



**REGULAR OF THE
CHARTER TOWNSHIP OF COMSTOCK PLANNING
COMMISSION**

**THURSDAY, MARCH 26, 2026 at 6:00 PM
NOTICE AND AGENDA
5858 KING HIGHWAY
COMSTOCK TOWNSHIP HALL**

Call to Order

Pledge of Allegiance to the Flag of the United States of America

Approval of Agenda

Approval of Minutes

March 12, 2026 Meeting Minutes DRAFT

Citizen Comment

A citizen may state their name and address and may speak only one time, for no more than three (3) minutes. This time may not be given to another citizen to extend their time. The person speaking has the floor and no other citizen shall speak during someone else's time. During this time, you will be making statements to the Board, without discussion from the Board members, but you are welcome to make an appointment with Planning & Zoning staff to discuss your comments further. Please keep comments clean and respectful.

New Business

Rezoning Request and Public Hearing - 5057 E Main and 1654 Leigh Ave

Old Business

Any Other Business

Tim Kerney Text Amendment Request

Citizen Comment

A citizen may state their name and address and may speak only one time, for no more than three (3) minutes. This time may not be given to another citizen to extend their time. The person speaking has the floor and no other citizen shall speak during someone else's time. During this time, you will be making statements to the Board, without discussion from the Board members, but you are welcome to make an appointment with Planning & Zoning staff to discuss your comments further. Please keep comments clean and respectful.

Updates from Other Boards

Training Updates

Informational/Future Action Items

Solar, Wind and Data Center Information

Planning Commissioner Comments

Adjournment



MEMO

Charter Township of Comstock Planning Commission March 26, 2026

From: Khayci Bryant, Planner

Re: March 12, 2026 Meeting Minutes DRAFT

Attachments:

[2026_03_12 Comstock PC Meeting Minutes.docx](#)

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**COMSTOCK CHARTER TOWNSHIP
PLANNING COMMISSION
MINUTES OF MEETING HELD MARCH 12, 2026**

A meeting of the Comstock Charter Township Planning Commission was held on Thursday, March 12, 2026 at the Comstock Township Hall beginning at 6:00 p.m.

Members Present: Amber Lawrence, Chair
Larry Nichols, Vice Chair
Greg Nowak
Bub Sherwood
Joseph Weintraub

Members Absent: Sandy Bloomfield
James Criteser, Secretary

Also in attendance was Township Attorney Rob Thall, Township Zoning Administrator Khayci Bryant, Township Planning Consultant Kyle Mucha and approximately 14 members of the general public.

Call to Order

Chair Lawrence called the Planning Commission meeting to order at 6:00 p.m.

Pledge of Allegiance

Pledge of Allegiance was recited.

Approval of Agenda

Sherwood motioned with support from Nichols, to approve the agenda as submitted. Upon voice vote, motion passed 5-0.

Approval of Minutes

Nichols motioned with support from Sherwood to approve the February 19, 2026 meeting minutes. Upon voice vote, motion passed 5-0.

Sherwood motioned with support from Nichols to approve the amended February 26, 2026 meeting minutes. Upon voice vote, motion passed 5-0.

Citizen Comment

Jason Knight: spoke in support of the Watt's housing development.

Anthony Sherman 5215 Fordham: requested information on the rear yard setback for the proposed homes as they will abut his home

Kellie Gerorge Leigh Ave: Shared that she was not thrilled about the potential housing development and had concerns, however she spoke with Matt Watts and a lot of the worries were addressed

William Knight: stated that the developer is here to make money and would like the board to listen to the residents

1 **New Business**

2
3 **1. Step One Review and Public Hearing – Leigh Ave Site Condominium**

4
5 Mucha provided a detailed overview of his staff report.

6
7 Sherwood motioned with support from Nichols to open the public hearing. Upon voice vote, motion
8 passed 5-0.

9
10 *Public Hearing:*

11
12 Seth Sherman 5215 Fordham: shared that he has lived in this home his whole life, voiced concerns that it
13 appears the developer does not care

14
15 Elizabeth Kucinich 2948 Casper: voiced concerns regarding traffic, as with the new development traffic
16 volume will increase and states that speed bumps may be needed

17
18 Jason Knight: shared that creating new housing like the proposed development will allow other housing
19 options to open up. Provided an example of a buyer purchasing one of these homes and moving from an
20 apartment, this will then free up the apartment for a young person to move out of their parents' home

21
22 William Knight: voiced opposition to this project, particularly due to the high cost of the homes

23
24 Sherwood motioned with support from Nichols to close the public hearing. Upon voice vote, motion
25 passed 5-0.

26
27 *Public Hearing Closed*

28
29 The engineer of the project, Paul Schram, was invited to the podium to speak further on the development.
30 He spoke to the infrastructure: discussing the 8-inch water mains they intend to place, along with walking
31 through the phases.

32
33 Following Schram, Matt Watts approached the podium to speak to residents' concerns. He confirmed
34 there is no plan to create a driveway coming off of Fordham, additionally there will be a setback of over
35 100 feet from the project's property line to the homes located on Fordham.

36
37 Watts spoke further on the traffic concerns and HOA system that will be created in this development.

38
39 Weintraub asked if Watts plans to sell these lots or to build every building on the parcels

40
41 Watts replied that he intends to be the exclusive builder for this development, further elaborating that
42 these will be custom homes

43
44 Weintraub inquired that perhaps the recommendation should include discussion of whether the project
45 should have private streets or public roads

46
47 Schram spoke on this item, stating that if the streets were to be private then the burden of snow cleaning,
48 maintenance, repair and eventual replacement is left to the homeowners.

49
50 Watts shared that he did receive a letter from Fire Chief Beauchamp stating that he has no concerns with
51 the 1000ft+ of road length proposed for the project, as they intend to meet the fire hydrant requirements.

52
53 Sherwood motioned with support from Nichols to waive their bylaws and take action tonight. Upon roll call
54 vote: Nichols- Yes; Sherwood- Yes; Nowak- Yes; Weintraub- Yes; Lawrence- Yes; Motion passed 5-0.

1 The Commissioners discussed the staff report, confirming compliance and completion with the site
2 condominium standards

3
4 Concerns arose regarding the request to waive the maximum 1000 ft street length requirement, while the
5 fire department is not worried about safety, the commissioners voiced concerns about speeding.

6
7 Watts confirmed that he has met with the road commission; they have no concerns and will not be
8 requiring a traffic study.

9
10 Nowak motioned with support from Sherwood to recommend approval to the Township Board for the
11 Leigh Ave Site Condominium review with the extension of the road based upon the findings reviewed
12 today.

13 Upon roll call vote: Nichols- Yes; Sherwood- Yes; Nowak- Yes; Weintraub- Yes; Lawrence- Yes; Motion
14 passed 5-0.

15 16 17 Old Business

18 19 20 **1. Landscaping with sample ordinances**

21 Bryant briefly went over the revisions from the previous meeting

22
23 Attorney Thall recommended a few edits which will offer further clarity and greater flexibility

24
25 The commissioners were in support of the small revisions recommended by Bryant and Thall

26
27 Sherwood motioned with support from Nichols to move the landscaping ordinance revisions to a public
28 hearing. Upon voice vote, motion passed 5-0.

29 30 31 32 33 **2. Planned Unit Developments with sample ordinances**

34 Bryant shared the minor revisions she completed from the previous meeting, confirming that section
35 numbers will be updated prior to the public hearing

36
37 Attorney Thall also offered revisions

38
39 The commissioners were in support of the small revisions recommended by Bryant and Thall

40
41 Nicholes motioned with support from Weintraub to move the Planned Unit Development revisions to a
42 public hearing. Upon voice vote, motion passed 5-0.

43 44 45 46 Any Other Business

47
48 None.

1 **Citizen Comment**

2
3 William Knight: stated there will be public outrage due to the Watts Project getting pushed through, as the
4 boards are aware the community does not want this

5
6 Kellie George: she shared that she is a part of the community and although she is not thrilled and excited
7 for this to happen a few doors down from her home, she understands the current housing situation

8
9 Elizabeth Kucinich: voiced that Watts has laid out the best plan possible to please everyone. We need
10 housing and it is the boards job to develop the community for the better. If there is a speeding concern
11 when the development is complete, that will have to be addressed later

12
13 Anthony Sherman: voiced concerns that this will raise property taxes for homes in the area

14
15 Matt Watts: shared that he appreciates the work the planning commission is doing on the landscaping
16 revisions. Suggested that they drive out to the new Planet Fitness on G Ave as this is an example of how
17 landscaping can make development and maintenance difficult

18
19 **Updates from Other Boards**

20
21 Bryant shared that there will be a ZBA meeting this month

22
23 **Training Updates**

24
25
26 None

27
28
29
30 **Informational/Future Action Items**

31
32 Bryant shared that she has completed an administrative site plan review for a project located at 7275 E H
33 Ave. The property is 132 acres and owned by the City of Kalamazoo, currently used for a Pump Station.
34 The site plan was for an accessory structure to protect key electrical equipment from future flood damage.

35
36 Bryant shared that the only applicant-based item on the 3/26/26 Agenda will be a rezone request from
37 Mark Zanotti.

38
39
40
41 **Planning Commissioner Comments**

42
43 Weintraub: none

44
45 Sherwood: none

46
47 Nichols: none

48
49 Nowak: shared that if Mr. Watts approached the PC originally with a description and definitive ideas/plan,
50 this could have been a quicker process. While not ideal, he likes what he saw tonight, and it does address
51 many problems in today's world.

52
53 Lawrence: reiterated that the commission is making a recommendation to approve the site condominium
54 project to the township board, as they do not have the final say. The planning commission does not have
55 the ability to deny projects if all the findings meet the standards. Shared that she is optimistic about the
56 housing design options this project will feature, it will look like a neighborhood as opposed to apartment

Adjournment

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There being no further business before the Planning Commission, Chair Lawrence adjourned the meeting at approximately 8:00 p.m.

Prepared by: Khayci Bryant, Zoning Administrator
Minutes prepared: March 18, 2026
Minutes approved:



MEMO

Charter Township of Comstock Planning Commission March 26, 2026

From: Khayci Bryant, Planner

Re: Rezoning Request and Public Hearing - 5057 E Main and 1654 Leigh Ave

Attachments:

[Rezoning Request \(1\).pdf](#)
[5057 E Main and Leigh Ave Rezone Request.docx](#)
[R1-A Permitted Uses and Special Land Use.pdf](#)
[B-3 Permitted Uses and Special Land Use.pdf](#)
[Zanotti_AdditionalMap.png](#)
[Zanotti_Documents.png.pdf](#)
[Zoning-Map-24x36-2025-Update \(1\).pdf](#)
[8_5X11-Future-Land-Use-Map \(2\).pdf](#)
[1980 Zoning Map.pdf](#)
[1992 Zoning Map.pdf](#)
[2006 Zoning Map.pdf](#)

Rezoning Request Summary

5057 E MAIN & 1654 LEIGH

Applicant: Mark Zanotti

PN: 3907-07-351-786 + 3907-07-351-812

Brief Summary of Request:

Applicant has submitted a rezone request for two contiguous parcels, 5057 E Main and 1654 Leigh Ave. The applicant purchased these properties in the late 1990's, and per our in person meetings and the letter he submitted, he is positive they were both zoned B-3, General Business District at the time of purchase.

However, our current zoning maps show the properties split zoned, R1-A Single Family District and B-3 General Business District. The applicant has shared that he believes this is an error on the Township's behalf.



Existing Site Information:

Site Zoning + Land Use	Surrounding Zoning + Land Use	Size of Site
<ul style="list-style-type: none"> • Split- Zoned: R1-A and B-3 • E Main Land Use: Commercial Building • Leigh Ave Land Use: Residential 	<ul style="list-style-type: none"> • North: R1-A, Residential • South: B-3, Commercial • East: R1- A, Residential • West: K- Township, Residential 	<ul style="list-style-type: none"> • E Main Parcel Size: 3.42 Acres • Leigh Ave Parcel Size: .76 Acres

5057 E Main & 1654 Leigh Ave

REZONE REQUEST- CONSIDERATIONS

<p>1. Whether the rezoning is consistent with the policies and uses proposed for that area in the Township's Master Land Use Plan.</p>	<p>This area is designated as mixed commercial on the Future Land Use Map.</p> <p>The request to rezone the parcels to B-3 General Business District is consistent with the Master Land Use Plan.</p>										
<p>2. Whether all of the uses allowed under the proposed rezoning would be compatible with other zones and uses in the surrounding area.</p>	<p>Consider the zoning and use of abutting parcels:</p> <table border="0"> <tr> <td>Zoning:</td> <td>Uses:</td> </tr> <tr> <td>North: R1-A</td> <td>Residential</td> </tr> <tr> <td>South: B-3</td> <td>Commercial</td> </tr> <tr> <td>East: R1-A</td> <td>Residential</td> </tr> <tr> <td>West: K-Township</td> <td>Residential</td> </tr> </table>	Zoning:	Uses:	North: R1-A	Residential	South: B-3	Commercial	East: R1-A	Residential	West: K-Township	Residential
Zoning:	Uses:										
North: R1-A	Residential										
South: B-3	Commercial										
East: R1-A	Residential										
West: K-Township	Residential										
<p>3. Whether any public services and facilities would be significantly adversely impacted by a development or use allowed under the requested rezoning.</p>	<p>Public water is available on E Main</p> <p>Public Sewer does not run to the West of N Sprinkle.</p> <p>Traffic levels are not expected to significantly increase if the site is rezoned to B-3, General Business District.</p> <p>Public services and facilities are not anticipated to be significantly impacted.</p>										
<p>4. Whether the uses allowed under the proposed rezoning would be equally or better suited to the area than uses allowed under the current zoning of the land.</p>	<p>As you evaluate this factor, refer to the attached ordinance excerpts and uses allowed in the two zoning districts.</p> <p>Also consider uses found in the area.</p>										

3.1.C R1-A Single-Family Residential

1. Intent

The intent here is to provide two (2) districts, the “R1-A” and “R1-B”, Single-Family Residential districts, of different lot sizes and/or density wherein single-family residential uses, incorporating a reasonable range of lot sizes, plus compatible and/or accessory uses, may develop while at the same time promoting a predominantly semi-urban character within the community.

i **User Note:** Click on [Blue](#) for use-specific standards or refer to Article 4 Use Standards.

2. Permitted uses

- a. [Single-family dwellings](#) [Ⓜ] §4.17
- b. Parks, parkways and recreational facilities, [Ⓜ] publicly owned and operated
- c. Educational institutions, public [Ⓜ]
- d. Cemeteries, public and private
- e. [Places of worship](#) §4.36
- f. Accessory buildings [Ⓜ] and uses [Ⓜ]
- g. Incidental raising and retail sale of horticultural and agricultural products grown on the premises
- h. [Family child care homes](#) [Ⓜ] §4.13
- i. [Temporary sales office](#) §4.50
- j. Adult foster care family home [Ⓜ]
- k. Adult day care family home [Ⓜ]
- l. [Accessory dwelling units](#), [Ⓜ] attached §4.1
- j. Radio stations
- k. Temporary buildings or trailer offices incidental to construction
- l. [Essential services](#) [Ⓜ] §4.18
- m. [Stables, public and riding academies](#) §4.42
- n. [Stables, private](#) §4.39
- o. [Public buildings or portions thereof no longer used for public purposes](#) §4.40
- p. [Planned unit developments](#) [Ⓜ] §3.24
- q. [Two-family dwellings](#), [Ⓜ] attached (duplexes) §4.55, §4.17
- r. [Raising and keeping of animals](#) [Ⓜ] §4.4, §4.12
- s. [Kennels](#) [Ⓜ] and/or [boarding kennels](#) [Ⓜ] §4.27
- t. [Group child care homes](#) [Ⓜ] §4.13
- u. [Telecommunication antennas](#) [Ⓜ] located on structures other than telecommunication towers [Ⓜ] §4.60
- v. Adult foster care small group home [Ⓜ]
- w. Adult day care group home [Ⓜ]
- x. [Temporary use for highway construction purposes](#) §4.52
- y. [Temporary use for anemometers and supporting towers](#) §4.51

3. Special land uses

- a. [Accessory dwelling units](#), [Ⓜ] detached §4.1
- b. Publicly owned buildings including libraries, post offices, community centers, and museums
- c. [Public utility](#) [Ⓜ] and [municipal buildings](#) §4.41
- d. [Child care centers](#) [Ⓜ] §4.13
- e. [Institutions of an educational, philanthropic or charitable nature](#) §4.25
- f. Kindergartens or nursery schools for children of preschool age
- g. [Golf courses and country clubs](#) §4.20
- h. Recreational facilities, [Ⓜ] private [Ⓜ]
- i. [Home occupations](#) §4.21

1. Purpose & Intent

2. Definitions

3. Zoning Districts

4. Use Standards

5. Site Standards

6. Development Procedures

7. Administration & Enforcement



3.1.C R1-A Single-Family Residential

4. Development standards

Lot size

	Unplatted		Platted		
	Without water and/or sewer	With water and sewer	Neither water nor sewer	With water or sewer	With water and sewer
Minimum area:	One (1) acre	¼ acre	13,200 s.f.	12,000 s.f.	10,000 s.f.
Minimum width:	165 ft.	150 ft.	100 ft.	90 ft.	80 ft.

Minimum setbacks (in feet)

Front yard:	30
Side yard	
One must be at least:	10
The other must be at least:	5
Rear yard:	35

Maximum building height

In stories:	2
In feet:	25

Lot coverage by buildings

Maximum percentage:	20
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Floor area per dwelling unit

Minimum single-story:	960 s.f.
Minimum ground floor two-story:	750 s.f.

See [§3.2](#), [§3.12](#), and [§3.25](#) for more information.

i **User Note:** Click on [Blue](#) for use-specific standards.

5. Additional requirements

These are links to additional, but not comprehensive, requirements for the district.

Article 5

[Residential accessory buildings and structures §5.1](#)

[Off-street parking requirements §5.2](#)

[Landscaping §5.4](#)

[Exterior lighting §5.10](#)

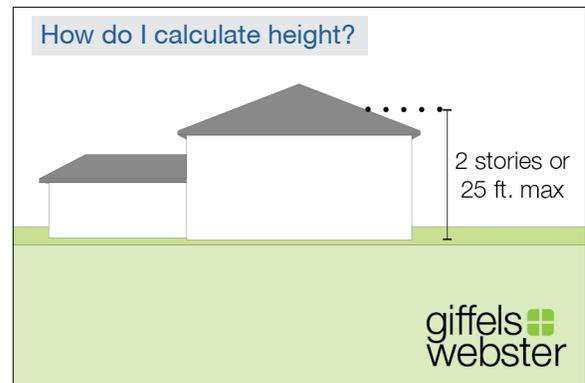
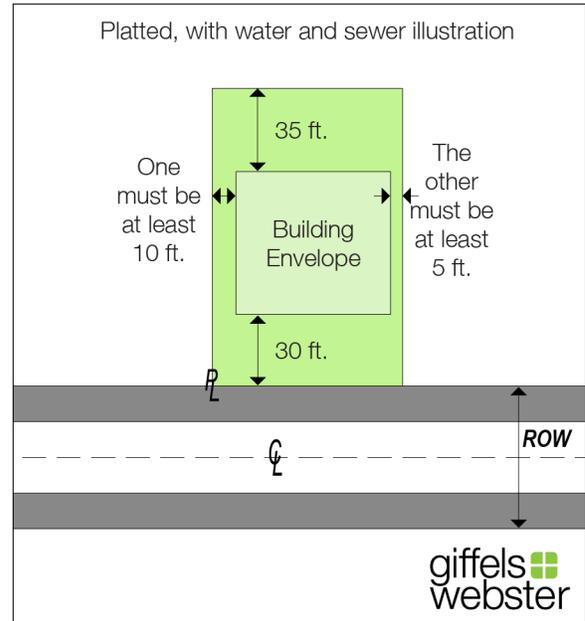
[Fences §5.9](#)

[Signs §5.18](#)

Article 6

[Site plan review procedures §6.1](#)

[Special land uses §6.2](#)



1. Purpose & Intent

2. Definitions

3. Zoning Districts

4. Use Standards

5. Site Standards

6. Development Procedures

7. Administration & Enforcement

3.1.M B-3 General Business

1. Purpose

The intent here is to provide a district wherein those commercial, business, and service uses which primarily cater to the motoring public, plus compatible and/or accessory uses, may be located instead of encroaching into other districts where their unique needs or circumstances would render them incompatible or undesirable.

i User Note: Click on [Blue](#) for use-specific standards or refer to Article 4 Use Standards.

2. Permitted uses

- a. [Offices and office buildings](#) [ⓘ] §4.33
- b. Medical or dental clinics
- c. Financial establishments [ⓘ]
- d. [Public utility](#) [ⓘ] and municipal buildings §4.41
- e. [Educational institutions, vocational and technical](#) §4.58
- f. [Educational institutions, private](#) §4.58
- g. Photographic studios
- h. Funeral homes
- i. Insurance offices, brokerage houses and real estate offices
- j. [Child care centers](#) [ⓘ] §4.13
- k. [Places of worship](#) §4.36
- l. Retail establishments [ⓘ]
- m. Personal service establishments [ⓘ]
- n. [Laundry or dry cleaning customer outlets](#) [ⓘ] §4.28
- o. Laundry/laundromats, [ⓘ] self-service
- p. Brewpubs [ⓘ]
- q. [Restaurants, carry out](#) [ⓘ] §4.44
- r. [Restaurants, fast food](#) [ⓘ] §4.44
- s. [Restaurants, sit down](#) [ⓘ] §4.44
- t. Accessory buildings [ⓘ] and uses [ⓘ]
- u. [Private service clubs, fraternal organizations, and lodge halls](#) §4.38
- v. [Temporary outdoor sales and service](#) §4.49
- w. Any retail business whose principal activity is the sale or rental of merchandise within a completely enclosed building
- x. Business service establishments [ⓘ]
- y. Craft and trade service establishments [ⓘ]
- z. Photographic film developing and processing
- aa. Physical culture establishments [ⓘ]
- ab. [Veterinary offices, hospitals, and clinics](#) §4.57
- ac. [Other similar uses](#) [ⓘ] §4.35
- ad. Recreational facilities, [ⓘ] indoor [ⓘ]
- ae. ATMs (Automated Teller Machines)
- af. [Vehicle wash establishments](#) §4.56
- ag. Outdoor display and sale of garages, swimming pools, and similar uses
- ah. Recreational facilities, [ⓘ] outdoor [ⓘ]
- ai. Lumber yards
- aj. [Hotels, motels, and motor courts](#) [ⓘ] §4.23
- ak. [Mini-storage facility](#) [ⓘ] §4.30
- al. [Restaurants, drive-in](#) [ⓘ] and [drive-thru](#) [ⓘ] §4.44

1. Purpose & Intent

2. Definitions

3. Zoning Districts

4. Use Standards

5. Site Standards

6. Development Procedures

7. Administration & Enforcement



3.1.M B-3 General Business

3. Special land uses

- a. Automobile repair facilities[ⓘ] §4.1
- b. Kennels[ⓘ] and shelters, with or without crematories §4.27
- c. Automobile service stations[ⓘ] §4.7
- d. Open air businesses[ⓘ] §4.34
- e. Essential services[ⓘ] §4.18
- f. Heavy equipment sales and storage incidental thereto
- g. Roofing business establishments
- h. Distribution centers used for storage purposes only §4.16
- i. Single-family dwellings[ⓘ] §4.17
- j. Tool and die shops §4.54
- k. Micro breweries[ⓘ]
- l. Telecommunication antennas[ⓘ] located on structures other than telecommunication towers[ⓘ] §4.60
- m. Places of worship in preexisting office or commercial buildings §4.36
- n. Temporary outdoor festivals and similar events §4.48
- o. Temporary use for anemometers and supporting towers §4.51

1. Purpose & Intent

2. Definitions

3. Zoning Districts

4. Use Standards

5. Site Standards

6. Development Procedures

7. Administration & Enforcement

3.1.M

B-3 General Business

[Intentionally blank]

1. Purpose & Intent

2. Definitions

3. Zoning Districts

4. Use Standards

5. Site Standards

6. Development
Procedures

7. Administration &
Enforcement



3.1.M B-3 General Business

- 1. Purpose & Intent
- 2. Definitions
- 3. Zoning Districts
- 4. Use Standards
- 5. Site Standards
- 6. Development Procedures
- 7. Administration & Enforcement

4. Development standards

Lot size

- Minimum area: *
- Minimum lot width: *

Minimum setbacks (in feet)

- Front yard: 40
- Side yard
 - One must be at least: 10
 - The other must be at least: 10**
- Rear yard: 20

Maximum building height

- In feet: 50

Floor area per dwelling unit

- Minimum: *

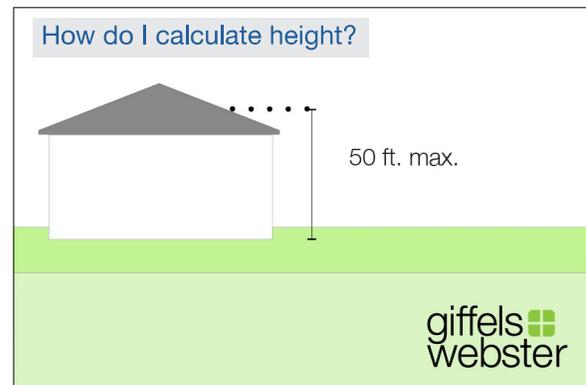
Lot coverage by buildings

- Maximum percentage: *

See [§3.2](#) and [§3.20](#) for more information.

* While no specific standards may be included herein, attention is directed to other applicable regulations in this ordinance for specific intended uses.

** Side yards are not required at interior side lot lines if walls are of fireproof masonry construction, excepting that when such walls of buildings facing such interior side lot lines have windows or similar openings, side yards of at least fifteen (15) feet shall be provided. A side yard of twenty (20) feet is required on all corner lots and whenever adjacent to a residential use.



i **User Note:** Click on [Blue](#) for use-specific standards.

5. Additional requirements

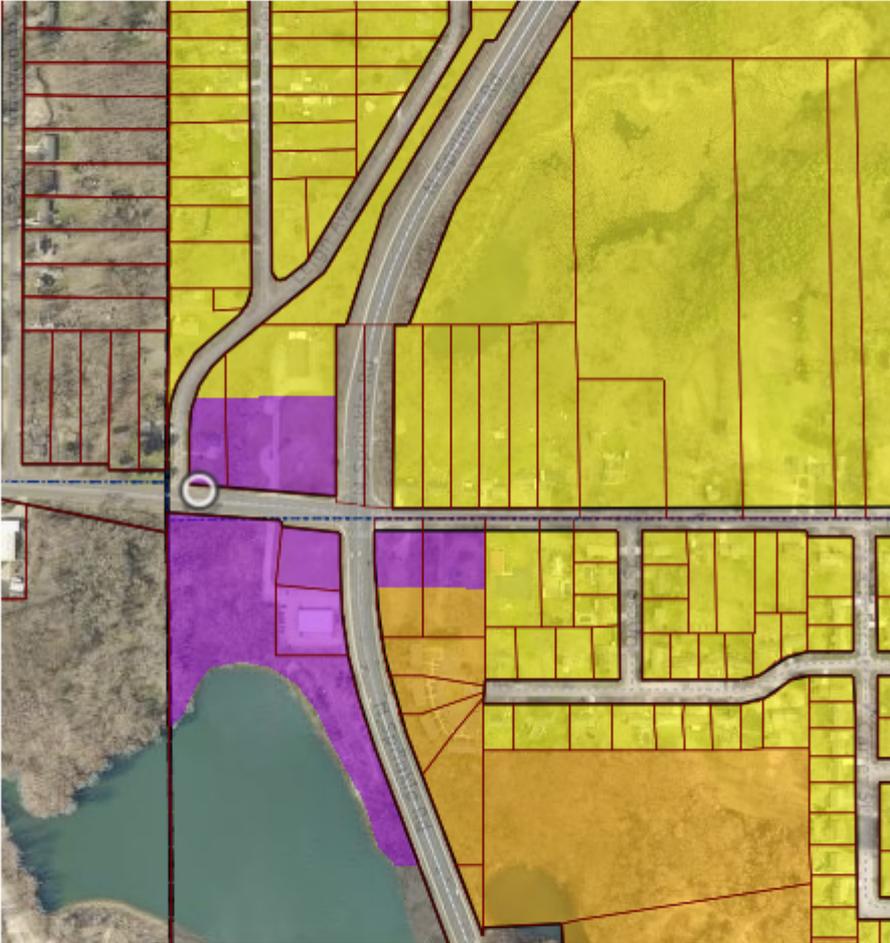
These are links to additional, but not comprehensive, requirements for the district.

Article 5

- [Residential accessory buildings and structures §5.1](#)
- [Off-street parking requirements §5.2](#)
- [Landscaping §5.4](#)
- [Exterior lighting §5.10](#)
- [Fences §5.9](#)
- [Signs §5.18](#)

Article 6

- [Site plan review procedures §6.1](#)
- [Special land uses §6.2](#)



January 28, 2026

Khayci Bryant
 Assistant Zoning Administrator
 P.O Box 449
 Comstock , MI 49041

R.E Parcels # 07-07-351-786 (5037/5057 East Main) + 3907-07-351-812 (1654 Leigh Ave)

Khayci,

I am writing in regards to the zoning mistake that Comstock Township has made on Two of my parcels on the Northwest corner of Sprinkle road and East Main.

When I purchased these parcels they were Zoned "B-3" I made sure of that BEFORE I purchased them from Bill Reynold's. I checked the zoning map that used to be available to review at the old township hall. Somehow the Township "lost" that map, perhaps in the move.

The building I'm in now was "Reynolds Plumbing". It was properly permitted and built on the back so that the front could be used later. Mr. Reynolds expressed that to me, your records should confirm it.

Now only the front ½ of these parcels are "Colored ^{purple} ~~Yellow~~" as B-3 Zoning. **All of them should be!**

I had at least 2 meetings with Jodi Steforia / prior Zoning official and nothing was done to correct this "coloring" / zoning mistake. **On my second meeting with you, we were able to bring up the minutes of an old township meeting where I got a special "Open Air" permit. I did this on November 19th. 1992.**

This was done the first year of my ownership of the larger parcel. You have a copy from records that we scanned together. I also have an original copy of that meetings minutes as well as my "original" lot plan! ***I am including a copy of that meeting.*** I may supply you with more info later.

Steve Gazdag was Chairman of the planning commission at that 1992 meeting. He and the entire commission were very capable. **The property had to be zoned B-3 (all the way back) or they would'nt have given me the permit that they approved.** All of that is a matter of public record. You have a copy from records on file and the one I'm giving you.

I've already spent a lot of my valuable time in this matter. I don't think I should have to pay for any fees to fix the townships mistake. If you need anything let me know so we can get this straitened out.

If it takes "rezoning" to fix this mistake, then let's get it done ASAP.

Respectfully,



Mark A. Zanotti



CHARTER TOWNSHIP OF COMSTOCK PLANNING & ZONING APPLICATION

Shipping: 6138 King Highway, Kal., MI 49048
Mailing: PO Box 449, Comstock MI 49041-0449
Phone: 269-381-2360 Fax: 269-381-4328

PLEASE PRINT

PROJECT NAME AND ADDRESS: 3057 E MAIN
+ 1654 LIGHT

APPLICANT:

Name MARK ZANOTTI
Company _____
Address 9145 E MAIN
GALUSBURG, MI 49053
Email KZOOPOOLMAN2@AOL.COM
Phone [REDACTED] Fax _____
Interest in the Property OWNER

Township Use:

Fee:
\$ _____

Escrow:
\$ _____

OWNER*:

Name SAWA
Company _____
Address _____
Email _____
Phone _____ Fax _____

Date Paid:

cash/credit card
check # _____

*If different

NATURE OF REQUEST: (Please check all the appropriate item(s))

- | | |
|--|--|
| <input type="checkbox"/> Site Plan Review | <input checked="" type="checkbox"/> Rezoning |
| <input type="checkbox"/> Administrative Site Plan Review | <input type="checkbox"/> Master Plan Amendment |
| <input type="checkbox"/> Special Exception Use | <input type="checkbox"/> Text Amendment |
| <input type="checkbox"/> Site Condominium | <input type="checkbox"/> Variance |
| <input type="checkbox"/> Subdivision Plat Review | <input type="checkbox"/> Interpretation |
| <input type="checkbox"/> PUD/PURD/PMUD | <input type="checkbox"/> Planning Escrow |
| <input type="checkbox"/> Other _____ | |

BRIEFLY DESCRIBE YOUR REQUEST (Use Attachments if Necessary):

SEE LETTER + ATTACHED INFORMATION

kan

COMSTOCK CHARTER TOWNSHIP PLANNING COMMISSION

MINUTES OF MEETING HELD NOVEMBER 19, 1992

A regular meeting was held by the Comstock Charter Township Planning Commission on Thursday, November 19, 1992 beginning at 7:30 p.m. at the Comstock Charter Township Hall.

Members Present: Steven Gazdag, Chairman
Miriam Shannon
Gail Fritz
James Richmond
Randy Ligman
Tim Hudson
William Shields
Jeffrey Balkema

Members Absent: Stanley Heidanus

Also present were Township Attorney Kenneth C. Sparks and approximately forty-five other interested persons.

REVIEW OF MINUTES

The Chairman called the meeting to order and indicated that the first item on the agenda would be a review of the proposed minutes of the Planning Commission meeting of November 5, 1992. It was noted that the word "District" in the second line of the last paragraph on page 6 of the minutes should instead be "Discount". In response to a comment from Mr. Balkema, Mr. Thomas Arnold indicated that he started farming on the property adjacent to the subject property in the fall of 1986. Upon motion of Mr. Richmond, seconded by Ms Shannon, the Planning Commission voted unanimously to approve the minutes with the one correction noted previously.

MARK A. ZANOTTI - SPECIAL EXCEPTION USE PUBLIC HEARING AND SITE PLAN REVIEW

The next matter to come before the Planning Commission was a public hearing on the application of Mark A. Zanotti for a special exception use permit to allow the operation of an open air business consisting of the annual sale of Christmas trees on property at 5057 East Main Street within Comstock Charter Township. The subject property is located in a "B-3" General Business District zoning classification. Also before the Planning Commission was the application of Mr. Zanotti for site plan review for the proposed open air business.

Mr. Zanotti was present and addressed the Planning Commission. He indicated that he wished to have special exception use approval to conduct for three weeks each year an open air business consisting of a retail sale Christmas tree lot. Mr. Zanotti noted that a site plan showing the location of the proposed business had been provided to the Planning Commission.

The Chairman inquired as to whether any members of the public present wished to make comment with respect to this matter. No public comment was offered.

Ms Shannon indicated that Mr. Zanotti has filed a very adequate site plan and that this was appreciated. Ms Shannon noted that Christmas tree banners were shown on the site plan and that it would be advisable for Mr. Zanotti to talk with Township Building Official Sheldon Lauderdale to determine whether or not such banners were in compliance with Township requirements. Mr. Zanotti indicated that he had not yet talked to Mr. Lauderdale regarding this matter. He indicated that if the proposed banners were not permitted, it would be possible for him to put a message on his existing sign to advertise the Christmas tree sales.

There being no further public comment, Mr. Shields moved that the public hearing be closed. Mr. Ligman seconded the motion and the motion passed unanimously.

Mr. Shields then moved that the Planning Commission grant the requested special exception use permit. Ms Fritz seconded the motion. Mr. Shields cited as reasons in support of his motion the fact that there was sufficient parking on the site for the proposed business, that the proposed business met all set back requirements and that the proposed open air business would be located on a very large parcel that could easily accommodate the business. A vote was then held on the motion and the motion passed unanimously.

