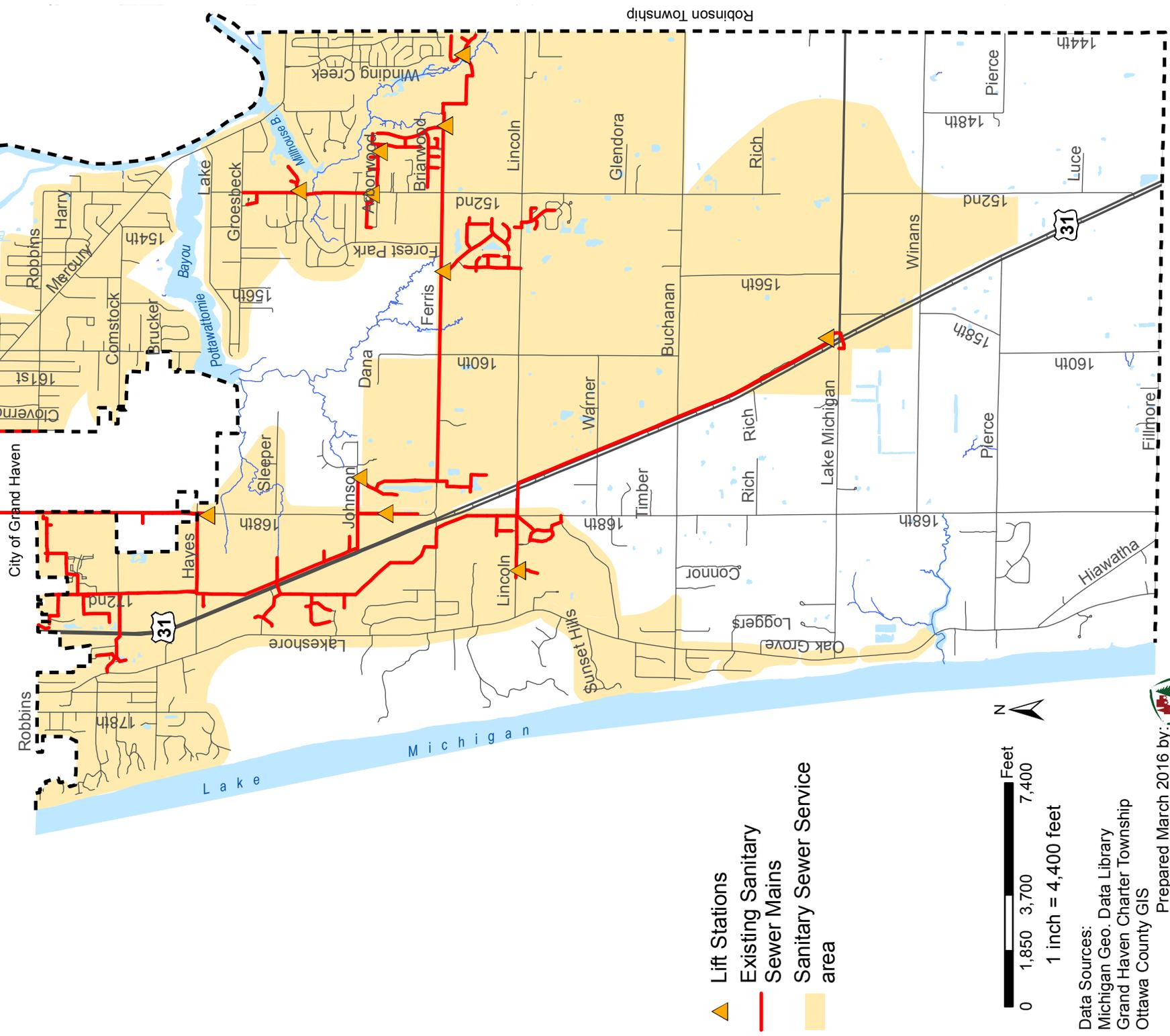


Data Sources:  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS

Prepared March 2016 by:  
**LIAA**



# Grand Haven Charter Township Existing Sanitary Sewer System Map #4.3



Data Sources:  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS



Prepared March 2016 by:

Port Sheldon Township

## ORPHAN DRAINS

There are numerous so-called “orphan drains” throughout Ottawa County. These drains are considered to be “orphans” inasmuch as the drains have never been accepted by a County Drain Commission and public monies cannot be spent to maintain or improve these drains.

Unfortunately many of these drains are found within street right-of-ways and/or provide stormwater management for residential or commercial developments. If there is a future need to maintain or improve the drain, neither the Ottawa County Water Resources Commissioner (OCWRC) nor the Township would be able to complete the work on this segment of this orphan because the drainage course is not public.

To address this issue, the Township has started a multi-year project to identify all orphan drains by comparing county drains records to all subdivision and development plans. Once the orphan drains are identified, the Township will request Board of Reviews on each of the orphan drains in order of importance to bring these orphan drainage systems under the authority of the OCWRC. At that point, Ottawa County would be responsible to maintain the drainage systems and would either assess the maintenance costs at-large solely to the Township, OCRC, and County or, if the project was significant and costly, spread the costs through both at-large assessments to municipal units and assessments to the private property owners.

## TOWNSHIP SERVICES

Grand Haven Charter Township is governed by an elected seven-member Board of Trustees. However, under the direction of the Township Manager, daily municipal activities are carried out under six departments and more than 17 service areas. The following is a summarized list of the Township departments and their responsibilities.

### 1. ADMINISTRATION AND HUMAN RESOURCES DEPARTMENT

The Administration and Human Resources Department oversees the enforcement of all laws and township ordinances, manages all undertakings of the Township; responsible for administrative services that include community development support, elections, and customer service; prepares the annual budget, is responsible for all personnel matters, monitors risk management and liability concerns, and advises the Township Board.

### 2. ASSESSING DEPARTMENT

The Assessing Department is responsible for determining the assessed value for all real and personal property, processing land division applications and maintaining records.

### 3. COMMUNITY DEVELOPMENT DEPARTMENT

The Community Development Department is responsible for all building, electrical, mechanical, plumbing permits, inspections, and the processing of all special land use applications, zoning permits, long-term planning, and the Township’s geographic information system.

### 4. FINANCE DEPARTMENT

The Finance Department is responsible for local tax collection (i.e., the Schools, District Library, Council on Aging, Museum, and County), investments, and all financial transactions for the Township.

## Water System Reliability Study

In 2016, the Township completed a Water System Reliability Study. The study established requirements for maintaining public water supply systems for drinking and household purposes. The Michigan Department of Environmental Quality requires this study to be completed at least every 5 years. Based on the three primary components of the water distribution system, the supply (source water through treatment), the water distribution system (pipe), and the storage requirements, the following conclusion could be made:

- The water supply has met the regulations for microbiological, radioactive, inorganic and volatile organic contaminants.
- The existing supply capacity is adequate for 2035 and further into the future. The maximum daily demand in 2015 comprised just 49 percent of the existing meter capacity. Projected through 2035, maximum daily demand may reach up to 61 percent of the existing meter capacity.
- The transmission and distribution system is generally adequate for the community. The Township provides adequate water supply for normal (non-emergency) system conditions and meets emergency supply goals. However, the reliability of the water system would be improved with some transmission system improvements, upsizing of several small diameter distribution mains, and looping of the dead end mains within the system.
- The Township’s goal is to provide fire protection to customer’s equivalent to 1,000 gpm for 3 hours at all locations and 3,500gpm for 3 hours for industrial and commercial customers. Specific distribution and transmission system improvements have been recommended for improved fire protection in some areas of the Township where these suggested thresholds are not met.

### Utility Expansion

In order to provide cost-effective services and achieve the community's vision of sustainable growth, this Master Plan identifies a number of policies for the expansion of utility services and infrastructure. In general, the cost of service expansion will be assumed by the new development, although Grand Haven Charter Township will continue to provide maintenance of existing infrastructure. See Goal #3 in Chapter 7 for a detailed discussion of utility service and infrastructure goals.

### Fire Protection

The Advanced Life Support (ALS) paramedic's increases survivability of the sick and injured. The Department's cardiac arrest save rate over the last five years was 52%. The national average of cardiac arrest saves is 11%.



### 5. PUBLIC SERVICES DEPARTMENT

The Public Services Department is responsible for the water distribution system, sanitary sewer collection system, non-motorized pathway system, parks, cemeteries, building and grounds, and information systems management.

### 6. FIRE/RESCUE DEPARTMENT

The Fire/Rescue Department is responsible for fire suppression, medical first response, technical rescues, and safety training.

#### FIRE PROTECTION

Fire protection in Grand Haven Charter Township is provided by a robust and skilled Fire/Rescue department that includes 7 full-time firefighters and 23 part-time firefighters.

Township firefighters are equipped with 1 quint (75 foot aerial), 1 engine, 1 tanker, a brush truck, a medical first responder truck and a paramedic rescue truck. The Township's Fire/Rescue Department is considered to be one of the premier departments in Northwest Ottawa County. In addition, because many firefighters are trained Paramedics, it is the only Fire/Rescue Department in West Michigan to operate with an Advanced Life Support Paramedic License.

As with many of the services in the Township, fire protection has seen an increase in demand and usually responds to nearly 1,100 emergencies annually. Fire protection is financed by a 1.9 millage. Because Grand Haven Township has an effective Fire/Rescue Department, Township property owners enjoy lower insurance rates.

#### EMERGENCY MEDICAL CARE

The nearest hospital to Grand Haven Charter Township is the North Ottawa Community Hospital (NOCH) located in the City of Grand Haven. This medical center is a private non-profit 81-bed acute care facility which is also equipped with an emergency room. Grand Haven Charter Township is also a member of a seven-member community group that contracts NOCH for ambulance services.

#### LAW ENFORCEMENT

Law enforcement in Grand Haven Charter Township is currently provided by the Michigan State Police and four full-time officers contracted from the Ottawa County Sheriff's Department, one of which is solely dedicated to traffic enforcement. In an effort to bring law enforcement officers closer to the community, the Township made office space available for both the sheriff deputies and a detective. The result has been that officers are more familiar with the Township and are better informed of issues within the Township. According to the 2014 Ottawa County Sheriff's report, 4,773 calls for service were made to the Sheriff department. This marked a 3 percent decrease in the number of calls made to the Sheriff's office in 2013. The Township continues to remain relatively safe as most of the crimes committed were not violent.

## SCHOOLS

All of Grand Haven Charter Township is located within the Grand Haven Area Public Schools District. Grand Haven High School and two of the district's elementary schools (i.e. Rosy Mound and Peach Plains Elementary Schools) are located within the Township. The Grand Haven Area Public Schools District is one of the primary reasons why families choose to live in the Township. Grand Haven schools have a proven track record as about 87% of students graduate and scores in the MEAP and ACT are consistently above county and state averages. In addition, about 66% of the graduating seniors go on to some type of college and almost half of the graduating seniors go on to a 4-year college or university.

### Schools

66% of the graduating seniors at Grand Haven High School go on to some type of college.



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## CHAPTER 5. NATURAL SYSTEMS

Grand Haven Charter Township is fortunate to have some of the most diverse and unique natural environments in Michigan. This chapter summarizes the water and land assets of the Township.

Grand Haven Charter Township is located along the beautiful shores of Lake Michigan, in northwest Ottawa County. The Township is bounded on the north by the City of Grand Haven and Spring Lake Township, on the east by Robinson Township, on the south by Port Sheldon Township, and on the west by Lake Michigan. Because of Lake Michigan and the Grand River, Grand Haven is also home to picturesque sand dunes, wetlands, native vegetation, and rich soils. Diverse elevation changes are present in the Township, as shown on Map 5.1 on the next page.

### GRAND HAVEN CHARTER TOWNSHIP'S WATER ASSETS

#### LAKE MICHIGAN

Grand Haven Charter Township's identity is partially formed around Lake Michigan and the Grand River. Lake Michigan and the Great Lakes are truly one of the most special and unique natural resources on the planet and Grand Haven Charter Township is fortunate to sit right on its doorstep! Home to 21% of the world's supply of surface freshwater and 90% of the United States' supply of surface freshwater, the Great Lakes have been, and continue to be, the foundation of Michigan's DNA and our most defining feature.

Today, the Great Lakes are center stage for the state's tourism industry and the Pure Michigan campaign. In addition, leaders from around the State are working to utilize the Great Lakes to further the "Blue Economy" – an economy where the Great Lakes provide for clean energy, promote sustainable systems, and create new food and mobility systems.

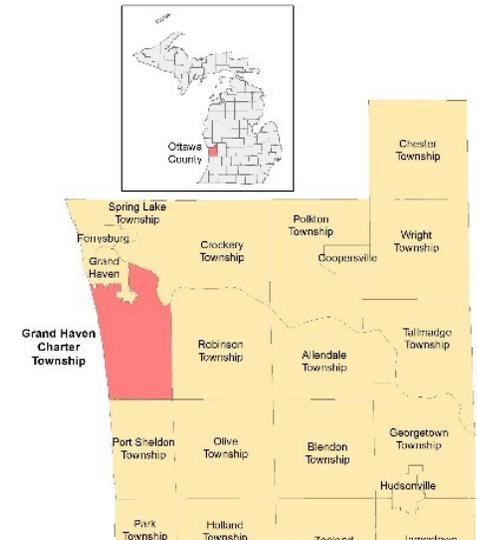
#### THE GRAND RIVER

The Grand River is Michigan's longest river winding 256 miles from Jackson to Grand Haven, and spans 19 counties with 12 major tributaries. The River forms part of the eastern and northern borders of the Township, before passing through the City of Grand Haven and into Lake Michigan.

Much of the Grand River along the Township is bordered by large riverine wetland areas. These wetlands and bayou areas have helped to limit intense development in close proximity to much of the riverbank within parts of the Township.

The Grand River supported the development of the region by providing a means of conveying logs to sawmills located on the banks of the Grand River. Steamboats ferried finished products between Grand Rapids and Grand Haven. In addition, gypsum, limestone, sand, and gravel were mined from the banks of the Grand River, and

Grand Haven Charter Township



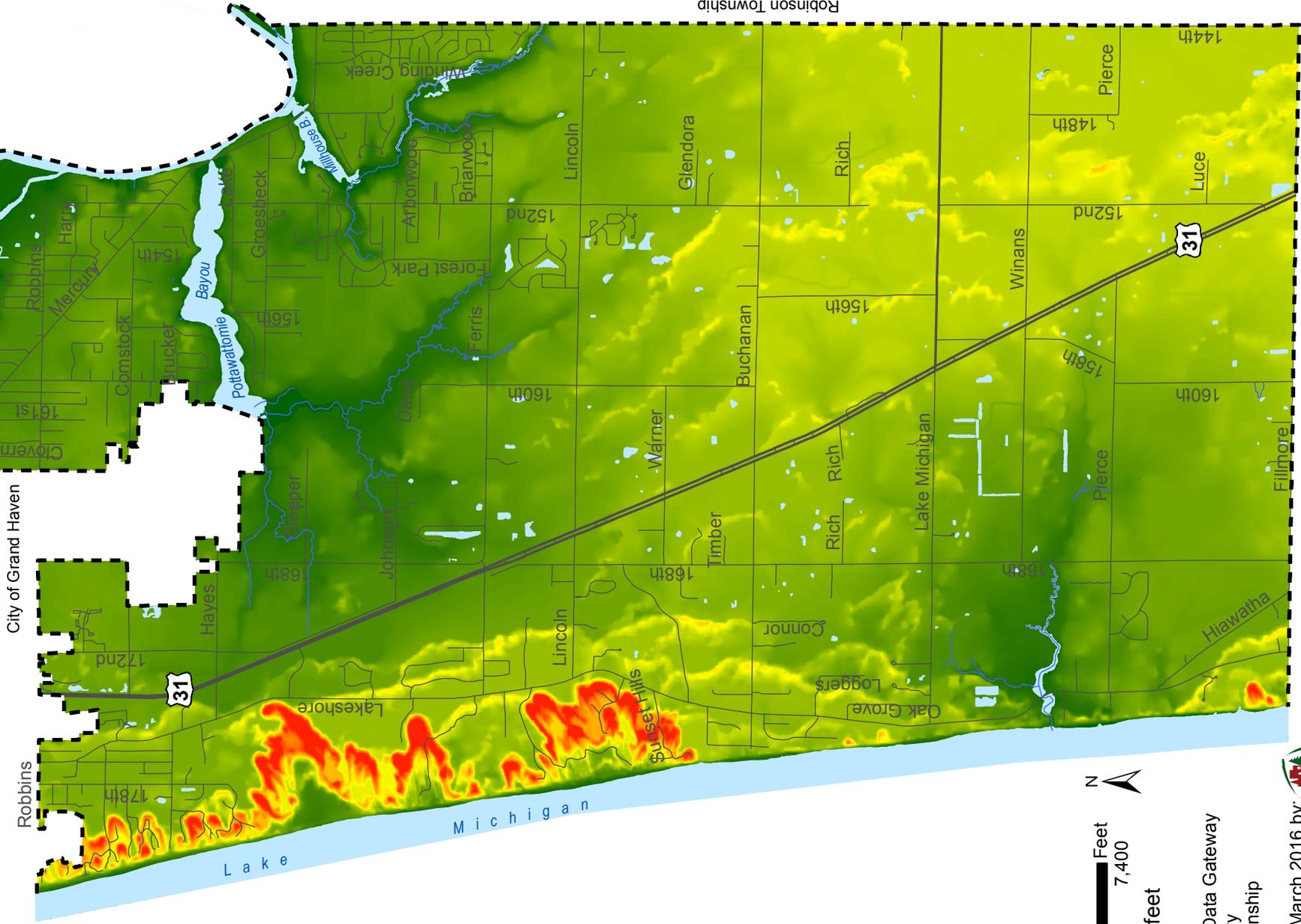
#### Water Assets

Grand Haven Charter Township is located on Lake Michigan, one of the unique and prominent features on earth.





# Grand Haven Charter Township Digital Elevation Model Map #5.1



High : 829.7 ft  
Low : 578.4 ft



0 1,850 3,700 7,400  
Feet

1 inch = 4,400 feet

Data Sources:  
USDA-NRCS Geospatial Data Gateway  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS



Prepared March 2016 by:

Port Sheldon Township

Robinson Township

City of Grand Haven

Robbins

178th

172nd

31

Lakeshore

Hayes

172nd

168th

164th

160th

156th

152nd

148th

144th

Lake Michigan

Lincoln

168th

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Lincoln

clams were harvested for commercial button production.

Today, the portion of Grand River flowing through Grand Haven still serves Great Lakes shipping, providing coal to the local power plant and shipping sand and aggregate from local businesses to markets elsewhere. However, this economic use of the river requires continued maintenance and, at times, dredging to keep shipping channels open. Further up-stream, the portions of the Grand River along Grand Haven Charter Township are used for recreational activities like boating, paddling and fishing.

In 2011, the Grand Valley Metropolitan Council updated the 2004 Grand River Watershed Management Plan. The Plan is a broad document to build and expand improvement efforts in the watershed, focusing on water quality. The Plan holistically considers the ecosystem of the entire Grand River Watershed as it casts a vision and strategies for the future of the Watershed.

### THE GRAND RIVER WATERSHED

The Grand River Watershed covers 5,660 square miles and drains portions of Muskegon, Newaygo, Mecosta, Montcalm, Gratiot, Ottawa, Kent, Ionia, Clinton, Shiawassee, Barry, Eaton, Ingham, Livingston, and Jackson counties. The watershed also includes several major sub-tributaries including the Lower and Upper Grand Rivers, Maple River, and Thornapple River. Local watersheds directly affecting Grand Haven Charter Township are illustrated in Map 5.2 on the next page.

Approximately 53% of the land within the Grand River Watershed is agricultural, 27% is urban, and 20% is forested. Water quality within The Grand River watershed is directly related to the land management practices in the region. For example, if new development creates a large amount of impervious surface (i.e. asphalt) and stormwater is not properly managed on site, the run-off entering into the creek, stream, or river deteriorates water quality and quickens erosion on stream banks.

Since Grand Haven Charter Township lies near the mouth of the Grand River, activities that occur upstream have a significant impact on the quality of the river and riparian areas in the Township. While local officials in Grand Haven Charter Township should continue to work towards improving the water quality of the lower Grand River, this task will require cooperation from numerous upstream stakeholders, including agencies and governmental units.

### SAND DUNES

Michigan's dunes are one of the most striking environmental features in the world. Together, they represent the largest freshwater dune ecosystem in the world. The dunes provide unique habitats for rare and endangered species and hold enormous environmental and recreational value. There are about 250,000 acres of sand dunes in Michigan. Of that, the Michigan Department of Environmental Quality classifies 70,000 acres of dunes as Critical Dune Areas (CDAs).

Grand Haven Charter Township has 1,056 acres of Critical Dune, which encompass approximately 6% of the Township's total land area. They are located along nearly the entire Lake Michigan coastline within the Township. The inland extent of the dune areas is quite substantial in the northern portions of the Township. Critical dune areas are illustrated on Map 5.3. For more information on current regulation and maps of Critical

### The Grand River

The Grand River supports a wide variety of recreational boating activities.



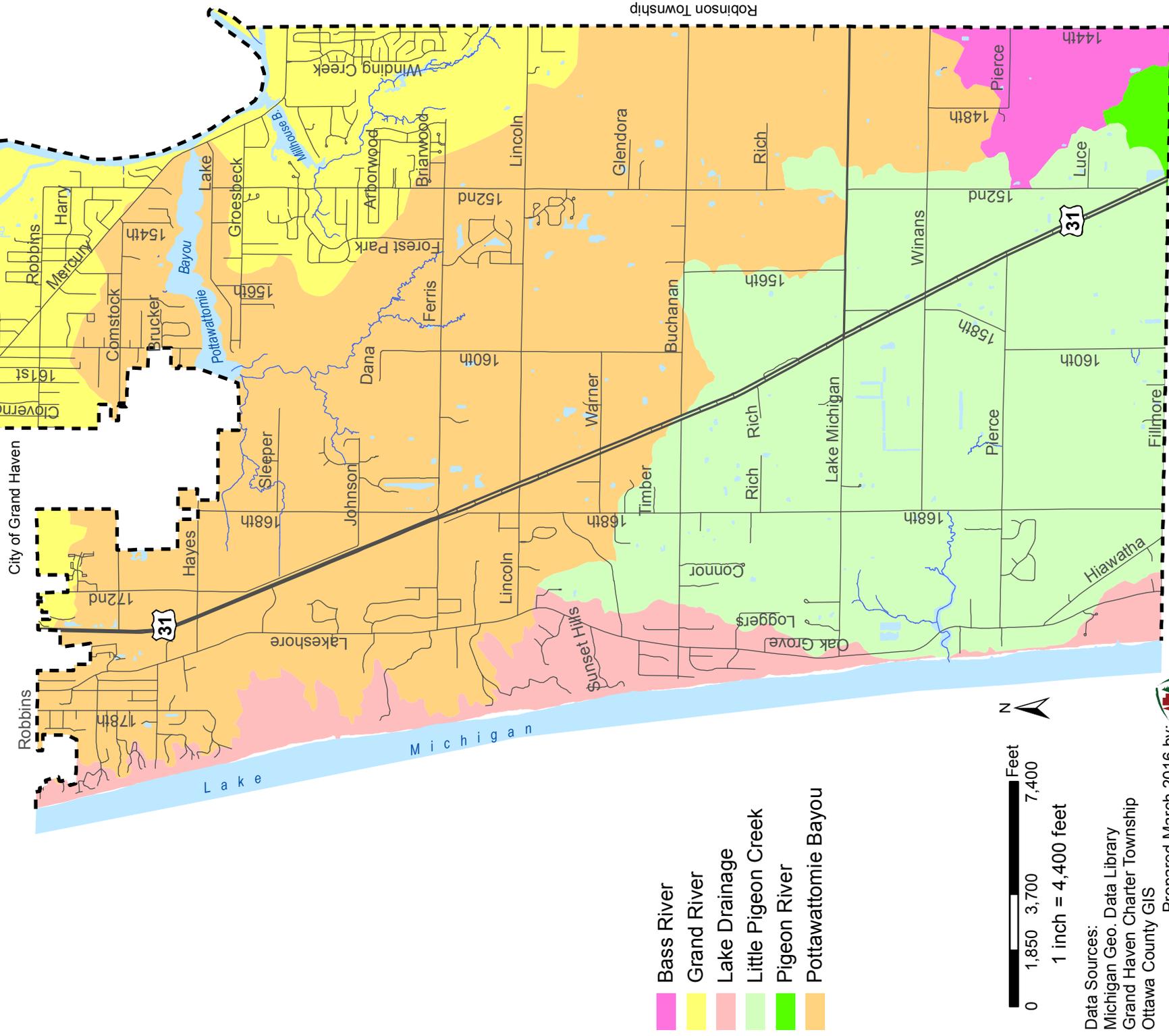
### What is a Watershed?

A watershed is a region of land that is drained by a particular river or river system. Typically, these systems include many smaller tributaries such as creeks and streams that feed into a larger river and are influenced by the land's elevation





# Grand Haven Charter Township Watersheds Map #5.2



- Bass River
- Grand River
- Lake Drainage
- Little Pigeon Creek
- Pigeon River
- Pottawattomie Bayou



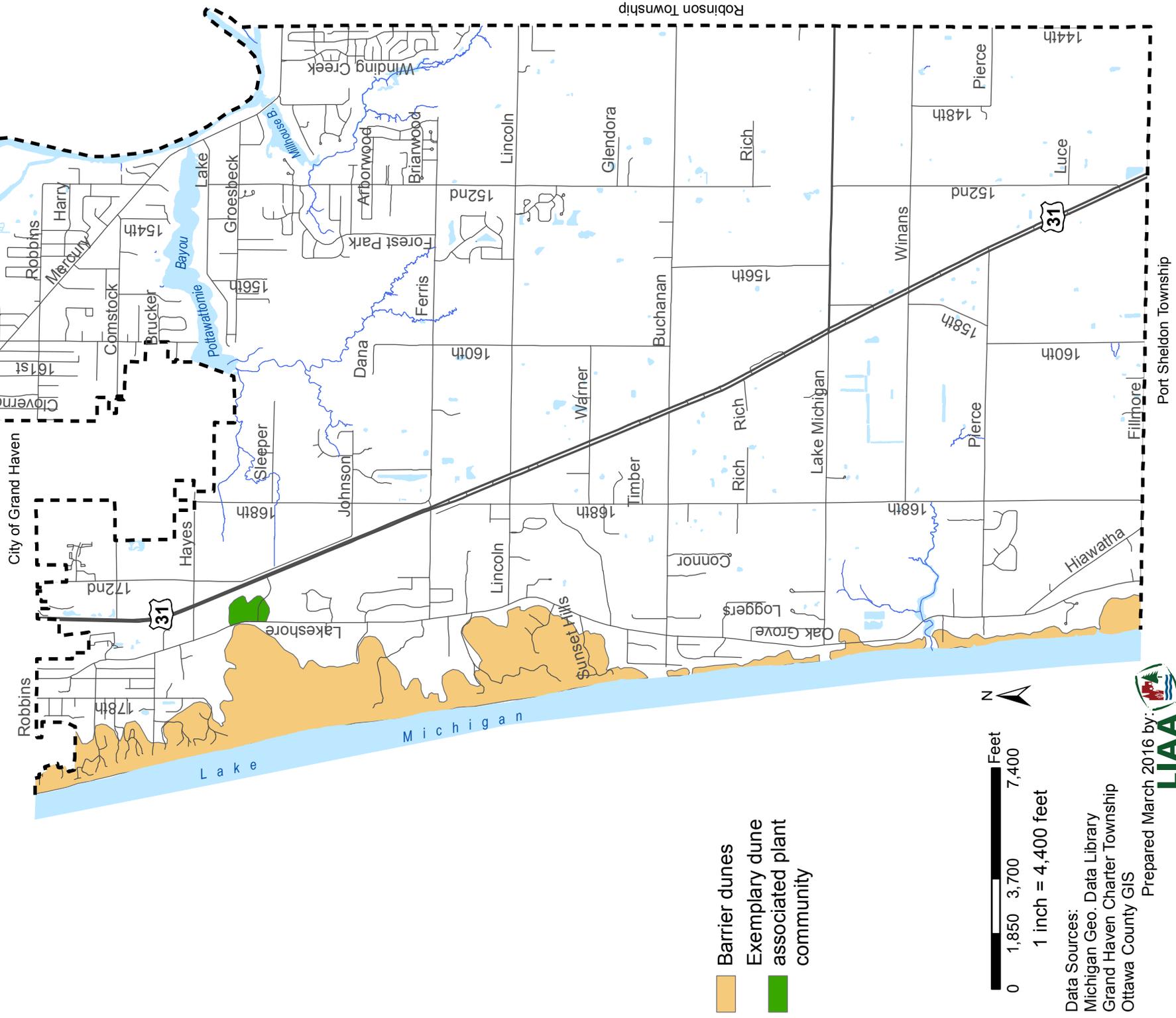
Data Sources:  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS

Prepared March 2016 by:  
**LIAA**

Port Sheldon Township



# Grand Haven Charter Township Critical Dunes Map #5.3



Data Sources:  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS

Prepared March 2016 by:  
**LIAA**

### Sand Dunes

Grand Haven Charter Township has 1,056 acres of Critical Dunes



Dunes in Grand Haven Charter Township, please see Chapter 12.

### WETLANDS

Wetlands play a critical role in regulating the movement of water within watersheds. Wetlands are also incredible flood absorbers and one acre of wetlands can retain up to one million gallons of water. The water-holding capacity of a specific wetland varies by the size, slope, type of vegetation, location relative to flooding path, and the water levels in the wetland prior to flooding. Coastal wetlands also control the severity of erosion along a shoreline during a storm. Perhaps more than any other environmental asset, wetlands absorb high energy waves and break the flow of currents. Michigan has coastal, tree, and shrub wetlands, each covered by water either all or part of the year.

This diversity of wetlands was misunderstood as European settlement began, and many wetlands were dredged, drained, and converted to serve industry. Today, less than half of the state’s wetlands remain, and in a time of changing climate, the need to conserve and restore wetlands is paramount.

Grand Haven Charter Township contains roughly 3,226 acres of wetlands. Map 5.4 on the next page illustrates the location of wetlands in the Township. For more information and detailed analysis on wetlands regulation and wetland analysis specific to Grand Haven Charter Township, see Chapter 12.

### SIGNIFICANT VEGETATION

Natural vegetation, along with other natural features, contributes to the high quality of life and beauty of Grand Haven Charter Township. The areas containing significant vegetation in Grand Haven Charter Township include the Rosy Mound Natural Area, the Hofma Preserve, Kirk Park, and the Hiawatha Forest. Whenever possible, existing mature vegetation should be preserved as development occurs, and additional plantings may be added in selected areas where aesthetics do not meet the standards established elsewhere in the community.

There are currently around 11,160 acres of tree canopy in Grand Haven Charter Township. The Township is committed to preserving this wonderful natural resource in a number of ways. For example, the U.S.-31 and M-45 Overlay Zone protects existing vegetation along these routes. Grand Haven Charter Township’s tree canopy is discussed in both Chapters 12 and 13.

### SOIL TYPES

Grand Haven Charter Township contains several different classifications of soils and varying slopes. The majority of the soils with steep slopes are found generally in the northwestern portion of the Township where the sand dunes are located. Overall, the Township contains soils in eight different classifications, which are described below and illustrated on Map 5.5, according to the Soil Survey of Ottawa County.

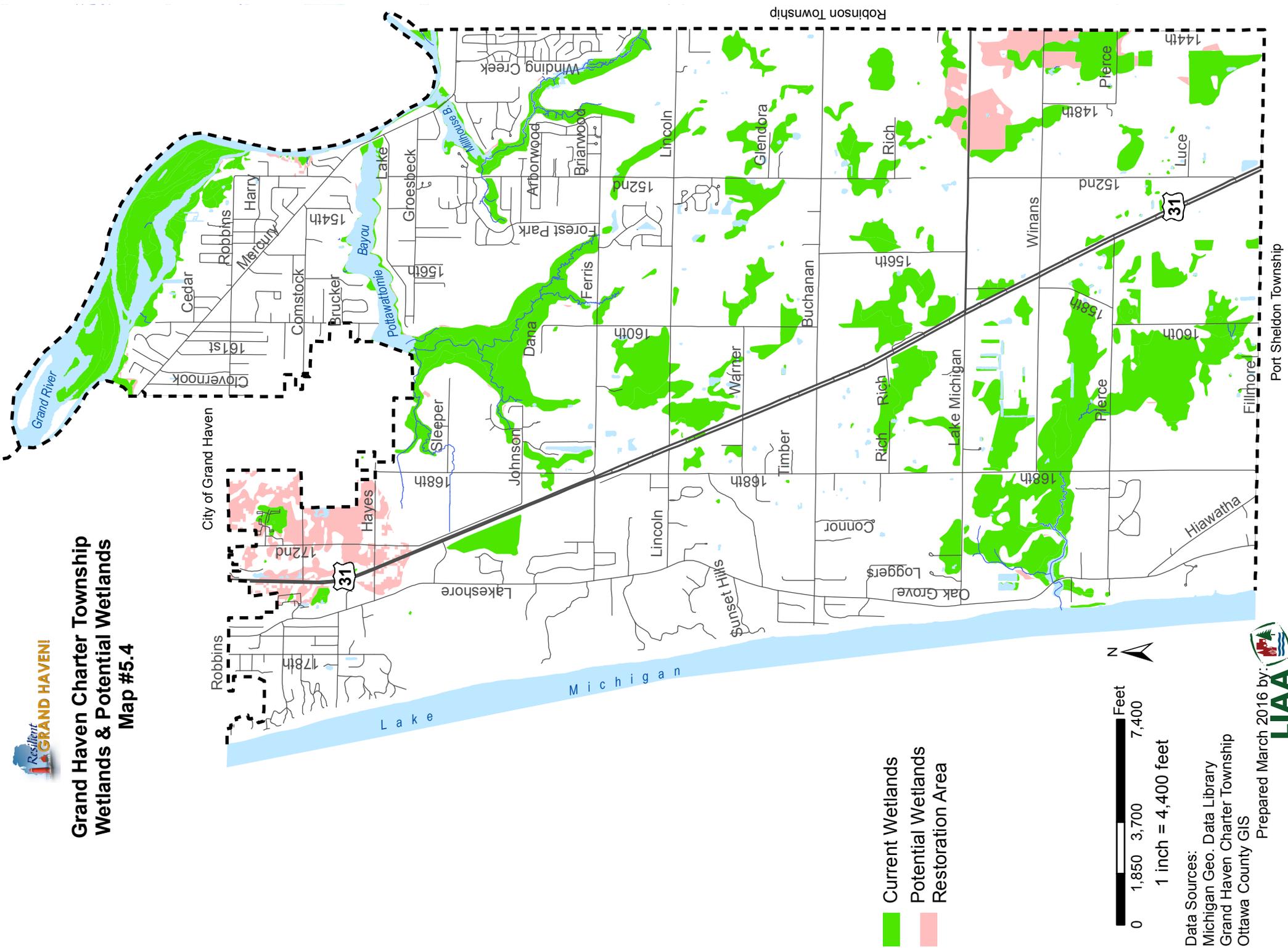
The **Adrian-Houghton** classification consists of very poorly drained soils that occur together as a complex. Available water capacity for both soils is very high and the surface runoff on both soils is very slow or ponded. These soils have a seasonal high water table at or near the surface from November to May. This land can be suitable for celery, onions, carrots, or grain. However, special fertilizers are required to grow crops in this soil

### Wetlands

Grand Haven Charter Township has 3,226 acres of wetlands, which account for about 18% of the Township’s total land area.

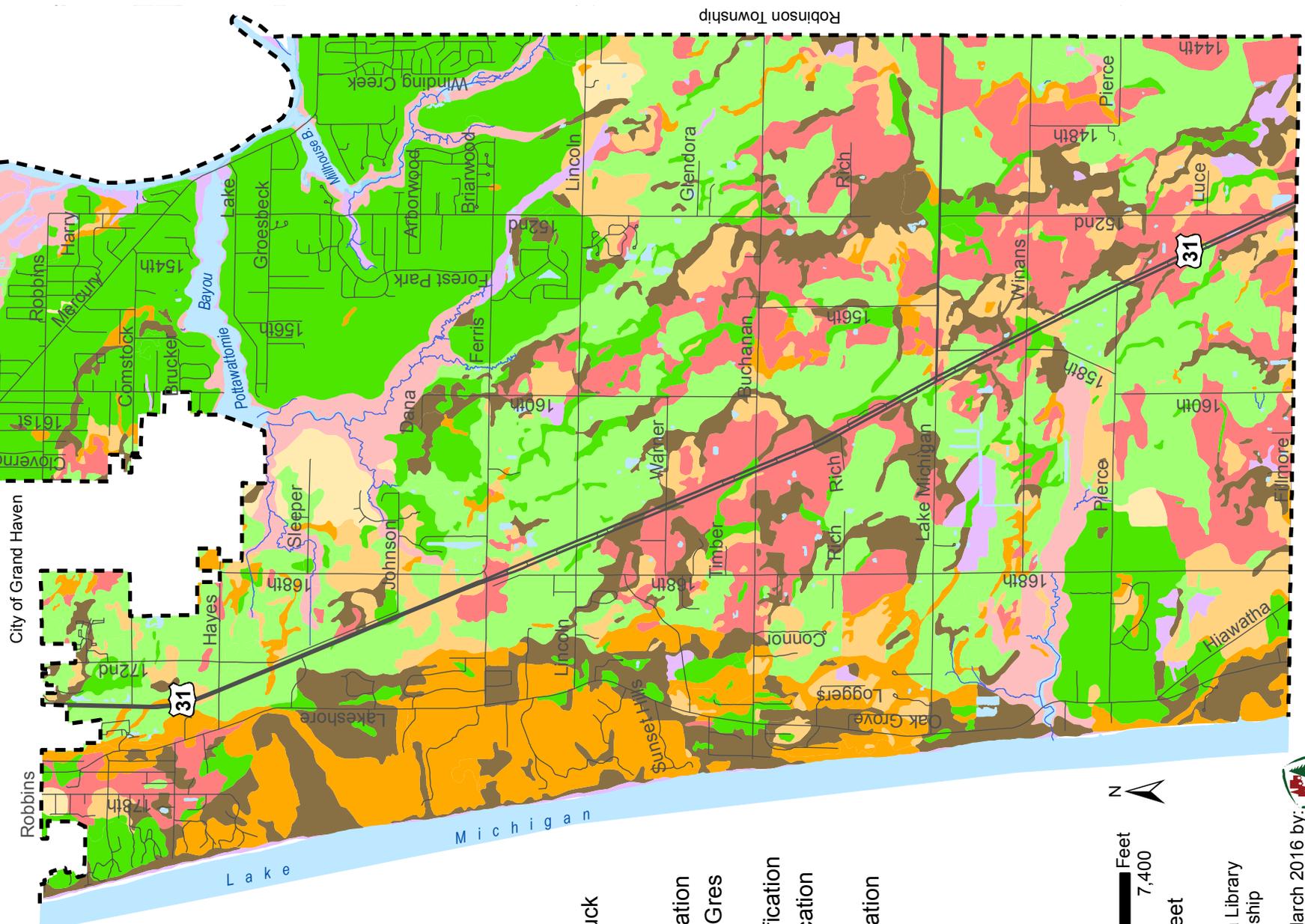


# Grand Haven Charter Township Wetlands & Potential Wetlands Map #5.4





# Grand Haven Charter Township Soil Classification Map #5.5



- Adrian-Houghton classification
- Au Gres-Saugatuck classification
- Blown-out land
- Chelsea classification
- Crosswell and Au Gres classification
- Deer Park classification
- Grandby classification
- Other
- Rubicon classification
- Water



Data Sources:  
 NRCS, Michigan Geo. Data Library  
 Grand Haven Charter Township  
 Ottawa County GIS



Prepared March 2016 by:

type, as this soil type quickly decomposes its organic matter.

The **AuGres-Saugatuck** classification are somewhat poorly drained soils that occur together as a complex. The available water capacity is low and the surface runoff is slow. These soils have a seasonal high water table from 0.5 to 1.5 feet below the surface from December to June. In some areas, this soil can naturally support a variety pine and spruce trees. With specialized fertilizer and supplemental irrigation, soil in this classification support blueberries, melons, strawberries, and cucumbers.

**Blown-out land** consists of sandy soils that were cleared of their original forest cover and left exposed to the erosive action of water and wind. Some areas have been stabilized, while others are actively eroding. This type of sandy soil can typically support trees, beach grass, and other vegetation hearty enough to withstand erosion.

The **Chelsea** classification is a somewhat excessively drained soil. Permeability is very rapid. Available water capacity is low. Runoff is slow to medium depending on slope. Land in this classification is suitable for hardwood forests.

The **Croswell and AuGres** classification are sandy soils that occur together as a complex. Croswell soils are moderately well drained and AuGres soils are somewhat poorly drained. Permeability is rapid, surface runoff is slow and available water capacity is low. These soils have an apparent seasonal high water table between 0.5 and 5.0 feet from November to May. A limited amount of land in this classification may be suitable for pine tree forestation, though it natively supports grass and sparse trees.

The **Deer Park** classification is described as an excessively drained sandy soil. Permeability is rapid and the available water capacity is low. Surface runoff is slow to rapid, depending upon slope, and the natural fertility is very low. This land is not suitable for farming, but has high recreational and aesthetic value for cottages, parks, and scenic woods.

The **Granby** classification is described as a poorly drained sandy soil. Permeability is rapid and the available water capacity is low. Surface runoff is very slow or ponded. The seasonal high water table is near or above the surface from late fall to early spring. This land is typically forested with low-lying hardwoods as crops in this soil require artificial drainage.

The **Rubicon** classification is described as an excessively drained sandy soil. Permeability is rapid and the available water capacity is very low. Surface runoff is slow and the natural fertility is low. Land in this soil type does not support crops but is useful for recreational facilities, woodland, and wildlife habitat.

## MANAGEMENT EFFORTS

The following management efforts are in place to protect and safeguard the resources within the greater Grand Haven Community. The following is not an exhaustive list of environmental management strategies. Rather, selected policies and plans are outlined that have significance to the goals and objectives in Chapter 7.

### FLOODPLAIN MANAGEMENT

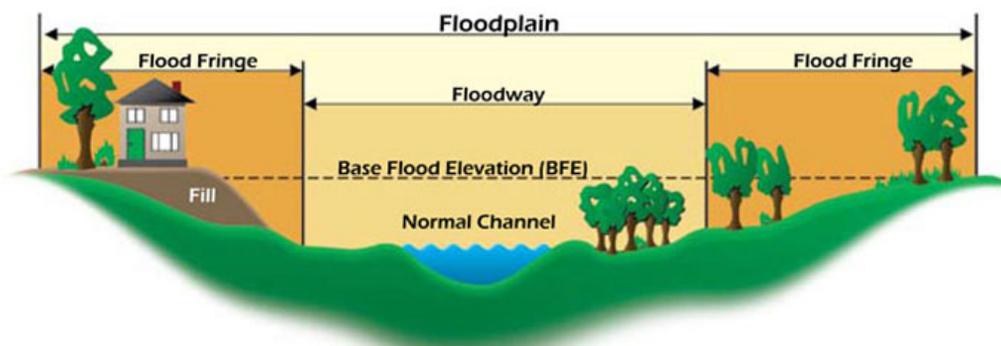
A river, stream, lake, or drain may occasionally overflow its bank and inundate adjacent lands. The land that is inundated by water is defined as a floodplain. Floodplains also serve as water recharge areas and natural

### Soil Types and Development Implications

Soil drainage or permeability measures the rate at which water moves through soil and is an important factor when deciding between a septic tank system or another type of on-site wastewater treatment system.

Poorly drained soils, like the Adrian-Houghton and AuGres-Saugatuck classifications, provide challenges for septic systems and do not generally support homes with basements. Whereas septic systems in well drained soils, like the Chelsea and Deer Park classifications may not adequately filter effluent.

### Characteristics of a Floodplain



Source: NFIP Guidebook, FEMA

water retention basins during periods of heavy precipitation or spring snow thaws. Development within the 100-year floodplain requires an exhaustive permitting process.

The National Flood Insurance Program (NFIP) is an optional program managed by the Federal Emergency Management Agency where communities can receive flood insurance for disaster relief by agreeing to regulate floodplain development. Most coastal communities participate in the NFIP, including Grand Haven Charter Township.

Flood Insurance Rate Maps (FIRMs) are created and released by the Federal Emergency Management Agency (FEMA), using event-based modeling and lake level elevations determined by a single storm event, for various return periods. It is important to note that individual property owners can petition to change the flood zone

designation for their property, so FIRMs may not be fully scientifically derived.

The FIRMs for Ottawa County, were adopted in 2011 by Grand Haven Charter Township, as seen in Map 5.6 on the next page. For an analysis of properties and environmental features that fall in floodplains based on the FIRMs, see Chapter 12.

### PARKS AND RECREATION

#### Parks

Hofma Park and Preserve allows visitors an opportunity to enjoy a variety of wetland and upland wooded ecosystems.

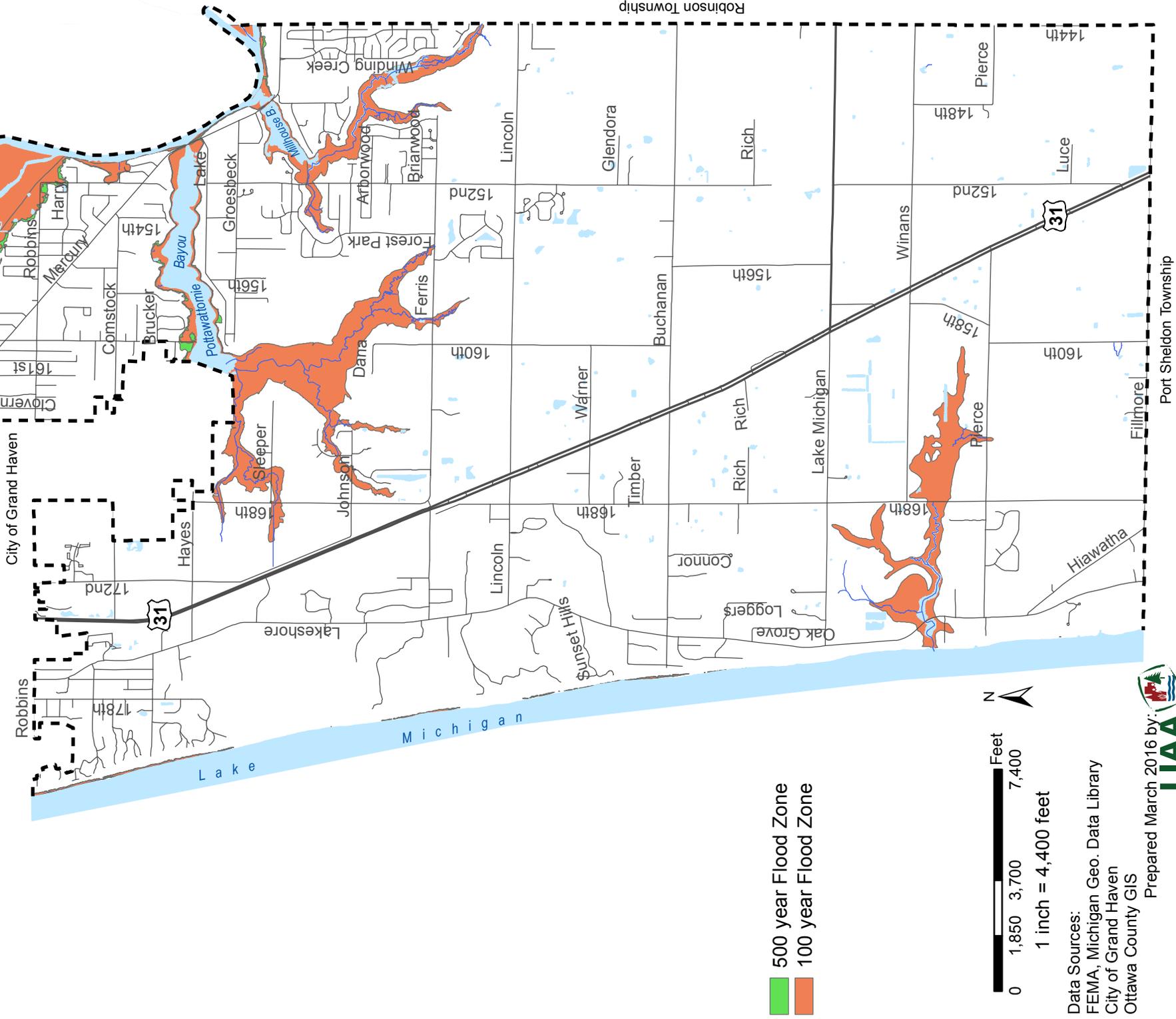


Parks, trails and recreation facilities play an integral role in the community. Parks and open space often link natural areas and help improve both water and air quality. Numerous studies have shown that when people have access to parks, they exercise more. This increased level of physical activity can reduce the risks for chronic diseases and help manage mental health. Perhaps most importantly, parks and recreation facilities can help build and strengthen a community and contribute to quality-of-life and sense-of-place.

Grand Haven Charter Township has a number of well-loved parks. In addition, the Township manages several public access sites, providing boaters, paddlers and fisherman access to the Grand River and its bayous. In 2015, the Township Board adopted Explore the Grand Region: A Community Parks and Recreation Plan in Northwest Ottawa County, a new community-wide Parks and Recreation Plan developed in partnership with the City of Grand Haven, the City of Ferrysburg, Spring Lake Township and the Village of Spring Lake. The Plan includes a list and description of each park and recreation facility within the five communities. The Plan also outlines specific goals and objectives for the park and recreation facilities for each participating jurisdiction as well as a number of action statements. See Map 5.7 for the locations of parks and recreational amenities in Grand Haven Charter Township



# Grand Haven Charter Township FEMA - 100 & 500 Year Flood Zones Map #5.6



Data Sources:  
FEMA, Michigan Geo. Data Library  
City of Grand Haven  
Ottawa County GIS

Prepared March 2016 by:  
**LIAA**

### Parks

Pottawattomie Park features a boardwalk and fishing pier.



### PARK AND RECREATION AMENITIES

- 152nd Access & Shiawassee Access  
Location: 152nd and Shiawassee Drive  
Size: 0.25 acres (each)
- Bignell Park  
Location: Bignell Drive  
Size: 0.5 acres
- Brucker Street and Buchanan Street Access  
Location: Brucker St & Buchanan St  
Size: 0.5 Acres Each
- Hofma Park and preserve  
Location: 15581 Ferris Street (16295 Sleeper St)  
Size: 565 Acres
- Mercury Park  
Location: 16715 Mercury Drive  
Size: 6.71 Acres
- Odawa/Battle Point Boat Launch  
Location: 14091 144th Avenue  
Size: 2.5 Acres
- Pottawattomie Park  
Location: 15600 Comstock Street  
Size: 20.83 Acres

### Pathways

Over 26 miles of non-motorized trails inter-connect Grand Haven Charter Township.



### TRAILS AND NON-MOTORIZED PATHWAY PLANNING

One of the Township’s most treasured assets is certainly its 26.7 miles of non-motorized pathways and trails (as seen on Map 5.7). There are numerous health, environmental, and community-wide benefits associated with non-motorized trails, many more than can be adequately described in this Master Plan. The following list identifies several key benefits of trails:

- **Trails provide physical benefits.** Trails can support both vigorous training and low impact recreation, which makes them a recreational asset that can be used by all skill-levels.<sup>1</sup> This is further supported by the 2016 County Health Rankings, which found Ottawa County ranked number one in Michigan for health outcomes, and second for health factors. Health outcomes are based on weighting the quality and length of life.<sup>2</sup> Health factor scores are based on health behaviors, physical environment, and social factors among others.

<sup>1</sup> Michigan Trails and Greenway Alliance: MichiganTrails.org

<sup>2</sup> 2016 County Health Rankings for Ottawa County: <http://www.countyhealthrankings.org/app/michigan/2016/rankings/ottawa/county/outcomes/overall/snapshot>

- **Trails are good for the economy.** Trails attract tourism, and tourists provide direct spending benefits (like souvenirs, and equipment) and indirect spending (a restaurant able to expand to a new location because of increased business) to a community.<sup>3</sup> Studies have shown that over half of tourists consider the availability of bicycling and trail opportunities as a strong influencing factor when choosing a vacation destination!<sup>4</sup> Trails also increase the property values of nearby homes and save homeowner’s money because they do not have to drive to other recreation destinations.<sup>5</sup>
- **Trails also provide psychological benefits.** Contact with the natural world, even for just a few minutes each day, improves psychological well-being, relieves feelings of anxiety, and improves a person’s ability to cope with stress.<sup>6</sup>
- **Trails benefit the environment.** Trails provide opportunities to educate the community about the environment, promote safe corridors for animal and plant migration, and preserve sensitive habitats. Additionally, trails provide an alternative to driving in Michigan’s auto-centric culture. Providing easy access to non-motorized pathways increases a community’s resilience as trails decrease dependence on air-polluting automobiles.<sup>7</sup>
- **Trails provide strong social benefits for a community.** Trails promote a sense of social cohesion and can act as a meeting place for the community.<sup>8</sup> Trails provide a safe place where children can ride bicycles and play away from fast moving traffic. In fact, in Grand Haven Township, safety concerns were one of the key reasons trails were first constructed. Additionally, studies have found that quality of life is a significant factor when a household is choosing where to live. Participants in one Michigan study listed safe streets as the #1 location factor, walkable streets as #3, and parks as #13.<sup>9</sup> Trails also encourage new relationships between strangers by providing a place to informally meet those that live or work nearby.

The Township has been committed to developing a strong network of trails in the community. The Township’s Pathway construction program was established in 1990 after voters approved a millage to construct the first 12 miles of pathway. A second phase began in 1998 after voters approved another millage to construct an additional 11 miles of trail. Since then, another 3 miles of pathways have been added by private developers or the Township’s Downtown Development Authority (DDA). Because of the popularity of the trails and the Township’s commitment to offering recreational opportunities, the Township Board will place another dedicated millage for an additional 10 miles of pathway on the ballot in November 2016.

The Township Department of Public Service is responsible for maintaining the Township’s pathways, including removing snow to ensure the pathways remain open year-round.

Currently, the section of trail along Lakeshore Drive is designated a regional shared use path by the West Michigan Shoreline Regional Development Commission.

<sup>3</sup> Michigan Trails and Greenway Alliance: MichiganTrails.org

<sup>4</sup> Economic Impact of Investments in Bicycle Facilities, 2004. <http://www.americantrails.org/resources/economics/NCouterbanks.html>

<sup>5</sup> Racca, David P. and Amardeep Dhanju. Property Value and Desirability Effects of Bike Paths Adjacent to Residential Areas, 2006. Delaware Center for Transportation and the State of Delaware Department of Transportation. <https://www.railstotrails.org/resourcehandler.ashx?id=4482>

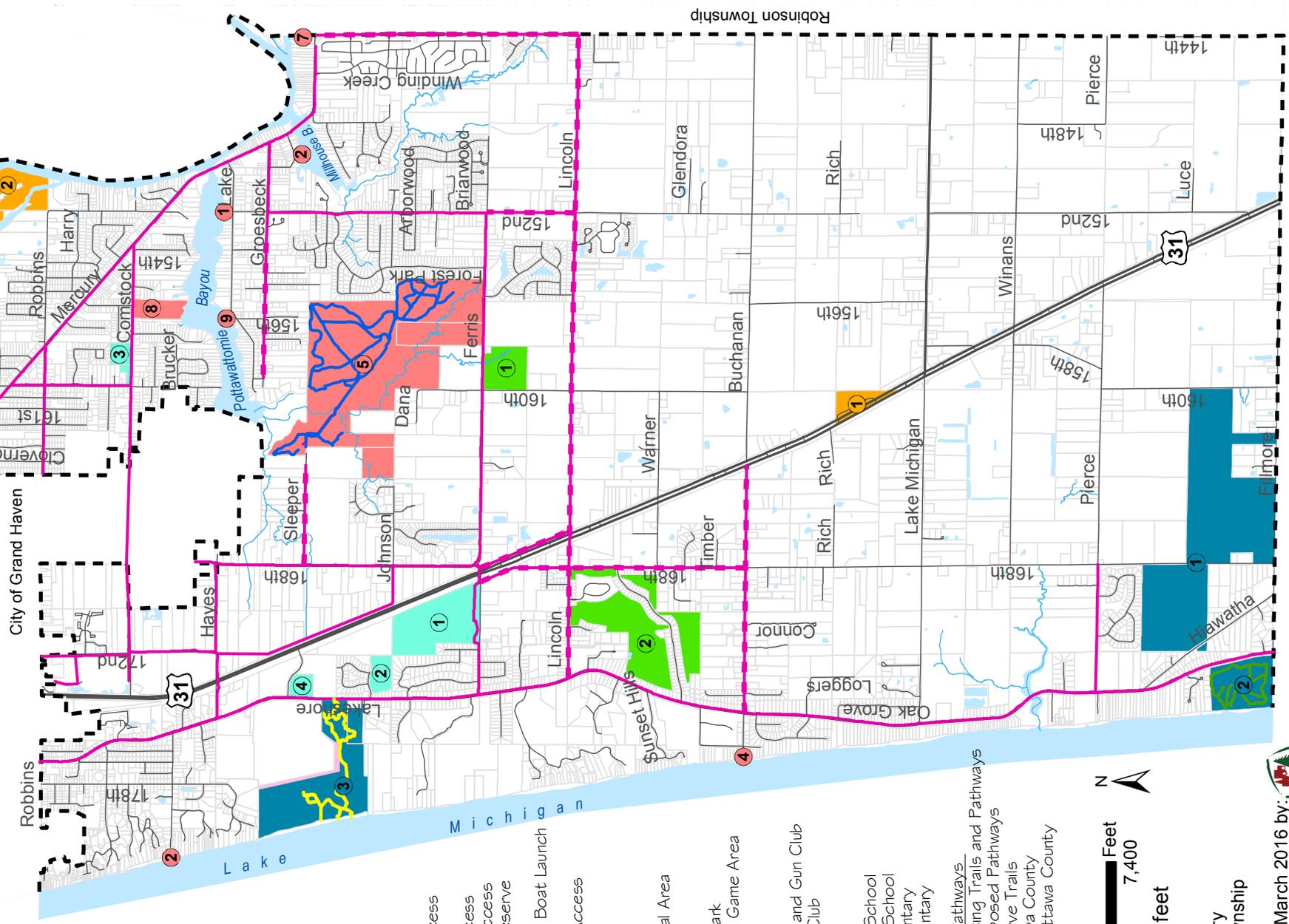
<sup>6</sup> Health Promot. Int. (March 2006) 21(1): 45-54.doi: 10.1093/heapro/dai032First published online: December 22, 2005

<sup>7</sup> <http://www.americantrails.org/resources/wildlife/>

<sup>8</sup> Go For Green: The Social, Health, and Heritage Benefits of Trails. <http://atfiles.org/files/pdf/BenGo4green.pdf>

<sup>9</sup> Michigan Cool Cities Initiative as cited by the NGA Center for Best Practices. <http://www.nga.org/files/live/sites/NGA/files/pdf/0510ACTIVEIVINGMI.PDF>

# Grand Haven Charter Township Parks and Trails Map #5.7



- **Local Parks**
  - 1 - 152nd Avenue Access
  - 2 - Bignell Park
  - 3 - Brucker Street Access
  - 4 - Buchanan Street Access
  - 5 - Hofna Park and Preserve
  - 6 - Mercury Park
  - 7 - Odawa/Battle Point Boat Launch
  - 8 - Pottawattamie Park
  - 9 - Shawassee Drive Access
- **County Parks**
  - 1 - Hiawatha Forest
  - 2 - Kirk Park
  - 3 - Rosy Mound Natural Area
- **State**
  - 1 - Agnew Roadside Park
  - 2 - Grand Haven State Game Area
- **Private**
  - 1 - North Ottawa Rod and Gun Club
  - 2 - Grand Haven Golf Club
- **Schools**
  - 1 - Grand Haven High School
  - 2 - Lakeshore Baptist School
  - 3 - Peach Plains Elementary
  - 4 - Rosy Mound Elementary
- Non-Motorized Trails/Pathways**
  - Grand Haven Twp Existing Trails and Pathways
  - Grand Haven Twp Proposed Pathways
  - Hofna Park and Preserve Trails
  - Kirk Park Trails - Ottawa County
  - Rosy Mound Trails - Ottawa County



Data Sources:  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS

## CHAPTER 6. ECONOMY

The following chapter provides a summary and analysis of the Township’s economic conditions. Understanding the economic profile of Grand Haven Charter Township helps inform and shape land use and development in the future. It can also highlight opportunities for public and private investment. This chapter will discuss the types of businesses, wages, employment, and other data relevant to the economic growth of Grand Haven Charter Township.<sup>1</sup>

### REGIONAL ECONOMIC OVERVIEW

According to the Upjohn Institute’s June 2015 Business Outlook report, the six Metropolitan Areas that make up West Michigan have overall seen job growth in manufacturing, construction, and most goods and service producing industries since 2014. It is unclear if job growth is a result of the economy rebounding from the Great Recession, or if other competitive advantages are driving changes in the West Michigan economy.

The U.S. Bureau of Labor Statistics provides information on the employment and wages for the Holland-Grand Haven Metropolitan Statistical Area (MSA). This data is only comparable through 2014, because the MSA boundaries have been expanded. Table 6.1 shows the Holland-Grand Haven MSA has continued to grow in terms of employment and jobs from 2010 to 2014.

Table 6.1 Holland-Grand Haven MSA Economic Overview, 2010 to 2014

	2010	2011	2012	2013	2014
Total Employment	98,600	100,000	102,770	105,430	113,270
Average Hourly Wage	\$ 18.67	\$ 18.83	\$ 18.63	\$ 19.26	\$ 19.58
Average Annual Wage	\$ 38,840	\$ 39,160	\$ 38,750	\$ 40,070	\$ 40,720

Source: Bureau of Labor Statistics

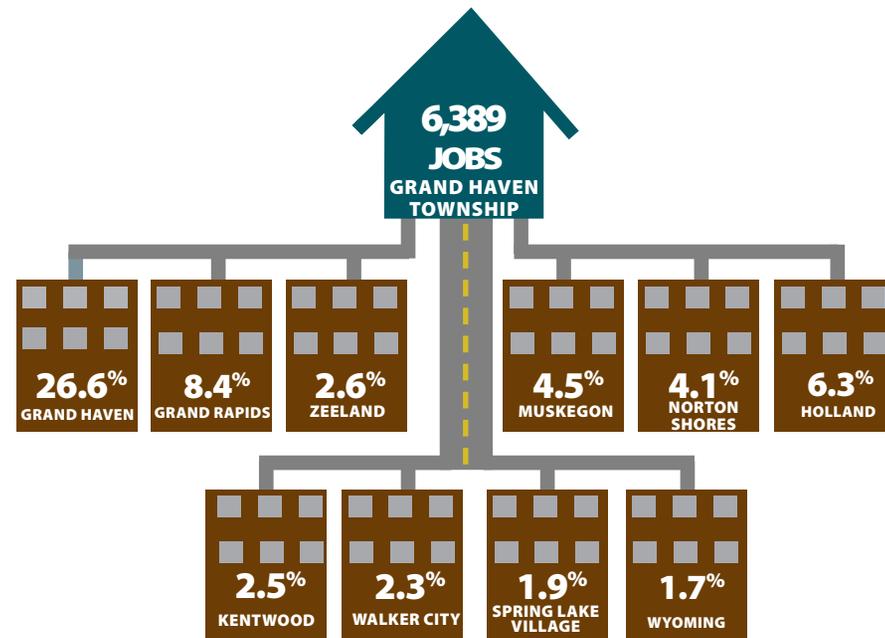
### COMMUTE PATTERNS

Grand Haven Charter Township residents held 6,389 primary jobs in 2013.<sup>2</sup> The graphic in Figure 6.1 on the next page shows the most common locations, outside of the Township, that job holders travel to for work. About 26% (1,698) of Grand Haven Charter Township’s workers commuted to the City of Grand Haven. 8.4% (538) worked in Grand Rapids, and fewer numbers worked in the City of Holland, Muskegon, and Spring Lake Township. About 10% (629) worked in Grand Haven Charter Township (not shown on Figure 6.1). The remaining

<sup>1</sup> It is important to note the sources listed below all collect data in slightly different ways. As much as possible, large discrepancies are avoided by using only one reliable source for each topic presented in this chapter. Each data source was carefully chosen to provide an overall, well-rounded look at the economic condition of Grand Haven Charter Township, and small discrepancies may exist.