The Planning Commission then conducted site plan review for the proposed business. Mr. Richmond moved that the Planning Commission grant site plan approval subject to the condition that the applicant meet with the Building Official for a sign compliance review and that any signs established in connection with the subject business be in compliance with the Township Ordinance requirements. Mr. Shields seconded the motion and the motion passed unanimously.

MICHAEL AND KAREN FISHER - PLANNED UNIT DEVELOPMENT SPECIAL EXCEPTION USE PUBLIC HEARING.

The next matter to come before the Planning Commission was a public hearing on the application of Michael and Karen Fisher for preliminary approval of a proposed Planned Unit Development

12/5/2017

7023

TOWNSHIP OF COMSTOCK

2017
WinterParcel Code Number:
3907-07-351-786

OFFICE HOURS BEGINNING JANUARY 1, 2018:
MONDAY, TUESDAY, AND THURSDAY 8:00 AM - 5:00 PM;
WEDNESDAY 8:00AM - 6:00PM; FRIDAY 8:00AM - 12:00PM

CLOSED TO OBSERVE THE FOLLOWING HOLIDAYS:

CHRISTMAS DAY: MONDAY, DECEMBER 25, 2017
NEW YEAR'S DAY: MONDAY, JANUARY 1, 2018
MARTIN LUTHER KING DAY: MONDAY, JANUARY 15, 2018
PRESIDENT'S DAY: MONDAY, FEBRUARY 19, 2018

FOR FURTHER INFORMATION CONTACT:

BRET PADGETT, TREASURER
(269) 381-2360

OPERATING FISCAL YEARS

The taxes on bill will be used for governmental operations for the following fiscal year(s):

County: JANUARY 1 - DECEMBER 31
Township: JANUARY 1 - DECEMBER 31
School: JULY 1 - JUNE 30
State: OCTOBER 1 - SEPTEMBER 30

Does NOT affect when tax is due or total amount.

PROPERTY INFORMATION

Property Assessed To: ZANOTTI MARK A Bill # 01024

9145 E MAIN ST
GALESBURG, MI 49053
Property Address: 5057 E MAIN ST
School: 39030 COMSTOCK PUBLIC

Tax Description: Prop #: 3907-07-351-786
SUPERVISOR'S PLAT OF WAVOSCO HEIGHTS LOTS 79, 80, 81 & 82
EXC W 20 FT LOT 82 & EXC S 17 FT LOTS 79, 80, 81 & 82

CHECK YOUR DESCRIPTION. THE TREASURER IS NOT RESPONSIBLE FOR PAYMENT ON THE WRONG PARCEL. IF YOU PAY ON THE WRONG DESCRIPTION, WE ARE NOT PERMITTED TO MAKE ADJUSTMENTS LATER. MAKE SURE YOUR PRICIPAL RESIDENCE EXEMPTION AND PROPERTY TRANSFER PAPERS ARE FILED WITH THE ASSESSOR. FAILURE TO RECEIVE TAX STATEMENT DOES NOT EXEMPT TAXES FROM PENALTIES.

RECEIPTING INFORMATION

When paying in person, bring this tax notice and the top portion will be received. When paying by mail, include a self-addressed, stamped envelope and a receipt will be mailed.

THIS TAX IS PAYABLE FROM 12/1/17 - 2/14/18 WITHOUT PENALTY

Taxes are payable to Comstock Township, 6138 King Highway, P.O. Box 449, Comstock, MI, 49041. TO AVOID PENALTY: PAYMENT MUST BE MADE BY FEBRUARY 14, 2018. On February 15, a 3% penalty will be added. Cash, money order, check, and major credit card (3% fee) are accepted forms of payment. Any check not honored by the bank is subject to a \$30 fee and the applicable tax is considered unpaid and will be restored to the tax roll without further notice. Taxes can also be paid online by electronic check (\$3 fee) or major credit card (3% fee) at www.comstockmi.gov.

On March 1st, any unpaid tax is considered delinquent and must be paid to the Kalamazoo County Treasurer, 201 West Kalamazoo Avenue, Kalamazoo MI 49007 Phone: (269) 384-8124

Taxes are based on taxable value. 1 mill equals \$1 per \$1,000 of taxable value. Amounts with no millage rate are either special assessments or other charges.

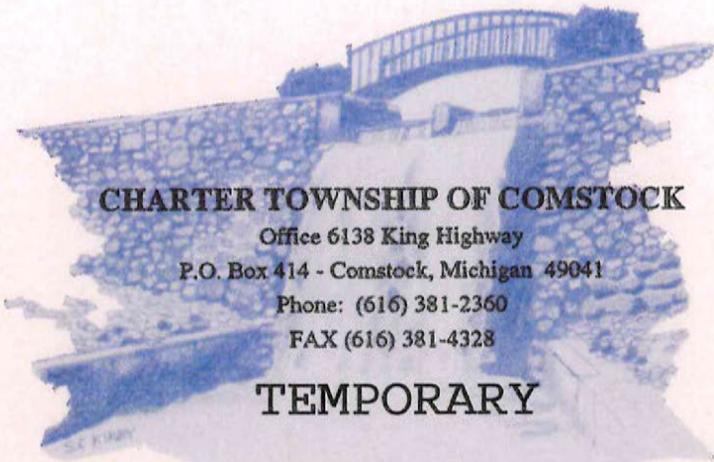
TAX DETAIL		
Taxable Value:	51,340	COMMERCIAL
State Equalized Value:	173,100	CLASS: 201
Principal Residence Exemption %:	0.00	
DESCRIPTION	MILLAGE	AMOUNT
CO PUBLIC SAFETY	1.44720	74.29
KVCC	2.80890	144.20
TOWNSHIP	0.97640	50.12
TWP ROADS	1.00000	51.34
ROAD PATROL	1.00000	51.34
LIBRARY-COMSTK	1.48540	76.26
SENIOR MILLAGE	1.00000	51.34
JUVENILE HOME	0.21400	10.98
HOUSING FUND	0.09980	5.12
KCTA	0.31450	16.14
CCTA	0.75000	38.50
FIRE OPERATING	3.00000	154.02
FIRE CAPITAL	0.50000	25.67
STREET LIGHTS	0.50000	25.67

Total Tax 15.09620 774.99
Administration Fee (1%) 7.74

TOTAL AMOUNT DUE 782.73

Supervisor -
Joseph Van Bruggen
Clerk -
Timothy A. Snow
Treasurer -
Janice Boers Shattuck

Trustees -
Shelly Pierce Cornell
Harry R. Haase
William Hegedus
William G. Shields



CHARTER TOWNSHIP OF COMSTOCK

Office 6138 King Highway
P.O. Box 414 - Comstock, Michigan 49041
Phone: (616) 381-2360
FAX (616) 381-4328

TEMPORARY

OCCUPANCY PERMIT

TO: PRECISION POOLS, INC. TELEPHONE#: 345-0888
ADDRESS: 5037 EAST MAIN ST.
CITY: KALAMAZOO STATE: MI ZIP: 49004

This certificate constitutes a Temporary Occupany Permit to occupy the premises located at 5037 E. Main St. within Comstock Township, Kalamazoo County, Michigan, for use of the premises for sales of cut Christmas Trees, one (1) portable office, one (1) portable sign and all lights necessary. (Lights not to cause traffic hazard or glare upon adjoining premises, residential or otherwise.)

All trees, signs, lights, poles, portable office, wire or other items must be removed from the premises on or before the 31st day of December.

THIS PERMIT IN NO WAY RELIEVES THE OWNER AND/OR LESSEE FROM LIABILITY FOR OR COMPLIANCE WITH ANY UNFORESEEN VIOLATION OR VIOLATION OF ANY OTHER ORDINANCE, LAW OR STATUTE.

Unless otherwise stated or noted herin, this temporary permit certifies that the premises described herein will comply with the applicable provisions of the Township Zoning Ordinance. #156 ARTICLE 21.00, Section 21.08 h.

THIS PERMIT EXPIRES ON DECEMBER 31, 1996

Mark C. [Signature]
LESSEE/OWNER/AGENT
Precision Pools, Inc.

Sheldon G. Lauderdale
BUILDING INSPECTOR
Sheldon G. Lauderdale

DATED - 11/25/1996

DATED - 11/25/1996

FEE: \$20.00

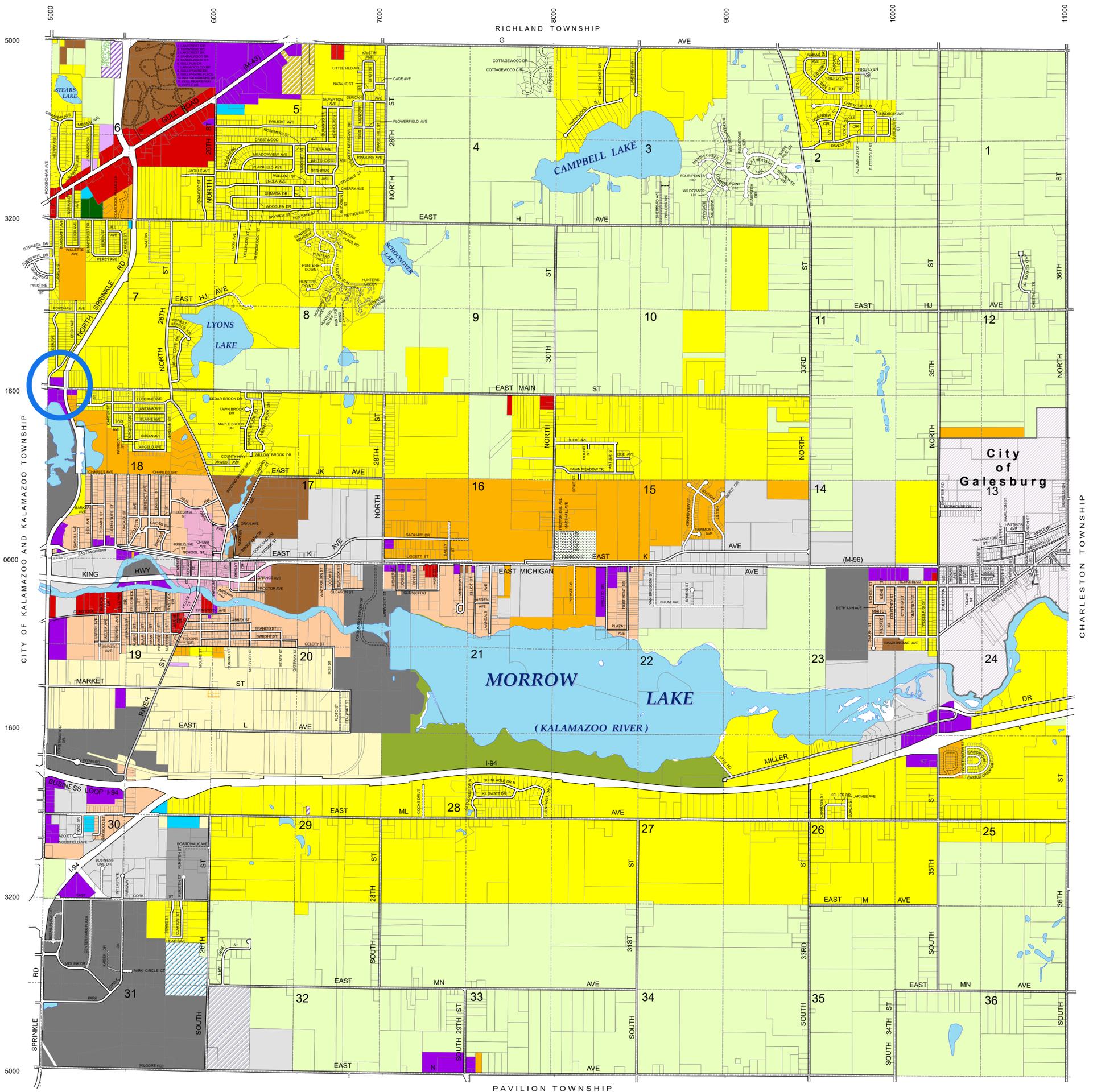
PAYMENT (x) CHECK# 6273



Charter Township of Comstock

Kalamazoo County, Michigan

Zoning Map



LEGEND

- | | | | |
|--|---|--|--|
| | AGR AGRICULTURAL RESIDENTIAL DISTRICT | | CC COMSTOCK CENTER |
| | A-H AGRICULTURAL-HORTICULTURAL DISTRICT | | B-1 NEIGHBORHOOD BUSINESS DISTRICT |
| | R-1A SINGLE FAMILY DISTRICT | | B-2 COMMUNITY BUSINESS DISTRICT |
| | R-1B SINGLE FAMILY DISTRICT | | B-2C COMMUNITY BUSINESS DISTRICT_CONDITIONAL |
| | R-1C CLUSTER HOUSING DISTRICT | | B-3 GENERAL BUSINESS DISTRICT |
| | RM MULTIPLE FAMILY RESIDENTIAL DISTRICT | | B-3C GENERAL BUSINESS_CONDITIONAL |
| | RM-C MULTIPLE FAMILY RESIDENTIAL_CONDITIONAL | | LM LIGHT MANUFACTURING DISTRICT |
| | RMH MOBILE HOME PARK DISTRICT | | LD RESTRICTED INDUSTRIAL DISTRICT |
| | RSM SENIOR CITIZENS MULTIPLE STORY RESIDENTIAL DISTRICT | | M MANUFACTURING DISTRICT |
| | O-1 OFFICE DISTRICT | | LM-C LIGHT MANUFACTURING_CONDITIONAL |
| | OW OPEN WETLANDS DISTRICT | | M_C MANUFACTURING_CONDITIONAL |
| | OW-C OPEN WETLANDS CONDITIONAL | | ALO - AGRICULTURAL LABOR HOUSING OVERLAY |



1,500 750 0 1,500 Ft

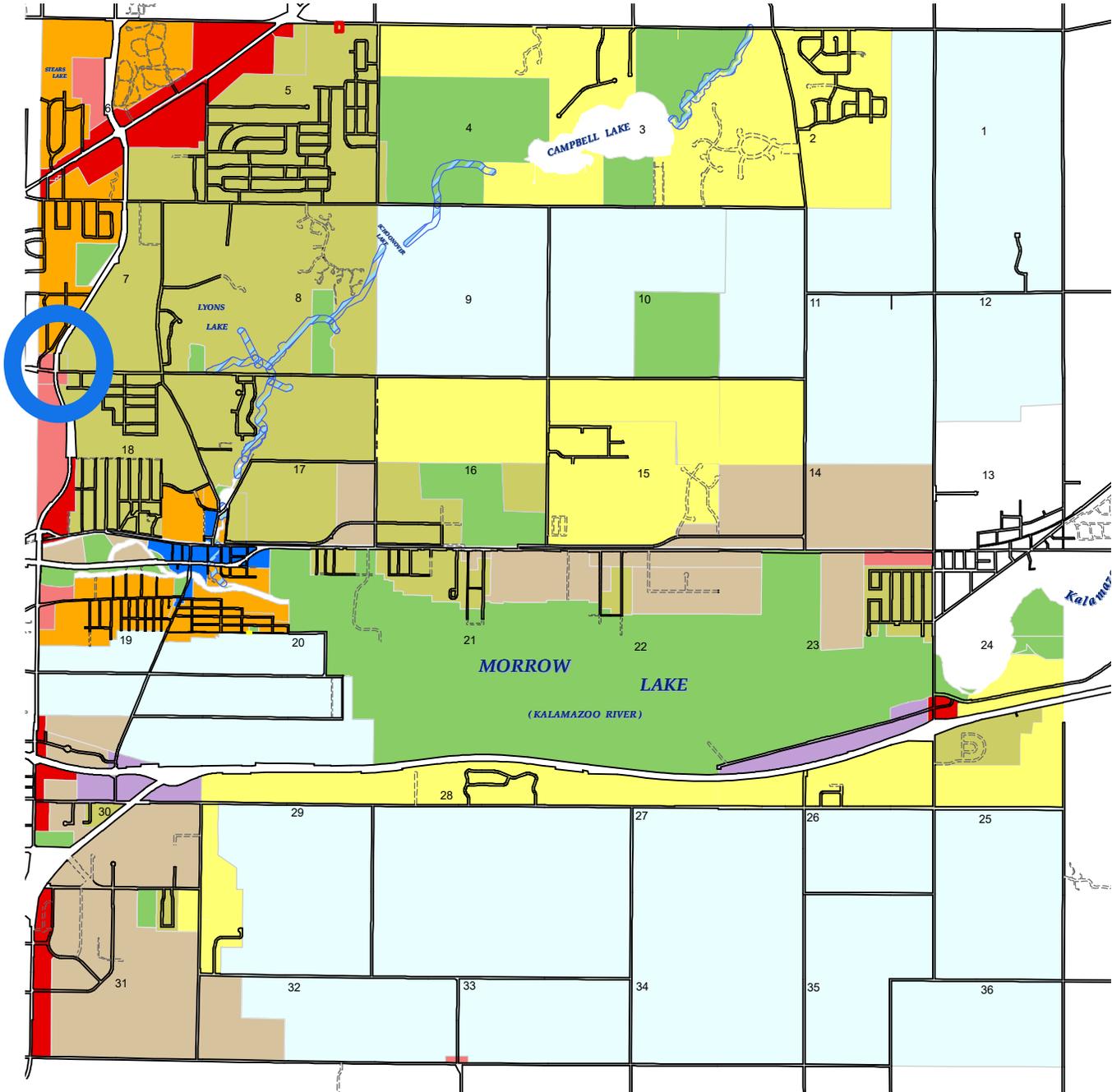
Scale: 1" = 1,500'

Last Revision per Ordinance No. 549
Adopted: June 16, 2025



FUTURE LAND USE MAP

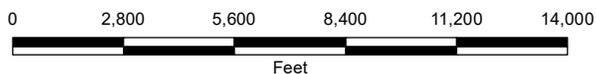
Charter Township of Comstock



Legend

Future Land Use

- | | | |
|--|---|--|
|  Agriculture |  Core Residential |  Transitional Industrial |
|  Suburban Residential |  Town Center |  General Industrial |
|  Compact Residential |  Mixed Commercial |  Parks and Open Space |
| |  Corridor Commercial |  Comstock Creek Overlay |



Adopted July 18, 2016
Amended December 4, 2017; August 21, 2023

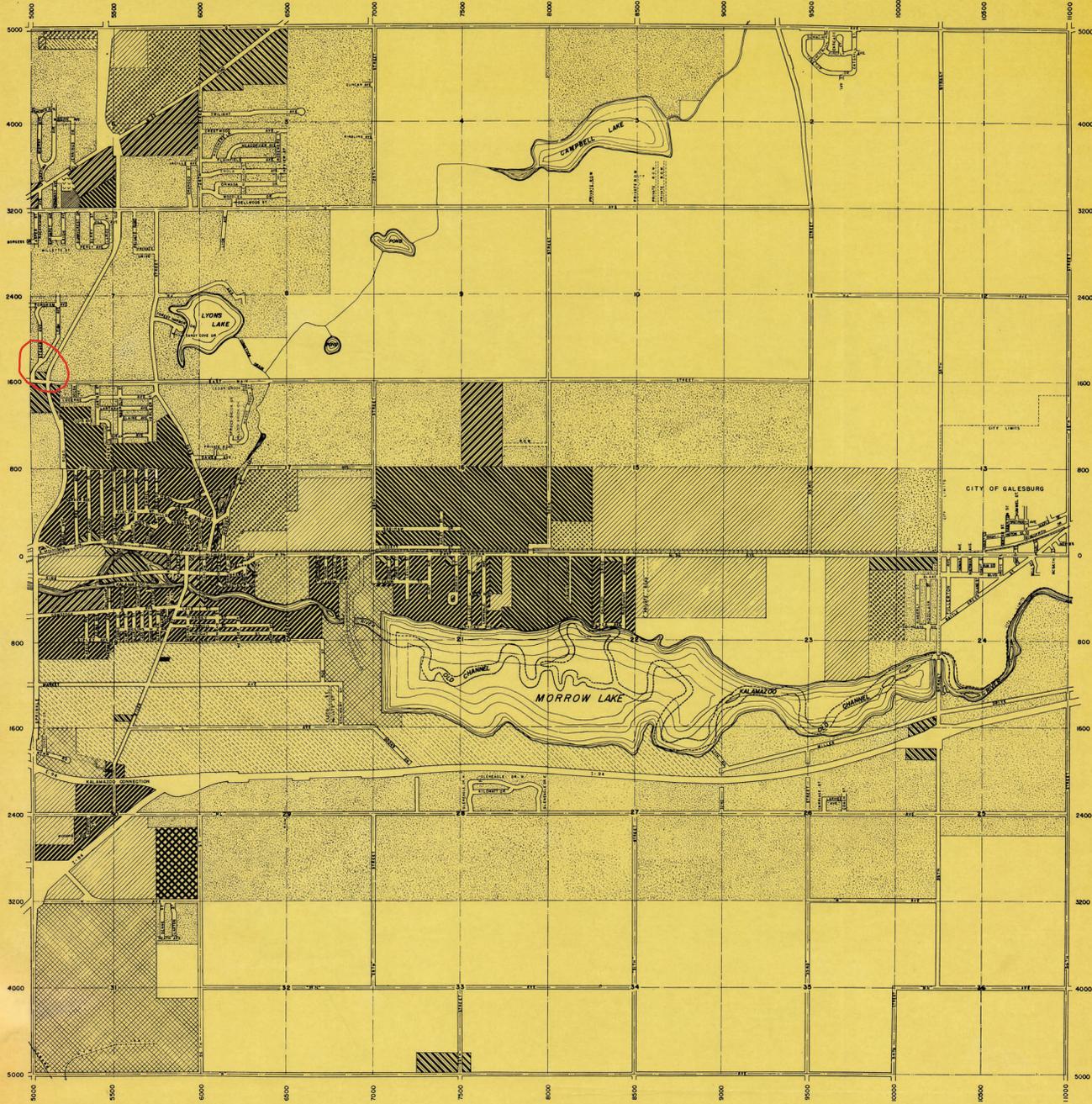
USE DISTRICT MAP OF THE TOWNSHIP OF COMSTOCK KALAMAZOO COUNTY, MICHIGAN



EFFECTIVE DATE OF ORDINANCE JANUARY 1977



BY AUTHORITY OF THE COMSTOCK TOWNSHIP BOARD



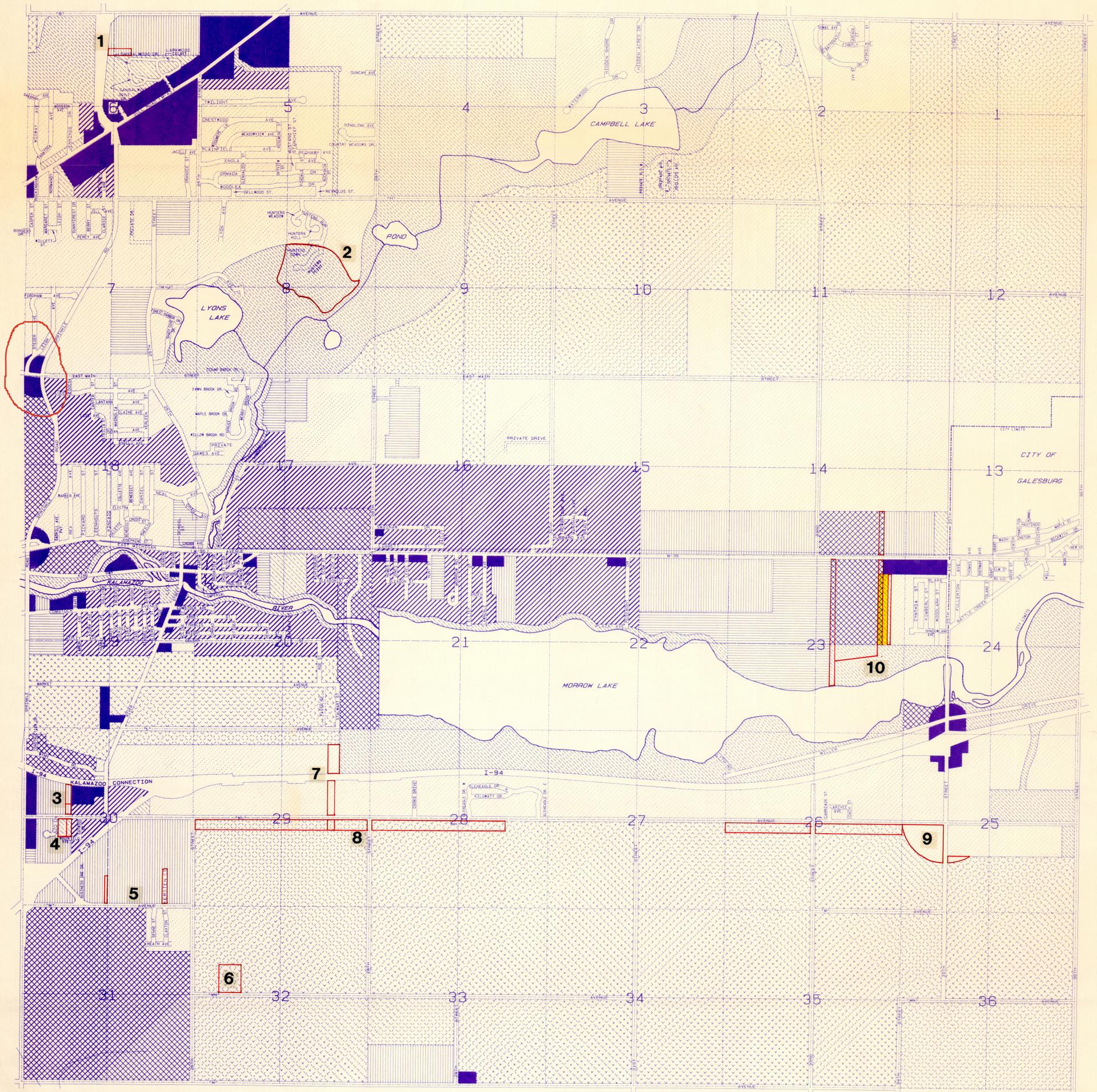
REVISED AS TO USE DISTRICT AMENDMENTS

- APRIL 4, 1977
- SEPTEMBER 2, 1977
- NOVEMBER 2, 1977
- JANUARY 6, 1978
- JANUARY 6, 1978
- FE BRUARY 2, 1978
- JANUARY 2, 1980
- MARCH 10, 1980
- JULY 7, 1980

- | | |
|--|--|
| <ul style="list-style-type: none"> AGR AGRICULTURE - RESIDENTIAL DISTRICT R-1A SINGLE FAMILY DISTRICT R-1B SINGLE FAMILY DISTRICT R-1C CLUSTER HOUSING DISTRICT RM MULTIPLE FAMILY RESIDENTIAL DISTRICT RSM SENIOR CITIZENS MULTIPLE STORY RESIDENTIAL RMH MOBILE HOME PARK DISTRICT | <ul style="list-style-type: none"> O-1 OFFICE DISTRICT B-1 NEIGHBORHOOD BUSINESS DISTRICT B-2 COMMUNITY BUSINESS DISTRICT B-3 GENERAL BUSINESS DISTRICT LM LIGHT MANUFACTURING DISTRICT LD RESTRICTED INDUSTRIAL DISTRICT M MANUFACTURING DISTRICT OW OPEN WETLANDS DISTRICT |
|--|--|

REVISED AS TO STREETS & HIGHWAYS

PROPOSED
LAND USE PLAN
TOWNSHIP OF COMSTOCK
KALAMAZOO COUNTY, MICHIGAN



LEGEND

- | | |
|---|--|
|  LOW DENSITY, RESIDENTIAL |  OPEN-SPACE PRESERVATION |
|  MEDIUM DENSITY, RESIDENTIAL |  TRANSITIONAL |
|  COMMERCIAL |  AGRICULTURAL |
|  GENERAL INDUSTRIAL |  LIGHT INDUSTRIAL |
|  MAJOR PUBLIC FACILITIES |  MAJOR THOROUGHFARE |

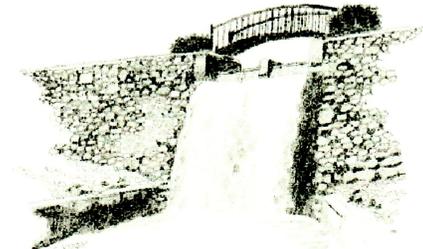
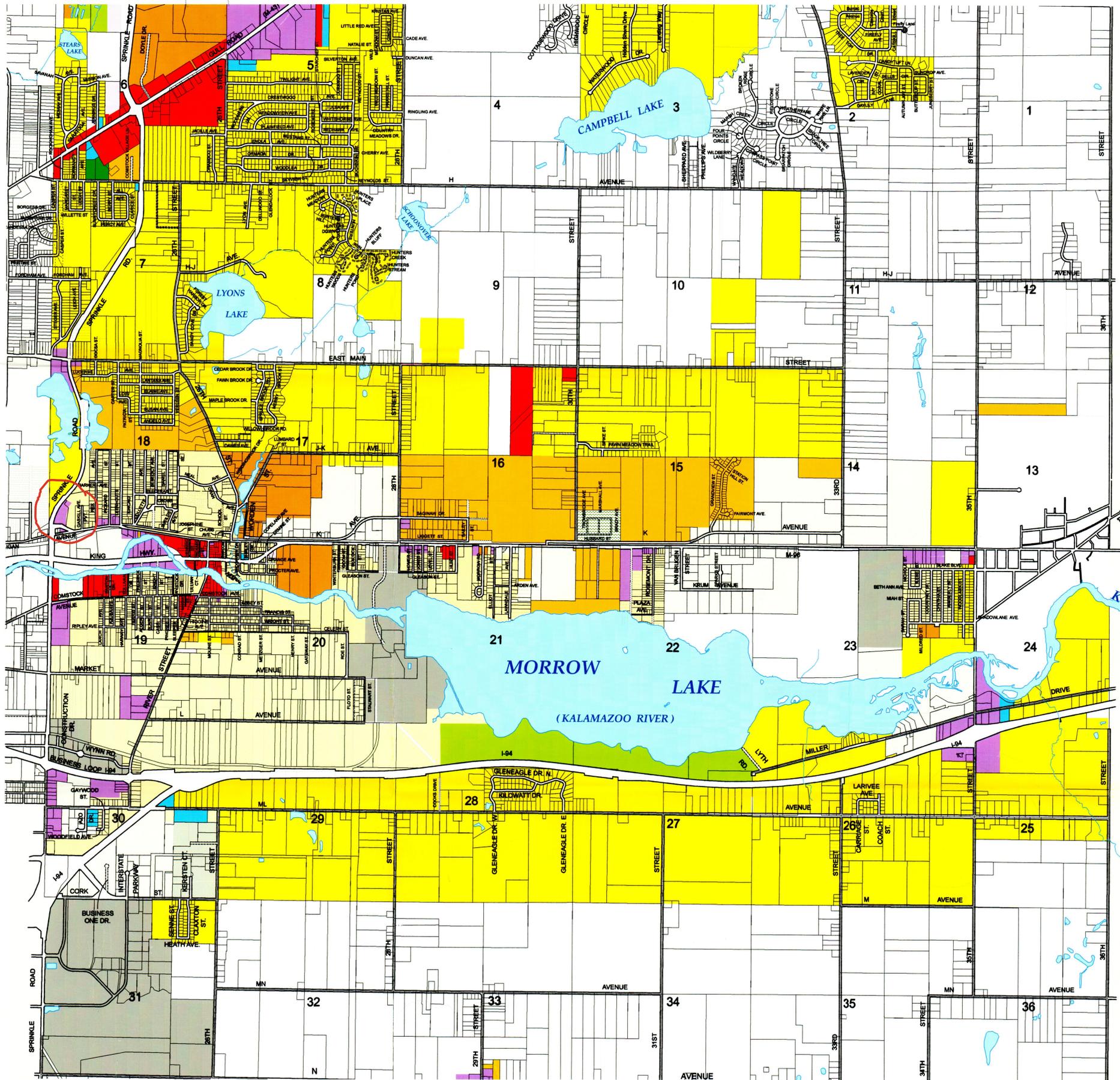


SCALE 1" = 1000'

COMPILED BY:
WILKINS & WHEATON
 ENGINEERING COMPANY
 169 PORTAGE STREET
 KALAMAZOO, MICHIGAN 49007
 PHONE: (616) 345-1158

EFFECTIVE DATE OF ORDINANCE
 JANUARY 1, 1977
 BY AUTHORITY OF THE
 COMSTOCK TOWNSHIP BOARD
 REVISED: JUNE 5, 1978
 JUNE 11, 1985
 MARCH 27, 1986
 JUNE 20, 1991
 AUGUST 2, 1991
 OCTOBER 1, 1992

Charter Township of Comstock Zoning Map Kalamazoo County, Michigan



- Legend**
- AGR AGRICULTURAL RESIDENTIAL DISTRICT
 - A-H AGRICULTURAL-HORTICULTURAL DISTRICT
 - R-1A SINGLE FAMILY DISTRICT
 - R-1B SINGLE FAMILY DISTRICT
 - R-1C CLUSTER HOUSING DISTRICT
 - RM MULTIPLE FAMILY RESIDENTIAL DISTRICT
 - RMH MOBILE HOME PARK DISTRICT
 - RSM SENIOR CITIZENS MULTIPLE STORY RESIDENTIAL DISTRICT
 - O-1 OFFICE DISTRICT
 - B-1 NEIGHBORHOOD BUSINESS DISTRICT
 - B-2 COMMUNITY BUSINESS DISTRICT
 - B-3 GENERAL BUSINESS DISTRICT
 - LM LIGHT MANUFACTURING DISTRICT
 - LD RESTRICTED INDUSTRIAL DISTRICT
 - M MANUFACTURING DISTRICT
 - OW OPEN WETLANDS DISTRICT



August 10, 2006



MEMO

Charter Township of Comstock Planning Commission March 26, 2026

From: Khayci Bryant, Planner

Re: Tim Kerney Text Amendment Request

These will be going to the Township Board on April 6, 2026, as the applicant is requesting a fee waiver.

Opportunity to have discussion

Attachments:

[Kerney_Request One.pdf](#)

[Kerney_Request Two.pdf](#)



CHARTER TOWNSHIP OF COMSTOCK PLANNING & ZONING APPLICATION

Shipping: 5858 King Highway, Kal., MI 49048
Mailing: PO Box 449, Comstock MI 49041-0449
Phone: 269-381-2360 Fax: 269-381-4328

PLEASE PRINT

PROJECT NAME AND ADDRESS: N/A 5922 King Hwy

APPLICANT:

Name Timothy Kerney
Company N/A
Address 5922 king HWY strip mall entire 5 store fronts
Comstock Mi. 49048
Email [REDACTED]
Phone [REDACTED] Fax _____
Interest in the Property Owner

Township Use:
Fee:
\$ _____
Escrow:
\$ _____
Date Paid:

cash/credit card
check # _____

OWNER*:

Name _____
Company _____
Address _____

Email _____
Phone _____ Fax _____

*If different

NATURE OF REQUEST: (Please check all the appropriate item(s))

- | | |
|--|--|
| <input type="checkbox"/> Site Plan Review | <input type="checkbox"/> Rezoning |
| <input type="checkbox"/> Administrative Site Plan Review | <input type="checkbox"/> Master Plan Amendment |
| <input type="checkbox"/> Special Exception Use | <input checked="" type="checkbox"/> Text Amendment |
| <input type="checkbox"/> Site Condominium | <input type="checkbox"/> Variance |
| <input type="checkbox"/> Subdivision Plat Review | <input type="checkbox"/> Interpretation |
| <input type="checkbox"/> PUD/PURD/PMUD | <input type="checkbox"/> Planning Escrow |
| <input type="checkbox"/> Other _____ | |

BRIEFLY DESCRIBE YOUR REQUEST (Use Attachments if Necessary):

Would like to add the verbiage "Protective Services" to Business Service Establishment description.

LEGAL DESCRIPTION OF PROPERTY (Use Attachments if Necessary):

PARCEL NUMBER: 3907 - 045

ADDRESS OF PROPERTY: 5922 King HWY Comstock MI 49048

PRESENT USE OF THE PROPERTY: Store fronts Strip Mall

PRESENT ZONING: P SIZE OF PROPERTY: See attached

NAME(S) & ADDRESS(ES) OF ALL OTHER PERSONS, CORPORATIONS, OR FIRMS HAVING A LEGAL OR EQUITABLE INTEREST IN THE PROPERTY:

Name(s)	Address(es)
_____	_____
_____	_____

SIGNATURES

I (we) the undersigned certify that the information contained on this application form and the required documents attached hereto are to the best of my (our) knowledge true and accurate. By submitting this Planning & Zoning Application, I (we) grant permission for Comstock Township officials and agents to enter the subject property of the applicant as part of completing the reviews necessary to process the application. I (we) as Applicant(s), understand that I (we) am responsible for the reimbursement to the Township of its actual expenses in connection with my (our) application, under the Township's Escrow Fee Policy, and I (we) agree to pay such amounts under the terms of that policy.

Timothy Kerney
Applicant's Signature

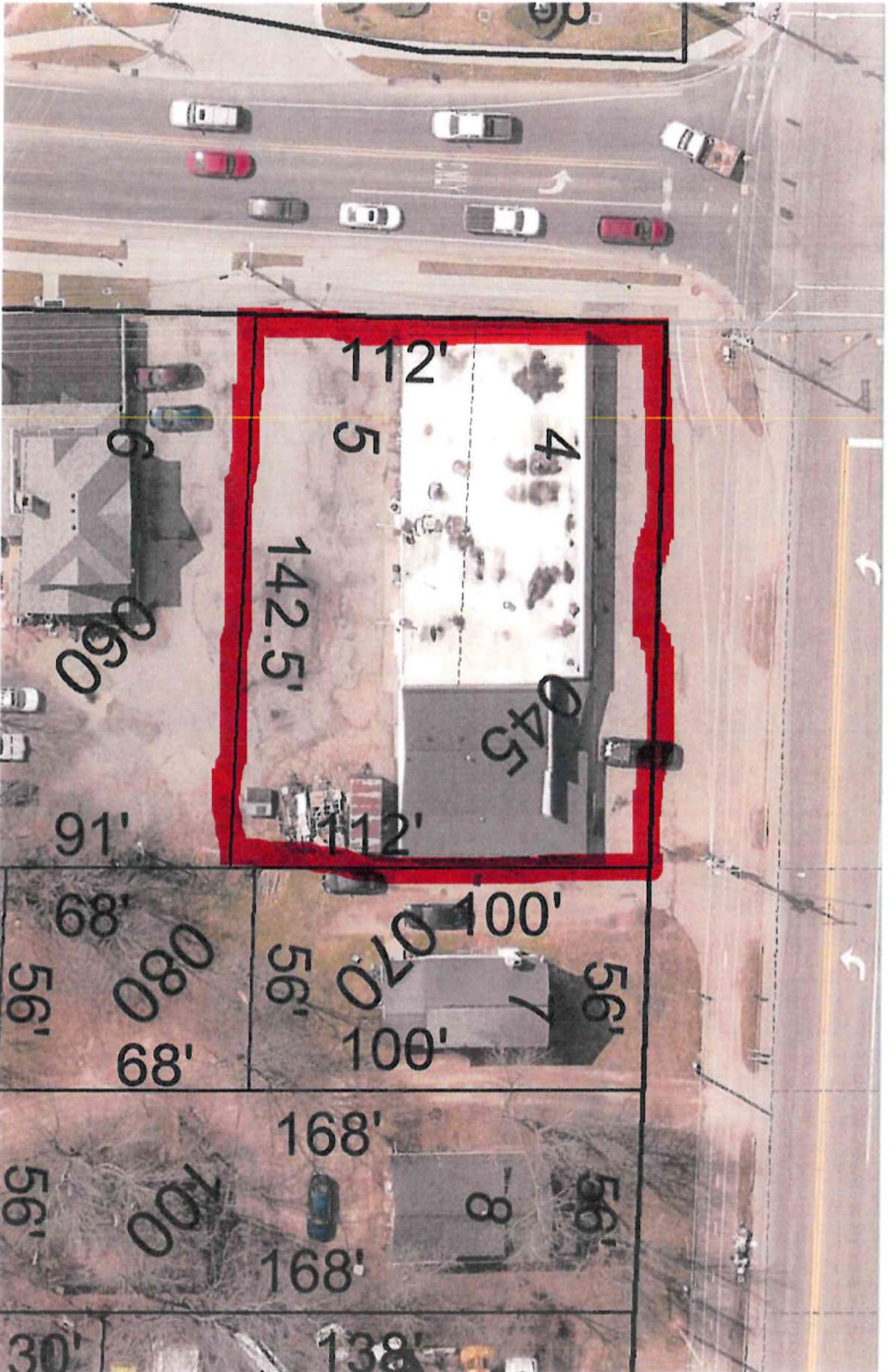
03/12/2026
Date

Owner's Signature authorizing submission of Application
(* If different from Applicant)

Date

** PLEASE ATTACH ALL REQUIRED DOCUMENTS **

- Copies to:
- Planning & Zoning - 1
- Applicant - 1
- Treasurer - 1
- Assessor - 1
- Administrative Assistant - Original



Steve Deiter,
 Executive Director
 Comstock Township Downside Development Authority



CHARTER TOWNSHIP OF COMSTOCK PLANNING & ZONING APPLICATION

Shipping: 5858 King Highway, Kal, MI 49048
Mailing: PO Box 449, Comstock MI 49041-0449
Phone: 269-381-2360 Fax: 269-381-4328

PLEASE PRINT

PROJECT NAME AND ADDRESS: Text Amendment 5922King HWY & 211 River ST.

APPLICANT:

Name Timothy Kerney
Company _____
Address 5922 King HWY & 211 River ST.
Comstock MI. 49048
Email [REDACTED]
Phone [REDACTED] Fax _____
Interest in the Property owner

Township Use:
Fee:
\$ _____
Escrow:
\$ _____
Date Paid:

cash/credit card
check # _____

OWNER*:

Name _____
Company _____
Address _____

Email _____
Phone _____ Fax _____

*If different

NATURE OF REQUEST: (Please check all the appropriate item(s))

- | | |
|--|--|
| <input checked="" type="checkbox"/> Site Plan Review | <input type="checkbox"/> Rezoning |
| <input type="checkbox"/> Administrative Site Plan Review | <input type="checkbox"/> Master Plan Amendment |
| <input type="checkbox"/> Special Exception Use | <input checked="" type="checkbox"/> Text Amendment |
| <input type="checkbox"/> Site Condominium | <input type="checkbox"/> Variance |
| <input type="checkbox"/> Subdivision Plat Review | <input type="checkbox"/> Interpretation |
| <input type="checkbox"/> PUD/PURD/PMUD | <input type="checkbox"/> Planning Escrow |
| <input type="checkbox"/> Other _____ | |

BRIEFLY DESCRIBE YOUR REQUEST (Use Attachments if Necessary):

Include the verbiage "permanent or seasonal" to food truck permits available to purchase

LEGAL DESCRIPTION OF PROPERTY (*Use Attachments if Necessary*):
See Attached.

PARCEL NUMBER: 3907 - 045 & 060 _____

ADDRESS OF PROPERTY: 5922 King HWY & 211 River St. _____

PRESENT USE OF THE PROPERTY: _____

PRESENT ZONING: P _____ **SIZE OF PROPERTY:** _____

NAME(S) & ADDRESS(ES) OF ALL OTHER PERSONS, CORPORATIONS, OR FIRMS HAVING A LEGAL OR EQUITABLE INTEREST IN THE PROPERTY:

Name(s)	Address(es)
_____	_____
_____	_____

SIGNATURES

I (we) the undersigned certify that the information contained on this application form and the required documents attached hereto are to the best of my (our) knowledge true and accurate. By submitting this Planning & Zoning Application, I (we) grant permission for Comstock Township officials and agents to enter the subject property of the applicant as part of completing the reviews necessary to process the application. I (we) as Applicant(s), understand that I (we) am responsible for the reimbursement to the Township of its actual expenses in connection with my (our) application, under the Township's Escrow Fee Policy, and I (we) agree to pay such amounts under the terms of that policy.

Timothy Kerney
Applicant's Signature

03/16/2026
Date

Owner's Signature authorizing submission of Application
(* If different from Applicant)

Date

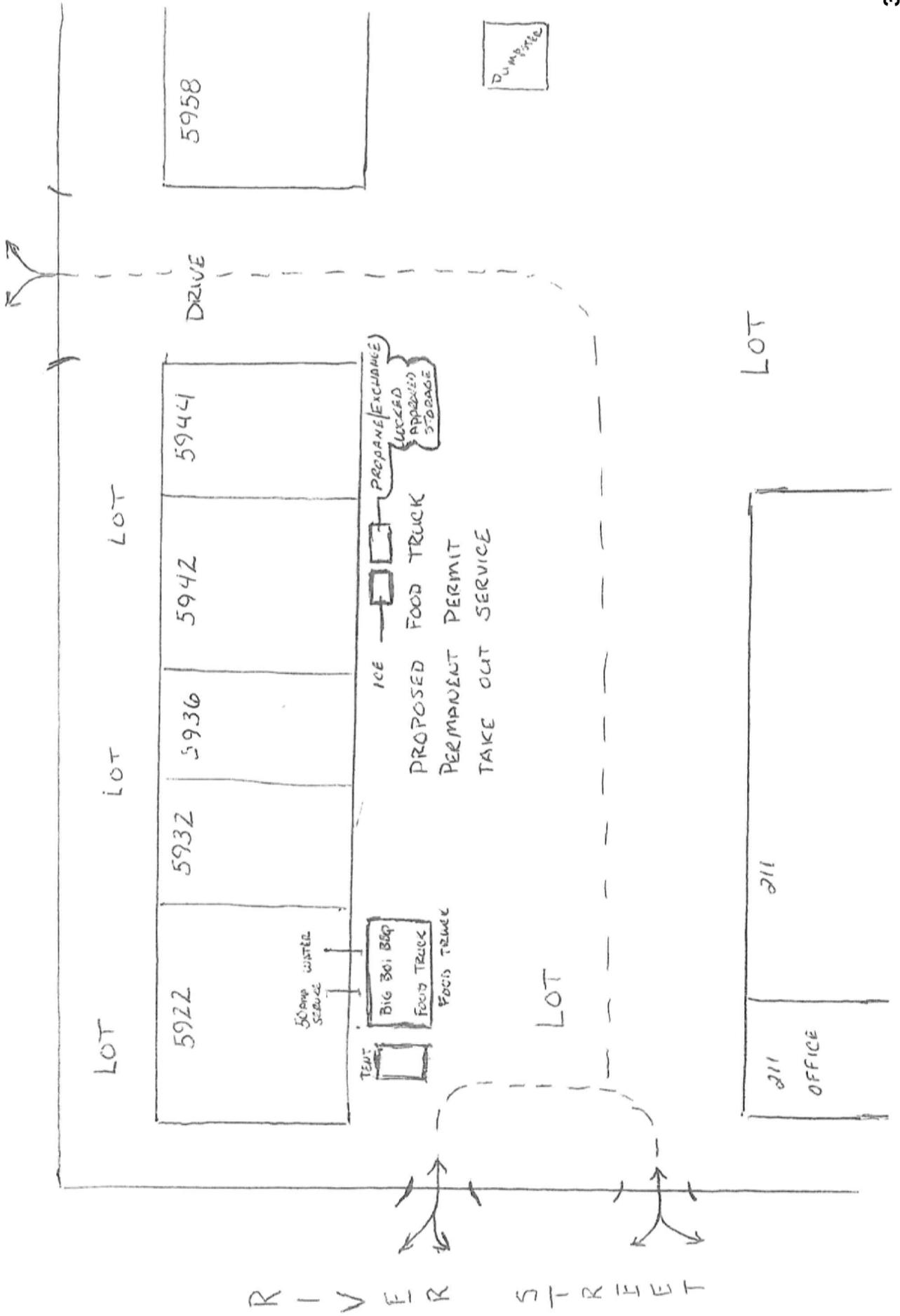
**** PLEASE ATTACH ALL REQUIRED DOCUMENTS ****

Copies to:
Planning & Zoning - 1
Applicant - 1
Treasurer - 1
Assessor - 1
Administrative Assistant - Original



Steve Deisler
Executive Director
Comstock Township Downtown Development Authority

KING HIGHWAY



The food truck would be located approximately 24 feet off the sidewalk and 4 – 6 feet away from the building behind 5922 / 5932 King HWY. A tent would be set up as well to provide service within the same distances. The driveways are more than 24 feet from the location on an angle approach. The vendor will have brute type trash barrels lined with garbage bags that will be emptied on our sight locked dumpster daily. And put up in the truck during non-open times. This food vendor is a grab and go service and there will be no seating for eating. As far as business hours I would say that it would follow any ordinance requirement so if there is a requirement of no service past a certain hour at night that would be followed unless a special event permit was obtained. Such as the vendor partners with one of your events that may go past ordinance timeframe, but I would imagine in that circumstance your team would handle that.



MEMO

Charter Township of Comstock Planning Commission March 26, 2026

From: Khayci Bryant, Planner

Re: Solar, Wind and Data Center Information

Attachments:

[Van Buren Township Wind and Solar.pdf](#)

[Richland_Solar Ordinance.pdf](#)

[Flushing Township Solar Ordinance.pdf](#)

[Data-Center-Guidebook-2026-02-06.pdf](#)

[CCSD-Guidebook-2024-16.pdf](#)

[SES-Planning-and-Zoning-for-Solar-Systems-MI-20250515-02_final.pdf](#)

- (D) Required Barrier.** For the protection of the general public, all swimming pools shall be completely enclosed by a chain link fence or a fence of comparable safety not less than four (4) feet nor more than six (6) feet in height, set at a distance of not less than four (4) feet from the outside perimeter of the pool wall provided; however, that fencing shall not be required in the following two (2) circumstances:
- (1)** To the extent that there is no public access to the lot or enclosure is accomplished by a building four (4) feet or more in height having no means of public access; or
 - (2)** If a swimming pool is above grade and has exterior side walls with a smooth surface not less than four (4) feet in height where all means of access are secured, raised and/or locked to prevent unauthorized use.

All openings in an enclosing fence or building shall be equipped with a tamper proof lock when the pool is not in use. If the entire premises upon which a swimming pool is located are enclosed by fence or wall, the Building Inspector, after inspection and approval thereof, may determine that a fence is not required.

- (E) Electrical Installations.** All electrical installations or wiring in connection with below ground swimming pools shall conform to the provisions of the Van Buren Township Code of Ordinances and any State Electrical Code requirements. If utility wires cross under or over the proposed pool area, the applicant shall make satisfactory arrangement with the utility involved for the relocation thereof before a permit shall be issued for the construction of the swimming pool.
- (F) Code Compliance.** Notwithstanding the requirements of this section, all private swimming pools shall comply with all applicable federal, state, county, and local codes and ordinances. Where the requirements of this Ordinance exceed the requirements of any other code or ordinance, the requirements of this Ordinance shall prevail.

Section 7.207 Solar Energy Systems

- (A) Purpose.** It is the purpose of this sub-section to promote the safe, effective, and efficient use of solar energy systems to generate electricity. Further, it is the purpose of this sub-section to standardize and streamline the review and permitting process for solar energy systems.
- (B) Findings.** The Township has found that solar energy is an abundant, renewable, and nonpolluting energy resource of which some residents and utility companies would like to make use. Generation of electricity by these facilities will reduce dependence on non-renewable energy resources and decrease air and water pollution that results from the use of conventional fossil fuels. Solar energy systems will also enhance the reliability and power quality of the power grid, reduce peak power demands, and help diversify the Township's energy supply.
- (C) Roof-Mounted Solar Energy Systems:** Roof--mounted solar energy systems for the on-site use are permitted accessory structures in all zoning districts, subject to the following regulations:

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- (1) **Height.** Roof-mounted systems shall not extend more than three (3) feet above the roofline nor shall they extend above the maximum permitted height of the building to which it is attached.
 - (2) **Location.** Roof-mounted solar energy systems may be located anywhere on a roof, but shall not be located in a required setback nor protrude beyond the edge of the roof.
- (D) Ground-Mounted Solar Energy Systems (10 kW or less).** Ground mounted and freestanding solar energy systems of 10kW or less for the on-site use are permitted accessory structures in all zoning districts, subject to the following regulations:
- (1) **Location and Setbacks.** Solar energy systems shall be located to the side or rear of the principal building. Solar energy systems shall also meet the minimum setbacks of the zoning district.
 - (2) **Height.** The height of the solar energy system and any mounts shall not exceed ten (10) feet when oriented at maximum tilt.
 - (3) **Screening.** Evergreen landscaping shall be provided to screen the racking (i.e., the framing below the panels) from view on all sides.
 - (4) **Area.** Ground-mounted solar energy systems shall be subject to the maximum lot coverage standards for accessory structures in the zoning district.
- (E) Ground-Mounted Solar Energy Facilities – Utility Grade (over 10 kW, operated by a public utility or government entity only).** Ground mounted and freestanding solar energy systems over 10 kW capacity are permitted for public utilities and government entities only, subject to special land use approval in the AG, M-1, M-T, M-2, and AP zoning districts and subject to the following regulations:
- (1) **Location and Setbacks.** The solar energy system shall not be located closer to the street than any portion of the principal building, and shall meet the minimum front, side and rear yard setbacks of the zoning district.
 - (2) **Height.** The height of the solar energy system and any mounts shall not exceed fifteen (15) feet when oriented at maximum tilt.
 - (3) **Screening.** Evergreen landscaping shall be provided to screen the racking (i.e., the framing below the panels) from view on all sides.
 - (4) **Area.** Ground-mounted solar energy systems shall be subject to the maximum lot coverage standards of the zoning district.
 - (5) **Power Lines.** All power lines between solar panels and inverters shall be placed underground.
- (F) General Standards.** The following requirements are applicable to all roof-mounted or ground-mounted solar energy systems.

- (1) **Building Permit.** A building permit shall be required for any roof-mounted or ground-mounted solar energy system.
- (2) **Batteries.** When solar storage batteries are included as part of the solar collector system, they must be placed in a secure container or enclosure when in use, and when no longer used shall be disposed of in accordance with applicable laws and regulations. If located in an accessory building, the accessory building must meet the requirements of [Article 7, Chapter 2](#).
- (3) **Electrical Emissions.** The design and construction of solar energy systems shall not produce electrical emissions that would interfere with aircraft communications systems or navigation equipment.
- (4) **Light Emissions and Reflection.** The design and construction of solar energy systems shall not produce light emissions, either direct or indirect (reflective), that would interfere with pilot vision and/or air traffic control operations. The solar panels shall be composed of anti-reflective material and/or treated with anti-reflective coating.
- (5) **Removal.** If a solar energy system ceases to perform its intended function (generating electricity) for more than six (6) consecutive months, the operator shall remove the collectors, mounts, and associated equipment and facilities no later than ninety (90) days after the end of the six (6) month period. Where the removal has not been lawfully completed as required above, and after at least thirty (30) days written notice, the Township may remove or secure the removal of the solar energy system or portion thereof, with the Township's actual cost of administrative and legal charges to be placed as a lien on the property. A lien on the property shall be superior to all other liens except taxes.

Section 7.208 Wind Energy Systems

- (A) **Purpose.** It is the purpose of this sub-section to promote the safe, effective, and efficient use of wind energy systems to generate electricity and thereby reduce or replace on-site consumption of utility-supplied electricity. Further, it is the purpose of this sub-section to standardize and streamline the review and permitting process for wind energy system.
- (B) **Findings.** The Township has found that wind energy is an abundant, renewable, and nonpolluting energy resource that some residents of the Township would like to use. Generation of electricity by these facilities will reduce dependence on non-renewable energy resources and decrease air and water pollution that results from the use of conventional fossil fuels. Wind energy systems will also enhance the reliability and power quality of the power grid, reduce peak power demands, and help diversity the Township's energy supply.
- (C) **Small Wind Energy Systems.**
 - (1) **Where Permitted.**

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- (a) Roof-Mounted Small Wind Energy Systems are permitted by right in the AG, R-1A, R-1B, and R-1C districts, provided that all of the applicable requirements of this Ordinance are met.
- (b) Tower-Mounted Small Wind Energy Systems may be permitted as a special land use in the AG and R-1A districts, provided that all of the applicable requirements of this Ordinance are met.

(2) Minimum Lot Area.

- (a) Roof-Mounted Small Wind Energy Systems shall have no minimum lot area.
- (b) Tower-Mounted Small Wind Energy Systems shall be located on a lot with a minimum area of one (1) acre.

(3) Maximum Wind Turbine Height.

- (a) Roof-Mounted Small Wind Energy Systems shall have a maximum height of ten (10) feet above the highest point of the roof or ten (10) feet above the maximum height of the zoning district, whichever is lower.
- (b) Tower-Mounted Small Wind Energy Systems shall have a maximum height of twenty (20) meters (65.617 feet).

(4) Minimum Setbacks.

- (a) Roof-Mounted Small Wind Energy Systems shall adhere to the minimum setbacks of the zoning district.
- (b) Tower-Mounted Small Wind Energy Systems shall be set back from all property lines, overhead utility rights-of-way and easements, and other towers a distance equal to or greater than the height of the windmill or tower.

(5) General Standards. The following requirements are applicable to all wind energy systems.

- (a) **Noise.** A wind energy system shall comply with the noise standards set forth in the Township's Ordinances.
- (b) **Shadow Flicker.** The application for a wind energy system shall include a shadow flicker analysis demonstrating impact on adjacent and nearby residential properties. Wind energy systems shall be constructed in locations that minimize the impacts of shadow flicker on residences.
- (c) **Lighting.** No wind energy system shall be artificially lighted unless required by the Federal Aviation Administration (FAA).

- (d) **Appearance, Color, and Finish.** The wind energy system shall be maintained in the color or finish that was originally applied by the manufacturer, unless otherwise approved in the building permit. All wind energy systems shall be a single non-reflective, non-obtrusive, matte finished color (e.g. white or gray).
- (e) **Signs.** The manufacturer or installer's identification sign, appropriate warnings signs, and an owner identification sign, are permitted. All other signs are prohibited.
- (f) **Electrical Wires.** All electrical wires associated with a wind energy system, other than wires necessary to connect the wind generator to the tower wiring, the tower wiring to the disconnect junction box, and grounding wires, shall be located underground.
- (g) **Compliance with Electrical Code.** Building permit applications for wind energy systems shall be accompanied by line drawings of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code.
- (h) **Construction Codes, Towers, and Interconnection Standards.** Wind energy systems, including towers, shall comply with all applicable state construction and electrical codes and local building permit requirements. Wind energy systems including towers, shall comply with the FAA requirements, the Michigan Airport Zoning Act (Public Act 23 of 1950 as amended), and other applicable local and state regulations. A wind energy system connected to the public utility electrical grid shall comply with the Michigan Public Service Commission and Federal Energy Regulatory Commission standards. Off-grid systems are exempt from this requirement.
- (i) **System Access.** Small wind energy systems shall be designed and installed such that step bolts, ladders, or other means of access readily accessible to the public are located at least eight (8) feet above grade level.
- (j) **Safety.** A wind energy system shall have an automatic braking, governing, or feathering system to prevent uncontrolled rotation or over speeding. All wind towers shall have lightning protection. If a tower is supported by guy wires, the wires shall be clearly visible to a height of at least six (6) feet above the guy wire anchors.
- (k) **Minimum Ground Clearance.** The lowest extension of any blade or other exposed moving component of a wind energy system shall be at least twenty (20) feet above the surrounding grade at its highest point within twenty (20) feet of the base of the tower and at least twenty (20) feet above any outdoor surface intended for human use, such as balconies or roof gardens, that are located below the wind energy system.
- (l) **Roof-Mounted Small Wind Energy Systems.** Roof-mounted small wind energy systems shall be limited to roof mounting and shall not be mounted on any other building wall or surface.

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- (m) Removal.** If a small wind energy system ceases to perform its intended function (generating electricity) for more than six (6) consecutive months or has been abandoned, the property owner shall remove the wind energy system, electrical components, and all other associated facilities no later than ninety (90) days after the end of the six (6) month period. Where the removal has not been lawfully completed as required above, and after at least thirty (30) days written notice, the Township may remove or secure the removal of the facility or portion thereof, with the Township's actual cost of administrative and legal charges to be drawn from the performance guarantee posted, or the costs and charges may be placed as a lien on the property. A lien on the property shall be superior to all other liens except taxes.
- (n) Performance Guarantee.** All applications for a small wind energy system shall be accompanied by a performance guarantee in an amount sufficient to ensure the decommissioning and removal of the system when it is abandoned or no longer needed.
- (o) Insurance.** The applicant shall submit proof of sufficient property damage and liability insurance.
- (p) Utility Connection.** The applicant shall submit evidence that the utility company has been informed of the customer's intent to install an interconnected, customer-owned wind energy generator and that such connection has been approved. Off-grid systems shall be exempt from this requirement.

Section 7.209 Satellite Dish Antennae Regulations

Unless exempt or otherwise regulated under Federal or State Law, satellite dish antennas and related structures shall meet the following requirements:

- (A) Compliance with Building Codes.** All satellite dish antennae which are to be constructed in the open and are not contained within buildings shall be considered structures subject to the requirements of the Township Building Code.
- (B) Permit.** No person, individual, corporation, business or partnership shall install or permit the installation of a satellite dish antennae on premises owned, occupied, used leased or rented by the aforesaid persons or entities, without first having applied for and received a permit allowing for same from the Township Building Official.
- (C) Application.** All applications for such permits shall include:

 - (1)** Site plan, showing the proposed location of the installation, including building location of the lot or premises on which the same is to be installed and all abutting properties, including properties abutting on the other side of the street from the proposed location.
 - (2)** For an antenna proposed to be mounted on a roof, a detailed plan showing the exact location of the antennae on the roof.

SECTION 1604. SOLAR FARM. (Revised 8-13-2024)

- 1) Intent and Purpose: To regulate the use of Solar Energy within Richland Township as an alternative energy source and to provide for the land development, installation, and construction regulations for solar farm facilities subject to reasonable conditions that will protect the public health, safety, and welfare. These regulations establish minimum requirements and standards for the placement, construction, and modification of solar farm facilities, while allowing a renewable energy source for our community in a safe, effective, and efficient manner.
- 2) Definitions used in this section:
 - a. Residential Solar Array – A small electricity generating system consisting of solar panels and associated equipment sized primarily to meet the needs of the on-site consumers for the home, farm, or small business on whose property they are constructed. While not intended to distribute electricity to other consumers as a primary purpose they may be inter-connected to a public utility.
 - b. Solar Farm – An electricity generating system consisting of solar panels and associated equipment designed or intended to provide electricity to off-site customers.
 - c. Solar Farm Operator – The person or entity that owns and/or operates the electricity generating system (solar panels and associated equipment). Solar Farm Operator does not include the owner or operator of a Residential Solar Array.
 - d. Participating Parcel – a parcel or tract of parcels where the owner of said parcel(s) has entered a contractual arrangement with the solar farm developer to allow the parcel(s) to be part of the solar farm.
 - e. Non-Participating Parcel – a parcel or tract of parcels where the owner of said parcel(s) has not entered a contractual arrangement with the solar farm developer to allow the parcel(s) to be part of the solar farm.
- 3) Residential Solar Arrays are allowed as a permitted accessory use to any residence or business in any zoning district.
- 4) Solar Farms are allowed by special use permit in the A1-Agricultural, A2-Agricultural Disbursed Residential, C2-General Commercial and M1-Industrial districts. They are not permitted in other zoning districts.
- 5) Solar Farms require a site plan review and approval by the Township Planning Commission.
- 6) An applicant proposing a Solar Farm may use an overlay process and submit multiple parcels as a tract for examination for a special use permit and site plan review. The applicant must have legal authority to submit the application for each parcel. Fees for the site plan review and special use permits will be assessed per parcel.

- 7) Minimum Lot Size: Solar farm facilities shall not be constructed on parcels or tracts with a combined size of less than twenty (20) acres.
- 8) Height Restrictions: All photovoltaic panels located in a solar farm shall be restricted to a maximum height of eighteen (18) feet.
- 9) Setbacks: All photovoltaic solar panels and support structures associated with such facilities, (including perimeter security fencing, shall comply with the following minimum setbacks:
 - a. Five hundred (500) feet from an occupied dwelling, a permitted dwelling, or any other occupied structure at the time of the site plan approval.
 - b. Three hundred (300) feet from a side or rear property line abutting a school, church, public park, or similar use.
 - c. One hundred (100) feet from a side or rear property line abutting a non-participating parcel.
 - d. One hundred (100) feet from any road or highway right-of-way.
 - e. Sixty (60) feet from any structure on a participating parcel which is not used as a component of the solar farm.
 - f. Zero (0) feet from a side or rear property line abutting a participating parcel.
 - g. Nothing in this section, or elsewhere in this ordinance, prohibits: 1) the erection of a structure or structures in these setbacks if the structure or structures is/are not used in the operation of the solar farm: and 2) the placement of underground electrical collection lines or necessary drainage infrastructure within required setback areas should such collection lines or drainage infrastructure be of sufficient space from non-participating parcels to allow maintenance, repair, and removal of lines or infrastructure (e.g., during decommissioning) to entirely occur on participating parcels and not result in any spoils being stored on or other activities occurring on non-participating parcels.
- 10) Maximum Lot Coverage: Maximum lot coverage restrictions shall not apply to photovoltaic solar panels. Any other regulated structures on the parcel are subject to maximum lot coverage restrictions.
- 11) Safety/Access: A security fence not less than seven (7) feet in height shall be placed around the perimeter of the solar power plant and electrical equipment. All gates and access points shall be locked when not in use. Damaged fences shall be immediately repaired.
- 12) Noise: No solar farms shall cause noise in excess of fifty (50) dBA (using Leq-10 minute or other acceptable scale to the Township) as measured at the property line of a non-participating parcel. Applicants must provide a pre-construction and post construction sound study to the Township demonstrating compliance with this standard.
- 13) The exterior surfaces of all equipment shall be generally neutral in color and substantially non-reflective of light. All solar panels shall be placed such that harmful

concentrated solar glare shall not be directed onto nearby properties or roadways. Applicants must provide a pre-construction and post-construction glare study to the Township demonstrating compliance with this standard and may be required to utilize operational controls on a solar farm (e.g., tilting of panels at certain times) to ensure compliance.

- 14) Landscaping: Solar farm facilities shall be required to install a perimeter landscaping buffer surrounding and on the exterior of the security fence, excluding access points. The Planning Commission may reduce or eliminate the buffer zone in areas not abutting residential uses or roadways. The buffer zone shall be not less than twenty-five (25) feet in width and shall be planted with assorted vegetation to provide a year-round visual buffer both at installation and in the future. Plantings shall be of a type and size to reach ten (10) feet in height within three (3) years. The number, species, and spacing of the plantings shall be sufficient to provide an adequate visual buffer as determined by the Planning Commission. Plantings must be maintained by the Solar Farm Operator, and dead, diseased, or damaged vegetation must be replaced annually or more frequently. Grass and weeds must be controlled by the Solar Farm Operator in the buffer areas during the entire growing season. Vegetation under and around the solar panels must be maintained by the Solar Farm Operator with proper mowing and weed control and shall not be allowed to exceed eighteen (18) inches in height. Land under PA116 has special requirements for the type of vegetation and maintenance.
- 15) Local, State and Federal Permits: Solar farm facilities shall be required to obtain all necessary permits from the U.S. Government, State of Michigan, and Richland Township, and comply with standards of the State of Michigan adopted codes.
- 16) Electrical Interconnections: All electrical interconnection or distribution lines shall comply with all applicable codes and standard commercial large-scale utility requirements.
- 17) Solar Farms shall not create any radio frequency interference in violation of any State or Federal regulation.
- 18) Decommissioning: The applicant shall provide a documented plan which details the removal methodology and cost for the project. The plan shall include at a minimum:
 - a. A written description of the proposed project service life.
 - b. An estimated cost to remove and restore the site to the original or a substantially similar condition, signed by a contractor familiar with the type of work or a registered professional engineer,
 - c. An acknowledgment that the applicant and/or any project owner will post a required financial security as required by Section 1604 (19) of the Zoning Ordinance and enter into a decommissioning agreement acceptable to the Township Board before issuance of required permits.
 - d. An acknowledgement that the estimate of project decommissioning costs will be updated and reviewed at a minimum of every three (3) years by a mechanism

- acceptable to the Township, including but not limited to, an inflationary index or review of decommissioning costs by a professional engineer or other qualified professional. The financial security required in Section 1604 (19) shall be adjusted by the change in the decommissioning costs by the mechanism above.
- e. An acknowledgement that the required financial security may be utilized by the Township if the project is abandoned, or site restoration is not completed within six (6) months of end of service life.
 - f. Certification of compliance with all county, state and federal regulations/laws.
 - g. Certification of compliance with other conditions established by the township planning commission as part of the special use permitting process.
- 19) The financial security required for decommissioning any project shall be in an amount that is sufficient to fully decommission the project and to restore lands to a conditional substantially similar to a pre-construction state and must exclude any credit/reduction in financial security for salvage values. The financial security may be in the form of a bond, letter of credit, or cash deposit as acceptable to the Township. Upon satisfactory removal and restoration as determined by the Richland Township Board of Trustees, any excess funds from a financial security will be returned by the Township to the depositing entity.
 - 20) The Solar Farm Operator shall provide a complaint resolution process to address any formal complaints filed with the Township Manager. The Solar Farm Operator shall acknowledge the receipt of the complaint within seven (7) days of notification of the complaint and shall resolve the complaint or provide a resolution plan with a resolution date within 30 days of the complaint. A resolution date beyond the thirty (30) day resolution deadline requires the operator to obtain approval from the Planning Commission.
 - 21) The Solar Farm Operator shall provide the township Planning Commission with a written affidavit showing the output of the solar farm. The report shall be provided on an annual basis or as the Planning Commission shall require.
 - 22) The Solar Farm Operator shall provide the Township Planning Commission with formal notification of any change in ownership or contact information.
 - 23) The Solar Farm Operator shall be required to provide 24 hour/7 days a week, direct contact number for emergency personnel to make contact. If this is a hotline, it must be staffed 24/7, otherwise a direct dial number to a focal point contact is required. This number shall be reviewed and updated on an annual basis. If changes to the emergency contacts are made, the Solar Farm Operator is required to notify the Richland Township Fire department within 12 hours of any changes.
 - 24) The Solar Farm Operator shall provide annual training regarding their installation(s), first response safety, and mitigation to the Fire Department. The training shall include site walk-through's if requested by the Fire Department.
 - 25) The Solar Farm Operator is required to provide SDS sheets to the Fire Department and comply with any Federal and State laws and reporting requirements.