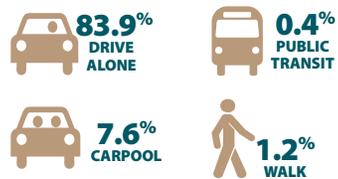
<sup>2</sup> 2013 Longitudinal Employer-Household Dynamics by the U.S. Census Bureau

Figure 6.1 Where Do Township Residents Work?



Source: U.S. Census (On The Map Tool, 2013 Commuting Data), American Community Survey, (Commuting Modes, 2009-2013)

Figure 6.2 How Do Township Residents Commute?



jobs are held in smaller numbers in various places throughout the State. It is clear from Figure 6.1 that a large percentage of employees living in the Township work nearby. This is reflected in a low commute time of 23 minutes for Grand Haven Charter Township residents.<sup>3</sup>

Figure 6.2 on the left shows the way Township residents commute to work. While majority of residents drive alone, many residents choose to carpool (7.6%). Fewer residents walk (1.2%) or take public transit (.4%) to work.

### INDUSTRIES IN GRAND HAVEN TOWNSHIP

The Grand Haven Chamber of Commerce produces annual reports showing the largest employers in the area. The top employers in the region in 2014 are shown in Table 6.2 on the next page.

A location quotient represents the share of jobs an occupation has in the regional economy, compared to the United States economy overall. In other words, if an industry’s location quotient is above 1.00, this industry is more represented in the Grand Haven regional economy than it is in the United States as a whole. The industries in Table 6.3 have a high location quotient, meaning the Grand Haven region specializes in producing

<sup>3</sup> American Community Survey, 2009-2013 5-year estimates for Grand Haven Charter Township

Table 6.2 Top Employers in the Grand Haven Region, 2014

Employer	Number of Full Time Equivalent Employees
Shape Corporation	1,500
Herman Miller	1,300
Grand Haven Area Public Schools	766
North Ottawa Community Health Systems	478
GHSP	387
Automatic Spring Products	315
Casting Technology Company	270
Meijer	250
West Michigan Molding	250
Engine Power Componentes	188
Brilliance Publishing	153

Source: Grand Haven Chamber of Commerce, 2014

### Manufacturing in Grand Haven Township

The Township is home to a number of manufacturing business, that provide vital jobs to residents throughout the Township and region. Grand Haven Township’s 2015-2018 Strategic Plan cites manufacturing as the most important wealth creating business in the community, providing 29%, or 30,000, of the region’s jobs. Manufacturing provides opportunity in what is referred to as the “secondary” job market, where raw materials are made into products like steel.



those products or services, is more inclined to attract these industries, and likely has a competitive edge in these areas. The third column in Table 6.3 shows the percent increase in employment from 2010 to 2014. It is unknown whether this increase in employment is evidence of rebound from the economic recession, new job creation, or a mix of both.

Table 6.3 Industries with High Location Quotients in 2014

Industry	2014 Location Quotient	% Increase in Employment, 2010 to 2014
Production Occupations	2.94	30.6
Architecture and Engineering	2.42	36.5
Building Grounds, Cleaning and Maintenance	1.44	22.7
Transportation and Material moving	1.24	2.7
Installation, Maintenance, Repair	1.05	30.3
Healthcare Support Operations	1.01	36.3

Source: Bureau of Labor Statistics

### Agriculture in Grand Haven Township

Ottawa County ranks second in the State of Michigan and 98 in the United States overall for agricultural production. Agricultural land provides aesthetic value cherished by many in the Township, but also provides a strong economic foundation for the Township and the region. Agriculture provides what is referred to as “primary” jobs, where natural resources are mined and produced, causing a chain reaction in the local economy of “secondary” jobs (manufacturing), and “tertiary” jobs (service sector).



### AGRICULTURE IN GRAND HAVEN TOWNSHIP

The Township also has a strong agricultural economy, as shown in Table 6.4. Ottawa County is home to 1.9% of the State’s farmland, but comprises 6.3% of the State’s total market value of agricultural products. The Township is leveraging its agricultural assets for continued growth, and between 2007 and 2015, the amount of land used for agricultural purposes in the Township increased by 181 acres.

Table 6.4 Agriculture Overview, 2012

	Ottawa County	Michigan Total	Ottawa County as a % of Michigan Total
Total Farmland (Acres)	186,154	9,948,564	1.9
Number of Farms	1,363	52,194	2.6
Estimated Market Value of Land and Buildings (in thousands of dollars)	1,202,183	39,993,227	3.0
Market Value of Agricultural Products (thousands of dollars)	543,405	8,678,050	6.3
Number of Cattle and Calves in Inventory	40,910	1,130,477	3.6
Number of Hogs and Pigs in Inventory	37,041	681,128	5.4
Number of Broilers and other Meat-type Chickens Sold	1,985,020	5,737,416	34.6
Corn for Silage or Green Chops (Acres)	15,566	309,709	5.0
Land in Orchards (Acres)	4,648	111,372	4.2

Source: Census of Agriculture, 2012

## CHAPTER 7. GOALS AND OBJECTIVES

The primary function of the *Resilient Grand Haven Charter Township Master Plan* is to guide future development and growth within the Township. The Master Plan identifies a vision for the future and a series of goals and objectives to guide decision making. The goals and objectives in this chapter of the Master Plan provide guidance for the future planning of the Township, and are based on the input gathered during the Resilient Grand Haven planning process, discussions with the Grand Haven Charter Township Planning Commission, and previous community planning efforts.

Goals provide statements that describe the desired future for the Township and provide general direction for local decision makers. Objectives are more detailed descriptions of actions needed to achieve the goals. The following pages identify the goals and accompanying objectives of the *Resilient Grand Haven Charter Township Master Plan*.

**Goal 1: The Township will preserve valuable natural resources, and the shorelines along Lake Michigan and the Grand River. These natural assets provide a cultural identity and add economic value to the community.**

1. The sensitive natural resources that distinguish the Grand Haven landscape will be identified and protected, which include but are not limited to: wetlands, critical dunes, high risk erosion, floodplains, and water resources.
2. Develop and implement shoreline protection standards such as riparian buffers, erosion protection with native vegetation plantings, and low-impact development.
3. Limit the amount of impermeable surface with all new development to minimize surface runoff and maintain infiltration.
4. The Township will take thoughtful measures to ensure residents will have long-term sustainable water sources.
5. Develop best management practices to prevent the introduction, and spread, of invasive species and diseases transmitted by flora and fauna.
6. Encourage forest stewardship practices through public education.

**Goal 2: The preservation and enhancement of natural features of the community will be a central consideration in all civic decisions in Grand Haven Township. Buildings and infrastructure will be planned, constructed and maintained to protect and improve the quality of the natural environment while serving the needs of the population and allowing residents and visitors appropriate access to enjoy natural features.**

1. Develop a green infrastructure plan to enhance and sustain the network of natural features.
2. Preserve the viewsheds of Lake Michigan, the Grand River, and the bayous by minimizing encroachment into riparian areas, floodplains, and steep slope areas within the Township.
3. Recognizing the importance and value of tree coverage the Township will evaluate the need and feasibility of implementing a tree planting policy.

4. Incorporate the use of renewable energy whenever feasible.
5. Support the goals and objectives of the Explore the Grand Region: A Community Parks and Recreation Plan in Northwest Ottawa County, 2015 – 2019.

**Goal 3: Discourage the inappropriate and unplanned use of land through sporadic and isolated land divisions. Encourage carefully planned developments that are responsive to market demands.**

1. Support a Township land use policy that results in a well-balanced, but diverse pattern of land uses that incorporates sustainable growth principles.
2. Establish ordinances to achieve the targeted growth areas defined in the 2009 Master Plan.
  - a. Land east of US-31 – new residential development should generally be limited to the north side of Lincoln Street. However, the Township may consider future residential Planned Unit Developments or Cluster Developments along the immediate southern edge of Lincoln Street in limited circumstances. Such as, the proposed development would fulfill a unique housing niche (i.e., affordable housing, senior housing, assisted living, PUD with a crop and livestock theme, etc.).
  - b. Land west of US-31 – limit new residential development to land north of Buchanan Street.
  - c. Limit future commercial and industrial development along US-31 and M-45 to those areas that are currently served, or are planned to be served, by municipal water and sewer. The costs associated with any utility extensions must be assumed by the developer.
  - d. Limit new development to land that is supported by existing infrastructure and paved roads. All proposed developments within 2,700 feet of municipal water or sewer must bear all costs to extend the infrastructure services.
3. Preserve the local character of the Township by implementing development regulations to protect the rural character, thriving agricultural operations, and successful agri-businesses, which include roadside stands and farmers markets.
4. Refine and enhance the Planned Unit Development (PUD) and Cluster Development Ordinances to ensure that residential developments are designed to promote the goals of clustered residential development, the preservation of large tracts of contiguous open space, and the preservation of development buffers along external county roads.
5. Support an amendment of the PUD ordinance that permits residential crops and livestock as the main theme of the new development.

**Goal 4: Support multiple housing options and mixed-use developments for all segments of the population that place users near daily services.**

1. Support the development of diverse housing types to expand choices available to current, and new, Township residents.
2. Examine the need, and viability, of increasing densities in certain segments of the Township.
3. Support and encourage senior housing and assisted living facilities (i.e., aging in place).

**Goal 5: Grand Haven’s public facilities, including its roads, utilities, parks, and public buildings will be carefully planned, constructed and maintained to efficiently serve the needs of current and future generations.**

**Goal 6: Residents and visitors to the greater Grand Haven community will have safe and convenient access by way of non-motorized pathway system, private automobiles, and public transportation.**

1. Expand the Township’s pathway system to promote the health and safety of residents and visitors.
2. Investigate the potential impacts of the new M-231 bypass on future development, traffic, and infrastructure in the Township.
3. Develop a best practices access management plan with OCRC and Ottawa County Planning Commission. This plan will strive to reduce traffic volumes; correct unacceptable traffic conditions; address safety concerns on major thoroughfares; and develop street design standards.
4. Coordinate current and future development projects with the Ottawa County Road Commission (OCRC).
5. Support efforts to increase access to a regional transit system. This includes supporting the goals and objectives of Harbor Transit’s strategic plan.

**Goal 7: Grand Haven Township will continue to be a vital economic center that includes a balance of clean manufacturing, professional and personal service, the arts, hospitality, retail, commercial, and institutional employment.**

1. Research the viability of incorporating an incentive-based development plan for all land uses, including energy efficiency and brownfield redevelopment.
2. Support the manufacturing sector in the Township by promoting existing opportunities and encouraging future growth.
3. Support the expansion, and improved access, to high-speed and reliable wireless broadband service.

**Goal 8: Grand Haven Township will be a leader in working with other units of government, state agencies, schools, and special authorities to manage growth and service delivery to the residents and businesses of the area in the most efficient and transparent manner possible.**

1. Coordinate planning efforts with surrounding municipalities for well-planned and cooperative communities.
2. Cooperate with other area communities in the evaluation and implementation of any feasible joint approach to service delivery.
3. Consolidate separate community initiatives into a common vision, which results in sound community building, promotes leadership, engages volunteers, and involves students.
4. Complete an evaluation of Township buildings and facilities to identify improvements to reduce energy consumption and stormwater runoff and implement those that prove feasible.
5. Partner with the Tri-Cities to create a marketing and branding strategy for the community.

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## CHAPTER 8. EXISTING LAND USES

This chapter discusses the current development patterns and existing land uses in the Township. The characteristics of land in Grand Haven Charter Township and the way people use land, have changed over time. Trees have grown and matured in areas that were once open fields. Lands that were once cultivated as farmlands have become shrub-covered fields or new housing developments. The current land development patterns reflect the Township’s development history and help inform the existing land use classifications discussed at the end of this chapter.

### CURRENT LAND DEVELOPMENT PATTERNS

The term “land development” refers to the conversion of land for the purposes of residential, commercial, industrial or other such uses. Land development can be described by the amount of land per type of use in an area, as well as by the characteristics of development (e.g. residential density). The process of developing land can have intermediate impacts that result in a variety of other changes to the physical environment. These impacts can potentially include the loss of sensitive habitats and wetlands, degradation of water quality due to increased runoff, and the loss of agricultural lands and open spaces.

Historically, development patterns in the Township were dictated by the layout and location of existing roads, which generally followed section lines and natural features such as the river and bayous. This created a land use pattern of individual homes that directly fronted onto main roads, or small scale residential neighborhoods that were located near main roads. Large plots of agricultural lands and open spaces were maintained behind these “strips” of roadside residential development.

The Township recognized this development pattern was causing safety hazards for residents. The growing population of the Township was leading to more driveways being accessed from heavily traveled public roadways that typically have a 45 – 55 mph speed limit. In 2011, the Township adopted an ordinance to directly address this issue. This ordinance requires any lot that abuts, and is accessed from, a public street (which are classified as State Trunkline, County Primary, or County Local by the Ottawa County Road Commission) shall have the minimum lot width doubled (e.g., R-1 increases from 100 feet to 200 feet). Furthermore, the Township requires properties located on corner lots to obtain driveway access from the lesser traveled of the two roads. These two provisions have made great strides in reducing the number of driveways on public roadways, and improving the safety of residents traveling in the Township.

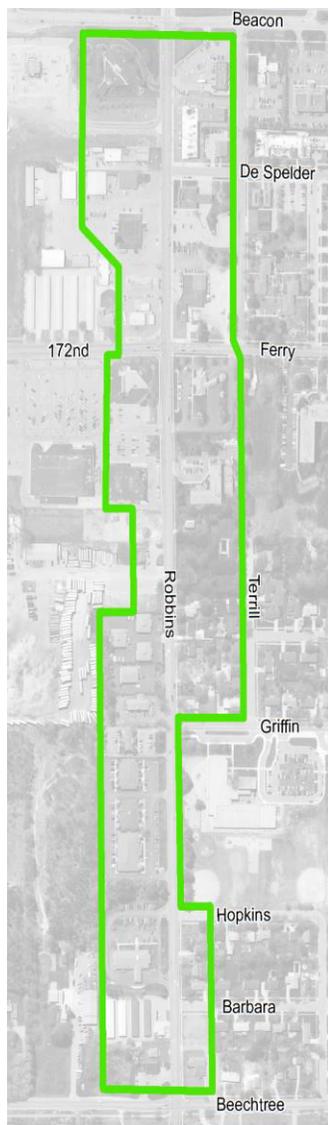
However, over the past twenty years the high rate of growth in the community has led to land development that has forever changed the landscape. Urban growth has pushed outward from the cities of Grand Haven (immediately north) and Holland (12 miles south) into adjacent Townships. As the Township grows, it is taking steps to protect existing agriculture land in the face of development pressure. Notably, as the Township has

Township Land Uses



### Robbins Road Sub-Area Plan

The Robbins Road Corridor planning process covered the study area shown below and included several walking tours and design charrettes.



grown, open and undeveloped land has been used for development, leaving the agricultural land, and its aesthetic rural character of the Township intact. This is clear in the different types of land uses that can be identified as “patterns” when looking at the Existing Land Use Map (Map 8.1 on the next page).

Medium to high density residential development, which accounts for the majority of residential development within the past 20-30 years, is generally located in two main “regions” of the Township. It is found in the northeast quadrant, which includes large subdivisions such as Forest Park, Grand Oak, Forest Park East, and Dermshire Forest. The River Haven Village manufactured home park is also located in this region. The second “region” of residential development is along the lakeshore the full length of the Township. This development is primarily single family and includes some of the older, more established residential areas and neighborhoods.

Given the importance of good highway access, the majority of the Township’s commercial and industrial development is located along or near US-31 and M-45. However, Grand Haven Charter Township is different than many other communities traversed by major highways, such as Holland and Muskegon, in that the amount of land currently used or zoned for commercial development is comparatively limited.

### SOUTHWEST QUADRANT SUB-AREA PLAN

In 2004, Grand Haven Charter Township adopted the Southwest Quadrant Sub-Area Plan as an amendment to the 1996 Master Plan. It covered the area south of Buchanan Street and west of US-31. This plan was created as a direct result of the development pressure that was occurring in this region (e.g. the proposed 80 acre Lakeshore Woods PUD residential development on Pierce Street).

The 2004 update included many goals and recommendations to help guide decisions about anticipated growth in the still-rural southwest quadrant of the community. Specifically, the plan recommended that many properties greater than 10 acres be “downzoned” as a way to delay development until appropriate infrastructure was in place to support higher densities. The Future Land Use Map in Chapter 9 reinforces the Southwest Quadrant Sub-Area Plan by continuing to “downzone” parcels in order to relieve development pressure and support the statements of purpose for each Zoning District.

### ROBBINS ROAD SUB-AREA PLAN

In 2009, Grand Haven Charter Township, partnered with the City of Grand Haven to develop a joint plan for the Robbins Road Corridor. The Plan addresses land uses on both sides of Robbins Road and traffic issues between US-31 and Beechtree/168th Avenue. The Plan recommends a series of access management techniques to improve safety and traffic operations along the corridor. The Plan also recommends a series of zoning changes and the establishment of building design standards. The recommendations outlined in the Robbins Road Sub-Area Plan can be found in Appendix A.

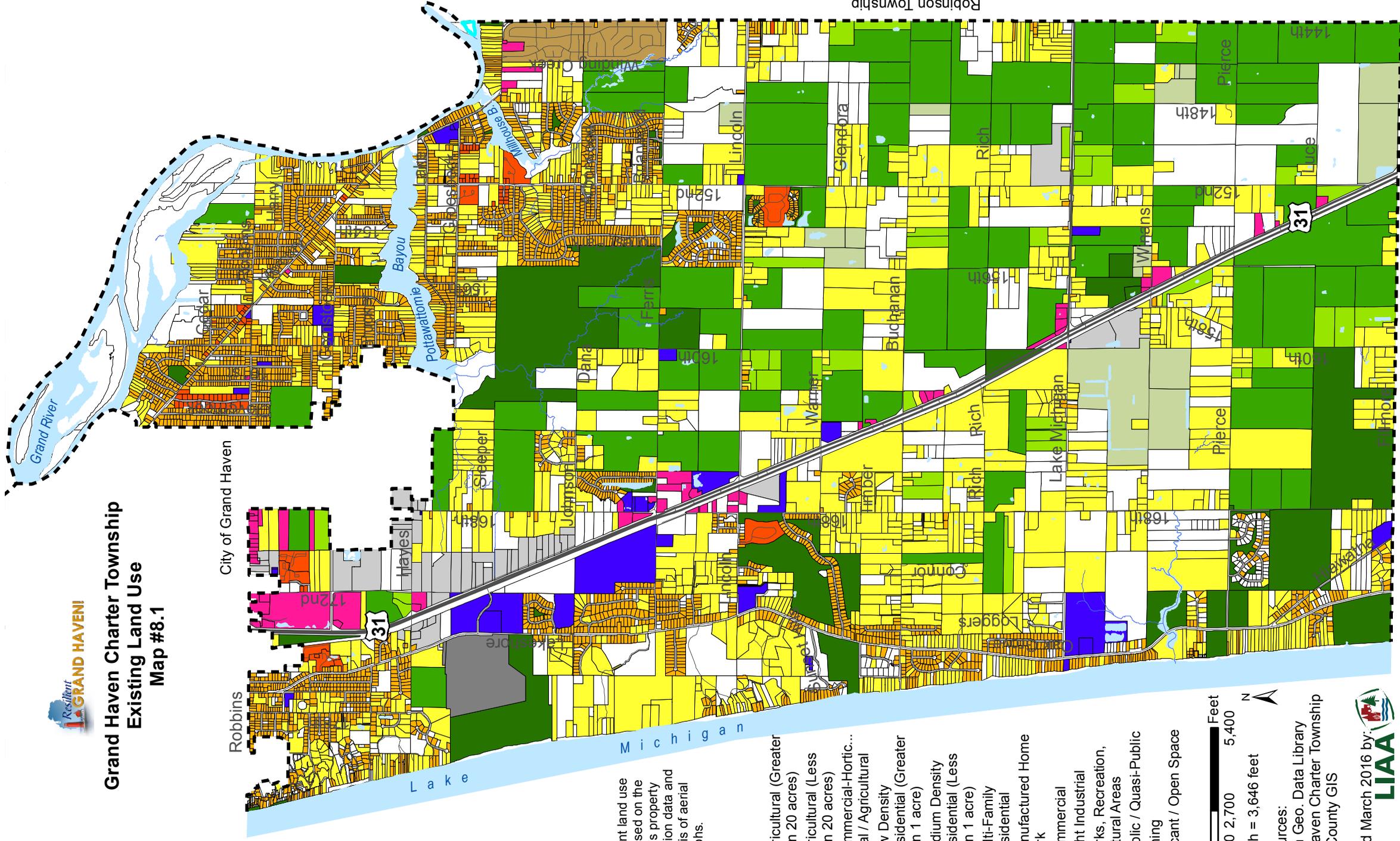
### EXISTING LAND USES

Existing land use classifications are important to understand because they can significantly shape a community’s character. Land use is a term that describes how a particular piece of property is being used, or will be used in the future. When grouped together, individual land uses can establish an overall development pattern of





# Grand Haven Charter Township Existing Land Use Map #8.1



The current land use map is based on the Township's property classification data and an analysis of aerial photographs.

- Agricultural (Greater than 20 acres)
- Agricultural (Less than 20 acres)
- Commercial-Horticultural / Agricultural
- Low Density Residential (Greater than 1 acre)
- Medium Density Residential (Less than 1 acre)
- Multi-Family Residential
- Manufactured Home Park
- Commercial
- Light Industrial
- Parks, Recreation, Natural Areas
- Public / Quasi-Public
- Mining
- Vacant / Open Space



Data Sources:  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS

Robbins  
City of Grand Haven  
Port Sheldon Township



similar or like uses.

### AGRICULTURAL

Agricultural land is the Township’s second largest land use making up 23% of the total land area. This category includes land that is currently used for agriculture such as farming, nurseries, dairying, forestry operations, and other similar activities. Agricultural uses are generally found on large, vacant parcels. However, they are distinct from the Vacant/Open Space classification in that they are actively being used for agricultural purposes.

On the Existing Land Use Map (Map 8.1), agricultural land was divided into two classifications: greater than 20 acres and less than 20 acres. It is important to identify the larger agricultural parcels of actively farmed land because they conform to the minimum acreage requirements for the Agricultural zoning classification, and they have a greater potential to change the character of Grand Haven Charter Township should their land use be converted to a more intensive use such as a residential subdivision.

Blueberries are one of the primary crops successfully grown in Grand Haven Charter Township. They do well in the Township’s soils and the moist air from Lake Michigan. Christmas trees are also a major agricultural activity, a crop that grows well in sandy soils. Several large greenhouse operations that grow nursery plants and shrubs benefit from the Township’s lakeshore climate.

### COMMERCIAL-HORTICULTURAL/AGRICULTURAL

There are a few agricultural sites in the Township which are unique from the other types previously described. Agricultural uses that maintain permanent commercial structures such as greenhouses and retail market buildings often generate larger volumes of daily truck traffic, engage in more intensive growing practices, and attract more frequent “customers.” These types of uses are considered Commercial–Horticultural/Agricultural uses, and they account for 2.9% of the Township’s total land area. Zelenka Nursery LLC, Autumn Leaves LLC, and Reenders Blue Acres LLC are all examples of these types of land uses.

### LOW DENSITY RESIDENTIAL

Low Density Residential is the Township’s dominant land use in terms of acreage, occupying 28% of the total land area. Parcels that are classified as Low Density Residential are greater than one acre (43,560 per square foot) and contain a single-family home. These uses fall somewhere between a typical subdivision lot and a larger, more rural or agricultural residential use. Concentrations of low density residential can be found in the western portion of the Township (west of US-31).

### MEDIUM DENSITY RESIDENTIAL

Medium Density Residential parcels are less than one acre (43,560 per square foot) but still contain a single-family home. This land use comprises 10.5% of total land area. Concentrations of Medium Density Residential uses can be found in the north half of the Township (i.e. north of Ferris Street), as well as along Lakeshore Drive. Similar parcels less than one acre with a single family home that were approved as a Planned Unit Development (PUD) are also classified as Medium Density Residential.

PUDs are the preferred residential development alternative within the Township. This trend can be expected to

### Agricultural Land Uses

Agricultural land makes up 23% of the Township’s total land area.



### Commercial/Horticultural Ag. Land Uses

Commercial/Horticultural Ag. land makes up 2.9% of the Township’s total land area.



### Low-Density Land Uses

Low Density land uses make up 28% of the Township’s total land area.



### Medium Density Land Uses

Medium Density land uses make up 10.5% of the Township's total land area.



continue because PUDs often result in creatively-designed residential developments that preserve a portion of a site's natural features. In addition, they also allow developers greater design flexibility and the possibility of incentives such as bonus densities. Given that lot sizes in a Medium Density area are typically smaller (sometimes less than allowed under standard zoning requirements), these developments often emphasize "cluster-type" patterns. Examples of Medium Density Residential PUDs include the Shores of West Olive, Lakeshore Woods, Hidden Creek and Forest Park East Subdivisions.

### MULTI-FAMILY RESIDENTIAL

Multi-Family Residential land uses account for a very small percentage (i.e. 0.9%) of Township's total land area, but they can have a much higher density. Multi-Family housing includes any residential structure with two or more units. This category also includes mixed-use residential housing (i.e. single-family mixed with multiple-family) and multiple-family housing units approved as a PUD.

The majority of these units are renter-occupied or renter/owner occupied (i.e. the owner lives in one unit and rents out the other(s)). Pockets of Multi-Family Residential can be found in the northern half of the Township along Lakeshore Drive, 172nd Avenue, and other areas. Such residential developments include the Timber View Apartment Complex, Grand Haven Club Condominiums, Hunters Woods Subdivision, Bayou Point Condominiums, and Bignell Ridge Condominiums.

### Multi-Family Land Uses

Multi-family land uses make up just 0.9% of the Township's total land area.



### MANUFACTURED HOME PARK

This classification includes developments approved for multiple, manufactured housing units. River Haven Village is currently the Township's only Manufactured Home Park. This type of land use uniquely impacts the Township because of the high population density or units per acre that is allowed. River Haven Village has 726 available manufactured home lots, of which about 638 are currently occupied. Assuming at least 1.9 residents per unit, the park could house about 1,379 people if it were fully occupied. Based on a site area of 152 acres, the resulting density would be 4.8 units per acre, which is considered an extremely high density for single-family housing. Though greatly different in style, this land use classification has similar characteristics to that of Multi-Family Residential. River Haven Village accounts for 0.9% of the Township's total land area.

### Commercial Land Uses

Commercial land uses make up 1.3% of the Township's total land area.



### COMMERCIAL

Commercial land uses are primarily concentrated on the US-31 and Robbins Road corridors, but there are some exceptions. This classification includes personal services, retail sales establishments, offices, restaurants, and other non-residential/non-industrial uses.

Large-scale commercial uses such as Meijer and Walmart Super Center also fall under this category. Additionally, these two developments fall under the US-31 Overlay District, and thus are subject to higher quality design standards than a typical commercial development. The commercial nodes in the Township provide needed goods and services for Township and neighboring residents, and for those traveling through the community. Future commercial growth will likely be fueled by an increase in area-wide population and the availability of commercial land suitable for development, which accounts for 1.3% of the total land uses.

## INDUSTRIAL

Industrial uses include operations engaged in the manufacturing, fabricating, assembling, and treatment of products and materials. These uses may create excessive noise, release air pollution, generate truck traffic, and cause ground vibration more than other, less-intensive land uses. The majority of the industrial uses in the Township are located along the 172nd Avenue corridor between Comstock and Johnson Streets, as well as along Hayes Street.

As a relatively small segment of all land uses in the Township (i.e. 2.0% of the total land area), industrial uses can have a significant influence on the overall community. These uses require additional planning consideration such as the availability of adequate public services and their compatibility with adjacent uses.

## PARKS, RECREATION, NATURAL AREAS

This category includes land used for recreation and social activities that are offered by public and private entities. These uses account for a considerable amount of the Township's total land area (i.e. 7.6%) and includes Township-operated parks like Pottawattomie and Hofma Preserve and county-operated parks like Kirk Park. This category also includes privately owned and operated facilities such as the Grand Haven Golf Club and the North Ottawa Rod and Gun Club. Designated open space within approved PUDs is also included within this classification. Plans are in place to acquire 40 acres of open space through the Michigan Natural Resources Trust Fund by early 2016. The Township is also in the process of receiving a donation of 118 acres of land.

These uses contribute greatly to the quality of life in Grand Haven Charter Township. Many people choose to live and work in communities that offer quality parks and recreational opportunities and Grand Haven Charter Township offers some of the best in the region. The Township's recreation amenities are discussed in more detail in Chapter 5.

## PUBLIC/QUASI-PUBLIC

Sometimes referred to as "Institutional" uses, Public/Quasi-Public uses include schools, churches and community facilities such as the Township administrative offices and fire station. Each individual parcel in this category has a specific use and role for the community. Churches for example, though privately owned, are considered quasi-public because of their role as a community center for many people.

These types of uses can be found throughout Grand Haven Charter Township and are closely tied to neighborhoods and are conveniently located for residents. Similar to the parks and recreational uses previously described these uses positively contribute to the quality of life for residents and businesses. They foster interaction between neighbors and are important for the future stability of the community. Public/Quasi-Public uses account for 2.1% of the Township's total land area.

## MINING

The sole mining operation in the Township is the Standard Sand mine located between Lake Michigan and Lakeshore Drive in the north part of the Township. Sand is an important natural resource, plentiful in the Great Lakes region, due to its raw material value for glass making, industrial molds, and concrete. The Standard Sand property is approximately 121 acres, which accounts for 0.7% of the Township's total land area.

### Industrial Land Uses

Industrial land uses make up 2% of the Township's total land area.



### Parks, Recreation, and Natural Area Land Uses

Land devoted to parks and recreation (including natural areas) make up 7.6% of the Township's total land area.



### Public/Quasi-Public Land Uses

Land used by churches, schools and Township facilities make up 2.1% of the Township's total land area.



### Vacant/Open Space Land Uses

Vacant or open spaces account for 19.6% of the Townships total land area.



### VACANT/OPEN SPACE

This category includes sites that have no structures and are not used for any of the previously described activities. Close analysis of vacant sites is necessary to better understand the potential impacts of new development and to shape their future uses. This category accounts for 19.6% (approximately 3,396 acres) of the Township’s total land area, a significant amount of acreage.

Table 8.1 shows the acreage in each land use category in 2015.

Table 8.1 Acreage of Existing Land Uses

	Acreage	% of Total Acreage
Large Agricultural (Lot size > 20 Acres)	3,633	21.0
Small Agricultural (Lot size < 20 Acres)	443	2.6
Commercial/Horticultural	501	2.9
Low Density Residential (Lot size > 1 Acre)	4,803	27.8
Medium Density Residential (Lot size < 1 Acre)	1,823	10.5
Multi-Family Residential	151	0.9
Manufactured Home Park	152	0.9
Commercial	227	1.3
Light Industrial	347	2.0
Parks, Recreation, and Natural Areas	1,321	7.6
Public/Quasi-Public	366	2.1
Mining	129	0.7
Vacant/Open Space	3,396	19.6

Source: Grand Haven Charter Township

## CHAPTER 9. FUTURE LAND USE AND ZONING PLAN

The Future Land Use Plan depicts the preferred but generalized composition of future land uses for Grand Haven Charter Township. The Future Land Use Plan is the general framework upon which land use and policy decisions will be guided for the next 20 to 25 years. The Future Land Use Plan was developed after careful consideration of several dynamic factors, including: availability of utilities, type of roadway (paved or gravel), existing land use, future development plans, community services, environmental features and a built-out analysis.

### RELATIONSHIP BETWEEN THE MASTER PLAN AND ZONING PLAN

The Master Plan describes the vision, goals and objectives for the Township. The Zoning Plan is based upon the Master Plan and is intended to guide in the development of the zoning ordinance. The zoning ordinance is the primary implementation tool for the future development of Grand Haven Charter Township.

There are two key elements to a Future Land Use Plan:

- **Future Land Use Map** - The Future Land Use Map (Map 9.1) designates specific land uses that are to occur on certain parcels or areas of the Township.
- **Future Land Use Text** - The Future Land Use text provides the written support for the map regarding the purposes and intent of the plan, as well as strategies for implementation.

The Township should continue to develop as a place with quality residential neighborhoods, natural beauty, and limited commercial and industrial development. This plan bases many of its policies on the 2009 Master Land Use Plan. A foundation for the success of that plan has been the policy of “balanced residential development,” which still remains a critical component. The goal of balanced residential development is to protect rural, agricultural, and environmentally sensitive land from untimely or inappropriate residential development. In support of such a goal a two-pronged strategy is recommended:

- Encourage residential development in those areas adequately served by infrastructure, including paved roads, natural gas, municipal water, and sanitary sewers.
- Employ zoning regulations, in conjunction with the Future Land Use Plan, to prevent residential development from occurring in areas designated as Agricultural Preservation.

While commercial and industrial uses are critical for the economic health of any community, an expansive amount of such land uses would have a significant impact on the Township’s character. However, such expansion, especially in areas where dense commercial and industrial uses already exist may be necessary to attract new industries and expand the Township’s tax base.

This balance weighs the community’s current character against opportunities for future economic growth and development. Consequently, the Plan supports an appropriate amount of land available for both commercial and industrial uses. These land uses are strategically

clustered on the US-31, M-45 and Robbins Road corridors. These concentrations focus development activity in locations that are well served by roads and utilities, and result in separating additional traffic and nuisances from the Township’s residential neighborhoods. Concentrating such activities allows residents, laborers, and visitors to enjoy shopping, restaurants and other services without disturbing residential neighborhoods.

## FUTURE LAND USE CLASSIFICATIONS

### AGRICULTURAL PRESERVATION

#### Intended Land Uses

This designation describes areas of the Township that consist of agricultural and agri-business uses such as blueberry and Christmas tree farms, dairies, commercial nurseries, and other such farm-related uses. However, it also includes large vacant properties, fallow fields, and woodlots that contribute to the rural character in certain areas of the Township.

Agri-business remains a significant activity in the growing Township, particularly on those lands deemed valuable for specialty farms, such as blueberry production. While a home that is subordinate to an agricultural use conducted on a property would be allowed, this classification is not intended for residential development. In fact, the creation of residential lots through land divisions or new residential development are strongly discouraged given the lack of appropriate infrastructure and the large inventory of pre-approved residential lots and units located elsewhere in the Township.

Properties identified as Agricultural Preservation on the Future Land Use Map that are not currently zoned Agricultural, but meet its criteria, should be allowed to downzone to Agricultural, or be used for agricultural purposes whenever the opportunity arises.

#### Corresponding Zoning District

Land uses that are allowed in the Agricultural zoning district should correspond to the Agricultural Preservation land use designation and require a 20 acre minimum lot size. This will ensure that agricultural and rural lands are not subdivided into small parcels, which affect their ability to maintain adequate, contiguous areas for farm land and the preservation of rural character.

#### General Location

Agricultural Preservation land uses are primarily located south of Lincoln Street (east of US-31) and south of Buchanan Street (west of US-31).

### RURAL RESIDENTIAL

#### Intended Land Uses

Areas planned for Rural Residential (RR) are characterized by single-family homes on lots that range from 1 to 10 acres. This “rural development” pattern is typically integrated, with or adjacent to, agricultural activities and generally there is a significant separation distance between homes. Unchecked, the indiscriminate application of this type of development can lead to an early or inappropriate transition of agricultural/rural land uses

#### Agricultural Preservation

**Corresponding Zoning Districts:** AG Agricultural

**Minimum Infrastructure Required:** None

#### Rural Residential

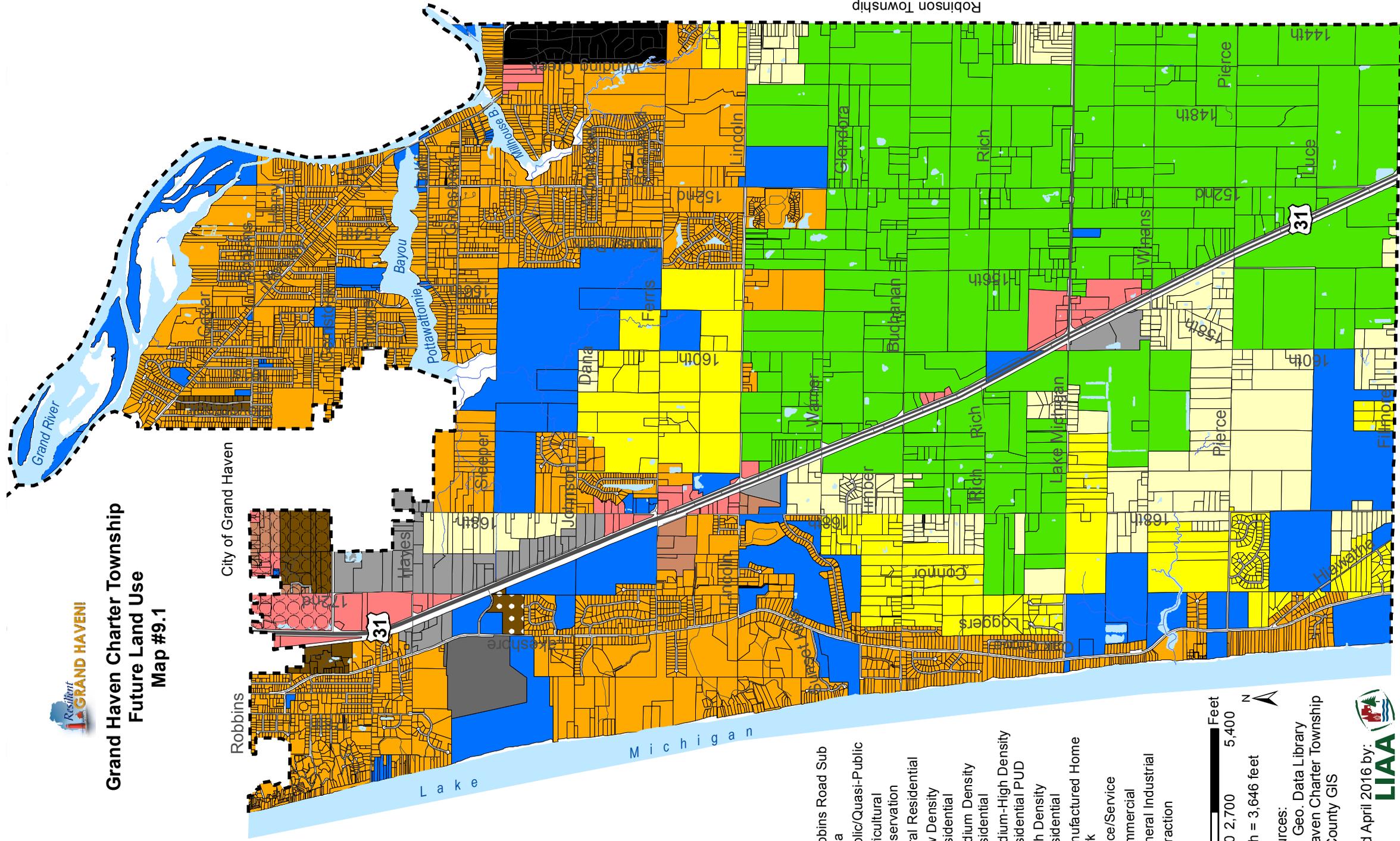
**Corresponding Zoning Districts:** RP (Rural Preserve), RR (Rural Residential)

**Minimum Infrastructure Required:** Direct Access from a Paved Public Roadway





# Grand Haven Charter Township Future Land Use Map #9.1



- Robbins Road Sub Area
- Public/Quasi-Public
- Agricultural Preservation
- Rural Residential
- Low Density Residential
- Medium Density Residential
- Medium-High Density Residential/PUD
- High Density Residential
- Manufactured Home Park
- Office/Service
- Commercial
- General Industrial
- Extraction



Data Sources:  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS

Robbins  
City of Grand Haven  
Pottawatomie Bayou  
Cedar  
Lincoln  
Rich  
Pierce  
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to a sprawling suburban residential development pattern. Therefore, this classification should be applied cautiously. The transition to Rural Residential should be guided by the availability of public infrastructure. For parcels smaller than ten acres this means requiring direct access to a paved public roadway.

As established by a 2011 Zoning Text Amendment Ordinance (ZTAO), certain large scale developments with eight or more lots (includes subdivisions, site condominiums, and mixed uses) shall not be created in the RR Zoning District unless it is developed as a Planned Unit Development. This form of regulation will enable the Township to control and moderate the size, scope and impact of future projects.

### **Corresponding Zoning Districts**

Rural Preserve (RP) and the Rural Residential (RR) zoning districts correspond to areas planned for Rural Residential. These two zoning districts require 10 acre and 45,000 square foot minimum lot sizes, respectively. The primary purpose for the RP zoning district is to preserve large areas of rural land from premature development and act as a buffer in order to reduce development pressure on agriculture land. Therefore, parcels ten acres or greater that are designated Rural Residential and are currently zoned RR, or more intensely, are encourage to be rezoned to RP.

### **General Location**

Small pockets of Rural Residential are found throughout the Township primarily near areas designated Agricultural Preservation. Specifically, these areas are concentrated in the Southwest quadrant of the Township. Rural Residential areas are so designated because of existing patterns of this type of land use. Most existing one acre or greater lots either contain a single family home, or they are vacant but are too small to subdivide or develop as a Planned Unit Development. Therefore, to avoid an inappropriate transition from agricultural/ rural land to residential sprawl development. This plan limits its application.

## **LOW DENSITY RESIDENTIAL**

### **Intended Land Uses**

When served by adequate public infrastructure, Low Density Residential areas are appropriate places for future residential development. However, additional residential growth in the Township, even in areas master-planned for such uses, must be carefully evaluated and should be permitted only where there is a demonstrated need.

To promote high quality development, Planned Unit Development (PUD) or Open Space Cluster requirements should apply to all future development in Low Density Residential areas. While these development options may allow increased residential densities, they also promote innovative design techniques (e.g. open space preservation, public amenities, and mixed housing and land use types) which are supported by this Master Plan.

As established by a 2011 Zoning Ordinance Text Amendment, certain large scale developments with eight or more lots (includes subdivisions, site condominiums, and mixed uses) shall not be created in the LDR Zoning District unless it is developed as a Planned Unit Development. This form of regulation will enable the Township to control and moderate the size, scope and impact of future projects.

### **Corresponding Zoning Districts**

#### **Low Density Residential**

##### **Corresponding Zoning Districts:**

LDR (Low Density Residential)

##### **Minimum Infrastructure Required:** Direct

Access from a Paved Public Roadway, Natural Gas, Municipal Water, and if available, Sanitary Sewer

The Low Density Residential District accommodates the land uses in this category. Specifically, the minimum lot size is 25,000 square feet, or in the case of a PUD, it should be used to establish a base density that is appropriate for the area.

#### **General Location**

This category is primarily found near Buchanan Street, west of 168th Avenue, and east of Lakeshore Drive. The Southwest quadrant is facing high development pressures to convert agricultural land into residential uses. Therefore, it is important to establish gradient buffers to preserve the valuable agricultural land. To accomplish this, LDR designations are established between Medium Density Residential and Rural Residential land uses. Another substantial pocket of an LDR designation is found along Ferris Street between US-31 and the Cutter Park Subdivision.

### **MEDIUM DENSITY RESIDENTIAL**

#### **Intended Land Uses**

Medium Density Residential accommodates both single and two-family residences on lot sizes ranging from 13,000 to 15,000 square feet for single family residences, and 26,000 for two-family residences. However, individual lot sizes within a Planned Unit or Open Space Development may be smaller provided the overall density does not exceed the appropriate levels of the underlying zoning district and surrounding area, as determined by the Planning Commission. This wide range of housing and residential densities provides the well balanced, but diverse pattern of land uses the Master Plan encourages. However, any future residential growth in the Township, even in areas master-planned for such uses, must be carefully evaluated and allowed only where there is a demonstrated need.

To promote high quality development, Planned Unit Development (PUD) or Open Space Cluster requirements should apply to all future development in Medium Density Residential areas. In addition, two-family residences are preferred to locate in areas planned for High Density Residential rather than Medium Density Residential. However, new residential developments that include two-family residences may be considered on lands planned for Medium Density Residential if approved as a Planned Unit Development in order to provide the Township with an opportunity to require high standards of site layout, architectural design, and construction quality.

As established by a 2011 Zoning Text Amendment Ordinance, certain large scale developments with eight or more lots (includes subdivisions, site condominiums, and mixed uses) shall not be created in the R-1 and R-2 Zoning District unless it is developed as a Planned Unit Development. This form of regulation will enable the Township to control and moderate the size, scope and impact of future projects.

#### **Corresponding Zoning Districts**

The R-1 and R-2 single family residential zoning districts correspond to the Medium Density Residential category.

#### **General Location**

Generally speaking, most existing, developed neighborhoods, subdivisions, and lots in the Township have been designated Medium Density Residential. They are mainly located in the northeast quadrant of the Township

#### **Medium Density Residential**

**Corresponding Zoning Districts:** R-1 and R-2 Single Family Residential

**Minimum Infrastructure Required:** Direct Access from a Paved Public Roadway, Natural Gas, Municipal Water, and if available, Sanitary Sewer

(north of Lincoln Street), and near the lakeshore (along Lakeshore Drive).

### **MEDIUM-HIGH DENSITY RESIDENTIAL**

#### **Intended Land Use**

This designation describes areas of the Township that are adjacent to single-family residential, multiple-family residential, and more intense land uses such as commercial and industrial. Medium-High Density Residential PUD land uses include a variety of housing types that act as a transition between a traditional single-family neighborhood to higher densities and more intense land uses. Furthermore, these lighter uses should generate less traffic than a traditional high density use, which makes it more appropriate to be located near single-family residential neighborhoods. These residential land uses may include senior housing, assisted living facilities, housing for the elderly, family foster care facilities, adult day care facilities, nursing or convalescent homes, and housing types identified as the “missing middle” in Chapter 3.

This use is not intended to reach the level of intensity that is afforded by the High Density Residential district. Rather, this designation is intended to act as a transition between medium density residential land uses, high density residential land uses, and more intense land uses such as commercial and industrial. Land in this district must be developed as a Planned Unit Development to ensure the Township can control and moderate the size, scope and impact of a project.

#### **Corresponding Zoning Districts**

The Residential Planned Unit Development district corresponds to the Medium-High Density Residential PUD category.

#### **General Location**

This category is limited, and the only area designated for this land use is on Rosy Mound Drive between Lakeshore Drive and US-31.

### **HIGH DENSITY RESIDENTIAL**

#### **Intended Land Use**

High Density Residential land uses include a variety of housing types at a density greater than a typical neighborhood. These residential land uses may include duplexes, apartments, multi-unit condominiums, and senior housing. Since these are more intense land uses they should only be allowed if a property is well served by public infrastructure including natural gas, municipal water, sanitary sewer, and has direct access to a paved public roadway.

#### **Corresponding Zoning Districts**

The R-3, R-3.5, and R-4 multi-family residential zoning districts correspond to the areas designated High Density Residential. The application of a PUD is strongly encouraged whenever a rezoning is considered in order to provide the Township with an opportunity to require high standards of site layout, architectural design, and construction quality.

#### **Medium-High Density Residential**

**Corresponding Zoning Districts:** Residential PUD

**Minimum Infrastructure Required:** Direct Access from a Paved Public Roadway, Natural Gas, Municipal Water, Sanitary Sewer

#### **High Density Residential**

**Corresponding Zoning Districts:** R-3 (Two Family Residential), R-3.5 (Restricted Multiple Family Residential), and R-4 (Multiple Family Residential)

**Minimum Infrastructure Required:** Direct Access from a Paved Public Roadway, Natural Gas, Municipal Water, and if available, Sanitary Sewer

**General Location**

Existing High Density Residential designated areas include the 43 North Condominium and Apartment PUD, Timber View Apartments PUD, Piper Lakes Apartments PUD, and the area flanked by numerous two- to four-unit structures along Clovernook Drive. These developments are all located near, or north of, Comstock Street. Understanding the Township is expected to experience continued growth, it was necessary to identify additional locations suitable for High Density Residential development. Therefore, land south of the 43 North PUD, south of the Timber View Apartments PUD, and north of the Piper Lakes Apartments PUD have been master-planned for additional HDR. This designation also aligns with the goals found in the Robbins Road Sub-Area Plan.

Other High Density Residential developments (that are inconsistent with the Master Plan) could be considered on a case-by-case basis only where there is a clear demonstrated need, and where adequate public infrastructure exists and surrounding land uses are compatible and would help support a particular land use proposal. For example, a higher density senior housing development located near shopping and personal services could be considered given a desire to accommodate this type of housing for an aging population.

**MANUFACTURED HOME PARK**

**Intended Land Use**

Manufactured Home Parks are designed for a long-term duration of stay, and must comply with the applicable requirements of Public Act 419 of 1976, as amended, and Public Act 96 of 1987, as amended, and all other applicable local, county, state, or federal regulations.

**Corresponding Zoning District**

The R-5 Manufactured Home Park Residential District is the only applicable zoning district.

**General Location**

The only area designated for this land use is the River Haven Manufactured Home Park located at the corner of Mercury Drive and 144th Avenue.

**OFFICE/SERVICE**

**Intended Land Use**

Areas planned for Office/Service should allow low-intensity commercial uses such as general office buildings, service professional offices, medical clinics, financial institutions, and service establishments. These land uses are desirable transitions between major thoroughfares, commercial, and residential areas.

**Corresponding Zoning Districts**

The SP-Service Professional and Commercial PUD zoning districts correspond to the Office/Service classification. Any future development proposals that are significant in scale or scope should be considered as Planned Unit Developments.

**General Location**

**Manufactured Home Park**

**Corresponding Zoning Districts:** R-5 (Manufactured Home Park)

**Minimum Infrastructure Required:** Direct Access from a Paved Public Roadway, Natural Gas, Municipal Water, Sanitary Sewer

**Office/Service**

**Corresponding Zoning Districts:** SP (Service Professional)

**Minimum Infrastructure Required:** Direct Access from a Paved Public Roadway, Natural Gas, Municipal Water, and Sanitary Sewer

Areas designated Office/Service are limited in the Township and are mainly located near existing uses, such as Robbins Road. This corridor has been subject to more detailed planning and is included in Appendix A. Other existing and planned Office/Service areas are found at the southeast corner of 168th and Lincoln, and at the southwest corner of Ferris and U.S.-31.

## COMMERCIAL

### Intended Land Use

The Commercial designation provides for the continuation, redevelopment and new construction of a variety of commercial uses in the Township. These include retail businesses, restaurants, theaters, shopping centers, as well as most of the uses in the Office/Service land use classification.

Commercial land uses that are appropriately located, high quality, and further the intent and purpose of this Master Plan are very important for the continued economic prosperity and quality of life.

### Corresponding Zoning Districts

The C-1 Commercial, SP-Service Professional, and Commercial PUD zoning districts correspond with the Commercial land use designation. Any future development proposals that are significant in scale or scope should be considered as Planned Unit Developments.

### General Location

The major areas designated as Commercial are located adjacent to the US-31 and Robbins Road corridors. Both locations are appropriate for commercial activity because of existing land uses and available infrastructure. Additionally, this area can accommodate higher traffic volumes, provide relatively easy access, and offers the visibility that is desirable in a suburban setting.

A primary goal for the US-31 corridor is to keep businesses and the environment they inhabit attractive and unobtrusive. This concept is buttressed by the Township's Overlay Zoning District. Several large areas along US-31 are also planned for non-commercial uses so as to preserve the existing rural character. Commercial land uses are located in several areas of the Township but the majority are along US-31. These have been clustered in three primary commercial "nodes" and include:

- US-31/M-45 intersection (including a small area south of Buchanan Street)
- US-31/Ferris Street intersection (extending north to Johnson and south to Lincoln)
- US-31/Robbins Road intersection (extending south to Hayes Street)

## GENERAL INDUSTRIAL

### Intended Land Use

General Industrial land uses include a wide range of industrial-related operations such as manufacturing, assembly, fabrication, millwork, wholesale businesses, warehousing, and research and development facilities. They may also include more intense commercial uses that have potential to impact properties beyond their boundaries.

### Commercial

**Corresponding Zoning Districts:** C-1 (Commercial) and SP (Service Professional)

**Minimum Infrastructure Required:** Direct Access from a Paved Public Roadway, Natural Gas, Municipal Water, and Sanitary Sewer

### General Industrial

**Corresponding Zoning Districts:** I-1 (Industrial), I-1A (Corridor Industrial)

**Minimum Infrastructure Required:** Direct Access from a Paved Public Roadway, Natural Gas, Municipal Water, Sanitary Sewer

These land uses are also important for the continued economic prosperity and quality of life in Grand Haven Charter Township. Quality manufacturing jobs are highly sought after across the country and successful manufacturing operations can provide numerous benefits to a community, such as jobs and tax revenues. For those reasons, high-quality industrial land uses that further the intent and purpose of this Master Plan are encouraged.

**Corresponding Zoning Districts**

The I-1 Industrial and Industrial I-1A Corridor Industrial zoning districts correspond with the General Industrial land use designation. Any future development proposals that are significant in scale or scope should be considered as Planned Unit Developments.

**General Location**

Currently, there are many industrial uses in the Township, and these are a vital part of the region’s economy. However, due to the intensive nature of industrial activities, the area planned for General Industrial is somewhat limited. In fact, most of the areas are already developed, such as along 172nd Avenue (between Comstock Street and Johnson Street) and Hayes Street (between 172nd Avenue and 168th Avenue), the property south of Lincoln Street (west of US-31), and the properties south of Lake Michigan Drive (west of US-31). There is also a small section of General Industrial planned along the west side of US-31 near Hayes Street where Heyboer Excavating operates.

**Extraction**

**Corresponding Zoning Districts:** All that permit the Removal and Processing of Natural Resources

**Minimum Infrastructure Required:** Varies

**EXTRACTION**

**Intended Land Use**

Extraction is essentially a sub-category of the General Industrial classification and recognizes the continued existence of Standard Sand, the sole sand mining operation in the Township.

**Corresponding Zoning Districts**

Zoning districts that permit the removal and processing of natural resources, either by right or as a special land use, correspond with the Extraction land use classification. However, the property that Standard Sand occupies is currently zoned R-1 Residential and should not be zoned otherwise. This will allow the property to someday revert back to a residential use, which is consistent with the surrounding properties.

**General Location**

This land use classification is tied directly to the Standard Sand mining operation, located west of Lakeshore Drive, south of Hayes Street and is the only area master-planned for Extraction.

**PUBLIC/QUASI-PUBLIC**

**Intended Land Uses**

This designation accommodates schools, government facilities, public utilities, parks, natural areas, and public recreational uses. It also recognizes churches, private recreational uses, and other community-oriented activities located on privately-owned land. These uses positively contribute to the quality of life for Township

**Public/Quasi-Public**

**Corresponding Zoning Districts:** All that Permit Public/Quasi-Public Land Uses

**Minimum Infrastructure Required:** Varies

residents and businesses. They foster interaction between neighbors and are important for the future stability of the community.

### **Corresponding Zoning Districts**

All zoning districts that permit these types of uses either by right or as a special land use correspond with the Public/Quasi-Public land use designation. Specifically, schools, parks, recreation areas, and churches are permitted in most of the Township's residential zoning districts as special land uses.

### **General Location**

Public/Quasi Public land uses can be found throughout Grand Haven Charter Township and are closely tied to neighborhoods and conveniently located for residents. Because of the importance of these land uses, the Future Land Use Plan accounts for all such existing uses in the Township.

## **ZONING REGULATIONS**

### **AGRICULTURAL DISTRICTS**

The agricultural zoning districts in Grand Haven Charter Township are:

- AG - Agricultural District
- RP - Rural Preserve

The primary purpose of the Agricultural District is to provide for farming, dairy farming, forestry operations and other rural activities. The primary purpose of the Rural Preserve District is to provide a buffer between the agricultural uses and residential uses.

### **RESIDENTIAL DISTRICTS**

The residential zoning districts in Grand Haven Charter Township are:

- RR - Rural Residential District
- LDR - Low Density Residential District
- R-1 - Single Family Residential District
- R-2 - Single Family Residential District
- R-3 - Two Family Residential District
- R-3.5 - Restricted Multiple Family Residential District
- R-4 - Multiple Family Residential District
- R-5 - Manufactured Home Park Residential District

The main purpose of these zoning districts is to provide a variety of housing options within the Township. The Rural Residential District is intended to provide for large-tract housing developments that co-exist with agricultural activities on open areas in the Township. The Low Density Residential District is designed to

support new residential development between large areas of rural residential properties and medium density development. The R-1 and R-2 Single Family Residential Districts are intended to provide for single family neighborhoods. The R-3 and R 3.5 Two-Family Districts are intended provide for a higher density of single family and multi-family neighborhoods. The R-4 Multiple Family Residential District is intended to provide high density residential developments as well as nursing homes and other adult care or medical facilities. The R-5 Manufactured Mobile Home Park Residential District is dedicated to providing for manufactured housing.

### COMMERCIAL DISTRICTS

The commercial zoning districts in Grand Haven Charter Township are:

- SP - Service/Professional District
- C-1 - Commercial District

The primary purpose of these zoning districts is to provide for a variety of commercial and service uses that serve local residents as well as those traveling throughout the region. The SP Service/Professional District is designed to accommodate uses such as offices, banks and other services in areas adjacent to neighborhoods. The C-1 Commercial District allows all SP uses including office buildings and personal service establishments. In addition, the C-1 District is intended to provide for retail operations and other commercial services.

### INDUSTRIAL DISTRICTS

The industrial zoning districts in Grand Haven Charter Township are:

- I-1 - Industrial District
- I-1A - Corridor Industrial District

The primary purpose of these zoning districts is to provide for manufacturing, assembling, and fabricating activities within the Township.

### PUD DISTRICT

The PUD District is designed to provide for unique developments that substantially benefit both the users of the project and the community. In areas where such benefits would be unfeasible or unlikely under the other zoning districts.

## CHAPTER 10. PUBLIC PARTICIPATION

Because the Master Plan is a reflection of the values and vision of the community, engaging the public was a critical component of the community-wide planning process. Outreach and engagement activities for the Master Plan were designed to:

- Build awareness and promote the community-wide planning process.
- Encourage Township and City citizens to talk about issues of mutual concern and interest.
- Engage citizens and stakeholders about the future of the community.
- Make connections and build partnerships between community stakeholders, non-profits and civic organizations.
- Build awareness about local, state, regional and national issues that impact the community.
- Determine if more detailed information about coastline processes influence coastal land use policy.

The following civic engagement activities were conducted during the community-wide planning effort.

### PROJECT WEBSITE

In an effort to raise awareness about the planning project, the consultant team developed an interactive project website ([www.resilientmichigan.org/grand\\_haven.asp](http://www.resilientmichigan.org/grand_haven.asp)). The website provided information about upcoming public meetings, post-meeting notes, draft documents, links to videos and presentations, news articles and an interactive forum. At the conclusion of the planning process, the Township and City Master Plans were placed on their respective websites.

### PUBLIC MEETINGS

Over 200 members of the public directly contributed to the Master Plan by participating in the Leadership Summit, Community Action Team Meetings, and a Public Open House.

### LEADERSHIP SUMMIT

Nearly 100 people participated in the Leadership Summit, a multi-faceted workshop designed to engage citizens, public officials and community stakeholders with an in-depth discussion about community resilience. During the Summit, experts from the University of Michigan, Michigan State University's Land Policy Institute and the State's Climatology Office, among others, delivered presentations on how the community could become more resilient to challenges associated with a changing climate, shoreline processes and the dynamic global economy.

### Outreach & Civic Engagement

An interactive project website was developed to raise awareness for the master planning effort.



### Leadership Summit

During the Leadership Summit, several well-regarded state-wide experts discussed how the community could become more resilient to future climate and economic challenges.



### Community Action Team Meetings

Over the course of three meetings, citizens and community stakeholders worked to map community assets and develop goals and objectives for six community topics.



### COMMUNITY ACTION TEAM MEETINGS

Over 120 people participated in three successive public meetings to help develop recommendations for the community. Following brief presentations from local stakeholder organizations on specific issues facing the community (e.g. transportation, local economy, and families in need), participants were organized into topic specific groups, referred to as *Community Action Teams*.

### COMMUNITY ACTION TEAMS

1. Access and Transportation
2. Energy and Economy
3. Neighborhoods and Infrastructure
4. Agriculture and Food
5. Human and Social Systems
6. Parks and Natural Systems

Over the course of three meetings, participants of the six Community Action Teams (CAT) worked to identify and map assets and threats pertaining to their topic as well as develop specific goals and objectives. The results of these meetings helped create the goals and objectives outlined in Chapter 7.

### Youth Charrette

Members of the YAC worked to identify community assets and illustrate a vision for the community.



### PUBLIC OPEN HOUSE

An open house was held on October 20th, 2015 to introduce the Plan to the public. Around 35 people attended the open house to view the draft plan, offer comments, and hear about the process.

### COMMUNITY OUTREACH

#### KEY PERSON AND GROUP INTERVIEWS

The consultant team met with staff members from different community organizations such as Harbor Transit, the Grand Haven Area Community Foundation and the Chamber of Commerce, as well as Township staff members and local officials to identify and learn more about land use and community development issues and discuss their vision for the community.

#### YOUTH ACTIVITIES

In February 2015, about 30 members of the Grand Haven Area Community Foundation Youth Advisory Committee (YAC) participated in a youth charrette. The YAC consists of high school students from the Tri-Cities area that regularly meet to discuss and assess youth issues. The youth charrette kicked off with an interactive Resilient Bingo game, in which members were asked to identify fellow students who were doing “resilient” things at home (e.g., has ridden a bicycle to run an errand sometime in the last six months). Students then worked to identify and map community assets and illustrate their vision for the community in an activity called *Crayon Your Community*.

At a second meeting in April, students worked to develop a preferred non-motorized map for the community.

Following the meeting, the YAC worked to develop a “Youth Chapter” for this Master Plan, which can be found in Chapter 11.

### SOCIAL MEDIA

The Grand Haven Charter Township Board approved the use of a Facebook page as a method to inform residents about events and communicate important Township news to followers. During the Resilient Grand Haven planning process, this Facebook page was used to support this Master Plan and encourage participation. Social media will continue to engage the community as this Master Plan is implemented. The page can be found at: [www.facebook.com/GHTownship](http://www.facebook.com/GHTownship).

### COMMUNITY PARTICIPATION

A wide variety of community stakeholders participated in the *Resilient Grand Haven* planning process. Public meeting attendees and community outreach participants included local citizens, public officials from a number of local units of government, planning commissioners, municipal staff members, and representatives from the following organizations:

- Alliance for the Great Lakes
- Brilliance Publishing
- Buster Mathis Foundation
- Center for Women in Transition
- Covenant Life Church
- David C. Bos Homes
- Financial Empowerment Center
- Four Pointes Area Agency on Aging
- Friends of Grand Haven Township Parks
- GEI Consultants, Inc.
- Grand Haven Area Community Foundation
- Grand Haven Area Public Schools
- Grand Haven Chamber of Commerce
- Grand Haven Main Street DDA
- Harbor Transit
- Hesselsweet Architects
- Hofma Park Commission
- Human Services Coordinating Council
- Lakeshore Environmental, Inc.
- Lakeshore Nonprofit Alliance
- Loutit District Library
- Michigan State University Extension
- North Ottawa Community Health
- Northwest Ottawa Recreation Authority
- Old Things, LLC
- Ottawa Conservation District
- Ottawa County Parks Commission
- Southside Neighborhood Association
- St. Patrick Church
- Tri-Cities Area Habitat for Humanity
- West Michigan Environmental Action Council
- West Michigan Sustainable Business Forum

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## CHAPTER 11. THE FUTURE OF GRAND HAVEN – A YOUTH PERSPECTIVE

This Chapter was written by the youth of the Grand Haven Community through the Youth Advisory Committee (YAC). In an effort to better understand the values and vision for the community of young people in the Grand Haven community, the consultant team worked closely with the Youth Advisory Committee (YAC). Organized as a formal program within the Grand Haven Area Community Foundation, the YAC consists of high-school students from the Tri-Cities area that regularly meet to talk about and think through youth issues. In February, about 30 YAC members participated in a “youth charrette” in which students were asked to identify and map community assets and illustrate their vision for the community in an activity called *Crayon your Community*. In April, the consultant team worked with YAC members to develop a preferred non-motorized map for the greater Grand Haven Community. Following these hands-on activities, a handful of YAC members were tasked to summarize and write - in their own words - the results of the planning activities for this chapter of the Master Plan.