- 26) The Solar Farm Operator shall provide site safety plans to include electrical, fire, smoke, and hazardous materials release, emergency response protocols and identify all hazards with regard to electrical, fire, smoke and hazardous materials.
- 27) The Solar Farm Operator is required to provide a copy to the fire department of the site/safety plan which will include any response for which there is an expectation that the Fire Department can safely mitigate.
- 28) The Solar Farm Operator shall maintain an emergency access road to the site that is accessible to fire department response apparatus. This access road must be maintained and accessible throughout the year.
- 29) Additional Special Use Criteria: The following topics shall be addressed in a Special Use application for solar farm facilities in addition to the Special Use Review Criteria defined elsewhere in the zoning ordinance:
- a. Project description and rationale: Identify the type, size, rated power output, performance, safety, and noise characteristics of the system, including the name and address of the manufacturer, and model. Identify time frame, project life, development phases, likely markets for the generated energy, and possible future expansions.
 - b. Analysis of onsite traffic: Estimated construction jobs, estimated permanent jobs associated with the development.
 - c. Visual impacts: Review and demonstrate the visual impact using photos or renditions of the project or similar projects with consideration given to tree plantings and setback requirements.
 - d. Wildlife: Review potential impact on wildlife on the site.
 - e. Environmental analysis: Identify impact on the water quality, water supply, potential ground contamination and changes to waterflow in the project area. Analysis must identify possible issues caused by construction, operation, and decommissioning.
 - f. Waste: Identify solid waste or hazardous waste generated by the project.
 - g. Lighting: Provide lighting plans showing all lighting within the facility. No light may adversely affect adjacent parcels. All lighting must be shielded from adjoining parcels, and light poles are restricted to eighteen (18) feet in height.
 - h. Transportation plan: Provide access plan during construction and operation phases. Show proposed project service road ingress and egress access onto primary and secondary routes, layout of the plant service road system. Due to infrequent access to such facilities after construction is completed, it is not required to pave or curb solar panel access drives. It will be necessary to pave and curb any driveway and parking lots used for occupied offices that are located on site.
 - i. Public safety: Identify emergency and normal shutdown procedures. Identify potential hazards to adjacent properties, public roadways, and to the community in general that may be created.

- j. Sound limitations and review: Identify noise levels at the property line of the project boundary when completed.
 - k. Telecommunications interference: Identify electromagnetic fields and potential radio frequency interference generated by the project and present plan to prevent such interference.
 - l. Life of the project and final reclamation: Describe the decommissioning and final land reclamation plan after anticipated useful life or abandonment or termination of the project, including evidence of an agreement with the property owner that ensures proper final removal of power generating equipment within six (6) to twelve (12) months of decommissioning.
- 30) The Planning Commission Review: Because of the ever-changing technical capabilities of photovoltaic solar panels and of new technology in general, the Planning Commission shall have the authority to review and consider alternatives in both dimensional requirements as well as physical development requirements found in this Section. The Planning Commission shall not have the authority to review or to allow solar farm facilities within any other zoning district.
- 31) A continuing escrow deposit shall be held by the Township and shall be funded by a cash deposit by the applicant prior to the commencement of construction of a solar farm and shall be maintained by the owner or operator until the solar farm has been permanently decommissioned and removed. The monetary amount placed by the applicant in escrow with the Township shall be estimated by the Township to cover all reasonable costs and expenses associated with continuing enforcement of this Ordinance and the terms of the special use permit, which costs can include, but are not limited to, reasonable fees for the Township Attorney, the Township Planner, and Township Engineer, as well as costs for any reports or studies that the Township determines are reasonably related to enforcement of the Ordinance and the special use permit. If the Township is required to expend any portion of the escrow deposit or if the existing escrow amount paid by the applicant provides to be insufficient to cover the Township's enforcement costs, the Township may require the applicant to place additional monies into escrow with the Township.
- 32) Each solar farm must be kept and maintained in good repair and condition at all times. If the Township determines that a solar farm fails at any time to materially meet the requirements of this Ordinance and/or the conditions of a special use permit, or that it poses a potential unreasonable safety hazard, the applicant shall shut down the solar farm within 48 hours after notice by the Township and not operate, start, or restart the solar farm until the condition has been corrected. Applicants shall keep a maintenance log on the solar farm and all its components and an annual report summarizing project maintenance activities shall be provided to the Township upon beginning of operation until a project is decommissioned. Solar farm owners and operators shall keep all sites within the solar farm neat, clean, and free of refuse, waste, or unsightly, hazardous, or unsanitary conditions.

Flushing Township Solar Energy Zoning Ordinance Provisions

Article 2 DEFINITIONS

ROOF-MOUNTED SOLAR ENERGY COLLECTOR: A solar energy collector that is attached to a building's roof on the parcel of land including solar shingles.

COMMERCIAL SOLAR ENERGY SYSTEM: A utility-scale facility of solar energy collectors with the primary purpose of wholesale or retail sales of generated electricity. Commonly referred to as solar farms.

GROUND-MOUNTED SOLAR ENERGY COLLECTOR: A solar energy collector that is not attached to and is separate from any building on the parcel of land on which the solar energy collector is located (Figure 1).

ON-SITE: A solar energy system designed to help meet the electrical needs within the limits of the area encompassed by the tract area or parcel of record on which the activity is conducted.

RACKING: Racking is any structure or building material used in the mounting of a solar panel (Figure 1).

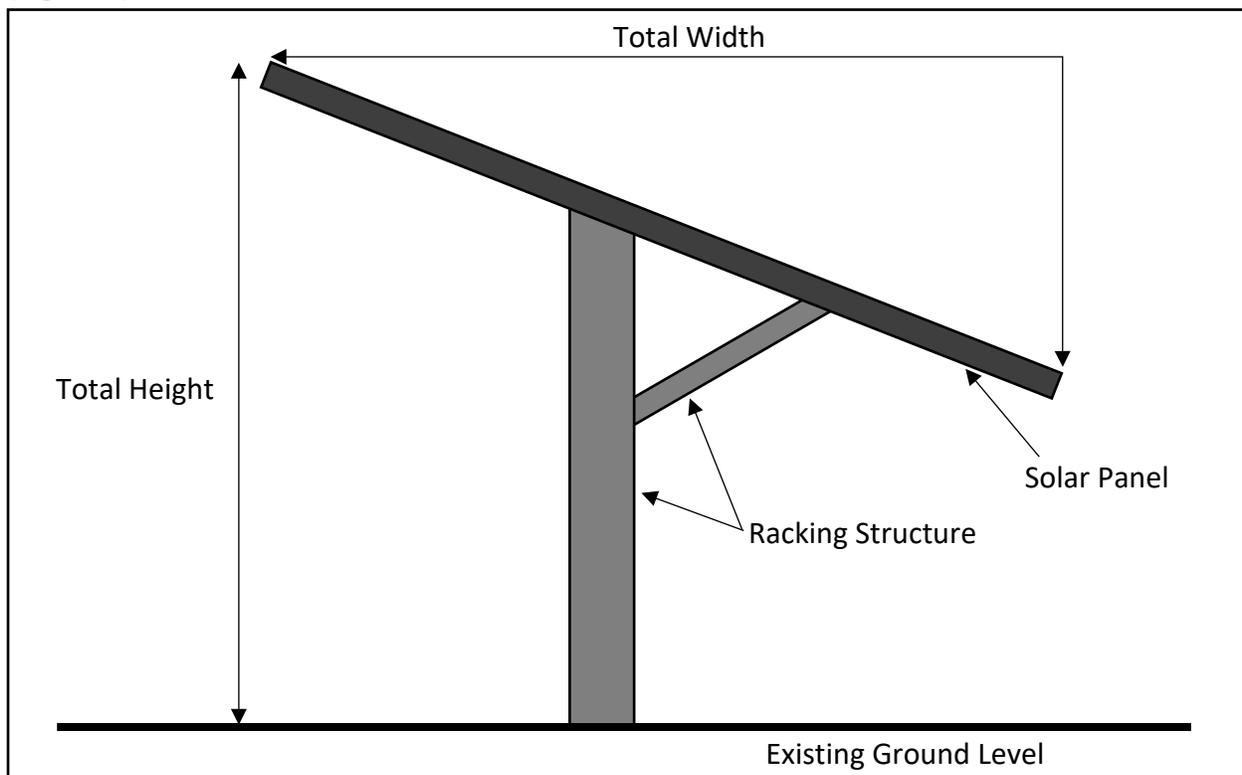


Figure 1

SOLAR COLLECTOR: A device or combination of devices, structure, or part of a device or structure that transforms direct solar energy into thermal, chemical, or electrical energy and that contributes significantly to a structure's energy supply.

SOLAR ENERGY: Radiant energy (direct, diffuse, and reflected) received from the sun.

SOLAR ENERGY SYSTEM: A solar collector or other device or structural design feature of a structure that relies upon sunshine as an energy source and is capable of collecting, distributing, and storing (if appropriate to the technology) the sun's radiant energy for a beneficial use.

SOLAR PANEL: A panel consisting of an array of solar cells used to generate electricity directly from sunlight.

SOLAR SHINGLES: A roofing product made by combining thin film solar technology (which converts sunlight to electricity) with a durable backing to provide a structural roof shingle comparable to traditional roofing shingles.

Article 4 Site Regulations

Sec. 20-419 On-Site Solar Energy Regulation

(a) All Solar Energy Collectors

- (1) The installation of any solar panel (on-site or commercial) shall not negatively impact adjacent properties with additional or excessive storm water runoff and/or drainage.
- (2) It shall be shown that all panels are adequately secured to the surface upon which they are mounted and that the mounting structure has the capability of supporting the panels.
- (3) All panels shall have tempered, non-reflective surfaces.
- (4) Solar energy equipment shall be repaired, replaced, or removed within three months of becoming nonfunctional.
- (5) Each system shall conform to applicable industry standards including those of the American National Standards Institute (ANSI).
- (6) Solar energy collectors shall be installed, maintained, and used only in accordance with the manufacturer's directions. Upon request, a copy of such directions shall be submitted to the building inspector prior to installation. Building inspector approval is required.
- (7) Solar energy collectors and installation and uses shall comply with construction code, electrical code, and other state requirements.

(b) On-Site Roof-Mounted Solar Energy Collector

- (1) Solar energy collectors shall be such a weight to be safely supported by the building. Building inspector approval is required.
- (2) Solar energy collectors shall be considered part of the building and meet all the required building height and setback requirements.
- (3) Solar energy collectors shall not project more than 2 feet above highest point of roof or exceed maximum building height limitations allowed in that zoning district.
- (4) Solar energy collectors shall not be located within 3 feet of any peak, eave, or valley to maintain adequate accessibility.

(c) On-Site Ground-Mounted Solar Energy Collector

- (1) Ground-mounted solar energy systems are only permitted in the side and rear yards, unless permitted in front yard by issuance of a discretionary special use permit pursuant to Section 20-1804(A) of the Ordinance.
- (2) Ground-mounted solar energy systems may not extend into the side-yard or rear setback when oriented at any designed tilt angle.
- (3) Ground-mounted solar energy collectors shall not exceed 12 feet in height measured from the ground at the base of such equipment. The height of the ground-mounted solar energy collector shall be measured from ground level to the highest point of the solar panel.
- (4) There shall be a minimum of 25 feet from all-natural features including water courses, wood lots, wetlands, and 100-year floodplains.
- (5) The total area of ground-mounted solar energy collections shall be included in calculations to determine lot coverage and shall not exceed the maximum lot coverage.
- (6) For the RU-1, RU-2, RU-4, RSA, C-1, C-2, C-3, M-1, and M-2 zoning districts, ground-mounted solar energy collectors requesting a lot coverage of 15 percent or less be considered an accessory use. A Discretionary Special Use Permit may be considered for ground-mounted solar energy collectors requesting a lot coverage over 15 percent.
- (7) Ground-mounted solar energy collectors shall meet the requirements of Sec. 20-400 Accessory Structures.

Article 7 District Regulations

Section 20-701 Zoning District Uses

ZONING DISTRICT USES									
SCHEDULE OF USES (Uses Permitted by Right (P), Uses Permitted by Non-Discretionary Special Use Permits (NS), Uses Permitted by Discretionary Special Use Permit (DS), Accessory Uses and Buildings (A))									
TYPE OF USES	DISTRICTS								
	RSA	RU-1	RU-2	RU-4	C-1	C-2	C-3	M-1	M-2
ACCESSORY USES, STRUCTURES, AND BUILDINGS									
On-Site Roof-Mounted Solar Energy Collector	A	A	A	A	A	A	A	A	A
On-Site Ground-Mounted Solar Energy Collector (15 percent Lot Coverage or Less)	A	A	A	A	A	A	A	A	A
On-Site Ground-Mounted Solar Energy Collector (Over 15 percent of Lot Coverage)	DS	DS	DS	DS	DS	DS	DS	DS	DS
INDUSTRIAL AND RELATED USES									
Commercial Solar Energy Collector	DS							DS	DS

Article 18 Special Use Permits Article

Section 20-1804 Requirements for Permitted Special Land Uses

(OO) Commercial Solar Energy Collector System

- (a) The commercial solar energy collector system must meet all requirements in Sec. 20-419(a) all solar energy collectors and (b) roof-mounted solar energy collectors.
- (b) All commercial solar energy collector systems that are ground-mounted shall follow the following requirements:
 - (1) Ground-mounted solar energy collectors shall not exceed 12 feet in height measured from the ground at the base of such equipment. The height of the ground-mounted solar energy collector shall be measured from ground level to the highest point of the solar panel.
 - (2) The total area of ground-mounted solar energy collections shall be included in calculations to determine lot coverage and shall not exceed a maximum lot coverage of 25 percent regardless of the residing zoning district.
- (c) Required to be on lots larger than 2 acres.
- (d) Any commercial solar energy collector system adjoining any residential development shall be provided with a buffer of at least 60 feet along the adjacent property line. Such buffer shall be planted with evergreen and other suitable plantings and used for no other purposes. A landscaped planting area of at least 60 feet shall also be provided along all street frontage. The Planning Commission may approve to substitute the above described greenbelt for an obscuring fence, wall, and other protective barriers as long as it meets requirements in Sec. 20-408.
 - (1) The planting of native ground covers that shall be maintained on site during the operation, until the site is decommissioned.
 - (2) Provide verification that adequate infrastructure exists to transport the electricity generated into the larger grid system.
 - (3) Power and communication lines running between the banks of the solar panels may be placed above ground, provided the lines are placed no higher than top of the solar panels.
 - (4) Power and communication lines to electric substations or interconnections with buildings shall be buried underground.
- (e) Exception for underground power communication lines:
 - (1) Where shallow bedrock, water courses, or other elements of the natural landscape interfere with the ability to bury lines.
 - (2) When required by the utility company.
 - (3) Unless otherwise determined by the Planning Commission.
- (f) The installation of the solar energy collectors shall not disturb the existing topography.
- (g) A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life. Decommissioning of solar panels must occur in the event they are not in use for 90 days. The plan shall include provisions for removal of all structures,

foundations, electrical equipment and internal or perimeter access roads, restoration of soil and vegetation, and a plan ensuring financial resources will be available to fully decommission the site. The applicant shall submit a financial guarantee in the form of a bond in favor of Flushing Township equal to 125 percent of the costs to meet the requirements of the decommissioning plan. The type of guarantee is subject to the Planning Commission's approval.

R:\Projects\17C0091\Docs\Planning and Zoning Services\Zoning Ordinance\2017\Text Amendment\Solar Energy\Township Board Adopted Draft.docx



WHAT MICHIGAN LOCAL GOVERNMENTS SHOULD KNOW ABOUT DATA CENTERS

February 2026



GRAHAM SUSTAINABILITY INSTITUTE
CENTER FOR EMPOWERING COMMUNITIES
UNIVERSITY OF MICHIGAN

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Background & Purpose

While data centers have operated in Michigan for some time,¹ they have largely existed without debate or public scrutiny. With the growth of AI and cloud computing, however, demand for larger, more resource-intensive data center facilities has surged. Following the recent expansion of state-level tax incentives for data centers, developers have begun looking to Michigan to identify new siting opportunities for significantly larger facilities.

Much has been written about the opportunities and risks that AI and data centers pose to society at large.² **This guide is not intended to resolve or mediate this society-wide debate; instead, it focuses on local-level considerations.** Like all land uses, data centers bring both positive and negative local impacts to the communities that host them. These impacts can vary depending on the specific technology used within a data center, the state regulations that shape its development, and its location within the host community. For example, there is a trade-off between the amount of water and energy a data center consumes, which depends heavily on the cooling technology used. State and local policy can also shape data center impacts on water and energy, as well as the direct economic impacts on the host community, including property taxes and job creation.

This guide is intended to provide Michigan local government officials and planners, particularly those with zoning authority, with the information they need to effectively participate in data center siting conversations. The first section of this guide provides a basic introduction to the environmental and economic impacts of data centers and links them to the current Michigan policy context. In the second section, we offer planning and zoning recommendations applicable not just to data centers but to a range of industrial land uses. Wherever possible, we draw on lessons from data center development in other states and from other industrial development, including our own expertise with large-scale renewable energy projects. **Since policies, technologies, and best practices for data center siting are rapidly evolving, readers should treat this guide as a working document. We plan to revise it or add supplementary guides as we learn more.**

¹ Estimates range on the number of data centers currently in Michigan, likely due to the broad definition of what constitutes a data center. The U.S. Department of Energy's Office of Scientific and Technical Information's Data Center Atlas lists nine data centers in Michigan. Recent local reporting has noted approximately 44 data centers in the state. Mongird, K., Thurber, T., Vernon, C., Burleyson, C., Akdemir, K. Z., & Rice, J. (2025). *Im3 open source data center atlas*. Pacific Northwest National Lab (United States). <https://doi.org/10.57931/2550666>; *Your guide to Michigan's data center boom—And the growing backlash*. (2025, November 18). WKAR Public Media. <https://www.wkar.org/wkar-news/2025-11-17/your-guide-to-michigans-data-center-boom-and-the-growing-backlash>

² *Data centers are amazing. Everyone hates them*. (n.d.). MIT Technology Review. Retrieved February 5, 2026, from <https://www.technologyreview.com/2026/01/14/1131253/data-centers-are-amazing-everyone-hates-them/>; Copley, M. (2025, October 14). Data centers are booming. But there are big energy and environmental risks. *NPR*. <https://www.npr.org/2025/10/14/nx-s1-5565147/google-ai-data-centers-growth-environment-electricity>

Data Center Basics

A data center is any physical room or facility that houses information technology infrastructure. Many data centers provide computing services that keep websites running, enable video streaming, and support the software used by banks, hospitals, and human resources departments. With the rise of technologies such as cloud-based services and the Internet of Things (e.g., “smart” appliances, building systems, and other equipment that send data and can be controlled via the internet), we have seen the construction of newer, larger data centers to accommodate these increasingly popular technologies.³ In particular, the advent of generative artificial intelligence (genAI) and large language models (LLMs) has driven the development of very large data centers.

A data center’s infrastructure includes not just the servers (i.e., computers) that store and process information, but also networking equipment to get information to and from the internet, power supply equipment to protect the computers against fluctuations in electricity, and environmental control equipment to cool and maintain humidity.⁴ The graphic on the next page includes a useful depiction of the components of a data center.

While a data center supporting a small business’s operations, for example, may be as small as a closet, most of the current attention – and the rest of this guide – focuses on large, “hyperscale” data centers. Hyperscale data centers house over 5,000 servers, and have a footprint ranging in size from 10,000 to millions of square feet.⁵ Generally, the digital services enabled by hyperscale data centers benefit a national or multi-region customer base rather than just the community or business property where the facility is located.

Data center companies choose sites for new development based on a variety of factors. In addition to needing to find a site with enough land to house the data center, they also require sites near an electric transmission line with sufficient capacity to provide power to the facility and high-capacity, low-latency fiber-optic cable to connect to the internet.^{6 7} If the data center plans to use water for cooling, it must also be sited near an adequate water source. From a financial perspective, developers are also more likely to build new facilities in localities that offer tax exemptions or other financial incentives.

³ Center for Sustainable Systems, University of Michigan. 2025. "Artificial Intelligence Factsheet." Pub No. CSS25-22. <https://css.umich.edu/publications/factsheets/built-environment/artificial-intelligence-factsheet>

⁴ *What is a data center?* | ibm.

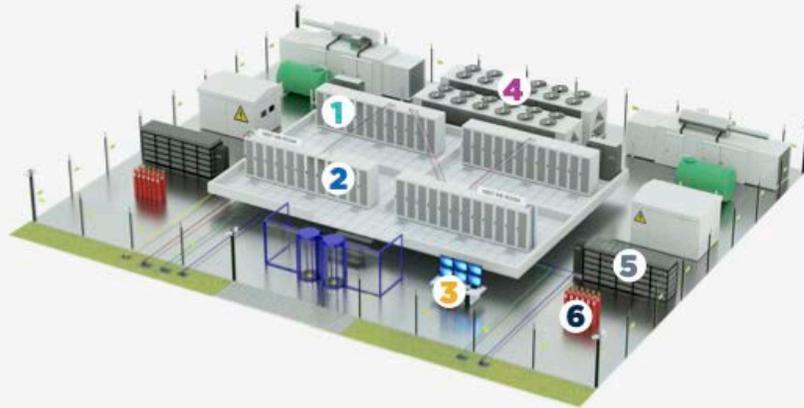
⁵ *What is a hyperscale data center?* | IBM. (2024, March 21). <https://www.ibm.com/think/topics/hyperscale-data-center>

⁶ CallisonRTKL, R. B., Vice President and Director, Mission Critical Group. (2015, January 19). *Parameters to consider in the data center location decision*. Area Development. <https://www.areadevelopment.com/data-centers/data-centers-q1-2015/data-center-location-decision-parameters-46734866.shtml>

⁷ A recent trend in hyperscale data center development is for hyperscalers to build their own privately-owned, low-latency fiber networks if their preferred site lacks reasonable access to backbone fiber. Datacenters.com. (2025, September 3). *Who’s Building the Next 200MW Colocation Campuses—And Why?*. <https://www.datacenters.com/news/who-s-building-the-next-200mw-colocation-campuses-and-why>

Components of Data Centers

Data centers consist of several [critical components](#) that ensure efficient operation and reliability.



Source: <https://datacenteruniversitybe/whats-inside-a-data-center> To view this interactive graphic visit the Data Center University website.

1 Servers

The backbone of data processing and storage, servers are computers connected together to run applications and computing tasks.

2 Storage Systems

Data centers house vast amounts of digital information, stored on solid-state drives or hard disk drives.

3 Networking Equipment

Includes routers, switches and firewalls that manage data traffic and security.

4 Cooling Systems

Prevent overheating by using air or liquid cooling methods to maintain optimal operating temperatures for computers.

5 Power Infrastructure

Includes backup generators and uninterruptible power supplies to ensure continuous operation.

6 Security Systems

Physical and cyber security measures such as biometric access controls, surveillance cameras and fire suppression systems.

Source: [National League of Cities](#)

Environmental Impacts and Michigan Policies

This section details a summary of key environmental impacts; generally, the most environmentally-friendly data centers are those that:

- Use water- and energy-efficient equipment and practices within the data center
- Are powered by electricity sources that have low water use and reduced emissions⁸
- Have thoughtful site selection that avoids important habitats and sensitive lands
- Commit to decommissioning - removing infrastructure at the end of the facility's useful life

Energy and Water Consumption

Questions about water and energy consumption frequently arise in data center discussions. Because the numbers associated with data center resource consumption are so large, it may be helpful to put them in context. Some of the most water-intensive hyperscale data centers, for example, can require up to five million gallons of water per day.⁹ Putting this into perspective within Michigan's context, the Great Lakes Water Authority's five freshwater treatment plants have maximum rated capacities between 240 and 540 million gallons per day, and currently have an estimated combined maximum demand of 1 billion gallons per day.¹⁰ Using an example within the context of Michigan's energy consumption, the proposed data center in Saline Township would require 1,400 megawatts of power capacity. By comparison, the state's total generation capacity in 2024 was just over 32,000 megawatts.¹¹

Energy and water consumption are presented here together because they are linked. While there is currently a gap in publicly available data on energy and water use by specific computing and cooling technologies,¹² we do know that there is typically a trade-off between energy and water use. Technologies like evaporative cooling are more energy-efficient but more water-intensive. Meanwhile, air-cooled or closed-loop chillers use minimal to no water, but are energy-intensive.¹³ Both types of cooling systems are common, and often the developer may choose between them based on availability of water and cost; the water-efficient closed-loop systems are currently more costly than open-loop evaporative cooling.¹⁴ As noted in this document's state-level tax abatement section, the sales and use tax exemptions for "enterprise" data centers, which were

⁸ Xiao, T., Nerini, F.F., Matthews, H.D. *et al.* Environmental impact and net-zero pathways for sustainable artificial intelligence servers in the USA. *Nat Sustain* 8, 1541–1553 (2025). <https://doi.org/10.1038/s41893-025-01681-y>

⁹ Wroth, K. (2025, October 17). *Data drain: The land and water impacts of the ai boom*. Lincoln Institute of Land Policy. <https://www.lincolninst.edu/publications/land-lines-magazine/articles/land-water-impacts-data-centers/>

¹⁰ GLWA 2022–2026 CIP Appendix D: System Background Information. (n.d.). Great Lakes Water Authority. https://www.glwater.org/wp-content/uploads/2020/12/GLWA-2022-2026-CIP_AppendixD.pdf

¹¹ <https://www.eia.gov/electricity/state/michigan/>

¹² Shehabi, A., Smith, S.J., Hubbard, A., Newkirk, A., Lei, N., Siddik, M.A.B., Holecek, B., Koomey, J., Masanet, E., Sartor, D. 2024 United States Data Center Energy Usage Report. Lawrence Berkeley National Laboratory, Berkeley, California. LBNL-2001637. <https://escholarship.org/content/qt32d6m0d1/qt32d6m0d1.pdf>

¹³ *Google's Water Risk Framework Assessing watershed health in data center communities*. (2023, December).

¹⁴ *Chilling out: Data centers find new ways to reduce cooling costs | news & insights*. (n.d.). Gray. Retrieved February 4, 2026, from <https://www.gray.com/insights/chilling-out-data-centers-find-new-ways-to-reduce-cooling-costs/>

signed last year, include requirements related to water and energy. However, these same provisions are not required for the “qualified” data center exemption category, which has been available since 2015.

When thinking about a data center’s sustainability, something to note is that even in data centers that have minimal *direct* use of water for cooling, there may still be *indirect* use of water. That is because most U.S. power plants are thermoelectric¹⁵ and require significant amounts of water to operate.¹⁶ This indirect water impact is no different from that of other high-demand electricity users, and can be minimized when data centers are located in electricity grids that have less reliance on thermoelectric power plants or when the data centers themselves are powered by electricity sources that do not require water for operations (e.g., wind and solar power). Consequently, this water use is rarely in the community hosting the data center, but rather in communities that host power plants that supply electricity to the grid. While Michigan’s electricity fleet has been reducing its reliance on thermoelectric power plants as it adds renewables to the grid, in 2024, Michigan’s electric power plants withdrew roughly 5.4 billion gallons of water per day for power plant cooling.¹⁷

Like the federal government, Michigan does not have policies specifically governing data center energy use.¹⁸ However, the Michigan Public Service Commission (MPSC, also known as the Commission) regulates several policies relevant to data centers. Primarily, the MPSC regulates both the investor-owned utilities that charge data centers for electricity and natural gas and the terms of service under which those utilities operate. The Commission also requires all entities that provide electricity to customers in Michigan, including investor-owned utilities, cooperatives, municipal utilities, and alternative electric suppliers, to prove each year that they have adequate resources planned four years ahead to meet their customers' electricity needs.¹⁹ Furthermore, the Commission has the power to require additional customer protections in special contract requests submitted by investor-owned utilities seeking to work with data centers, and to attach conditions to any approval it grants. However, the Commission cannot control where data centers are built, approve their construction, or issue permits related to their water consumption.²⁰

¹⁵ A thermoelectric power plant uses an energy source (e.g., coal, natural gas, or nuclear) to heat water to create high-power steam which is then used to spin a turbine to generate electricity.

¹⁶ In 2023, data centers directly consumed approximately 17 billion gallons of water in their operations and indirectly consumed 211 billion gallons through their energy use. Sadasivam, N. (2025, November 24). *How to make data centers less thirsty*. Grist. <https://grist.org/energy/how-to-make-data-centers-less-thirsty/>

¹⁷Annual Report of the Great Lakes Regional Water Use Database. (2024). Great Lakes Commission. <https://cms.waterusedata.glc.org/media/2024-Water-Use-Report-FINAL.pdf>

¹⁸There is currently federal guidance (not requirements) on data centers used by the federal government. Offutt, M., & Zhu, L. (2025). *Data Centers and Their Energy Consumption: Frequently Asked Questions*. Library of Congress. <https://www.congress.gov/crs-product/R48646#fn59>

¹⁹ *Resource planning*. (n.d.). Retrieved January 4, 2026, from <https://www.michigan.gov/mpsc/regulatory/electricity/resource-planning>

²⁰ *Issue Brief: Case No. U-21990, DTE Electric's Application for Approval of Special Contracts*. (2025, December 18). Michigan Public Service Commission. [https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/info/briefs/Issue_Brief_U_21990_DTE_12_18_25-\(002\).pdf](https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/info/briefs/Issue_Brief_U_21990_DTE_12_18_25-(002).pdf)

The MPSC also manages the implementation of Michigan’s clean energy standard, legislation that shapes the types of power plants that provide electricity to Michigan utilities.²¹ This law requires utilities to obtain 15% of their power from renewable energy resources each year through 2029, and then 50% in 2030. In 2035, an 80% clean energy standard will take effect, with a target of 100% in 2040. During this transitional period, the MPSC is responsible for reviewing each utility’s renewable energy plan to ensure compliance with the standard and for approving cost-recovery mechanisms for regulated utilities. The Commission also has the ability to grant a utility an extension for compliance under certain circumstances.²²

While the MPSC has jurisdiction over the state’s utility rates and customer protections, the Department of Environment, Great Lakes, and Energy (EGLE) regulates water withdrawals. Within EGLE, the Geologic Resources Management Division (GRMD) oversees Michigan’s regulation of large quantity water withdrawals, with the goal of protecting the state’s environment from significant impacts caused by large-volume water consumers. Specifically, Michigan landowners, such as a data center using traditional evaporative cooling, must obtain prior approval before operating pumps capable of withdrawing at least 70 gallons per minute.²³ The permitting process relies on GRMD’s Water Withdrawal Assessment Tool (WWAT) for wells or surface water intakes from streams, rivers, or ponds with less than five acres of surface area. GRMD grants approval when no Adverse Resource Impact (ARI) on nearby streams and rivers is determined, resulting in a Water Withdrawal Registration that becomes void if the withdrawal isn’t operational within 18 months.²⁴ Further permitting is required in sensitive areas or when large-quantity withdrawal owners seek new or increased withdrawals exceeding 2,000,000 gallons per day (pumps with flow rates of 1,389 gallons per minute or more).²⁵ These regulations apply to any on-site water producers in the state, from agriculture to public water supplies, and would apply whether a data center seeks to withdraw water via a well or if its increased demand would prompt a public water supply to increase its water withdrawals.

In the case of a data center seeking supply through a public water utility, Michigan’s Safe Drinking Water Act requires these facilities maintain adequate capacity and reliability for existing customers.²⁶ Further, EGLE will reject water treatment plant construction permits if capacity assessments reveal a proposed expansion or alteration will leave a system with inadequate technical, financial, or managerial capacity to meet requirements.²⁷

²¹ *Clean energy standard*. (n.d.). Retrieved January 4, 2026, from <https://www.michigan.gov/mpsc/commission/workgroups/2023-energy-legislation/clean-energy-standard>

²² MCL 460.1032 (2). <https://legislature.mi.gov/documents/mcl/pdf/MCL-ACT-295-OF-2008.pdf>

²³ *Wwat*. (n.d.). Retrieved October 7, 2025, from <https://www.egle.state.mi.us/wwat/home>

²⁴ *Wwat*. (n.d.). Retrieved October 7, 2025, from <https://www.egle.state.mi.us/wwat/home>

²⁵ *Wwat*. (n.d.). Retrieved October 7, 2025, from <https://www.egle.state.mi.us/wwat/home>

²⁶ Safe Drinking Water Act, Mich. Comp. Laws § 325.1005(1)(e) (1976).

²⁷ Safe Drinking Water Act § 325.1004(2), (7).

Wastewater

Data center cooling systems influence not only water consumption but also the overall quality and volume of wastewater produced. Some cooling systems, like evaporative cooling, can generate wastewater with altered pH, and high concentrations of conditioning chemicals and biocides that are used to reduce the growth of bacteria such as *legionella*.²⁸ While these chemicals are important for minimizing public health risks, they could strain local treatment plants that are not equipped to handle them. Other next-generation data center designs, such as closed-loop and dry cooling, are moving toward minimal or near-zero wastewater discharge.

EGLE's Water Resources Division (WRD) regulates waste or wastewater discharging into the waters of the state. Waters of the state are defined in law as groundwaters, lakes, rivers, and streams, along with all other watercourses and waters, including the Great Lakes. The regulations applicable to wastewater discharges can be divided into three permitting categories: discharges directly into surface water, discharges directly onto the ground or subsurface into the groundwater, and indirect discharges into nearby municipal wastewater treatment systems.

The first category applies to anyone discharging, or proposing to discharge, waste or wastewater into the state's surface waters. This type of permit is required by law under the National Pollution Discharge Elimination System (NPDES) program. This applies to any type of wastewater, including commercial, industrial, and sanitary sewage. The NPDES program is intended to control direct discharge into the surface waters of the state by imposing effluent limitations and other conditions to meet state and federal requirements.

The second category applies to anyone discharging, or proposing to discharge, waste or wastewater directly onto the ground or into groundwater. This type of discharge would require a Groundwater Discharge Permit or an exemption. A groundwater discharge permit imposes effluent limitations and/or groundwater limits set to protect the groundwater for the intended purposes. The intended purposes include protecting nearby drinking water wells, along with groundwater seeping into nearby surface water, to ensure the groundwater is safe for all who use it. This permit type applies to any wastewater, including commercial, industrial, and sanitary sewage. There are other regulating authorities, such as the Local Health Departments, that may become involved through the issuance of construction permits for discharges containing only sanitary sewage generating less than 10,000 gallons per day.

The third category applies to any indirect discharges (those who discharge to a municipal wastewater treatment facility via a sanitary sewer) and does not require an NPDES or groundwater discharge permit. Discharge to a separate storm sewer (i.e., does not go to a municipal wastewater treatment facility) is considered a direct discharge and may require either

²⁸ CDC. (2024, May 8). *Strategies for identifying cooling towers*. Investigating Legionnaires' Disease. <https://www.cdc.gov/investigate-legionella/php/public-health-strategy/identifying-cooling-towers.html>

an NPDES or a groundwater discharge permit. Discharge to a municipal wastewater treatment facility may require a permit from the municipality under the Industrial Pretreatment Program.

Air Quality

The main air quality impact of data centers stems from emissions associated with electricity production, specifically nitrogen oxides and fine particulate matter (PM_{2.5}).²⁹ Data centers typically draw most of their power from the grid, so the majority of these emissions are generated off-site in the communities hosting the power plants serving the power grid at large. Thus, when data centers are built in regions with cleaner power plants, these air emissions are lower. This impact can be furthered through the adoption of flexible operational strategies, such as load shifting, dynamic scheduling, and participation in virtual power plant (VPP) programs, which can help reduce emissions during peak demand periods. While these strategies are not yet widespread, research indicates that they most effectively reduce emissions when utilized in regions where renewables are already abundant and cost-competitive.³⁰

Even when connected to the grid, data centers have on-site back-up generators, typically fueled by natural gas or diesel, to maintain operations during outages.³¹ Actual emissions at the data center will depend on the number of generators, their size, and permitted runtime hours, and will vary based on individual data center operational standards. In Michigan, EGLE's Air Quality Division (AQD) requires air use and installation permits for equipment emitting air contaminants unless exempted explicitly under Part 2 of the air quality rules (Rules 277-291). While Rule 285(g) exempts the sort of small internal combustion engines that might be used in emergency back-up generators, data centers must also comply with Rule 278, which prohibits using exemptions when total project emissions exceed significance thresholds (e.g., 40 tons/year of nitrogen oxides, 100 tons/year of carbon monoxide, or 10 tons/year of particulate matter 2.5 micrometers or smaller). If aggregate emissions from all back-up generators exceed these thresholds, individual engine exemptions become invalid, and the site must obtain a permit for the entire fleet of generators on-site and any other air-emitting equipment.³²

Land

As with other land uses, the environmental impact of a data center on its site largely depends on site characteristics, the land management practices used during construction, and what happens to the site at the end of the facility's lifespan.

²⁹ Mitigating the public health impacts of ai data centers. (2025, November 5). *Harvard Business Review*. <https://hbr.org/2025/11/mitigating-the-public-health-impacts-of-ai-data-centers>

³⁰ Tran, T. (2025, October 29). Flexible data centers and the grid: Lower costs, higher emissions? -. *CEEPR*. <https://ceepr.mit.edu/flexible-data-centers-and-the-grid-lower-costs-higher-emissions/>

³¹ *A primer for local governments: Understanding data centers*. (2025, April). National League of Cities. <https://www.nlc.org/wp-content/uploads/2025/04/Data-Centers-Fact-Sheet.pdf>

³² Insights from Liesl Clark, Director of Climate Action Engagement at the University of Michigan

Data centers may cause environmental harm if sited in areas with sensitive natural features, such as steep slopes, wetlands, floodplains, and unique habitats. Construction activities, such as grading or heavy equipment use, can lead to soil compaction, topsoil removal, and changes in natural water flow, which can hinder the site’s future plant growth and water-holding capacity.³³ Furthermore, if infrastructure is abandoned at the end of the project’s life, it may result in the creation of a brownfield or make future redevelopment challenging. Such impacts, however, are not unique to data center development, and there are already state and local policies in place to address these common concerns with other industrial developments.

Sometimes there is a concern about whether data centers will impact other land uses, for example, by converting agricultural land. Even if many data centers are constructed, at the national- or state-level, they are only expected to be a minuscule fraction of total land area.³⁴ At the local level, however, there could be noticeable impacts if multiple large data centers are built in close proximity, or if data center development is combined with land-use changes from other sectors (e.g., housing development, energy infrastructure).

Quality of Life

In addition to direct impacts on land, data centers can raise several quality-of-life concerns for neighboring properties. Drawing on lessons from data centers in both Loudoun County, Virginia’s “Data Center Alley,” and Linn County, Iowa, we have learned that many of these issues can be mitigated through attentive siting.

Many quality-of-life concerns arise from other similar types of industrial development. Construction activities, for example, often have exceptionally high levels of disruption for neighbors, with heavy truck traffic, construction-related noise, and dust.³⁵ When foundations are being constructed, the developers may need to dewater, raising concerns of temporary impacts on local water tables or soil erosion.³⁶ As with other construction activities, soil erosion permits issued by the county or municipality would be required for “any earth change activity that disturbs one or more acres of land or which is within 500 feet of a lake or stream.”³⁷ Similarly, when data centers or other industrial activities are developed on previously undeveloped sites,

³³ Augst, T., Fierke-Gmazel, H., Gould, M. C., Krol, M., Mills, S., Neumann, B., Reilly, M., & Stoetzer, O. (2025). *Planning and Zoning for Solar Energy Systems: A Guide for Michigan Local Governments* (Updated ed.). Michigan State University Extension, Michigan State University School of Planning, Design and Construction, and University of Michigan Center for EmPowering Communities.

³⁴ *Power Play: The Emerging Powered Land Opportunity* (n.d.) Hines. Retrieved January 5, 2026, <https://www.hines.com/powered-land/power-play-full-report>

³⁵ *Data Centers in Virginia*. (2024). [Report to the Governor and the General Assembly of Virginia]. Joint Legislative Audit and Review Commission. <https://jlarc.virginia.gov/pdfs/reports/Rpt598.pdf>

³⁶ *\$750m iowa data center’s unpermitted wells draw \$20k fine against dewatering contractor* | *engineering news-record*. (n.d.). Retrieved February 4, 2026, from <https://www.enr.com/articles/61162-750m-iowa-data-centers-unpermitted-wells-draw-20k-fine-against-dewatering-contractor>

³⁷ *Soil Erosion and Sedimentation Control Program (SESC)*. (n.d.). Retrieved February 6, 2026 from <https://www.michigan.gov/egle/about/organization/water-resources/soil-erosion/sesc-overview>

there is a visual change to the landscape. This is apparent not just during the day, but also at night when parking lot and security lighting may create a notable change to the nighttime character of the property.

Other impacts, though, are more unique to data centers. One of the primary complaints of existing data centers in Loudoun County, for example, is the associated noise.³⁸ Unlike many industrial facilities with variable operational patterns, data centers operate continuously, producing consistent noise that can be problematically disruptive for neighboring residents. In particular, Loudoun County found that inaudible low-frequency sounds were a nuisance to some data center neighbors.³⁹

³⁸ *Data Centers in Virginia*. (2024)

³⁹ *Data Centers in Virginia*. (2024).

Economic Impacts and Michigan Policies

The primary draw of data centers as a land use, at both the state and local levels, is the economic activity they generate. There are, however, concerns about whether data centers will increase electricity costs for consumers. Here, we outline the potential economic impacts of data centers and the policies in Michigan that shape them.

State-level Tax Abatements to Attract Industry

Data centers, like other industries, drive economic activity in the states and communities where they are located. This includes, notably, the direct economic impacts of the surge in construction activity and the initial investment in data center equipment. But it also includes indirect economic benefits to the suppliers of the equipment and other materials that go into data centers, as well as induced effects when data center workers spend their wages on goods and services.⁴⁰ While new economic activity in a state expands the tax base and can fund state and local government services, states often reduce certain taxes to attract industry. Today, 36 states have laws approving state tax incentives for new data center development.⁴¹

For the past decade, the state of Michigan has offered a state-level sales and use tax exemption for “qualified” data centers, with new legislation adopted in 2024 aimed primarily at attracting hyperscale or “enterprise” data centers. The policies governing the sales and use tax exemption are from three key pairs of laws:

- Effective December 23, 2015, **PA 251 and 252 of 2015** added Michigan Compiled Law (MCL) 205.54ee and MCL 205.94cc to Michigan’s General Sales Tax Act and Use Tax Act to create sales and use tax exemptions through December 31, 2035, for the sale, use, or consumption of data center equipment for qualified data centers. Under these Acts, a “qualified data center” is “facilities of one or more buildings located in Michigan that are owned or operated by an entity whose primary business is operating a data center for itself and colocated businesses; the entity must also receive 75% or more of its revenue from unaffiliated colocated businesses.” The Acts required the creation of 400 new data center-related jobs by January 1, 2022, and 1,000 by January 1, 2026. Data center-related jobs include “jobs created at qualified data centers, by colocated businesses, and by contractors making improvements to realty that constitute a qualified data center.”⁴²

⁴⁰*DataCenters-JoyceFoundation_2026-01-13_Final.pdf* | Powered by Box. (n.d.). Retrieved February 4, 2026, from <https://virginia.app.box.com/s/8qq2ggbdgwhf4atrorghtrcqsq64wd74>

⁴¹ *An overview of state data center-related tax incentives* | naiop | commercial real estate development association. (n.d.). Retrieved January 12, 2026, from

<https://www.naiop.org/research-and-publications/magazine/2024/Winter-2024-2025/development-ownership/an-overview-of-state-data-center-related-tax-incentives/>

⁴² *Notice Regarding Data Center Exemption*. (2016, March 14). State of Michigan Department of Treasury.

https://www.michigan.gov/treasury/-/media/Project/Websites/taxes/Notices/Data_center_exemption_notice.pdf?rev=e6f7d971f9bd4eccba3f208b3fe9d862&hash=DF4CBADC90F299058E7F2F3358A823A2

- Effective February 13, 2020, **PA 29 and 30 of 2020** amended MCL 205.54ee and MCL 205.94cc to establish reporting obligations for sales and use tax exemption claims regarding the sale or purchase of data center equipment.⁴³ Under these Acts, persons seeking exemptions in a particular calendar year must file Form 5726 by January 31 of the following year. Form 5726 requires information on the sales or purchase price of all exempt equipment, and any information needed by the Department of Treasury to calculate School Aid Fund revenue loss as a result of tax exemption claims.
- Effective April 2025, **PA 181 and 207 of 2024** amended MCL 205.54ee and MCL 205.94cc to extend the original tax exemption period from 2035 to 2050 (and to 2065 for data centers built on brownfields), and to establish a new “enterprise data center” facility type that must meet more stringent requirements compared to “qualified data centers” to receive tax exemptions.⁴⁴ In August 2025, the Michigan Strategic Fund (MSF) published formal implementation guidelines for the new amendments, including related to clean energy, water, and green building standards.⁴⁵ Since then, several organizations have submitted comments to the MSF Board requesting changes, particularly related to the interpretation of the clean energy requirements, asking for that standard to be applied from the outset of the data center’s operations rather than a future date.^{46, 47}

Table 1 summarizes key features of these incentives. While both incentive categories have job-creation requirements, their other requirements vary considerably. While smaller, non-hyperscale data centers may only meet the definition of a “qualified” data center, many of the current larger data center development proposals may meet both definitions. Notably, while “enterprise” data centers have many more requirements than “qualified” data centers, the certification process provides greater certainty for developers because the certificate is granted by MSF before they purchase the equipment. By contrast, the “qualified” data center incentive is provided by the retailer at the point of sale, but subject to a Treasury audit which introduces some risk that the exemptions may have been invalid. It is difficult to determine which of the two exemptions data center developers will seek.

⁴³ *Notice: Report for qualified data center exemptions - form 5726*. (n.d.). Retrieved from <https://www.michigan.gov/treasury/reference/taxpayer-notice-notice-report-for-qualified-data-center-exemptions-form-5726>

⁴⁴ *Enterprise Data Center Sales & Use Tax Exemption*. (2025, August 26). Michigan Economic Development Corporation. https://www.michiganbusiness.org/globalassets/documents/data-center/enterprise_data_center_information.pdf

⁴⁵ *Enterprise Data Center Sales & Use Tax Exemption*. (n.d.). Michigan Economic Development Corporation. <https://www.michiganbusiness.org/services/data-centerreitissuegulate/>

⁴⁶ *2025-11-13 letter to msf re data center tax exemption guidelines*. (n.d.). Retrieved from <https://www.documentcloud.org/documents/26285411-20.25-11-13-letter-to-msf-re-data-center-tax-exemption-guidelines/>

⁴⁷ Lyijynen, N. (2025, December 11). *Comments on data center generation* » *mieibc*. MIEIBC. <https://www.mieibc.org/comments-on-data-center-generation/>

Table 1. Summary of Sales and Use Tax Exemptions for Qualified and Enterprise Data Centers

	Qualified Data Center	Enterprise Data Center
Key definitional feature	Must receive 75% or more of revenue from colocated businesses that are not affiliates of the owner/operator	Must have a minimum of \$250M equipment investment
Job Requirements	400-1,000 aggregate statewide	30 per facility at 150% median prosperity wage
Clean Energy	No requirements	90% of usage (interpretation unclear, see below)
Green Building Standards	No requirements	One or more certified standards within 3 years
Water Source	No requirements	Municipal
Property Tax	No requirements	Cannot receive sunset, state, or local property tax benefits without local approval
Certification Requirements/Details	To claim the exemption when purchasing eligible data center equipment, the purchaser must provide a completed Michigan Sales and Use Tax Certificate of Exemption (Form 3372) to its seller. Must also file Form 5726	Must receive Michigan Strategic Fund certification before making purchases that are qualified for the exemption. No new certifications after December 31, 2029.
Revocation	No requirements	If certification is revoked, repayment of all related tax exemptions is required (if the revocation occurs 10 years after certification, 50% of the tax exemptions must be repaid).

Local Taxes and Employment

Job creation is a primary focus of state-level tax incentives. While state-level estimates of Michigan-specific job creation suggest there will be significant employment opportunities,⁴⁸ it is unclear how many direct or indirect data center jobs could be filled by residents of the host community. The vast majority of direct data center jobs are temporary construction positions. Once completed, there would be on-site operational and security positions, but estimates of how many range from dozens⁴⁹ to hundreds.

The more significant economic incentive for the host community would likely be the property taxes paid by the data center developer and operator. Because data center equipment is costly, data centers can significantly increase the property tax base. However, these increases may shift year-to-year.

The State Tax Commission lists data centers as a commercial use,⁵⁰ and the equipment within the data center would be taxed as commercial personal property. Most of the equipment, including servers and networking equipment, would likely be reported in Section F of the Personal Property Statement, which has a relatively fast depreciation.⁵¹ The 2026 multipliers for Section F assess true cash value at 60% of the installed cost of that equipment in year 1, but just 8% of the true cash value when that equipment is 7 years old. As older equipment in the data center is replaced with newer equipment, that new equipment would again start out at a 60% multiplier, but—as is the case with many classes of personal property—there may be years when the taxable value of the personal property is less than the previous year. If there is a large increase in the real property on the site (for example, from new buildings or significant site improvements), these swings in tax revenue may be more muted. Regardless, local governments may need to think strategically about how to utilize these new personal property tax revenues. Lessons might be gleaned from our recent guide on renewable energy revenue streams.⁵²

⁴⁸ Group, T. B. (n.d.). *Michigan data center jobs 2026: Openai stargate hiring update*. Retrieved February 4, 2026, from <https://thebirmgroup.com/michigan-data-center-jobs-2026-stargate-project-brings-thousands-of-opportunities-to-washtenaw-county/>; Gov. Whitmer submits public comment in support of stargate project, creating thousands of jobs, meeting strong environmental standards. (n.d.). Retrieved February 4, 2026, from <https://www.michigan.gov/whitmer/news/press-releases/2025/12/03/whitmer-submits-public-comment-in-support-of-stargate-project-creating-thousands-of-jobs>

⁴⁹ Chung, W. (2025, October 6). *Data center staffing levels: How many people does a facility need?* Broadstaff. <https://broadstaffglobal.com/data-center-staffing-levels-how-many-people-does-a-facility-need>

⁵⁰ Michigan State Tax Commission Property Classification MCL 211.34c. (2018) https://www.michigan.gov/treasury/-/media/Project/Websites/treasury/MISC_4/ClassificationRealProperty.pdf?rev=efb8cc4963494e1393d2675b4fab9092&hash=B7240AE93E5ABE808D0CDC7FD8AB38BE

⁵¹ 2026 Personal Property Statement (Form L-4175), https://www.michigan.gov/taxes/-/media/Project/Websites/taxes/Forms/Property-Tax/632/632_ty2026.pdf?rev=9bd5f68f4fda4d828cc4306ea6ba749b&hash=F72987A0B2EC0E2795E0C065E33E265D

⁵² Stoetzer, O., Krol, M., & Mills, S. (2025). *Strategies for Renewable Energy Revenue: A Guide for Michigan Local Governments*. University of Michigan Center for EmPowering Communities. <https://graham.umich.edu/project/renewable-energy-revenue>

Local governments do have discretion to offer data center property tax incentives, including via PA 198 agreements.⁵³ In certain situations, data centers may also be eligible for property tax exemptions via the Michigan Renaissance Zone Act, which are not approved at the local level but instead approved by the Michigan Strategic Fund.⁵⁴ In order to qualify for the “enterprise” data center sales and use tax exemption, however, any local property tax incentive must be approved by each local unit of government affected by the incentive. This is not a provision to qualify for the “qualified” data center sales and use tax exemption.

Impacts on Electricity Rates

Another common data center question is whether they will increase electricity costs, given the reports on electricity rate increases in some states like Virginia and Ohio that have undergone significant data center development.^{55, 56} There is also, however, nationwide data finding the opposite impact: that looking across all states, those that had increased electricity load typically saw decreases in electricity rates compared to the others.⁵⁷

There are multiple reasons that conflicting observations can be true at the same time. One key point is that it is challenging to assess what would have happened to electricity rates in the absence of data center load growth. Across the country, U.S. average retail electricity prices have been rising faster than inflation for residential consumers due to costs associated with grid maintenance and capacity expansion.⁵⁸ On the one hand, the load growth that data centers bring can help spread these fixed grid-related costs over more kilowatt-hours of electricity consumed, thereby reducing increases or the rates themselves for residential customers. On the other hand, if grid expansion is only needed to bring data center load online, data centers may be contributing to cost increases.

In Michigan, customer utility rates and ratemaking policy are set by the MPSC. By statute, Michigan abides by cost-of-service ratemaking, which means that utility rates assign “costs to customer classes based on usage patterns.”⁵⁹ Additionally, Michigan’s recent legislation on enterprise data center use and sales tax exemptions dictates that these data centers can only qualify if they use an electric service rate that prevents residential customers from subsidizing

⁵³ 1974 PA 198, MCL 207.551 to 207.572

⁵⁴ 1996 PA 376, MCL 125.2681 to 125.2696

⁵⁵As data centers for AI strain the power grid, bills rise for everyday customers. (n.d.). Washington Post.

<https://www.washingtonpost.com/business/2024/11/01/ai-data-centers-electricity-bills-google-amazon/>

⁵⁶ Saul, J. Nicoletti, L. Pogkas, D. Bass, D. and Malik, N. (2025, September 29) AI data centers are sending power bills soaring. Bloomberg Technology. <https://www.bloomberg.com/graphics/2025-ai-data-centers-electricity-prices/>

⁵⁷ Wisner, R., O’Shaughnessy, E, Barbose, G., Cappers, P., & Gorman, W. (2025) Factors influencing recent trends in retail electricity prices in the United States. The Electricity Journal.

<https://www.sciencedirect.com/science/article/pii/S1040619025000612#sec0020>

⁵⁸New Berkeley Lab report summarizes trends in retail electricity prices and price drivers. (2025, January 6). Energy Markets & Planning Berkeley Lab; Lawrence Berkeley National Laboratory.

<https://emp.lbl.gov/news/new-berkeley-lab-report-summarizes-trends-retail-electricity-prices-and-price-drivers>

⁵⁹Putnam, C. (n.d.). Cost of Service Ratemaking. Michigan Public Service Commission Department of Licensing and Regulatory Affairs. <https://pubs.naruc.org/pub.cfm?id=53889A44-2354-D714-5158-979D43EA47CF>

their facilities' electric costs.⁶⁰ Some of the Commission's recent decisions were designed to ensure that large-load customers, such as data centers, contribute significantly to the new and embedded costs associated with expanding Michigan's electric grid.

⁶⁰Enterprise Data Center Sales and Use Tax Exemption Guidelines. (2025).

Considerations for Local Government Policy-Making

The primary tool that local governments have to shape data center development is zoning. The Michigan Zoning Enabling Act (MZEA) sets out the minimum procedures that local governments must follow when making amendments.⁶¹ It, along with past state and federal court cases, also sets parameters for zoning authority. For example, the MZEA states that local zoning ordinances “shall not have the effect of totally prohibiting the establishment of a land use,” with only a few rare exceptions.⁶² While local governments have broad latitude to direct land uses to particular districts and set development standards or conditions on land uses, those standards and conditions must be reasonable and should be based on facts.⁶³

Furthermore, while there is much attention to the significant community benefits that a data center may be able to bring (e.g., financial contributions to park or open-space funds, fire departments, or other community priorities), there are limitations to making these agreements required as part of zoning approval, or enforcing them if the developer decides not to make-good on the agreement.⁶⁴ Agreements with developers for community benefits are more solidly enforceable if entered into in exchange for a public subsidy of the project, such as a local property tax abatement or some other publicly-funded improvement that will benefit the project.⁶⁵ As a result, we also briefly discuss property tax abatements below. Enforceable community benefits may also result from settling a lawsuit with the data center developer, but that path comes along with additional legal fees for the local government.⁶⁶

We offer the following considerations for local governments, but advise municipal officials to consult their local planner and municipal attorney before making any changes to their plans or zoning ordinances.

⁶¹ Michigan Zoning Enabling Act, MCL 125.3101 to 125.3702 (2006).

<https://www.legislature.mi.gov/documents/mcl/pdf/mcl-act-110-of-2006.pdf>

⁶² MCL § 125.3207

⁶³ MCL § 125.3504

⁶⁴ Review, T. R., & Elia, E. (2024, July 18). *Legislative exactions | the regulatory review*.

<https://www.theregreview.org/2024/07/18/elia-legislative-exactions/>

⁶⁵ Community Benefit Planning and Agreements: A Summary Overview. (2024). Michigan State University Center for Community and Economic Development.

https://ced.msu.edu/upload/community%20benefits/Community%20Benefits%20Brief_FinalVersion.pdf

⁶⁶ Consent Judgment, RD Michigan Property Owner I LLC v. Saline Township, No. 2025-001577-CZ (Washtenaw County Circuit Court Oct. 15, 2025).

<https://salinetownship.org/uploads/notices/SalineDataCenterConsentJudgmentFinalExecutionCopy492124804975v1.pdf>

#1: Consider whether your industrial zone is appropriate for data centers

The footprint of a data center and the state regulations that apply to this land use are not significantly different from those of other large industrial activities, so it may be logical for local governments to use their approach to industrial development as a starting point for data center policymaking. However, given limited greenfield industrial development in Michigan over the last three decades and the comparatively large footprint of data centers relative to other light industrial uses, we recognize that few Michigan communities have had robust conversations about their industrial zones. Now is the time for such a conversation.

The first step should be to review the spatial footprint of your industrial district(s) and the infrastructure capacity to serve them. Many industrial uses—not just data centers—require electricity infrastructure and access to water (even if only a well). Your community’s master plan (sometimes called a comprehensive plan) may have already considered where infrastructure is most suitable for industrial development, and so you should compare the spatial extent of your current industrial zoning with what is suggested in the Master Plan. This will help you determine whether it is appropriate to expand your industrial district.

In addition to dictating where industrial uses may be permitted in your community, zoning also lays out which processes developers must follow if they wish to develop their properties. It is very common to allow industrial development “by-right” in industrial zones - that is, with limited discretion by the planning commission or Township board / City Council, so long as the developer meets all of the standards in the zoning ordinance (see Consideration #2). Given the increased scale of industrial developments, it may be appropriate to treat larger industrial uses (e.g., those greater than 15,000 square feet, or whatever has been typical in your community) as special land uses, which affords the Planning Commission and board the opportunity to give proposals additional review and apply conditions to their approval.

#2: Include quality-of-life impacts in industrial zoning regulation

Historically, industrial uses have been concentrated near other industrial uses to minimize impacts on surrounding land uses from emissions, noise, and light pollution. Industrial districts were commonly buffered from residential districts either through public infrastructure, such as roads or waterways, or through less sensitive uses, such as office or commercial zones. But in communities that have seen limited industrial activity, or in those where existing industrial zones are not large enough to accommodate new industrial activity like data centers, there may not be ample space to buffer from other land uses. As a result, a community might consider updating the standards in industrial zones to ensure that any new industrial activity—data centers included—is protecting quality-of-life in neighboring districts. Your community’s most important quality-of-life

impacts to regulate may be informed by your comprehensive plan. Common considerations might include:

- Visual screening: While it is common to require vegetative screening in some districts, this requirement may not apply in industrial districts, particularly if your zoning ordinance did not anticipate that an industrial district would expand to abut residential areas.
- Sound: Some communities have community-wide sound standards that exist outside of zoning codes. These often apply to all noise emitters and may differentiate sound levels by time of day or day of the week (with a higher expectation of quiet on weekends). This approach sets a constant expectation for all land uses, not just industrial uses. If this is not practical, it is also possible to include sound standards for specific land uses or land-use classes. Standards that apply to large-scale renewable energy projects may be a useful starting point, as sound standards are common in the regulation of these facilities.⁶⁷
- Light: Another common concern about industrial activities, particularly in rural areas, is the light pollution they may cause, especially when they are developed in areas without streetlights. Some communities, including Emmet County,⁶⁸ have dark-sky ordinances that limit light pollution from all land uses. These same concepts can be applied specifically to industrial uses if that is the concern. Another option is to require dark-sky-compliant light fixtures for all proposed site plans.
- Decommissioning: Many industrial facilities have specialized designs with limited opportunities for reuse at the end of their life. From our brownfield experience, when a company is no longer in business or decommissioning the facility is too costly, these facilities are sometimes abandoned, creating an eyesore and public health hazard in the community and increasing redevelopment costs. As a result, it is increasingly common that industrial facilities enter into a decommissioning agreement that includes a financial guarantee that the facility, and any infrastructure that no longer has a useful purpose, will be removed at the end of its life. Again, it may be instructive to look to large-scale renewable energy projects for sample language.

These regulations would be in addition to the setbacks, height, lot-area coverage, and parking standards that are common in most zoning ordinances. While it is possible to use these more customary regulations to help buffer or minimize the impacts of industrial uses, there may be unintended consequences (e.g., industrial uses actually requiring more land to comply with large setback requirements) and so you may wish consider directly addressing the quality-of-life concern (e.g., sound, visual impact, light), rather than using setbacks as a proxy for those concerns.

⁶⁷ Krol, M., and Mills, S. (2024). Planning & Zoning for Battery Energy Storage Systems: A Guide for Michigan Local Governments. University of Michigan Center for EmPowering Communities. <https://graham.umich.edu/project/bess-guide>; Augst, T., Fierke-Gmazel, H., Gould, M. C., Krol, M., Mills, S., Neumann, B., Reilly, M., & Stoetzer, O. (2025). Planning and Zoning for Solar Energy Systems: A Guide for Michigan Local Governments (Updated ed.).

⁶⁸ Emmet County. (2023). *Emmet County zoning ordinance* (Ordinance No. 15-1, updated through April 28, 2023). https://www.emmetcounty.org/UserFiles/Servers/Server_3942756/File/Ordinances,%20Bylaws%20&%20Rules/Zoning%20Ordinance/Emmet-County-Zoning-Ordinance-4_28_2023.pdf

#3: Get commitments in writing

While it is ideal to use your zoning ordinance to set clear standards and thresholds that apply to data centers or industrial districts, you may be able to get some commitments or added specificity on particular impacts in writing. For example, if your community wants on-site generators to only run during power outages or for weekly testing, it may be beneficial to obtain that commitment in writing and specify permitted operating hours to minimize noise impacts on residents. If there are other commitments that matter to your community, such as delivery truck routes or transparency on water or energy usage, etc., consider getting them in writing as well.

The appropriate mechanism to secure written commitments for your community will depend on the specific agreement at hand and whether it is tied to zoning (for example, special land-use conditions or willingly offered terms by the developer as part of a conditional rezoning), a development agreement, or a discretionary property tax incentive. A municipal attorney can help identify the most appropriate mechanism, though guidance from the Michigan Municipal League is instructive for municipalities seeking community benefits commitments.⁶⁹

#4: Request a Property Tax Guarantee

A primary community-wide benefit of hosting a data center is the increase in the property tax base that accompanies the project. It is not uncommon, however, for the personal property tax tables to change over the life of an industrial project such as a data center, which can prompt disputes between the local government and the taxpayer over the property tax valuation. Having a written commitment that the developer will pay the property tax revenues they discuss during the permitting process may help reassure the community that these benefits will materialize.

This approach has proven successful in Dickinson County, which accepted a Property Tax Guarantee from the developers of the Groveland Mine Solar project.⁷⁰ In the guarantee, the developer committed to a floor for property tax payments to the local governments. If the tax tables change in a way that reduces their required payments, they will still pay the committed amount. If, however, the tax tables change in favor of the local government, the developer is still responsible for paying the higher taxes.

#5: Explore data center integration with other industrial infrastructure

While a data center developer likely views the heat generated by their facility as a waste stream, other industries see it as an input and invest in generating it. Thus, there may be local

⁶⁹ *Handbook for General Law Village Officials* (p. 71). (2024). Michigan Municipal League . <https://mml.org/wp-content/uploads/2024/07/CH-14-Planning-and-Zoning.pdf>

⁷⁰ Stotzer, O., Krol, M., & Mills, S. (2025). *Strategies for Renewable Energy Revenue: A Guide for Michigan Local Governments*.

opportunities for the data center to create a circular economy and put at least some of that heat to beneficial use. Opportunities include greenhouses, other industrial processes, and district heating systems, as is being proposed in Lansing.⁷¹ Your local government can encourage the use of this waste stream by proactively identifying existing land uses in your community that require heat and sharing those with potential data center developers.

Similarly, local governments can explore with the data center developer the possibility of co-locating data centers with electricity infrastructure, like solar or battery energy storage. While a data center is unlikely to be able to fully power itself with on-site energy generation due to a mismatch between the footprints of large-scale renewables and data center technologies, siting some infrastructure on-site at the data center can reduce the need to build power plants elsewhere. Furthermore, this electricity infrastructure might boost the local property tax base.

⁷¹Kaplan, L. V. (2025, November 5). *Proposed downtown data center focused on sustainability*. City Pulse. <https://www.lansingcitypulse.com/stories/proposed-downtown-data-center-focused-on-sustainability,164052>

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MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY



SUPPORTING COMMUNITY- CENTERED SOLAR DEVELOPMENT

**A GUIDE TO HOSTING COMMUNITY
CONVERSATIONS ABOUT LARGE-
SCALE SOLAR DEVELOPMENT**

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Introduction

*This guidebook is intended to help you—whether you're a community leader, planner, advocate, developer, or interested resident—thoughtfully and proactively **plan for large-scale solar (LSS) development** in your area by hosting a “community conversation.” We've aimed to describe a process and make recommendations that are as practical and applicable as possible.*

The time for such community conversations is now. The number, size, and deployment rate of LSS projects¹ have all increased significantly across the United States in recent years. This growth is driven largely by significant reductions in the cost of solar panels and installation, coupled with financial incentives for zero- and low-carbon electricity sources such as LSS.

As a result, more communities across the U.S. are likely to encounter solar development. The **Solar Energy Industries Association (SEIA)** estimates that 40 gigawatts (GW) of solar will be deployed annually over the next five years. For reference, the U.S. currently has just over 200 GW of solar installed.

One GW is equal to half the output of the Hoover Dam—enough to power 750,000 homes. Even if your community doesn't yet have a solar project in operation or under construction, it's possible that a developer has begun leasing land or conducting the environmental studies required to initiate a project. Communities that already host a solar project may also see proposals for additional projects.

Like all forms of power generation, solar energy has both positive and negative impacts at the local level. The rapid growth of LSS has heightened the urgency to understand these impacts. Furthermore, as with many land uses, individuals within a community may have different perceptions of how a new solar development could adversely impact or significantly improve their quality of life.

Now is an ideal time to hold community conversations about solar, creating a space for honest and open discussions about its associated tradeoffs. The specific purpose of these conversations may vary—from planning for solar to envisioning how LSS aligns with community goals or even just providing a forum for residents and large landowners to ask questions. Whatever the purpose, **research** supports the value of early and deliberate engagement around solar development.

You may have considered hosting a community meeting about solar but feel daunted by the time, money, and energy required to start the discussion. You might worry about the potential for conflict or disrespectful behavior. Perhaps you feel it would



New York community meeting. Photo by Jacob White (Michigan State University).

¹ We consider solar projects that produce at least one megawatt (MW_{dc}) of electricity, are ground-mounted, and require at least five acres of land as “large-scale solar” (LSS).

be easier to avoid the conversation and let things unfold on their own. If so, you're not alone. Many others, including professionals we've worked with on this project, share these concerns.

However, [research](#) suggests that these conversations may be especially important in areas where anxiety about solar is high. We found that simply providing a space for people to voice their concerns to someone actively listening can help alleviate their worries about solar development.

In this guidebook, we outline a process for structuring community conversations that ensures everyone in your community feels welcome to share their perspectives and questions respectfully. We encourage both proponents and opponents of solar and renewable energy to participate actively and make their voices heard. We also provide strategies to help maintain a respectful atmosphere and prevent disruptions.

The types of conversations communities wish to have about solar vary, but we describe a tested process that we believe works well in most cases. This process was iteratively developed, facilitated, and evaluated in five different pilot communities across five states by five University Extension offices as part of the [Community-Centered Solar Development \(CCSD\) project](#). The Extension professionals involved—Michigan State University (MSU), University of Wisconsin (UW), Cornell University (CU), University of Maryland (UMD), and Iowa State University (ISU)—all had experience in land use, energy siting, permitting, policy, and community engagement. Although each pilot conversation was tailored to the unique social, political, land-use, and economic context of its community and resulted in a distinct follow-up report, they all shared a common goal: **helping community members better understand, communicate about, influence, and align LSS development with their values, interests, and priorities.**

In this guide, we outline eight key steps to help you prepare, plan, and conduct a successful community conversation about solar:

- **Step 1: Assess the status of LSS in your community and policy environment**
- **Step 2: Define the purpose of your community conversation**
- **Step 3: Establish a local advisory group**
- **Step 4: Create an agenda for your community conversation**
- **Step 5: Select an appropriate date, venue, and duration for your conversation**
- **Step 6: Engage in outreach and market your conversation**
- **Step 7: Conduct your conversation**
- **Step 8: Reflect and report**

Along the way, we share examples, experiences, and lessons learned from our five Extension partners. While some of their meetings required significant investments of time, money, and labor, some did not, and your conversation doesn't have to either. Drawing on their experiences, we provide timelines for each step and offer practical tips for managing costs.

Finally, this guide includes a free [Resource Library](#) with slides, agendas, templates, and other tools to support your community conversations.



Photo by Joerg Gastmann (Pixabay).

Step 1: Assess the Status of LSS in Your Community and Policy Environment



2-3 months prior to hosting a conversation

Before planning a conversation—or even determining if one is appropriate—it’s crucial to assess the status of LSS development in your community, the local policy environment, and the predominant attitudes toward LSS. Previous experiences with LSS or other large infrastructure projects can influence how the conversation unfolds and its potential outcomes. Gathering this information, though time-consuming, is key to engaging residents and stakeholders effectively with an informed and relevant conversation.

To gather this information, we recommend using a variety of methods, such as consulting public datasets, reaching out to local officials, contacting local reporters or university Extension offices, and even collecting your own data. If projects exist or are planned, gauge the community’s response. Are there pro- or anti-development groups? How have local boards and commissions reacted in the past?

□ Collect information about existing energy infrastructure development.

Start by understanding what development has already occurred in your community. Are there existing LSS or other energy generation sources, such as wind projects or gas wells or plants, or other large infrastructure like concentrated animal feeding operations (CAFOs)? Consider any projects in development, permitted, or nearing permitting. Have solar or wind developers already approached residents?

The [U.S. Large-Scale Solar Photovoltaic Database \(USPVDB\)](#) and the [U.S. Wind Turbine Database \(USWTDB\)](#) can provide insights into nearby wind and LSS projects. The [U.S. Energy Information Administration Form-860 data](#) can also be useful for finding energy projects that will soon be online, and the grid operator in many regions might map where interconnection requests have been made, indicating that solar developers are considering LSS projects.