### YOUTH DEMOGRAPHIC OVERVIEW

The population of 15 - 19 year olds in Grand Haven Charter Township and the City of Grand Haven 2010 was just over 1,600. However, between 2000 and 2010 the population of the youth in this age range decreased by 25.9% in the City, but increased 12.9% in Grand Haven Charter Township. It is also important to note that the number of households with children under 18 years has decreased by 7.4% in the City of Grand Haven and 0.1% in Grand Haven Charter Township between 2000 and 2010.

The racial makeup of the students in Grand Haven Area Public Schools is relatively Caucasian, which has stayed consistent over the past years, hovering right around 90% since 2010.

Between 2010 and 2015, the number of students in the Grand Haven Area School District increased by 4.6% (273 students), to 6,203 students.<sup>1</sup> There are a number of students who receive a Reduced Lunch in the GHAPS District. According to the United Way 2015 Community Assessment for Ottawa County 35% of students in GHAPS receive free or reduced lunch. There have also been expanded learning opportunities to accommodate for the different preferences in learning styles – Grand Haven Central High School offers a more individualized learning environment, and a smaller class size. Additionally, Grand Haven Cyber School is offered.

### WHAT WE LOVE ABOUT DOWNTOWN GRAND HAVEN

#### THE YOUTH OF GRAND HAVEN LOVE THE FOLLOWING ASPECTS OF OUR DOWNTOWN GRAND HAVEN

We love the Waterfront area because it connects our downtown area to the Boardwalk and Beaches. We like the accessibility factor of the downtown area and that everything is walkable and in close proximity. This makes it

#### Youth Charrette

YAC members work together to identify and map community assets during the Youth Charrette.



#### YAC Members



Photo Credit: Ed Post

<sup>1</sup> Michigan Department of Education



Photo Credit: Ed Post

easy for people of all walks of life to enjoy our downtown. We like that our downtown supports privately owned businesses, and that our downtown offers a diverse array of stores. We feel there is something for everyone.

There are great recreational opportunities in the Mulligan’s Hollow area – the skate park, YMCA, and the Imagination Station are just a few. We think it is great that our downtown area supports a variety of festivals and activities. These help to draw diverse crowds of people to our community – especially our downtown area. We enjoy having a Farmer’s Market connected to our Boardwalk and downtown area. We love the access to organic, fresh, and locally grown produce. We would love to see this Market continue to grow and expand.

## WHAT WE LOVE ABOUT THE GRAND HAVEN COMMUNITY

### THE YOUTH OF GRAND HAVEN LOVE THE FOLLOWING ASPECTS OF THE GRAND HAVEN COMMUNITY

We are very fortunate to have a great park system that provides us with access to several local parks and nature centers (Rosy Mound, Kirk Park, Hofma Park, and Harbor Island). We are also lucky to have a wide variety of recreational opportunities in our community such as the Rod & Gun Club, various boat launches, kayak launches, sports fields, and other water sport rentals. It is important for our community to be able to take advantage of the great recreation opportunities that are provided to us by our natural resources and landscapes.

We also like the family friendly entertainment options that are available, such as the Grand Haven 9 Movie Theater, and Starlite Lanes. We also like that local businesses support our school system in many ways – with their time, or with monetary support – it is great that they encourage us as students, and invest in our futures.

### MODES OF TRANSPORTATION/DIFFICULTIES

#### THE GRAND HAVEN YOUTH UTILIZE THE FOLLOWING MODES OF TRANSPORTATION (SOME FOR RECREATION)

We tend to travel via: car, bike, moped, Harbor Transit, skateboards, and by foot. There are other modes of transportation that we use as well. For recreational purposes we utilize: boats, bicycles, skateboards, and the Trolley.

We recognize the following barriers to transportation in our community:

We feel there is incomplete coverage in service with Harbor Transit and the inability to travel in a timely fashion (it does not provide service to all areas of our community). We also notice that in the summer, traffic is often congested and there is a lack of accessible parking spots. This leads us -- the youth and others in our community -- to seek other modes of transportation in the summer months.

We would like to see the following expanded:

We would like to see the Non-Motorized Trail Networks expanded throughout the Grand Haven community in order for non-motorized modes of transportation to be utilized safely. This will also help contribute to the health and well-being of our community members and give us more opportunities to participate in recreation.

We would also like to see increased efficiency with the pick-up, and delivery, times of Harbor Transit. Ridership, including other youth in our community, would grow if it was easier to access.



Photo Credit: Ed Post



Photo Credit: Ed Post



Photo Credit: Ed Post

## EDUCATIONAL OPPORTUNITIES IN OUR COMMUNITY

### THE YOUTH OF GRAND HAVEN WOULD LIKE TO SEE THE FOLLOWING EDUCATIONAL OPPORTUNITIES AND/OR CURRICULUM EXPANSIONS IN OUR SCHOOLS

We would like to be able to take courses that will prepare us for life beyond high school – either career or college readiness (Home Economics, Financial Planning, etc.). It is also important to expose us to as many career opportunities as possible – this could be done by offering more courses focused on specific career opportunities (engineering, coding, general business, accounting, etc.) and we'd also like to see expanded technical learning opportunities (trade schools, etc.).

## POTENTIAL FUTURE AMENITIES FOR GRAND HAVEN

### THE YOUTH OF GRAND HAVEN WOULD LIKE TO LIVE IN AREAS THAT HAVE THE FOLLOWING

We would like to live in an area that has more diversity and cultural opportunities for us to participate in. We'd like to be involved in creative opportunities through art, music, etc. that would be available in our community. We would like to live in an area that gives us the opportunity for an urban/bigger city feel in the downtown area while also providing the choice of living in more spacious areas. For this, we would need reliable, and easily accessible, public transportation.

In our future communities we will also be looking for a family friendly environment. A community that will provide and support good school systems, good childcare, and a high quality healthcare system. We would love to live in an area with expanded and continued recreational opportunities – the parks system, water access, and beaches.

## WHAT WE PLAN TO DO AFTER COLLEGE

### THE YOUTH OF GRAND HAVEN HAVE MANY PLANS FOR LIFE AFTER COLLEGE INCLUDING

We would like jobs in the following fields: Medical, Education, Financial, Public Relations, Automotive/Engineering, Social Work, and Technology. We would like to live in apartments, loft, single-family homes (in subdivisions), and single-family homes that are within walking distance to the downtown area.

We see Grand Haven as a great place to raise a family and would eventually like to return to the area. When we return to the area we would like to live in Grand Haven Township, the downtown area, or on waterfront property. We would also like to work in the downtown area, for major companies that are well-established in the area, or those that have recently relocated to provide jobs that are relevant to our experiences and provide great value to Grand Haven.



Photo Credit: Kelly Ruffing, IFG Photography



The following is a list of all members of the Youth Advisory Council at the Grand Haven Area Community Foundation who contributed to the ideas and concepts mentioned in this chapter: Max Anthes, Sophia Barron, Sydney Borchers, Tommy Clover, Gabby Coates, Jack Costello, Hannah Dillree, Sydney Fritz, Geoff Gabala, Abbi Garrison, Adam Greer, Leah Hoffer, Landon Hudson, Kaden Kar, Connor Kippe, Olivia Kuhn, Anish Mandala, Ryan Montgomery, Chase Palmer, Alli Pennington, Michala Ringquist, Ellie Scholtz, Lukas Steffel, Brant Verlinde, and YAC Advisor, Lauren Grevel.

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## CHAPTER 12. SUMMARY OF CLIMATE AND SHORELINE PROCESSES

This chapter provides an executive summary of a University of Michigan research study analyzing the shoreline of the Grand Haven community. The full report, including background information, methodology, all maps, and more detailed results are available online <http://www.ght.org/CoastalReport>.

### PURPOSE OF THE PROJECT

As part of this master planning process, the University of Michigan partnered with Grand Haven Charter Township and the City of Grand Haven to analyze shoreline dynamics to help Grand Haven manage its coastal areas. The project sought to answer several key questions. First, what data is readily available for coastal planning, and how well does this data reflect current and future climate conditions? Second, does increasing access to coastal research help local jurisdictions plan for coastal changes? These questions are addressed using a scenario planning framework. Environmental and land use ramifications of increased flooding are also considered.

### SUMMARY OF CLIMATE VARIABILITY

It is no secret the Great Lakes are one of the most unique and precious environmental features in the world. In fact, “the Great Lakes basin contains more than 20% of the world’s surface freshwater supplies and supports a population of more than 30 million people.”<sup>1</sup> Michigan is home to nearly 3,300 miles of Great Lakes shoreline, with 36,000 miles of rivers and streams, and 11,000 inland lakes.<sup>2</sup> Yet, the shoreline in Michigan is often left unprotected and misunderstood, especially in the face of a changing climate.

Climate and weather are directly related, but not the same thing. Weather refers to the day-to-day conditions in a particular place, like sunny or rainy, hot or cold. Climate refers to the long-term patterns of weather over large areas. When scientists speak of global climate change, they are referring to changes in the generalized, regional patterns of weather over months, years, and decades. Climate change is the ongoing change in a region’s general weather characteristics or averages. In the long term, a changing climate will have more substantial effects on the Great Lakes than individual weather events.

<sup>1</sup> Mackey, S. D., 2012: Great Lakes Nearshore and Coastal Systems. In: U.S. National Climate Assessment Midwest Technical Input Report. J. Winkler, J. Andresen, J. Hatfield, D. Bidwell, and D. Brown, coordinators. Available from the Great Lakes Integrated Sciences and Assessments (GLISA) Center, [http://glisa.msu.edu/docs/NCA/MTIT\\_Coastal.pdf](http://glisa.msu.edu/docs/NCA/MTIT_Coastal.pdf).

<sup>2</sup> Ardizzone, Katherina A. and Mark A. Wyckoff, FAICP. Filling the Gaps: Environmental Protection Options for Local Governments, 2nd Edition. Michigan Department of Environmental Quality, Coastal Zone Management Program with financial assistance from the National Oceanic and Atmospheric Administration, authorized by the Coastal Zone Management Act of 1972. December 2010.

Hurricane Sandy caused an estimated 755 billion dollars worth of damage in 2012. The impacts of this Hurricane were felt on Lake Michigan, causing waves up to 33 feet.

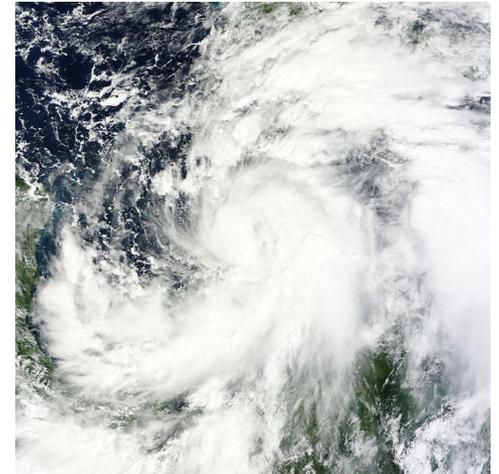
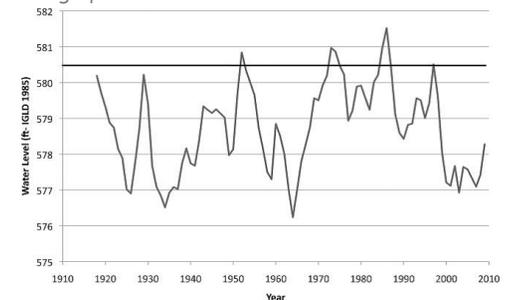


Photo Source: NASA 2012

Figure 12.1 The water levels of the Great Lakes fluctuate as shown in the figure below. The mean water level is indicated by the straight line across the graph.



Source: NOAA, 2011

Erosion on Lake Michigan endangers homes built too close to the shoreline. This photo was taken on the Indiana coastline of Lake Michigan.



Source: EPA.gov

Damage from a 1989 storm in Grand Haven.



Source: Grand Haven Charter Township

### INCREASED PRECIPITATION AND STORMINESS

There is strong consensus among climate experts that storms will occur in the Great Lakes region in greater frequency and intensity.<sup>3</sup> This is already happening as “the amount of precipitation falling in the heaviest 1% of storms increased by 37% in the Midwest and 71% in the Northeast from 1958 to 2012.”<sup>4</sup> As storms produce more precipitation and generate stronger sustained winds, the Great Lakes will see stronger and higher waves.<sup>5</sup> In addition to direct damage caused by storms, sustained increases in the number of storms and their intensity can both directly and indirectly pollute waters by overloading sewage and stormwater capabilities.<sup>6</sup> Increases in the intensity of storms also quickens the pace of erosion on Great Lakes shorelines.

### WATER TEMPERATURE

Climatologists predict there will be fewer days below freezing in Michigan and other Great Lakes states. As temperatures remain warm for a greater part of the year, the winter season will shorten and the lake ice cover that accompanies winter weather will decline. The ice coverage on the Great Lakes and Lake St. Clair declined by 71% from 1973 to 2010, and ice covers the lake for an average of 15 fewer days each year.<sup>7</sup>

The associated impacts of rising water temperature include changes to where fish and other aquatic animals can live, increased vulnerability to invasive species, and increased risk of algae blooms.<sup>8</sup> Rising water temperature also enables winds to travel faster across the surface of the lake, increasing the vulnerability of coastal communities to damaging waves as storms and winds increase.<sup>9</sup> Lastly, ice cover protects the shoreline during winter storms. With less ice cover, the shoreline is more susceptible to erosion and habitat disruption.

### REGULATORY INVOLVEMENT

The full report summarizes current State, Federal, and local regulation relevant to coastline management. These include the National Flood Insurance Program (NFIP), permitting processes for wetlands, High Risk Erosion Area management, Soil and Erosion and Sediment Control ordinances, Critical Dune Area designations, and Federal and State Water Mark Lines. Only the most relevant information for the National Flood Insurance Program, and Federal and State Water Mark Lines, and wetlands are presented in this summary.

<sup>3</sup> U.S. Global Change Research Program. Global Climate Change in the United States, 2009. Cambridge University Press, Cambridge, MA.

<sup>4</sup> Mackey, S. D., 2012: Great Lakes Nearshore and Coastal Systems. In: U.S. National Climate Assessment Midwest Technical Input Report. J. Winkler, J. Andresen, J. Hatfield, D. Bidwell, and D. Brown, coordinators. Available from the Great Lakes Integrated Sciences and Assessments (GLISA) Center, [http://glisa.msu.edu/docs/NCA/MTIT\\_Coastal.pdf](http://glisa.msu.edu/docs/NCA/MTIT_Coastal.pdf).

<sup>5</sup> Great Lakes Integrated Sciences and Assessments. Climate Change in the Great Lakes Region. GLISA, 2014. Web. Accessed July 2015. [http://glisa.umich.edu/media/files/GLISA\\_climate\\_change\\_summary.pdf](http://glisa.umich.edu/media/files/GLISA_climate_change_summary.pdf)

<sup>6</sup> Cruce, T., & Yurkovich, E. (2011). Adapting to climate change: A planning guide for state coastal managers—a Great Lakes supplement. Silver Spring, MD: NOAA Office of Ocean and Coastal Resource Management.

<sup>7</sup> The Heinz Center. (2000). Evaluation of Erosion Hazards. Web. Accessed July 2015. <http://www.fema.gov/pdf/library/erosion.pdf>

<sup>8</sup> Austin, J. A., & Colman, S. M. (2007). Oceans- L06604 - Lake Superior summer water temperatures are increasing more rapidly than regional air temperatures: A positive ice-albedo feedback (DOI 10.1029/2006GL029021). Geophysical Research Letters, 34, 6.).

<sup>9</sup> Dinse, Keely. Preparing for Extremes: The Dynamic Great Lakes. Michigan Sea Grant. Web. Accessed July 2015. <http://www.miseagrant.umich.edu/downloads/climate/11-701-Preparing-Coasts-for-Extremes.pdf>

Figure 12.2 The shoreline in Grand Haven for various years, 2015 photo



Source: Google Earth Pro, 2015 Imagery

### NATIONAL FLOOD INSURANCE PROGRAM

Of all the regulation analyzed, Grand Haven Charter Township is most interested in advancing participation in the National Flood Insurance Programs' Community Rating System. Grand Haven Charter Township joined the NFIP in 1981. Since that time, the Township has received over \$229,000 in aid for 17 separate claims.

Under the Community Rating System (CRS), the Grand Haven community can receive credit for implementing several of the changes recommended in this report (see recommendations at the end of this chapter and in the full report). As times of high intensity waves and inundation are expected to increase, the Grand Haven Community might consider making changes to zoning ordinances, building codes, and other policies to better manage floodplain development. Additionally, NFIP flood insurance premiums are rising nationwide as storms increase and payouts rise.<sup>10</sup> Participating in the CRS is a proactive approach to keeping costs low while protecting both man-made and natural resources near the shoreline.

### WETLANDS

In Michigan, development in some wetlands is regulated through a permitting process. Generally, a wetland is regulated if it is connected to, or within 1,000 feet of, a Great Lake shoreline, is connected to or within 500 feet of an inland lake, pond, or river, or is at least 5 acres in size.

### OVERVIEW OF RESEARCH FRAMEWORK

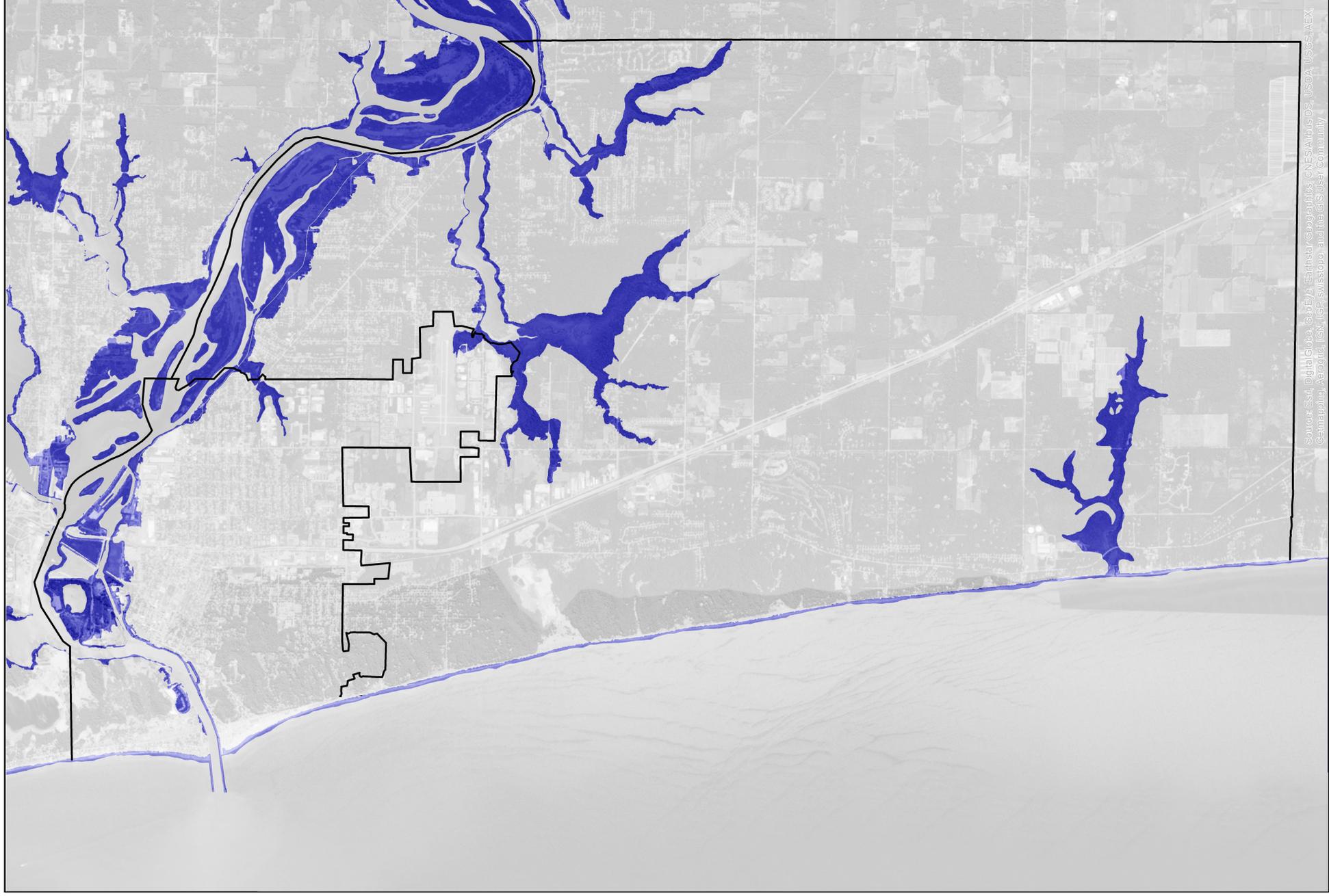
The Research Framework of this study uses scenario planning to assess environmental, fiscal, and land use conditions under different management options and Climate Futures. In this context, the project team identified two driving forces: (1) rising levels of flood waters and (2) local government management options. Each Climate Future was tested against each management option and evaluated for impacts on the environment and land use in the community.

### CLIMATE FUTURE DEFINITIONS

- “Lucky” Future – Under the Lucky Climate Future, Great Lakes water levels will continue to stay relatively low. Although there will be wave and wind action, major storm events and wave impacts will not encroach on properties landward of current beaches. A Lucky flood projection is shown in Map 12.1.
- “Expected” Future – Under the Expected Climate Future, Great Lakes water levels will continue to fluctuate according to long-term decadal patterns. There will be periods of high water levels similar to the long-term highs recorded in 1986, with Great Lakes still-water elevation closer to that of long-term average (580 feet). There will also be more frequent large storm events than in the past. Map 12.2 shows an Expected flood projection.
- “Perfect Storm” Future – Under the Perfect Storm Climate Future, Great Lakes water levels will continue to fluctuate according to decadal patterns. However, still-water elevation will be higher than the long-term average and closer to the long-term high (583 feet). Map 12.3 shows a Perfect Storm flood projection.

<sup>10</sup> Cruce, T., & Yurkovich, E. (2011). Adapting to climate change: A planning guide for state coastal managers—a Great Lakes supplement. Silver Spring, MD: NOAA Office of Ocean and Coastal Resource Management.

Map 12.1 Lucky Climate Future

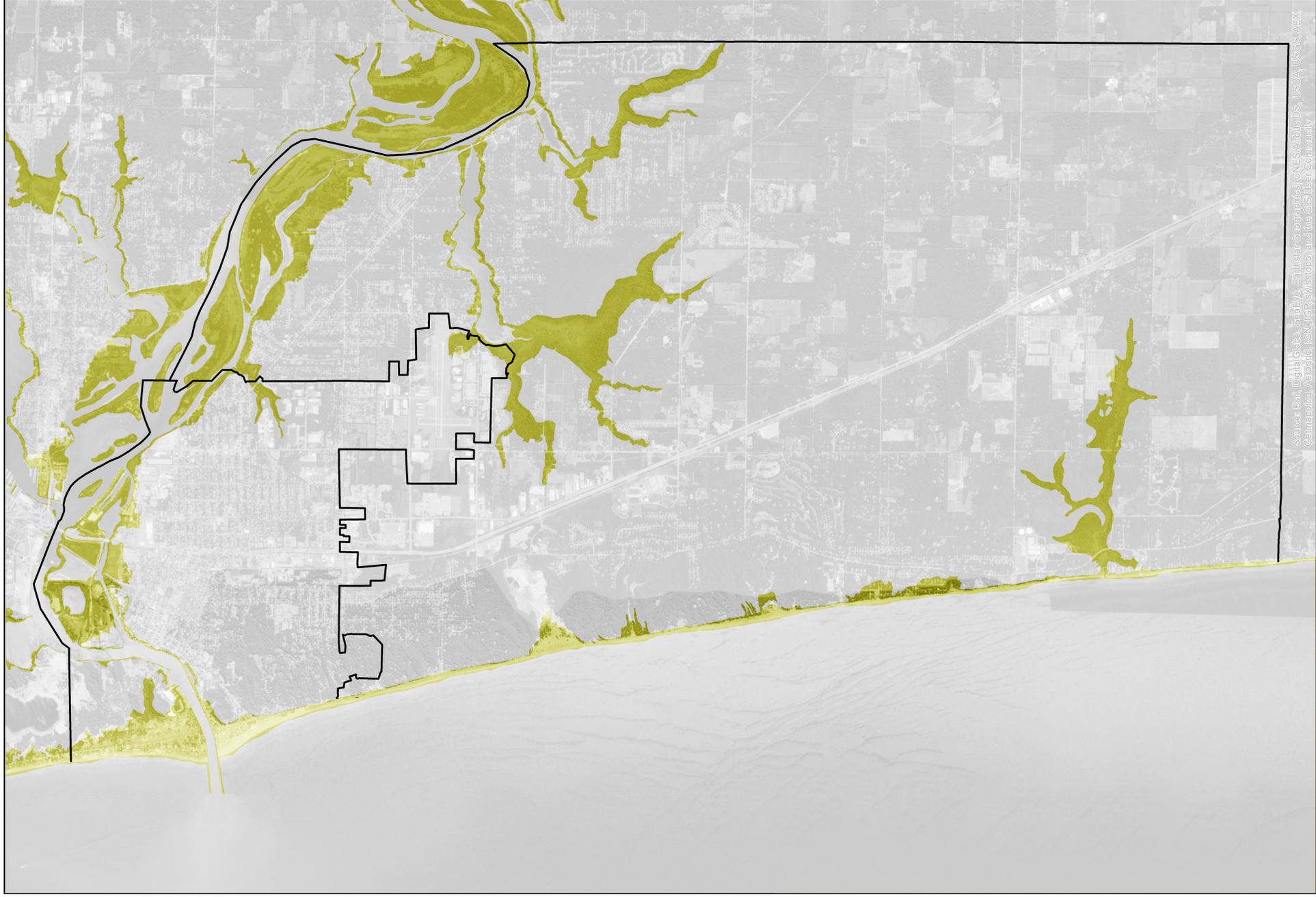


"Lucky" Flood Scenario

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, Swisstopo, and the GIS User Community

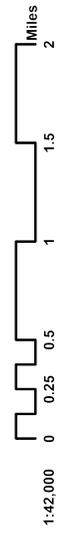


Map 12.2 Expected Climate Future

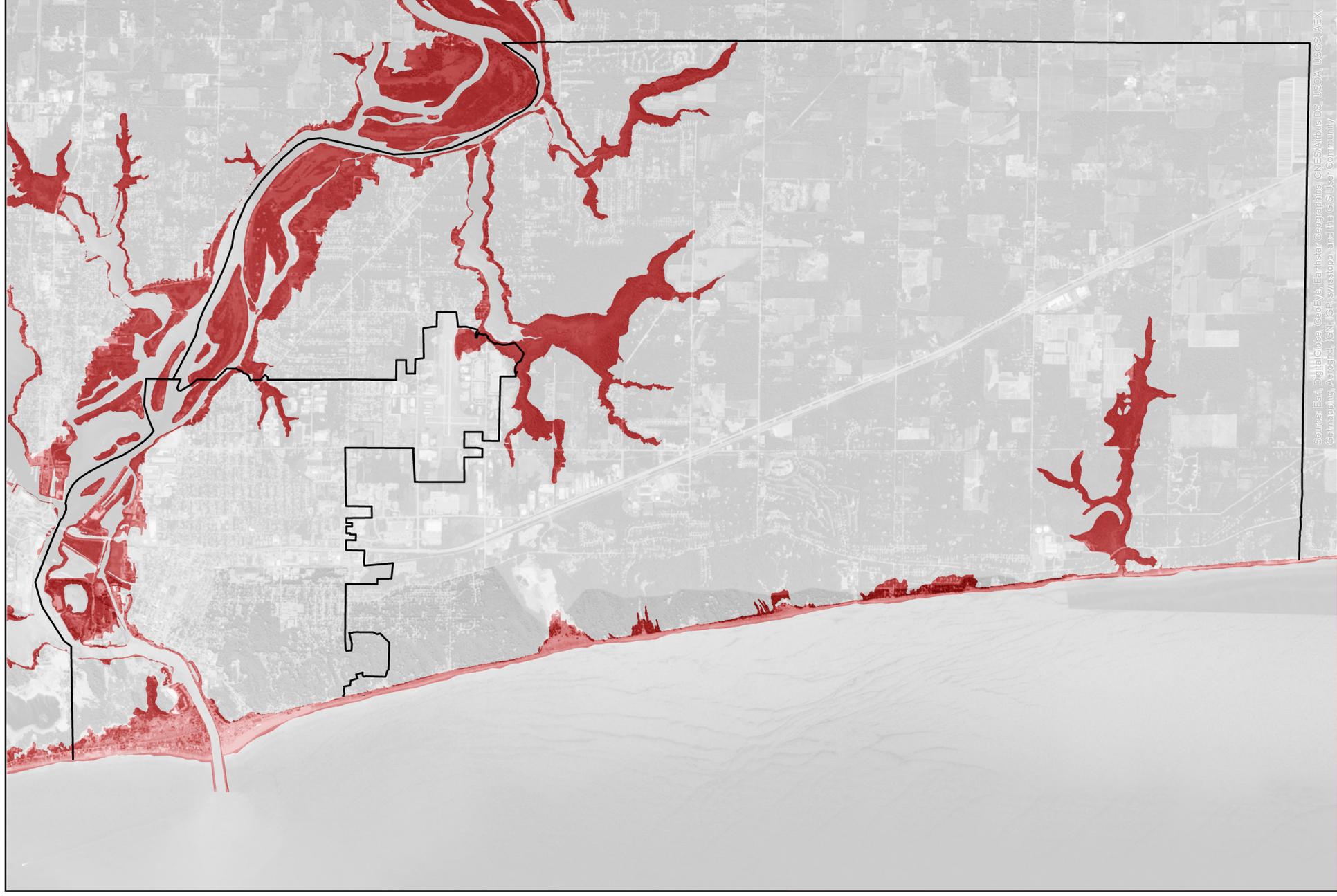


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroX, GeoEye, IGN, JP2, swisstopo, and the GIS User Community

'Expected' Flood Scenario



Map 12.3 Perfect Storm Climate Future



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroX, GeoEye, AeroGrid, IGN, IGN, swisstopo, and the GIS User Community

Perfect Storm<sup>®</sup> Flood Scenario



Table 12.1 Conceptual Research Framework

	Lucky Climate Future	Expected Climate Future	Perfect Storm Climate Future
Current Structures and Infrastructure			
Build-Out According to Current Zoning			
Build-Out According to Current Master Plan			
Build-Out According to Best Management Practices			

**MANAGEMENT OPTIONS**

The following four management options were used in the analysis.

- Current Structures and Infrastructure
- Build-out According to Current Zoning
- Build-out According to Best Management Practices (BMPs)

Map 12.4 on the next page shows a reasonable estimation of the Township’s development capacity by section (defined using census blocks). This map serves as a visual depiction of the “Build-out According to Current Zoning” Management option and was used as a baseline in this study to determine where changes to the current structures and infrastructure are likely and to identify the potential effectiveness of Best Management Practices. It is very important to note this is not an exact picture of the development capacity in the Township, rather this work equates to an estimate of where development may possibly occur under the current zoning ordinance.

Clearly, the Township allows for significant growth under its current zoning ordinance, especially in the west (near Lake Michigan) and the northeast (near the riverine system). The total number of residential building units that could be added, given the above limitations, is nearly 4,600 units. It is important for the Township to carefully consider areas where development should be concentrated in order to maintain its rural character and natural/open space as it grows.

The remainder of the study analyzed impacts to land use (total acres, parcels, number of structures, and critical facilities) and environmental assets (wetlands, tree canopy, impervious surface, Critical Dune Areas, and High Risk Erosion Areas.) The following summarizes the key results for some variables analyzed. Expanded results, including a description of methods and limitations, can be found in the full report.

**LAND USE RESULTS**

**ACREAGE AND PARCELS IMPACTED**

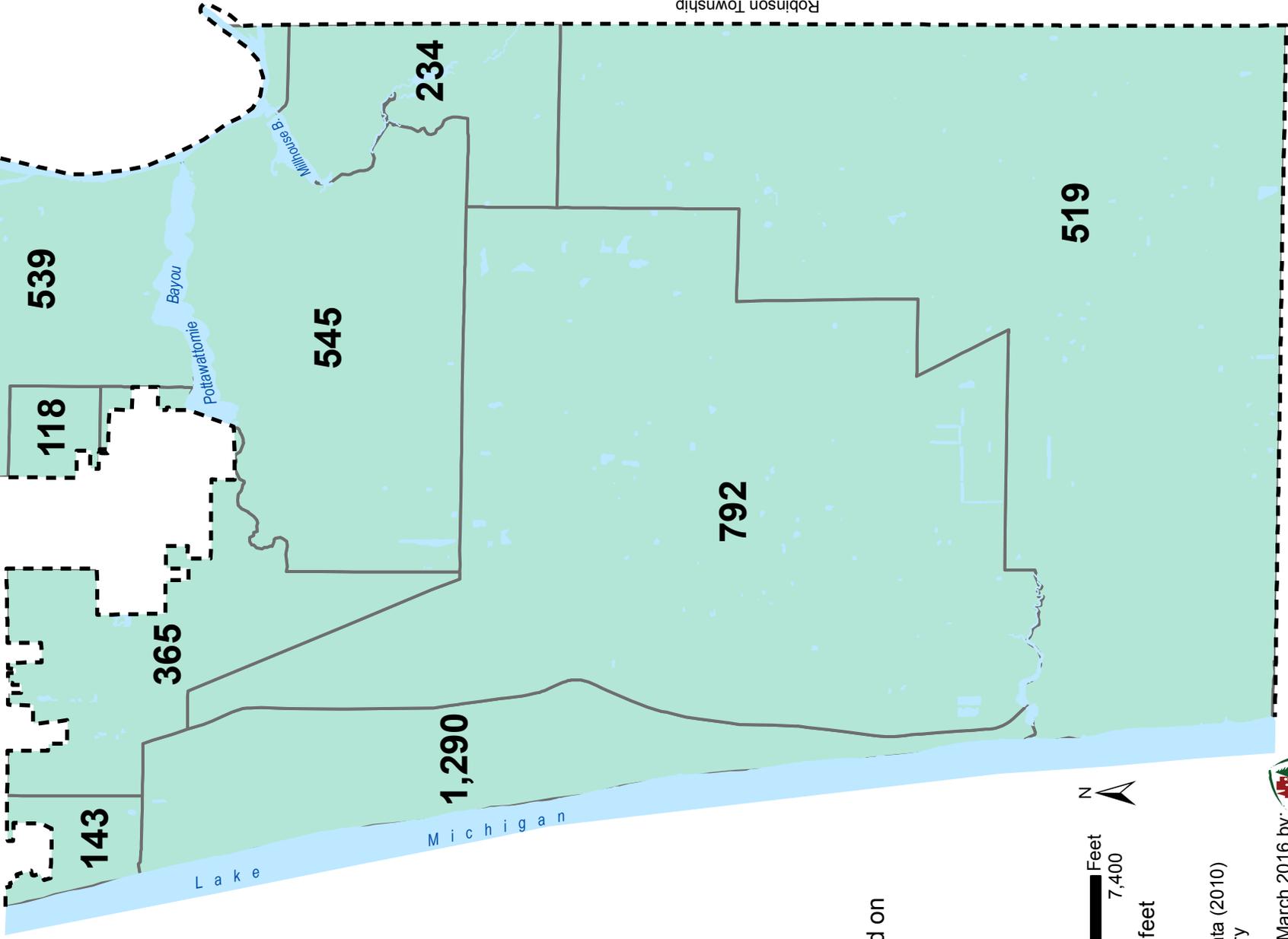
The number of acres impacted by flooding increases the most between the Lucky and Expected forecast (15%). Between Expected and Perfect Storm, the total acres impacted increases by about 3%. Additionally, as the Climate Future causes more severe flooding, greater numbers of residential and publicly owned parcels may be impacted. Commercial parcels seem to bear the least impact across all Climate Future forecasts. Additionally, there were no critical facilities impacted under any future climate forecast. Critical facilities include current locations of police and fire stations, schools, places of worship, utilities, public facilities, and water treatment plants.

**NUMBER OF STRUCTURES IMPACTED BY FLOODING**

Between 46 and 385 structures would be impacted in the Township depending on the severity of the climate and the management practices the Township pursues. In general, as the community grows and as the Climate Futures cause more severe flooding, implementing Best

# Grand Haven Charter Township Buildout Analysis Map #12.4

City of Grand Haven



Sections, based on  
Block Groups\*



1 inch = 4,400 feet

Data Sources:

U.S. Census Bureau,  
Block Group Level Data (2010)  
Michigan Geo. Data Library  
Ottawa County GIS

Prepared March 2016 by:

Management Practices will reduce the number of structures impacted by over 60%.

## ENVIRONMENTAL RESULTS

### WETLANDS

This study analyzed existing, potential, and unprotected wetlands. Key findings include:

- There are nearly 1,400 acres of existing wetlands impacted by all three Climate Futures, which account for over 40% of the Township’s existing wetlands.
- There is some potential to increase the size and number of wetlands in order to increase resiliency to severe flooding and maximize the ecosystem benefits that wetlands provide. Currently, there is opportunity to increase the total acreage of wetlands in the Climate Future flood areas by about 15 percent.
- Wetlands under 5 acres in size are considered unprotected, as they are not currently regulated by any local or state process. In aggregate, small wetlands can still have a large effect on the ecosystem’s flood control capacity. The Township has between 80 to 90 acres of unprotected wetlands in areas likely to flood in each Climate Future.

### CRITICAL DUNE AREAS IMPACTED BY FLOODING

Critical Dune Areas are important assets for the Grand Haven Community and, due to their soil composition, may be especially vulnerable to damage from flooding. The intent of this study is to provide some base of analysis for the future health of Critical Dunes, especially as development on Critical Dunes is likely to increase due to weakened regulations, which are noted in greater detail in the full report.

While it is impossible to predict the number and scope of development permits that may be granted in the future, this study provides insight into parcels that may be developed in or near Critical Dune Areas. Relatively few acres of Critical Dune Area would be impacted by flooding in any of the Climate Futures analyzed, and around 10% of the Critical Dune land is impacted under Expected and Perfect Storm Climate Futures. However, the potential for development in, and near Critical Dune Areas is very high. The Township should consider methods, as recommended in the next section, to restrict this potential for development.

## RECOMMENDATIONS

In total, this analysis showed that even minimal use of Best Management Practices can greatly reduce the number and size of land use and environmental assets at risk. The following is a list of Best Management Practices collected from other research throughout the state. This list is not comprehensive, and each recommendation needs further research to determine if it is appropriate in Grand Haven Charter Township. The following Best Management Practices are organized into key goals, and additional BMPs are presented in the full report.

### PROTECTING PRIVATE PROPERTY

- a. Public acquisition of repetitive loss areas or areas identified as at risk for coastal flooding. Develop these areas as parks, trails, or other community amenities that can withstand temporary flooding and inundation.
- b. Participate in the FEMA Community Rating System and set benchmarks to increase score.
- c. Adopt a local wetland ordinance to protect smaller wetlands (less than 5 acres) to promote wetland services in neighborhoods.
- d. Enact deed restrictions stating the existence of an environmentally sensitive area on public property.

- e. Encourage implementation of green infrastructure through incentives, stormwater utility fees and stormwater credit manuals.
- f. Encourage cluster development that allows structures to be sited in less vulnerable coastal areas.
- g. Adopt performance standards that minimize on-site soil and vegetative disruptions.
- h. Implement a Transfer of Development Rights program, where development rights are transferred to inland areas away from coastal hazards.
- i. Implement a Purchase of Development Rights program by working with a land bank or conservation district to purchase rights to development in areas at risk for coastal zone flooding.

#### **PROTECTING PUBLIC HEALTH**

- j. Disconnect combined sewer systems (stormwater and sanitary).
- k. Provide incentives for on-site stormwater treatment to reduce standing water.
- l. Increase capacity of stormwater sewer system to handle heavier precipitation events.

#### **EMERGENCY MANAGEMENT**

- m. Ensure at least one municipal staff employee is a certified floodplain manager.
- n. Identify public locations with back-up power supplies.

#### **PROTECTING PUBLIC INFRASTRUCTURE**

- o. Update design standards to build roads, culverts, and bridges in adherence with updated precipitation tables.
- p. Do not allow public infrastructure to be built in Special Flood Hazard Areas, or the following zones: VE, AE, AO, or X.
- q. Ensure critical facilities are sited outside the VE/AE zones.
- r. Encourage development to occur in high, vertical density in areas where infrastructure is available. This will help ensure the protection of natural spaces and help local governments maintain valuable infrastructure.

#### **PROTECTING NATURAL RESOURCES AND MAXIMIZING ECOSYSTEM SERVICES**

- s. Identify high priority public lands for wetland restoration and apply for grants to fund restoration projects.
- t. Conduct a community inventory of environmentally sensitive areas and create 50-foot buffers around all environmentally sensitive areas.
- u. Require native vegetation on coastal properties, particularly near Critical Dune Areas and other environmentally sensitive areas.
- v. Zone for low intensity and low density around environmentally sensitive areas.
- w. Adopt overlay zones, including: prohibition of off-road vehicles; special use permits and developments in well-protected

and vegetative areas behind foredunes; impervious surface restrictions; design standards allowing for raised structures; and native vegetation requirements.

#### PROTECTING WATER QUALITY

- x. Prioritize open space protection through the master plan process for areas that are continuous, provide flood protection, and provide stormwater filtration.
- y. The Master Plan should recognize the relationship between water quality and stormwater management.
- z. Limit percentages of impervious surfaces in new developments (no more than 10%).
- aa. Adopt lakeshore setbacks to regulate tree cutting, mowing, and fertilizer use.

#### CONCLUSION AND NEXT STEPS

Overall, this project outlines a clear way for the Grand Haven Community to identify areas at risk of flooding. It includes a strategy for reasonably assessing build-out potential in relation to flood risk, and evaluates how that risk is lowered when each jurisdiction adopts several Best Management Practices as ordinances. This analysis suggests the Grand Haven Community should conduct further research and choose Best Management Practices that fit the community's unique needs.

## CHAPTER 13. SUMMARY OF DEFINING VULNERABILITY IN THE GRAND HAVEN COMMUNITY

Many communities across Michigan are experiencing the impacts of climate variability on agriculture, infrastructure and human health.<sup>1</sup> Severe storms, extreme heat events, and heavy flooding are all projected to increase in West Michigan, but with thoughtful planning and preparation, communities can better withstand and recover from these events and become even better places to live and thrive.<sup>2</sup> Figure 13.1 on the next page shows the history of severe weather events in the Grand Haven region.

The following pages summarize the results of a vulnerability assessment for the Grand Haven Community. A vulnerability assessment is a useful step toward increasing resiliency. The full report, *Defining Vulnerability in the Grand Haven Region*, is available on the Township's website at: <http://www.ghc.org/VulnerabilityReport>. By using maps and data, this vulnerability assessment identifies areas of the community where populations are most likely to experience the negative effects of climate variability. This assessment focuses on the Township's vulnerabilities to extreme heat and heavy rain events, as these are each expected to occur more often and with greater intensity in West Michigan. However, many risk factors identified here may also apply to other types of shocks and changes within the community.

The project team used a method developed by the University of Michigan's Taubman College of Architecture and Urban Planning in order to determine the Township's vulnerability to extreme heat events and heavy rain and flooding events.<sup>3</sup> This vulnerability assessment identifies the most vulnerable areas in the Grand Haven Community using a simple model:

### VULNERABILITY = SENSITIVITY + EXPOSURE

In this model, *sensitivity* refers to the degree to which a community or certain segments of a community could be impacted by an event, while *exposure* refers to hazards in the natural or built environment. Vulnerability occurs when the environment is more susceptible to a climate event in areas where more sensitive populations live. Separate maps for sensitivity (where sensitive populations live) and exposure (where the environment is most susceptible to extreme heat) were created. The overall sensitivity and exposure maps and the resulting vulnerability maps are included for both extreme heat and heavy rain events in the following pages.

<sup>1</sup> There are many resources available to study this more. One good example is the Union of Concerned Scientists publications. See this 2009 bulletin on Michigan's response to climate change: [http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global\\_warming/cli-mate-change-michigan.pdf](http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/cli-mate-change-michigan.pdf)

<sup>2</sup> Great Lakes Integrated + Assessment Center's Regional Climate Change Maps: <http://glisa.umich.edu/resources/great-lakes-regional-climate-change-maps>

<sup>3</sup> Foundation for Community Climate Action: Defining Climate Change Vulnerability in Detroit (December 2012) University of Michigan's Taubman College of Architecture and Urban Planning.

<sup>4</sup> National Research Council. Reconciling observations of global temperature change. Washington, DC: National Academy Press, 2000:86.

<sup>5</sup> National Institute of Environmental Health Sciences. A human health perspective on climate change. April 2010.

### A Resilient Community Often Has:

1. Minimal human vulnerability
2. Diverse livelihoods and employment
3. Adequate safeguards to human life and health
4. Collective identity and mutual support
5. Social stability and security
6. Availability of financial resources and contingency funds
7. Reduced physical exposure and vulnerability
8. Continuity of critical services
9. Effective leadership and management
10. Empowered stakeholders
11. Integrated development planning

Source: Rockefeller Foundation

The impacts of climate change extend beyond what is studied in this Vulnerability Assessment. In fact, there are major health effects caused by long-term changes to the climate that are predicted for the Midwest Region. Already, people in Michigan are experiencing higher rates of skin and eye damage from increased exposure to ultraviolet radiation, increased incidence of respiratory and cardiovascular diseases, and increased incidence of vector-borne and water-borne diseases.<sup>4,5</sup> Weather conditions and high heat events exacerbate poor health conditions like allergies, asthma, and obesity.

Figure 13.1 Extreme Weather Events Timeline

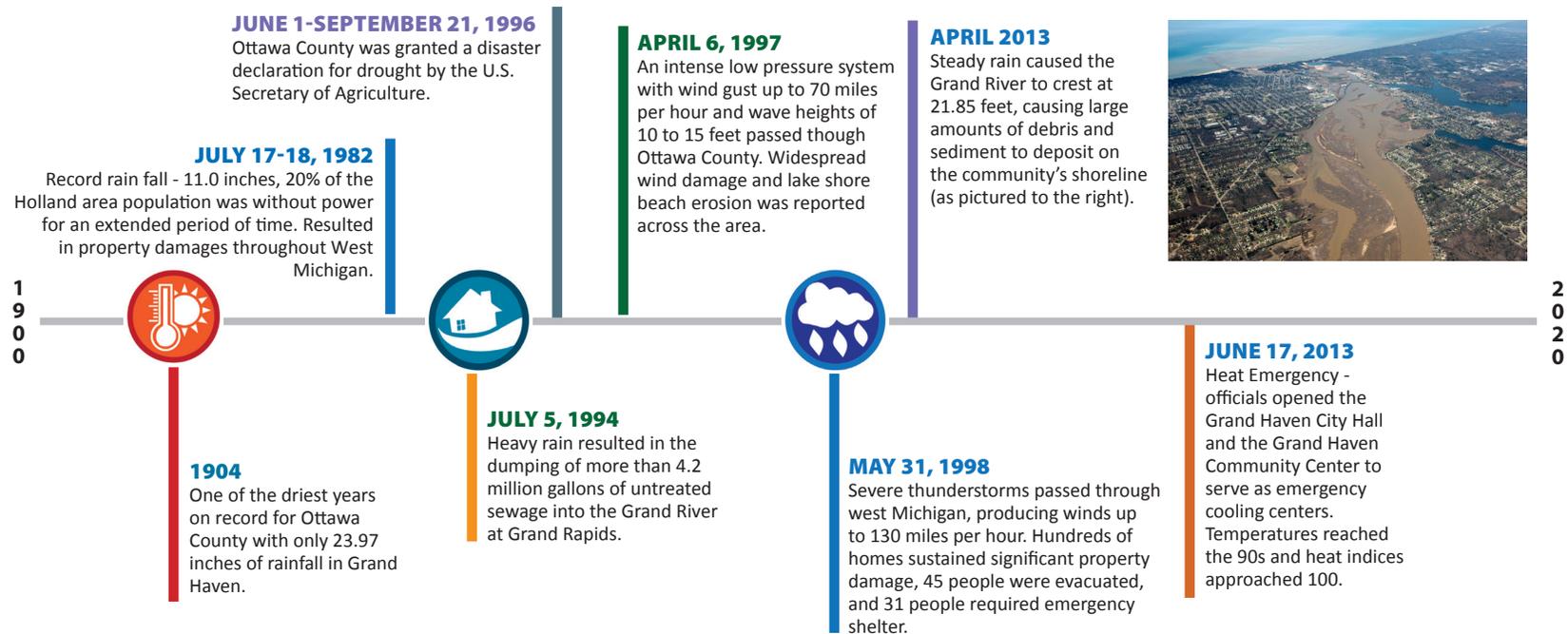


Figure 13.1 above summarizes a few of the major weather-related events in the Grand Haven Community and West Michigan over the past century. Oftentimes, severe weather events result in negative impacts to the local economy and have a greater impact on the vulnerable populations within the community.

## EXTREME HEAT EVENTS

Extreme heat is caused by very high temperatures and very high humidity. Extreme heat events that last for several days are called heat waves, and can cause serious health conditions like heat exhaustion, heatstroke, and even death.<sup>6</sup> Heat waves can also damage agricultural products, exacerbate drought, and create problems for infrastructure like roads and utilities. Additionally, extreme heat events are hard to plan for, as weather forecasts often fail to predict prolonged heat waves in the long-term, and short-term forecasts leave little time to prepare.<sup>7</sup> It is important for communities across the State to build the relationships and resources necessary to mitigate the severe consequences of heat waves before an event occurs. This vulnerability assessment provides one step in that process.

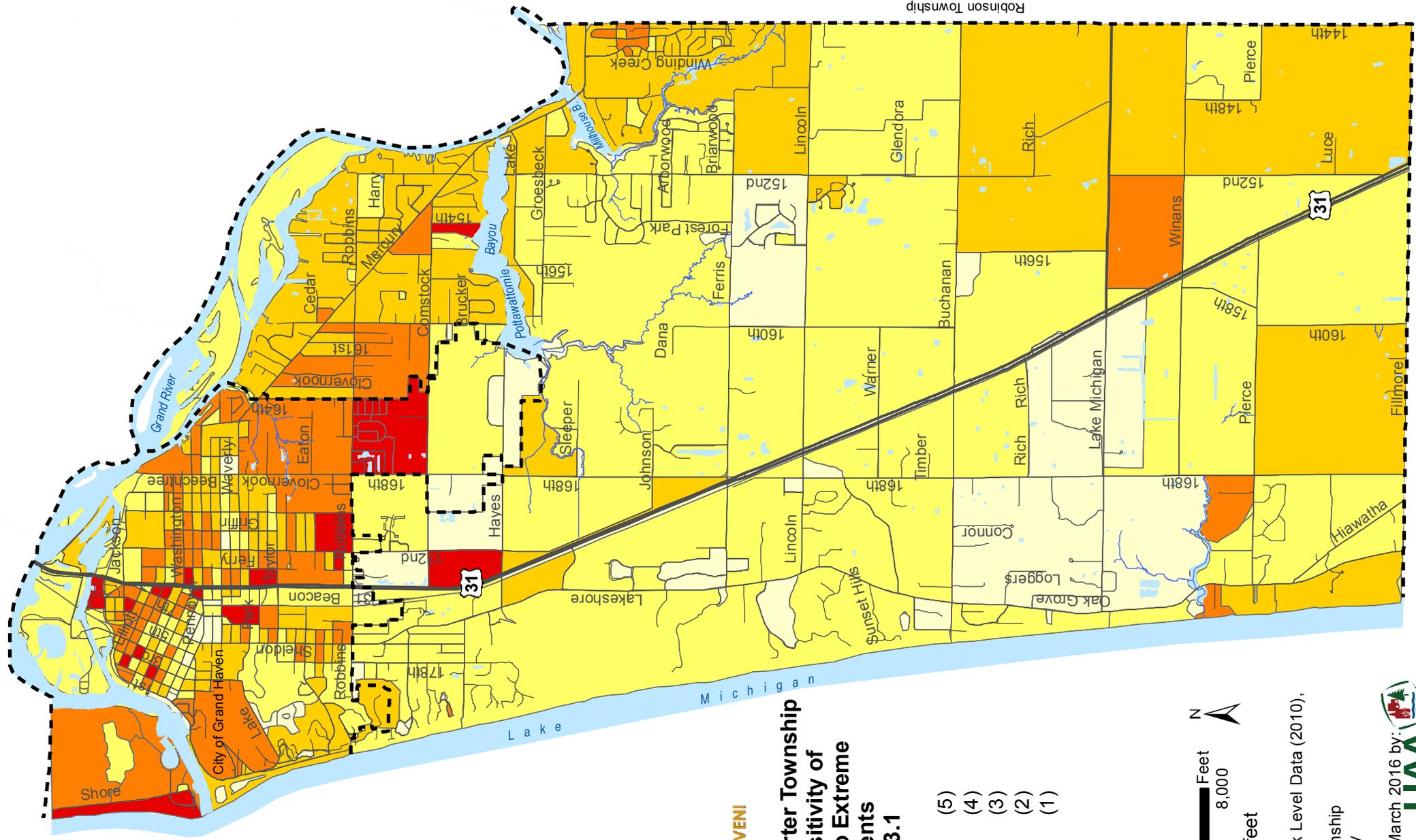
### STEP ONE: IDENTIFYING POPULATIONS SENSITIVE TO EXTREME HEAT EVENTS

Researchers who study heat impacts have found that several groups of people tend to experience the most harm from a heat event.<sup>8</sup> The following populations are considered relatively more sensitive (see Map 13.1):

<sup>6</sup> Center for Disease Control and Prevention, Climate Change and Extreme Heat Events. <http://www.cdc.gov/climateandhealth/pubs/ClimateChangeandExtremeHeatEvents.pdf>

<sup>7</sup> Ibid.

<sup>8</sup> Foundation for Community Climate Action: Defining Climate Change Vulnerability in Detroit (December 2012) University of Michigan's Taubman College of Architecture and Urban Planning.



**Grand Haven Charter Township  
Relative Sensitivity of  
Populations to Extreme  
Heat Events  
Map #13.1**

- 16 - 21 (5)
- 13 - 15 (4)
- 10 - 12 (3)
- 6 - 9 (2)
- 1 - 5 (1)



Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS

### What About the Winters of 2014 & 2015?

Remember, weather reflects the short-term conditions of the atmosphere while climate is the average daily weather for an extended period of time. This difference was never more evident in Michigan than over the last two years. Although most of the Great Lakes froze over the winters of 2014 and 2015 overall there has been a 71% reduction in the extent of ice cover between 1970 and 2010. Temperatures have also increased by 2.5 degrees since 1950, with NASA stating that 2016 is likely to be the warmest year on record.



Source: NASA , 2010 <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=43038&src=nha>

- Residents 65 years of age and over - Studies indicate that older age is associated with higher hospital admission rates in heat waves.<sup>9</sup>
- Residents living alone - Although living alone is not necessarily a risk, people who are socially isolated are at greater risk during an extreme heat event. Isolated people may not be able to recognize symptoms of heat-related illness and fail to take proper action.<sup>10</sup>
- Minority populations - Studies also suggest that minorities are at greater risk during extreme heat events. This may be for various reasons, including less reliable access to health care, transportation and other social supports needed to reduce heat exposures.<sup>11</sup> In other words, a correlation exists between non-white populations and increased sensitivity to extreme heat.
- Populations in poverty - Living in poverty is associated with increased heat-related morbidity and mortality. In general, persons living at or below the poverty line have less access to resources, like air conditioning or cooling options for their residences. This can limit a person's access to relief from an extreme heat event.<sup>12</sup>
- People over 25 with less than a high school education - Similarly, studies demonstrate a link between low educational attainment and heat-related illness and death.<sup>13</sup>

### WHERE DO THE MOST SENSITIVE POPULATIONS LIVE IN GRAND HAVEN TOWNSHIP?

The Sensitivity of the Population to Extreme Heat Events (Map 13.1) provides a reasonably detailed assessment of where sensitive populations live. This does not mean residents in these locations are in immediate danger. Rather, the map provides planning officials a new way of identifying areas where heat waves could present serious problems for a significant number of citizens. In general, the map shows that populations in some areas are relatively more sensitive to extreme heat events than others. There are a number of areas within the Township with relatively high concentrations of sensitive populations.

### STEP TWO: IDENTIFYING AREAS WITH HIGH EXPOSURE TO EXTREME HEAT EVENTS

Exposure refers to the environmental factors that increase the risk of extreme heat. When larger communities experience heat waves, air temperatures can vary significantly from place to place during the day and at night. Some of these differences can be attributed to the varying types of land cover found throughout the community.<sup>14</sup> For example, temperatures can be significantly lower at night in locations with a heavy tree

<sup>9</sup> Curriero FC, Heiner KS, Samet JM, et al. Temperature and mortality in 11 cities of the eastern United States. *American Journal of Epidemiology*. 30 (2001): 1126-8.

<sup>10</sup> Smoyer-Tomic, K.E.; Kuhn, R.; Hudson, A. Heat wave hazards: An overview of heat wave impacts in Canada. *Nat. Hazards* 2003, 28, 465-486.

<sup>11</sup> Waugh and Tierney (eds.) *Emergency Management: Principles and Practices for Local Government*. Chapter 13: Identifying and addressing social vulnerabilities by Elaine Enarson.

<sup>12</sup> Smoyer KE. Putting Risk in its place: Methodological Considerations for Investigating Extreme Event Health Risk. *Social Science and Medicine*. 47:11 (1998):1809-1824.

<sup>13</sup> Curriero FC, Heiner KS, Samet JM, et al. Temperature and mortality in 11 cities of the eastern United States. *American Journal of Epidemiology*. 30 (2001): 1126-8.

<sup>14</sup> Landsberg, H. (Ed.), 1981. *The Urban Climate*. Academic Press, New York.

canopy and very little pavement. Conversely, temperatures can be higher in locations with little greenery and lots of pavement. This temperature relationship is called the Urban Heat Island effect.

When the Urban Heat Island effect is not present, heat indexes (the combination of air temperature and humidity) rise when the sun is shining during the day and drop when the sun goes down in the evening. Urban Heat Islands are caused when buildings, roads, and other impervious surfaces absorb heat from the sun during the day and release heat throughout the night. In other words, in areas with excessive impervious surfaces and less natural ground coverage, heat indexes are higher, even at night. During a heat wave, the environment stays warm even at night, and sensitive populations are at even greater risk of heat-related illness. Studies have documented that despite nearby rural areas, the Urban Heat Island effect can cause a 2 to 9 degree Fahrenheit increase.<sup>15</sup> Two key factors were used to determine areas with high exposure: impervious surfaces and tree canopy coverage.

- Impervious Surfaces - Impervious surface refers to parking lots, roads, sidewalks, building footprints, and any other area that is paved. Data for impervious surfaces was digitized using aerial imagery.
- Tree Canopy Coverage- Tree canopy refers to the land within a community covered by trees, shrubs, or other vegetation. Trees and vegetation actually lower the surface and air temperature nearby, reducing the Urban Heat Island effect.<sup>16</sup> Grand Haven Township's tree canopy data was digitized using aerial imagery and mapped as a percentage of total land cover within each Census Block.

#### WHERE IS THE RISK OF EXTREME HEAT THE GREATEST?

The Exposure to Extreme Heat Events Map (Map 13.2) shows the areas within Grand Haven Charter Township where the risk of the Urban Heat Island effect is greatest. In other words, the darker shades of blue indicate where extreme heat may be most intense during a heat wave. This map can help the Township better assess where new vegetation and tree canopy should be prioritized, existing canopy preserved, and where reducing impervious surfaces (e.g., with specialized pavement or native landscaping) would be most beneficial.

#### STEP THREE: COMPOSITE VULNERABILITY FOR EXTREME HEAT EVENTS

The Grand Haven Community Heat Vulnerability Map is a simple additive combination of the overall sensitivity map and the overall exposures map (see Map 13.3). The resulting vulnerability index depicts where concentrations of exposures and sensitive populations create a higher risk for community residents. In general, those areas with a composite score of 22 to 27 (red) have residential populations that may be particularly vulnerable to extreme heat events.