□ Gauge attitudes from news, social media, and government meeting minutes.

In addition to speaking with friends, neighbors, and local officials, you can learn a lot about people’s attitudes and concerns by reading local news articles, reviewing government meeting minutes and agendas, and browsing social media posts—there may also be organized groups communicating online.

Consider reaching out to community-based organizations or other representatives of marginalized groups for their perspectives. This may also be a good time to begin forming a local advisory group ([Step 3](#)). Recognize that some people or groups may face constraints in expressing their questions and concerns.

WHEN IS A GOOD TIME FOR A CONVERSATION ABOUT SOLAR?

The best time to discuss solar development is now! While we encourage proactive planning and conversations before LSS development has started, that’s not always possible. Many communities are already responding to operational LSS projects, those in permitting phases, or developer outreach. The first step in preparing for a conversation is identifying your community’s current stage of development.

□ Consider surveying or interviewing community members.

Depending on your resources, you might consider deploying more intensive methods to identify residents' key questions, concerns, and attitudes. This could involve a community survey, like the one used in our Michigan pilot (see the [Resource Library](#) for the survey instrument). Your state's planning association or a local college or university may help draft and distribute an online survey. Partnering with municipal or county governments can help with distribution, but be mindful that involving local officials might make the conversation appear politically motivated to some residents.

If feasible, consider also holding focus groups or one-on-one interviews, as done in our Wisconsin pilot (see the [Resource Library](#) for details). Engaging residents who live near potential development locations, such as those near transmission lines, substations, or large open or agricultural land, could provide valuable insights. A mixed-method approach is recommended, as each method provides unique insights and outcomes, but this requires additional resources. If resources are limited, it is still possible to hold an effective meeting without conducting surveys or interviews.

□ Identify and access publicly available datasets.

There may be existing datasets that provide relevant information on demographics and land use in your community. The [U.S. Census Bureau](#) offers a wealth of information, and the USDA provides [rural land use](#) details such as the number of acres in production and types of crops grown. [Headwaters Economics](#) provides easy-to-access socioeconomic data and community profiles. Additionally, local or county planning associations, planning commission members, and University Extension specialists may assist in identifying and analyzing datasets. Finally, the grid operator in many regions also maps where solar developers are considering LSS projects.²

Siting Policies and Permitting Authorities by State

Primary authority for large scale, land-based solar and wind project siting for U.S. States and Puerto Rico

Local State Both Contigent

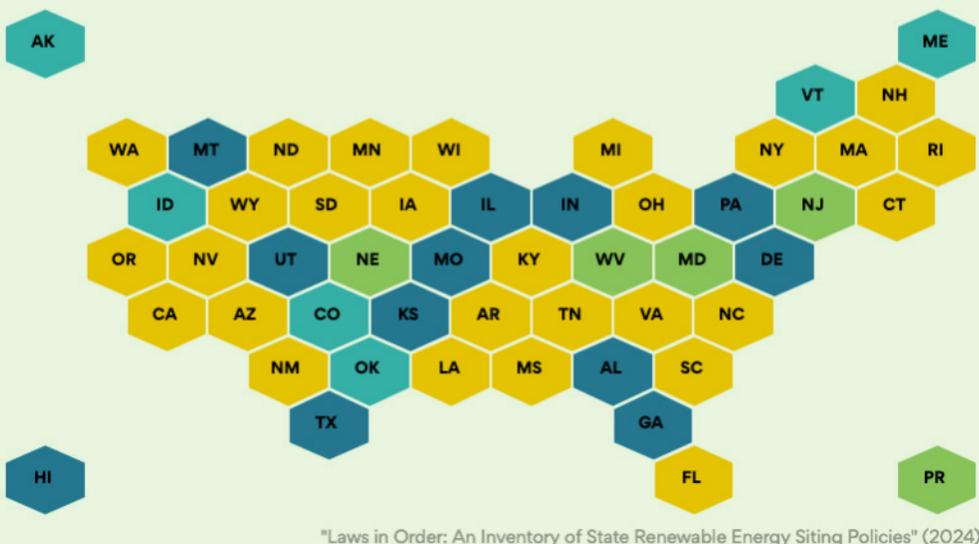


Figure 1. This figure shows the primary authority for LSS and large-scale wind project siting and permitting across the US. More information on these policies can be found in LBNL's [Laws in Order](#) report. Note that policies can differ within a single jurisdiction across different forms.

² [This map](#) may help you learn which regional grid operator serves your community. While the availability of data varies between operators, you can sometimes find information about the location of proposed energy projects in the operator's "interconnection queue."

□ Understand the policy environment and constraints.

Assessing the policy contexts and constraints within which LSS development may occur is essential. State and local contexts for LSS development vary. In some areas, municipalities and counties control LSS permitting, while in others, state boards hold this authority. Other regions have mixed or contingent control, where project size dictates the extent of local control over permitting and siting (see [Figure 1](#) for your state's primary authority for LSS siting). These laws define what local officials and residents can control—or influence—in the solar development process. While the outcomes of permitting processes can often be influenced, the process itself is less flexible. Understanding how any conversation you initiate may integrate with existing permitting, approval processes, or upcoming ordinance votes is vital. For example, by clarifying the balance of state and local control, facilitators of the pilot conversation in Wisconsin were able to guide a realistic, grounded, and pragmatic discussion about the potential local influence and tradeoffs of solar development.

ACKNOWLEDGE THAT POLICIES CHANGE

In 2023, Osceola County, Michigan, lacked county-wide zoning, though some townships had their own zoning. A new law, PA 233, set to take effect in November 2024, would change the siting and permitting authority for large-scale solar, wind, and battery energy storage systems. The impending law complicated the Osceola County pilot conversation, as the law's exact impact was unclear, making the drafting of ordinances seem challenging. In this shifting policy environment, the conversation could have felt unproductive.

Instead, the MSU Extension facilitator and guest speakers took the time to explain how PA 233 might impact the roles of residents and local officials. By being transparent and forthcoming about both the current state and potential changes, the facilitators not only built trust with the community but also turned what could have seemed like a futile conversation into a productive and meaningful exchange.



Ground-mounted LSS with pollinator garden. Photo by Rob Davis.

Step 2: Define the Purpose of Your Community Conversation



2-3 months prior to hosting a conversation

After assessing your community's LSS status and understanding the policy environment, the next step in planning a community conversation is to define its purpose. While our purpose was, "to help community members better understand, communicate, influence, and align LSS development with their values, interests, and priorities," yours may differ. Whatever it is, be sure to put it in writing.

Are you looking to inform a planning process, answer questions from local officials or developers, provide a forum for residents to share perspectives, or offer information to landowners about leasing opportunities? Perhaps residents want an update on an existing project's location or status. Draft a clear statement outlining what you hope to achieve.

Your purpose will also depend on the timing of solar development and your community's policy and permitting processes. Conversations early in a project's life cycle may focus on cost, size, or environmental impact, while those in communities with existing projects may center on resident experiences and future improvements.

Articulate desired outcomes and deliverables.

In addition to articulating the purpose of your conversation, consider what outcomes and deliverables you want to generate as a result. Will your conversation generate a list of questions or recommendations for a developer or planning board? Will it articulate a broader vision for how LSS development aligns, or conflicts, with your community's goals? Remember, some outcomes may require multiple meetings and significant effort, like building relationships and maintaining communication—so be realistic about your resources and time. Regardless, clarifying the outcomes and deliverables now will help you articulate to participants why they are needed and what they can expect after the meetings ([Step 8](#)).

Anticipate potential questions.

Also consider the types of questions community members are asking ([Step 1](#)). This will help you plan the topics to cover in your meeting(s), which might include:

- What do LSS projects look like?
- How does LSS compare to other forms of solar energy, such as cost and intermittency?
- How are LSS projects sited and permitted?
- What type of land is best suited for LSS?
- How are LSS projects built, operated, and eventually decommissioned?
- How safe are LSS and large-scale battery storage and what emergency procedures are in place?
- What are the positive and negative social, environmental, and economic impacts of LSS?
- Taking into account the policy environment ([Step 1](#)), how can community members influence the design, approval process, and economic benefits of a proposed project?

□ Stay realistic and focused.

With your purpose and topics in mind, you might feel apprehensive about leading a discussion on LSS development, especially if you lack technical expertise. This is normal! We also needed assistance in our pilot projects and couldn't answer all questions in the moment—nor can we answer them all now, as many are context-specific.³

Consider whether your conversation will focus on local issues and how residents can influence development within existing policy constraints, or if it will extend to broader discussions on the role and impacts of solar energy at the state or national level. Be cautious about the latter; in our experience, broader conversations often prove challenging to navigate and tend not to foster meaningful dialogue. Either way, you'll likely need help understanding and communicating technical information about solar, as well as legal and land-use requirements. See below for guidance on whom to contact for assistance.

□ Consider your target audience and keep the meetings public.

Determine your target audience, as this will guide how you set the agenda ([Step 3](#)), and conduct outreach and marketing ([Step 6](#)). In our pilot programs, we aimed for inclusivity, inviting all community members in the county. You may want a narrower focus, such as residents of a specific area or those with strong opinions—whether supportive or critical—about solar energy.

Regardless of your target audience, we strongly recommend keeping the meetings public.⁴ Although a closed-door meeting might appeal to residents who feel uncomfortable speaking publicly, [research](#) shows that inclusivity and transparency are critical to perceptions of fairness. Our public meetings, though geared toward community members, also provided opportunities for local officials, utility personnel, and even solar developers to join and contribute to the discussion.

MAPPING AND MODELING CAN BE COMPLICATED—PROCEED WITH CAUTION!

Participatory mapping activities in our pilot conversations required significant time and preparation. Without careful planning, these activities risked confusing participants. While mapping can be a valuable tool in LSS development, it is challenging to integrate effectively into community conversations, particularly when the goal is to identify potential solar siting locations. The process is inherently complex and often requires specialized expertise, including input from developers.

In Michigan, the pilot team used mapping to capture community preferences for LSS siting, focusing on identifying marginal lands and open areas suitable for solar development. However, the mapping model narrowed the scope to specific properties and small tracts. Many participants felt uncomfortable marking exact locations during the conversation.

With additional time and resources, the team instead could have printed a map that included transmission lines and substations, allowing participants to use highlighters and sticky notes to share their insights more comfortably.

³ We recommend recording people's questions and responding after the meeting concludes. This provides time for you to think, research, and reach out to others for help.

⁴ It may not be possible for all of your initial planning meetings, especially those with a local advisory board ([Step 3](#)), to be public. For convenience, it might make more sense to hold those meetings privately.

□ Briefly outline your resources and constraints.

Before diving deeper, take a quick inventory of available resources and those you may need to host a successful conversation. Are you managing the process alone or do you have the help of a team with various skills and expertise? Can you run the meeting yourself or will you need to hire a trained facilitator? What financial resources do you have? Will you fund the process yourself or will you need to raise funds?⁵

Do you have a venue in mind or will you need to find or rent one? How many meetings will you need? Do you require facilitators for small-group discussions? How much time do you have? Do you need to coordinate with other community events or a pending LSS proposal? We'll discuss these questions in more detail later in the guide, but a quick sketch of your resources and constraints now will help refine your purpose.

MANAGING COSTS

The financial cost of conducting community conversations can vary significantly. According to our pilot partners, a simple, straightforward conversation can cost as little as \$100-\$200, especially if you and your dedicated organizers are willing to volunteer your time, use a local venue for free, and handle marketing, without needing to pay for guest speakers or a facilitator. In this case, your only expenses would be for food—which could be cookies and lemonade—and some miscellaneous supplies and printing.

Costs rise as you expand the scope of the conversation. At the high end, you could budget between \$3,000 and \$5,000. This assumes holding the event at a venue like the county fairgrounds or a hotel (with room rentals ranging from \$100 to \$350), providing a catered or buffet dinner (\$400-\$500 per event), and hiring an experienced facilitator (\$1,000-\$3,000 per meeting). If you need to cover travel and honoraria for guest speakers, expect to budget an additional \$500 to \$1,000 per speaker, with higher costs if speakers need to be flown in.⁶

Personnel costs, which include paying people to plan, organize, and run the conversations, are typically the largest expense. If you need to pay individuals to build and meet with a local advisory group, assess the status of LSS and other developments, create agendas, market the event (through flyers and digital advertising), analyze data from surveys, and write reports or develop a website, these tasks require significant time and resources. Our partners suggested that a hired planning firm could charge between \$10,000 and \$20,000 to run a series of meetings.

Photo by Rahael Cruz (Unsplash).

⁵ Don't worry too much about financial resources at this stage. Our pilot partners suggest that a conversation can be held for minimum expense with some creativity.

⁶ One consideration is whether to offer a financial incentive to attendees, such as compensating them for their participation. We have not included a cost estimate, as we have reservations about this approach ([Step 6](#)).

Step 3: Establish a Local Advisory Group



3 months prior to hosting a conversation

Forming a local advisory group is essential to assess the status of LSS development and understand your community's policy environment. The advisory group can also help identify topics and process elements for your meeting, contribute relevant skills or expertise, connect you with additional stakeholders, and ultimately help publicize your meeting. A strong group will also be invaluable for managing local project logistics (such as venues, food, and meeting locations) and navigating local relationships and politics. We recommend including individuals from diverse stakeholder groups, such as residents and historically marginalized groups like renters, to ensure that your conversation includes a wide range of perspectives.

Include at least one local elected or appointed official in your advisory group.

Including at least one local elected or appointed official, such as a member of the planning commission or zoning board, is highly recommended. An official known for being open-minded and committed to listening to community members can add legitimacy to your conversation and enhance its impact. Ideally, select an official who has experience with wind or solar permitting processes. Your local government website should provide the contact information you need to reach out.

In addition to local officials, consider including stakeholders from the following groups:

- Residents, including both long-term and short-term renters
- Land-use planners, such as those from state, regional, or county planning commissions or the [American Planning Association](#)
- Local or state Farm Bureau chapter representatives
- Utility personnel
- Community foundation representatives
- Historic preservationists
- Business leaders or local Chamber of Commerce representatives
- Wildlife conservation and hunting groups
- Farmers, both landowners and renters
- Large landowners

ADVISORY GROUP ORGANIZATION AND STAKEHOLDER MAPPING

An effective advisory group should include four to seven members. Start by creating a spreadsheet to track potential members, noting their roles, interests, and contact details. Use this tool to note people interested in public meetings or who could serve as resources (e.g., utilities), even if they can't join the group.

Regularly ask, "Who isn't here that should be?" to ensure diverse perspectives and fill gaps in expertise.

To identify key community members, consider a [Stakeholder Mapping Exercise](#) (or Audience and Stakeholder Analysis). This method uses a simple matrix to plot impact/interest against influence, helping prioritize participants with significant stakes, even if their influence is minimal.

- Soil Conservation Service or **Natural Resources Conservation Service** (NRCS) personnel
- University Extension agents or faculty members

These groups represent key constituencies or provide connections to them. It's essential to clarify whether individuals are participating in an official capacity, representing their group, or more informally, offering a unique or underrepresented perspective or technical expertise. Some of these groups may also assist by facilitating or presenting at your public meetings.

□ Hire or enlist an experienced facilitator.

In addition to including key stakeholder groups, you'll want to involve someone experienced in facilitating group deliberative processes. If you don't have facilitation experience yourself, consider hiring a skilled facilitator or finding a local facilitator willing to volunteer. An experienced facilitator can help align the conversation with your goals and community planning objectives.

While the facilitator doesn't need to be a member of your advisory group, involving them early will help identify specific process points, such as how to handle particular issues thoughtfully. Note that not all facilitators are adept at planning extended deliberative processes; some are better at running meetings, while others excel at both.

STYLE MATTERS

If you plan to hire a facilitator, research their approach and philosophy. Ideally, select someone with experience in helping groups identify and achieve common goals. Facilitators specializing in dispute or conflict resolution may not be the best fit for this type of gathering. Mediators experienced in multi-party public issues, however, should be well-suited to handle controversy and debate effectively.

□ Enlist an individual with administrative support skills.

To ensure that both advisory group meetings and community conversations run smoothly, you'll want to engage someone with administrative experience. This person can record meeting minutes, enter qualitative data, create social media posts, design flyers, communicate with local contacts, and manage meeting logistics, including tracking comments and questions from participants. Having administrative support will be critical to the success of your event.



Lapeer Solar Park. Photo by Bradley Neumann (Michigan State University).

□ Carefully consider the right role for developers and utility representatives at your event.

A key challenge in our pilot conversations was determining how to include developers and utility representatives. While the meetings are open to the public, formally including developers as experts, speakers, or advisory group members can create tensions. If they do attend, it's important for the facilitator or a trusted official to acknowledge their presence and clarify that they are available to answer technical questions upon request. Facilitators should similarly acknowledge participants (such as developers or land use planners) who are not affiliated with the project planning but can provide technical knowledge.

While developers and utilities offer valuable expertise and are essential to community-centered solar development, our research suggests that they are often not trusted by residents. Their formal inclusion can risk distorting the perception of the conversation's purpose. Residents may worry that the meeting is being used to promote large-scale solar projects or "make life easier" for developers. As a result, it's important to be cautious about how their involvement affects trust and dynamics.

DEVELOPER PARTICIPATION IN WISCONSIN

In Wisconsin, during a community conversation coinciding with an LSS development, the developer attended as a technical resource. They agreed to answer project questions privately after the meeting. Extension staff clarified that the meeting's purpose was to learn about community priorities to help shape future projects, not to discuss the current development. That approach worked well.

That said, developers are not all the same. Some work to build positive relationships with host communities. Their involvement can be beneficial and excluding them entirely can increase the risk of conflict later. Without being part of the conversation, developers may miss key concerns and misunderstand local values, which can lead to tensions down the road.

Before deciding on developer participation, it's important to discuss their role with your advisory group. Balancing transparency and community concerns can help ensure a more collaborative, effective process.



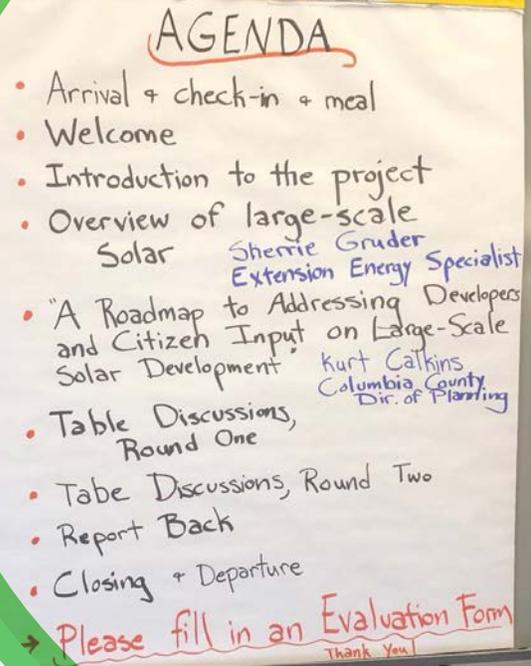
Photo by Fatimah Bolhassan (University of Michigan).

Step 4: Create an Agenda for Your Community Conversation

1.5 months prior to hosting a conversation

A successful community conversation, like any well-run meeting, requires a detailed agenda. We used a similar agenda in all five of our pilot conversations, and an example is included in the [Resource Library](#). Rather than specify exact processes and timing here, we outline key topics, insights, and suggestions to consider as you build your own agenda.

Engaging with participants is far more effective than speaking at them. Prioritize discussion wherever possible, and tailor the structure of your meetings accordingly. The purpose of your meeting should guide the length and number of presentations, as well as the time allotted for small-group discussions and Q&A sessions. A common approach, and the one taken in each pilot community, is to begin with presentations to spark ideas and provide consistent information to all attendees, followed by small group roundtable discussions.

- 
- Arrival + check-in + meal
 - Welcome
 - Introduction to the project
 - Overview of large-scale Solar
Sherrie Gruder
Extension Energy Specialist
 - "A Roadmap to Addressing Developers and Citizen Input on Large-Scale Solar Development"
Kurt Calhins
Columbia County
Dir. of Planning
 - Table Discussions, Round One
 - Table Discussions, Round Two
 - Report Back
 - Closing + Departure
 - Please fill in an Evaluation Form
Thank You!

Use small groups and roundtables to increase inclusivity.

While larger full-room discussions may seem expedient, small-group formats—such as roundtables—can enhance topic diversity, participant engagement, discussion depth, and control over dominant voices. Ideally (resources permitting), assign one staff member, trained facilitator, intern, or volunteer to record and report the discussion at each table or provide a summary afterward. Avoid asking participants to take on these tasks, as it may place them in uncomfortable positions and reinforce potentially harmful power dynamics. Be mindful that comprehensive summaries from each group can become lengthy as attendance grows, so have a plan for managing this.

Select relevant topics for presentations and roundtable discussions.

Assuming you will have some combination of presentations and/or small group discussions, picking topics is important. The topics you choose should align with the purpose of your conversation ([Step 2](#)) and the local context ([Step 1](#)). Rather than prescribing specific topics, we recommend tailoring your selections based on your understanding of local solar energy development, relevant policies, input from your advisory group and stakeholders, surveys or focus groups you conduct, and existing community priorities or planning efforts.

The posted agenda at the community conversation. Photo by Jacob While (Michigan State University).

Below are examples of presentation and roundtable discussion topics that proved relevant in our pilot communities. Multiple topics can often be combined into a single presentation. The [LBNL Community-Centered Solar Development \(CCSD\)](#) website provides several helpful resources—including this guidebook—that could be used to develop or inform topics.

Potential Presentation Topics:

- **Solar resource potential** (e.g., nationally or regionally)
- **Existing solar installations** (e.g., nationally or regionally)
- **Trends in solar development** (e.g., cost comparisons, deployment rates, policy decisions, tax credits, project size, “fair-share” arguments)
- **Types and scales of solar** (e.g., rooftop, ground-mounted, community, brownfield, utility-scale, agrivoltaics)
- **Solar and farmland preservation** (e.g., food vs. fuel debate, agricultural economy, wildlife habitat, alternative development, farm livelihood, rural aesthetics)
- **Zoning and landowner decisions** (e.g. local vs. state permitting and policy, land leasing considerations)

Potential Roundtable Discussion Topics:

- **Residents’ concerns and tradeoffs associated with LSS projects** (e.g., land use, agricultural impacts, viewshed impacts, environmental and wildlife impacts)
- **Participants’ visions for solar’s role in the community**, (e.g., alignment with long term goals)
- **Community influence over LSS project characteristics** (e.g., screening, setbacks, decommissioning)
- **Negotiation tactics for the community and individuals with developers**
- **Community input to state permitting boards** (e.g., LSS impacts relative to the goals of the comprehensive plan)
- **Community revenue use** (e.g., priority uses for annual revenue generated from LSS projects)



□ Focus on local community.

Although mentioning national trends provides local context, focusing on broad-level solar policy can distract from achievable goals. Instead, we suggest focusing your event on local solar development, which the pilots found to be more effective and relatable. Discussing county or township projects can keep the conversation grounded and actionable. While broader policy questions may arise and should be documented, focusing on what’s achievable given the time resources available makes for a more productive discussion.

Michigan community conversation. Photo by Jacob White (Michigan State University).

□ Clarify how people can (and cannot) influence change.

Attendees want to know how they can make an impact. While local governments do not control solar land use regulations in all states, even where approval is state-level, there may still be opportunities for public input. Our work and a [2024 survey of renewable energy developers](#) suggest several areas where residents may influence projects, including vegetative screening, excluding properties, setbacks, compensation, decommissioning, community benefits agreements, and revenue use. It's important to clarify these avenues during your conversation.

□ Select credible guest speakers.

Selecting credible, knowledgeable speakers is essential. According to our [National LSS Neighbor Survey](#), trusted sources include local residents living near energy projects, non-profits, community organizations, and university faculty, staff, and Extension representatives. In contrast, energy developers and state and federal government officials tend to be viewed with more skepticism. Ensure that speakers are prepared to deliver accurate, balanced information and are comfortable acknowledging when they don't have an answer. Extension staff, with their expertise in science communication, can be especially valuable.

SPEAKER-AUDIENCE RAPPORT

Dr. Sarah Mills and Kurt Calkins, guest speakers at two of our pilot projects, both provided excellent examples of how to introduce their work, history, and unique perspectives. Dr. Mills began by establishing her expertise and explaining her personal history. While not a local *per se*, she grew up on a farm in a similar community and focused her dissertation research on farmland preservation. She also set the tone for the presentation early by saying, "If you're pro-solar, I'm going to say some things that upset you. If you're against solar, I'm going to say some things that upset you. By the end of the night you'll likely all be upset at me. But don't worry, I have thick skin." We noted a collective sigh of relief among the crowd following this statement. [You can watch Dr. Mills introduce her presentation here](#). Her presentation materials are in the [Resource Library](#).

At the beginning of his presentation in Wisconsin, Kurt Caulkins provided his credentials for speaking about LSS. Not only did he highlight his professional experience (32 years in local planning in Wisconsin), but he also made clear his ties to the local community and rural area. He spoke about how he spends his free time fishing with his wife in their Wisconsin cabin.

These introductions are crucial for building rapport with the audience. However, it's important to remember that such connections may resonate more with certain groups (e.g., farmers or fishers). Therefore, the content of speakers' presentations must remain objective and evidence-based. Speakers should focus on presenting the strengths and weaknesses of the evidence, regardless of their position.



Wisconsin community conversation. Photo by Jacob White (Michigan State University).

□ **Prepare for “Frequently Asked Questions”**

Over time, we’ve gathered a list of frequently asked questions that you might encounter, provided in the [Resource Library](#). Review these with your advisory group to determine which ones to address proactively. For others, be prepared to respond during the Q&A, but be transparent if you can’t answer every question on the spot. Be sure that participants know you are recording all of the questions asked and commit to following up post-meeting on unanswered questions.

□ **Use “it depends” for complex answers.**

Many questions have nuanced answers, depending on factors like location, policy, and project design. It is often appropriate to say “it depends” and provide a range of outcomes or examples. Being honest about uncertainties helps build credibility and avoids perceptions of bias.

Many times, these questions arise not from idle curiosity but because the asker has a preconceived notion of the answer. It can be helpful to present worst- and best-case scenarios. For example, to answer a question about local job creation, you could reference the many jobs created during the construction phase of the project while acknowledging that operational projects produce very few long-term jobs in the host community.

□ **Ask for written or submitted questions instead of hosting an open-mic night.**

In our pilot conversations, it became clear that providing attendees with the chance to ask questions is essential. However, open-mic sessions often led to comments rather than questions. Instead, we found it more effective to have attendees submit questions in writing—such as on 3x5 cards collected by a staff member or facilitator. Reading and recording these questions (and comments) aloud still allows for gauging what matters most to community members. If time does not permit answering all questions during the session, having them in writing enables follow-up responses afterward. This can be done by providing written replies or recommending organizations or individuals better suited to respond.

□ **Establish expectations and ground rules.**

Begin by setting ground rules for respectful discussion, with input from your advisory group on enforcement. This helps maintain a productive atmosphere and ensures that all participants feel comfortable engaging.

In our pilots, we were clear that our conversations were not a forum to debate whether solar power is appropriate. Instead, our conversations focused on:

- How to best align development with your community's goals
- Residents’ concerns and questions and how we can best address them
- Opportunities for residents to provide input or influence how solar projects are developed in the community
- Financial and/or other community benefits residents would like to see from local solar projects

Photo by American Public Power Association (Unsplash).



Should disruptions arise, facilitators can remind individuals of the established ground rules. Continued disruption may result in those individuals being asked to leave. For further guidance on creating ground rules that foster respectful, open, and constructive dialogue, refer to the University of Minnesota Extension's [suggestions for working agreements for productive discussions](#).

□ **Have a local leader set the stage.**

Conversations about solar energy can become heated and sometimes veer off track in ways you didn't intend. [Our work](#) shows that one effective way to ensure a productive meeting is to enlist a trusted local leader—ideally someone charismatic—to set the tone and help keep residents respectful and focused. These individuals could include civic leaders, former local officials, business leaders, or Extension agents. While they need not be a facilitator, they should understand the goals of the meeting, commit to impartial language, and ideally be part of the advisory group. As noted in [Step 3](#), it is important to have an experienced facilitator run the meeting, but the local leader can play a crucial supporting role.

□ **Conduct an exit survey.**

An exit survey provides valuable feedback for improving future community conversations and offers participants a chance to share lingering questions, comments, requests, or compliments. It also helps gather additional information for summarizing and reporting back to respondents. Both Google Forms and paper surveys are effective formats, though the medium can influence response rates—digital surveys may reach a broader audience, while paper surveys may encourage participation from those less comfortable with technology.

The exit survey from our Kossuth County, Iowa pilot is available in the [Resource Library](#).



A solar array outside the community conversation in Wisconsin. Photo by Jacob White (Michigan State University).

Step 5: Select an Appropriate Date, Venue, and Duration for Your Conversation



1.5 months prior to hosting a conversation

With a grasp of LSS development in your community, a local advisory group established, and an agenda created, it's time to consider the timing, location, and length of your conversation. Below are guidelines for selecting dates and booking a venue effectively.

☐ Choose days, times, and dates when participants are likely to be available.

Across our pilots and **most community meetings**, older residents, often retired, comprise a significant portion of attendees. To foster greater diversity of perspectives, it's important to consider individuals who may face attendance constraints, such as working parents or those without reliable transportation. Weeknights and Saturday mornings are generally preferable to events scheduled during work hours. Avoid scheduling on Sundays, holidays, or during other major community events, government meetings, and sporting events. Additionally, be mindful of the agricultural calendar—avoid scheduling during crop planting and harvest seasons, especially if you want to engage local farmers.

Consult with your advisory group to identify potential scheduling conflicts and determine the best days and times for community members. Ensure there is sufficient lead time (a few weeks to a few months) for advertising, allowing residents ample time to plan and make arrangements, such as childcare. Better yet, consider offering compensation for childcare or providing it on-site to further facilitate participation.

Consider the duration of your conversation, as well. Pilot conversations ranged from 90 minutes to three hours (with breaks). If the goal is to share information and host a Q&A on LSS, a shorter meeting may suffice. For more in-depth engagement—such as informing a permitting process, discussing community benefit plans, or conducting a visioning process—you may need a longer or multi-meeting format.

☐ Select a venue that is accessible for participants.

Choosing the best venue for community conversations can be more complex than expected. You might select a location close to areas most impacted by LSS development, which are often the more rural parts of a county. However, a venue closer to population centers may attract more attendees. Recognize that attendees may vary by location, with some groups more supportive or opposed to solar than others. Hosting sessions in multiple locations can help address these differences.

Public facilities known to county residents are generally preferable to private ones. Avoid spaces co-located with police departments or jails. Schools or educational facilities are convenient for parents, often providing space for children to play—but ensure there are adult-sized tables and chairs available. Also, verify that the venue can accommodate your program needs, such as a stage or podium for presenters and a projector. All of our pilot meetings involved small-group discussions around round tables seating 6-8 people, but many venues only have rectangular tables. Ensure there's enough room for people to move about, especially those with mobility needs.

Acoustics are another important consideration, both for audio amplification during presentations and arranging seating to minimize interference during small-group discussions. If possible, the venue should have a registration area outside the main meeting room to reduce disruptions, as well as space for youth activities.

Make sure visual aids are clearly visible. Portable projectors and screens can be hard to see from a distance or due to room lighting, so test visibility from various angles and, if needed, provide printed materials like slide decks, especially for participants with visual impairments. Ensure the venue is accessible in other ways—check for appropriate lighting for evening meetings, wheelchair ramps, and accessible restrooms.

If virtual meetings are common in your community, it's fine to offer this option. However, from our experience, in-person meetings are much more productive in achieving the goals of community conversations. Further, if you're struggling to get subject matter experts to attend in person, you can certainly consider Zooming them in—this is perfectly acceptable, but it should be used as a supplement rather than a replacement for face-to-face interaction.

□ Provide food.

Regardless of whether the meeting occurs in the evening or on a weekend morning, it is a good idea to make sure that the venue you choose allows for food and beverages, and that they will accept local caterers. Serving meals increases the cost of meetings, but also ensures that those participants who lack the time or resources to eat before your conversation will be active and engaged. If you can't afford to provide full meals, consider providing coffee, soft drinks, and snacks. Finally, be aware of people's different dietary preferences or restrictions; provide vegan and vegetarian options. If you're pre-registering guests, ask about any dietary restrictions.



Food options at the community conversations in Iowa (left) and Maryland (right). Photos by Jacob White (Michigan State University).

Step 6: Engage in Outreach and Market Your Conversation



At least 1 month prior to hosting a conversation

With the date and venue selected for your community conversation, it's time to invite participants.

Publicize the event widely to maximize diverse perspectives and experiences.

These community conversations are intended to be open, inclusive, public events, so aim to reach out to as many people as possible. [Research shows](#) that residents within a one-mile perimeter of a solar project tend to be more engaged and concerned about its impacts. However, renewable energy development affects a much wider range of community members than just nearby residents. Consider, for instance, the community surrounding a coal plant that may close due to a new solar project. They might also want to be involved in the conversation. Similar to the advisory group, reach out to a range of stakeholders, including local officials, business leaders, the agricultural community (e.g., farmers, landowners, farm suppliers), and historically underrepresented groups, such as renters and people of color.⁷ Use the stakeholder mapping exercise described in [Step 3](#) to identify others to invite.

Digital advertising, including flyers and social media posts, can work well, but not all residents, especially in rural areas, have reliable internet access. Additional options include postcard announcements, door-knocking, local media, and press releases. Advertising on local radio and in newspapers or making announcements at public meetings can also help. For instance, one pilot partner in Iowa found that advertising on two AM radio stations in the county boosted attendance.

Engage with local schoolteachers (they often know everyone), school administrators, and community and farm organizations. Word-of-mouth works well, so ensure that well-connected community members know about your meeting. Local advisory group members, officials, or county Extension agents are great resources for where and how to advertise. Finally, keep in mind that direct mailings may not reach renters, absentee landlords, and tenant farmers.

Inform those most interested and affected.

Ask the local advisory group to identify community segments who are either interested in leasing land to solar developers or likely to be affected by development. Seek communication channels to reach those groups. If prior research (e.g., interviews, focus groups, surveys) on community perceptions of solar has been conducted, invite participants from those activities to attend. Be sure to reach out to residents near any existing and proposed solar project sites.

⁷ Be aware that successfully including historically marginalized and underrepresented groups requires a significant commitment of resources and time, sometimes spent building or repairing relationships.

□ Organize a table of target populations, outreach channels, and considerations.

Building a table to track outreach activities can be helpful. This table could identify target populations (e.g., neighbors near solar development, environmental and energy groups, farmers), potential outreach channels, and key considerations for each group. The table below serves as a starting point, but your advisory group and stakeholder mapping from [Step 3](#) can further customize it to fit your community. Start this early to ensure comprehensive outreach.