#### HEAVY RAIN AND FLOODING EVENTS

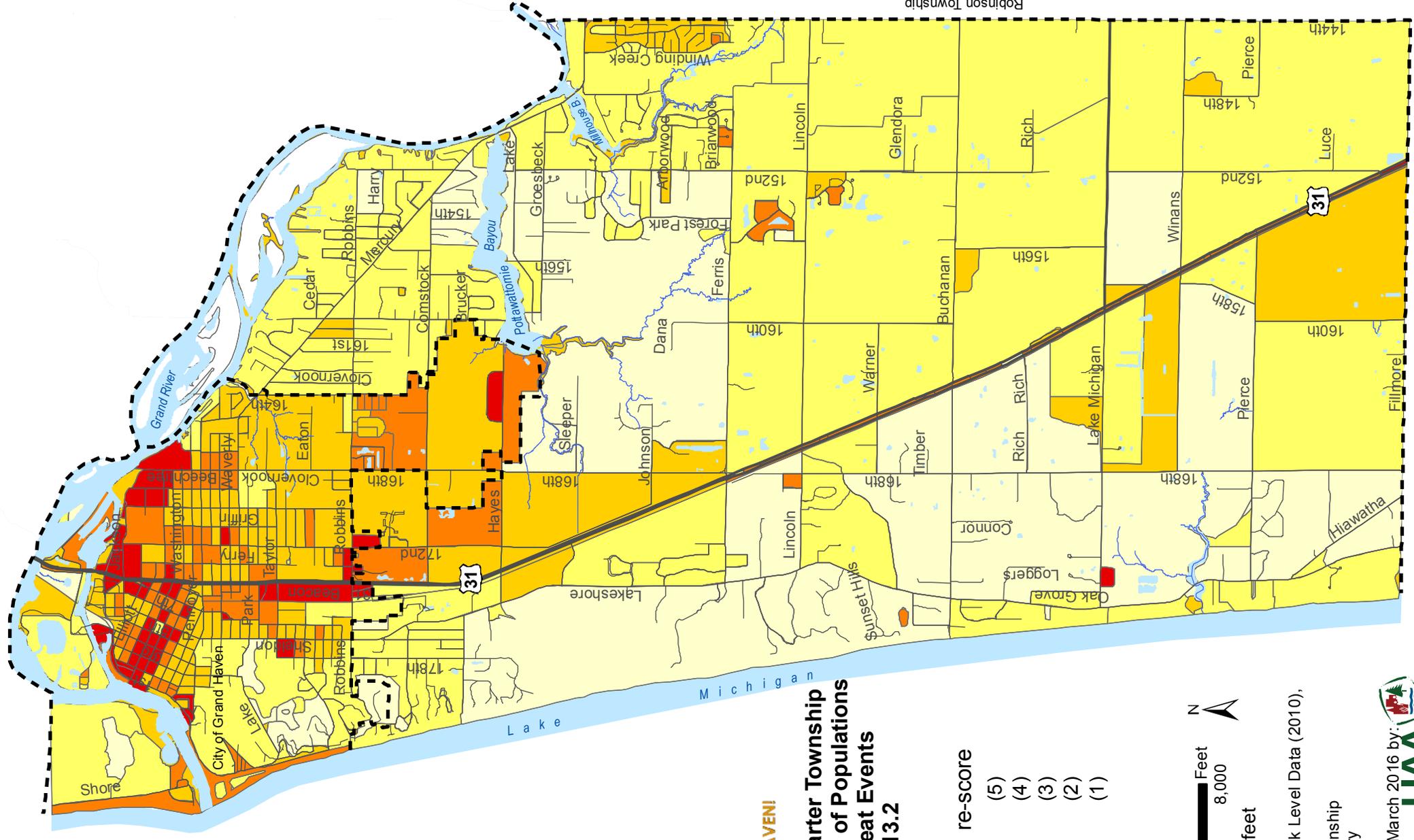
Climate models suggest the Grand Haven Community and West Michigan can expect more frequent storms of increasing severity in the decades ahead. In many communities, flooding impacts are felt most significantly at the household level. Recall that this study uses a model where "Vulnerability = Sensitivity + Exposure." The

Based on the most recent models, the climate of the Grand Haven Community will continue to warm, with greater increases in temperature during the winter months and at night. There are a variety of weather impacts expected with this change. Some of the potential impacts of climate variability in the Grand Haven Community include:

1. Storms are expected to become more frequent and more severe.
2. Increases in winter and spring precipitation
3. Less precipitation as snow and more as rain
4. Less winter ice on lakes
5. Extended growing season (earlier spring/late fall)
6. More flooding events with risks of erosion
7. Increases in frequency and length of severe heat events
8. Increased risk of drought, particularly in summer

<sup>15</sup> Environmental Protection Agency: <http://www.epa.gov/sites/production/files/2014-06/documents/basicscompndium.pdf>

<sup>16</sup> Environmental Protection Agency Heat Island Cooling Strategies Page: <http://www.epa.gov/heat-islands/heat-island-cooling-strategies>



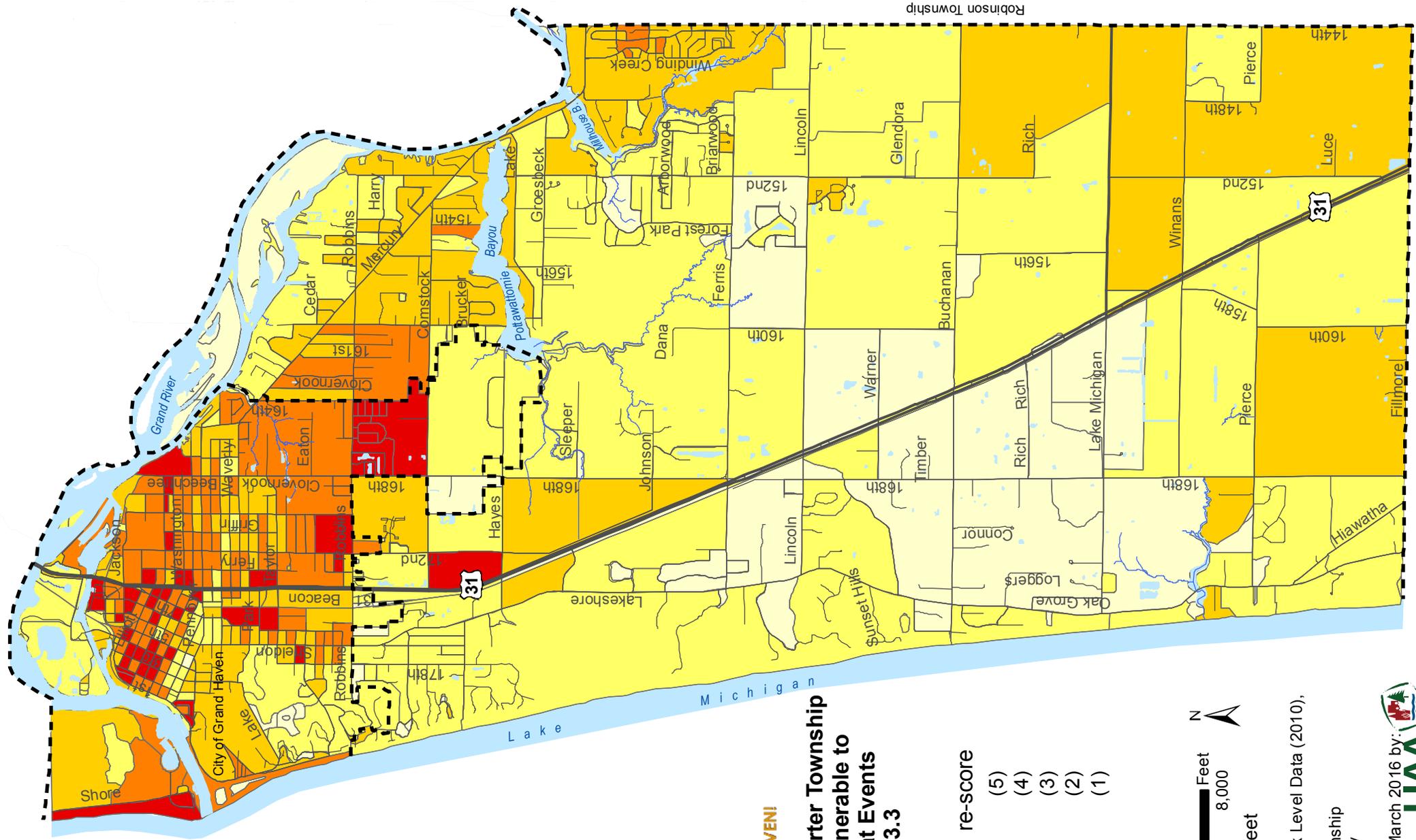
### Grand Haven Charter Township Relative Exposure of Populations to Extreme Heat Events Map #13.2

additive score	re-score
<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span> 9 - 10	(5)
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span> 7 - 8	(4)
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span> 5 - 6	(3)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span> 3 - 4	(2)
<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey;"></span> 1 - 2	(1)



1 inch = 4,750 feet

Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS



**Grand Haven Charter Township  
Population Vulnerable to  
Extreme Heat Events  
Map #13.3**

additive score	re-score
<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span>	22 - 27 (5)
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	18 - 21 (4)
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span>	14 - 17 (3)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	10 - 13 (2)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	3 - 9 (1)



1 inch = 4,750 feet

Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS

Severe storms have the potential to cause powerful waves and damage to properties near the shoreline, in addition to flooding further inland.



Source: LIAA

following paragraphs summarize who is most sensitive to flooding, where in the Township environmental exposure to flooding is highest, and the resulting vulnerability assessment.

#### **STEP ONE: IDENTIFY POPULATIONS SENSITIVE TO FLOODING**

In many communities, flooding impacts are felt most significantly at the household level. A home's flood risk is based on its relative location to floodplains and other flooding hazard areas. The household flood sensitivity refers to how well the house structure is equipped to deal with flooding. As modeled by the University of Michigan, household sensitivity to flooding can be determined by looking at the age of the housing stock and a homeowner's financial ability to maintain and improve the home, which is approximated using the median household income. In general, homes built before 1940 used a more porous concrete material for basement construction, so water can flow more rapidly through the foundation. Older homes may be more vulnerable if residents have not had the financial resources to make improvements and upgrades. By looking at median household income as a marker of likely upkeep of the home, an attempt was made to exclude older homes that have been well-maintained and undergone upgrades from our areas of flood damage risk.

#### **STEP TWO: IDENTIFY AREAS WITH HIGH EXPOSURE TO FLOODING**

During heavy rain events, areas of low elevation are most likely to flood, according to the Federal Emergency Management Agency (FEMA). For this study, FEMA's Flood Insurance Rate Maps for the Grand Haven Community were used to define areas that are subject to flooding (see Map 5.6). For more information on how FEMA's maps were used in this study, see the full report.

#### **STEP THREE: COMPOSITE VULNERABILITY FOR HEAVY RAIN AND FLOODING EVENTS**

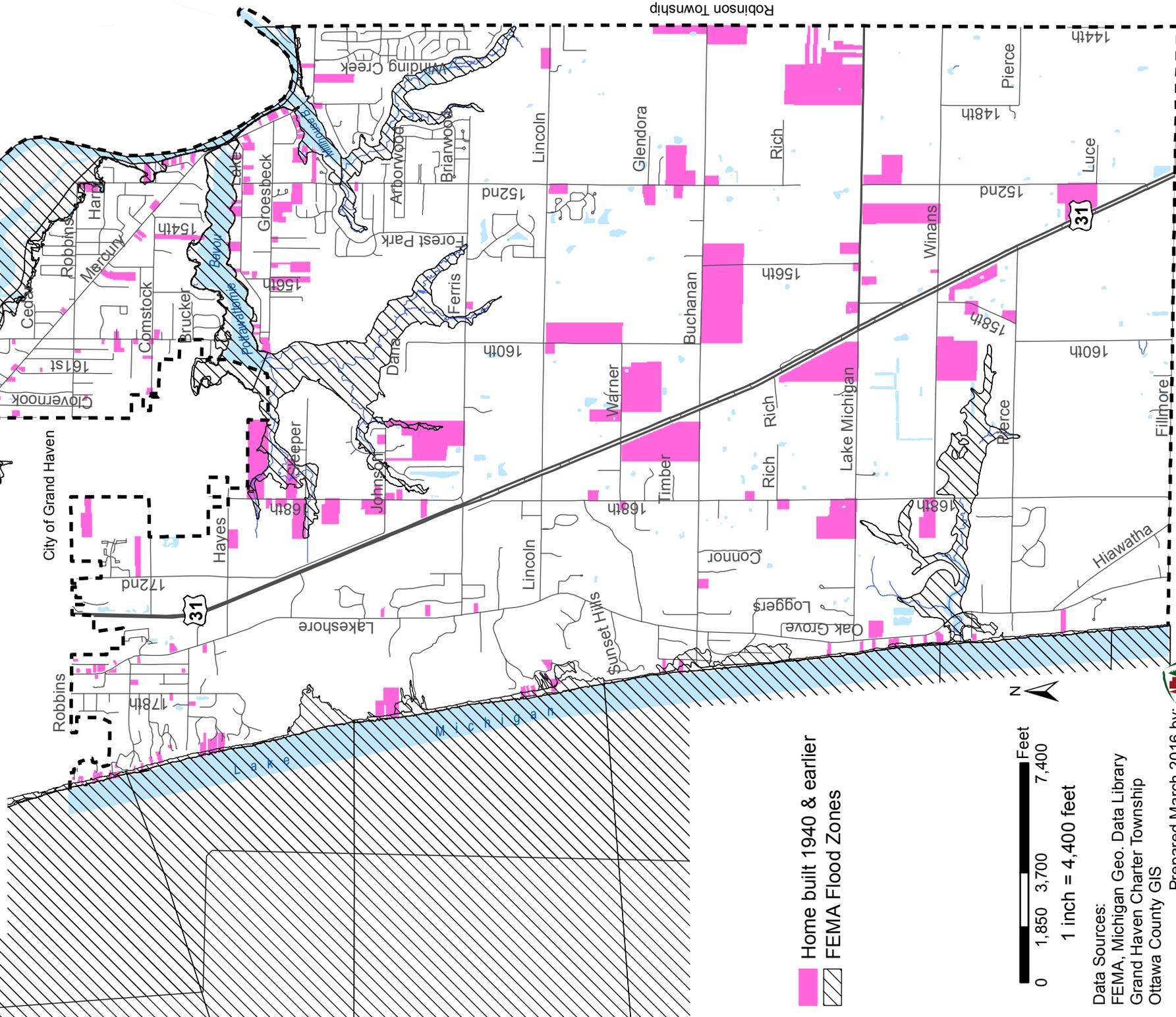
By looking at the overlap of flooding exposure and housing sensitivity, the project team identified a number of Census Blocks that are the most vulnerable in the community to flooding damage. Map 13.4 depicts the Community Flooding Vulnerability.

### **CONCLUSION**

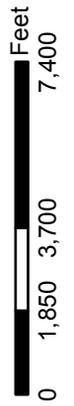
In conclusion, there are a number of areas in the Grand Haven Community that have relatively high vulnerability to extreme heat events and/or heavy rain and flooding events. In order to increase community resilience, the community can use the above vulnerability assessments to inform action plans to reduce sensitivities and exposures to hazards of all kinds. The maps in this summary chapter can provide direction for Grand Haven Township's planning commissioners, staff, and public health officials as they work to reduce risks to human health. This vulnerability assessment can also be used to channel resources to the areas in greatest need, develop emergency preparedness materials and programs, and reduce environmental exposure through land use planning and other policies.



# Grand Haven Charter Township Population Vulnerable to Heavy Rain and Flooding Events Map #13.4



- Home built 1940 & earlier
- FEMA Flood Zones



Data Sources:  
 FEMA, Michigan Geo. Data Library  
 Grand Haven Charter Township  
 Ottawa County GIS

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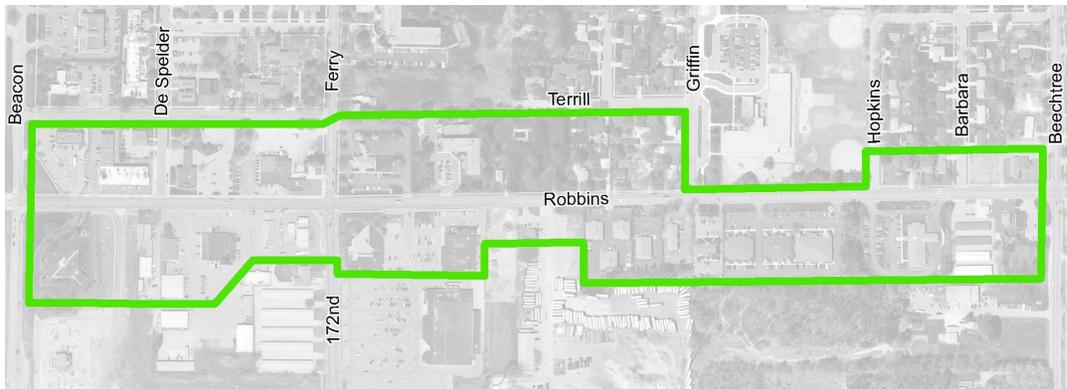
## APPENDIX A. 2009 ROBBINS ROAD SUB AREA PLAN

### INTRODUCTION

While a Master Plan must recognize broad development patterns, it is also important to structure realistic objectives and recommendations. As such, many land use and development challenges respond effectively to area-wide solutions and approaches. However, portions of any community face unique opportunities or challenges that respond best to focused attention. This is the case for the Robbins Road corridor. Its unique circumstances are made somewhat more complex since both the City of Grand Haven and Grand Haven Township have control over the area.

Recognizing that the corridor's future affects both communities and that the decisions of one will affect land uses in the other, the township and city cooperated in the development of this Sub Area plan. The plan identifies corridor liabilities and assets and presents a strategy to overcome obstacles and to maximize opportunities. While the Robbins Road Sub Area is distinct, it is nevertheless important to consider its relationship to the larger community. Therefore, this Appendix provides recommendations for the Robbins Road corridor and its improvement that are consistent with the greater Township Master Plan.

Given that both communities were updating their Master Plans simultaneously in 2009, the Township and City coordinated their planning activities recognizing that the decisions of one community affect land uses in the other.



The Robbins Road Sub Area extends from US-31 on the west to Beechtree/168th on the east.

### METHODOLOGY AND CITIZEN INPUT

The Robbins Road Sub Area plan began with extensive research and site visits. The consulting team walked and drove the corridor and prepared an extensive inventory of photos and noted its key features, development patterns, unique land uses, traffic patterns, as well as aesthetic and land use strengths and weaknesses. This work concluded on August 14, 2008, with a joint meeting of both the city's and township's Master Plan Steering Committees. The meeting began with a description of the planning process and initial impressions of the sub



area. Participants then divided into two groups, (each included representatives of both jurisdictions) who then undertook a SWOT (Strengths/Weaknesses/Opportunities/Threats) assessment. The following table summarizes those results:

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>◆ Traffic volumes</li> <li>◆ Vacant land to south</li> <li>◆ Twp. desire to contain commercial growth in nodes and near City</li> <li>◆ Viable commercial area</li> <li>◆ Area-wide resource</li> <li>◆ Deeper Lots</li> <li>◆ Larger Ownership</li> <li>◆ DDA West End</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>◆ Tight Access at Meijer (division between jurisdictions)</li> <li>◆ Poor pedestrian safety</li> <li>◆ People avoid light by cutting through Res. On Ferry &amp; Despelder</li> <li>◆ Lack of left turn lanes results in rear end accidents</li> <li>◆ Disorganized onsite circulation</li> <li>◆ Difficult lefts at 168th and Beechtree</li> <li>◆ Twp. lacks control of roads</li> <li>◆ 66' R.O.W.</li> <li>◆ Solvent plume in ground water</li> <li>◆ Shallow ground water</li> <li>◆ Narrowness of properties on North Side – West End</li> <li>◆ Bad past planning (need to redevelop)</li> <li>◆ A lot of commercial property exists today</li> <li>◆ Lack of pedestrian connections</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>◆ Realign Whittaker Way with Despelder</li> <li>◆ Reduced curb cuts at Walgreen's</li> <li>◆ Meijer out lots</li> <li>◆ Brownfield Redevelopment Authority, in both City and Township</li> <li>◆ DDA in Township</li> <li>◆ Commitment to cooperate across boundaries</li> <li>◆ US-31 Bypass, by 2012 (?)</li> <li>◆ Infrastructure</li> <li>◆ Expansion of public transit</li> <li>◆ Corridor TIF Plan</li> <li>◆ Architectural character standards</li> <li>◆ Size of parcels South of road</li> <li>◆ Intersection – Meijer</li> <li>◆ 3 – Lane Road</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>◆ Possible dev. to south w/access to Robbins Road</li> <li>◆ Possible lack of cooperation from stakeholders</li> <li>◆ Ottawa County Rd. Commission</li> <li>◆ Revenue source</li> <li>◆ Economics today</li> <li>◆ Amount of commercial</li> <li>◆ By Pass</li> <li>◆ Lack of transportation choices</li> <li>◆ Nothing happens with redevelopment</li> </ul>

Based on the preliminary research and the SWOT input, an existing features map, (using 2004 aerial photos) and a site analysis were prepared. These were assembled as “Walking Audit Packets”, which the township and city staffs and local residents used to self-guide tours of the Sub Area. This approach helped all gain a better understanding of the Sub Area and its issues and opportunities.

To maximize public involvement, local residents and business owners were notified by mail, phone, and

newspaper articles, and through the City of Grand Haven Master Plan website about the Robbins Road Sub Area planning process. They were also invited to obtain a “Walking Audit Packet” either at the township, city, or to download it from the project website and to participate in a planning charrette for the area. A charrette is a short-duration, intense planning and design session that directly involves the public, local stakeholders, and a consultant led planning and design team. The charrette process allows planners and designers to work in a focused manner with the immediate input from participants.

The planning charrette began on the evening of September 15, 2008, with a trolley bus tour of the corridor. Participants identified and discussed various land use and design-related issues that were addressed in greater detail during a facilitated brainstorming session later that evening. This discussion included a facilitated evaluation of liabilities, assets, needs, and desires, and helped focus input on commonly held beliefs and how the character of the Sub Area affects perceptions. Participants then voted and ranked priority issues and opportunities.

Significant area-wide liabilities included a lack of:

- Sidewalks on the south side of Robbins Road
- Street trees and landscaping,
- Clearly defined internal circulation patterns
- A dedicated left-turn lane.

However, several “dreams and desires” were identified including:

- Greater corridor design consistency
- Slower traffic speeds
- Planned development south of the corridor

Participants were invited to return the next day to view progress and to offer further input. The opportunities for immediate feedback created a very dynamic atmosphere and resulted in innovation that might not otherwise have been possible. Consequently, a number of ideas were tested, re-worked, and either embraced, or rejected.

An open house was held at the close of the charrette process to review the draft Sub Area plan. The informal atmosphere helped further engage stakeholders and decision-makers in a dialogue about planning assumptions; it offered an opportunity for residents and business owners to see the initial outline of the Sub Area plan, and allowed a discussion about the remaining work.

The resulting joint community plan for the Robbins Road corridor was finalized and then integrated, as this chapter, into the 2009 Grand Haven Township Master Plan.

Using the input from the brainstorm sessions, alternative responses to each sub area’s challenges were developed.



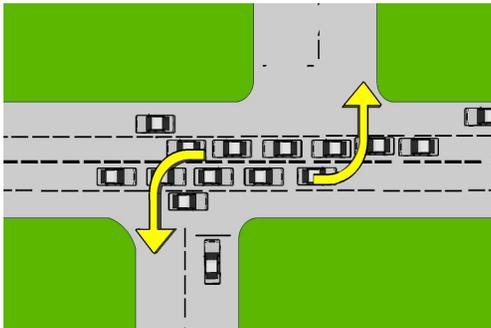
The open house offered an opportunity for residents and business owners to see the initial outlines of the sub area plans.



Successive layers of pavement have nearly overtopped the curb, further exacerbating access management in this area



Ineffectively aligned opposing intersections create the potential for "left turn lock-ups"



## ROBBINS ROAD CORRIDOR

Robbins Road is controlled by the City of Grand Haven; however, since it is a jurisdictional boundary, properties along its north side fall within the city while properties to the south fall primarily into the township. Initially, the corridor study area extended about 250 - 300 feet north and south of Robbins Road and from US-31 to Beechtree Street/168th Avenue. The planning area was about 48 acres and included properties developed as a variety of commercial uses at the west end, but with office and residential toward the east. To gain a better understanding of land uses and development opportunities it was later broadened to approximately 100 acres, taking in more land to the south.

Much of the recent activity in and adjacent to the corridor has occurred in the township, however, more land remains there to be developed. As such, the township seeks a plan for this area that focuses development, taking advantage of existing infrastructure, committed development patterns, and targeted land uses that create a better sense of place for this key community gateway.

During the planning process several challenges and assets were identified; these are more fully developed below:

### TRANSPORTATION

Robbins Road has four travel lanes (two in each direction) and carries upwards of 12,000 vehicle per day at its west end and about 9,800 at the east. While the US-31 and Robbins Road intersection is signalized, south bound US-31 movements require an indirect left. The Robbins Road, 172nd Avenue/Ferry Street and 168th Avenue/Beechtree Street intersections are also signal controlled.

The majority of vehicle crashes on Robbins Road (22 out of 25 reported accidents in 2008 through August) occurred between US-31 and 172nd Avenue/Ferry Street. This is where commercial activity is concentrated and multiple and poorly defined curb cuts are located. Many accidents in this vicinity are rear-end crashes, most likely due to the lack of a dedicated left turn lane and poor access management.

With forty-nine access points along Robbins Road, left-turn movements are common. As a result, the inside lanes are often encumbered with turning cars and weaving traffic as drivers change lanes to avoid vehicles and queues. Furthermore, many opposing driveways are poorly aligned, creating several potential left-turn lock-up situations. There is also a lack of uniform access to and from the roadway, although this disorganized pattern is much more prevalent west of Ferry Street/ 172nd Avenue.

About 800 feet east of US-31, parking lots extend right up to the street resulting in an oppressive, asphalt-dominated environment with little room to sort out parked cars from drive aisles and to define sidewalks. Successive layers of pavement in this area have nearly overtopped the curb, further exacerbating access management.

### AN ENTRY OPPORTUNITY

The US-31/Robbins Road intersection is a major community gateway. The broad highway boulevard and indirect left turns work well to regulate traffic, but missing are elements that support aesthetics and create a

memorable “arrival experience” that enhances both communities.

### PARKING LOT LAYOUT

Many parking lots along Robbins Road interconnect and yet while this cross access is poorly defined, overall it likely helps reduce traffic congestion. These interconnections could be enhanced and made safer by improving pavement markings and clearly channelizing internal parking lot traffic. The current



The lack of definition within the parking areas may lead to confusion for drivers and an unsafe environment for pedestrians

situation, with poorly defined access and internal drive aisles not only leads to confusion, it also makes walking in this area unfriendly at best, and dangerous, at worst.

These challenges are also exacerbated by what may be an oversupply of parking, especially at the southeast corner of Robbins Road and 172nd Avenue. It appears that additional commercial development could be accommodated there, strengthening the vitality of the area and making more efficient use of vast parking lots without overburdening sites or roadways. Care must still be taken to carefully integrate any new uses with existing development.

### PEDESTRIAN ACCESS

The corridor does not accommodate pedestrians very well as sidewalks are only consistently located along the north side of Robbins Road. On the south side, immediately east of 172nd Avenue, only about 500 feet of sidewalk exists. West of 172nd Avenue there is little, if any parkway between the road, pedestrian zones, and parking lots. Consequently, pedestrians are very exposed to fast moving traffic. Given traffic volumes and turning movements, crossing Robbins Road on foot can be a daunting experience that must



The quality and safety of pedestrian areas vary significantly across the corridor.



be addressed by appropriately designed sidewalks, tree lined parkways and safe and clearly defined pedestrian crossings.

### **SITE AND ARCHITECTURAL DESIGN**

Site and building design and architectural character vary tremendously along the corridor; from outdated commercial strip development to more modern office settings. Some structures, however, may be reaching the end of their useful life. While Southtown Plaza, a 1960s strip center, is about to be replaced with a modern Walgreens pharmacy and convenience store it should not deter a continued focus on the importance of architectural design and character. In fact this new development should be viewed as a catalyst opportunity to establish a set of consistent corridor design principles for the city and township, guaranteeing consistency in theme, the location and placement of buildings and parking, building materials, signs and lighting.

### **AN AREA OF STRONG POTENTIAL**

Despite traffic and access issues, the Robbins Road Sub Area provides vital commercial and retail services to the township and city. Immediately to the south, Meijer and Wal-Mart have expanded their retail reach attracting shoppers beyond just the surrounding area. In terms of total sales volume, the Sub Area and its environs rivals many other shopping areas in West Michigan. In addition, Pinewood Place, located on Ferry Street just north of Robbins Road, is undergoing an expansion; providing more senior housing and added employment opportunities.

Vacant and underutilized lands in the township also provide future opportunities. Several large parcels are planned and zoned for medium to high density residential and/or commercial uses, creating the potential for more traffic. Yet, if done correctly this development can lessen roadway impacts by promoting more walkable environments within the context of a mixed land use district, one with jobs, housing and shopping all within close proximity. In addition, the Meijer PUD has yet to be built out.

## **PLAN DESIGN POLICIES**

Several transportation, and planning and design policy recommendations have been identified through this effort. These will help resolve issues and enhance the Robbins Road corridor so that it can continue to serve commercial and residential interests in both the township and city.

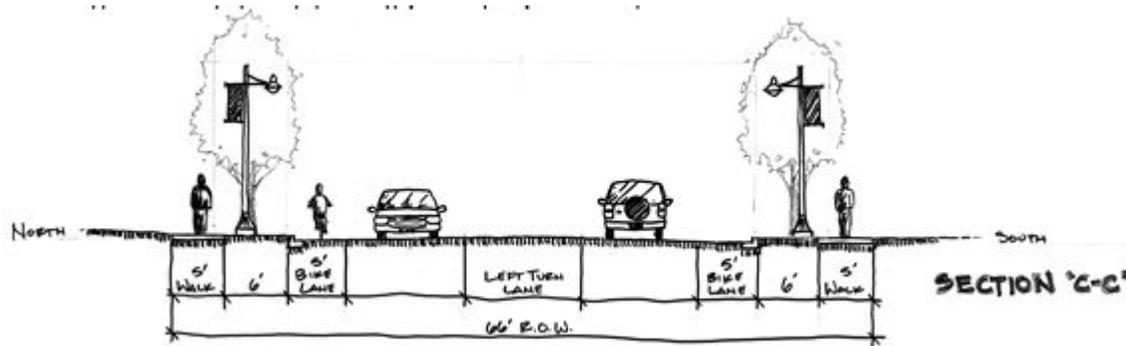
### **1. DEDICATED LEFT TURN LANE**

Robbins Road traffic volumes vary considerably from west (with the highest levels) to the east; however, the lack of a dedicated left turn lane encumbers the entire corridor. This issue was identified and potential solutions were discussed during the process to gain citizen input.

The recommended alternative reconfigures Robbins Road to a three-lane section (possibly with right-turn lanes at appropriate high-volume locations, such as 172nd Avenue and the newly proposed Whittaker Way/DeSpelder intersections). A five-lane cross-section with a dedicated left was also considered, but ultimately rejected based on the modest traffic volumes and the relatively narrow right-of-way.

The proposed three-lane section accommodates a travel lane in each direction and a dedicated center left. This configuration better and more safely accommodates traffic flow and left turn movements than the current four lane pattern and should result in reducing crashes.

The figure above illustrates the proposed three-lane section within a 66-foot wide right-of-way. It also demonstrates sufficient area to accommodate changes to the roadway; leaving five-foot wide bicycle lanes, six-foot wide parkways to accommodate street trees and five-foot wide sidewalks on both sides of the road.



## 2. UNIFORMITY AND CONSISTENCY OF DESIGN

With some properties reaching obsolescence and others being considered for redevelopment, now is the time to improve the character and functionality of Robbins Road by applying consistent site, building, and architectural design standards that are coordinated between the city and township. In fact, citizens ranked uniform and consistent design standards as among their highest priorities. Such an approach would benefit both municipalities and assure compatible development within the corridor; of course, not all sites are poised for new development or redevelopment. Therefore, any standards must be flexible enough to address current uses while anticipating enhancements as new investment occurs. Design standards will also need to recognize that uses transition from west to east; shifting from relatively intense regional commercial on the west, to employment and residential on the east.

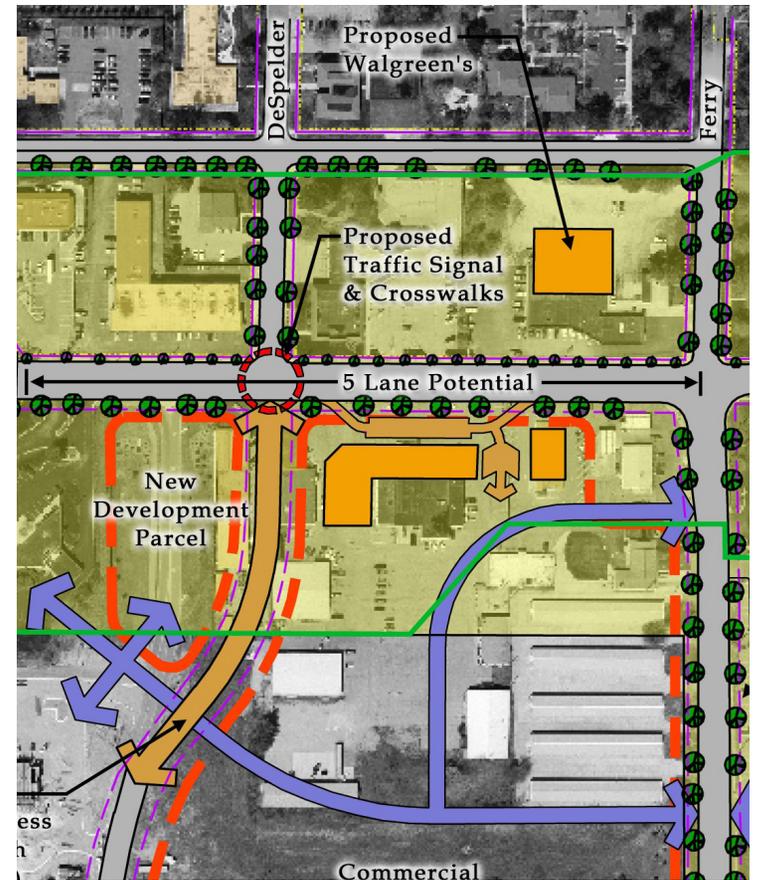
This Plan recommends the following required site development standards that at a minimum address the standards on the following page.

## 3. NEW ROADS AND INTERCONNECTIONS

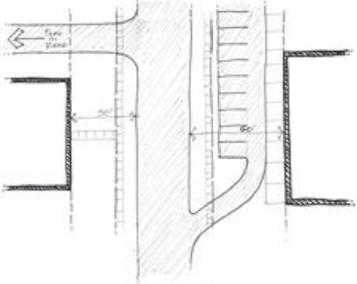
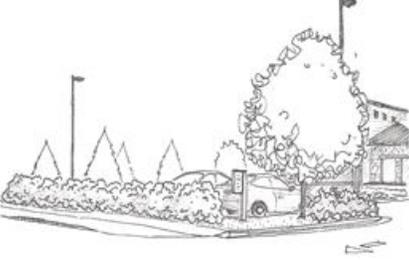
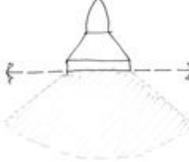
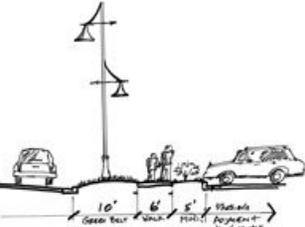
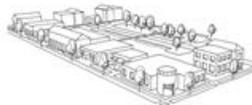
The vacant lands to the south present an important opportunity for the township, but without carefully considered implementation strategies the wrong kind of development could trigger additional traffic issues and undermine efforts to manage growth. While some properties have direct access to Robbins Road, others will require connections to 172nd or 168th Avenues. Interestingly, charrette results ranked “better connectors among all areas” as one of the top implementation strategies for the Plan.

As such, the Plan recommends an expanded and interconnected system of public streets to serve future development and to better distribute traffic. Specifically, an east-west street, located about 900 feet south of Robbins Road, is proposed between 172nd and 168th Avenues. Griffin Street should also be extended south to meet the new street and a round-about explored for that intersection. Eventually, a further extension of Griffin south to Comstock Street should be considered.

Aligning Whittaker Way and Despelder would improve the efficiency of the intersection and create a new development parcel.



Robbins Road Conceptual Uniform Design Standards

<p><b>Setbacks, variables</b></p> <ul style="list-style-type: none"> <li>o Without front parking</li> <li>o With front parking (and screening)</li> </ul> 	<p><b>Landscape Treatment</b></p> <ul style="list-style-type: none"> <li>o Buffer depth along roads</li> <li>o Trees, size and quantities</li> <li>o Shrub screens for parking lots</li> </ul> 
<p><b>Signage</b></p> <ul style="list-style-type: none"> <li>o Size (area and height)</li> <li>o Illumination</li> <li>o Freestanding and Building</li> </ul> 	<p><b>Lighting Standards</b></p> <ul style="list-style-type: none"> <li>o Cutoff Fixture Types</li> <li>o Wattage Limitations</li> </ul> 
<p><b>Sidewalks</b></p> <ul style="list-style-type: none"> <li>o Size</li> <li>o Location options</li> </ul> 	<p><b>Building Design, by type</b></p> <ul style="list-style-type: none"> <li>o Height, Roofline</li> <li>o Minimum/Maximum footprint</li> <li>o Finish architecture</li> </ul> 
<p><b>Site Layout</b></p> <ul style="list-style-type: none"> <li>o Access management (spacing and offsets)</li> <li>o Shared drives, parking &amp; Cross Access</li> </ul> 	<p><b>Low Impact Storm Water Management</b></p> <ul style="list-style-type: none"> <li>o Landscape for detention</li> <li>o Rain gardens</li> </ul> 

Whittaker Way (the Meijer access drive to Robbins Road) should also be realigned to connect with DeSpelder Street. Not only would this improve traffic circulation, but it would also expand development opportunities for properties to the west. To accomplish this, however, will require demolition and redesign of existing sites; but as the area transitions, affected businesses can be relocated to new corridor development.

New roads to better serve the Meijer PUD and the larger parcels to the east are also recommended to enhance circulation and development potential. Finally, streetscape enhancements, including sidewalks, should apply to all new and existing roadways.

#### 4. TRADITIONAL NEIGHBORHOOD DEVELOPMENT (TND) CONCEPT

The area south of Robbins Road, between 172nd and 168th avenues, is ideally suited for a Traditional Neighborhood Development. A TND emphasizes compact, mixed-use, transit and pedestrian-oriented development and offers a blueprint based on traditional town patterns. Neighborhoods, sized for easy walking distance, would function as the basic building block. Such neighborhoods should further emphasize human-scale design, town and neighborhood centers, public spaces, civic uses and other features that foster a sense of community. TNDs are also characterized by an interconnected network of narrow streets. Narrow street widths, on-street parking, street trees and other features are intended to slow local traffic and create a safe, attractive environment for pedestrians, in addition to cars. Transit and bicycle travel are also accommodated. The grid pattern of streets includes collectors and arterials, but also provides a variety of routes for local traffic. Service alleys are also a hallmark of TNDs.



Since this area has convenient access to shopping, restaurants, employment, and schools, and is also served by the area's public transportation system, Harbor Transit, it is a natural extension of the traditional development patterns located to the north of Robbins Road in Grand Haven. TND design principles should, therefore, apply to all new development using the following criteria:

- **Mixed Land Uses** – Land uses should include a blend of single and multiple-family residential, office, and regional and neighborhood-serving commercial, either integrated horizontally across the Sub Area or vertically within buildings.
- **Varying Densities and Unit Types** – Lot sizes, densities and residential types should vary and allow a compact design form. Setbacks should be replaced with build-to lines that locate buildings in a predictable pattern near the street, without intervening parking lots. Minimum building heights should be established and allowed to exceed 2.5 stories and 35 feet.
- **Interconnected Streets** – Narrow, inter-connected streets, with on-street parking should be laid out in a grid pattern. New connections between Robbins Road and Comstock Street, and 172nd Avenue and 168th Avenue should be made with respective extensions of DeSpelder Street and Timberview Drive. Streets should be lined with trees and sidewalks, and illuminated by street lights that not only serve the automobile, but pedestrians as well.



- Quality Design – Buildings (including residential, commercial and office) should have a distinct architectural character that supports TND principles. These include: clearly defined front doors that face the street; ample windows that support CPTED (Crime Prevention Through Environmental Design) principles by orienting to public spaces and increasing “eyes’ on the street”; pitched roofs for residences and quality building materials.
- Parking in the Rear – In TNDs automobiles are accommodated, but they are not allowed to dominate. To promote pedestrian-friendly neighborhoods, parking areas should be situated at the rear of a building and be accessed via alleys. Garages should be either set back from the front façade of a home or they should be located at the rear to avoid dominating the street scene with blank walls and parked cars. On-street parallel parking should be allowed to provide a buffer between traffic and pedestrians on the sidewalks.

### 5. PEDESTRIAN CONNECTIONS

Other than sidewalks along the north side of Robbins Road the corridor lacks crosswalks or crossing signals. This was ranked among the highest liabilities identified by the public. Consequently, crosswalks should be added at Robbins and Griffin, including alternative crosswalk paving to further delineate pedestrian zones.

### 6. ENTRY FEATURE

The US-31 and Robbins Road intersection is a recognized community entrance which offers an excellent opportunity for enhancements. One example of an entry feature enhancement is an archway that extends over US-31, welcoming visitors to Grand Haven. The historic entry archway in Frankfort Michigan and the archway at the Grand Valley State University Allendale campus entrance are both good examples of such an entry feature.



The wide boulevard intersection of US-31 and Robbins Road offers an excellent opportunity for an entry feature such as these archways at Frankfort and Grand Valley State University.

## IMPLEMENTATION STRATEGIES

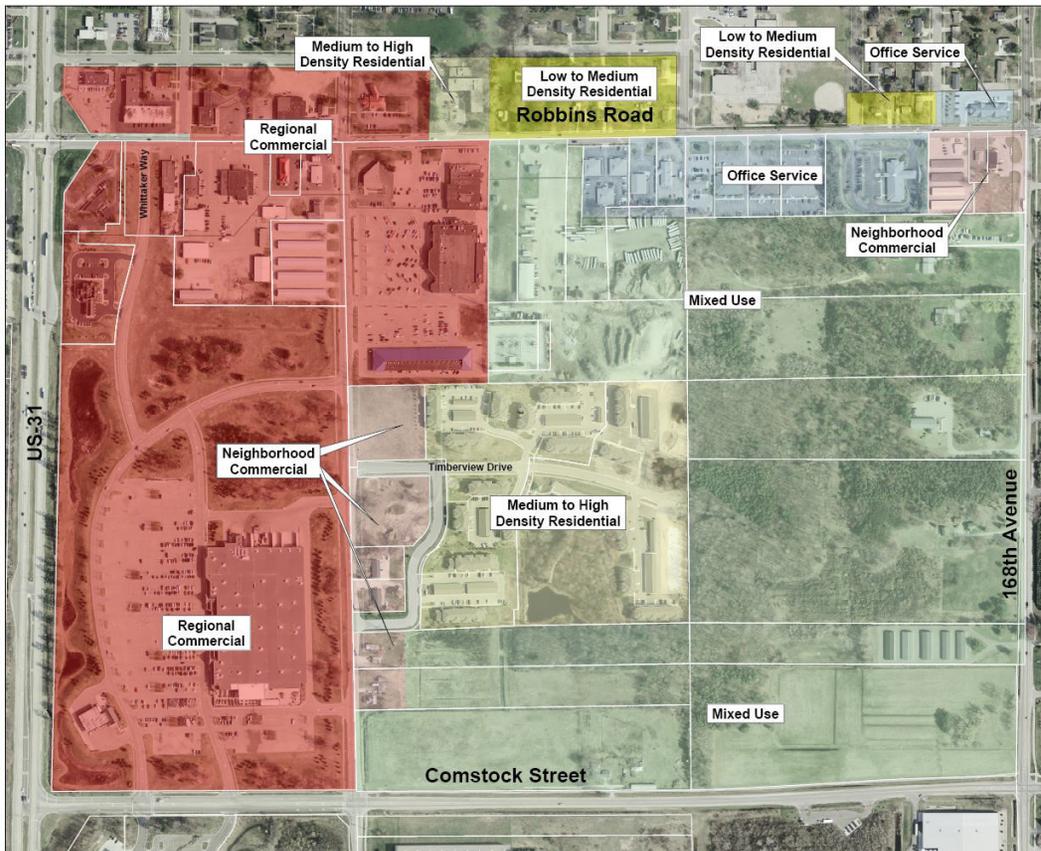
The following recommendations help establish an agenda for further action by the township and city, either working separately or jointly:

### 1. FUTURE LAND USE AND ZONING ADJUSTMENTS.

The township recognized the need to develop a more detailed concept for the Robbins Road Corridor, which is reflected in this plan. Recommendations include a diversity of land uses that vary by type, density, and design. Since this is a shared vision, uniform standards for design and site access must be developed and all new development must be required to meet them.

#### FUTURE LAND USE CONCEPT

Future land use patterns along Robbins Road are designed to transition from commercial in the west to residential in the east; development densities should also be varied. As vacant properties develop in the township they should be interconnected with a new network of streets that link to Robbins Road, Comstock Street, and 168th 172nd Avenues. Such vacant lands should be developed with a mixture of land uses, preferably as a Traditional Neighborhood Development, as described earlier in this Appendix.



The following future land use designations are proposed for the township’s portion of the Robbins Road Sub Area. The Office Service and Medium to High Density Residential designations are not included due to the fact that these uses are already built out and are not anticipated to change.



Buildings should generally be residential in character with pitched roofs.

### REGIONAL COMMERCIAL

Land uses generally include larger single or multi-occupant structures providing products and services in an auto-oriented environment. However, future development must be designed to provide a safe and inviting place for both pedestrians and drivers. Sites should interconnect using existing and planned drives enabling patrons to access more than one use without being forced back onto a major road. Landscaping should be used to define sites, access drives, and streets, and to soften the regional scale of development.

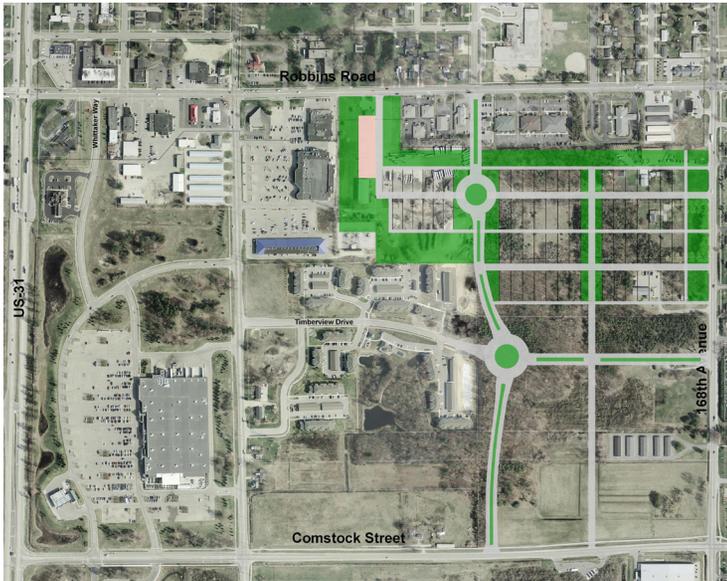
### NEIGHBORHOOD COMMERCIAL

A location for small-scale retail and service facilities, these land uses primarily serve nearby residents. Buildings should generally be residential in character, with pitched roofs and sites carefully designed offering safe and inviting environments for pedestrians, bicyclists, and motorists alike. Parking should be convenient, but not configured so that nearby sidewalks and streets are dominated.

### MIXED USE

This Plan recommends that the areas planned for Mixed Use are developed in accordance with the TND principles outlined earlier in this Appendix. Appropriate land uses include a mixture of single- and multi-family residential, commercial and office that are compactly integrated at varying densities and are located in buildings of varying scale and design.

The area should be developed around a grid-form street network that branches off two main street extensions; an extension of Griffin Street south to Comstock Street, and an extension of Timberview Drive east to 168th Avenue. All streets should include sidewalks, landscaping and decorative lighting to promote a safe and comfortable pedestrian environment. The graphic on the previous page provides an illustrative concept of a TND plan for the Robbins Road Sub Area.



### ZONING

Areas in the township are regulated under the C-1 (Commercial) and SP (Service Professional) zones, while four zoning districts apply in the city. These are Commercial, Multiple-family Residential, Single-Family Residential and Office Service. West of Ferry/172nd zoning is consistent – “C” in the city and “C-1” in the township and permitted and special land uses are comparable in both codes. The township’s C-1 district requires a minimum lot size of 35,000 sq. ft. with a minimum width of 110 feet. However, the city’s code relies on setback and lot coverage standards to regulate parcel dimensions. A front setback in the township is 50 feet while it is 25 feet in the city.

These differences point out the need for uniformity and consistency; therefore, adjustments to both the city’s and township’s ordinance standards will be necessary to implement plan goals. However, since the defined zoning districts may apply elsewhere in either jurisdiction, care must be taken to avoid unintended conflicts. Therefore, a mixed use zoning district, if considered in the township, must be tailored specifically to the objectives of this plan. In addition, the township’s PUD provisions (if those district regulations are

used to implement recommendations) should be evaluated so that they reflect the land use objectives of this Plan. Alternative approaches, including adopting a uniform set of design standards as an overlay applying to both jurisdictions, should be explored. Other approaches include a form-based code or a pattern book used as a development guide. While either approach would provide uniform standards, mandatory requirements will only guarantee positive change.

Implementation of the portion of this Plan relating to the TND concept is dependent on the township's prior adoption of specific zoning district regulations that will allow for (1) additional flexibility in site design (flexibility, that is, beyond what is afforded under the current PUD Ordinance), (2) the intended quality and variety of building characteristics, (3) the compatible integration of mixed land uses, and (4) such other regulations as are deemed necessary to implement the township's goals of promoting high quality development, based on the TND principles outlined earlier in this Appendix. *Therefore, no TND proposals will be considered or approved by the township until such time the township has formulated and adopted the necessary zoning regulations to effectively regulate such a development concept.*

## 2. ROAD RECONSTRUCTION

A redesign of Robbins Road is recommended to better manage traffic, including left-turns and since it falls under the city's jurisdiction, Grand Haven is in a position to take leadership role for improvements. But it will be important to involve adjoining property owners; and the city and township should collaborate bringing the Ottawa County Road Commission and MDOT together to achieve consensus on its ultimate design, roadway landscaping, the configuration of intersections and, ultimately, the potential redesign of the US-31 intersection. A combination of funding sources will certainly be necessary to accomplish this, but the initial step would be to move from the concepts outlined in this plan to testing their feasibility and preliminary design.

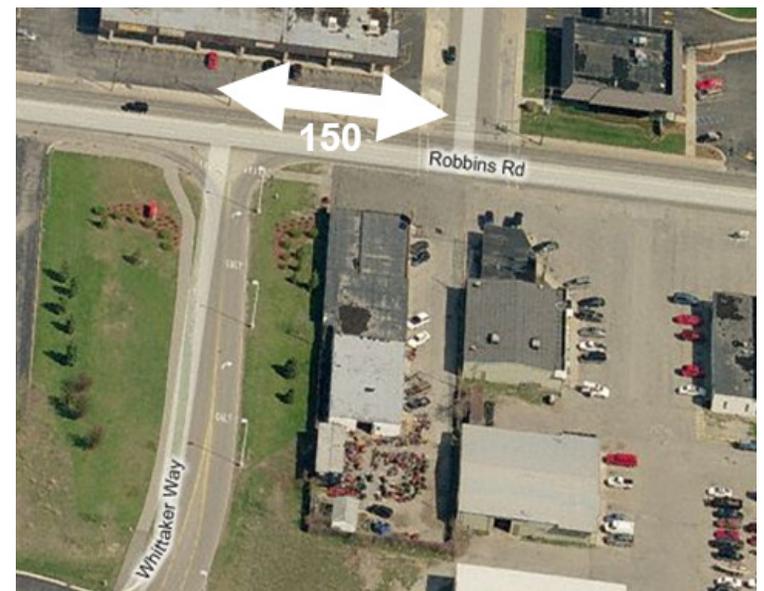
## 3. PLANNED NEW ROADS

The Plan contemplates an expanded and interconnected network of streets to better channel traffic, to reduce pressure on a limited number of key intersections, and to permit efficient use of the lands adjoining the corridor. While part of this area may be outside the current planning boundaries, attention must still be paid to the implications of anticipated growth that could impact Robbins Road. The township should, therefore, work with the affected property owners to evaluate roadway options, curb cuts, and access management. As new development proposals occur in this area, the Planning Commission should use the Master Plan to guide the type and location of changes to its transportation system.

## 4. REALIGNED WHITTAKER WAY AND DESPELDER INTERSECTION

An adjustment to the Meijer PUD is recommended that would result in shifting Whittaker Way (its northerly access road) to the east about 150 feet to align with Despelder Street. This change, together with the proposed Robbins Road three-lane cross section, will significantly enhance access and the market potential of surrounding properties. It will

Shift the Whittaker Way, Robbins, Despelder intersection for better alignment



also make possible a signalized intersection and designated crosswalks to improve pedestrian access. Additional stacking and left-turn movements may also be enhanced. Of course, this alignment will require property acquisition and the demolition and relocation of some existing buildings and businesses. But, it also creates an expanded development area to the west that currently lacks visibility and exposure.

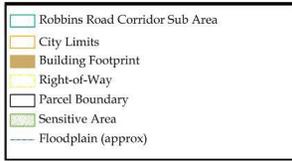
**5. CONSIDER A CORRIDOR IMPROVEMENT AUTHORITY**

Act 280 of 2005 authorizes municipalities to establish a tax increment financing authority to plan and implement improvements along a defined commercial corridor. This statute uniquely contemplates cooperation between jurisdictions to address the challenges of boundary roads. Two such entities would need to be established individually by the township and city, but they could work jointly on a development and financing plan. The act allows tax increment financing as a funding source for improvements. These could include some or all of the costs of road reconstruction, streetscape improvements, land acquisition, site redevelopment, and others. The tax increment captured by the authority would include township and city levies, as well as the levies of other taxing jurisdictions that agree to participate.

**6. WORK WITH MDOT AND THE CITY OF GRAND HAVEN ON ENTRY FEATURE IN INTERSECTION**

Given that US-31 is a state highway, and Beacon Boulevard and Robbins Road are both city-controlled roadways, coordination with MDOT and the City of Grand Haven is critical to the development of an entry feature at the US-31 and Robbins Road intersection.

# Robbins Road Corridor Sub Area - West Site Analysis

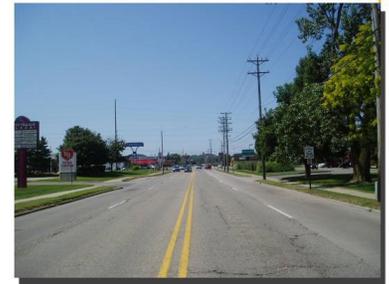
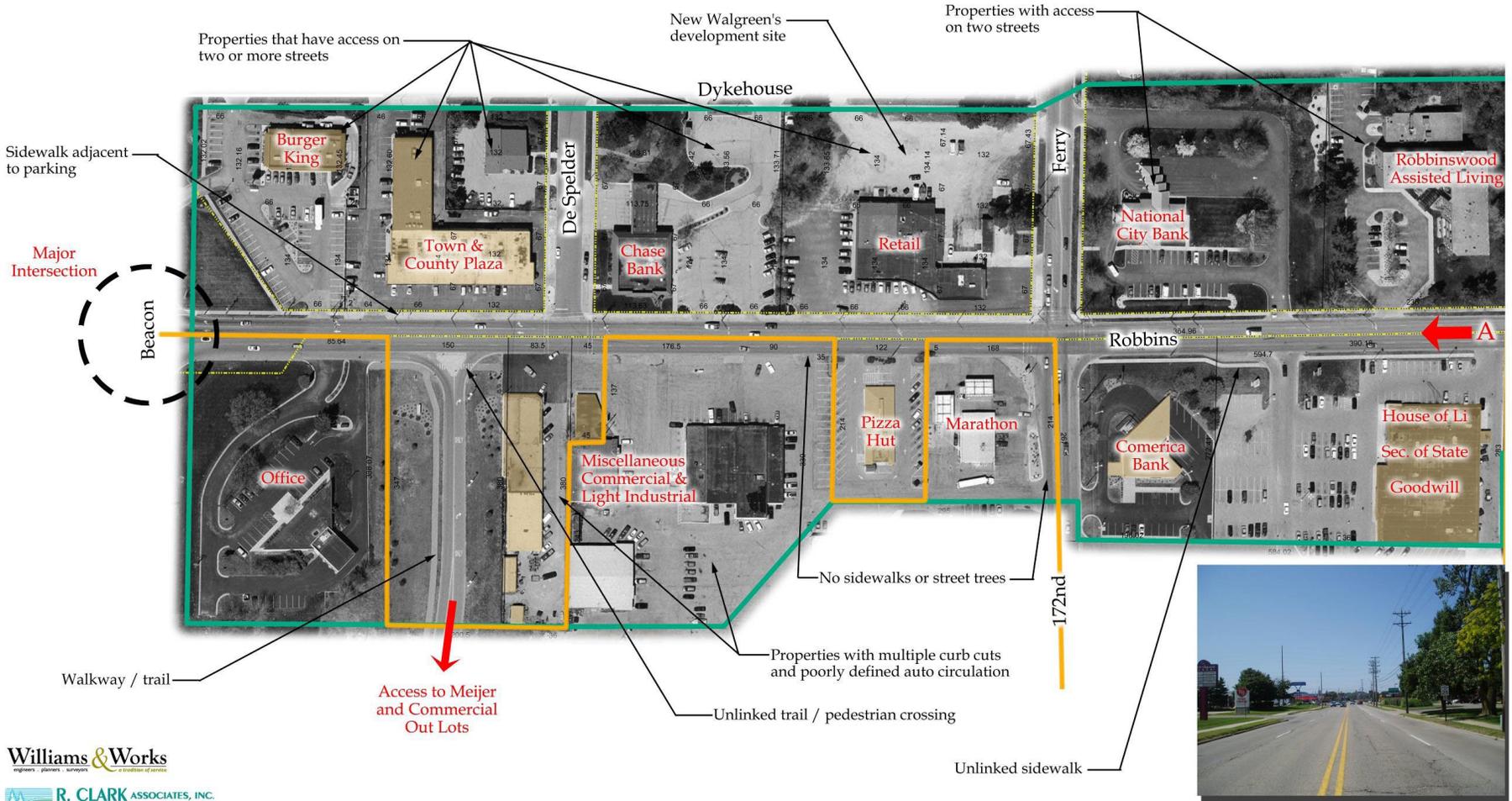


**Inventory Notes:**

- Power lines are located primarily on the north side of Robbins Rd.
- Continuous sidewalk on the north side of Robbins Rd. only. The south side of Robbins Rd. has two unconnected sections of sidewalk

**Analysis Notes:**

- Mixture of land uses throughout the corridor
- Large variety of building scales and setbacks
- High volume traffic flows (4 lanes) - no left turn lane
- Large variety of sign sizes



A - Road Profile

**Williams & Works**  
engineers • planners • architects

**R. CLARK ASSOCIATES, INC.**  
LANDSCAPE ARCHITECTS & PLANNERS  
11335 W. South Airport Rd., Suite 105, Tomerose City, WI 49884  
920.961.8265 Fax 920.967.2748 rclark@rcassocs.com



A - Road Profile

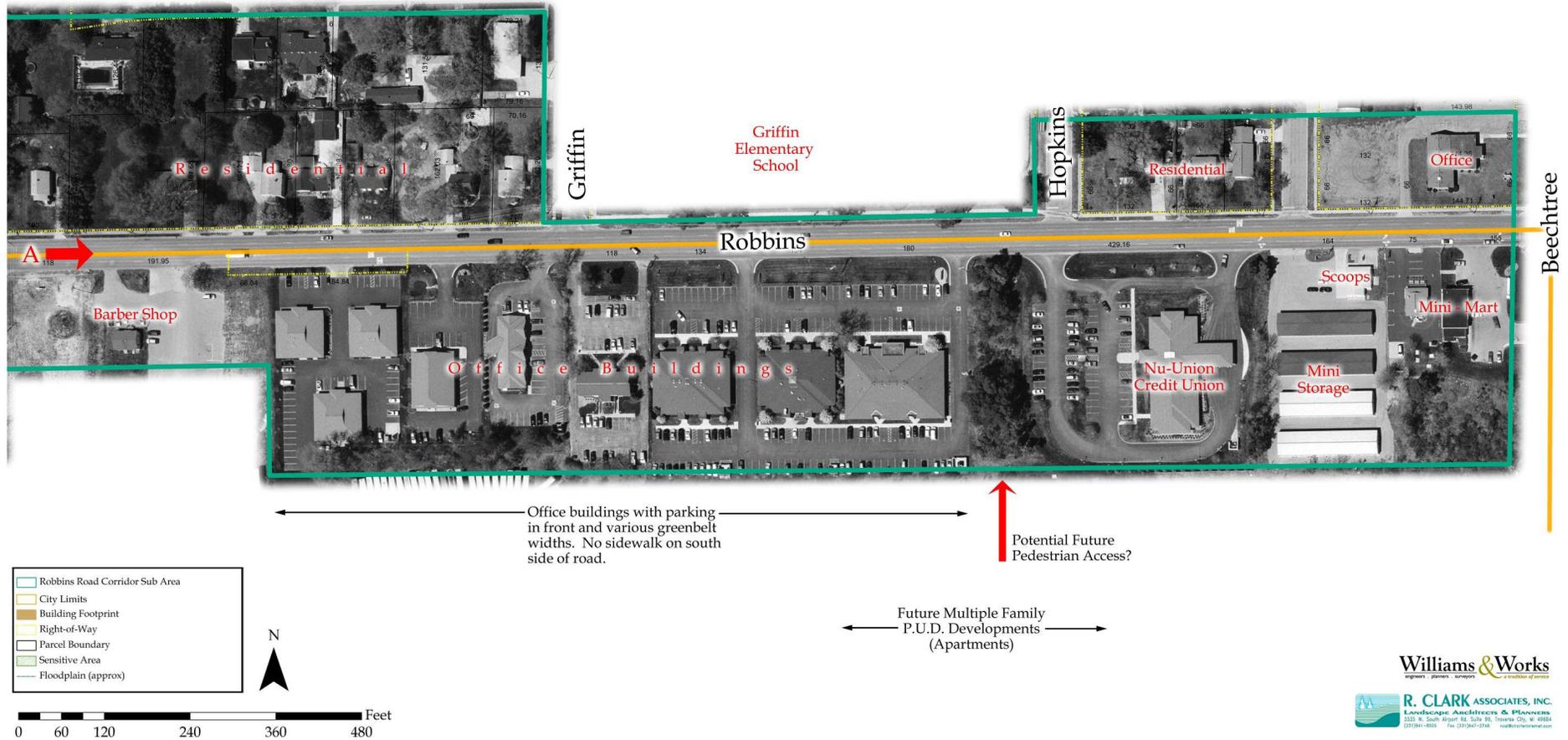
## Robbins Road Corridor Sub Area - East Site Analysis

**Inventory Notes:**

- Power lines are located primarily on the north side of Robbins Rd.
- Continuous sidewalk on the north side of Robbins Rd. only.
- No crosswalks provided on Robbins Rd.

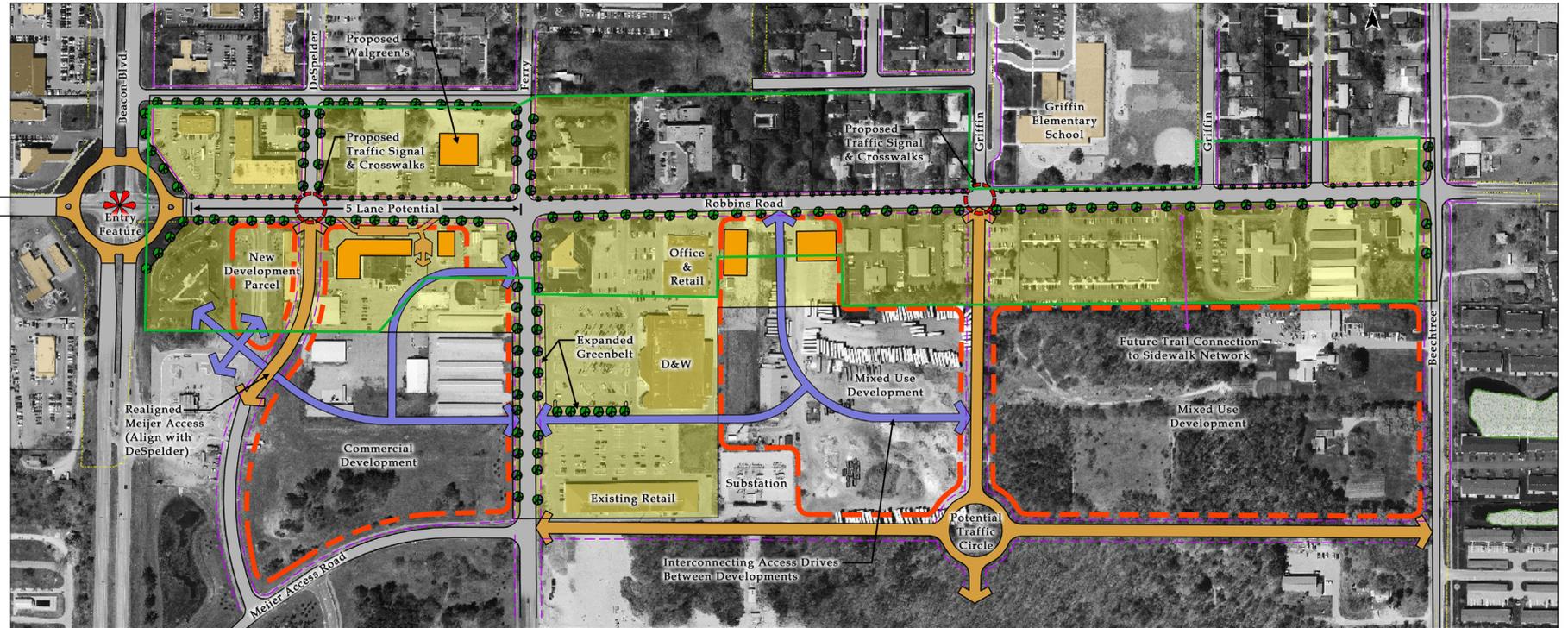
**Analysis Notes:**

- Parcels on the south side of Robbins Rd. are typically larger and deeper than the lots on the north side of the street
- Corridor provides services for a large area (city and township)



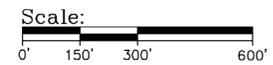
# Robbins Road Corridor Sub Area

10-13-08  
**Williams & Works** engineers · planners · surveyors  
**R. CLARK ASSOCIATES, INC.** Landscape Architects & Planners  
 2335 W. South Airport Rd., Suite 200, Troy, MI 48064  
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## Legend

- Future Development Areas
- Existing Sidewalks
- Proposed Sidewalks
- Existing Roads
- Proposed Roads
- Unification Guidelines Area



# PLANNING FOR COASTAL RESILIENCY IN GRAND HAVEN CHARTER TOWNSHIP

Identifying Coastal Dynamics, Resources, and Risks



This report summarizes the results of a year-long study of coastal dynamics in Grand Haven Charter Township. This project was developed by a University of Michigan project team as part of the Resilient Grand Haven planning process conducted by the Land Information Access Association (LIAA). All materials and presentations are available on the project's page on [www.ResilientMichigan.org/grand\\_haven.asp](http://www.ResilientMichigan.org/grand_haven.asp).

This report was prepared by the Land Information Access Association (LIAA) as the product of a study conducted by the University of Michigan Taubman College of Architecture and Urban Planning as part of the Resilient Grand Haven project. Support for the project came from the Michigan Municipal League (MML), Michigan Association of Planning (MAP), and the University of Michigan's Taubman College of Architecture and Urban Planning. A special thank you is owed to the many organizations and individuals that contributed to the planning process.

This project was funded in part by Grand Haven Charter Township, the City of Grand Haven, the University of Michigan Water Center, the Michigan Coastal Zone Management Program, Department of Environmental Quality, Office of the Great Lakes; and the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.



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# PLANNING FOR COASTAL RESILIENCY IN GRAND HAVEN CHARTER TOWNSHIP

## THE IMPORTANCE OF PLANNING IN COASTAL COMMUNITIES

It is no secret the Great Lakes are one of the most unique and precious environmental features in the world. In fact, “the Great Lakes basin contains more than 20% of the world’s surface freshwater supplies and supports a population of more than 30 million people.”<sup>1</sup> Michigan is home to nearly 3,300 miles of Great Lakes shoreline, with 36,000 miles of rivers and streams, and 11,000 inland lakes.<sup>2</sup>

Yet in general, riparian land throughout Michigan is not adequately protected from development pressures.<sup>3</sup> Coastal communities especially have an important role to play in protecting the Great Lakes. In 2001, the Michigan Department of Environmental Quality acknowledged “fragmentation of coastal habitats, loss of agricultural and forest lands, increased impervious surfaces and resulting stormwater runoff, and the increased development in coastal hazard areas, wetlands, and Great Lakes Islands, could be improved through better coastal land use planning.”<sup>4</sup>

Planning for coastal areas at the local level requires knowledge of both local conditions and state and federal regulations. This report aims to address these challenges for the Grand Haven Community and provide clear, well-founded recommendations for future land use planning.

## OVERVIEW OF COASTAL DYNAMICS AND THE GREAT LAKES

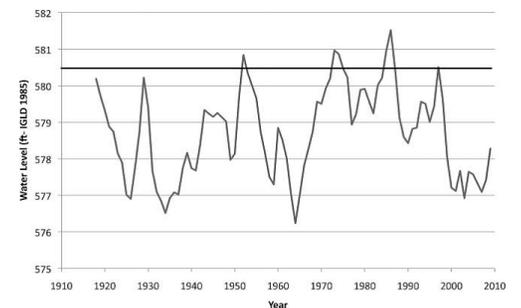
The Great Lakes function differently than other inland water bodies and tidal oceans. Understanding these dynamics can help Grand Haven Township plan for naturally occurring changes along the shoreline.

### OSCILLATING WATER LEVELS OF THE GREAT LAKES

Great Lakes water level changes do not result from the moon’s gravitational pull, but from cyclical changes in rainfall, evaporation, and riverine and groundwater inflows.<sup>5</sup> These factors work together to raise and lower the water levels of the Great Lakes in small increments daily, and larger increments seasonally and over the course of years and decades. Long-term water levels fluctuate by multiple feet as shown in Figure 1.

The Great Lakes are in a period of rising lake levels. Since the early 2000s, water levels have remained low, but historical patterns over the last century indicate higher water levels are sure to return.<sup>6</sup> Lake Michigan’s water

Figure 1. Oscillating water levels of the Great Lakes and the mean water level



Source: NOAA, 2011

<sup>1</sup> Mackey, S. D., 2012: Great Lakes Nearshore and Coastal Systems. In: U.S. National Climate Assessment Midwest Technical Input Report. J. Winkler, J. Andresen, J. Hatfield, D. Bidwell, and D. Brown, coordinators.

<sup>2</sup> Ardizzone, Katherina A. and Mark A. Wyckoff, FAICP. Filling the Gaps: Environmental Protection Options for Local Governments, 2nd Edition. 2010.

<sup>3</sup> As cited by Norton 2007- Michigan Department of Environmental Quality. 2001. 309 Enhancement Grants Assessment/Strategy. Lansing, MI: DEQ Coastal Management Program.

<sup>4</sup> Ibid.

<sup>5</sup> Norton, Richard K. , Meadows, Lorelle A. and Meadows, Guy A.(2011) ‘Drawing Lines in Law Books and on Sandy Beaches: Marking Ordinary High Water on Michigan’s Great Lakes Shorelines under the Public Trust Doctrine’, Coastal Management, 39: 2, 133 — 157, First published on: 19 February 2011 (iFirst)

<sup>6</sup> Meadows, Guy A., and Meadows, Lorelle A., Wood, W.L., Hubertz, J.M., Perlin, M. “The Relationship between Great Lakes Water Levels, Wave Energies, and Shoreline Damage.” Bulletin of the American Meteorological Society Series 78: 4. (1997): 675-683. Print.

Erosion on Lake Michigan endangers homes built too close to the shoreline. This photo was taken on the Indiana coastline of Lake Michigan.



Source: EPA.gov

level in August of 2015 averaged 579.79 feet, which is equal to the water levels in fall of 1998.<sup>7</sup>

The decadal and multi-decadal shifts in water levels are not solely responsible for the movement of the shoreline landward and lakeward over time. The velocity and height of waves, erosion of shorelines, and variability in the oscillation of water levels also contribute to coastal dynamics on the Great Lakes.

### WAVE ENERGY AND HEIGHT

The Great Lakes are subject to high energy waves and wave setup along the coastline. High energy waves are high in speed and strong in intensity and are primarily created as fast winds move across the surface of the water for extended distances.<sup>8</sup> Wave setup is the height of the water as waves reach the shore. High wave setup results as regional storm patterns create high winds on the bounded water bodies of the Great Lakes.<sup>9</sup> Powerful and tall waves are natural conditions that can increase the pace of erosion and damage structures on, or near, the shoreline.<sup>10</sup>

### EROSION

The shorelines of Lake Michigan are mostly made of gravel and sands that easily erode during times of high energy waves.<sup>11</sup> Coastal erosion can flood and damage infrastructure along bluffs and beaches and is a natural occurrence on the geologically young Great Lakes. Erosion is caused mainly by storms and winds, not necessarily by rising lake levels.<sup>12</sup>

### QUICKLY CHANGING CONDITIONS

The Great Lakes are contained in gradually shifting and tilting basins. This tilting results as the Earth slowly decompresses and rebounds from the immense weight of the glaciers that created the Great Lakes.<sup>13</sup> This shifting causes long-term water levels to change more quickly in some places than others, because the shape of the water basin varies along the coast.<sup>14</sup> This attribute of the Great Lakes makes it difficult to predict the pace of shoreline movement. Therefore, it is safest to plan for great variability and rapid change in water levels.<sup>15</sup> Figure 2 shows the movement of the shoreline in the Grand Haven Community.

## CLIMATE CHANGE AND THE GREAT LAKES

Powerful waves, erosion, and quickly changing shorelines are natural processes of the Great Lakes, each having implications for planning efforts along the coast, however, augments these natural processes,

<sup>7</sup> <http://www.glerl.noaa.gov/data/dashboard/GLWLD.html>

<sup>8</sup> National Oceanic and Atmospheric Administration. "Coastal Currents." Ocean Service Education. NOAA, 25 March 2008. Web. Accessed July 2015. <sup>9</sup> Norton, Richard K., Meadows, Lorelle A. and Meadows, Guy A. (2011) 'Drawing Lines in Law Books and on Sandy Beaches: Marking Ordinary High Water on Michigan's Great Lakes Shorelines under the Public Trust Doctrine', Coastal Management, 39: 2, 133 — 157, First published on: 19 February 2011 (iFirst)

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Meadows, Guy A., and Meadows, Lorelle A., Wood, W.L., Hubertz, J.M., Perlin, M. "The Relationship between Great Lakes Water Levels, Wave Energies, and Shoreline Damage." Bulletin of the American Meteorological Society Series 78: 4. (1997): 675-683. Print.

<sup>13</sup> Dorr, J. A., and D. F. Eschman. 1970. Geology of the Great Lakes. Ann Arbor: University of Michigan Press.

<sup>14</sup> Wilcox, D.A, Thompson, T.A., Booth, R.K., and Nicholas, J.R., 2007, Lake-level variability and water availability in the Great Lakes: U.S. Geological Survey Circular 1311, 25 p

<sup>15</sup> Ibid.



and requires preemptive planning in coastal communities. This section will discuss climatologist predictions of increased precipitation and storminess in the Great Lakes region, variable lake water levels, and rising water temperature. First, it is important to understand the global context of climate disruption.

### GLOBAL CHANGES IN CLIMATE

Climate and weather are directly related, but not the same thing. Weather refers to the day-to-day conditions in a particular place, like sunny or rainy, hot or cold. Climate refers to the long-term patterns of weather over large areas. When scientists speak of global climate change, they are referring to changes in the generalized, regional patterns of weather over months, years and decades. Climate change is the ongoing change in a region's general weather characteristics or averages. In the long term, a changing climate will have more substantial effects on the Great Lakes than individual weather events.

Evidence collected over the last century shows a trend toward warmer global temperatures, higher sea levels, and less snow cover in the Northern Hemisphere (see Figure 3). Scientists from many fields have observed and documented significant changes in the Earth's climate.<sup>16</sup> Warming of the climate system is unequivocal and is now expressed in higher air and ocean temperatures, rising sea levels, and melting ice.<sup>17</sup>

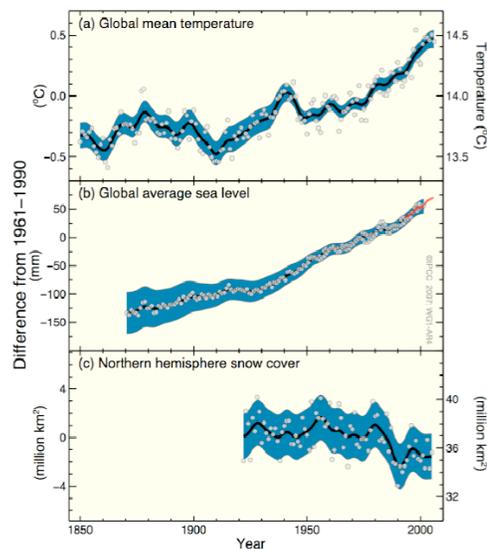
To help predict what the climate will be in the future, scientists use computer models of the Earth to predict large-scale changes in climate. These General Circulation Models (GCM) have been improved and verified in recent years, resulting in relatively reliable predictions for climate changes over large regions.<sup>18</sup> Scientists downscale these techniques to predict climate change for smaller regions.

### CLIMATE CHANGE ON THE GREAT LAKES

The Great Lakes Integrated Sciences + Assessments Center (GLISA) is a consortium of scientists and educators from the University of Michigan and Michigan State University that provides climate models for the Great Lakes Region in support of community planning efforts like this Master Plan. According to GLISA, the Great Lakes region experienced a 2.3 degree Fahrenheit increase in average air temperatures from 1900 to 2012.<sup>19</sup> An additional increase of 1.8 to 5.4° F in average air temperatures is projected by 2050. Although these numbers appear relatively small, they are driving very dramatic changes in Michigan's climate and greatly impact the Great Lakes.<sup>20</sup>

The National Climate Assessment for 2009 included a number of illustrations to help us understand the extent and character of anticipated climate change impacts.<sup>21</sup> One of these illustrations, Figure 4, shows Michigan under several emissions scenarios, each leading to changes in Michigan's climate. Just by maintaining current emission levels, Michigan's climate will feel more like present-day Arkansas or Oklahoma by the end of the century.<sup>22</sup>

Figure 3.



Source: International Panel on Climate Change, [https://www.ipcc.ch/publications\\_and\\_data/ar4/syr/en/mains1.html](https://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html)

<sup>16</sup> Intergovernmental Panel on Climate Change. (2007). Observed changes in climate and their effects. Web. Accessed July 2015.

<sup>17</sup> Ibid.

<sup>18</sup> Intergovernmental Panel on Climate Change (2013). What is a GCM? Web. Accessed July 2015.

<sup>19</sup> Great Lakes Integrated Sciences and Assessments (2015). Temperature. Web. Accessed July 2015.

<sup>20</sup> Ibid.

<sup>21</sup> U.S. Global Change Research Program. Global Climate Change in the United States, 2009. Cambridge University Press, Cambridge, MA.

<sup>22</sup> Ibid.

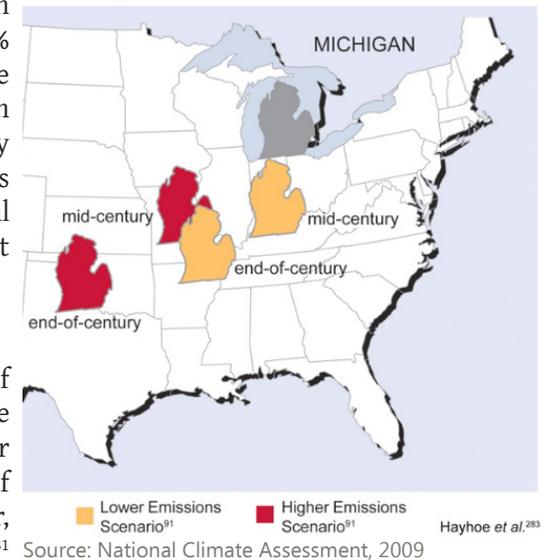
### INCREASED PRECIPITATION AND STORMINESS

There is strong consensus among climate experts that storms, greater in number and intensity, will occur in the Great Lakes region.<sup>23</sup> This is already happening as “the amount of precipitation falling in the heaviest 1% of storms increased by 37% in the Midwest and 71% in the Northeast from 1958 to 2012.”<sup>24</sup> As storms drop more precipitation and generate stronger sustained winds, the Great Lakes will see stronger and higher waves.<sup>25</sup> In addition to direct damage caused by storms, sustained increases in the number of storms and their intensity can both directly and indirectly pollute waters by overloading sewage and stormwater capabilities.<sup>26</sup> Increases in the intensity of storms also quickens the pace of erosion on Great Lakes shorelines. In fact, the Federal Emergency Management Agency (FEMA) projects approximately 28% of structures within 500 feet of a Great Lakes shoreline are susceptible to erosion by 2060.<sup>27</sup>

### VARIABILITY OF LAKE WATER LEVELS

The natural ups and downs in the water levels of Lake Michigan will continue regardless of the impacts of climate change.<sup>28</sup> However, climate change is likely to augment this natural process resulting in more variable water levels as warmer air temperatures result in fewer days of ice cover and faster evaporation.<sup>29</sup> In other words, lake levels will rise and fall faster and with less predictability than in the past. Fortunately, much of Michigan’s coastal infrastructure was built in previous decades during times of high water levels.<sup>30</sup> However, fast rising waters can erode shorelines, damage infrastructure, and cause extensive flooding in inland rivers.<sup>31</sup> When lake levels fall, access to infrastructure like docks may be restricted and navigation hazards in shallow waters may be exposed. Low lake levels pose a threat to coastal vegetation and can reduce the pumping efficiency of drinking water intake pipes.<sup>32</sup> Additional ramifications of changing lake levels include a drop in water supply,<sup>33</sup> restricted fish habitats,<sup>34</sup> more invasive species,<sup>35</sup> faster erosion, and an overall decline in beach health.<sup>36</sup> Climate change is likely to augment the natural highs and lows of lake levels, causing more variability and a faster rate of change, making each of these potential ramifications both more likely and less predictable.

Figure 4.



Source: National Climate Assessment, 2009

Hurricane Sandy caused an estimated 755 billion dollars worth of damage in 2012. The impacts of this Hurricane were felt on Lake Michigan, causing waves up to 33 feet.



Photo Source: NASA 2012

<sup>23</sup> Ibid.

<sup>24</sup> Mackey, S. D., 2012: Great Lakes Nearshore and Coastal Systems. In: U.S. National Climate Assessment Midwest Technical Input Report. J. Winkler, J. Andresen, J. Hatfield, D. Bidwell, and D. Brown, coordinators.

<sup>25</sup> Great Lakes Integrated Sciences and Assessments. Climate Change in the Great Lakes Region. GLISA, 2014. Web. Accessed July 2015.

<sup>26</sup> Cruce, T., & Yurkovich, E. (2011). Adapting to climate change: A planning guide for state coastal managers—a Great Lakes supplement. Silver Spring, MD: NOAA Office of Ocean and Coastal Resource Management.

<sup>27</sup> The Heinz Center. (2000). Evaluation of Erosion Hazards. Web. Accessed July 2015.

<sup>28</sup> Dinse, Keely. Preparing for Extremes: The Dynamic Great Lakes. Michigan Sea Grant. Web. Accessed July 2015.

<sup>29</sup> Cruce, T., & Yurkovich, E. (2011). Adapting to climate change: A planning guide for state coastal managers—a Great Lakes supplement. Silver Spring, MD: NOAA Office of Ocean and Coastal Resource Management.

<sup>30</sup> Dinse, Keely. Preparing for Extremes: The Dynamic Great Lakes. Michigan Sea Grant. Web. Accessed July 2015.

<sup>31</sup> Ibid.

<sup>32</sup> Ibid.

<sup>33</sup> Cruce, T., & Yurkovich, E. (2011). Adapting to climate change: A planning guide for state coastal managers—a Great Lakes supplement. Silver Spring, MD: NOAA Office of Ocean and Coastal Resource Management.

<sup>34</sup> Ibid.

<sup>35</sup> Ibid.

<sup>36</sup> Dinse, Keely. Preparing for Extremes: The Dynamic Great Lakes. Michigan Sea Grant. Web. Accessed July 2015.

Damage from a 1989 storm in Grand Haven.



Source: Grand Haven Charter Township

### WATER TEMPERATURE

Climatologists predict there will be fewer days below freezing in Michigan and other Great Lakes states. As temperatures remain warm for a greater part of the year, the winter season will shorten and the lake ice cover that accompanies winter weather will decline. Lake ice cover allows heat radiation to be reflected, and when it declines, the surface water temperature will increase as more heat is absorbed by the water. The ice coverage on the Great Lakes and Lake St. Claire declined by 71% from 1973 to 2010, and ice covers the lake for an average of 15 fewer days each year.<sup>37</sup>

The associated impacts of rising water temperature include changes to where fish and other aquatic animals can live, increased vulnerability to invasive species, and increased risk of algae blooms.<sup>38</sup> Rising water temperature also enables winds to travel faster across the surface of the lake, increasing the vulnerability of coastal communities to damaging waves as storms and winds increase.<sup>39</sup> Lastly, ice cover protects the shoreline during winter storms. With less ice cover, the shoreline is more susceptible to erosion and habitat disruption.

### PARTNERSHIP WITH THE UNIVERSITY OF MICHIGAN

In an effort to make planning decisions based on known information about the Great Lakes systems, a project team from the University of Michigan has collaborated with LIAA, with funding from the University of Michigan Water Center, to identify and analyze hazard areas and work with community groups to plan for better coastline management. The multi-disciplinary project team has integrated scientific knowledge and research with local planning processes in Grand Haven Charter Township and the City of Grand Haven.

**Multi-disciplinary project team.** The project team includes University of Michigan researchers and community planning staff from LIAA. The Principal Investigator is Richard K. Norton (UM Urban and Regional Planning). Co-investigators include Maria Arquero (UM Urban and Regional Planning); Jennifer Maigret (UM Architecture); Guy Meadows (Michigan Tech Great Lakes Research Center); Paul Webb (UM School of Natural Resources and Environment); and Lan Deng (UM Urban and Regional Planning).

**Funding overview.** Funding for the project came from the University of Michigan Water Center and the Michigan Department of Environmental Quality's Coastal Zone Management Program. The local governments of the City of Grand Haven and Grand Haven Charter Township also provided a local match.

**Research questions and scope of work.** The project sought to answer several key questions. First, what data is readily available for coastal planning, and how well does this data reflect current and future climate conditions? Second, does increasing access to coastal research help local jurisdictions plan for coastal changes? These questions are addressed using a scenario planning framework. Environmental and land use ramifications of increased flooding are considered.

The project team chose the jurisdictions of the City of Grand Haven and Grand Haven Charter Township as

<sup>37</sup> Austin, J. A., & Colman, S. M. (2007). Oceans- L06604 - Lake Superior summer water temperatures are increasing more rapidly than regional air temperatures: A positive ice-albedo feedback (DOI 10.1029/2006GL029021). *Geophysical Research Letters*, 34, 6.).

<sup>38</sup> Dinse, Keely. *Preparing for Extremes: The Dynamic Great Lakes*. Michigan Sea Grant. Web. Accessed July 2015.

<sup>39</sup> Cruce, T., & Yurkovich, E. (2011). *Adapting to climate change: A planning guide for state coastal managers—a Great Lakes supplement*. Silver Spring, MD: NOAA Office of Ocean and Coastal Resource Management.

candidates for this work. LIAA's ongoing work with the *Joint Planning Commission* and the dynamic coastline in each community made the Grand Haven community a strong partner for this research.

Over the course of 18 months, the project team held several meetings with the Grand Haven *Joint Planning Commission* and was present for the Leadership Summit. The project team also held several public meetings to better inform the research and communicate progress.

## GOVERNMENT REGULATIONS

Federal, state, and local policies play an important role in shaping land use and development along the shoreline. Here, the Federal Emergency Management Agency's National Flood Insurance Program is discussed, in addition to Michigan policies to protect wetlands, High Risk Erosion Areas, Critical Dune Areas, and the shoreline. Possible actions local governments can take to supplement state and federal regulations are outlined as well.

### NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) is an optional program from which communities can receive flood insurance for disaster relief by agreeing to regulate development in the floodplain. The NFIP was created in 1968 under the National Flood Insurance Act. The NFIP is currently administered by FEMA and has four major goals:

- To charge flood insurance premiums to private property owners, ensuring taxpayers do not bear the sole burden of private property flood losses
- To provide residents with aid after flooding
- To guide development away from hazard areas
- To require building construction to minimize or prevent flood damage

**Flood Insurance Rate Maps.** The floodplain must be locally regulated to qualify for the NFIP, but FEMA defines what land is considered eligible in a floodplain for the NFIP. Floodplains are mapped in either a Flood Hazard Boundary Map (FHBM) or, more commonly, a Flood Insurance Rate Map (FIRM).

FIRMs are created and released by FEMA. FIRMs are generated for various return periods, like the 50-year storm, 100-year storm, and 500-year storm.<sup>40</sup> It is important to note that individual property owners can petition to change the flood zone designation for their property, so FIRMs may not be fully derived from scientific analysis.

The FIRMs for Ottawa County were adopted in 2011 by the City of Grand Haven and Grand Haven Charter Township.

In 1973, the Flood Disaster Protection Act was passed, which penalized communities that did not participate in the NFIP by limiting federal money to acquire floodplain property available to non-participating communities. This act also mandated buildings in floodplains must have flood insurance coverage in order to receive any federal financing, loans, or disaster relief.<sup>41</sup>

**Community Rating System.** In 1994, the Community Rating System (CRS) was added to the NFIP through the National Flood Insurance Reform Act of 1994. The CRS offers discounts in the premium a property owner must pay if a community's floodplain management exceeds the minimum NFIP regulations. A community can receive credit toward premium reductions by educating the public, increasing mapping and regulation, reducing flood likelihood by relocating and retrofitting flood-prone structures, maintaining drainage systems,

<sup>40</sup> FEMA (2013). Great Lakes Coastal Flood Hazard Studies. Web. Accessed July 2015.

<sup>41</sup> FEMA (2005). Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials. Web. Accessed July 2015.

and creating flood warning and response programs. Currently, 22 Michigan communities participate in the CRS,<sup>42</sup> and Grand Haven Charter Township is taking steps toward joining.

**Local Government Role.** A participating community has a number of responsibilities to remain compliant with NFIP regulations. These include monitoring floodplain development and building permits, inspecting development, maintaining records, revising and assisting in floodplain mapping, and providing information to the local public about the requirements of the program. Once a community’s FEMA region releases updated FIRMs, a community has a period to review and appeal the drafted map. After that point, the community has six months to adopt the new FIRM through an ordinance.<sup>43</sup>

### GREAT LAKES COASTAL FLOOD STUDY

In 2010, FEMA and the United States Army Corps of Engineers (USACE) began the Great Lakes Coastal Flood Study. The project seeks to update existing FIRMs to account for revised lake levels, wave setup, and wave energy. The process to create the drafted maps differs significantly from the process to create existing FIRMs. The existing FIRMs are determined using event-based modeling, where the projected flooding impacts are derived from a selected historical storm.<sup>44</sup> The updated approach is statistically based, where the influences of wave energy and wave setup are modeled using refined 100-year lake level elevations provided by the USACE.

The Great Lakes Coastal Flood Study is scheduled to release maps for public comment and adoption in 2016. Preliminary draft maps are available for Ottawa County and are used in the analysis further described in this report.

**Local Opportunity.** Both Grand Haven jurisdictions participate in the NFIP. The City of Grand Haven joined the NFIP in 1978 and the Township followed in 1981. Since that time, each jurisdiction has submitted claims as seen in Table 1. The Township has received over \$229,000 in aid for 17 separate claims.

Table 1. NFIP Claims

	Total Number of Claims	Total Value of Claims
Grand Haven Charter Township	17	229,374
City of Grand Haven	19	309,623
Ottawa County	255	2,562,999
Statewide	11,183	66,748,379

Source: FEMA, 2015.

Under the Community Rating System, the Grand Haven community can receive credit for implementing several of the changes recommended in this report (see recommendations at the end of this report). As times of high intensity waves and inundation are expected to increase, the Grand Haven Community might consider making changes to zoning ordinances, building codes, and other policies to better manage floodplain development. Additionally, NFIP flood insurance premiums are rising nationwide, as storms increase and payouts rise.<sup>45</sup> Participating in the CRS is a proactive approach to keeping costs low while protecting both man-made, and natural, resources near the shoreline.

<sup>42</sup> FEMA. <https://www.fema.gov/media-library/assets/documents/26319>

<sup>43</sup> Ibid.

<sup>44</sup> FEMA (2013). Great Lakes Coastal Flood Hazard Studies. Web. Accessed July 2015.

<sup>45</sup> EDEN Inc. (201v4). Flood Premiums Rising Dramatically. Web. Accessed July 2015.

## WETLANDS

### BENEFITS OF COASTAL WETLANDS

Wetlands help to reduce flood damage by absorbing flood water and then slowly releasing it. One acre of the typical wetland is able to absorb one million gallons of water,<sup>46</sup> protect adjacent and downstream land from damage,<sup>47</sup> and slow the speed of flooding across an area.<sup>48</sup> The storage capacity of a specific wetland varies by its size, slope, type of vegetation, location relative to the flooding path, and water levels in the wetland prior to flooding.<sup>49</sup> Coastal wetlands also alleviate the severity of erosion along a shoreline during a storm.<sup>50</sup> Perhaps more than any other environmental asset, wetlands buffer the coast by absorbing high energy waves and disrupting the flow of currents.<sup>51</sup>

### EXISTING REGULATION FOR WETLANDS

The Clean Water Act of 1972 mandated permits be granted for development on regulated wetlands. This federal act gives the United States Army Corps of Engineers (USACE) the authority to grant permits to build on regulated wetlands, with the Environmental Protection Agency (EPA) having the authority to veto permits issued to fill wetlands. The Michigan Department of Environmental Quality (MDEQ) is the co-administrator of the permitting process, sharing joint regulation with the Army Corps of Engineers.<sup>52</sup> Michigan was the first state, and is one of only two states, to assume a role in the permitting process for wetlands.<sup>53</sup> Here, the MDEQ issues a permit to build on wetlands if the applicant meets qualifications. Permitting decisions are subject to public comment, including those made by local governments.

A property owner must obtain a permit from the State before building on a regulated wetland. A wetland is regulated if it:<sup>54</sup>

- Is connected to or within 1000 feet of a Great Lake shoreline
- Is connected to or within 500 feet of an inland lake, pond, or river
- Is equal to or greater than 5 acres in size
- Is essential to the preservation of the state's natural resources, as designated by the MDEQ

Michigan has coastal, forested, and shrub wetlands, each inundated with water either all or part of the year.<sup>55</sup> The function and diversity of wetlands was misunderstood as European settlement began, and many wetlands were dredged, drained, and converted to serve industry and agriculture.<sup>56</sup> Today, less than half of the state's wetlands remain, and in a time of changing climate, the need to conserve and restore wetlands is paramount.<sup>57</sup> Wetlands face a number of challenges related to climate variability:

- Rising water levels will actually increase the number of naturally occurring wetlands on low-lying uplands. However, wetlands cannot expand where structures like bulkheads, dikes, and other structures block their advance.<sup>58</sup>
- As precipitation and storminess increase, runoff water and draining can increase sedimentation and nutrient input in wetlands.

<sup>46</sup> Environmental Protection Agency (2001). Functions and Values of Wetlands: Wetland Fact Sheet. Web. Accessed July 2015.

<sup>47</sup> Ibid.

<sup>48</sup> Ibid.

<sup>49</sup> Ibid.

<sup>50</sup> Ardizzone, Katherina A. and Mark A. Wyckoff, FAICP. Filling the Gaps: Environmental Protection Options for Local Governments, 2nd Edition. 2010.

<sup>51</sup> Ibid.

<sup>52</sup> Ibid.

<sup>53</sup> Ibid.

<sup>54</sup> NREPA PA 451 of 1994, Part 303

<sup>55</sup> Michigan Department of Environmental Quality. Wetlands Protection: Protecting Michigan's Wetlands. Web. Accessed July 2015.

<sup>56</sup> NREPA PA 451 of 1994, Part 303

<sup>57</sup> LIAA (2014). Climate Change Adaptation & Local Planning for Michigan's Coastal Wetland Resources. Web. Accessed July 2015.

<sup>58</sup> Maryland Department of the Environment. Wetland Disturbance and Impact. Web. Accessed July 2015.

This can lead to algae blooms and invasive species.<sup>59</sup>

- Consistent high water levels endanger vegetation and animals that depend on the naturally fluctuating water levels in wetlands.

**Local Opportunity.** Local governments in Michigan can protect additional wetlands not regulated by the state.<sup>60</sup> Under Michigan’s Natural Resources and Environmental Protection Act (NREPA), local governments can require wetlands less than 5 acres in size be regulated by a permitting process.<sup>61</sup> A local government must possess an inventory of existing wetlands to adopt a wetland ordinance. The MDEQ must be notified of a local wetland ordinance, though the State does not need to review or approve.<sup>62</sup>

Local governments can also protect wetlands through site plan review provisions and zoning ordinances.<sup>63</sup> Under the Michigan Zoning Enabling Act, protecting the natural environment is a justification for zoning requirements like buffers and other tools.<sup>64</sup> Site plan review provisions in the zoning ordinance can require wetland permits be obtained from the MDEQ as a condition of local zoning approval.<sup>65</sup>

### HIGH RISK EROSION AREAS

The State of Michigan regulates development in what it designates as High Risk Erosion Areas (HREAs). The purpose of this regulation is to prevent costs associated with cleaning up damaged structures and moving infrastructure and buildings away from eroding bluffs, while protecting the life and health of residents and keeping insurance costs down. Preventing buildings in HREAs also protects the Great Lakes from pollutants from structure debris and septic fields.<sup>66</sup> The authority for this regulation comes from the Shoreline Protection and Management statute.<sup>67</sup>

The MDEQ compares new and historic imagery to designate areas of coastline that have eroded by more than 1 foot per year as HREAs. The MDEQ then uses erosion rates to calculate 30- and 60-year setbacks from the “erosion hazard line,” or generally, the line of stable vegetation. Usually, new structures must be built landward of the erosion hazard line by either 30 times or 60 times the erosion rate, as designated by the MDEQ. While some small permanent structures may be permitted within the 30-year setback, all new structures must be built landward of the erosion hazard line. MDEQ is in the process of updating HREAs in some areas of Michigan.<sup>68</sup>

**Local opportunity.** Local governments can assume the MDEQ’s permitting responsibilities for HREAs through an ordinance. To do so, the ordinance cannot be less restrictive than the State’s regulations and the MDEQ must approve the ordinance. A local government can adopt an ordinance requiring greater and more uniform setbacks in HREAs than the MDEQ.<sup>69</sup>

Other actions can be taken through a local zoning ordinance, including performance standards for soil and vegetation, clustering development away from vulnerable erosion areas, and instituting site plan review processes for any development in HREAs.<sup>70</sup>

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<sup>59</sup> Ibid.

<sup>60</sup> Ardizzone, Katherina A. and Mark A. Wyckoff, FAICP. Filling the Gaps: Environmental Protection Options for Local Governments, 2nd Edition. 2010.

<sup>61</sup> Ibid.

<sup>62</sup> NREPA, Michigan Public Act 303, 324.30307

<sup>63</sup> Ardizzone, Katherina A. and Mark A. Wyckoff, FAICP. Filling the Gaps: Environmental Protection Options for Local Governments, 2nd Edition. 2010.

<sup>64</sup> NREPA, Michigan Public Act 303, 324.30307

<sup>65</sup> Ardizzone, Katherina A. and Mark A. Wyckoff, FAICP. Filling the Gaps: Environmental Protection Options for Local Governments, 2nd Edition. Michigan Department of Environmental Quality, Coastal Zone Management Program with financial assistance from the National Oceanic and Atmospheric Administration, authorized by the Coastal Zone Management Act of 1972. 2010.

<sup>66</sup> Ibid.

<sup>67</sup> Ibid.

<sup>68</sup> Ibid.

<sup>69</sup> NREPA, 1994 Michigan PA 451, Part 323.

<sup>70</sup> Michigan Department of Environmental Quality. High Risk Erosion Areas: Program and Maps. Web. Accessed July 2015.

## SOIL EROSION AND SEDIMENT CONTROL

Eroding soil and sediment deposition into Michigan waterways damage wildlife habitats, pollute water, and decrease water depth. Sedimentation can also carry nutrients and toxic pollutants, mainly from agriculture and construction activities, directly into water systems.<sup>71</sup> Soil erosion and sediment control comes from a variety of activities, but construction and earth change is specifically monitored by the State under Part 91 of NREPA.<sup>72</sup> A permit is required for earth changes that disturb 1 or more acres of land or are within 500 feet of the water’s edge of a lake or stream.

**Local Opportunity.** County governments can administer Soil Erosion and Sediment Control programs by adopting an ordinance. Ottawa County has done so and currently administers permits through the Ottawa County Water Resources Commission.<sup>73</sup> Local monitoring can be more restrictive than the state by permitting for earth changes adjacent to wetlands, storm drains, or environmentally sensitive areas, or earth changes on less than 1 acre.<sup>74</sup> Local governments, however, cannot expand Part 91 to monitor stormwater management control outside of soil erosion control.<sup>75</sup> Any local control program must be approved by the MDEQ, and the MDEQ offers assistance to communities looking to implement stricter regulation under NREPA.

Outside of NREPA, local governments can adopt stormwater control ordinances, impervious surface limitations, or require street sweeping to reduce pollutants in water runoff.<sup>76</sup>

## CRITICAL DUNE AREAS

Michigan’s dunes are one of the most striking environmental features in the nation. Together, they represent the largest freshwater dune ecosystem in the world.<sup>77</sup> The dunes provide unique habitats for rare and endangered species and hold priceless environmental and recreation value.<sup>78</sup>

Michigan’s Sand Dune Protection and Management statute calls for the protection of Critical Dune Areas (CDAs) through state regulation, which is administered by the MDEQ. Under the statute, a property owner must receive a permit for any activity that alters the appearance or contour of a Critical Dune.

Generally, CDA regulation states development:

- Should not occur lakeward of the crest of the dune
- Should plan for soil erosion and water runoff
- Should not alter the elevation or slope of the dune

**Recent updates to the Sand Dune Protection and Management Act.** In 2012, Governor Snyder signed Public Act 297. This Act updates the Critical Dune regulation in several ways, which all make acquiring permits to build on the dunes easier. The amendment clarifies the MDEQ cannot deny a permit solely because “public interest” would be violated by the proposed development. It also limits who is able to challenge a permit to just property owners and those living nearby. The Act no longer requires an analysis of alternative placements for buildings and requires the MDEQ to issue permits for driveways and other paved pathways to permanent structures in a CDA. Additionally,

<sup>71</sup> Ardizzone, Katherina A. and Mark A. Wyckoff, FAICP. Filling the Gaps: Environmental Protection Options for Local Governments, 2nd Edition. 2010.

<sup>72</sup> Ibid.

<sup>73</sup> Ibid.

<sup>74</sup> Soil Erosion and Sedimentation Control of the Natural Resources and Environmental Protection Act 1995 PA 451, as amended: R 323.1704.

<sup>75</sup> Ardizzone, Katherina A. and Mark A. Wyckoff, FAICP. Filling the Gaps: Environmental Protection Options for Local Governments, 2nd Edition. 2010.

<sup>76</sup> Ibid.

<sup>77</sup> Ibid.

<sup>78</sup> Ibid.

the Act now permits building on the lakeward-facing slope of the first foredune.<sup>79</sup>

**Local Opportunity.** Local opportunity under the updated Sand Dune Protection and Management Act is limited. While Part 353 allows the local government to assume the permitting process for CDAs, local governments can no longer be more restrictive than the State. As a result, adopting the permitting power of the State through the Sand Dune Protection and Management Act will not increase regulation on Critical Dune Areas. A local government can do much more to protect the dunes through zoning ordinances and other planning efforts.<sup>80</sup> Only 30% of the State’s dunes are considered Critical Dune Areas and are subject to state regulation, unless wetlands, High Risk Erosion Areas, or other environmental areas are located on the property.<sup>81</sup> Local government administration of the permitting process has been met with mixed results, especially in areas with small coastal lot sizes, where the requirements of Part 353 may trigger a regulatory takings claim.

### WATER MARK LINES

In addition to the above regulatory powers, there are also three water marks used by different entities to regulate activities along the shoreline.

First, the United States Army Corps of Engineers uses a high water mark line (called the Ordinary High Water Mark or OHWM) to determine the extent of navigational waters they regulate. This boundary is set based on a 581.5-foot water level above sea level for Lake Michigan. Second, the MDEQ regulates development below a separately determined water line. This is sometimes referred to as the Elevation Ordinary High Water Mark Line (EOHWM). This water line is elevation-based and is determined using a 580.5-foot water level above sea level for Lake Michigan.

There is only a 1-foot difference between the water level used to determine the regulatory authority of the USACE and the MDEQ. Because of this, the two bodies co-administer a joint permitting process for activities taking place below either water mark line. These include dredging, placing seawalls or rock revetment, or building of permanent docks.

Lastly, Michigan uses a water mark line sometimes referred to as the Natural Ordinary High Water Mark (NOHWM) to determine the extent of the public trust with regard to access along the shore. The NOHWM comes from the 2005 Michigan Supreme Court case *Glass v. Goeckel*, which determined the public has a valid right to walk below the NOHWM, defined as the point where natural vegetation begins or evidence of past high water levels exist.<sup>82</sup> This case also determined the NOWHM line is not equal to, or dependent on, the State’s regulatory power defined by the Elevation Ordinary High Water Mark.

### UNIVERSITY OF MICHIGAN RESEARCH STUDY

As part of this master planning process, the University of Michigan partnered with Grand Haven Charter Township and the City of Grand Haven to analyze shoreline dynamics to help Grand Haven manage its coastal areas. The remainder of this report summarizes the project team’s framework, results, and recommendations pertinent to this planning effort.

### OVERVIEW OF RESEARCH FRAMEWORK

The Research Framework of this study uses scenario planning to assess environmental and land use conditions under different management options and Climate Futures. Scenario planning, in general, identifies driving forces to inform a range of scenarios that are analyzed

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<sup>79</sup> Ibid.

<sup>80</sup> Ibid.

<sup>81</sup> Ibid.

<sup>82</sup> *Glass v. Goeckel*. Michigan Supreme Court. 29 July 2009

and evaluated. In this context, the project team identified two driving forces: (1) rising levels of flood waters and (2) local government management options. These forces informed the creation of multiple Climate Futures each of which are managed differently. Each Climate Future was tested against each management option and evaluated for impacts on the environment and land use in the community. This framework is presented visually in Table 2.

Table 2. Research Framework

	Lucky Climate Future	Expected Climate Future	Perfect Storm Climate Future
Current Structures and Infrastructure			
Build-Out According to Current Zoning			
Build-Out According to Current Master Plan			
Build-Out According to Best Management Practices			

## CLIMATE FUTURE DEFINITIONS

### “LUCKY” FUTURE

Under the Lucky Climate Future, Great Lakes water levels will continue to stay relatively low. Although there will be wave and wind action, major storm events and wave impacts will not encroach on properties landward of current beaches. Potentially flooded inland areas will remain as currently delineated by FEMA under effective FIRMs (specifically, zones A and AE). Other climactic conditions (e.g., storm frequency and intensity, heat waves) will remain consistent with patterns in recent history. The Lucky Climate Future also accounts for riverine flooding. A Lucky flood projection is shown in Map 1 at the end of this report.

### “EXPECTED” FUTURE

“Expected” Future – Under the Expected Climate Future, Great Lakes water levels will continue to fluctuate according to long-term decadal patterns, including recent extreme storm events incorporated into FEMA’s ongoing Great Lakes Coastal Flood Study. There will be periods of high water levels similar to the long-term highs recorded in 1986, with Great Lakes still-water elevation closer to that of long-term average (580 feet). There will also be more frequent large storm events than in the past. During these high water periods, waves from a “100-year” storm event will encroach on properties, with areas subject to wave action as delineated by FEMA’s proposed coastal high velocity (VE) zones; areas subject to sheet flow as delineated by FEMA’s proposed AO zones; and nearshore areas subject to inundation as delineated by FEMA’s proposed AE zones. During the “100-year” storm, areas located within the high velocity (VE) zone will be substantially damaged, and in some instances completely destroyed, while areas of the community within the AO and AE zones will be severely damaged by inundation. The Expected Climate Future also accounts for riverine flooding. Map 2 at the end of this report shows an Expected flood projection.

### “PERFECT STORM” FUTURE

“Perfect Storm” Future – Under the Perfect Storm Climate Future, Great Lakes water levels will continue to fluctuate according to decadal patterns, consistent with assumptions made for the Expected future. However, still-water elevation will be higher than the long-term average and closer to the long-term high (583 feet). In addition to that assumption, because of increased frequency and intensity of storms,

the shoreland areas subject to high velocity (VE) zones, as well as inundation as delineated by FEMA's proposed 500-year storm event (shaded-x zones), will essentially become the 100-year storm event (i.e., much more likely to occur), such that properties within these areas (i.e., in addition to the proposed AE and AO zones) will be severely damaged by inundation. Similar to the Expected Climate Future, during the "100-year" storm, areas located within the high velocity (VE) zone will be substantially damaged, and in some instances completely destroyed. The Perfect Storm Climate Future also accounts for riverine flooding. Map 3 at the end of this report shows a Perfect Storm flood projection.

## MANAGEMENT OPTIONS

### 1. Current Structures and Infrastructure

Under this option, the Grand Haven Community will continue to manage land in the same manner it currently employs, in accordance with adopted plans, zoning ordinances, and relevant local ordinances.

### 2. Build-out According to Current Zoning

Under this option, the community will undergo a full build-out of development according to its existing zoning code. Additional homes are built in areas at the base flood elevation and are at risk for flooding. This is not an exact picture of the development capacity in the community; rather, this work equates to an estimate of where development may possibly occur under the current zoning, with additional land set aside for open space, driveways, streets, and yards. See Map 4 at the end of this report for a visual of where these points are located.

### 3. Build-out According to Master Plan

Under this option, the community will achieve a full build-out in accordance with guidelines set forth in its master plan. This experimental option was intended to capture measurable differences between a master plan and a zoning ordinance, which could help local jurisdictions identify opportunities to improve both documents.

### 4. Build-out According to Best Management Practices (BMPs)

Under this option, the Grand Haven Community will adopt and implement Best Management Practices to preserve natural resources and protect private property. See Map 4 at the end of this document for a visual of where these points are located. For this study, only several Best Management Practices are modeled. The selected BMPs were chosen as they have a significant spatial effect that can be easily modeled using CommunityViz software. Additionally, each has a policy or regulatory impact achieved through a zoning ordinance.

The intent of including this management option is to present several amendments that could be adopted that may influence the impact on land use and the environment in the community.

The BMPs modeled in this management option are:

- 50-foot buffers around any inland water like rivers, lakes, and streams.
- 50-foot buffers around any wetland 5 or more acres in size, as defined by the State of Michigan's Final Wetland Inventory data.
- A complete restriction of any development within a wetland 5 or more acres in size, as defined by the State of Michigan's Final Wetland Inventory data.

**Scope of analysis.** Each Climate Future was tested against each management option for its impact on the land use and environmental conditions in the Grand Haven Community. The experimental “Build-out According to Master Plan” management option served as a useful conceptual aid during the planning process, but it did not yield enough measurable data to be effectively modeled. Therefore, only the results of the “Current Practices,” “Build-out According to Current Zoning,” and “Build-out According to Best Management Practices” management options are discussed in this report.

## SCENARIO PLANNING TO ASSESS LAND USE AND ENVIRONMENTAL CONDITIONS

Each management option can be analyzed in each of the three Climate Futures. This creates an array of scenarios the Township could reasonably encounter in the foreseeable future regarding flooding and local government management options. Each scenario has a different impact on the land use and environmental conditions in Grand Haven Township. The remainder of this report presents the results of the modeling, derived by pairing each management option with each Climate Future. Land use impacts include the acreage, parcels, structures, and critical facilities that would be impacted under different Climate Futures for each management option. Environmental conditions include the acreage of wetlands, tree canopy, impervious surface, Critical Dune Areas, and High Risk Erosion Areas impacted in each Climate Future for each management option. Lastly, the fiscal conditions associated with scenario are evaluated.

## LAND USE RESULTS

### TOTAL ACRES IMPACTED BY FLOODING

The total acres of land impacted by flooding increases from the Lucky Climate Future to the Perfect Storm Climate Future. The number of acres impacted increases the most between the Lucky and Expected forecast (15%). Between the Expected and Perfect Storm, the total acres impacted increases by about 3%. Table 3 shows the total acres of land impacted under each future flood forecast in Grand Haven Township.

Table 3. Total Land Acres Impacted by Flooding

	Lucky	Expected	Perfect Storm
Grand Haven Township	1,195	1,381	1,418

### PARCELS IMPACTED BY FLOODING

As Table 4 shows on the next page, between 700 and 950 parcels are impacted by flooding depending on the severity of the Climate Future.

In the Lucky Climate Future, 89% of the parcels impacted are zoned for some type of residential use. An additional 5% (37 parcels) are zoned agricultural, and nearly 3% (19 parcels) are zoned for Planned Unit Development.

In the Expected Climate Future, 91% percent of parcels impacted by flooding are zoned for some type of residential use. Between the Lucky and Expected Climate Futures, an additional 224 parcels are impacted. The bulk of this increase impacts parcels zoned R-1 Single Family Residential, which encompass the majority of the shoreline.

In the Perfect Storm Climate Future, the number of residential parcels impacted increased by 39% from the Lucky Climate Future to a total of 869 parcels. In this Climate Future, a greater number of Planned Unit Development parcels are also impacted.

In general, as the Climate Future causes more severe flooding, greater numbers of residential and publicly owned parcels may be impacted. Commercial parcels seem to bear the least impact across all Climate Future forecasts.

Maps 5, 6, and 7 visualize the type of parcels impacted under the Lucky, Expected, and Perfect Storm Climate Futures.

Table 4. Parcels Impacted by Zone

	Lucky		Expected		Perfect Storm	
Agricultural (AG)	37	5.3%	37	4.0%	37	3.9%
Commercial I (C-1)	3	0.4%	3	0.3%	3	0.3%
Industrial I (I-1)	1	0.1%	1	0.1%	1	0.1%
Planned Unit Development (PUD)	19	2.7%	22	2.4%	22	2.3%
Residential I (R-1)	303	43.3%	523	56.6%	535	56.3%
Residential II (R-2)	279	39.9%	279	30.2%	293	30.9%
Residential V (R-5)	1	0.1%	1	0.1%	1	0.1%
Rural Preserve	15	2.1%	15	1.6%	15	1.6%
Rural Residential (RR)	40	5.7%	40	4.3%	40	4.2%
Other	2	0.3%	3	0.3%	3	0.3%
<b>Total Parcels Impacted by Zone</b>	<b>700</b>	<b>100%</b>	<b>924</b>	<b>100%</b>	<b>950</b>	<b>100%</b>

### NUMBER OF STRUCTURES IMPACTED BY FLOODING

Between 46 and 385 structures would be impacted in the Township depending on the severity of the Climate Future and the management practices the Township pursues. Table 5 summarizes the total number of structures impacted under the Climate Futures and management options.

Table 5. Number of Structures Impacted by Flooding

	Lucky	Expected	Perfect Storm
Current Infrastructure and Development	46	96	119
Build-Out According to Current Zoning <i>(Additional Structures Impacted)</i>	209	347	385
Build-Out According to Best Management Practices <i>(Additional Structures Impacted)</i>	52	145	171

In the Lucky Climate Future, 52 properties could be impacted if Best Management Practices are implemented for future development. If Best Management Practices are not implemented and the Township achieves a full build-out according to current zoning, 209 structures could be built in areas subject to inundation.

In the Expected Climate Future, 145 properties could be impacted if Best Management Practices are implemented for future development. If Best Management Practices are not implemented, 347 structures could be subject to inundation.

In the Perfect Storm Climate Future, 171 properties could be impacted if Best Management Practices are implemented for future development. If Best Management Practices are not implemented, 385 structures could be subject to inundation.

In general, as the Climate Future causes more severe flooding, implementing Best Management Practices reduces the number of structures impacted by over 60% as the community grows.

### CRITICAL FACILITIES IMPACTED BY FLOODING

There were no critical facilities impacted under any future climate forecast. Critical facilities analyzed included current locations of police and fire stations, schools, places of worship, utilities, public facilities, and water treatment plants.

### ENVIRONMENTAL RESULTS

#### WETLANDS

Wetlands are an important tool for community resilience, particularly for benefits related to flood control and water quality. GIS was used to compare existing wetlands to areas of potential wetland restoration in each Climate Future to give the Township a broader picture of areas that could best provide the flood-control benefits of wetlands. Additionally, the project team used GIS to count the number of unprotected wetlands under 5 acres in size using GIS. It is important that this analysis is an overall, generalizable study useful to compare one scenario to another. It should not be used to identify individual wetlands or areas of private property suitable to wetland restoration.

Table 6 shows the number of acres of wetlands impacted by flooding in each Climate Future. Existing wetlands are estimated using national and state data, and wetlands included in Maps 8, 9, and 10 either are, or are likely to be, a wetland. Table 6 shows the inundation of existing wetlands is relatively stable across the Climate Futures. There are nearly 1,400 acres of existing wetlands impacted by all three Climate Futures. These wetlands provide some flood protection by absorbing flood water. While this study does not quantify the benefit of the existing wetlands to the Township, studies have shown one acre of coastal wetlands can hold up to one million gallons of water.

Over 40% of the Township’s existing wetlands are likely to received flood waters in the Lucky Climate Future. The existing wetlands compared to the three Climate Futures are shown in Maps 8, 9, and 10.

Potential wetlands are areas with hydric soils, are not currently developed, and have been identified by the National Wetland Inventory as potential wetland restoration areas. Table 6 shows there is some opportunity to increase wetlands in each flood zone – an increase of about 14% to 15% depending on the Climate Future. Potential wetlands compared to three Climate Futures are shown in Maps 11, 12, and 13.

Wetlands under 5 acres in size are considered unprotected, as they are not currently regulated by any local or state process. In aggregate, small wetlands can still have a large effect on the ecosystem’s flood control. Table 6 shows the Township has between 80 to 90 acres of unprotected wetlands in areas likely to flood in each Climate Future, totaling over one-third of the Township’s total unprotected wetlands. Unprotected wetlands are shown in Maps 14, 15, and 16.

Table 6. Wetlands Summary

	Lucky		Expected		Perfect Storm	
	Acres	% of total wetland type	Acres	% of total wetland type	Acres	% of total wetland type
Existing Wetlands	1,390	41%	1,394	41%	1,399	42%
Potential Wetlands	199	6%	201	6%	216	6%
Unprotected Wetlands	82	33%	89	36%	91	37%

**WETLANDS AT RISK**

It is difficult to estimate the impacts of future development on existing and potential wetlands, given the site-specific permitting process currently in place. That is, it is impossible to predict how many land owners may apply to develop a wetland area, or how many of those applications may be approved or denied. However, the project team was able to demonstrate the impact future development may have on wetlands by visually showing the wetlands on or near properties with room for development under current zoning. Map 17 shows existing wetlands and nearby areas that are open, under current zoning, for development. Many existing wetlands in the Township are near areas open to development.

If the Township pursues development in line with Best Management Practices, fewer existing wetlands are at risk as seen by comparing the orange and purple points in Map 17.

**TREE CANOPY**

Trees help absorb some inundation during times of flooding. In addition to flood mitigation, tree canopies reduce heat by providing shade and wildlife habitat, improving air quality, and adding aesthetic value. The Township has 11,168 acres of land covered by tree canopy.

The purpose of this tree canopy analysis is to roughly estimate the area on public properties and road right of ways that might be forested to better mitigate increased flooding and its associated impacts. It may lay a groundwork for future research into areas that could be strategically reforested to help reduce flood risk. Table 7 shows the acres of existing and potential tree canopy in each Climate Future.

This tree canopy analysis shows the potential for increased tree canopy on public properties and road right of ways (i.e., not including private property) in each flood zone. Map 18 shows the existing and potential tree canopy used in this analysis. In general, tree planting is a weak strategy for flood reduction in the Township, as the potential tree canopy is only three acres in each Climate Future. The high acreage of existing tree canopy suggests maintaining existing tree canopy is a key strategy the Township can use to increase resiliency.

Table 7. Tree Canopy Analysis

	Lucky	Expected	Perfect Storm
Existing Tree Canopy (Acres)	636	710	728
Potential Tree Canopy (Acres)	3	4	4
% of Potential Tree Canopy Increase	1%	0.5%	0.5%

**IMPERVIOUS SURFACES IN AREAS LIKELY TO FLOOD**

Impervious surfaces have a well-understood negative impact in a flood event. The increased runoff can exacerbate the risk of structural damage and reduce regional water quality. This is an especially important variable to consider in a flood zone. Impervious surface includes building footprints as well as sidewalks, driveways, and roads.

The purpose of this analysis is to roughly estimate the percentage of each flood zone that is currently impervious. These numbers only reflect current conditions and can be seen as conservative in light of inevitable future growth.

The Township has, compared to nearby urbanized areas, a low proportion of impervious surface as shown in Map 19. Table 8 shows a nominal percentage of each Climate Future’s flood area is paved. Studies recommend the percentage of impervious surface in any general

area be below 10% to remain protected from harmful amounts of runoff.<sup>83</sup> This analysis suggests the Township should work to prevent large increases in impervious surface, especially in the Climate Future areas subject to flooding.

Table 8. Impervious Surfaces in Acres

	Lucky	Expected	Perfect Storm
Impervious Surface (Acres)	5	11	13
% of Impervious Land in Each Climate Future	0%	1%	1%

### CRITICAL DUNE AREAS IMPACTED BY FLOODING

Critical Dune Areas are important assets for the Grand Haven Community and, due to their soil composition, may be especially vulnerable to damage from flooding. Our intent is to provide some base of analysis for the future health of Critical Dunes, especially as development on Critical Dunes is likely to increase due to weakened regulations noted earlier.

While it is impossible to predict the number and scope of development permits that may be granted in the future, the project team was able to provide some insight into parcels that may be developed in or near Critical Dune Areas (Maps 20 and 21).

Table 9 shows that relatively few acres of Critical Dune Area would be impacted by flooding in any of the Climate Futures analyzed. Around 10% of the Critical Dune land is impacted under Expected and Perfect Storm Climate Futures. While this analysis does not investigate how dune land behaves during flooding, the proportion of dune land in each flood zone is useful information for planning future development in the Township.

Perhaps more importantly, the potential for development in and near Critical Dune Areas is very high. Map 20 shows the “Build-out According to Current Zoning” management option in relation to Critical Dune Areas. It is clear the Grand Haven Community has intense build-out potential in areas designated as Critical Dunes. The Township should consider methods, as recommended in the next section, to restrict this potential for development. Map 21 shows the build-out potential of the Township in relation to Critical Dune Areas if the Township builds out according to Best Management Practices. Still, great potential for development is clustered in or near Critical Dune Areas, suggesting the Township should consider new methods, beyond what is modeled here, to address this concern.

Table 9. Critical Dune Areas

	Lucky	Expected	Perfect Storm
Critical Dune (Acres)	56	198	198
% of land in each climate future designated Critical Dune	3%	10.4%	10.2%

### HIGH RISK EROSION AREAS IMPACTED BY FLOODING

Nearly the entirety of Grand Haven Township’s shoreline is designated as a High Risk Erosion Area (HREA). As part of this study, we compared HREAs in the Township with VE zones, the zones designated in the Great Lakes Coastal Flood Study as having strong, high velocity waves that could increase the pace of erosion. Map 22 shows the areas along the coastline designated as an HREA as a line offset from the shore. The map also shows areas designated as a VE zone in the Great Lakes Coastal Flood Study.

<sup>83</sup> Flinker, AICP (2010). The Need to Reduce Impervious Cover to Protect Water Quality. Web. Accessed July 2015.

## **FISCAL RESULTS**

The fiscal analysis is meant to give Grand Haven Charter Township an idea of the tax revenue, property values, and potential fiscal risk generated by residential homes in high risk flood areas. Using the project framework in Figure 1, the fiscal analysis determines the risk and benefit of development in coastal areas in the Lucky, Expected, and Perfect Storm Climate Futures under the various management options. For the ease of the reader, the results are organized in steps. First, the existing revenue generated by properties in high risk flood areas is identified. Next, the cost associated with public services and potential damages from flooding is calculated. Finally, the revenue (positive value) and costs (negative value) are added together to produce an overall net value. The end result of the fiscal study shows the net value as a negative number in each flood scenario. In other words, regardless of how extreme future flooding may be, the costs of servicing and repairing coastal properties outweigh the fiscal benefits to the Township.

In addition to analyzing existing properties, the project also estimated the fiscal conditions of homes that could be built in the Township under the current zoning classifications. To do this, the team used simply assigned a “future” property the average fiscal conditions of properties within a quarter mile radius of the future development.

### **STEP ONE: IDENTIFY THE REVENUE**

There are two kinds of revenue looked at in this fiscal analysis. First, the share of the Township’s tax base residing in high risk flood areas was identified using the SEV or State Equalized Value. Second, this analysis identified the total property tax revenue the Township collects for homes located in high risk flood areas under each Climate Future and Management Option.

### **COMPARING THE TAX-BASE USING SEV VALUES**

The number of properties and share of the tax-base impacted by flooding under the Lucky, Expected, and Perfect Storm Scenarios are included in Tables 10, 11, and 12. Each table shows a different management option.

Under current conditions (Table 10), only 0.27% of properties may be impacted under the Lucky Climate Future. If the Township builds to fully maximize its current zoning ordinance (Table 11), about 2.86% of properties may be impacted under the Perfect Storm Climate Future. If the Township grows instead according to Best Management Practices (Table 12), about 1.4% properties may be inundated in the Perfect Storm Climate Future.

The SEV of properties at risk is proportionately higher than properties not at risk under the various scenarios. In other words, a property in a high risk flood area tends to have a higher SEV than properties elsewhere in the Township. For example, if the Township builds to fully maximize its current zoning ordinance (Table 11), 385 homes are likely to flood in the Perfect Storm Climate Future. Those properties comprise 2.86% of the Township’s total stock yet 3.01% of the Township’s total SEV.

Table 10. Comparing the Taxbase under the Current Infrastructure Management Option

	Lucky	Expected	Perfect Storm
# of Properties Impacted by Flooding	23	96	119
# of Properties Outside the Flooded Area	8,636	8,563	8,540
<b>Share of Flooded Properties (compared to total)</b>	<b>0%</b>	<b>1.1%</b>	<b>1.4%</b>
Total SEV of Properties Impacted by Flooding (\$)	20,460,600	56,208,600	59,617,400
Total SEV of Properties Outside the Flooded Area (\$)	3,774,088,250	3,738,340,350	3,734,931,450
<b>Share of Total SEV located in Flooded Areas</b>	<b>1%</b>	<b>1.5%</b>	<b>1.6%</b>

Table 11. Comparing the Taxbase under the Build-Out According to Current Zoning Ordinance Management Option

	Lucky	Expected	Perfect Storm
# of Properties Impacted by Flooding	186	347	385
# of Properties Outside the Flooded Area	13,655	13,494	13,456
<b>Share of Flooded Properties (compared to total)</b>	<b>1%</b>	<b>2.6%</b>	<b>2.9%</b>
Total SEV of Properties Impacted by Flooding (\$)	50,283,817	137,149,006	141,818,332
Total SEV of Properties Outside the Flooded Area (\$)	4,805,355,624	4,471,490,435	4,713,821,109
<b>Share of Total SEV located in Flooded Areas</b>	<b>1%</b>	<b>2.9%</b>	<b>3.0%</b>

Table 12. Comparing the Taxbase under the Build-Out According to Best Management Practices Management Option

	Lucky	Expected	Perfect Storm
# of Properties Impacted by Flooding	29	145	171
# of Properties Outside the Flooded Area	12,398	12,282	12,256
<b>Share of Flooded Properties (compared to total)</b>	<b>0%</b>	<b>1.2%</b>	<b>1.4%</b>
Total SEV of Properties Impacted by Flooding (\$)	22,618,123	82,589,741	86,241,018
Total SEV of Properties Outside the Flooded Area (\$)	5,416,430,586	4,580,325,594	4,576,674,317
<b>Share of Total SEV located in Flooded Areas</b>	<b>0%</b>	<b>1.8%</b>	<b>1.9%</b>

**PROPERTY TAX GENERATED BY HIGH-RISK PROPERTIES**

The dollar amount of property tax revenue Grand Haven Charter Township collects from properties impacted under the various scenarios are presented in Table 13. This analysis shows the Township currently benefits from floodplain development in significant way (ranging from about 90,000 to 638,000 dollars depending on the extent of the flooding and management option). On one hand, the Township could gain significant tax revenue by encouraging development in high risk areas according to current zoning ordinances. However, by restricting development in high risk areas using Best Management Practices, the Township would still gain considerable tax revenue (around 388,000 dollars).

Table 14 shows the values of Table 13 in a standardized form to allow for an easier comparison between categories.

Table 13. Property Tax Revenue Collected by the Township

	Lucky	Expected	Perfect Storm
Current Infrastructure and Development	92,011	252,770	268,099
Build-Out According to Current Zoning <i>(Additional Tax Revenue)</i>	226,126	616,759	637,757
Build-Out According to Best Management Practices <i>(Additional Tax Revenue)</i>	101,713	371,406	387,825

Table 14. Property Tax Revenue Collected by the Township, Standardized

	Lucky	Expected	Perfect Storm
Current Infrastructure and Development	1.0	2.7	2.9
Build-Out According to Current Zoning <i>(Additional Tax Revenue)</i>	2.5	6.7	6.9
Build-Out According to Best Management Practices <i>(Additional Tax Revenue)</i>	1.1	4.0	4.2

**STEP TWO: IDENTIFY THE COST**

This analysis identified two kinds of costs for development in floodplains: the public cost to serve developments in high risk areas and the cost of flood damages based on depth of flooding and wave action. In the next step, these costs are summed together and compared to the revenue identified in step one.

**PUBLIC SERVICE COST**

Information on the Township’s annual public cost to provide services is public information found in annual financial reports. The public cost included in the Table 15 is found by dividing the Township’s total government expenses by the number of properties, and then multiplying by the number of properties impacted by flooding in each scenario.

In general, the Township spends nearly \$10,000 to serve current residences in the Lucky Climate Future. If the Township builds out according to its current zoning ordinance, the public service cost would increase to about \$167,000. If the Township builds out according to Best Management Practices, however, the public service cost would be around \$74,000.

Table 16 shows the values of Table 15 in a standardized form to allow for an easier comparison between categories.

Table 15. Public Cost to Serve Development

	Lucky	Expected	Perfect Storm
Current Infrastructure and Development	9,956	41,555	51,511
Build-out According to Current Zoning	80,513	150,204	166,653
Build-out According to Best Management Practices	12,553	62,765	74,020

Table 16. Public Cost to Serve Development, Standardized

	Lucky	Expected	Perfect Storm
Current Infrastructure and Development	1.0	4.2	5.2
Build-out According to Current Zoning	8.1	15.1	16.7
Build-out According to Best Management Practices	1.3	6.3	7.4

**DIRECT BUILDING DAMAGE**

The project team developed a simple, repeatable method to estimate the cost of damages to properties in flooded areas. The method relies on the Base Flood Elevations and Wave Run-Up Heights to inform the depth and extent of flooding in the Township. Each flooded property was then assigned a percentage of damage based on its depth of flooding. The percent damage estimate is based on the Depth Damage Curves developed by the United States Army Corps of Engineers. A cost, using the property’s SEV, was assigned to all properties impacted by flooding under the scenarios. The direct building damage estimates are shown in Table 17. A range of damage estimates are listed for the Current Infrastructure Management Option.