Target population	Channels with greatest reach	Considerations
Nearby neighbors	<ul style="list-style-type: none"> Postcard announcement 	<ul style="list-style-type: none"> Addresses can be found in tax rolls Consider absentee landlords—will you mail to the landowner tax address or to the physical address?
Residents in general area	<ul style="list-style-type: none"> Extension websites Local media (press and radio) Social media posts with website links for more information Flyers posted in local businesses Community organizations Announcements at public meetings 	<ul style="list-style-type: none"> These methods may not reach specific, hard-to-reach populations While advertising through social media can be inexpensive, it excludes those who lack internet access
High school and college students	<ul style="list-style-type: none"> Social media posts with website links for more information Environmental or farming organizations High school and college club leaders 	<ul style="list-style-type: none"> These students have a stake in the future but may have scheduling and transportation difficulties that get in the way of attending events
Environmental and energy groups	<ul style="list-style-type: none"> Champions from within the organization Organization listservs 	<ul style="list-style-type: none"> While not always hyper-local, these organizational representatives can provide a more global perspective
Farmers and agricultural service businesses	<ul style="list-style-type: none"> Agriculture organizations Farm radio Trusted vendors or consultants 	<ul style="list-style-type: none"> Printed flyers at ag supply stores and coffee shops or gas stations can be useful
Agricultural workers	<ul style="list-style-type: none"> Trusted members of labor community 	<ul style="list-style-type: none"> Outreach materials may need to be developed in a non-English language (Spanish, Hmong)
Extension offices	<ul style="list-style-type: none"> University and Extension website 	<ul style="list-style-type: none"> Extension personnel may also be able to present or answer questions at your event

□ Choose a title that signals discussion on LSS tradeoffs.

In Michigan, a pilot conversation was titled, “The Good, the Bad, and the Tradeoffs for Large Scale Solar.” Cornell Extension in New York used, “Interested in Getting Involved with Large Scale Solar Development in Your Community? Come Share Your Questions, Insights, and Concerns!” Balanced titles like these encourage a range of residents, whether cautious or enthusiastic about LSS, to attend.

□ Include essential information in your advertising.

Clearly communicate the event’s date, time, and location in your advertising. If multiple meetings are scheduled, make sure to share the locations of all meetings in advance to prevent concerns about specific groups or regions being excluded. If food will be provided, be sure to mention that as well. While including a weblink for additional details can be helpful, keep in mind that not everyone will have access to the internet.

Consider whether to ask attendees to register for your event. On one hand, registration helps estimate attendance, which is especially useful if you’re providing food or other incentives. It also allows you to track who is local and who has traveled from farther away, helping you identify participants most likely to be impacted by development. Registration can provide this information, or you can use a sign-in sheet at the event to collect names, addresses, and reasons for attending. On the other hand, registration can create a barrier to participation if it feels too complicated. In our pilot conversations, we found that the number of people who registered and actually attended varied significantly—some who registered didn’t attend, and some who attended didn’t register.

Example promotional materials from previous pilots are available in the [Resource Library](#).

□ Consider providing incentives.

Attendance varied across pilot conversations, with Michigan and Wisconsin—where financial incentives were offered—having higher attendance. Financial incentives, like gift cards, travel allowances, or childcare support, may make attendance more appealing, but it’s unclear if they were the primary attendance drivers, as those locations had strong community outreach or active solar projects that drew interest.

Offering incentives can increase meeting costs and affect perceptions of legitimacy, as some may view it as “paying off” participants. However, incentives can make it easier for people who might not otherwise attend and some philanthropic organizations and government programs are interested in funding meetings of this type.

CONSIDER REGISTERING ATTENDEES FOR MULTIPLE MEETINGS SIMULTANEOUSLY

To simplify registration, consider combining options for multiple meetings into a single form. Here’s an example of how Michigan and Wisconsin handled this:

In Michigan, two sequential meetings were designed as a series, with each session building on the previous one. However, some participants mistakenly believed that attending one session either meant they couldn’t attend the other, or that signing up for one session automatically registered them for both.

In Wisconsin, by contrast, two identical meetings were offered on different nights in different locations, and attendees were clearly instructed to select just one session based on their availability.

Offering a single registration form with an option to select one or both sessions can help reduce confusion.

Step 7: Conduct Your Conversation

The day of your conversation

Today is the day! It's time to host your community conversation. You've put a lot of effort into preparing for this moment, so remember: while something unexpected may happen, you've organized and planned thoroughly. Trust in your preparations!

Prepare for arrival, set-up, and greeting participants.

Coordinate arrival details with your venue ahead of time, and plan to arrive at least two hours early to set up and ensure everything is ready. The exact arrival time may vary depending on the event logistics, but it's essential to be prepared, as some attendees might arrive early. Confirm if the venue will handle the food and drinks or if you'll need to set those up yourself.

Set up a greeting and registration table in an obvious location near the venue entrance well before the designated start time. This table will serve as a central spot for collecting participants' information via a sign-in sheet, distributing conversation materials, assisting with reimbursements or incentives, and providing exit surveys. It's also helpful to answer logistical questions, such as the locations of bathrooms or information on food allergies.



The registration table at the community conversation in Michigan. Photo by Jacob White (Michigan State University).

□ **Stick to the agenda.**

Adhering to your planned agenda is essential for a successful community conversation. Following the agenda keeps the meeting on time and helps minimize disruptions. Meetings that run long tend to make attendees irritable. If a presentation is scheduled for 45 minutes, ensure that the speaker stays within that time. Don't hesitate to politely keep them on track. Likewise, if you've scheduled a five-minute break, allow precisely five minutes, but no longer.

Avoid making last-minute changes to the agenda during the meeting. In our pilots, second-guessing the plan often led to confusion. If an aspect of the agenda didn't work as hoped, take note for the next conversation rather than altering it on the spot. Sticking to your agenda demonstrates your preparation and control, which reduces the likelihood of participants disrupting or delaying the meeting.⁸

□ **Handle disruptions quickly and confidently.**

Disruptions were rare during our pilot conversations, with only one instance of a combative outburst. Setting expectations early helps minimize these disruptions. If someone does interrupt, handle it quickly, confidently, and professionally. Politely remind the participant that, by attending, they agreed to the meeting expectations and ground rules. Assure them that you're interested in hearing their perspective, but ask them to wait until the Q&A session or roundtable discussion. If they persist, let them know that they're being disrespectful to others and depriving other attendees of their opportunity to speak. If necessary, politely but confidently ask the individual to leave and wait for them to do so. Do not try to talk over them.

For larger, organized disruptions, familiarize yourself with your venue's rules. Some venues may permit law enforcement presence, while others may not. Although some partners and local advisory group members have considered having a sheriff's deputy or police presence, this can be counterproductive. While some attendees might feel safer, others—particularly historically marginalized communities—may view this presence as intimidating. A good compromise might be to ask an off-duty officer to attend in plain clothes, ensuring that they are identifiable yet less imposing.

□ **Close the conversation and articulate next steps.**

Congratulations—you've done it! While it might not have gone perfectly, the conversation provided a valuable forum for everyone involved and hopefully provided what was needed to fulfill your desired outcomes, deliverables, and planned next steps. Thank your attendees for their time, energy, and patience, and remind them of what to expect next ([Step 8](#))⁹: Is there another meeting planned? Will you send out the results? Will this inform a planning process? If you have an evaluation or exit survey, distribute it and instruct participants on where to return it. Finally, ensure attendees know how to reach you by displaying your contact information on a final slide or providing cards on each table.

⁸ Recognize the limits of this advice. If a significant portion of the audience is asking for a change to the agenda, such as wanting more time for answering questions, don't be so stubborn that you alienate the entire audience or cause people to leave.

⁹ Don't forget to identify what the planned next steps will be at the beginning of your meeting.

Step 8: Reflect and Report



After your conversation

Many outputs, outcomes, and next steps may emerge from your community conversation. Since you discussed potential results early on with your local advisory group, now is the time to reflect and follow through. If your goal was to provide information to decision-makers, consider what they need moving forward. Were you aiming to inform a planning process or contribute to a master plan? Now is the moment to compile the specific information to be shared—perhaps preparing a presentation of your results for local officials is in order.

□ Hold a final meeting with your advisory group.

After your conversation(s) has concluded, consider meeting one last time with your advisory group to debrief and reflect. If you used an exit survey to collect information from participants, this would be a great time to review those results. Additionally, you might want to address any unanswered questions from the event and revisit the planned next steps—such as preparing a community report—including how and when those steps will be carried out.

□ Prepare and disseminate a community report.

All five of our pilot programs prepared community reports that were shared with participants and other local stakeholders. Hopefully this useful resource is one you've planned in your desired outcomes and deliverables ([Step 2](#)). Distributing a report helps participants feel their concerns and priorities were acknowledged, and it provides a way to address specific questions that couldn't be answered during the conversation. Community reports can also include resources useful to participants and residents, such as information for landowners interested in leasing land to developers. Check out the [Resource Library](#) for examples of community reports from our pilot conversations. Hopefully this useful resource is one you've planned in your desired outcomes and deliverables ([Step 2](#)).

□ Create an online “home” for resources.

In addition to, or instead of, a community report, consider developing an online space to share results and related [resources](#) from your conversation(s). You might use an existing [website](#) or create a new one. In either case, ensure your online hub allows for easy updates and additional information for interested or concerned residents.



Screenshot of website for pilot conversation in Michigan.

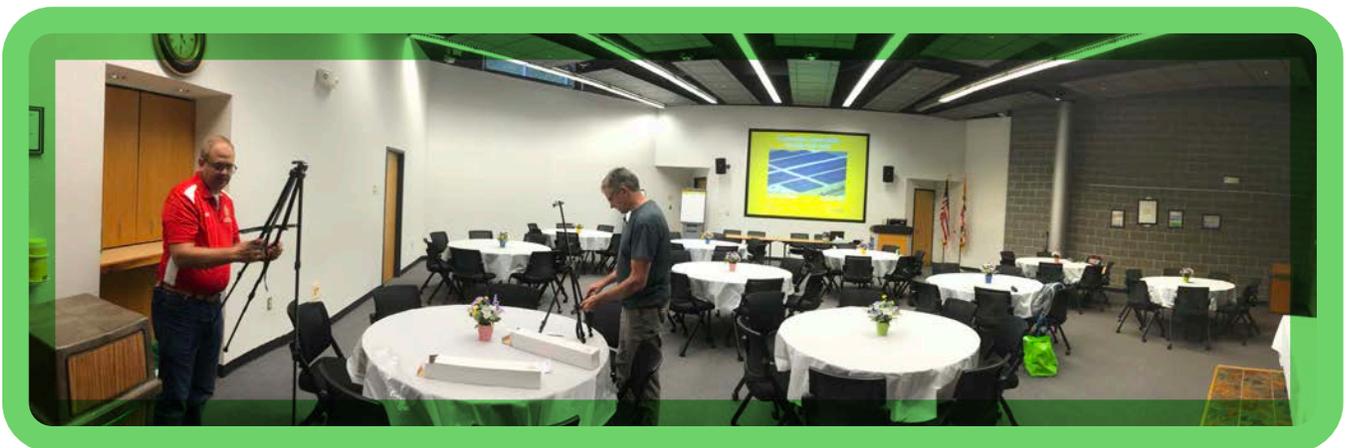
A great example is this [website](#), created using Google Sites by our pilot partner in Michigan. The site includes tools and recommendations that community members and local stakeholders can use to inform or influence LSS development, such as:

- Planning and zoning guides
- Examples of developer agreements
- Sample resolutions
- Good neighbor agreement examples
- Community benefits agreement examples
- Decommissioning plan examples
- Solar leasing guides for farmers
- Fire and safety training manuals
- Fact sheets on solar panels and projects (e.g., toxicity, taxes)

Consider also providing documentation about the conversation itself, which could include:

- Meeting notes
- Maps
- Survey results
- Video recordings of presentations and/or slide decks
- Frequently asked questions with responses or contacts for follow-up
- Contact information for meeting conveners, advisory group members, and guest speakers

We hope the information and recommendations in this guidebook help you host a successful community conversation. For additional resources and sample documents, visit our online [Resource Library](#). It features sample agendas, marketing materials, slide decks, roundtable discussion prompts, and a list of frequently asked questions, among other tools. Each resource is numbered to correspond with the steps in this guidebook. For example, if you're conducting a community survey as outlined in [Step 1](#), refer to *Resource 1.2: Community Survey: Michigan*. Looking for examples of websites created from community conversations? Check out *Resource 8.1: Online Hubs for Conversations*.



Setting up for the Maryland conversation. Photo by Jacob White (Michigan State University).

For Sample Documents and More Information, Visit Our Resource Library

Visit our [Resource Library](#) for sample documents, relevant links, and other useful materials. The library is regularly updated, so check back often for newly added materials that could be helpful.

- | | |
|---|--|
| 1.1 CCSD Project Introduction | 4.7 Sample Agenda: Wisconsin |
| 1.2 Community Survey: Michigan | 4.8 Sample Agenda: Iowa |
| 2.1 FAQs | 6.1 Digital & Print Flyer 1: Michigan |
| 4.1 Exit Survey: Iowa | 6.2 Digital & Print Flyer 2: Michigan |
| 4.2 Handouts for Roundtable Conversations: Wisconsin | 6.3 Digital & Print Flyer 3: Iowa |
| 4.3 Posters for Roundtable Conversations | 6.4 Social Media Flyer 1: Michigan |
| 4.4 Presentation 1—The Good-the Bad-and the Tradeoffs for LSS: Michigan | 6.5 Social Media Flyer 2: Michigan |
| 4.5 Presentation 2—Community Conversations on LSS in Portage County: Wisconsin | 6.6 Social Media Flyer 3: Michigan |
| 4.6 Presentation 3—Linn County & the Utility-Scale Solar Experience: Iowa | 8.1 Online Hubs for Conversations |
| | 8.2 Community Report: Michigan Pilot |
| | 8.3 Community Report: Wisconsin Pilot |
| | 8.4 Community Report: New York |
| | 8.5 Community Report: Maryland |

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About the Solar Energy Technologies Office

The U.S. Department of Energy Solar Energy Technologies Office accelerates the advancement and deployment of solar technology in support of an equitable transition to a decarbonized economy. Learn more at energy.gov/eere/solar.



PLANNING & ZONING FOR SOLAR ENERGY SYSTEMS

A GUIDE FOR MICHIGAN LOCAL GOVERNMENTS

2025 EDITION

MICHIGAN STATE
UNIVERSITY

Extension



GRAHAM SUSTAINABILITY INSTITUTE
CENTER FOR EMPOWERING COMMUNITIES
UNIVERSITY OF MICHIGAN



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Find this document and more about the project online at extension.msu.edu/solarzoning

Cover image: *Ground-mounted SES with pollinator garden. Photo by Fatimah Bolhassan.*

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MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

BACKGROUND & PURPOSE



Calhoun Solar Energy Center in Calhoun County. Photo by Kelly Jones.

Solar energy development in Michigan is in full motion. From residential rooftop solar to solar systems supporting local businesses and utility-scale solar power plants, the prevalence of solar energy systems (SES) is growing across the state.¹ This shift is evidenced by the expanding installations of smaller on-site SES² and the number of utility-scale SES currently under construction or in the grid interconnection queue.³

The rise in solar development is largely driven by technology advancements that have significantly reduced costs at all levels of solar development, making solar a cost-competitive option compared to natural gas and coal, both nationally and in Michigan specifically.⁴ Even though the solar resources in Michigan and other Midwestern states are not as abundant as in the Southwest United States⁵ (a solar panel in Michigan produces approximately 70% of the energy it would generate in Phoenix, Arizona, over the course of a year),⁶ Michigan utility companies, homeowners, and businesses are increasing the amount of power generated from solar energy.

Michigan communities are now tasked with planning for renewable energy development in their jurisdictions.⁷ By addressing these solar development proposals through thoughtful master planning and zoning ordinance development, communities have the opportunity to proactively determine how SES can fit into their

1 To learn more about how much solar is operational in Michigan, refer to the hub site of the Michigan Public Service Commission: <https://data-michiganpsc.hub.arcgis.com/pages/solar-resources>.

2 Michigan Public Service Commission (MPSC). (2024). Status of Renewable Energy, Distributed Generation, and Legacy Net Metering in Michigan. <https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/regulatory/reports/RE-DG/2024-RE-DG-Report.pdf>

3 Midcontinent Independent System Operator (MISO). Generator Interconnection Queue. https://www.misoenergy.org/planning/resource-utilization/GI_Queue/

4 For national data, see Lazard. (2024). Levelized Cost of Energy+. <https://www.lazard.com/research-insights/levelized-cost-of-energyplus/>. Specifically for Michigan, National Renewable Energy Laboratory's (NREL) State and Local Planning for Energy (SLOPE) tool averages cost of utility-scale solar energy as \$47 per megawatt-hour (MWh), compared to coal with \$83 per MWh and gas ranging between \$31 per MWh for gas combined cycle and \$53 per MWh for gas combined with carbon capture and sequestration in 2020. <https://maps.nrel.gov/slope/data-viewer?filters=%5B%5D&layer=lcoc.levelized-cost-of-electricity&geold=G26&year=2020&res=state>

5 National Renewable Energy Laboratory (NREL). Solar Resource Data, Tools, and Maps. <https://www.nrel.gov/gis/solar>

6 National Renewable Energy Laboratory (NREL). PVWatts Calculator. <https://pvwatts.nrel.gov/pvwatts.php>

7 Guidance for planning and zoning for wind energy systems and battery energy storage systems is available online: https://www.canr.msu.edu/resources/sample_zoning_for_wind_energy_systems_1 and <https://graham.umich.edu/project/bess-guide>.

landscapes—rural, suburban, or urban. The purpose of this guide is to help Michigan communities navigate these local land-use policy decisions and adopt plans and regulations that meet their needs.

This guide is written for local planners, officials, attorneys, and policymakers within the State of Michigan. It outlines the current policy landscape for solar in Michigan, describes the various SES components and configurations, and provides principles for how SES might fit within various land-use patterns across the state. The guide includes a discussion of local zoning options for large-scale SES in light of Michigan’s new energy siting law Public Act 233 of 2023. Starting on Page 26, the guide provides sample language for regulating SES through a community’s zoning ordinance.

The findings and recommendations in this document are based on federal guidance, university peer-reviewed research (whenever available and conclusive), and the parameters of Michigan law as it relates to the topic(s) in Michigan. The zoning and regulatory rules and concepts discussed here may not apply in other states.

Planning and Zoning for Solar Energy Systems: A Guide for Michigan Local Governments was developed by experts within Michigan State University Extension in partnership with the Center for EmPowering Communities at the University of Michigan’s Graham Sustainability Institute. Further review of this document was completed by content experts from local units of government, energy-related non-profits, utility experts, attorneys, and members of academia.

This guide, first published in 2021, has been significantly updated in 2025 and will continue to be updated as solar technology evolves, as the legal framework changes, and as we learn more from the deployment of existing technology.



Ground-mounted SES with pollinator garden. Photo by Rob Davis.

STATE-LEVEL POLICY CHANGES FOR SOLAR ENERGY IN MICHIGAN



Ground-mounted monopole SES. Photo by Bradley Neumann.

Recent state legislation makes it essential for Michigan's local governments to (re)consider SES at all scales within their master plans and zoning ordinances. This chapter overviews key state policies affecting solar energy in Michigan, providing the context in which local governments operate.

Public Act 235 of 2023 (PA 235), adopted by the Michigan legislature in November 2023, requires utilities to source 50% of their electricity from renewable sources by 2030 and 60% by 2035.⁸ Even prior to this legislation, the economic models of Michigan's two largest utilities found that an energy mix including significant increases in solar energy was the most cost-effective means to keep the lights on. Specifically, DTE Energy expected to add 6,500 megawatts (MW) of solar energy by 2042,⁹ and Consumers Energy announced plans to build roughly 8,000 MW of solar energy by 2040.¹⁰ New state-mandated renewable energy portfolio standards accelerate the utilities' plans by providing binding target milestones for the next several years.

Beyond adopting new renewable energy standards, Michigan also became the first state in the Midwest to set a statewide renewable energy storage mandate, requiring utilities to collectively procure 2,500 MW of energy storage by 2029.¹¹ Because some of these storage megawatts are expected to be paired with utility-scale SES, communities should be aware of increased development of these hybrid projects when planning and zoning for utility-scale SES.

PA 235 also included changes to distributed generation policy and now enables more build-out of accessory SES, such as rooftop solar for homeowners or local businesses. Prior to PA 235, Michigan's distributed generation cap stood at 1%, meaning utilities were not required to purchase excess energy from residential solar installations above 1% of the utilities' average peak loads. This cap was a limiting factor to the expansion of rooftop solar. PA 235 increased the cap to 10%, enabling more rooftop solar projects to qualify for compensation through net metering and supporting a broader adoption of rooftop solar for homeowners and businesses.

8 Michigan Legislature. (2023). Public Act 235 of 2023. <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0235.pdf>

9 DTE Energy. (2022). 2022 DTE Electric Integrated Resource Plan. https://dtecleanenergy.com/downloads/IRP_Executive_Summary.pdf

10 Michigan Public Service Commission (MPSC). (2022). Issue Brief: Consumers Energy 2021 Integrated Resource Plan. <https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/consumer/info/briefs/Consumers-Energy-2021-Integrated-Resource-Plan-Issue-Brief.pdf>

11 MLive. (2023). Michigan First State in Midwest to Set Power Storage Benchmark. <https://www.mlive.com/public-interest/2023/11/michigan-first-in-midwest-to-set-power-storage-benchmark.html>

Public Act 233 of 2023 (PA 233) is Michigan’s new renewable energy siting law, which provides developers the opportunity to bypass local zoning and obtain land use approval from the Michigan Public Service Commission (MPSC) for large-scale projects—including SES with a nameplate capacity of 50 MW or more.¹² However, developers and utilities must still obtain local zoning approval if:

1. All local zoning¹³ authorities where a project is proposed have enacted a Compatible Renewable Energy Ordinance (CREO) that does not impose stricter provisions than those outlined in PA 233.
2. The SES project is entirely within a city or village, and that city or village is the SES developer, owns participating property, or owns a utility that will utilize the SES.¹⁴ This exception does not extend to townships.

While PA 233 provides a new state-permitting option, utilities and developers may still opt for local zoning approval, particularly if the applicable local zoning regulations are deemed “workable” by the developer. Page 21 of this document outlines the pros and cons for local governments considering whether to adopt a CREO, establish a workable ordinance, or stipulate that all large projects undergo the state-level process.¹⁵ Regardless of the path chosen for large SES projects (≥ 50 MW), any SES below this threshold remains subject to local zoning authority. Alongside PA 233, the legislature amended the Michigan Zoning Enabling Act accordingly through the companion bill PA 234.

Public Act 108 of 2023 (PA 108), also known as the Solar Energy Facilities Taxation Act or the Solar “Payment in Lieu of Taxes (PILT)” Act, offers an alternate tax treatment for utility-scale solar energy facilities.¹⁶ Utility-scale SES are generally taxed as industrial personal property. The taxable value decreases over time based on depreciation schedules adopted by the State Tax Commission. In response to litigation over changing depreciation schedules applied to wind turbines, PA 108 offers communities the option of accepting payments in lieu of taxes for utility-scale SES installations, creating a predictable revenue stream for local governments. Under PA 108, using a solar PILT requires both the local government and the developer to agree to enter into this tax arrangement. Under this PILT, qualified solar energy facilities (with a capacity of 2 MW or larger) are exempt from the ad valorem industrial personal property tax and any new real property improvements and instead are locked into a fixed rate of \$7,000 per MW (AC) annually for 20 years. After this period, properties return to the ad valorem tax roll.¹⁷ Properties located on brownfields, on state-owned land, or in opportunity zones are subject to a reduced rate of \$2,000 per MW. PILT revenue is shared among the taxing jurisdictions based on each jurisdiction’s millage rate.

Public Act 68 of 2024 (PA 68), the Michigan Homeowners’ Energy Policy Act, addresses restrictions on residential SES. It nullifies any provisions in homeowners’ association (HOA) rules that prohibit or effectively hinder SES installation and maintenance.¹⁸ This law aims to remove private barriers such as HOA rules, deed restrictions, or architectural standards that can limit the installation of SES despite supportive local government policies.

12 Michigan Legislature. (2023). Public Act 233 of 2023. <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0233.pdf>

13 Whether a local government that does not have zoning authority (e.g., an unzoned township or a county government where there is township zoning) can enact a CREO is one of several questions raised in a November 2024 lawsuit (COA #373259), which was still pending as of the publication of this guide.

14 Michigan Legislature. (2023). Public Act 233 of 2023, Section 222(4). <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0233.pdf>

15 The University of Michigan Center for EmPowering Communities has resources on PA 233, including an overview of the Act and FAQs: <https://graham.umich.edu/project/MI-energy-siting>.

16 Michigan Legislature. (2023). Public Act 108 of 2023. <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0108.pdf>

17 The Michigan Department of Treasury has FAQs, memos, and more on PA 108: <https://www.michigan.gov/taxes/property/exemptions/solar-energy-facility-exemption>.

18 Michigan Legislature. (2024). Michigan Homeowners’ Energy Policy Act, PA 68 of 2024. <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2024-PA-0068.pdf>

COMPONENTS, TYPES & SCALES

This section discusses SES across a range of sizes, scales, configurations, and related components. SES cannot be treated uniformly by local governments because the scale of installations and energy generation capacity can vary dramatically. For example, a small solar panel powering a streetlight might be exempt from regulation, while a large-scale SES, providing power to the grid through a system of components, may require more rigorous local review.

COMMON SOLAR COMPONENTS



(Clockwise from top left) Racking and tracking system; inverter, weather station and collector box (both Madeleine Krol); bifacial panels; transformer and inverter (both Mary Reilly).

All SES require specific equipment to operate properly, although this equipment may differ based on the scale and configuration of the system. Besides the solar panels, or modules as they are sometimes called, the four common components of an SES include an inverter, a battery system (if in use), racking, and wiring. There are also other “balance of system” components that may or may not be present: combiner boxes, disconnect switches, a weather station, performance monitoring equipment, and transformers.

Solar Panels: Photovoltaic (PV) solar panels convert light (photons) to electricity (voltage). The majority of today’s solar panels are made of silicon solar cells, but there are also panels that use cadmium telluride technology, with the United States at the forefront of global manufacturing in this field.¹⁹ An individual solar panel is typically mounted on racking to function with other panels as part of an array. Commercial solar panels are constructed with one or more anti-reflective coatings, often made of magnesium fluoride. Antireflective coatings have highly improved in the last 20 to 30 years to ensure that panels maximize how much light reaches the PV cells. Glare from modern solar panels is insignificant, and local regulation of glare, even adjacent to airports, is not necessary.

¹⁹ National Renewable Energy Laboratory (NREL). Cadmium Telluride Solar Cells. <https://www.nrel.gov/pv/cadmium-telluride-solar-cells>

Bifacial Panels: Bifacial PV panels capture sunlight and produce electricity from both the front and back sides of the panel. These modules specifically take advantage of light reflected from a surface, such as snow, through the albedo effect.²⁰ Field data and analyses from Sandia National Laboratories and Michigan Technological University have shown that bifacial panels have the potential to increase system outputs, particularly in snowy environments, by 10%–20%.^{21,22} These panels are initially more expensive due to higher technology and labor costs, but may pay off over time with increased energy production.

Inverter: Inverters convert direct current (DC) electricity generated by photovoltaic modules into alternating current (AC) electricity that is compatible with the electrical grid.²³ Inverters may produce sound when in operation, which can be managed by placement as well as other sound mitigation measures (e.g., surrounding inverters with damping walls). Communities may choose to adopt sound regulations to influence the placement and design of inverters within an SES.²⁴

Battery Energy Storage: Some homeowners or solar developers include batteries in their solar installations, allowing the solar energy to be stored and used later when it is needed (such as at night). These on-site batteries make solar energy more accessible and reliable as an electricity source, as they provide energy for use during peak-rate hours or when solar production is low, such as during the evening or on cloudy days. They also serve as an emergency backup during power outages. Batteries are becoming increasingly common for all scales of SES as per-unit costs of batteries decline. Batteries can vary in size depending on the level of storage needed and may also vary in their location on the site. For rooftop solar systems, the batteries may be within the building that supports the solar panels. Currently, lithium-ion batteries for energy storage are the prevailing technology deployed across the country. They are favored over other types of batteries due to better energy retention and their quick response time in delivering energy to customers, among other advantages. For more information on lithium-ion battery energy storage systems, refer to *Planning & Zoning for Battery Energy Storage Systems: A Guide for Michigan Local Governments*, by the University of Michigan’s Graham Sustainability Institute.²⁵

Racking: SES may be ground or roof mounted. The frames, support posts, hardware, and foundations (if required) used to secure solar panels and other SES equipment are often collectively referred to as “racking.”

Trackers: Solar trackers are systems that move during the day to align solar panels with the location of the sun. There are two common types: single-axis trackers, which adjust the panels along one direction, and dual-axis trackers, which offer movement in two directions for optimal alignment. By positioning panels to remain perpendicular to the sun’s rays throughout the day, solar trackers enable more direct sunlight to strike the panels, therefore significantly increasing energy absorption and maximizing efficiency. Though these technologies allow the facility to produce more energy per panel, they are more expensive and may not last as long as the panels themselves.²⁶

Wiring: Solar panels are wired together to create an electrical circuit that allows current to flow through the component parts. Wiring extends beyond the panels to inverters, batteries, electronic devices, transformers, and distribution lines, depending on whether the SES generates electricity for use on-site or export to the electrical

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- 20 U.S. Department of Energy, Solar Energy Technologies Office. Project Profile: Performance Models and Standards for Bifacial PV Module Technologies. <https://www.energy.gov/eere/solar/project-profile-performance-models-and-standards-bifacial-pv-module-technologies>
- 21 Sandia National Laboratories. Bifacial PV Project. <https://pvpmc.sandia.gov/pv-research/bifacial-pv-project/>
- 22 Hayibo, K. S., et al. (2022). Monofacial vs Bifacial Solar Photovoltaic Systems in Snowy Environments. *Renewable Energy*, 193, 657–668. <https://doi.org/10.1016/j.renene.2022.05.050>
- 23 U.S. Department of Energy, Solar Energy Technologies Office. Solar Integration: Inverters and Grid Services Basics. <https://www.energy.gov/eere/solar/solar-integration-inverters-and-grid-services-basics>
- 24 Kaliski, K., Old, I., & Duncan, E. (2020). An Overview of Sound from Commercial Photovoltaic Facilities. June 29–July 1. NOISE-CON 2020. <https://rsginc.com/wp-content/uploads/2021/04/Kaliski-et-al-2020-An-overview-of-sound-from-commercial-photovoltaic-facilities.pdf>
- 25 The guide is available at: <https://graham.umich.edu/project/bess-guide>.
- 26 Reca-Cardena, J., & López-Luque, R. (2018). Design Principles of Photovoltaic Irrigation Systems. In I. Yahyaoui (Ed.), *Advances in Renewable Energies and Power Technologies* (pp. 295–333). Elsevier Science. <https://www.sciencedirect.com/topics/engineering/solar-tracking-system>

grid. While cabling within a solar array often runs along the racking system, wiring between arrays is typically underground, unless soil conditions prevent this. Wiring from the inverter to the transformer is generally buried to comply with electrical codes.

Larger SES also include transformers and project-specific substations for connecting to transmission lines that serve the electrical grid. Often, solar developers connect to existing distribution substations, but new or upgraded substations or dedicated generation tie-lines may be proposed as part of the SES. Transformers in substations increase voltage to higher levels for more efficient transmission over long distances. Transformers may produce low audible noise.



(Clockwise from top left) Rooftop SES, Petosky (Richard Neumann); Ground-mounted SES, Grand Traverse waterfront (Mary Reilly); Coldwater Solar Field Park (City of Coldwater, MI); Electric City Solar in Sturgis (Mary Reilly).

TYPES

Solar energy generation is a unique land use, at both the large and small scale. As such, these developments should be clearly defined as a separate land use within a zoning ordinance. Treating all scales of SES the same may unnecessarily restrict accessory and small-scale installations. In addition, solar developments are scalable and can be sited across many zoning districts. Therefore, in zoning ordinances, SES should be defined at the different system scales that the community desires (e.g., accessory vs. principal-use SES, small vs. large SES, ground- vs. roof-mounted SES).

The first distinction to consider for SES is accessory versus principal use. System types can also be standalone or hybrid integrated with other supporting energy generation or energy storage.

Accessory: These SES are accessory structures to the primary use of a property, such as a residence or a commercial building, and provide electricity that is intended for use by a primary building located on the same parcel as the SES. Accessory systems can range in size and configuration. They typically range from being small enough to power a single-family home to being large enough to power electricity for multiple buildings, such as livestock or equipment barns. On-site systems can be integrated into the building materials, affixed to the roof of a building, or freestanding, ground-mounted structures.

Principal: Principal-use SES generate electricity for transmission to the grid and export to a wholesale utility market. These projects occupy one or more large parcels of land and are typically the primary use on the site. These SES vary greatly in size, covering as little as an acre to thousands of acres.

Hybrid: Project sites may also contain wind energy generation or battery energy storage systems (BESS), creating what are often termed hybrid or co-located projects. Many newly developed solar projects in the United States are co-located with BESS to help smooth out variations in how solar energy flows on the grid. Similarly, wind and solar energy generation may be co-located to make more efficient use of grid connections. These uses all have characteristics that make them more or less suitable for particular districts or situations. In a hybrid project, it may be appropriate to consider the different technologies—such as solar, wind, and battery energy storage—as distinct principal land uses requiring distinct siting considerations, even though they may be located in proximity or sometimes even on the same property.²⁷ At a smaller scale, residential hybrid SES, where a rooftop solar system is paired with a battery capable of providing backup power, are also increasingly common. A companion guide—*Planning & Zoning for Battery Energy Storage Systems*—provides more information about BESS and sample language to help municipalities incorporate BESS-specific regulations into their zoning ordinances.²⁸

In addition, SES have four primary configurations: building integrated, roof mounted, wall mounted, and ground mounted.

Building Integrated: A building-integrated SES is an integral part of a primary or accessory building or structure (rather than a separate mechanical device), replacing or substituting for an architectural or structural component of the building or structure. Building-integrated systems include, but are not limited to, PV or water heating solar energy systems that are contained within roofing materials, windows, and skylights.

Roof Mounted: A roof-mounted SES has solar panels affixed to a racking system on the roof of a structure or building. Roof-mounted panels are often installed parallel to the roof surface on a pitched roof, or protrude from the roof at an angle on a flat roof. A roof-mounted SES typically has fixed mounts that do not rotate throughout the day to track the sun. By definition, roof-mounted systems are accessory structures relative to the principal use of the building.

Wall Mounted: A solar energy system mounted or attached to the wall of a building or structure is sometimes parallel to the wall surface but often protrudes at an angle like an awning. Wall-mounted systems are a functional component of the building, accessory or principal, to which they are attached.

Ground Mounted: A ground-mounted SES is a structure composed of solar panels affixed to a racking system on one or more support posts. These posts are most commonly driven into the ground, without requiring a concrete foundation. In cases where the soil cannot be penetrated, such as with a brownfield or capped landfill, ground-mounted SES can be designed with ballasted supports that sit atop the ground. A ground-mounted SES may be fixed (i.e., stationary) or have single- or double-axis trackers to follow the sun throughout the day. While nearly all principal-use SES are ground mounted, some accessory SES may be ground mounted too. For example, solar parking canopies are becoming more common in Michigan and present unique characteristics as compared with a typical ground-mounted SES. These characteristics include unique panel height, vehicle support post collision mitigation, lighting, and site configurations.

Ground-mounted SES can also be distinguished by scale—small, medium, or large—as described in the following section.

27 U.S. Department of Energy. Solar Integration: Solar Energy and Storage Basics. <https://www.energy.gov/eere/solar/solar-integration-solar-energy-and-storage-basics>

28 The guide is available at: <https://graham.umich.edu/project/bess-guide>.

Figure 1. Examples of Solar Energy System Types Across Different Geographies

Solar Energy System Type	Natural	Rural	Urban	General Urban
Accessory Roof Mounted				
Accessory Ground Mounted				
Principal Use (Small)				
Principal Use (Medium/Large)				

Figure 1 shows the type and scale of SES that exhibit predominant factors for compatibility in a given setting.