As Table 17 shows, the estimated damage costs escalate dramatically between the Lucky and Expected Climate Futures (from 560,000 dollars to upwards of 50 million dollars as a high estimate). However, by building out according to Best Management Practices, impacted properties would incur substantially less damage (from 1.5 to 35 million dollars) than if no Best Management Practices were implemented.

Table 18 shows the average value of each range in Table 17 in a standardized form to allow for an easier comparison between categories.

Table 17. Approximate Cost of Building Damages Caused by Flooding in High-Risk Areas

	Lucky	Expected	Perfect Storm
Current Infrastructure and Development	560,000	600,000 to 2 Million	2 to 53 Million
Build-out According to Current Zoning	11 Million	38 to 113 Million	59 to 121 Million
Build-out According to Best Management Practices	500,000	1.5 to 35 Million	3 to 36 Million

Table 18. Approximate Cost of Building Damages Caused by Flooding in High-Risk Areas, Standardized

	Lucky	Expected	Perfect Storm
Current Infrastructure and Development	1	92.9	94.6
Build-Out According to Current Zoning	20.6	294.6	310.7
Build-Out According to Best Management Practices	2	155.4	158.9

**STEP THREE: COMPARE REVENUES AND COSTS**

Steps One and Two identified likely revenues and costs for properties impacted by flooding under the various scenarios. In Step Three, the revenues and costs are compared in order to provide a greater understanding of the overall fiscal risk associated with floodplain development.

As Table 19 shows, the revenue gained from floodplain development each year far outweighs the cost to provide public services to floodplain properties. However, the damage incurred during times of flooding is exponentially higher than the net annual revenue. In other words, if damaged, the cost of building in high risk areas far outweighs the fiscal benefits the Township receives. The fiscal risk is lowered if the Township adopted Best Management Practices and restricts new development accordingly.

Table 19. Summary of Fiscal Conditions in Grand Haven Township

	Total Annual Revenues	Total Annual Costs	Net Annual Revenue	Potential Damage Cost
<b><i>Management Option 1: Current Infrastructure and Development</i></b>				
Lucky	97,996	9,956	88,041	560,000
Expected	277,751	41,555	236,196	52,000,000
Perfect Storm	299,066	51,511	247,555	53,000,000
<b><i>Management Option 2: Build-Out According to Current Zoning</i></b>				
Lucky	274,527	80,513	194,015	11,560,000
Expected	707,057	150,204	556,852	165,000,000
Perfect Storm	737,943	556,852	571,290	174,000,000
<b><i>Management Option 3: Build-Out According to Best Management Practices</i></b>				
Lucky	109,260	12,553	96,708	1,060,000
Expected	409,138	62,765	346,373	87,000,000
Perfect Storm	432,324	74,020	358,304	89,000,000

## RECOMMENDATIONS

The analysis presented above modeled only several of many Best Management Practices. Yet, even these minimal interventions greatly reduced the land use and environmental assets at risk as the community and the climate continues to change. The goal of this exercise was to identify how the order of magnitude changes as flood risks rise. By implementing Best Management Practices, this analysis suggests the land use and environmental risks can be largely addressed.

Following is a list of Best Management Practices collected from other research throughout the state. This list is in not comprehensive, and each recommendation needs further research to determine if it is appropriate in either community.

These recommendations are summarized around six key areas of focus:

- Private Property
- Public Health
- Emergency Management
- Public Infrastructure
- Natural Resources and Ecosystem Services
- Water Quality

### PROTECTING PRIVATE PROPERTY

- a. Public acquisition of repetitive loss areas or areas identified as at risk for coastal flooding. Develop these areas as parks, trails, or other community amenities that can withstand temporary flooding and inundation.
- b. Participate in the FEMA Community Rating System and set benchmarks to increase score.
- c. Adopt a local wetland ordinance to protect smaller wetlands (less than 5 areas) to promote wetland services in neighborhoods.
- d. Require that state and local wetland permits are obtained prior to a zoning amendment approval.
- e. Enact deed restrictions stating the existence of an environmentally sensitive area on public property.
- f. Encourage implementation of green infrastructure through incentives, stormwater utility fees and stormwater credit manuals.
- g. Encourage cluster development that allows structures to be sited in less vulnerable coastal areas.
- h. Adopt performance standards that minimize on-site soil and vegetative disruptions.
- i. Implement a Transfer of Development Rights program, where development rights are transferred to inland areas away from coastal hazards.
- j. Implement a Purchase of Development Rights program by working with a land bank or conservation district in order to purchase rights to development in areas at risk for coastal zone flooding.

### PROTECTING PUBLIC HEALTH

- k. Disconnect combined sewer system (stormwater and sanitary).
- l. Provide incentives for on-site stormwater treatment to reduce standing water.

- m. Increase capacity of stormwater sewer system to handle heavier precipitation events.

#### **EMERGENCY MANAGEMENT**

- n. Regularly update the County Hazard Mitigation Plan to address coastal hazards and dynamic coastal conditions.
- o. Ensure at least one municipal staff employee is a certified floodplain manager.
- p. Convene collaborative discussions to integrate emergency management planning and land use planning from a climate adaptation perspective.
- q. Implement and test emergency communications systems.
- r. Identify public locations with back-up power supplies.
- s. Require homes in areas prone to flooding and/or storm events to have back-up power supplies.
- t. Ensure all large institutions have an all-hazards plan.

#### **PROTECTING PUBLIC INFRASTRUCTURE**

- u. Update design standards to build roads, culverts, and bridges in adherence with updated precipitation tables.
- v. Do not allow public infrastructure to be built in Special Flood Hazard Areas, VE zones, AE zones, AO zones, or X zones.
- w. Ensure critical facilities are sited outside the VE/AE zones.
- x. Encourage development to occur in high, vertical density in areas where infrastructure is available. This will help ensure the protection of natural spaces and help local governments maintain valuable infrastructure.

#### **PROTECTING NATURAL RESOURCES AND MAXIMIZING ECOSYSTEM SERVICES**

- y. Identify high priority public lands for wetland restoration and apply for MDEQ grants to fund restoration projects.
- z. Conduct a community inventory of environmentally sensitive areas and create 50-foot buffers around all environmentally sensitive areas.
- aa. Require native vegetation on coastal properties, particularly near Critical Dune Areas and other environmentally sensitive areas.
- bb. Zone for low intensity and low density around environmentally sensitive areas.
- cc. Adopt a local soil erosion and sedimentation control ordinance.
- dd. Adopt a stormwater control ordinance for stormwater retention and treatment.
- ee. Adopt overlay zones, including: prohibition of off-road vehicles; special use permits and developments in well-protected and vegetative areas behind foredunes; impervious surface restrictions; design standards allowing for raised structures; and native vegetation requirements.
- ff. Designate Critical Dune Areas and adopt a local critical dune ordinance to protect these areas.

#### **PROTECTING WATER QUALITY**

- gg. Require street vacuuming or street sweeping on a regular basis.

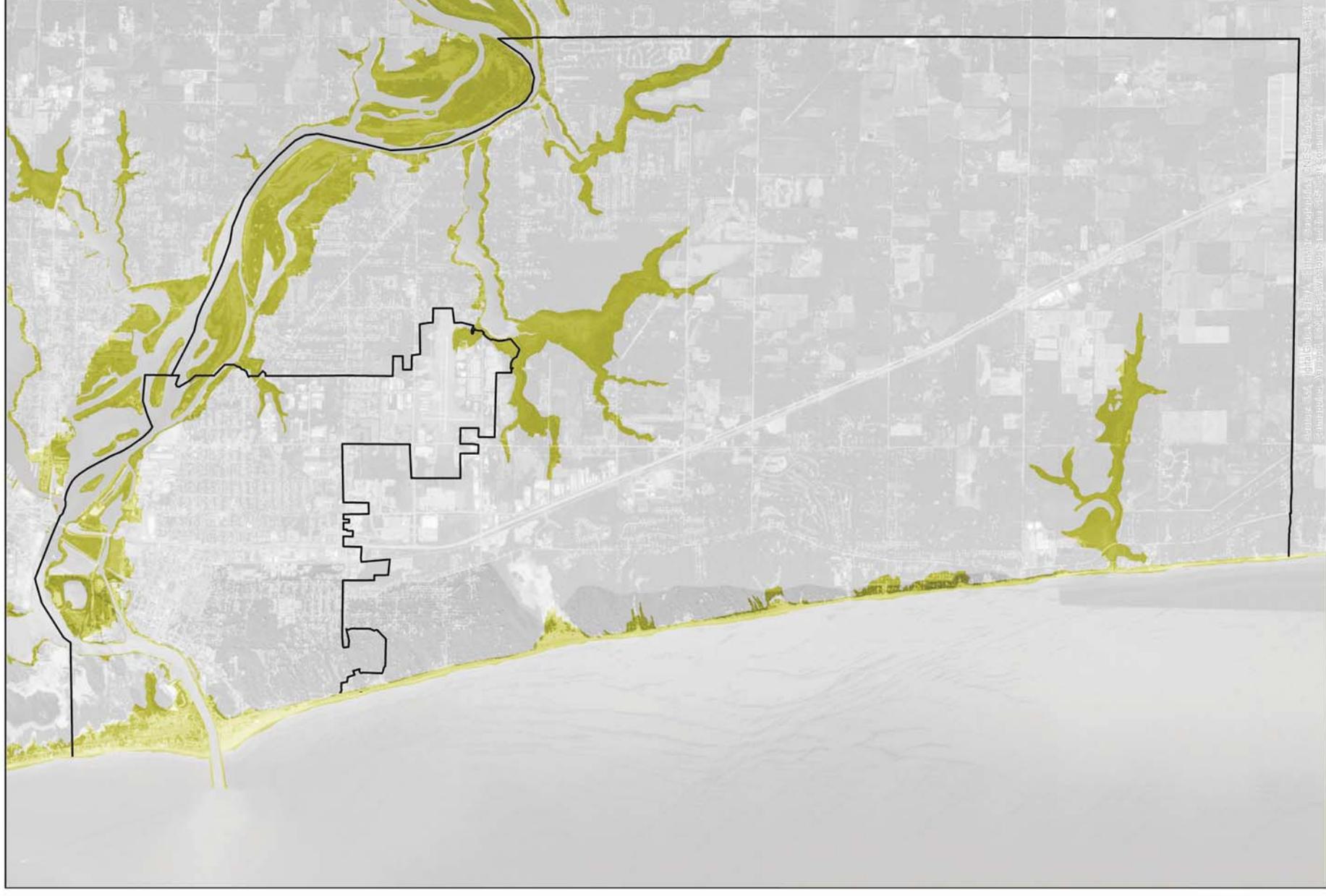
- hh. Prioritize open space protection through the master plan process for areas that are continuous, provide flood protection, and provide stormwater filtration.
- ii. The Master Plan should recognize the relationship between water quality and stormwater management.
- jj. Limit percentages of impervious surfaces in new developments (no more than 10%).
- kk. Adopt lakeshore setbacks to regulate tree cutting, mowing, and fertilizer use.
- ll. Regulate key hole development (large developments with narrow frontage on the water).

## **CONCLUSION AND NEXT STEPS**

Overall, this project outlines a clear way for the Grand Haven Community to identify areas at risk of flooding. It includes a strategy for reasonably assessing build-out potential in relation to flood risk, and evaluates how that risk lowers when each jurisdiction adopts several Best Management Practices as ordinances. These carefully adopted Best Management Practices can make the community more resilient to flood risk in terms of land use (structures, roads, and critical facilities impacted) and environmental assets (wetlands, trees, pervious surface). This analysis suggests that the Grand Haven Community should conduct further research and choose Best Management Practices that best fit the community's unique needs. To that end, this report includes a library of Best Management Practices that could be adopted in this and future master plans, zoning ordinances, and other ordinances.



Map 2. "Expected" Climate Future



"Expected" Flood Scenario

Map 2. "Expected" Climate Future. Prepared by the City of Seattle, Washington, in partnership with the University of Washington.

1:42,000 0 0.25 0.5 1 1.5 2 Miles

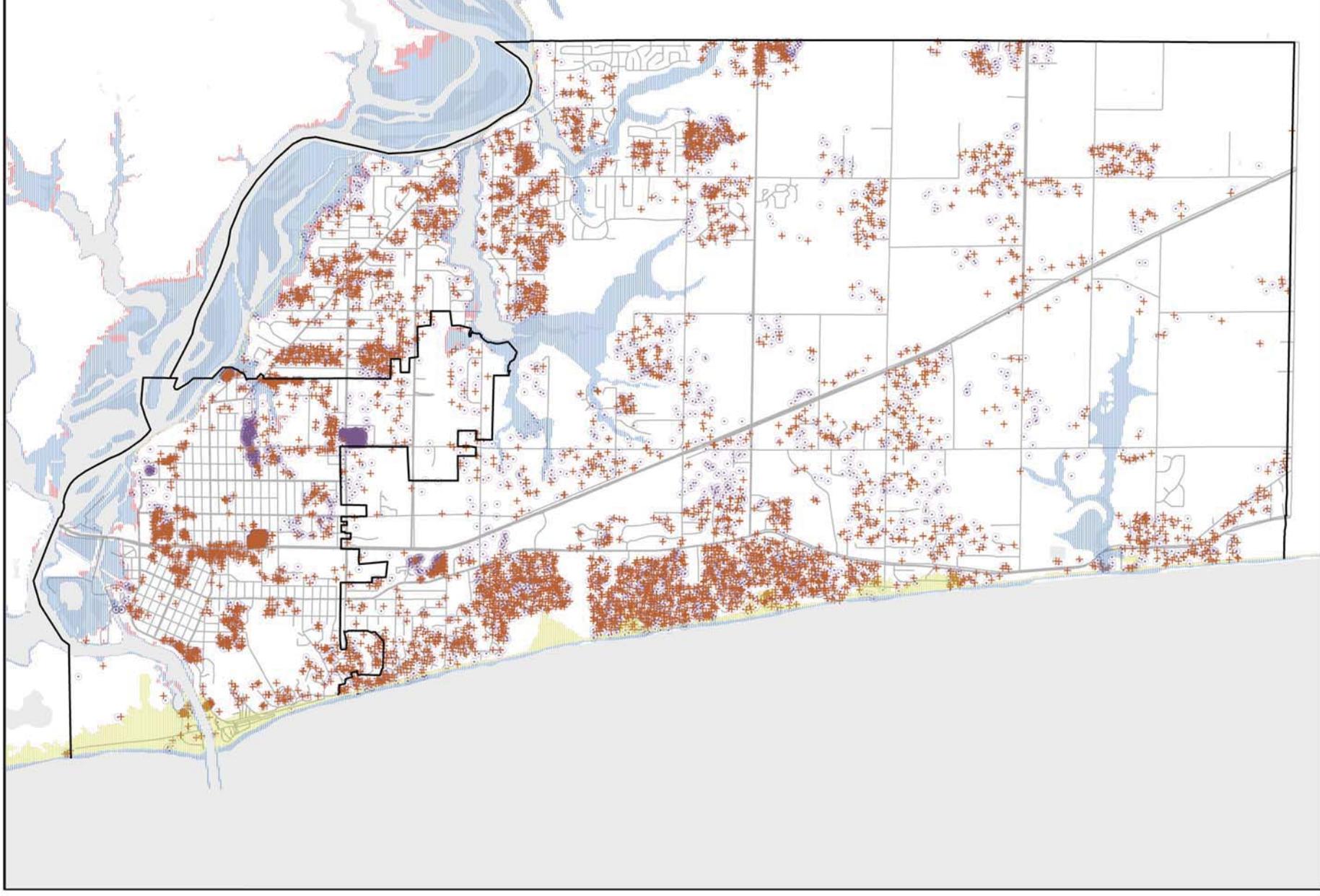
Map 3. "Perfect Storm" Climate Future



Perfect Storm Flood Scenario

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Map 4. Build-out Management Options and Climate Futures



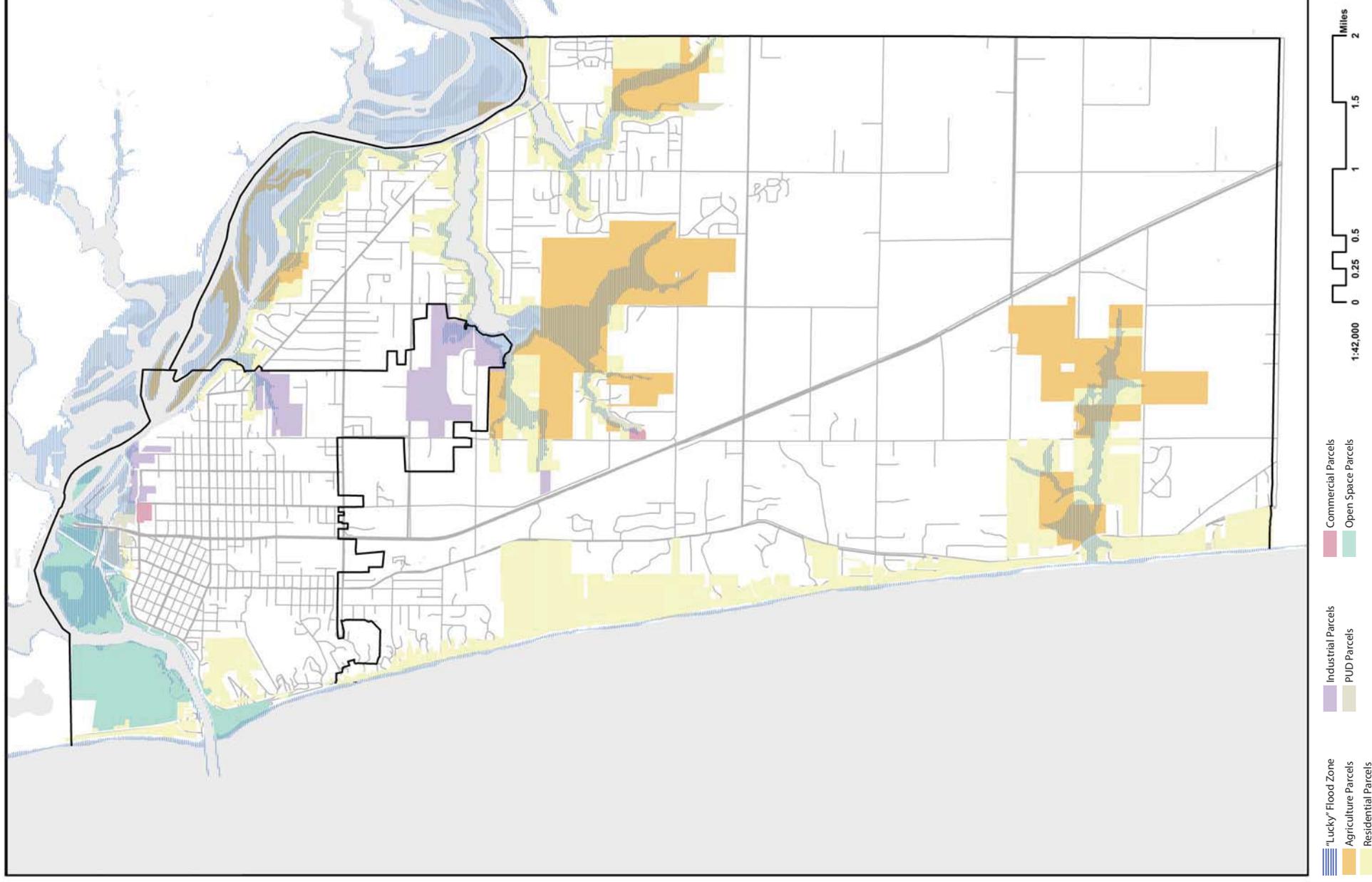
█ Lucky Flood Zone  
█ Expected Flood Zone  
█ Perfect Storm Flood Zone

○ Build-out According to Current Zoning  
+ Build-out According to Best Management Practices

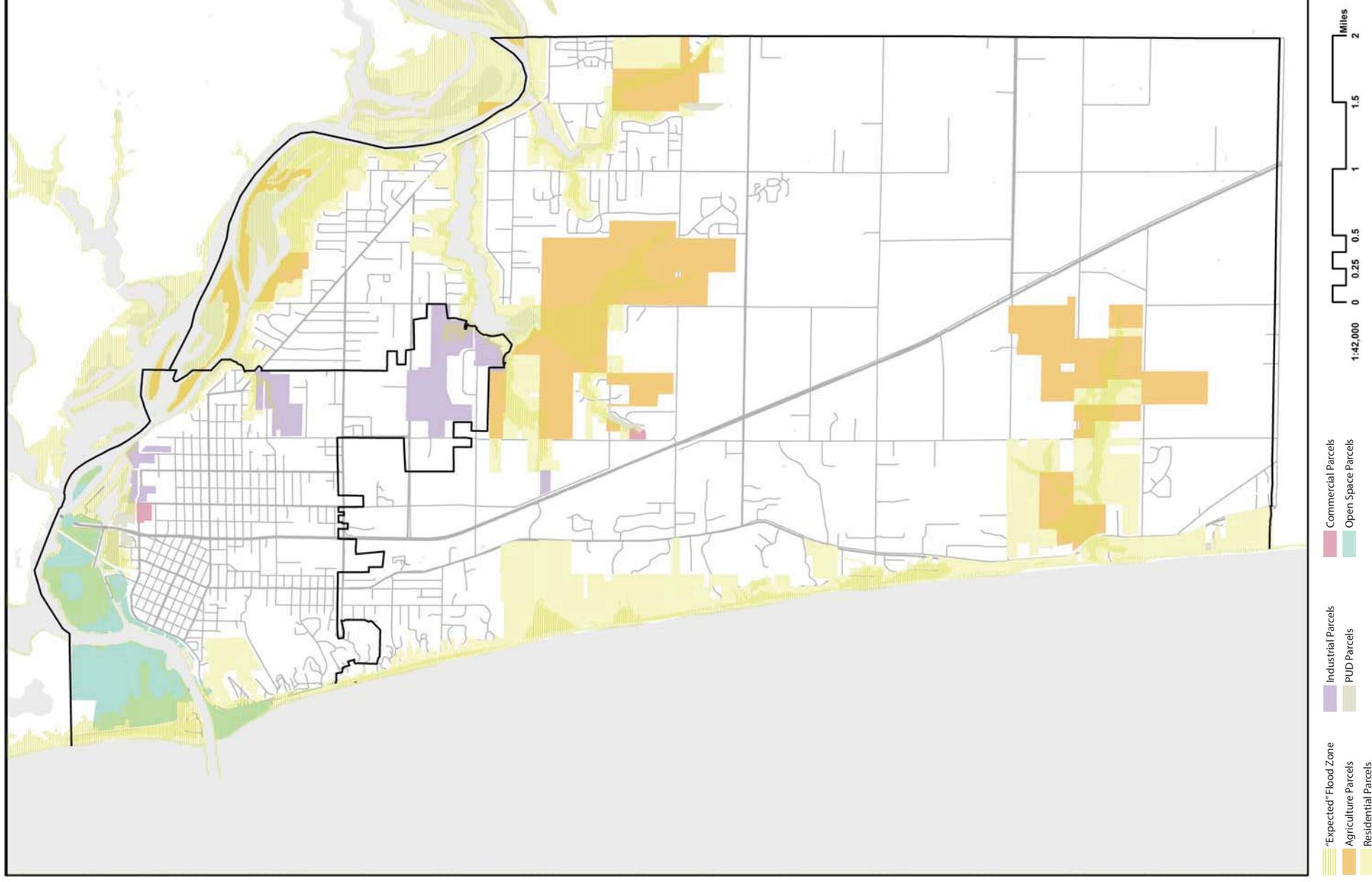
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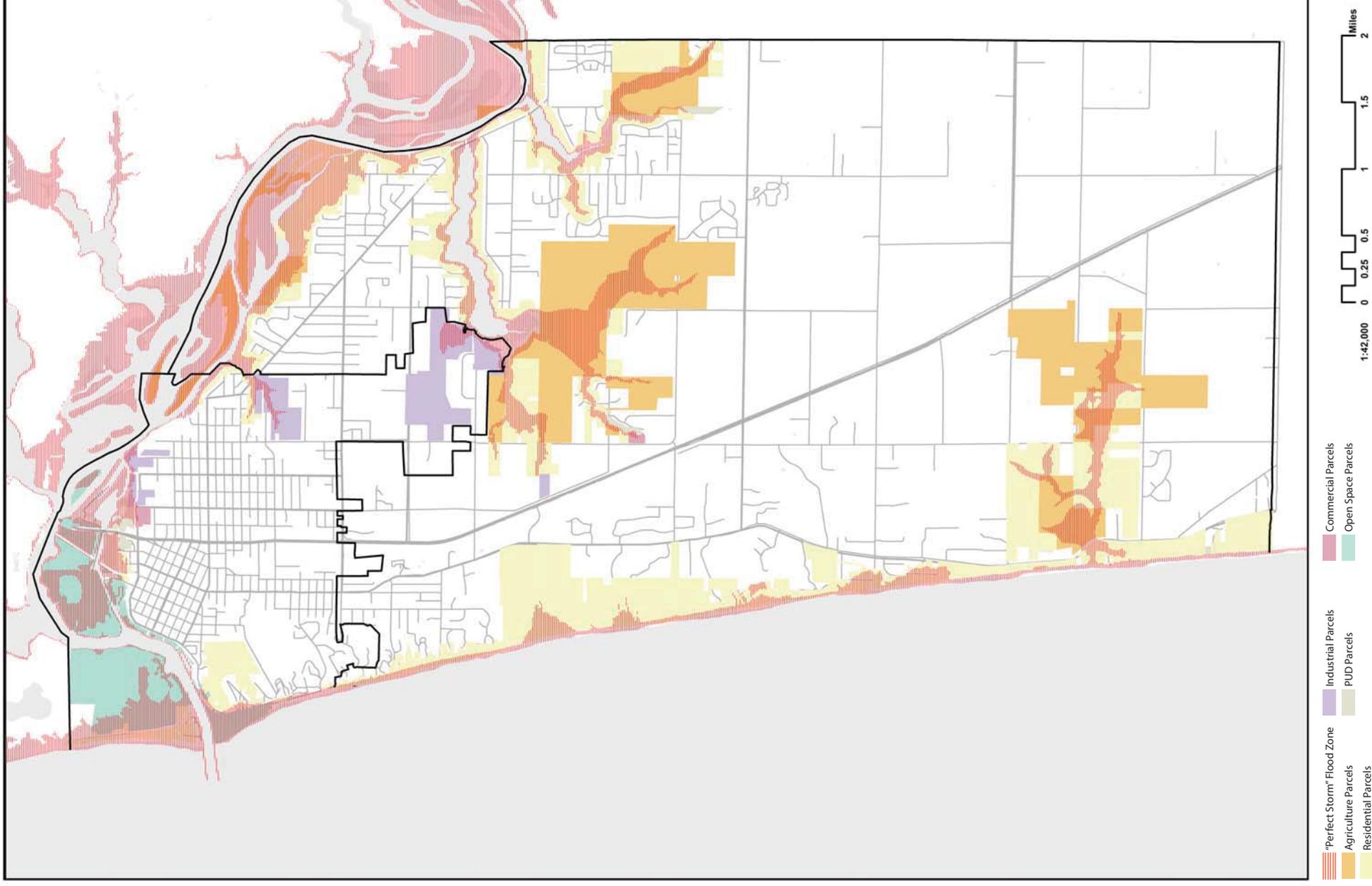
Map 5. Parcels Affected in the “Lucky” Climate Future



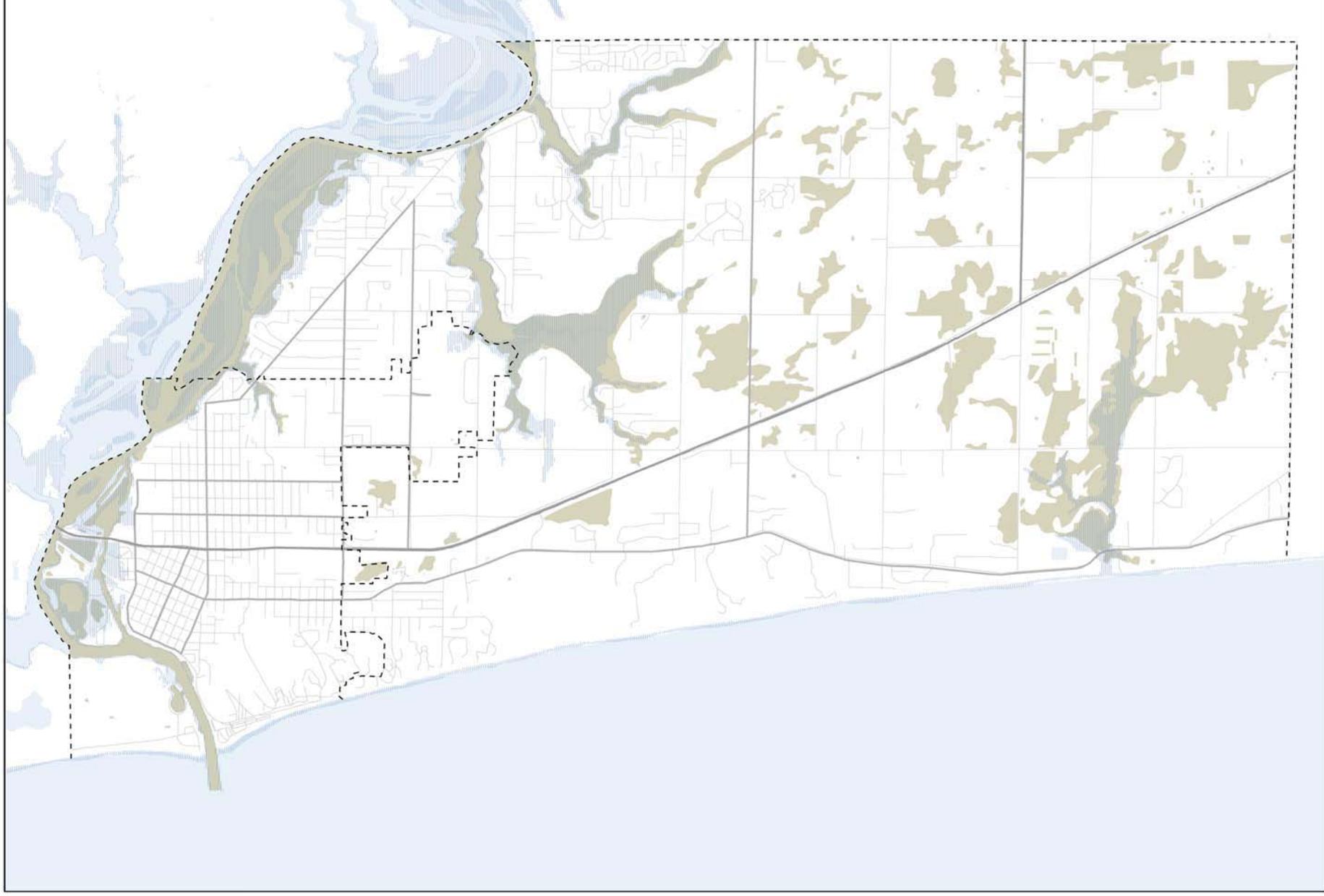
Map 6. Parcels Affected in the “Expected” Climate Future



Map 7. Parcels Affected in the “Perfect Storm” Climate Future



Map 8. Existing Wetlands under "Lucky" Climate Future

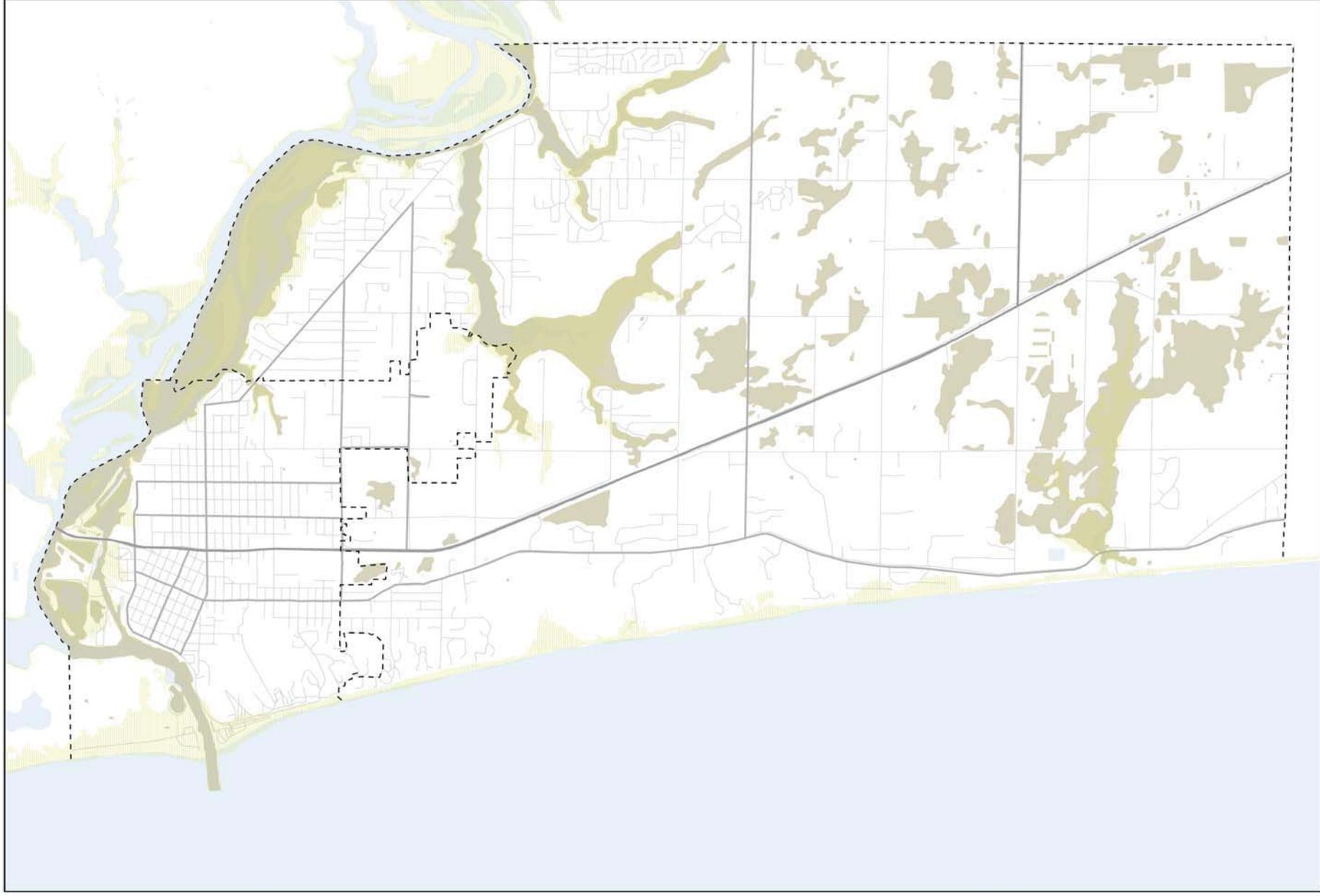


▨ "Lucky" Flood Zone

■ Existing Wetlands

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**Map 9. Existing Wetlands under "Expected" Climate Future**

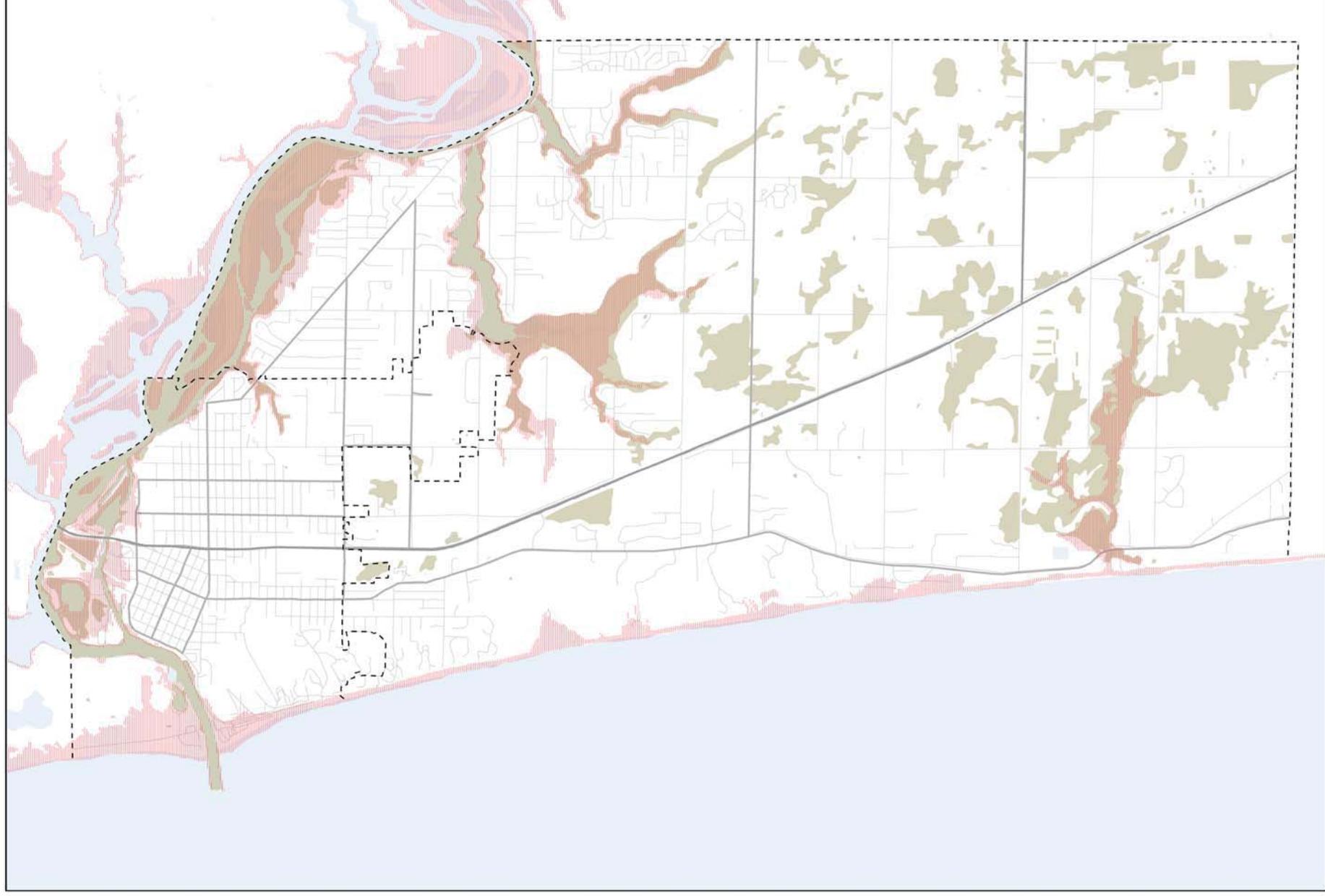


Existing Wetlands

"Expected" Flood Zone

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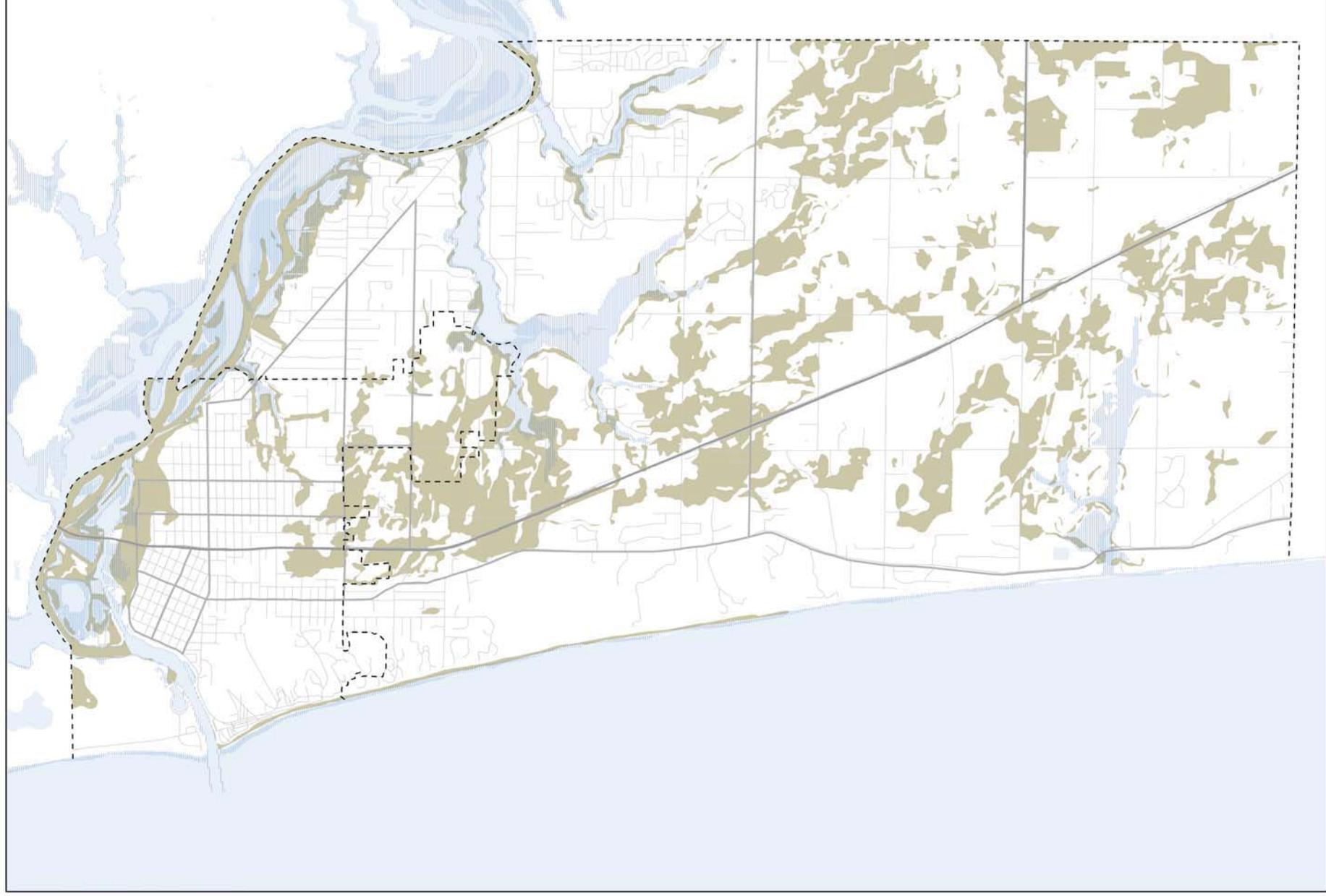
Map 10. Existing Wetlands under "Perfect Storm" Climate Future



Perfect Storm" Flood Zone Existing Wetlands

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Map 11. Potential Wetlands under "Lucky" Climate Future

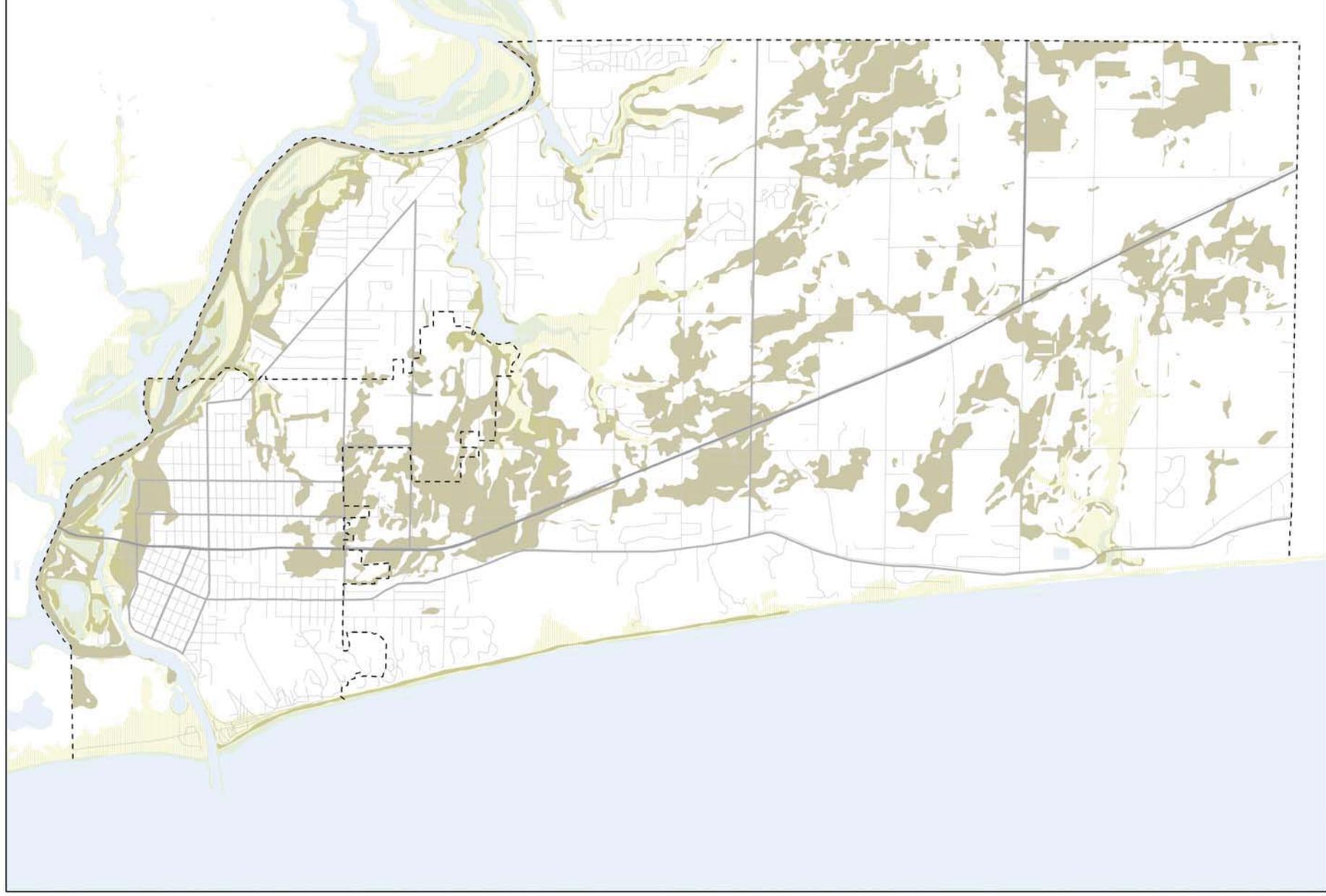


▨ "Lucky" Flood Zone

■ Potential Wetlands

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Map 12. Potential Wetlands under "Expected" Climate Future

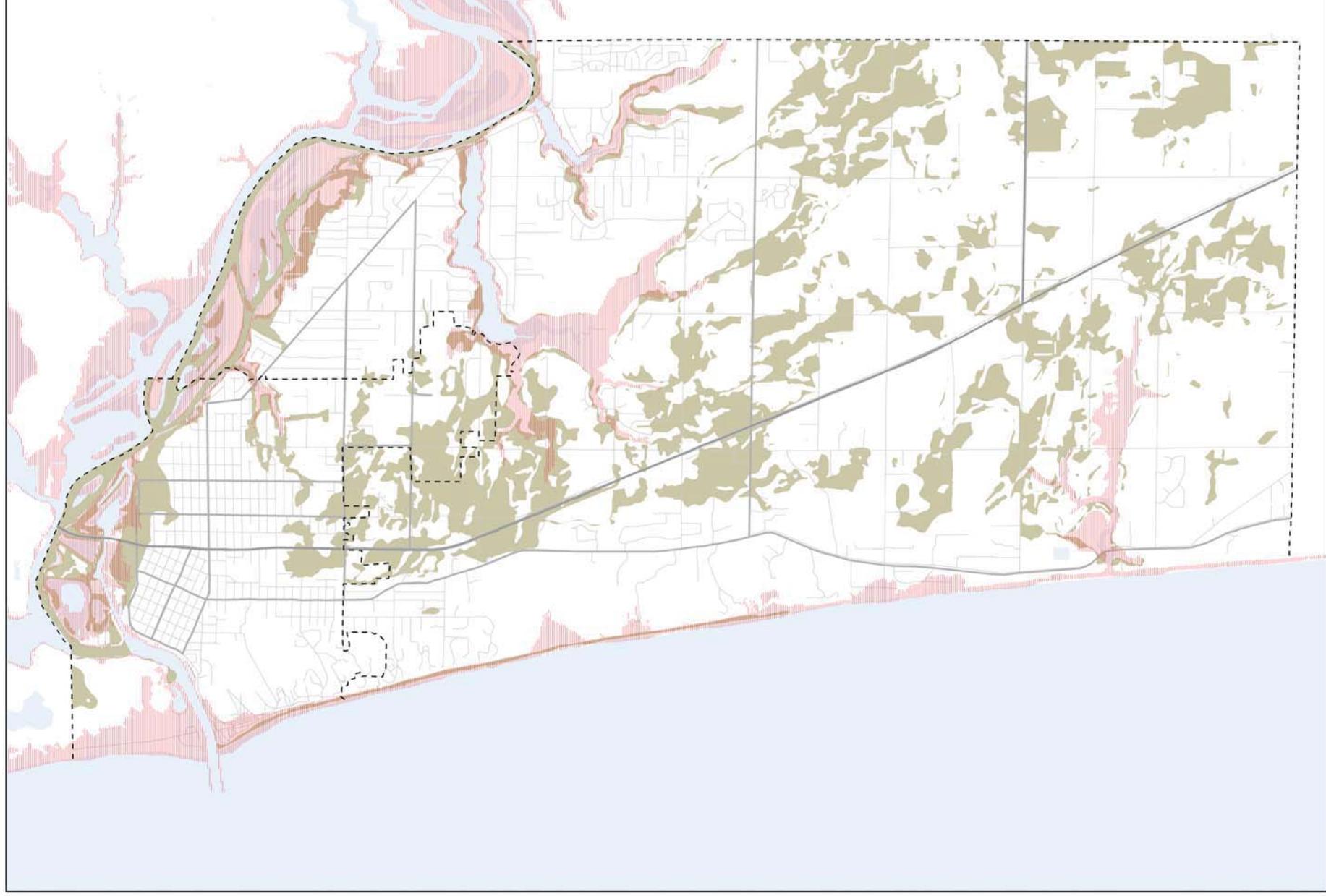


Expected Flood Zone

Potential Wetlands

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Map 13. Potential Wetlands under "Perfect Storm" Climate Future



Perfect Storm Flood Zone

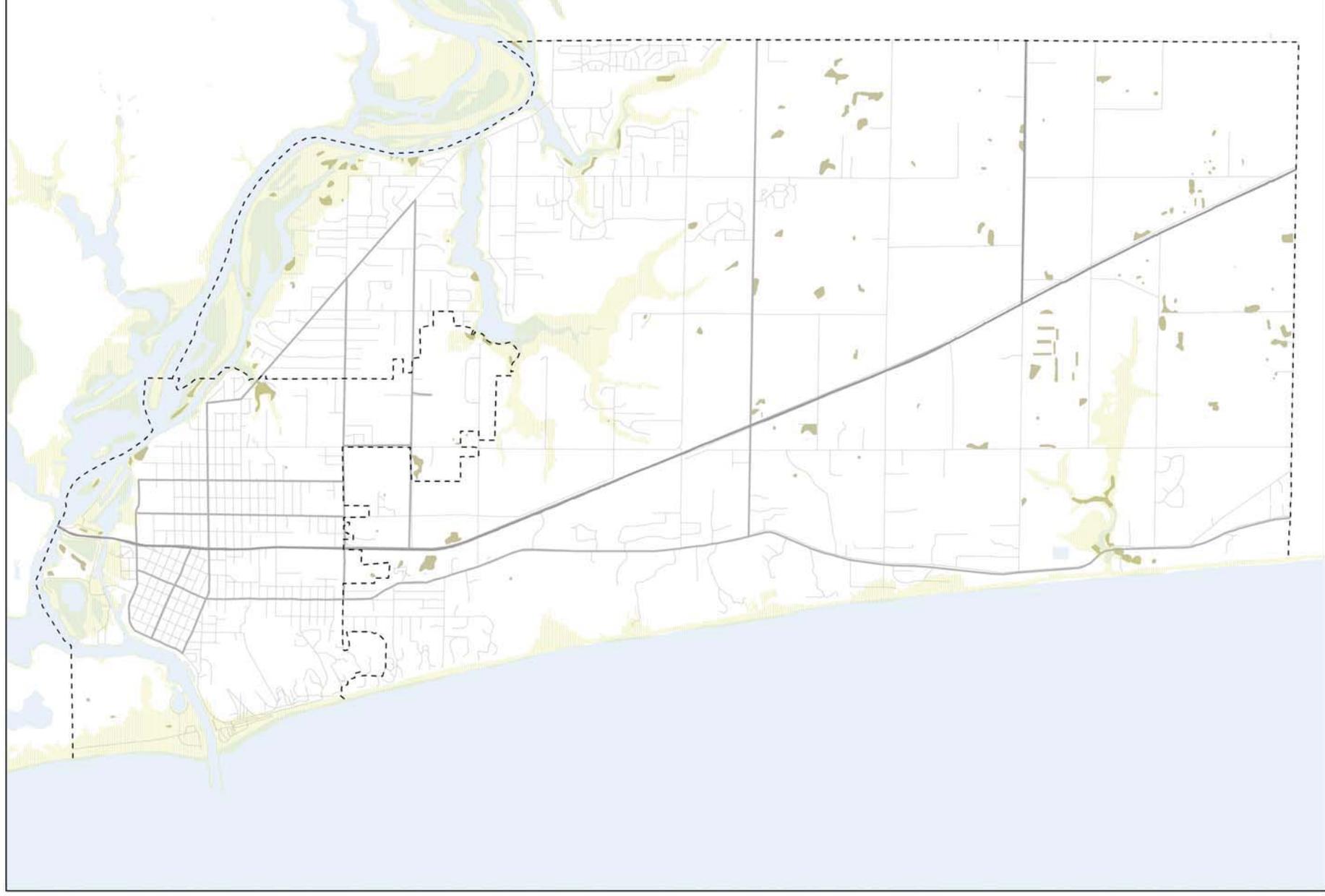
Potential Wetlands

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Map 14. Existing Wetlands under 5 Acres under "Lucky" Climate Future



**Map 15. Existing Wetlands under 5 Acres under "Expected" Climate Future**



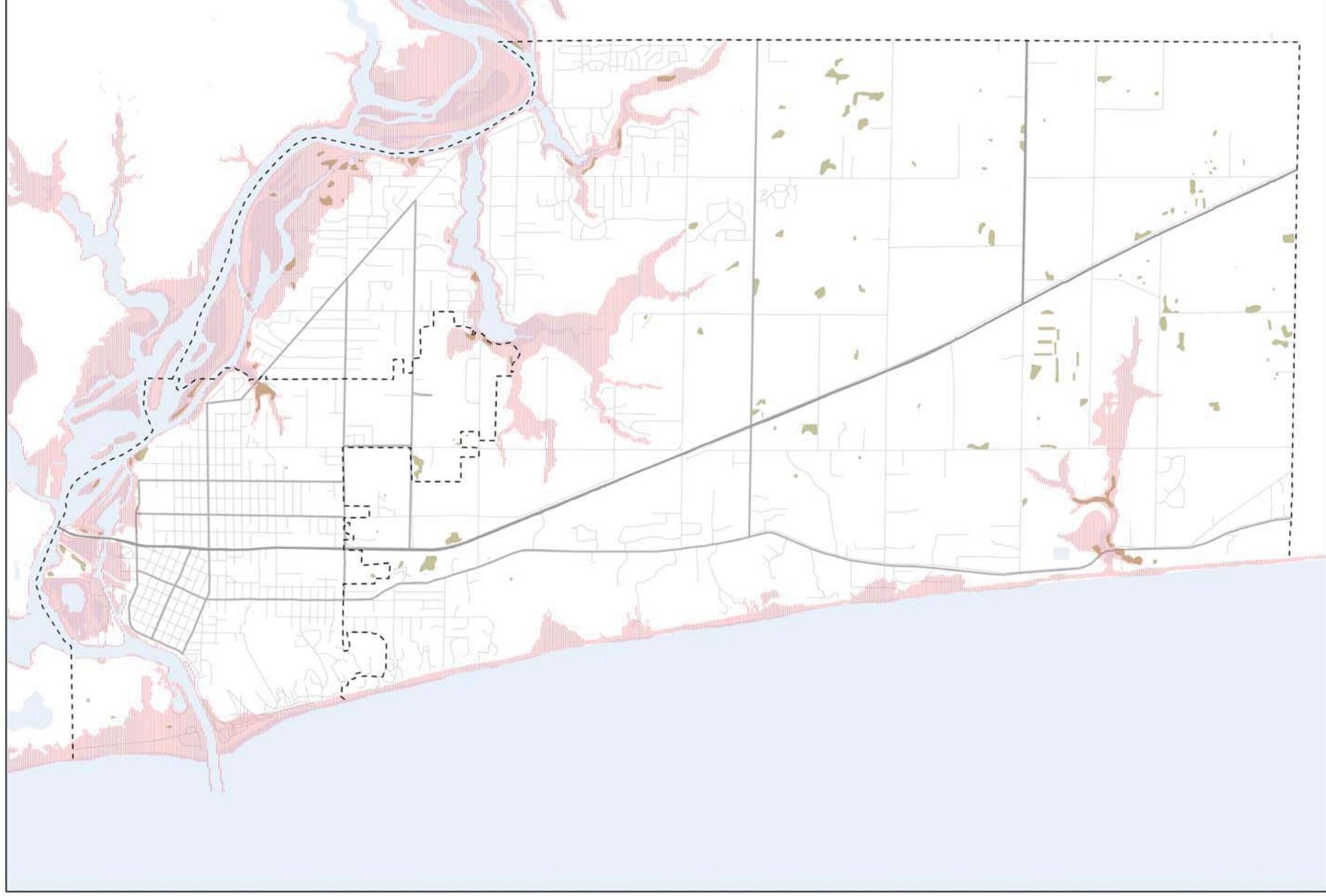
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Existing Wetlands under 5 Acres

Miles

0 0.25 0.5 1 1.5 2

Map 16. Existing Wetlands under 5 Acres under "Perfect Storm" Climate Future



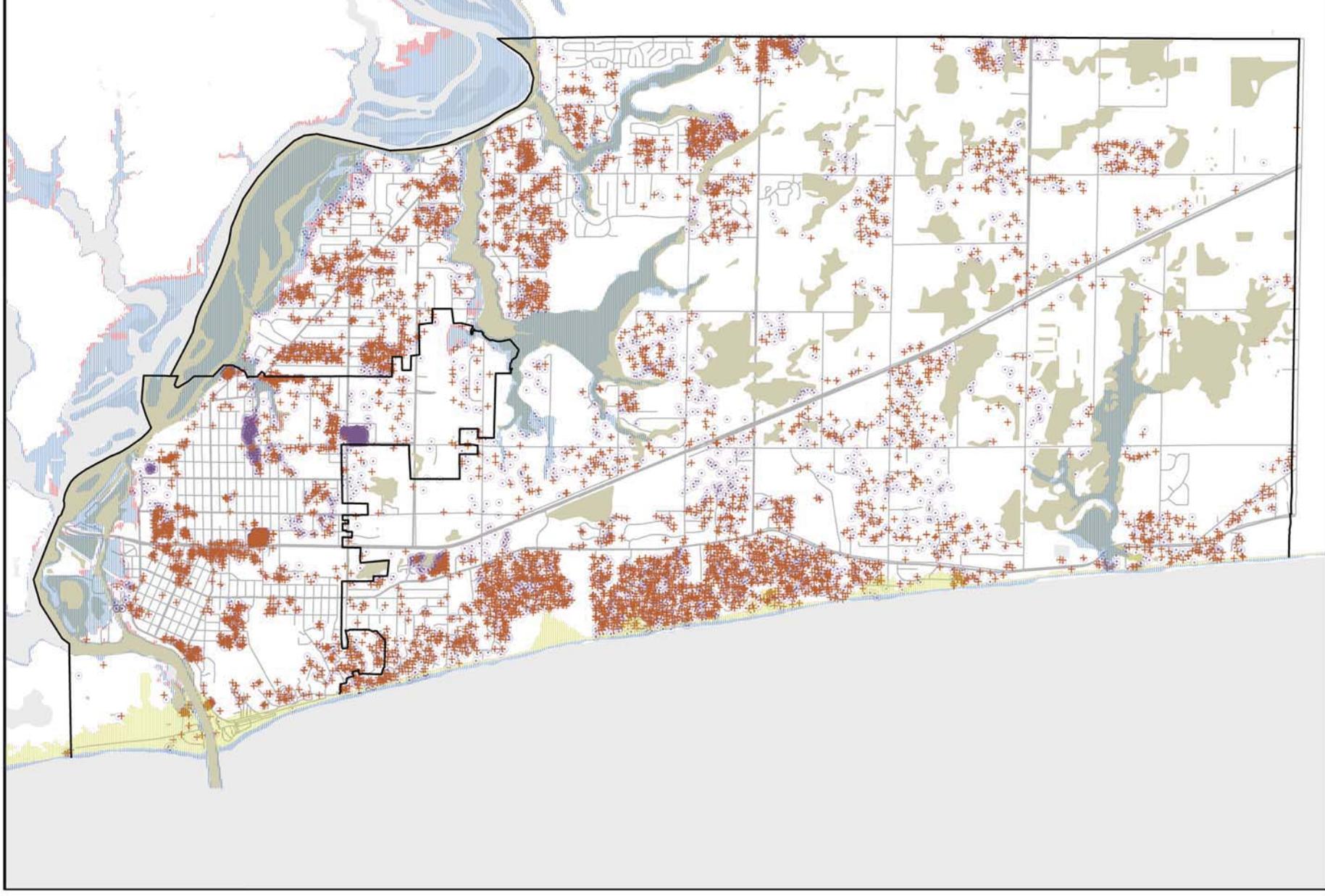
Perfect Storm Flood Zone

Existing Wetlands under 5 Acres

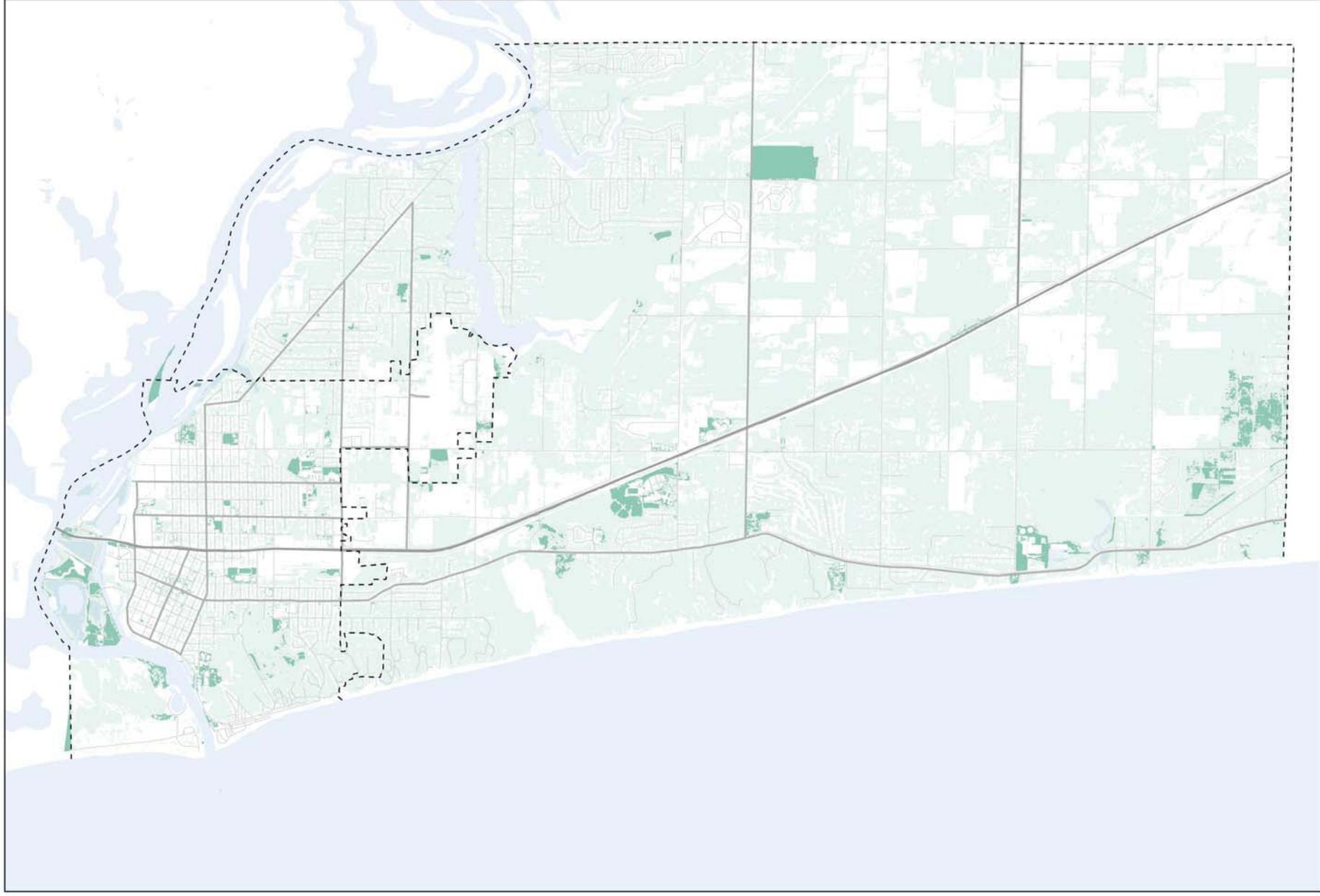
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Map 17. Existing Wetlands with Climate Futures and Management Options



**Map 18. Existing and Potential Tree Canopy**

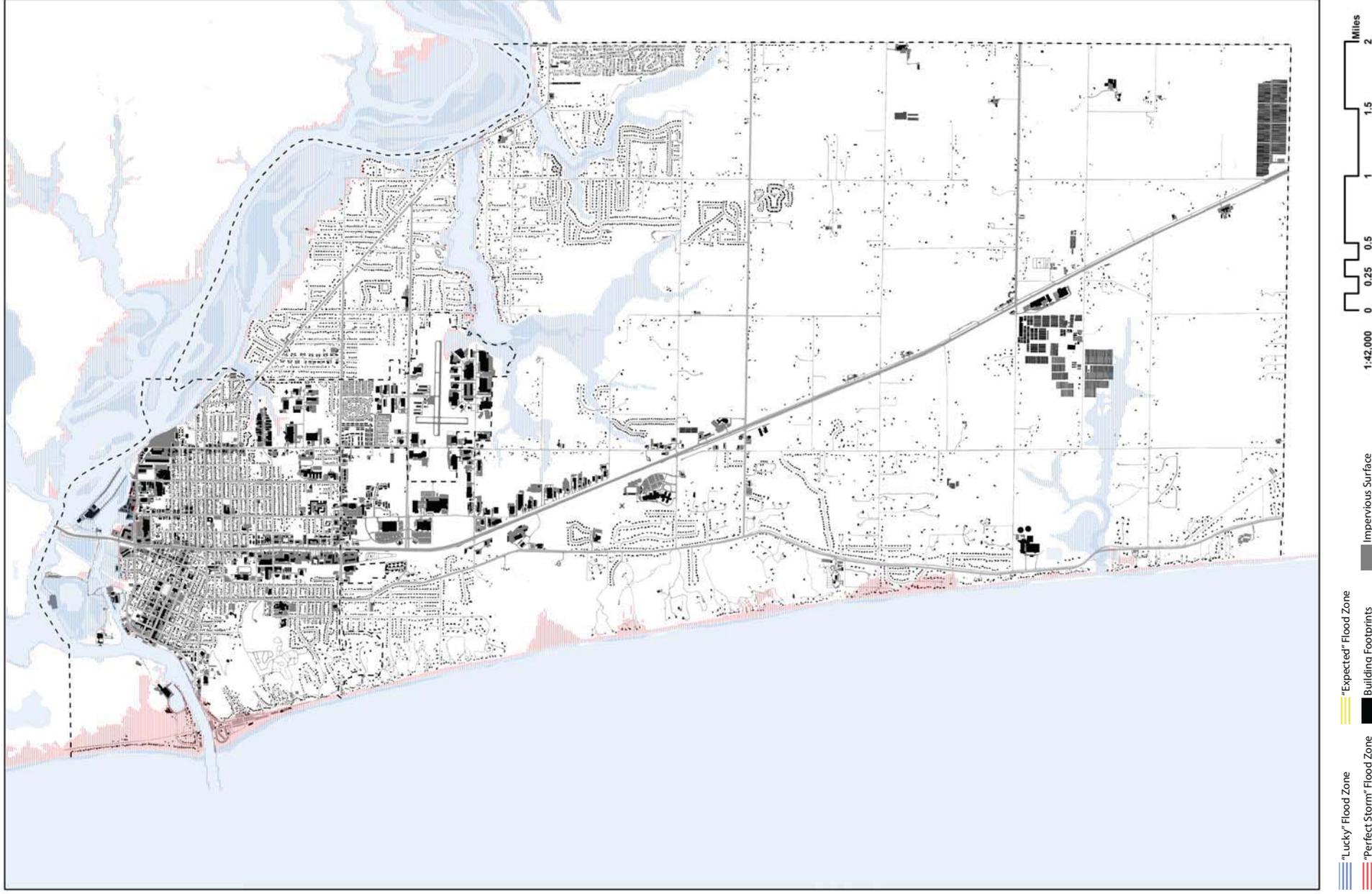


Potential Tree Canopy

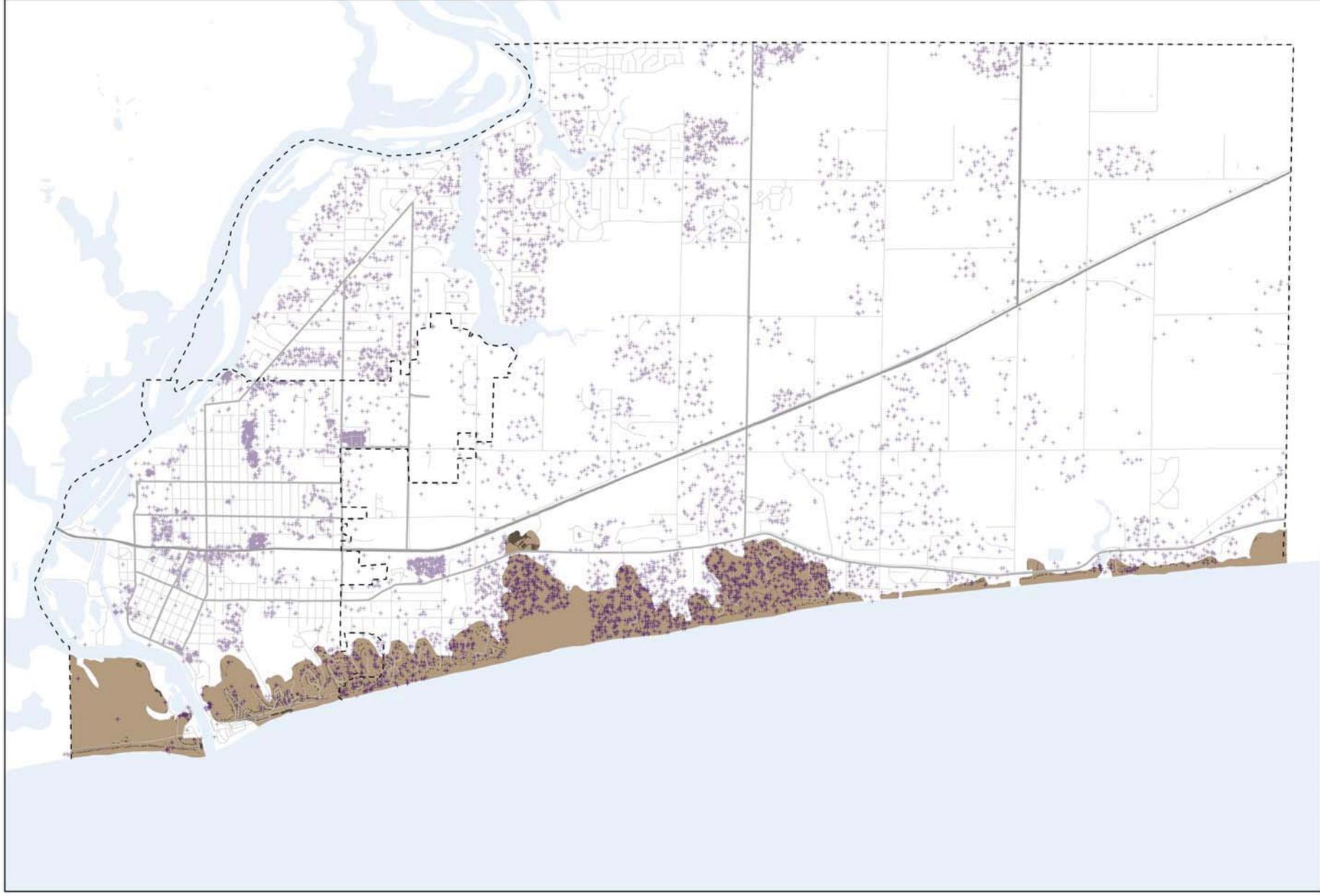
Existing Tree Canopy

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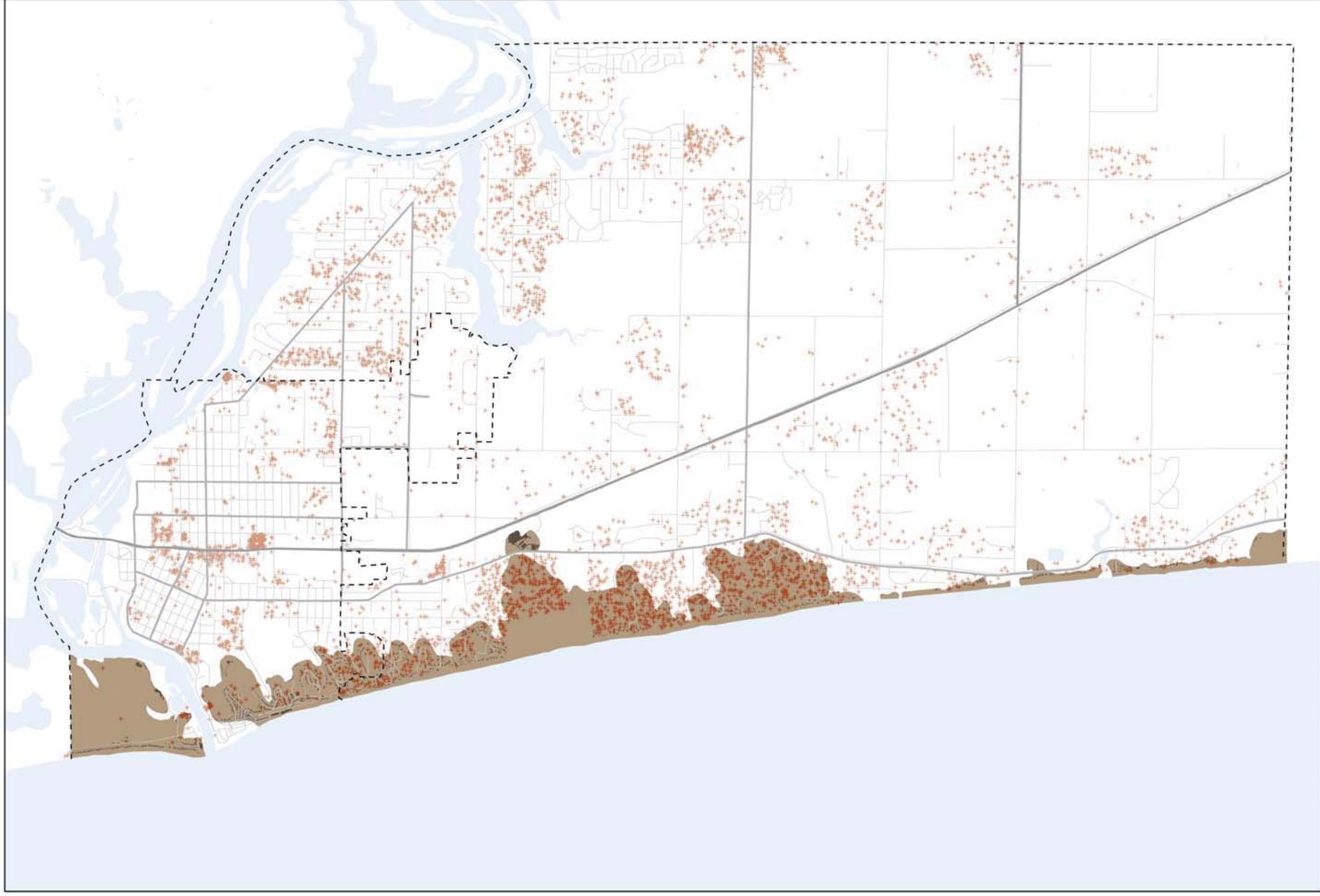
Map 19. Impervious Surface under Climate Future Scenarios



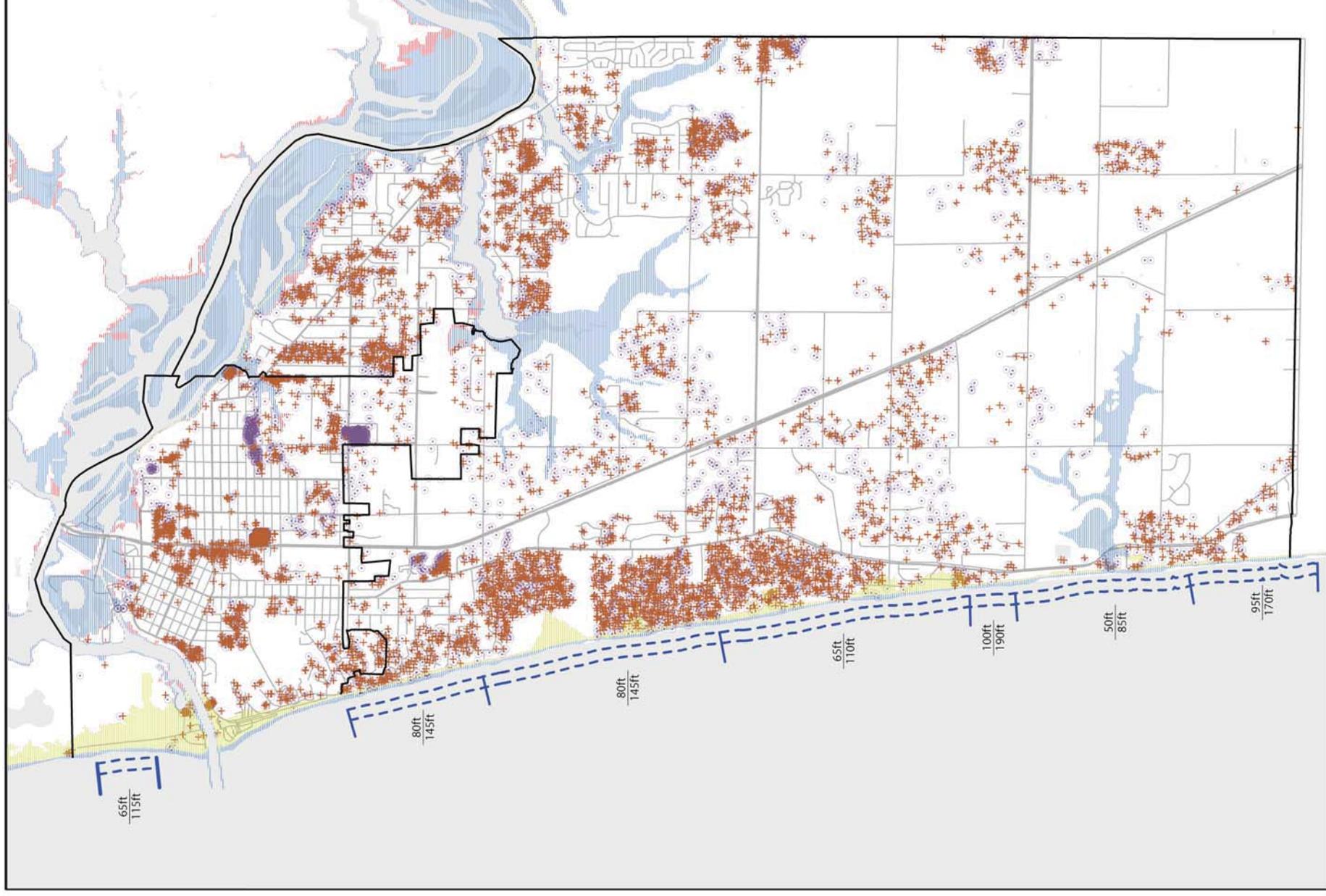
**Map 20. Build-out According to Current Zoning and Critical Dune Areas**



**Map 21. Build-out According to Best Management Practices and Critical Dune Areas**



Map 22. High Risk Erosion Area and Climate Futures



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Miles

# DEFINING VULNERABILITY IN THE GRAND HAVEN COMMUNITY



This report summarizes the results of a climate vulnerability assessment conducted for the Grand Haven Community, including the City of Grand Haven and Grand Haven Charter Township as part of the Resilient Grand Haven planning process. This project was developed by the Land Information Access Association (LIAA).

This report was prepared by the Land Information Access Association (LIAA) as part of the Resilient Grand Haven project. Support for the project came from the Michigan Municipal League (MML), Michigan Association of Planning (MAP), and the University of Michigan's Taubman College of Architecture and Urban Planning. A special thank you is owed to the many organizations and individuals that contributed to the planning process.

This project was funded in part by Grand Haven Charter Township, the City of Grand Haven, the Michigan Coastal Zone Management Program, Department of Environmental Quality, Office of the Great Lakes; and the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.



## DEFINING VULNERABILITY IN THE GRAND HAVEN COMMUNITY

The impacts of climate variability on agriculture, infrastructure and human health are being felt almost everywhere across Michigan. With thoughtful planning and preparation, communities can better withstand and recover from severe storms, becoming even better places to live and thrive. Through community-wide planning efforts like this one, resilient municipalities can actively cultivate their abilities to recover from adverse situations and events, working to strengthen and diversify their local economies and communication networks, increase social capital and civic engagement, enhance ecosystem services, improve human health and social systems, and build local adaptive capacity.

### BUILDING COMMUNITY RESILIENCE

Community resilience is a measure of the sustained ability of a community to utilize available resources to respond, withstand, and/or recover from adverse situations.<sup>1</sup> The Rockefeller Foundation, a noted global leader on such issues, emphasizes equity as an important component of resilience, stating that community resilience is the capacity for people – particularly the poor and vulnerable – to survive and thrive no matter what stresses or shocks they encounter.<sup>2</sup> Communities that are resilient are able to learn from adversity and quickly adapt to change. In general, the most important characteristics of community resilience are: (1) strong and meaningful social connections, (2) social and economic diversity, (3) innovation and creative problem solving capacity, and (4) extensive use of ecosystem services.<sup>3</sup> The Rockefeller Foundation has identified 12 indicators that make for a resilient community (see right panel). However, it is important to acknowledge every community is unique and not all indicators or characteristics are needed to be “resilient.”

Community master planning processes can increase resilience by fostering civic engagement and improving communication and cooperation between cultural and service organizations. To improve economic resilience, communities can work to encourage and support local production of goods and supplies, increasing self-reliance and reducing the flow of money and resources out of the community. Programs to encourage local investing and entrepreneurship have been helpful in building both employment and production capacity. Consuming locally produced products, shopping at locally owned businesses and investing in local companies are activities that help to diversify the community’s economy, giving it greater resilience.

The following report discusses the results of a community vulnerability assessment for Grand Haven Township and the City of Grand Haven. This assessment begins with an overview of regional climate trends and predicted societal impacts, then transitions to detailed assessments of the community’s vulnerabilities to extreme *heat*

#### A Resilient Community Often Has:

1. Minimal human vulnerability
2. Diverse livelihoods and employment
3. Adequate safeguards to human life and health
4. Collective identity and mutual support
5. Social stability and security
6. Availability of financial resources and contingency funds
7. Reduced physical exposure and vulnerability
8. Continuity of critical services
9. Effective leadership and management
10. Empowered stakeholders
11. Integrated development planning

Source: Rockefeller Foundation

<sup>1</sup> The Rand Corporation. <http://www.rand.org/multi/resilience-in-action/faqs.html>

<sup>2</sup> The Rockefeller Foundation: City Resilience Framework. April 2014. ARUP. <https://www.rockefellerfoundation.org/report/city-resilience-framework/>

<sup>3</sup> Walker and Salt. (2006) Resilience Thinking: Sustaining Ecosystems and People in a Changing World. Island Press, Washington.

and *flooding* events. Although the assessment is concentrated on these two specific types of events, many of the considerations and societal impacts identified would be present under other stresses and shocks within the community.

In completing the assessment, factors such as demographics, environmental conditions, locations of critical facilities and essential services, and the built environment were considered. This assessment informs recommendations throughout this Master Plan.

### CLIMATE CHANGE AND VARIABILITY

Climate and weather are directly related, but not the same thing. Weather refers to the day-to-day conditions we encounter in a particular place: sun or rain, hot or cold. The term *climate* refers to the long-term weather patterns over regions or large geographic areas. When scientists speak of global climate change, they are referring to generalized, global patterns of weather over months, years and decades. To help predict what the climate will be in the future, scientists use three-dimensional computer models of the earth’s atmosphere, oceans and land surfaces to understand past trends and predict future changes. These General Circulation Models (GCM) have been improved and verified in recent years, resulting in relatively reliable predictions for climate changes over large regions. To help predict future climate patterns for smaller regions, scientists apply *downscaling techniques*.

As stated by the Intergovernmental Panel on Climate Change (IPCC), significant changes in the earth’s climate have been observed and thoroughly documented.<sup>4</sup> Warming of the climate is now evident in combined average

air and ocean temperatures around the globe (Figure C.1 provides a summary of observed changes in land and ocean temperatures over the last 150 years).<sup>5</sup> This change has significant impacts for the Midwest. The graph in Figure C.2 presents observed changes in the amount of ice cover on the Great Lakes. Overall, there has been a 71% reduction in the extent of Great Lakes ice cover between 1973 and 2010, with Lake Ontario experiencing the greatest loss.<sup>6</sup>

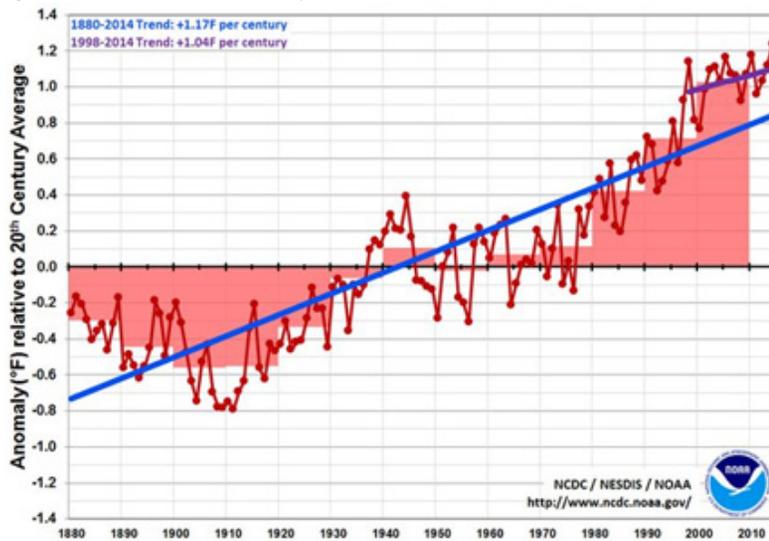
The Great Lakes Integrated Sciences Assessment (GLISA) is a consortium of scientists and educators from the University of Michigan and Michigan State University that is funded by the National Oceanic and Atmospheric Administration (NOAA) to provide climate resources, including downscaled models, for communities across the Great Lakes Region. According to GLISA, the Great Lakes Region has already experienced a 2.3° F increase in average temperatures. An additional increase of 1.8 to 5.4° F in average temperatures is projected by 2050. Although these numbers are relatively small, they are driving very dramatic changes in Michigan’s climate.

Based on the most recent models, the climate of the Grand Haven Community will continue to warm, with greater increases in temperature during the winter months and at night. There are a variety of weather impacts expected with this change. Some of the potential impacts of climate variability in the Grand Haven Community include:

#### Downscaled Climate Data

Downscaling climate data is a strategy for generating locally relevant data from global scaled predictions. The result is regionally specific forecasts.

Figure C.1. Annual Global Temperature (Combined Land and Ocean)



Source: NOAA, <http://www.ncdc.noaa.gov/>

<sup>4</sup> International Panel on Climate Change 2014 Synthesis Report. 2014 <http://www.ipcc.ch/>

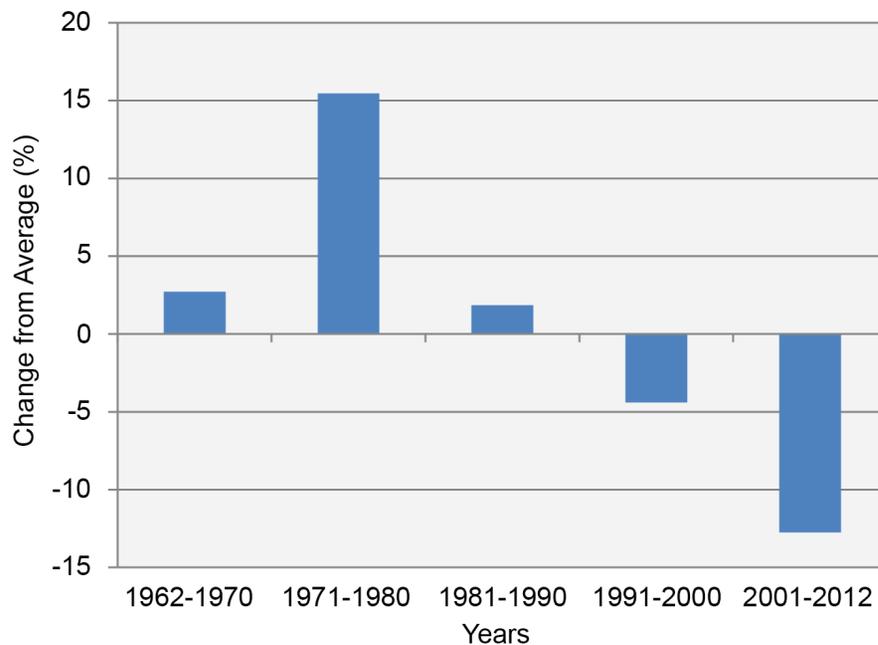
<sup>5</sup> NCDC/NEDIS/NOAA [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

<sup>6</sup> Wang, J., X. Bai, H. Hu, A. Clites, M. Colton, and B. Lofgren. 2011. Temporal and spatial variability of Great Lakes Ice Cover, 1973-2010. *Journal of Climate* 25:1318-1329.

- Storms are expected to become more frequent and more severe.
- Increases in winter and spring precipitation
- Less precipitation as snow and more as rain
- Less winter ice on lakes
- Extended growing season (earlier spring/late fall)
- Greater frequency and intensity of storms
- More flooding events with risks of erosion
- Increases in frequency and length of severe heat events
- Increased risk of drought, particularly in summer

It is important to note that increased flooding and more intense droughts are not mutually exclusive nor contradictory. In the Great Lakes region, scientists are predicting more intense rain events in the fall and winter and more intense droughts in the summer months. These changes in climate could have a number of positive and negative effects on the Grand Haven Community.

Figure C.2 Great Lakes Ice Cover Decline



Source: <http://nca2014.globalchange.gov/report/our-changing-climate/melting-ice#graphic-16703>

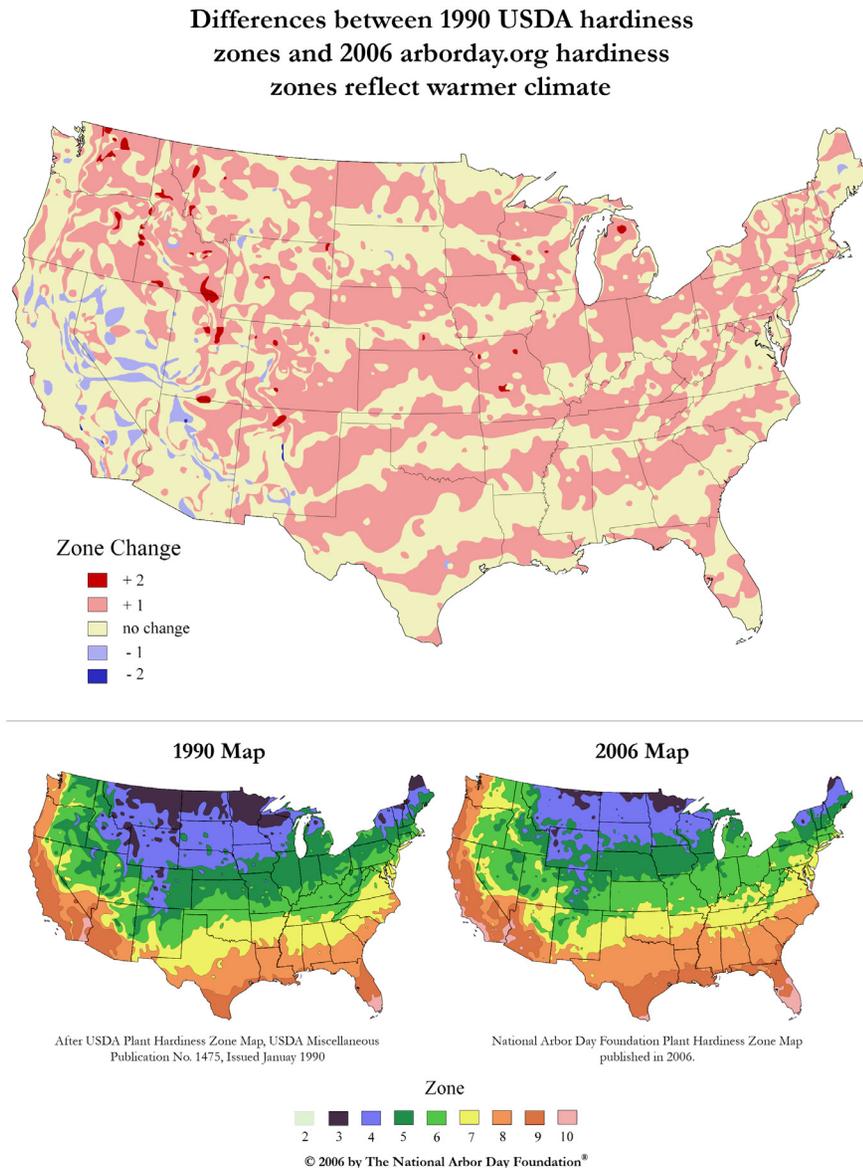
### What About the Winters of 2014 & 2015?

Remember, weather reflects the short-term conditions of the atmosphere while climate is the average daily weather for an extended period of time. This difference was never more evident in Michigan than over the last two years. Although most of the Great Lakes froze during the winters of 2014 and 2015 overall there has been a 71% reduction in the extent of ice cover between 1970 and 2010 .



Source: NASA , 2010 <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=43038&src=nha>

Figure C.3. Hardiness Zones



For example, an extended growing season could help support new crops and increase crop yields for area farmers. On the other hand, the highly variable weather conditions such as severe storms and flooding mixed with summer droughts could impact future crop production and stress groundwater supplies.

Much of the U.S. has been warmer in recent years, and that affects which plants grow best in various regions. The Arbor Day Foundation completed an extensive updating of the U.S. Hardiness Zones based upon data from 5,000 National Climatic Data Center cooperative stations across the continental United States. As is illustrated in Figure C.3, zones in West Michigan are shifting northward. Zone 5 plants that previously thrived in the Grand Haven community now do best in Northern Michigan, while Zone 6 plants that once thrived in states like Tennessee, now will grow well in the Grand Haven Community.

### Agricultural Impacts

According to the third U.S. National Climate Assessment (2014), "Future crop yields will be more strongly influenced by anomalous weather events than by changes in average temperature or annual precipitation. Cold injury due to a freeze event after plant budding can decimate fruit crop production, as happened in 2002, and again in 2012, to Michigan's \$60 million tart cherry crop.

While there are no cherry farms in Grand Haven Township, analogous weather events could affect local crop production.

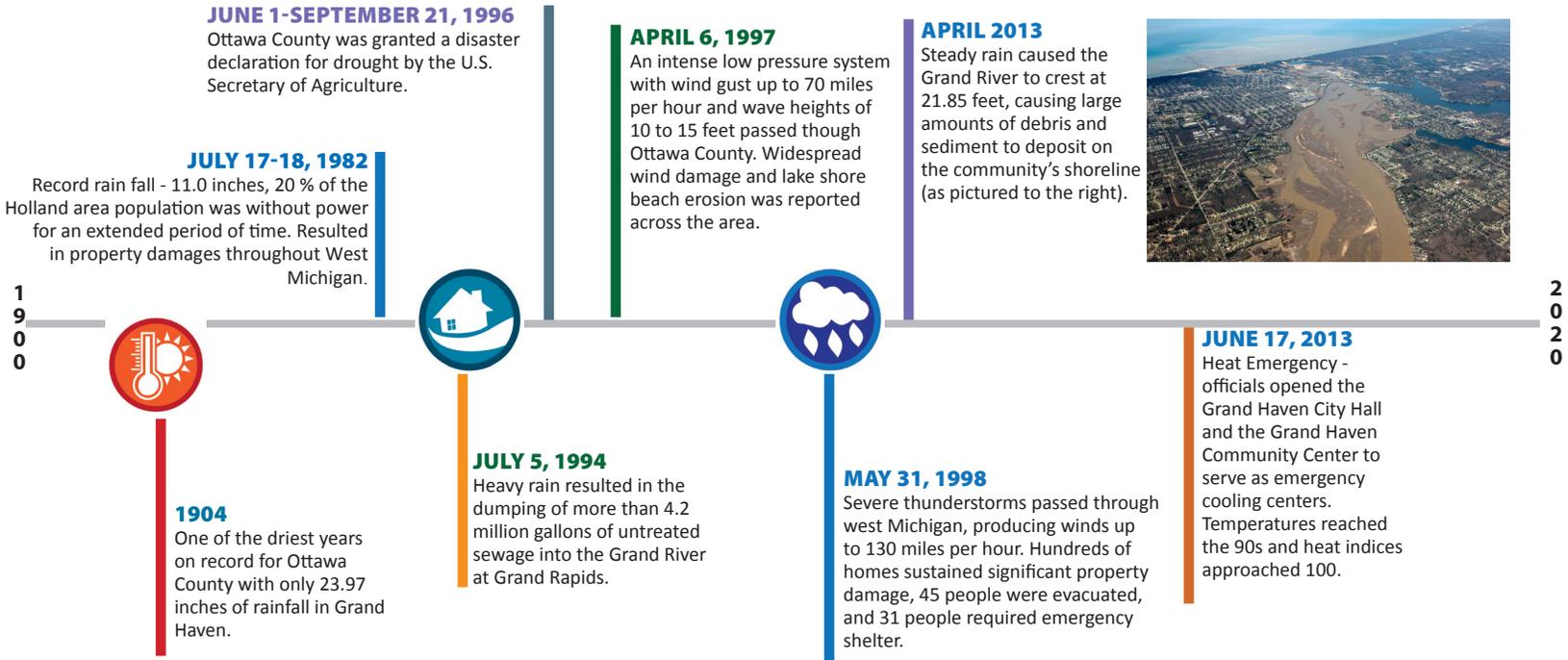


Source: [https://www.arborday.org/media/map\\_change.cfm](https://www.arborday.org/media/map_change.cfm)

### SEVERE WEATHER EVENTS IN THE GRAND HAVEN COMMUNITY

The following section summarizes a few of the major weather-related events in the Grand Haven Community and West Michigan over the past 100 years. Oftentimes, severe weather events result in negative impacts to the local economy and to vulnerable populations within the community.

Figure C.4. Severe Weather Events Timeline





sensitivity, and resilience.<sup>11</sup>

By assessing the potential for exposure to a hazard and the sensitivities of specific populations, maps are generated that identify areas with greater vulnerability. This tool provides direction for planning commissioners, staff and public health workers as they work to reduce risks to human health.

Based on the greatest risks for Michigan and predicted climate trends, the vulnerability assessments were limited to extreme heat waves and flooding. However, climate change is predicted to result in increases of other exposures that should also be considered in community planning and development (e.g., high winds, tornadoes, and extreme heat).

These assessments were based in part on data obtained from the 2009-2013 American Community Survey (ACS). This data includes information on housing, income, and education characteristics of the populations in geographic areas called Census Block Groups, containing between 600 and 3,000 individuals. Data from the 2010 Census was also used, including population age and racial composition collected by Census Blocks, which are the smallest available geographic areas for demographic data. Data sets concerning parcel characteristics were obtained from Ottawa County, Grand Haven Charter Township and the City of Grand Haven. Building footprint data was obtained from Ottawa County and tree canopy cover was digitized using an orthophotograph from 2009.<sup>12</sup>

## HEAT VULNERABILITY

Community vulnerability to heat events varies depending on location. In Michigan, there are varying degrees of vulnerability to heat based on a community's proximity to the Great Lakes. Access to air conditioning, and surrounding environmental factors like tree canopy and impervious surfaces also play a role.

Studies have shown that heat-related mortality generally occurs in areas of the community that are warmer, less stable, and home to more disadvantaged populations.<sup>13</sup> One study found that neighborhoods with the highest temperatures and the least amount of open space and vegetation were also likely to be the most socioeconomically disadvantaged.<sup>14</sup> The same study also found the strongest protective factor for residents was access to air conditioning in the home and in other places, as well as having access to transportation.

A 2012 literature review conducted by researchers at the University of Michigan indicates that infants under five and persons over 65 are highly sensitive to heat events, as are persons living in lower-income census tracts and minority populations. Living alone, being confined to bed, having a mental illness, not leaving home daily, living on higher floors of multistory buildings, and suffering from alcoholism are additional factors that are associated with increased risk of heat-related mortality.

There have been limited studies conducted on how heat events impact rural and suburban communities, but one study notes that rural populations may exhibit patterns of vulnerability different from those of urban populations.<sup>15</sup>

### Vulnerability Assessment

**Vulnerability**, equals **exposure** plus **sensitivity**.

**Exposure** refers to the natural or built environment while **sensitivity** refers to the degree to which a community or certain segments of a community could be impacted by an event.

<sup>11</sup> Polsky, C., R. Neff, and B. Yarnal (2007). "Building comparable global change vulnerability assessments: the vulnerability scoping diagram." *Global Environmental Change* 17(3-4): 472-485.

<sup>12</sup> USDA and NRCS Geospatial Data Gateway

<sup>13</sup> Foundations for Community Climate Action: Defining Climate Change Vulnerability in Detroit. University of Michigan. December 2012

<sup>14</sup> Semenza JC, Rubin CH, Falter KH, et al. Heat-related deaths during the July 1995 heat wave in Chicago. *N Engl J Med* 1996; 335:84-90.

<sup>15</sup> Mapping Community Determinants of Heat Vulnerability. *Environ Health Perspectives* 117:1730-1736 (2009). doi:10.1289/ehp.0900683 available via <http://dx.doi.org/> [Online 10 June 2009]

## HEAT SENSITIVITY ASSESSMENT

To create the sensitivity and exposure maps for this Plan, as well as the resulting vulnerability maps, the consultant relied on methodologies developed at the University of Michigan's Taubman College of Architecture and Urban Planning.<sup>16</sup>

To conduct the heat sensitivity assessment of the Grand Haven Community, the project team used a geographic information system (GIS) for spatial data analyses to show the relative distribution of people most at risk. Five factors were identified as the primary contributors to the sensitivities and risks of people exposed to a heat wave:

- People over 65 years of age
- People living alone
- People over 25 with less than a high school education
- Minority populations
- People living below the poverty line

Using U.S. Census data, the project team identified the percentages of people living in each area (by Block Group or Block) for each sensitivity factor.

Studies show that people who are older have greater sensitivity to extreme heat events. Studies also indicate that older age is associated with higher hospital admission rates in heat waves. The Percent of Population 65 and Older (Map 1) depicts the relative concentration of older adults in the community by Census Block.

Upon review of the map, planning commission members noted that many older people do not live in the Grand Haven Community full-time, thus people who leave for the winter (snowbirds) may not be counted. It was also noted there are three senior complexes in close proximity to one another at the intersection of Ferry Street and Robbins Road.

Another sensitivity factor is living alone, which serves as a measure of social isolation. Although living alone is not necessarily a risky thing, people who are socially isolated are at greater risk during an extreme heat event. Isolated people may not be able to recognize symptoms of heat-related illness and take proper action. For this factor, the project team used the American Community Survey data for Census Block Groups, broken out into individual Census Blocks for geographic representation (Census Blocks with no population were not included). Map 2 depicts the high concentrations of people living alone. The higher concentration of people living alone in downtown Grand Haven is in line with nationwide trends because downtowns generally have a greater supply of live-work units, single apartments, and condominium units.

Studies also suggest that minorities are at greater risk during extreme heat events for various reasons, including less reliable access to health care, transportation and other social supports needed to reduce heat exposures.<sup>17</sup> Census Blocks were used to map the relative percentages of non-white populations in the Grand Haven Community (see Map 3). One specific area noted by the planning commission was a cluster of migrant housing in the southeast corner of the community.

Two socioeconomic factors associated with increased heat-related morbidity and mortality are the percentage of the people living in poverty and percentage of people without a high school diploma. In general, persons living at or below the poverty line have less access

<sup>16</sup> Foundation for Community Climate Action: Defining Climate Change Vulnerability in Detroit (December 2012) University of Michigan's Taubman College of Architecture and Urban Planning.

<sup>17</sup> Waugh and Tierney (eds.) Emergency Management: Principles and Practices for Local Government. Chapter 13: Identifying and addressing social vulnerabilities by Elaine Enarson.

to air conditioning or cooling options for their residences. This could limit a person's access to relief from an extreme heat event. Census Block Groups were used to map the relative percentages of households living below the poverty threshold in the Grand Haven Community (please see Map 4).

Similarly, the University of Michigan research team found studies that demonstrate a direct link between low education attainment and poor health.<sup>18</sup> There is also an established correlation between lower educational attainment and income. Based on these findings, Census Block Groups were used to map the relative percent of persons 25 years and older with less than a high school education in the Grand Haven Community (see Map 5). One area with a high concentration of low education attainment was the Village Green Mobile Home Park. However, the planning commission also noted that higher income neighborhoods in the northern part of the Township were being flagged as having high concentrations of low education attainment, but may not necessarily be at higher sensitivity for heat events.

To complete the heat sensitivity assessment, a cumulative score for all five sensitivity factors for each Census Block was created. In each of the sensitivity factors, the percentages were grouped into five categories (ranging from a very low percentage of people to a relatively high percentage living with the identified sensitivity). The five categorical groupings were generated by the GIS software ArcMap using natural breaks in the data (groupings). A ranking of 1 to 5 was assigned to each of the categories, ranging from 1 for the lowest percentage to 5 for the highest. Finally, the team combined the scores within each Census Block. Thus, the most sensitive Census Blocks could be scored up to 25. The sensitivity is color coded for ease of identifying areas with the greatest sensitivity.

The Grand Haven Community Sensitivity to Excessive Heat Map (Map 6) provides a reasonably detailed map of locations where the highest percentages of at-risk residents live. This does not mean these community residents are in immediate danger. Rather, the map provides planning officials a new way of identifying areas where heat waves could present serious problems for a significant number of citizens. These are populations that could be sensitive to extreme heat events.

The Census data used likely counts people twice, such as in cases where a person is both a minority and over 65. This may over-estimate the severity of the sensitivities in some locations. Additionally, the sensitivity analysis may underestimate risk because it leaves out several key sensitive populations, such as those with preexisting health concerns (for example, cardiovascular disease or psychiatric disorders). Such data is not often available publicly or on the Census Block level. Emergency managers, hospitals, and community health departments within the region may have additional data available that can be analyzed and considered as the community looks to better understand its overall sensitive populations. To further improve the analysis, additional variables could be collected through local surveys and observation, such as the degree of social connections among individuals within a community, or materials used in housing.<sup>19</sup>

## HEAT EXPOSURE ASSESSMENT

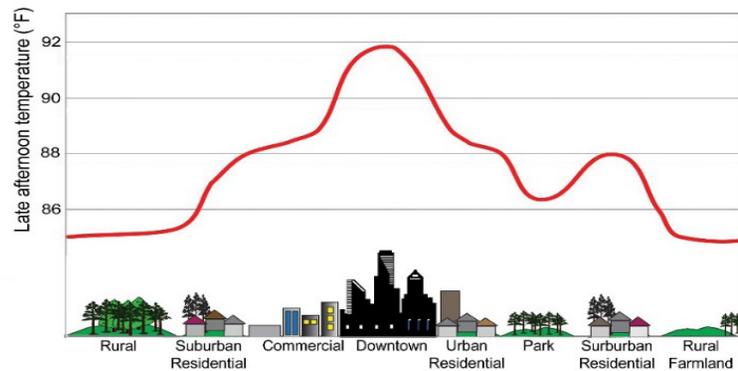
When larger communities experience heat waves, air temperatures can vary significantly from place to place during the day and at night. Some of these differences can be attributed to the varying types of land cover found throughout the community. For example, temperatures can be significantly lower at night in locations with a heavy tree canopy and very little pavement. Conversely, temperatures can be higher in locations with little greenery and lots of pavement.

Impervious surfaces such as paved parking lots, roadways, and buildings absorb large amounts of heat from the air and sunshine which is radiated back into the environment when temperatures begin to fall. At the same time, tree canopy and other vegetation can help cool an area through evaporation and transpiration of water, and by providing shade. In places with a high percentage of impervious surface and

<sup>18</sup> Curriero FC, Heiner KS, Samet JM, et al. Temperature and mortality in 11 cities of the eastern United States. *American Journal of Epidemiology*. 30 (2001): 1126-8.

<sup>19</sup> Mapping Community Determinants of Heat Vulnerability. *Environ Health Perspectives* 117:1730–1736 (2009). doi:10.1289/ehp.0900683 available via <http://dx.doi.org/> [Online 10 June 2009]

Figure C.5 Urban Heat Island Effect



Source: US Global Change Research Program (2009) <http://www.epa.gov/climatechange/impacts-adaptation/health.html>

little tree canopy, the immediate environment can be much warmer. Urban areas typically have higher heat indexes (combinations of temperature and humidity) than surrounding suburban or rural areas. This condition has been termed the “Urban Heat Island Effect.”<sup>20</sup>

People living in settings with a Urban Heat Island Effect suffer greater exposures to heat over longer periods of time (e.g., warmer nights), making them more vulnerable to health impacts. Studies of the Urban Heat Island Effect (whereby air temperatures in an urban area are 2–9° F, higher than in a nearby rural area) have shown that the albedo, or reflectivity, of an urban area is one of the most important determinants in reducing the magnitude of the heat island.<sup>21</sup> Increasing the tree canopy cover can also reduce air temperature by 1–3° C. Green roofs and plantings on roofs and in large parking lots, may also decrease the Urban Heat Island Effect and decrease stormwater runoff and building energy use. An added benefit that stems from increasing albedo and vegetation include the reduction of ground level ozone and energy costs associated with air conditioning use.<sup>22</sup>

With data obtained from Ottawa County, two separate exposure maps were created. The first exposure map depicts the percentage of impervious surfaces within each Census Block, as used in the sensitivity assessment (Map 7). These percentages are divided into five categories using the GIS software’s natural breaks calculation. Since exposure is lowest in areas with the lowest percentage of impervious surface, those scored a 1, with a rating of 5 assigned to areas with the highest percentage of impervious surfaces.

The second exposure factor is percentage of tree canopy. Tree canopy is mapped within each Census Block (Map 8) and scored using a similar five category process. As illustrated on Map 8, the highest percentage of tree canopy (therefore the lowest heat exposure) received a 1 and the least vegetative areas received a 5.

The project team combined the results of the two exposure maps to provide a single Community Excessive Heat Exposures Map (Map 9), which provides a reliable depiction of where the Urban Heat Island Effect would be most and least intense during a heat wave. The Planning Commission and staff can use this map to better assess where new vegetation and tree canopy should be placed.

### COMPOSITE HEAT VULNERABILITY

The Grand Haven Community Heat Vulnerability Map is a simple additive combination of the overall sensitivity map and the overall exposures map (see Map 10). The resulting vulnerability index depicts where concentrations of exposures and sensitive populations create a higher risk for community residents. In general, those areas with a composite score of 22 to 27 (red) have residential populations that may be particularly vulnerable to

### What is Albedo?

Albedo is the fraction of solar energy reflected from the earth back into space. It is a measure of the reflectivity of the earth’s surface. Ice, especially with snow on top of it, has a high albedo, while pavement has a low albedo.

<sup>20</sup> Basu and Samet. (2002) Relation between Elevated Ambient Temperature and Mortality: A Review of the From the Department of Epidemiology, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD.

<sup>21</sup> Kolokotroni M, Giridharan R. Urban heat island intensity in London: An investigation of the impact of physical characteristics on changes in outdoor air temperature during summer. *Solar Energy* 2008;82(11):986–998.

<sup>22</sup> Akbari H. Shade trees reduce building energy use and CO2 emissions from power plants. *Environmental Pollution* 2002;116:S119–S126. [PubMed: 11833899]

extreme heat events.

## HEAVY RAIN AND FLOODING

Climate models suggest the Grand Haven Community and West Michigan can expect more frequent storms of increasing severity in the decades ahead. The total amount of rainfall per year is also likely to increase. However, climate models suggest the precipitation will be more concentrated in the winter, spring and fall seasons and there will be more localized, intense storms at almost any time of year. The potential for substantially larger rain events raises concerns over the potential for harm to human health and damage to buildings and infrastructure.

The following pages summarize a Flooding Vulnerability Assessment conducted for the Grand Haven Community. In assessing vulnerability, local officials can evaluate potential exposures as well as sensitivity to flooding. Buildings, roads, bridges, sewer lines and other infrastructure located in a flood zone are exposed to greater risks. Where flowing floodwaters have the greatest energy, structures may be undercut, collapse or move, and soils will erode. Even areas outside of an identified floodplain are subject to flooding from heavy downpours. Where the soils have low permeability and physical drainage is inadequate, water will accumulate and cause ponding during large storm events. Appropriate planning and land-use regulations can help reduce exposures caused by poor site selection. The sensitivity of structures can be modified to reduce risk of damage by applying flood-resistant design standards. Figure C.6 illustrates recommendations from FEMA for retrofitting homes to make them more resilient to flooding events.

## EXPOSURE TO FLOODING HAZARDS

The Digital Elevation Model Map (Map 11) offers a useful view of the topography of the Grand Haven Community, including the most prominent drainage patterns. On this map, the darkest green colors identify the lowest elevations, while the darkest red colors identify the highest elevations.

The Federal Emergency Management Agency (FEMA) develops Flood Insurance Rate Maps (FIRMs) for many counties in the United States (see Map 5.6 in the *Resilient Grand Haven Charter Township Master Plan*). According to FEMA, the FIRM is “the primary tool for state and local governments to mitigate the effects of flooding in their communities.” The National Flood Insurance Program was created in 1968 to reduce future damage and provide an insurance program that would help protect property owners from losses. The FIRM shows areas subject to flooding, based on historic, hydraulic and meteorological data as well as flood controls. The maps identify a base flood elevation (BFE), sometimes referred to as the 100-year flood zone. These are areas that have a 1% chance of flooding in any given year. The maps also identify the areas with a 0.2% chance of flooding in any given year, also known as the 500-year flood zone. FEMA points out these percentages are only probabilities, not forecasts.

## HOUSEHOLD SENSITIVITY TO FLOODING

In many communities, flooding impacts are felt most significantly at the household level. A home’s flood risk is based on its relative location to floodplains and other flooding hazard areas. The household flood sensitivity refers to how well the house structure is equipped to deal with flooding. As modeled by the University of Michigan, household sensitivity to flooding can be determined by looking at the age of the housing stock and homeowners financial ability to maintain and improve the home, which is approximated using the median household income. In general, homes built before 1940 used a more porous concrete material for basement construction, so water can flow more rapidly through the foundation (See Map 12) Older homes may be more vulnerable if residents have not had the financial resources to make improvements and upgrades. By looking at median household income as a marker of likely upkeep of the home, an attempt was

made to exclude older homes that have been well-maintained and undergone upgrades from our areas of flood damage risk (see Map 13).

### FLOODING VULNERABILITY

By looking at the overlap of flooding exposure and housing sensitivity, the project team identified a number of Census Blocks that are the most vulnerable in the community to flooding damage. It is important to note that other factors contribute to flood risk. For example, mobile and manufactured homes are often particularly susceptible to flood damage because they generally lack a reinforced foundation. In addition, the municipal infrastructure plays an important role in protecting homes from flood damage. Communities with an aging storm sewer system or ones where the storm sewer has not been fully disconnected from the sanitary sewer are more prone to damage from an overloaded system in the event of a severe rain event. Map 14 depicts the Community Flooding Vulnerability.

Figure C.6. FEMA recommendations for retrofitting homes to make them more resilient to flooding events

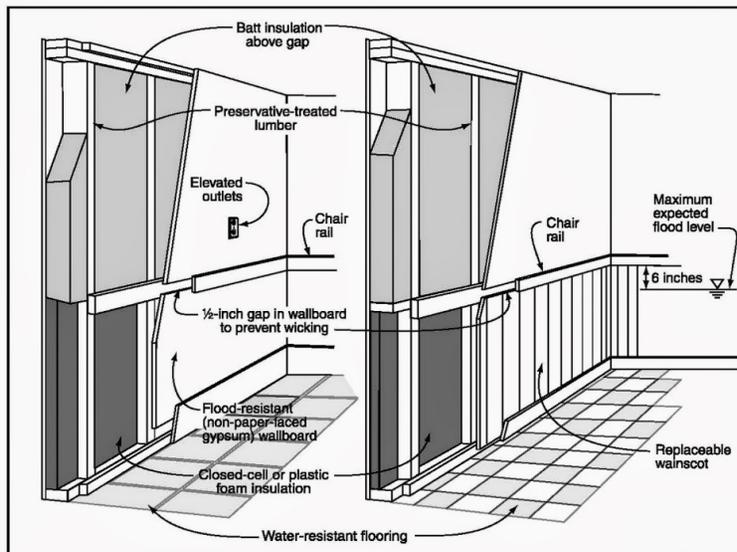


Figure 4. Partial wet floodproofing technique using flood damage-resistant materials for finished wall construction.

### OTHER CONSIDERATIONS FOR DEFINING COMMUNITY VULNERABILITY

Locations of key community assets are helpful to map to provide insight on how accessible they are to residents. It is also helpful to map locations of key infrastructure and assets that could be at risk, or would be most negatively impacted.

### CRITICAL FACILITIES

In general usage, the term “critical facilities” is used to describe all man-made structures or other improvements that, because of their function, size, service area, or uniqueness, have the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if they are destroyed, damaged, or if their functionality is impaired.<sup>23</sup>

Map 15 shows locations of critical facilities within the Grand Haven Community. Critical facilities include:

- Emergency response facilities (fire stations, police stations, rescue squads, and emergency operation centers)
- Custodial facilities (hospitals, long-term care facilities, jails and other detention centers, and other health care facilities);
- Schools;
- Emergency shelters;
- Utilities (water supply, wastewater treatment facilities, and power);

- Communications facilities;
- Other assets determined by the community to be of critical importance for the protection of the health and safety of the population; and
- Places where 300+ people congregate.

## ACCESS AND DISTRIBUTION OF SOCIAL SERVICES

Service centers and institutions (such as homeless shelters and churches) are important in delivering day-to-day support to residents. In the event of an emergency, such as an extreme heat event or flash flooding episode, service centers and institutions are especially important as a safe place where residents can go if they cannot return home. Map 16 highlights key locations of places where residents may seek temporary refuge in the event of an emergency. These locations include schools, places of worship, governmental buildings, hospitals and clinics, libraries, and other non-profit social service organizations. In the Grand Haven Community, social services are concentrated in downtown Grand Haven and along major commercial corridors.

Communities with high population densities, frequent extreme weather events, or both, are likely to have designated service centers. In the event of extreme heat waves, designated community cooling centers may provide refuge for sensitive populations and those without access to air conditioning. In the event of loss of power due to flooding or extreme storms, locations with a backup power source, such as a generator, are essential.

A Best Management Practice for a resilient community is to designate community service centers that are accessible, evenly distributed across the population, open 24 hours, and well-known to residents.

## FOOD AVAILABILITY

Climate variability will likely make significant impacts to the availability and cost of food. A community can decrease its vulnerability to disruptions in food sources by investing and supporting local agriculture and food processing activities. Support for, and reliance upon, locally produced foods not only alleviates potential future challenges in the food market, but also helps foster another strong economic sector for the region.

Just as cultivating local entrepreneurship makes a community stronger, the capacity of a community to produce and process its own food greatly increases resilience. Because of its ability to impact health, wealth, and quality of life, there is a national trend in support of the local food movement. Communities can leverage their existing assets, such as the local farmer's market, community gardens, and an established agricultural base, to lay the foundation for additional local food-related jobs. Communities can take more creative approaches as well, such as allowing for agriculture on publicly owned and vacant lands in existing neighborhoods and parklands. To evaluate community vulnerabilities, locations of full service grocery stores in relation to where people live are mapped. In the event of loss of power or disruption in potable water supplies, it is important to ensure that residents have access to affordable food and drinking water.

The project team also evaluated access to healthy food to see if there are areas of the community that qualify as a food desert. According to the United States Department of Agriculture (USDA), a food desert is defined as an area vapid (one-mile) of fresh fruit, vegetables, and other healthful whole foods, usually found in impoverished areas. This is largely due to a lack of grocery stores, farmers' markets, and healthy food providers.<sup>24</sup> Communities looking to reduce the number of residents living in a food desert can promote or zone for pop-up farm stands in low income areas, enact housing policies supportive of mixed income, and establish community gardens in areas identified as food deserts.

<sup>24</sup> <http://americannutritionassociation.org/newsletter/usda-defines-food-deserts>

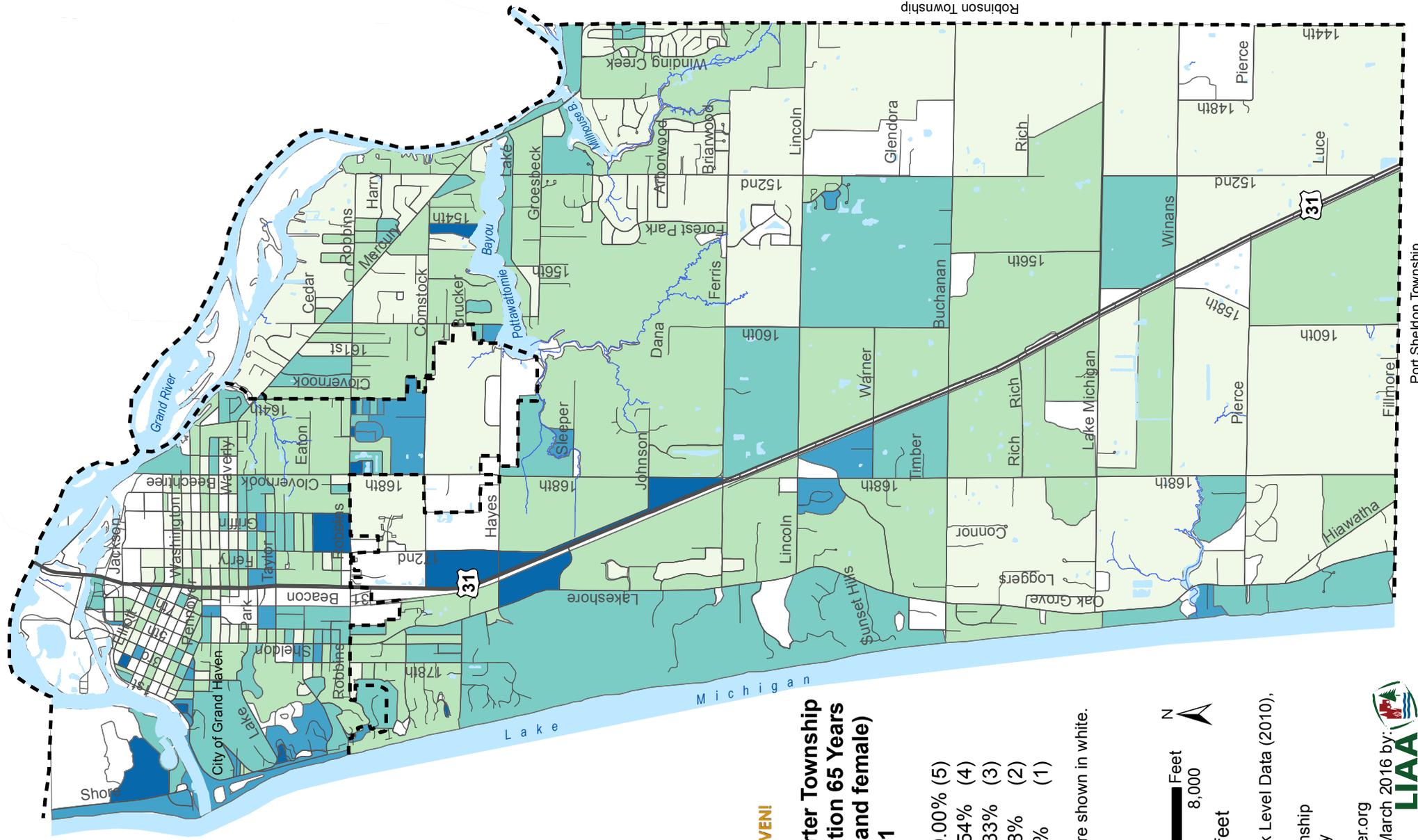
Map 17 identifies neighborhoods within Grand Haven Charter Township that are located within one mile of a full service grocery store.

**ADDITIONAL RESOURCES DRAWN FOR THIS REPORT:**

Snover, A.K., L. Whitely Binder, J. Lopez, E. Willmott, J. Kay, D. Howell, and J. Simmonds.

2007 Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments. In association with and published by ICLEI – Local Governments for Sustainability, Oakland, CA

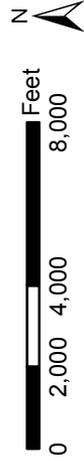
Michigan Climate and Health Adaptation Plan 2010-2015 Strategic Plan, Prepared by the Michigan Department of Community Health (2001)



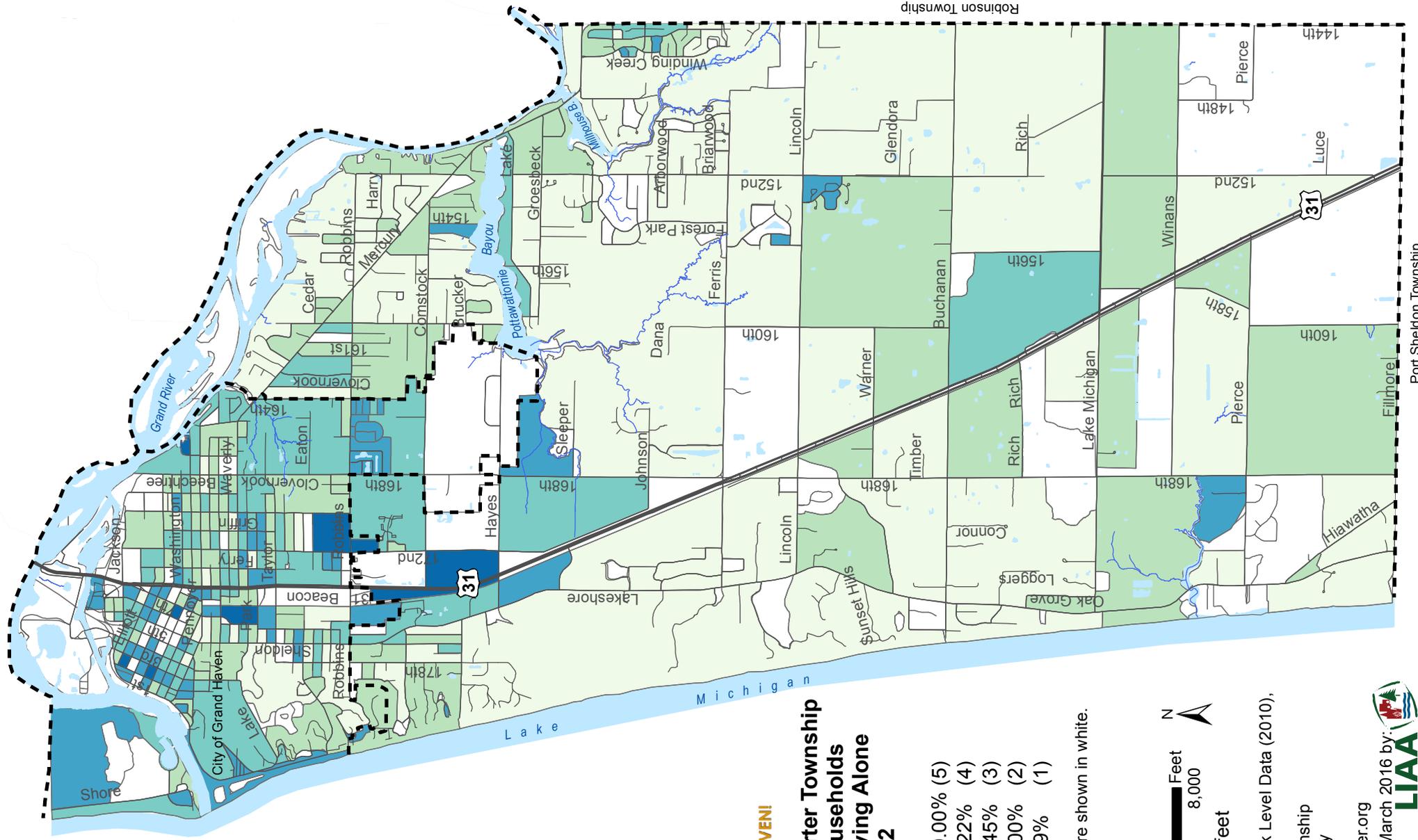
## Grand Haven Charter Township Percent of Population 65 Years and Older (male and female) Map #1

- 61.55 - 100.00% (5)
- 33.34 - 61.54% (4)
- 19.29 - 33.33% (3)
- 9.56 - 19.28% (2)
- 1.22 - 9.55% (1)

Note: Areas with no data are shown in white.



Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS  
 Color symbols: ColorBrewer.org



## Grand Haven Charter Township Percent of Households with People Living Alone Map #2

- 72.23 - 100.00% (5)
- 45.46 - 72.22% (4)
- 30.01 - 45.45% (3)
- 17.40 - 30.00% (2)
- 3.03 - 17.39% (1)

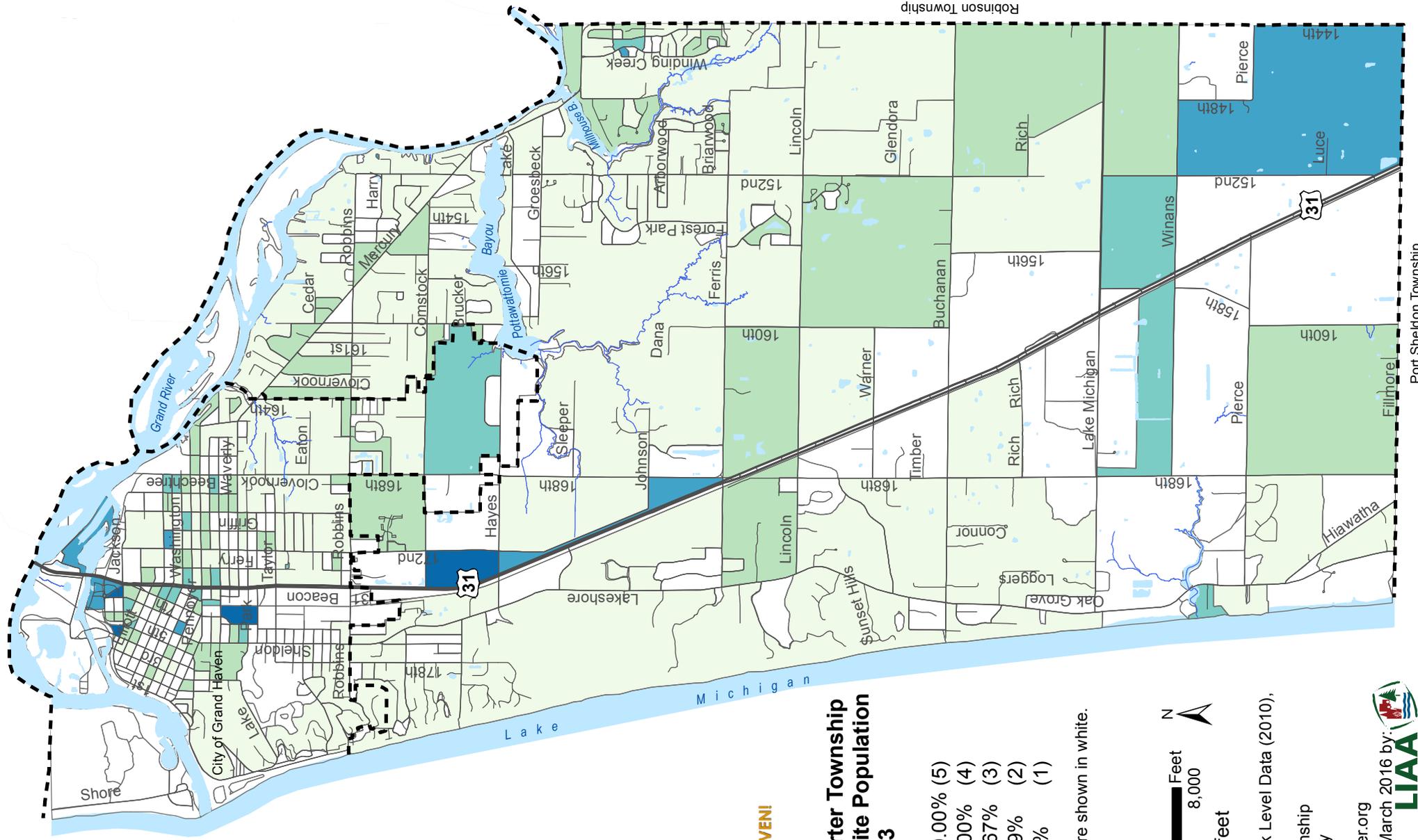
Note: Areas with no data are shown in white.



0 2,000 4,000 8,000 Feet

1 inch = 4,750 feet

Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS  
 Color symbols: ColorBrewer.org



## Grand Haven Charter Township Percent of Non-white Population Map #3

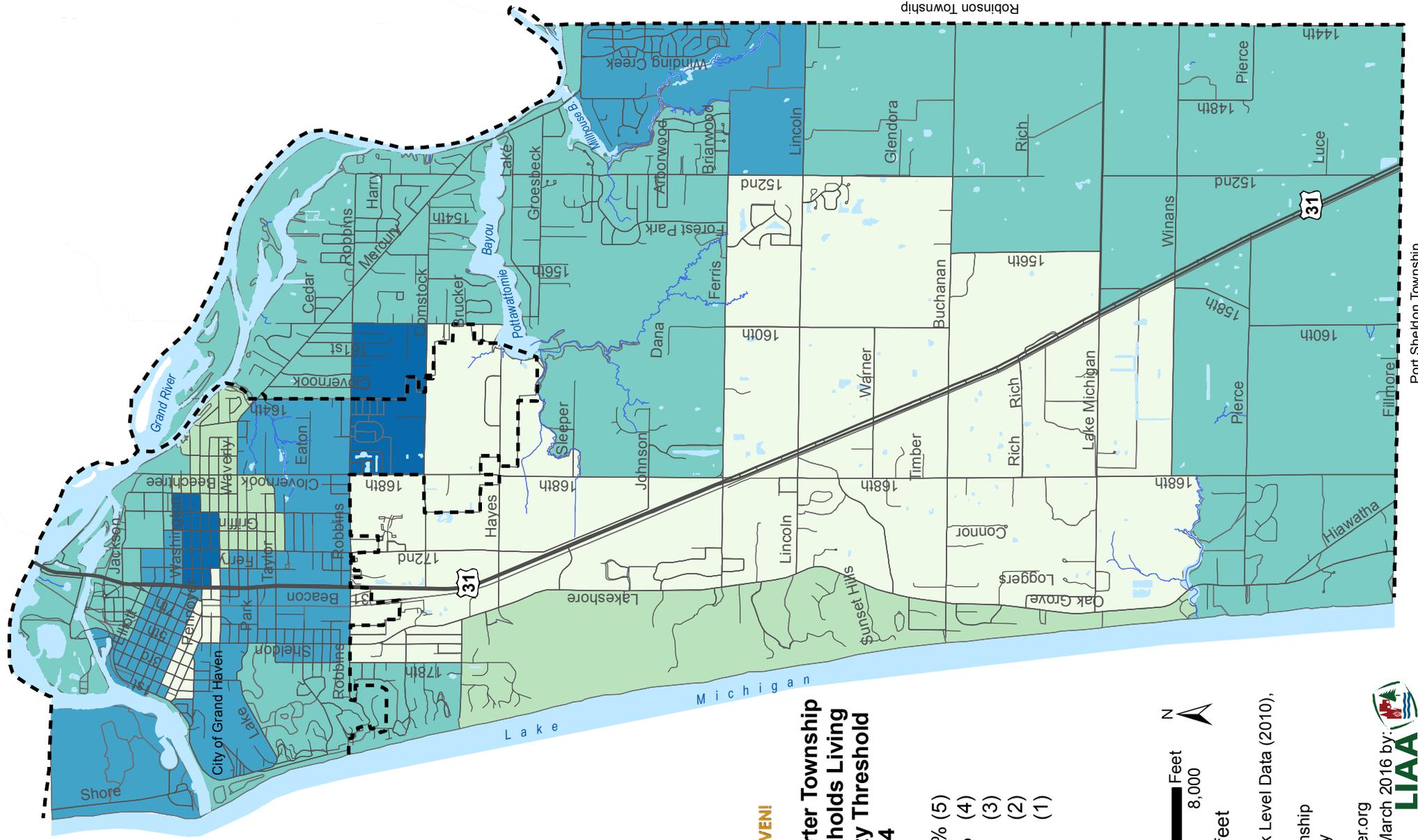
- 50.01 - 100.00% (5)
- 31.68 - 50.00% (4)
- 15.80 - 31.67% (3)
- 6.91 - 15.79% (2)
- 0.80 - 6.90% (1)

Note: Areas with no data are shown in white.

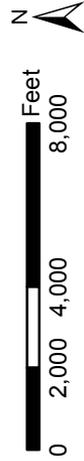
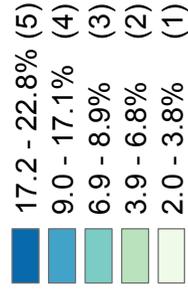


1 inch = 4,750 feet

Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS  
 Color symbols: ColorBrewer.org

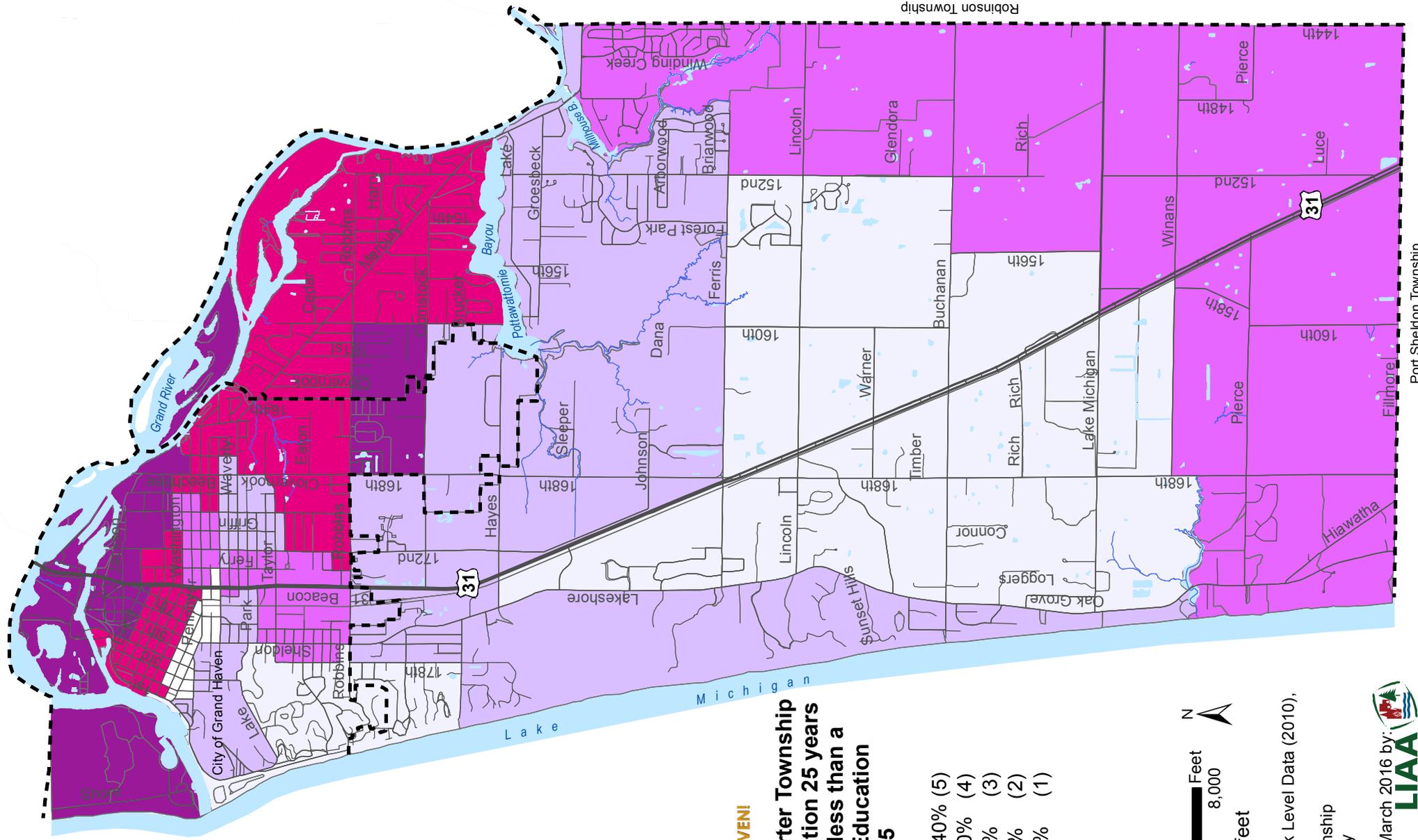


## Grand Haven Charter Township Percent of Households Living Below the Poverty Threshold Map #4



1 inch = 4,750 feet

Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS  
 Color symbols: ColorBrewer.org



**Grand Haven Charter Township  
Percent of Population 25 years  
and Older with less than a  
High School Education  
Map #5**

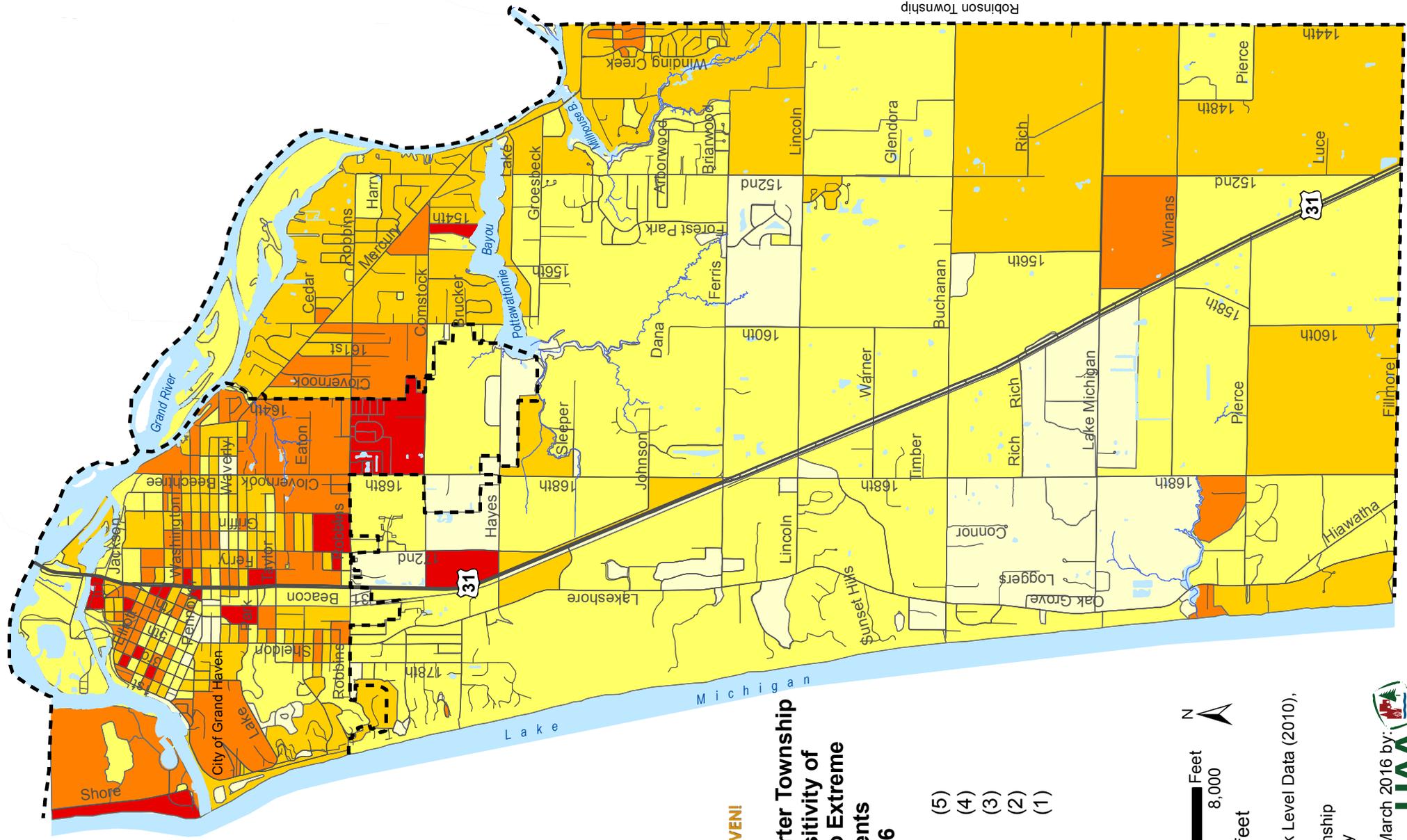
- 10.31 - 16.40% (5)
- 8.11 - 10.30% (4)
- 4.01 - 8.10% (3)
- 1.11 - 4.00% (2)
- 0.80 - 1.10% (1)



0 2,000 4,000 8,000  
Feet

1 inch = 4,750 feet

Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS



**Grand Haven Charter Township  
Relative Sensitivity of  
Populations to Extreme  
Heat Events  
Map #6**

<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span>	16 - 21	(5)
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	13 - 15	(4)
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span>	10 - 12	(3)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	6 - 9	(2)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	1 - 5	(1)

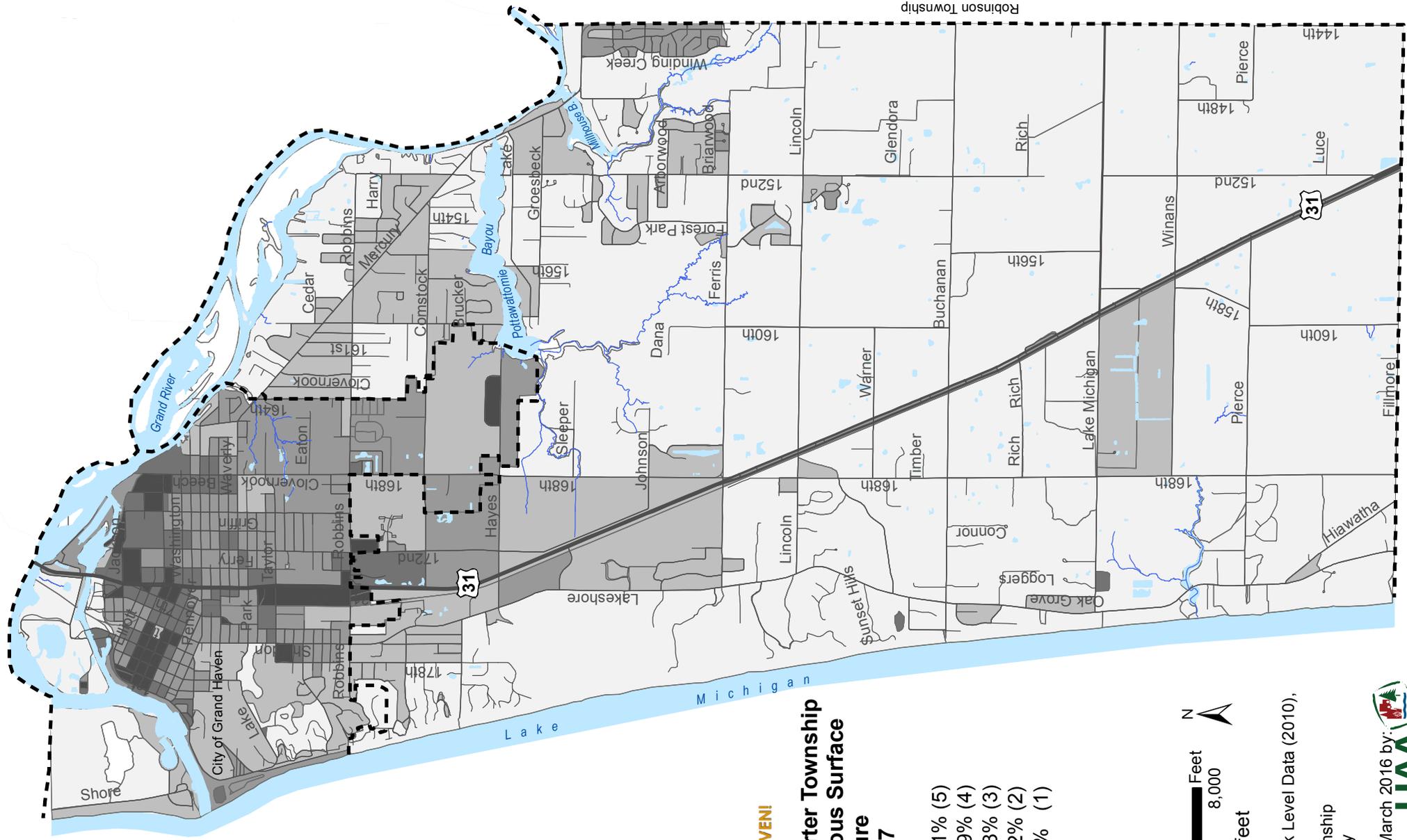


1 inch = 4,750 feet

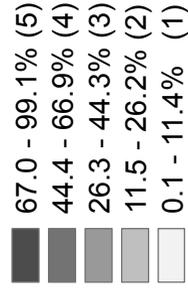
Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS

Prepared March 2016 by:  
**LIAA**

Port Sheldon Township

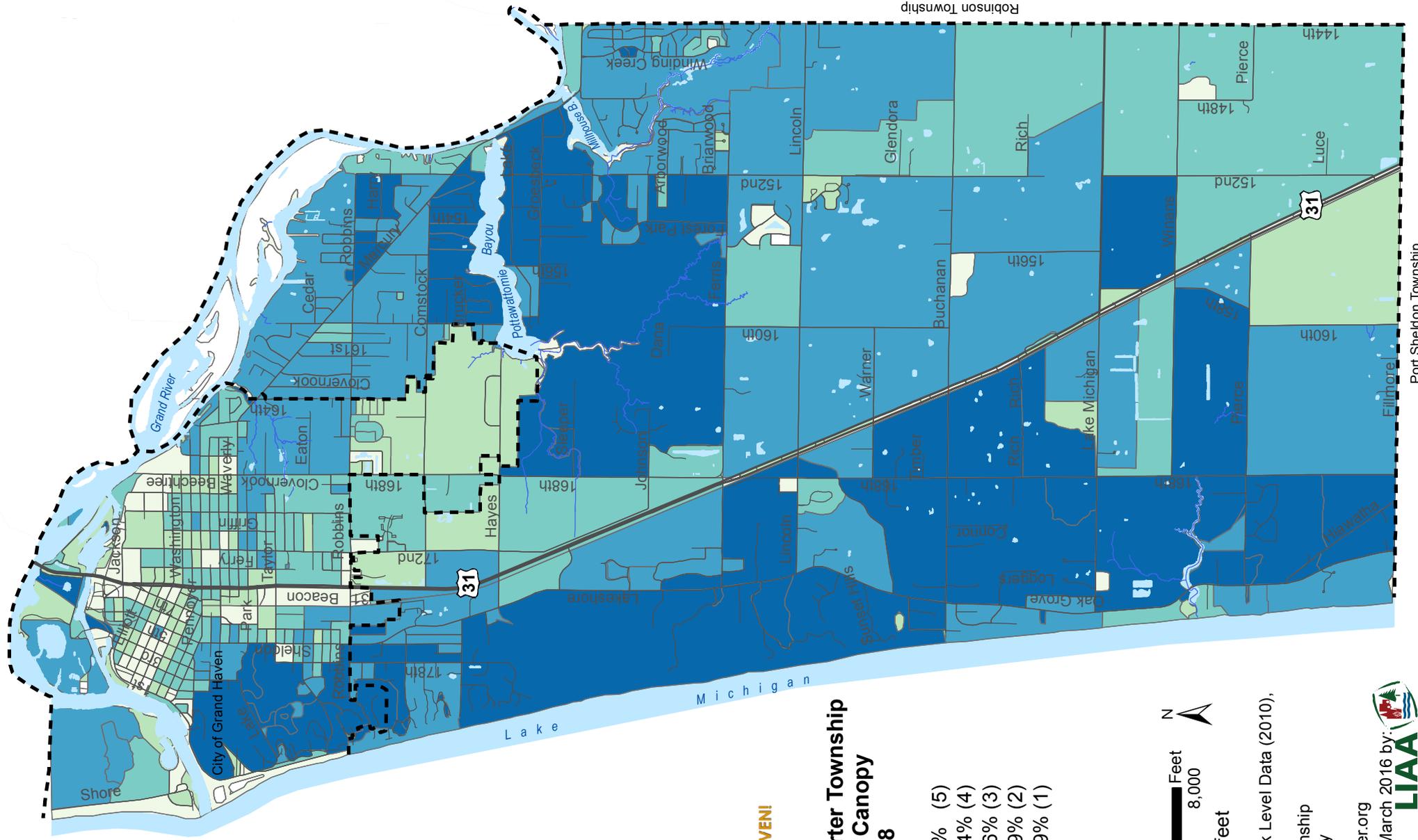


## Grand Haven Charter Township Percent Impervious Surface Exposure Map #7

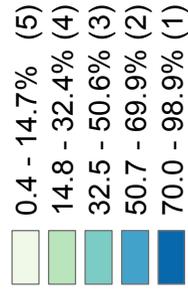


1 inch = 4,750 feet

Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS



## Grand Haven Charter Township Percent Tree Canopy Map #8

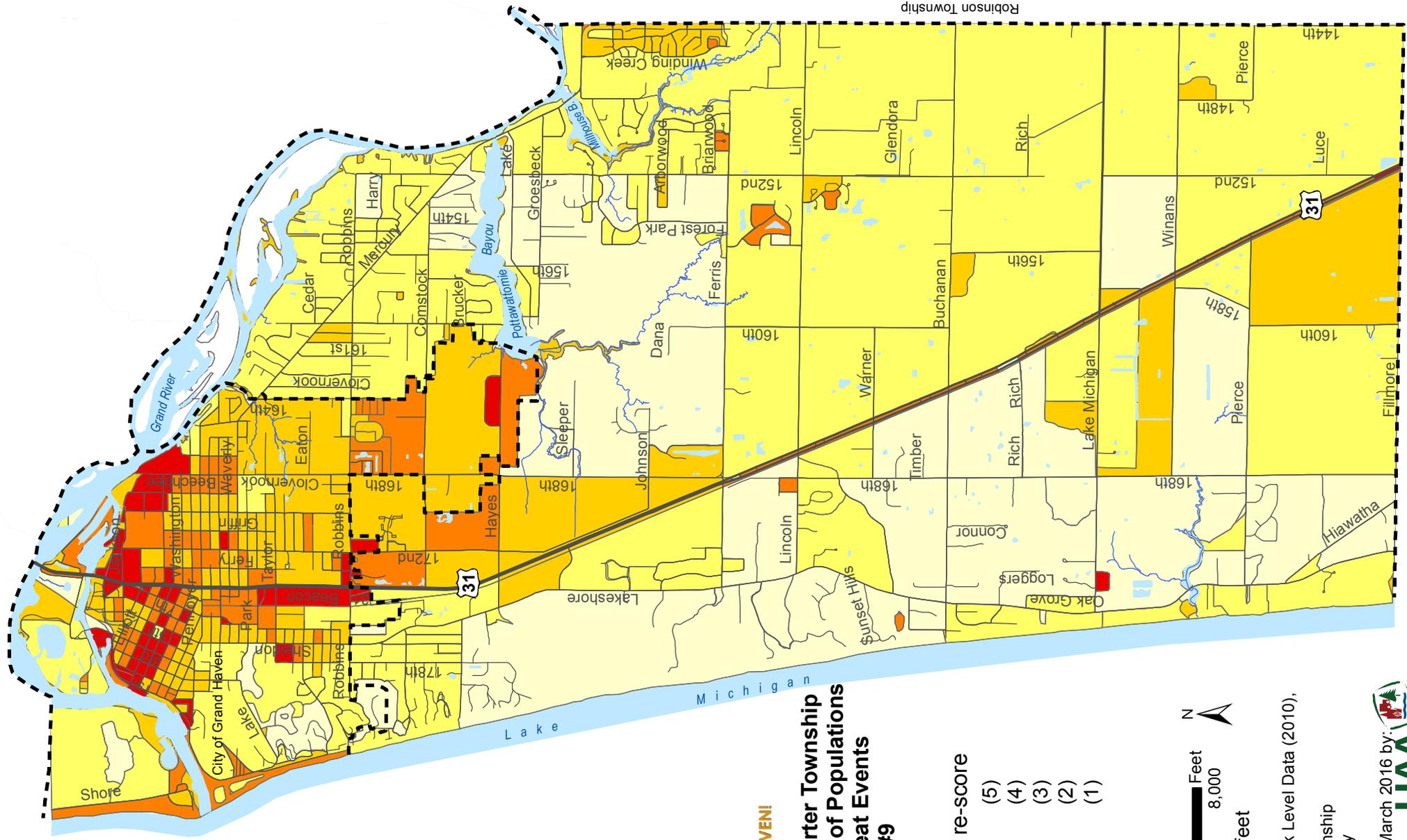


1 inch = 4,750 feet

Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS  
 Color symbols: ColorBrewer.org

Prepared March 2016 by:  
 LIAA

Port Sheldon Township



## Grand Haven Charter Township Relative Exposure of Populations to Extreme Heat Events Map #9

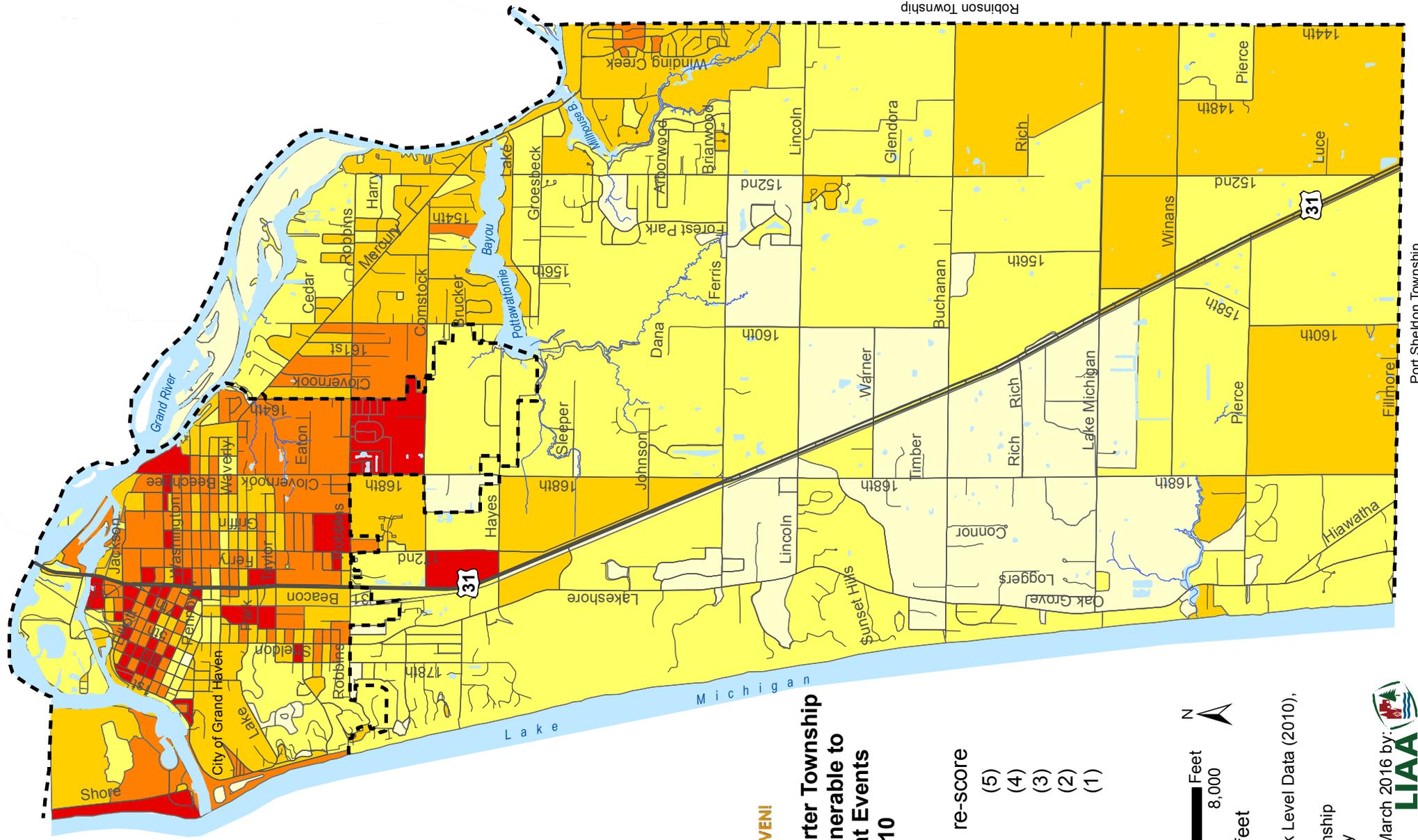
additive score	re-score
<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span>	9 - 10 (5)
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	7 - 8 (4)
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span>	5 - 6 (3)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	3 - 4 (2)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	1 - 2 (1)



Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS

Prepared March 2016 by:  
**LIAA**

Port Sheldon Township



## Grand Haven Charter Township Population Vulnerable to Extreme Heat Events Map #10

additive score	re-score
<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span>	22 - 27 (5)
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	18 - 21 (4)
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span>	14 - 17 (3)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	10 - 13 (2)
<span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span>	3 - 9 (1)



0 2,000 4,000 8,000 Feet

1 inch = 4,750 feet

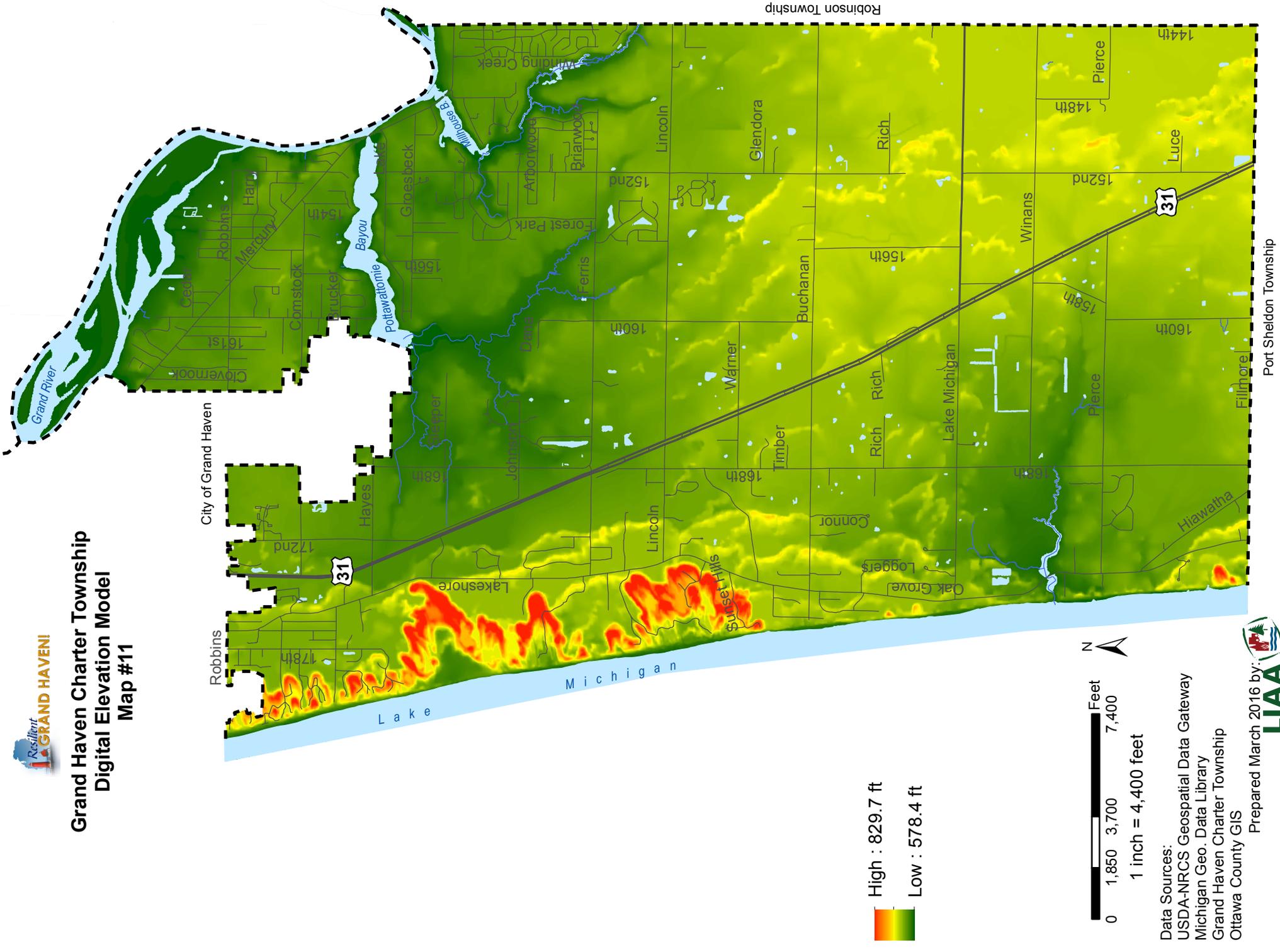
Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS

Prepared March 2016 by:  
**LIAA**

Port Sheldon Township



# Grand Haven Charter Township Digital Elevation Model Map #11



High : 829.7 ft  
Low : 578.4 ft



0 1,850 3,700 7,400 Feet

1 inch = 4,400 feet

Data Sources:  
USDA-NRCS Geospatial Data Gateway  
Michigan Geo. Data Library  
Grand Haven Charter Township  
Ottawa County GIS

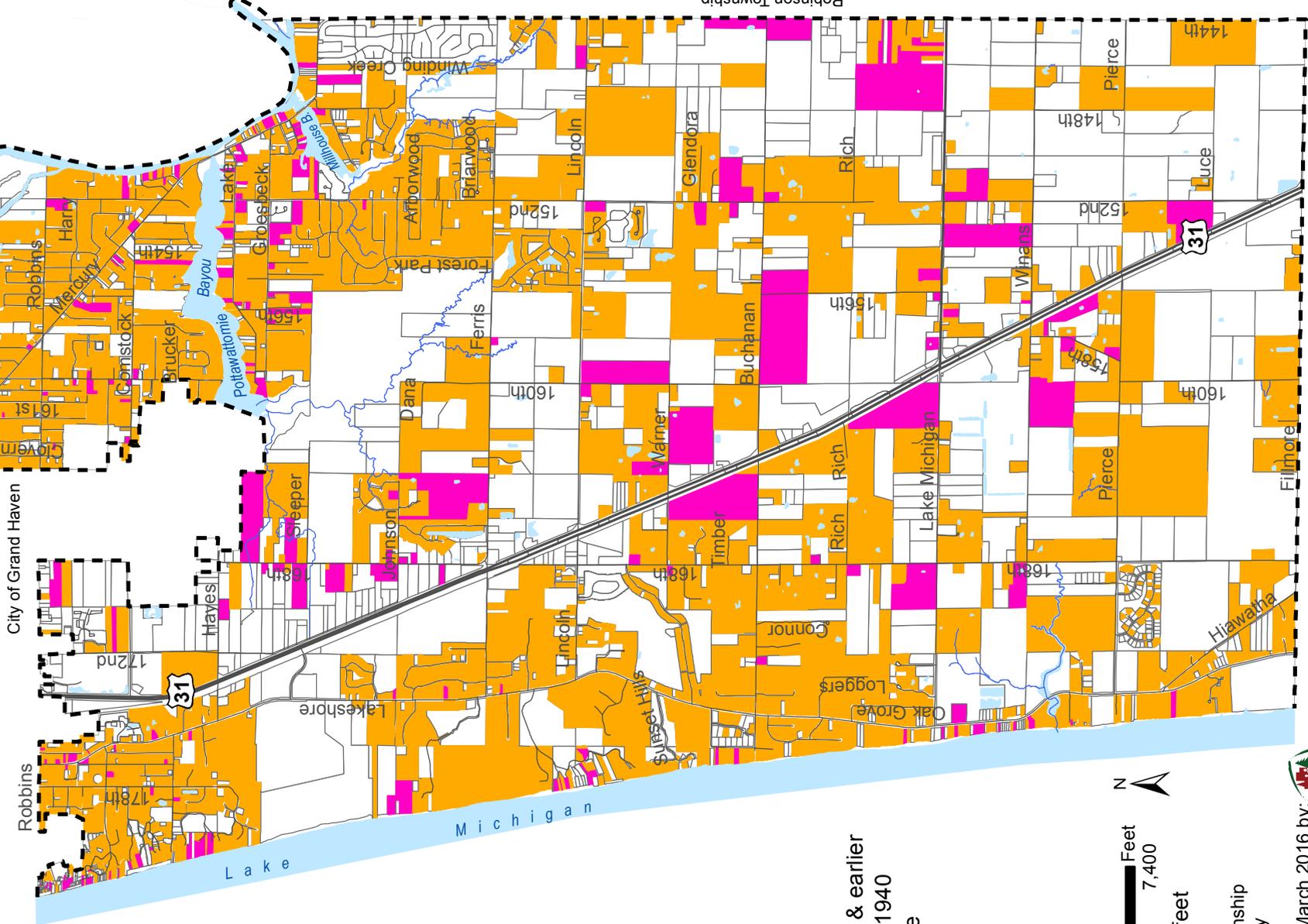


Prepared March 2016 by:

Port Sheldon Township



# Grand Haven Charter Township Year Home was Built Map #12



- Home built 1940 & earlier
- Home built after 1940
- No data available

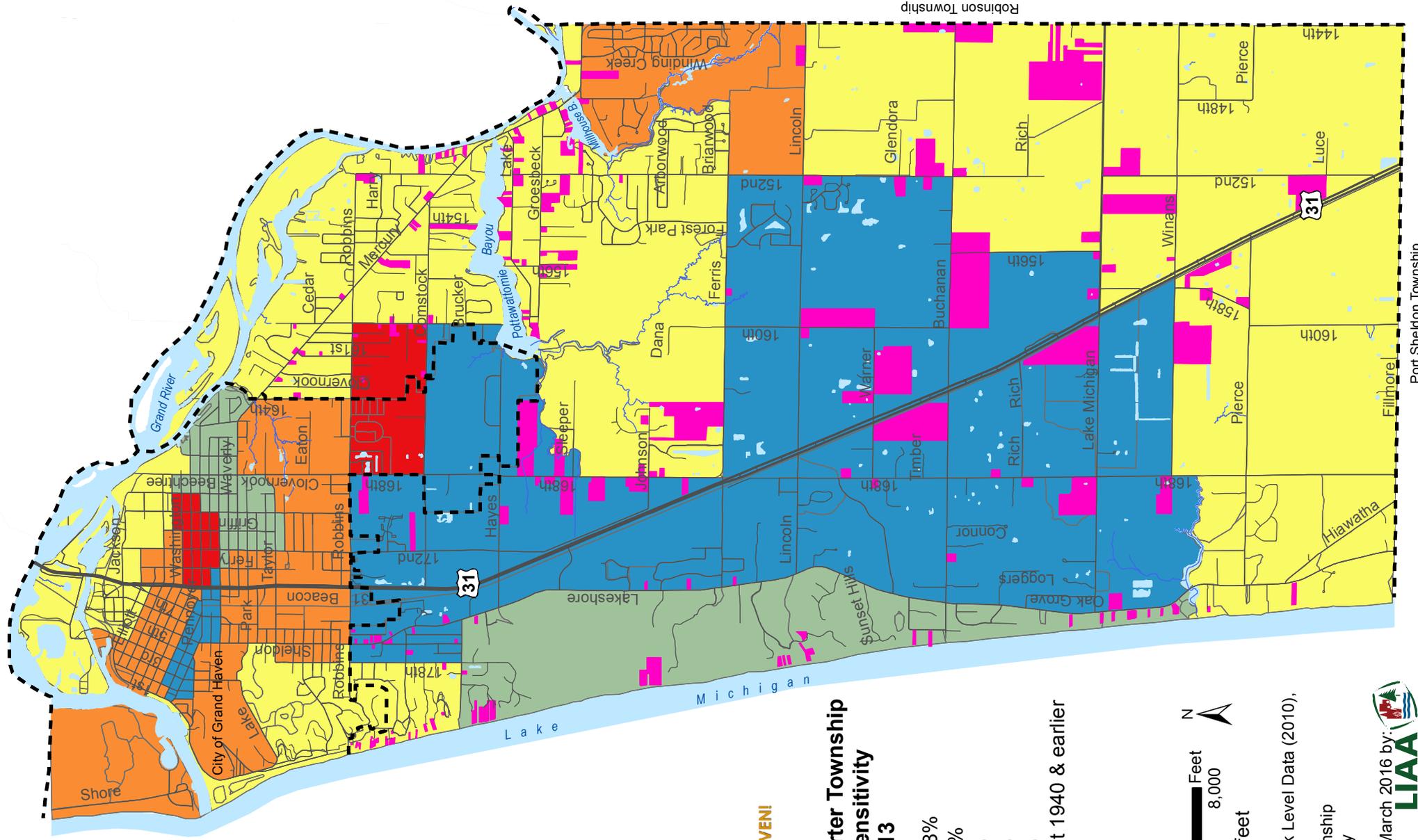


0 1,850 3,700 7,400 Feet  
1 inch = 4,400 feet

Data Sources:  
Grand Haven Charter Township  
Michigan Geo. Data Library  
Ottawa County GIS

Prepared March 2016 by:  
**LIAA**

Port Sheldon Township



## Grand Haven Charter Township Household Sensitivity Map #13

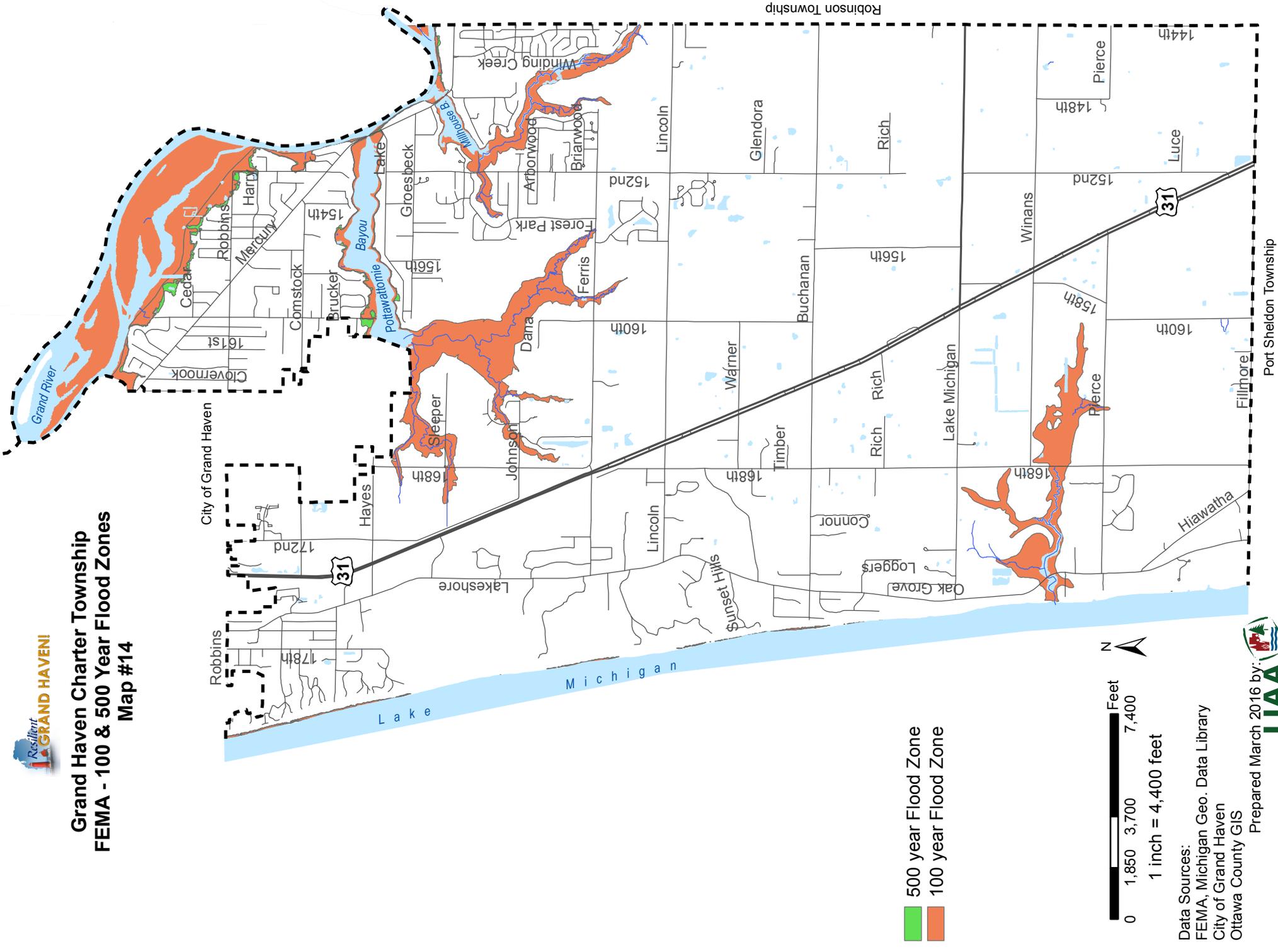
- 17.2 - 22.8%
- 9.0 - 17.1%
- 6.9 - 8.9%
- 3.9 - 6.8%
- 2.0 - 3.8%
- Home built 1940 & earlier



Data Sources:  
 U.S. Census Bureau, Block Level Data (2010),  
 ACS data (2009-2013)  
 Grand Haven Charter Township  
 Michigan Geo. Data Library  
 Ottawa County GIS



# Grand Haven Charter Township FEMA - 100 & 500 Year Flood Zones Map #14



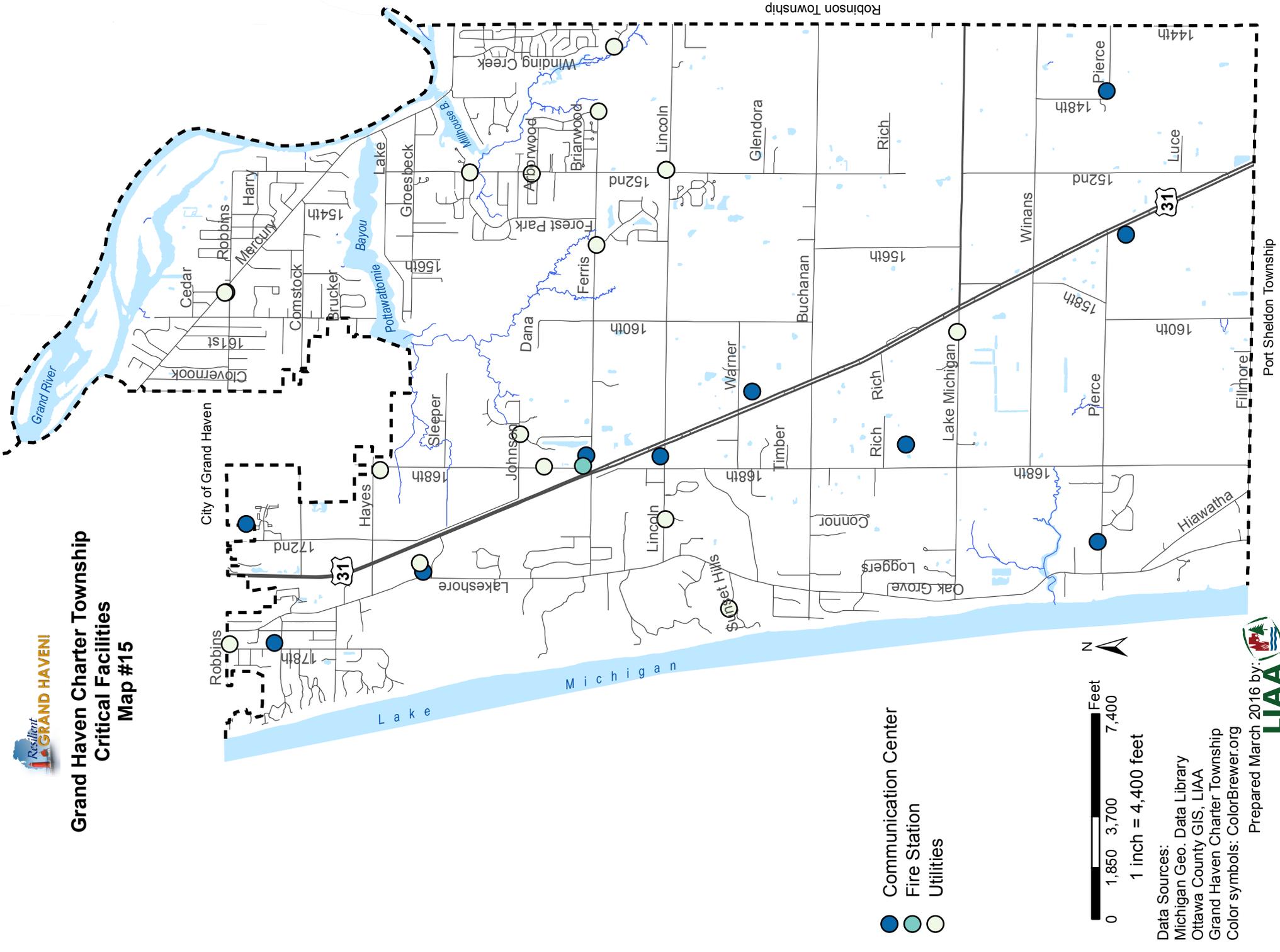
- 500 year Flood Zone
- 100 year Flood Zone



0 1,850 3,700 7,400 Feet  
1 inch = 4,400 feet

Data Sources:  
FEMA, Michigan Geo. Data Library  
City of Grand Haven  
Ottawa County GIS

# Grand Haven Charter Township Critical Facilities Map #15



- Communication Center
- Fire Station
- Utilities



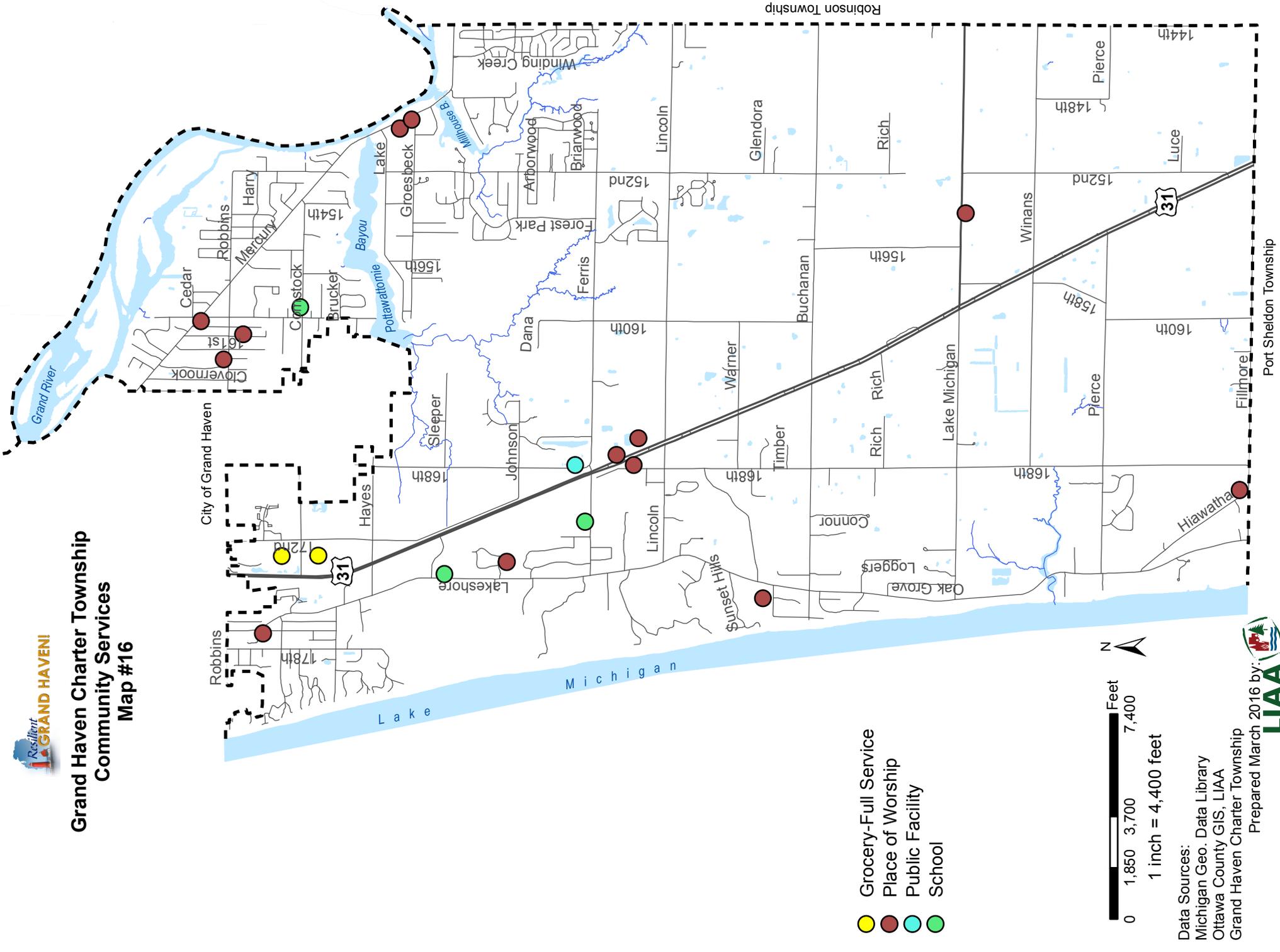
0 1,850 3,700 7,400  
Feet

1 inch = 4,400 feet

Data Sources:  
Michigan Geo. Data Library  
Ottawa County GIS, LIAA  
Grand Haven Charter Township  
Color symbols: ColorBrewer.org



# Grand Haven Charter Township Community Services Map #16



- Grocery-Full Service
- Place of Worship
- Public Facility
- School



Data Sources:  
Michigan Geo. Data Library  
Ottawa County GIS, LIAA  
Grand Haven Charter Township  
Prepared March 2016 by:  
**LIAA**



# Economic Development Report

By David Miller, Vice President Economic Development



One South Harbor Drive  
Grand Haven, MI 49417  
Phone 616-842-4910

## Chamber activities at a glance

- Chamber activities and events impacted businesses in the following communities during the First Quarter of 2016:
  - City of Grand Haven (15)
  - Grand Haven Charter Twp (1)
  - Spring Lake Twp (6)
  - Spring Lake Village (0)
  - City of Ferrysburg (0)
- Score Counseling sessions (6)
- SBDC Counseling sessions (49)

For any additional information please contact the following Chamber staff:

- David Miller, Economic Development 846-3153
- Nancy Manglos, Workforce Development 842-0529
- Pam Blake, Member Services 842-4910

## Economic Outlook

Economic activity for the first quarter of 2016 has shown some volatility, with several manufacturers reporting that sales were soft in January, and even into February, but by March, sales were once again up and forecasts looked strong for the year. Several companies have reported that they expect sales to be flat for 2016, but since many of them had record setting years leading up to 2016, flat is by no means a negative thing. Especially when coupled with the general lack of available talent to draw from. Many companies tied to the

automotive sector reported continued strong sales with aggressive projections for the rest of the year.

Wages rates continue to rise, with many employers offering across the board increases of \$1/hour or more. Most employers report starting wages above \$12/hour and some significantly higher than that.

Several have reported that they will invest in more automation in their local plants or if they have multiple locations, shifting work to other areas of the coun-

try where there is a perception of more available talent.

At least one area manufacturer is committing to a significant expansion here locally, investing nearly \$10million in building and equipment, and committing to hire 104 new employees in the next two years. Chamber staff worked with the local unit of government, the MEDC and West Michigan Works to secure the commitment. The identity of the company will be released once the MEDC has made their announcement.

## West Michigan Economic Forecast

We were fortunate to bring George Erickcek from the W.E. Upjohn Institute out of retirement for the 2016 Economic Forecast. Over one hundred attendees gathered one last time to hear George Erickcek reflect upon the economic conditions for 2015 and compare them to the forecast given last year.

Erickcek reported that the economy actually did better than he had expected, and that the West Michigan economy had fully recovered from the Great Recession of 2007-2008. There were still some concerns, related to educational attainment for the region. For the most part, it was the resurgence of our Manufacturing Sector, that lead the area to employment levels greater than the state or the nation.

George did acknowledge that this would be his final economic forecast in West Michigan as he has relocated out of state following his retirement, but we are thrilled to have had George's unique humor as he discussed the national, state and local economy over the past 25 years. George



did indicate that the W.E. Upjohn Institute would continue to provide forecasts for us into the future.

## Lakeshore 504

The 20 year rate for 504 loans in March was **4.54%** and the 10 year rate was **4.31%**. Rates have been trending down for the first quarter of 2016.

### 504 Update

In the 2016 federal appropriation bill, there was once again language that gives CDCs the ability to do straight refinancing projects. Most local bankers indicated that this will mean a significant increase in the amount of 504 loans that we do. The primary benefit of this is

that it allows companies to take advantage of equity in their real property and not require any new money down on refinancing. The SBA has indicated that it will take them 4-6 months to write the rules on SBA 504 refinancing. Hopefully we will begin to see deals during the second quarter.

### 504 Bank/Banker of the Year

At the February Early Bird Breakfast, the Northern office of the Lakeshore 504 awarded the 2015 Banker of the year award to Kelly Keuning from 5th/3rd Bank, who also received the 2015 Bank of the Year award. 5th/3rd worked with the Northern office of the Lakeshore 504 to finance the recent expansion of Odd Side Ales production facility located at 1810 Industrial Park Drive in the City of

Grand Haven. Congrats to Kelly and Tom Godfrey at 5th/3rd!



### Ribbon Cuttings

There was one ribbon cutting during the first quarter of 2016 at the new Flagstar Bank located at 12740 Hayes St. in Grand Haven Township.



### Freak Factor

On March 8th the Chamber hosted a half day workshop with speaker David Rendall and his Freak Factor message that we should maximize the benefits of our differences, rather than conform to the norm. There was something for businesses, schools as well as families in David's presentation. Additionally, on March 9th, there was a breakfast meeting with a shortened version of his presentation from the earlier day, but with a focus on community. Most attendees came away with an understanding of Mr. Rendall's message that amplifying what others consider to be weaknesses is crucial to our success