SCALES

As mentioned, even principal-use SES vary greatly in size, covering as little as an acre to thousands of acres. Because of this variety in the size and impacts on a site, many communities may choose to distinguish between small, medium, and large principal-use SES in their ordinances. There is no established definition of “small,” “medium,” or “large,” and for other industry or taxation purposes, scale distinctions may differ.

To assist a community in making a distinction between scales of SES based on size, [Table 1](#) (below) illustrates common SES outputs measured in megawatts (MW) of alternating current (AC) and the average acreage of land required to host an SES of that output.²⁹ While the amount of space the solar panels themselves take up is consistent across scales (roughly 4.2 acres per MW),³⁰ larger projects have a higher variability in land required per megawatt (5–10 acres per MW)³¹ because they often include multiple internal access roads. Furthermore, while smaller projects may be sited on a single parcel, larger solar projects span multiple parcels that may include areas with wetlands or county drains. While solar panels are not developed on these portions of the site, they may be within the overall project footprint.

29 Ong, S., et al. (2013). Land-Use Requirements for Solar Power Plants in the United States. National Renewable Energy Laboratory, Technical Report NREL/TP-6A20-56290. Table ES-1, Page v. <https://www.nrel.gov/docs/fy13osti/56290.pdf>
 30 Bolinger, M., & Bolinger, G. (2022). Land Requirements for Utility-Scale PV: An Empirical Update on Power and Energy Density. IEEE Journal of Photovoltaics, 12(2). <https://ieeexplore.ieee.org/document/9676427>
 31 Solar Energy Industries Association. Land Use & Solar Development. <https://seia.org/initiatives/land-use-solar-development/>

Table 1. Comparison Chart: Megawatt Outputs to Acreage Needed for SES

Megawatts (AC)	1 MW*	5 MW	50 MW	100 MW	200 MW
Acres	5-10	25-50	250-500	500-1,000	1,000-2,000

*The current national average (through Q1 2024) number of homes powered by 1 MW of solar is 172.³²

In this guide, the scale threshold between small and medium principal-use SES is 5 MW (or approximately 40 acres). This is generally the largest scale of a project that would connect into the local distribution power lines, though some distribution lines may be capable of hosting more. Currently, there are dozens of SES projects of 5 MW and less being developed in the state.³³ These projects are being approved by local communities, suggesting they fit within the character of the landscapes in which they are proposed. Thus, they could perhaps be permitted by right, with no public hearing, after an administrative site plan review (see discussion on Page 20).

This guide sets the threshold for large principal-use SES at 50 MW (to match PA 233). By default, medium principal-use SES are those between 5 MW and 50 MW. Each community, however, should determine what the right demarcation of scale is between small, medium, and large principal-use SES given the community’s context. In an urban environment, where parcels are smaller, the threshold to classify as a large principal-use SES may have fewer megawatts. In a community abundant with rural land or experience with expansive developments, a larger megawatt or acreage threshold for large projects may be more appropriate. Of further note, while research finds that there is generally more social acceptance of smaller projects rather than larger ones,³⁴ larger solar projects benefit from economies of scale and so are more cost-effective to install than multiple small projects.^{35, 36} Communities that wish to see more small projects may need to significantly streamline the local zoning and approval pathway for smaller projects to incentivize them.

32 Solar Energy Industries Association. What’s in a Megawatt? <https://seia.org/whats-in-a-megawatt/>

33 Most of these small projects are sized so that they can be considered “qualifying facilities” under PURPA, a federal law enacted in 1978, intended to diversify electricity generation. Specific capacity (MW) thresholds to receive the “standard offer tariff” vary from utility to utility. The current standard offer capacity threshold and more about PURPA can be found on the Michigan Public Service Commission’s website: <https://www.michigan.gov/en/mpsc/commission/workgroups/2016-energy-legislation/purpa>.

34 Hoesch, K., et al. (2024). Perceptions of Large-Scale Solar Neighbors. <https://graham.umich.edu/media/files/Perceptions-of-Large-Scale-Solar-Neighbors-2024-05.pdf>

35 Burger, S. P., et al. (2019). Why Distributed? A Critical Review of the Tradeoffs Between Centralized and Decentralized Resources. IEEE Power and Energy Magazine, 17(2). <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8643507>

36 Lazard. (2024). Levelized Cost of Energy+. <https://www.lazard.com/research-insights/levelized-cost-of-energyplus/>



LAND-USE CONSIDERATIONS



Calhoun Solar Energy Center in Calhoun County with active farmland in the foreground. Photo by Fatimah Bolhassan.

Ultimately, the compatibility of an SES at a given site depends on how it is perceived relative to local planning goals and the pattern and density of the surrounding physical and built environment. A community's master plan sets the vision and high-level goals for the community. Local policy related to renewable energy generation begins first in the master plan, with an explanation of how SES could fit into the unique landscapes and character of the jurisdiction. In addition to the master plan, goals related to SES are established in other local plans, which could include district or sub-area plans, resiliency plans, climate action plans, or renewable energy plans. Here, specific geographical areas are designated as ideal for SES development. A master plan ideally includes a spatial analysis of land-use suitability and incorporates community engagement to establish formal guidance for the regulations.

These local planning efforts build the foundation for any regulations or policies a community may choose to adopt related to SES. Communities should consult their local plans as they make policy decisions for SES, including choosing one of the zoning pathways for large SES projects (50 MW or greater). (See Page 21 for a discussion on zoning options). The weight that local plans will carry in siting decisions made by the MPSC under PA 233 remains to be seen. Though the law does not mention planning, the MPSC aims to take planning into consideration in their process by requiring applicants to submit local planning documents for review. Furthermore, the MPSC must consider the "percentage of land area in energy generation" when making permitting decisions.³⁷ A community's master plan should document existing energy generation infrastructure in the community to inform the conversation about future land-use needs.

³⁷ Michigan Legislature. (2023). Public Act 233 of 2023, Section 226(6). <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0233.pdf>. As of the publication of this guide, the MPSC had not yet determined how it would measure land area for different energy generators nor how it would apply this standard.

Lapeer Solar Park. Photo by Bradley Neumann.



Zoning, as a local regulatory mechanism, can mitigate the impacts of SES if standards are appropriately tailored to the various development patterns of a community. The plans described above would support the establishment of related zoning regulations, consistent with the requirements of the Michigan Zoning Enabling Act (MZEA).

The MZEA requires that all zoning be based on a plan.³⁸ The master plan, therefore, establishes the community's formal policy position on solar energy development. A plan should include guidance on SES at different scales, including accessory, small, medium, and large (see Page 9). For example, the master plan might set a goal that permits accessory SES throughout the jurisdiction. For small or medium principal-use SES, it might define what scale is appropriate as a permitted use (i.e., use by right) or determine appropriateness based on the location of marginal lands, soil types, or steep slopes. It could document community attributes or characteristics that are important to consider and/or protect when siting solar energy development.

After a community has incorporated solar development into its master plan, the zoning ordinance can be amended to include regulations for the various configurations and scales of SES. The zoning regulations protect the community's health, safety, and welfare and are based on policies outlined in the master plan. Zoning regulations define the location, scale, and form or configuration of SES allowed in the community and establish the permits and processes by which solar energy is allowed and even incentivized.

COMMENTARY: A zoning request for an SES may come before a community that has no mention of solar in the zoning ordinance or master plan. While neither ideal nor recommended, communities sometimes zone first and plan second. If a community cannot delay amending the zoning ordinance to first amend the plan, they should work closely with a qualified planner or municipal attorney to perform a master plan review in order to find elements that support or contradict a solar energy zoning amendment. Master plan elements to consider in this review:

- Vision statement: How do these broad community statements align with or contradict the contemplated ordinance amendment? Does the vision include renewable energy?
- Goals and objectives: If the solar amendment includes multiple scales of SES, then review the goals, objectives, and policies for all relevant land-use classifications on the future land-use map, such as agricultural, residential, commercial, forestry, industrial, etc.
- Brownfields or grayfields: Review plans, policies, and maps for recommended zoning approaches.
- Future land-use map: Review the map for projected areas of growth (infrastructure extension, type of growth, or change in land use) or areas with goals, objectives, and policies to preserve or maintain a unique community asset.
- Zoning plan: While not required as a precursor to a zoning amendment, a statement in the zoning plan³⁹ affirming the preferred scope and/or location of SES relative to other land-use classifications and zoning districts may be sufficient to show the community anticipated the solar zoning amendment but had not yet taken action to amend the ordinance.

38 Michigan Legislature. (2006). Michigan Zoning Enabling Act, MCL 125.3203(1). <https://legislature.mi.gov/Laws/MCL?objectName=MCL-125-3203>

39 Michigan Legislature. (2008). Michigan Planning Enabling Act, MCL 125.3833(2)(d). <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-125-3833>

FARMLAND CONSIDERATIONS



Langeland Farms SES. Photo by M. Charles Gould.

Solar projects are often built on cropland because it is flat and has direct access to sunlight.⁴⁰ Practices implemented when a solar project is built or decommissioned can impact the ability of the soil to grow crops in the future. For example, soil compaction, which occurs when equipment used to build or remove arrays is operated on partially frozen or wet soils, can hinder plant growth and reduce the soil's water-holding capacity. Site design standards, including stormwater management and visual screening with trees or berms, might further limit farming potential and impact drainage. Grading changes to prevent water pooling and ensuring uniform panel installation may not only involve moving of topsoil but also alter the natural water flow. Any landscaping and deep-rooting ground cover should be designed to not damage or negatively impact existing drain tile, and communities may want to consult with their county drain commissioners. However, implementing conservation practices, such as planting pollinator habitats or prairie strips, can improve soil carbon content.^{41, 42}

Currently, more than 3 million acres of land in Michigan are enrolled in the Farmland and Open Space Preservation Program, which was created by Public Act 116 of 1974 (PA 116).^{43, 44} The program preserves farmland from being developed for non-agricultural uses through the use of development rights agreements offering income tax benefits for the landowner. The Michigan legislature, through Public Act 230 of 2023 (PA 230), has determined that the placement of solar panels on property enrolled in the program is considered to be a permitted use when specific conditions are met.⁴⁵ These conditions include:

- The solar project is designed, established, and maintained in a manner that ensures the land can be returned to agricultural use.
- The site upon which the solar facility is located should be designed, planted, and maintained with ground cover that achieves a score of at least 76 on the Michigan Pollinator Habitat Planning Scorecard for Solar Sites⁴⁶ developed by the Michigan State University Department of Entomology, as well as designed, planted, and maintained in compliance with Natural Resource Conservation Cover Standard 327.⁴⁷ Michigan State

40 PA 233 allows for solar development on farmland but does require that projects must “not unreasonably diminish farmland,” including “prime farmland” and “farmland dedicated to the cultivation of specialty crops.”

41 Michigan State University. (2025). Long-term Study Reveals Best Practices for Building Soil Carbon in Agriculture. <https://www.canr.msu.edu/news/long-term-study-reveals-best-practices-for-building-soil-carbon-in-agriculture>

42 Colorado State University. (2021). Soil Carbon: What It Is and Why It Is Important. <https://agnext.colostate.edu/2021/10/26/soil-carbon-what-it-is-and-why-it-is-important/>

43 Michigan Department of Agriculture & Rural Development. (2024). Annual Equalization Report. <https://www.michigan.gov/mdard/environment/farmland/general/annual-equalization-reports>

44 Michigan Legislature. (2023). Natural Resources and Environmental Protection Act, MCL 324.36104e. <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-324-36104e>

45 Michigan Legislature. (2023). PA 230 of 2023. <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0230.pdf>

46 Rowe, L., & Isaacs, R. (2018). Michigan Pollinator Habitat Planning Scorecard for Solar Sites. <https://www.canr.msu.edu/news/michigan-pollinator-habitat-planning-scorecard-for-solar-sites>

47 U.S. Department of Agriculture, Natural Resources Conservation Service. (2015). Conservation Practice Standard: Conservation Cover: Code 327. https://efotg.sc.egov.usda.gov/api/CPSFile/4729/327_MI_CPS_Conservation_Cover_2015_pdf

University Extension has a Michigan Pollinator Habitat Planning Scorecard for Solar Sites certification program to help consultants understand the intent of each section in the scorecard.⁴⁸

- A bond or irrevocable letter of credit is posted with the state to ensure that solar panels will be removed and the land returned to agricultural use.

When these conditions are met, the landowner's agreement is amended to "pause" the preservation status for the portions of the land used by the solar project for the duration of the lease agreement. During this pause the landowner does not qualify for tax credits. This policy allows farmland owners to take advantage of the economic opportunity presented by solar development while maintaining the farmland preservation intent of PA 116. Under the terms of the Farmland Development Rights Agreement, it is the landowner's responsibility to work with the solar energy developer to ensure that all conditions associated with the program are satisfied. Therefore, a landowner will need to address such conditions in the solar energy lease, easement, or other agreement with the developer.

AGRICULTURAL DUAL USE

There are various co-location approaches to siting, designing, constructing, and managing SES to reduce impacts of solar land use on farmland and enhance a wide range of ecological and human-centered services. Land management and conservation practices within SES increasingly incorporate agrivoltaics or ecovoltaics. The approach of combining the two, generally referred to as agrisolar PV, emphasizes holistic farm integration beyond just vertical integration of solar and agricultural production. Agrisolar PV offers farmers and solar developers flexibility in choosing co-location models that best suit the land and enables farmers to implement ecologically sustainable farm plans.



Ground-mounted SES with grazing sheep. Photo by M. Charles Gould.

48 Learn more about the program and related courses at: <https://www.canr.msu.edu/courses/michigan-pollinator-habitat-planning-scorecard-for-solar-sites-certification-program>

Agrivoltaics

An agrivoltaic system is defined as a ground-mounted PV system that has been intentionally planned and designed with agricultural producers or experts. The system is constructed, installed, and operated to achieve integrated and simultaneous production of both solar energy and marketable agricultural products throughout the life of the solar project.⁴⁹ Though agrivoltaics is not the default practice for every SES development or may not be feasible or desired by all property owners, it offers a valuable approach for integrating solar with agriculture. Agricultural products and activities may happen on land beneath and between rows of solar panels and can include crop production, grazing, or animal husbandry.

The 2024 Solar Grazing Census reports that roughly 130,000 acres across more than 506 solar sites in 30 different U.S. states are being grazed by 113,050 sheep.⁵⁰ In Michigan, over 400 acres of SES are grazed by sheep. To manage the vegetation, sheep producers receive new farm income. Solar grazing also supports the livelihoods of veterinarians, feed suppliers, and other parts of the rural agriculture economy. Landowners and developers typically start planning for agrivoltaics during lease negotiations or early in the site design process since grazing sheep requires careful site design to ensure compatibility with project infrastructure, as well as vegetation planning so that the right forages are planted and the proper rotational grazing system is implemented.^{51,52,53}

In the United States, roughly 1,700 acres across 34 SES are producing crops alongside solar energy as of April 2025.⁵⁴ A Michigan example for agrivoltaics with crop production includes the urban agriculture project in Detroit, launched by Lightstar Renewables in 2024, where Detroit farmers will grow fresh vegetables and berries at two community-centered sites in 2026.⁵⁵ Additionally, Lightstar Renewables will provide energy efficiency upgrades to qualifying homeowners in the neighborhoods directly touched by the project, enhancing their quality of life. These upgrades, coupled with frequent community check-ins to incorporate feedback into the project design, result in development that aligns with the preferences and needs of the neighborhoods.⁵⁶

COMMENTARY: Integrating SES with agriculture offers an exciting opportunity for Michigan’s sheep industry. In February 2025, the USDA National Agricultural Statistics Service Sheep and Goat Inventory reported 85,000 head of sheep and lambs in Michigan.⁵⁷ Michigan sheep producers have the potential capacity to graze on between 7,200 to 22,000 acres of solar, depending on grazing models used and ground cover. According to the American Sheep Industry Association, 73% of the lamb and mutton supply in the United States is currently imported.⁵⁸ This provides Michigan sheep producers an opportunity to build a market to replace imports with Michigan-grown lamb and mutton.

49 American Farmland Trust. (2025). Policy Recommendations to Increase Agrivoltaic Development. https://farmland.org/wp-content/uploads/2025/02/AFT_Final_Policy_Recommendations_to_Increase_Agrivoltaic_Development_Definition_and_Incentives.pdf

50 American Solar Grazing Association. (2025). Solar Grazing Census. <https://solargrazing.org/census/>

51 Agrivoltaic Solutions. (2020). Agricultural Integration Plan: Managed Sheep Grazing & Beekeeping. https://www.edf-re.com/wp-content/uploads/004C_Appendix-04-B.-Agricultural-Integration-Plan-and-Grazing-Plan.pdf

52 Cassida, K., & Kaatz, P. (2019). Recommended Hay and Pasture Forages for Michigan. Extension Bulletin E-3309. Michigan State University. <https://forage.msu.edu/wp-content/uploads/2019/11/E3309-RecommendedHayPastureForagesForMichigan-2019.pdf>

53 Undersander, D., et al. (2014). Pastures for Profit: A Guide to Rotational Grazing. Extension Bulletin A3529. University of Wisconsin-Extension and Minnesota Extension Service. <https://cdn.shopify.com/s/files/1/0145/8808/4272/files/A3529.pdf>

54 OpenEI InSPIRE. Agrivoltaics Map. https://openei.org/wiki/InSPIRE/Agrivoltaics_Map

55 Reference to Lightstar Renewables is for educational purposes only and does not imply endorsement by the authors or bias against those not mentioned.

56 Lightstar. (2025). Press Release: Lightstar and the City of Detroit Illuminate the Future with Innovative Neighborhood Agrivoltaic Solar. <https://www.lightstar.com/news/detroit-innovative-neighborhood-agrivoltaic-solar>

57 U.S. Department of Agriculture, National Agricultural Statistics Service, Great Lakes Region. (2025). Sheep and Goat Inventory. https://www.nass.usda.gov/Statistics_by_State/Michigan/Publications/Current_News_Release/2025/nr2509mi.pdf

58 American Sheep Industry Association. (2025). Overview of Lamb and Mutton Imports. <https://www.sheepusa.org/wp-content/uploads/2025/03/ASI-Trade-One-Pager-on-Lamb-and-Mutton-Imports-final.pdf>; and U.S. Department of Agriculture, Research Service. (2025). Sheep, Lamb & Mutton: Sector at a Glance. <https://www.ers.usda.gov/topics/animal-products/sheep-lamb-mutton/sector-at-a-glance>



Dual-use ground-mounted SES and blueberry farm. Photo by Mary Reilly.

Ecovoltaics

Ecovoltaics is a term used to describe projects that co-prioritize energy production and ecosystem services during the design and management phases of solar development. This can include planting vegetation that provides food sources for pollinators or planting species that offer ecological services such as carbon sequestration, improved soil health, habitat preservation, surface water management, and enhanced water quality.⁵⁹ These approaches can be used to restore severely degraded or abandoned land. Ecovoltaic approaches could help restore and even enhance biodiversity in these places while providing clean energy.⁶⁰

SOLAR ON BROWNFIELDS AND GRAYFIELDS

A recommended practice is to use regulation to encourage the siting of SES on land that is difficult to develop or marginal for other uses. Examples of marginal land include brownfield sites, capped landfills, grayfield sites (previously developed property with no known contamination), and required safety buffer areas around industrial sites. On brownfields or capped landfills, solar development can allow productive use of land that might be compromised or have other development challenges.⁶¹ Solar arrays can be designed to avoid penetrating the ground and do not require as much remediation as other kinds of development. In a similar vein, development of solar on grayfield sites can provide an economic development opportunity for land that is otherwise disadvantaged from a redevelopment perspective.

While the use of marginal land for solar energy development is recommended, it is not a common practice, particularly among large SES, for a range of reasons.⁶² One reason is that most of these marginal lands are smaller than the preferred 500+ acres for a more typical SES, and these smaller sites typically do not allow for achieving economies of scale. Even when solar developers are building a smaller-scale project, developing on a brownfield site may require using ballasted support structures (rather than driven posts), which can be more expensive, or may require a less-than-ideal panel layout.

Communities wanting to attract solar development to marginal lands may need to reduce other costs or barriers to development, such as expediting review and permitting, providing land at low or no cost, decreasing required

59 Steinberger, K. (2021). Native Plant Installation and Maintenance for Solar Sites. The Nature Conservancy in Michigan. <https://www.nature.org/content/dam/tnc/nature/en/documents/Native-Plant-Management-at-Solar-Sites.pdf>

60 Sylte, A. (2023). How Can Solar Energy Installations Prioritize Ecosystems? Colorado State University. <https://natsci.source.colostate.edu/agrivoltaics-ecovoltaics-research/>

61 Michigan Department of Environment, Great Lakes, and Energy (EGLE). (2024). Design and Regulatory Considerations for Developing and Installing Photovoltaic (PV) Solar Arrays on Closed Landfills. <https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/MMD/Landfills/Guidance-Solar-Installations-Landfills.pdf?rev=9e72fe5bb1294cdd8b18b7a990e29ab2>

62 Schaap, B., et al. (2020). Reducing Barriers to Solar Development on Brownfields. <https://graham.umich.edu/media/files/dow/Dow-Masters-2019-Brownfields-GIS.pdf>

setbacks, or providing other incentives. A community can further financially incentivize solar on brownfields by offering property tax incentives where that is allowed,⁶³ or through the payment in lieu of taxes option, at a reduced rate of \$2,000 per MW for former industrial sites.⁶⁴ While Michigan has seen modest development of solar on brownfields to date,⁶⁵ that is expected to change soon. In 2024, Michigan was awarded funding from the U. S. Environmental Protection Agency to create a Brownfield Renewable Energy Pilot program to “provide grants for renewable energy projects on brownfields.”⁶⁶ While the details of the program were not known when this guide was published, the expectation is that the program will help provide communities with additional tools to incentivize renewable energy deployment on contaminated properties.



Coldwater Solar Field Park, a brownfield redevelopment in Coldwater. Photo by Mary Reilly.

SOLAR AND HISTORIC OR CULTURALLY SIGNIFICANT SITES

Solar panels can have a variety of impacts on character-defining features of historic or culturally significant structures or sites. Panels can obscure character-defining features of a structure or be incompatible with a structure’s roofline, exterior color, and the texture or shape of building materials. Despite these potential impacts, many Michigan communities allow for and regulate SES in historic districts and on other significant sites. It is important to allow ground-mounted or rooftop SES on historic sites and structures in a context-sensitive way, granting the use while preserving the integrity of site aspects deemed historic or culturally significant.

The U.S. Secretary of the Interior advises that solar panels installed on a historic property that cannot be seen from the ground will generally meet the Standards for Rehabilitation that govern most local historic districts.⁶⁷

Communities with historic district ordinances should update their ordinances to address roof and ground-mounted SES. For example, the cities of Grand Rapids⁶⁸ and Ypsilanti^{69, 70} provide for regulations that address these issues. For state or federally designated historic sites, applicants should review the U.S. Secretary of the Interior’s Standards for Rehabilitation or contact Michigan’s State Historic Preservation Office.

63 Michigan Department of Treasury. New Personal Property Exemption. <https://www.michigan.gov/taxes/property/exemptions/new-personal-property/new-personal-property-exemption>

64 Michigan Legislature. (2023). Public Act 108 of 2023. <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0108.pdf>

65 U.S. Environmental Protection Agency. RE-Powering America’s Land Initiative Mapper. <https://geopub.epa.gov/repoweringApp/>

66 Executive Office of the Governor. (2024). Gov. Whitmer Announces \$129.1 Million Investment from Biden-Harris Administration to Lower Costs, Create Jobs, Protect Clean Air and Water. <https://www.michigan.gov/whitmer/news/press-releases/2024/07/22/gov-whitmer-announces-291-million-investment-from-biden-harris-administration-to-lower-costs>

67 National Park Service, Technical Preservation Services. (2022). Solar Panels on Historic Properties. <https://www.nps.gov/orgs/1739/solar-panels-on-historic-properties.htm>

68 City of Grand Rapids, Historic Preservation Commission. (2024). Historic Preservation Guidelines. Solar Collectors (p. 57). <https://www.grandrapidsmi.gov/Government/Boards-and-Commissions/Historic-Preservation-Commission>

69 City of Ypsilanti. Historic District. <https://cityofypsilanti.com/263/Historic-District>

70 City of Ypsilanti. (2019). Historic District Fact Sheet: Alternative Energy. <https://cityofypsilanti.com/DocumentCenter/View/1998/Alternative-Energy>

DECOMMISSIONING AND REPOWERING

A question that commonly arises when communities are considering solar as a primary land use is what happens at the end of the solar project's life. Most solar panels are designed to operate for 25 to 40 years, so it is common for solar developers to have a lease or easement of roughly this length with a landowner. However, many landowner agreements include the option to extend, sometimes because there is still life left in the original panels and sometimes because the developer hopes to repower the project.



Ground-mounted SES in rural setting. Photo by Bradley Neumann.

It is important to note the distinction between the two primary options at the end of a solar project's life: decommissioning and repowering. Decommissioning is the process of removing the equipment and other infrastructure associated with the project. PA 233 defines repowering as refurbishing or replacing system components for the purpose of extending its life, excluding repairs related to the ongoing operations as long as they do not increase the energy facility's capacity of energy output.⁷¹ When repowering, some of the original infrastructure (e.g., racking, access roads, fencing) may be reused, even if other components have reached the end of their useful life. A community with zoning jurisdiction seeking to retain authority over repowering large SES (see discussion on zoning options for large SES on Page 21) should work with a municipal attorney to specify standards for approval. If a local ordinance does not adequately address repowering or is otherwise incompatible with PA 233, the system owner may apply to the MPSC for certification.⁷²

COMMENTARY: A fundamental zoning concept is that a zoning ordinance must allow for nonconformities—that is, the continuation of a land use, lot, building, or structure that was legally established before a change in zoning that no longer permits the use, the lot size, or the building or structure location. Zoning ordinances may provide for the completion, resumption, restoration, reconstruction, extension, or substitution of nonconformities. For example, if an ordinance no longer allows large SES projects in a zoning district or the setback requirements for SES change, the solar project (or elements of the project) could be nonconforming and a proposal to repower the SES might require a dimensional variance or be subject to ordinance standards on reconstruction or extension of nonconformities. If a proposal to expand or reconstruct an existing large SES is at odds with ordinance standards pertaining to nonconformities or other applicable standards, the applicant may seek certification through the MPSC. If retaining local review and approval is a priority, the local unit of government could negotiate a workable ordinance with the developer to modify or eliminate the regulation giving rise to the nonconformity. Communities should work closely with a municipal attorney if nonconformities exist for a large SES that is proposed to be expanded or repowered.

71 Michigan Legislature. (2023). Public Act 233 of 2023, MCL 460.1221(v). <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-460-1221>

72 Michigan Legislature. (2023). Public Act 233 of 2023, MCL 460.1221(v,g). <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-460-1221>

While decommissioning is commonly a provision in a landowner's agreement with a solar developer, many communities also require a decommissioning plan that includes a financial commitment as part of the approval process. The decommissioning plan details how the project equipment will be removed and the land restored when the contract for the SES expires, and the financial commitment guarantees there will be funding to implement the plan.

Large SES projects that go through the MPSC certification process must have a decommissioning agreement between the developer and the State. This agreement ensures the return of the properties to useful condition, similar to pre-construction, including removal of all above-ground facilities and infrastructure. The agreement must include a financial assurance that at least equals the estimated decommissioning cost.⁷³ A sample decommissioning agreement is included in the MPSC's Application Filing Instructions and Procedures for PA 233.⁷⁴

COMMENTARY: There are opportunities to recover valuable raw materials or reuse solar panels when SES are decommissioned. PV module materials are 99% non-hazardous, and 95% of the material is recyclable with current technologies.⁷⁵ PV panels in the United States are still relatively young, with approximately 70% of panels installed since 2017.⁷⁶ As a result, recycling facilities that take SES components are also new and still growing. Crystalline-silicon panels (the most common on the market today) contain recyclable materials such as glass, aluminum, copper, and plastic parts. Other components such as inverters, racks (steel), and batteries may also be recycled.⁷⁷ Some panels contain trace amounts of hazardous metals (lead, cadmium telluride, silver), and these materials vary by manufacturer and sourcing for components. If these metals are present in high enough quantities, they could be considered hazardous waste.⁷⁸ "Preliminary studies have shown that the amount of lead from modules are below the limits that EPA sets for determining if waste is hazardous."⁷⁹ The EPA and Department of Energy have further guidance on recycling of solar panels.

Questions about solar panel toxicity are occasionally raised due to general environmental and human health concerns associated with toxic metals and per- and polyfluoroalkyl substances (PFAS), a class of chemical compounds. PFAS are not used in PV panels, and no studies have shown the presence or leaching of PFAS from PV panels throughout their life cycle.⁸⁰ If panels break due to extreme conditions (e.g., tornado, tree limb impact), then a careful and professional removal process should be practiced when handling broken solar panels. Soil remediation may be necessary if solar panel components are not handled correctly or are otherwise improperly disposed of. Provided that broken solar panels are safely removed from the solar array, damaged PV modules can be sent to solar panel recycling providers. These specialists meet environmental compliance standards and disassemble solar panels into component parts that can be safely refurbished and reused, refined, or disposed of.⁸¹

73 Michigan Legislature. (2023). Public Act 233 of 2023, MCL 460.1225(r). <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-460-1225>

74 Michigan Public Service Commission (MPSC). (2024). Application Filing Instructions and Procedures. <https://www.michigan.gov/mpsc/regulatory/facility-siting/renewable-energy-and-storage-facility-siting>

75 U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. (2022). Solar Energy Technologies Office Photovoltaics End-of-Life Action Plan. <https://www.energy.gov/sites/default/files/2023-10/SETO-PV-End-of-Life-Action-Plan-1.pdf>

76 U.S. Department of Energy. End-of-Life Management for Solar Photovoltaics: What Is End of Life Management for Photovoltaics? <https://www.energy.gov/eere/solar/end-life-management-solar-photovoltaics>

77 U.S. Environmental Protection Agency, Hazardous Waste. Solar Panel Recycling. <https://www.epa.gov/hw/solar-panel-recycling>

78 U.S. Environmental Protection Agency, Hazardous Waste. End-of-Life Solar Panels: Regulations and Management: Are Solar Panels Hazardous Waste? <https://www.epa.gov/hw/end-life-solar-panels-regulations-and-management>

79 U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. (2022). Solar Energy Technologies Office Photovoltaics End-of-Life Action Plan (p. 11). <https://www.energy.gov/sites/default/files/2023-10/SETO-PV-End-of-Life-Action-Plan-1.pdf>

80 Ancil, A. (2020). Facts About Solar Panels: PFAS Contamination. Clean Energy in Michigan Series, No. 12. <https://graham.umich.edu/sites/default/files/pubs/Facts-about-solar-panels--PFAS-contamination-47485.pdf>

81 U.S. Environmental Protection Agency, Hazardous Waste. End-of-Life Solar Panels: Regulations and Management. <https://www.epa.gov/hw/end-life-solar-panels-regulations-and-management>

ZONING CONSIDERATIONS

Table 2. Example SES Scale and Type as Applied to Typical Zoning Districts

Example Zoning District	Resource Production / Agricultural	Low-Density Residential	Commercial / Office	Industrial	Medium-Density Residential	Mixed Use
Roof Mounted	P	P	P	P	P	P
Accessory Ground Mounted	P	P	P	P	P	P
Principal Use (Small) (e.g., up to 5 MW)	SPR	SPR/SLU	SPR	SPR	SPR/SLU	SPR
Principal Use (Medium) (e.g., 5-50 MW)	SLU	SLU	SLU	SPR/SLU	X	X
Principal Use (Large) (e.g., over 50 MW)	See Page 21 for discussion of options in light of PA 233					

P = Permitted (zoning standards apply); SPR = Site Plan Review; SLU = Special Land Use; X = Not Permitted

Local units of government have zoning jurisdiction for a range of SES, from a residential roof-mounted SES to a larger development up to a 50 MW system, typically 250 to 500 acres. Local units may opt to retain jurisdiction for large SES over 50 MW. Importantly, each community should tailor the SES type and scale to its own development patterns, zoning district characteristics, and local goals.

An appropriate zoning approval process should be calibrated to the necessary level of review and public input. [Table 2](#) describes general zoning districts, proposed SES size thresholds, and permitting options. At the smallest site scale, such as a roof- or accessory ground-mounted system, SES should be classified as a permitted accessory structure reviewed by a zoning administrator with non-discretionary requirements (e.g., height, setback).

For the small principal-use SES, up to 5 MW, an administrative site plan review or special land use is recommended depending on zoning classification, context, and community goals. An administrative review can be done by the zoning administrator, still applying the same SES-specific land-use standards as those applied to a special land use.

For the medium principal-use SES, a special land use permit would offer site plan review and increased opportunity for public input. A local threshold for determining the upper size limit for a small principal-use system (versus medium) could be the maximum acreage where site plan review/use by right is a locally acceptable regulatory approach. This could range from 2 to 80 acres, for example, depending on local context. Above a certain acreage, or megawatt threshold, a special land use may be preferred. [Table 2](#) suggests that large solar developments are potentially incompatible in medium-density residential and mixed-use districts that support a variety of uses such as commercial, residential, and retail that are likely to have significant infrastructure investments (sidewalks, water/sewer). However, a site plan review-only option for medium principal-use SES could incentivize redevelopment on large brownfields, grayfields, or abandoned industrial sites in support of community goals.

Large principal-use SES (250–3,000+ acres) are typically located in agricultural zoning districts due to the size of the projects and preferred site characteristics (e.g., clear of vegetation/trees, relatively flat, well drained).

ZONING PATHWAYS FOR LARGE SOLAR ENERGY SYSTEMS

When planning for large-scale solar project development, choosing a zoning pathway is one of the most important decisions for Michigan local governments. This section outlines three different zoning pathways for large principal-use SES under PA 233, each with its own set of pros and cons. [Table 3](#) on Pages 24-25 compares key zoning items across those three pathways.

For more information about the law and these options—especially any updates since this guide was published—consult the Michigan Department of Environment, Great Lakes, and Energy’s (EGLE) Renewable Energy Academy⁸² and the University of Michigan’s Graham Sustainability Institute,⁸³ which offer resources, recorded workshops, and programming to help communities understand the law and their options within it.

OPTION 1: ADOPT A COMPATIBLE RENEWABLE ENERGY ORDINANCE

The law defines a compatible renewable energy ordinance (CREO) as an ordinance “the requirements of which are no more restrictive than the provisions included in Section 226(8)” of the law.⁸⁴

Pros: This is the only option that ensures that developers must seek approval through local zoning. Additionally, because local authorities using a CREO are subject to strict time limits for approving or denying applications, this option is generally viewed as favored by developers and has the potential to attract more projects. SES projects approved at the local level under a CREO are also eligible for the Renewables Ready Communities Award.⁸⁵

Cons: A CREO does not allow for additional local requirements beyond those specified in the law, including common zoning provisions, such as locational requirements or screening.⁸⁶ Moreover, local governments with a CREO lose access to intervenor funds if they fail to approve a project within the mandated time limits, deny a project that meets the standards set in Section 226(8) of the Act, or amend their zoning ordinance to impose additional restrictions after a project has been announced.



Calhoun Solar Energy Center in Calhoun County. Photo by Madeleine Krol.

82 Michigan Department of Environment, Great Lakes, and Energy (EGLE). Renewable Energy Academy. <https://www.michigan.gov/egle/about/organization/materials-management/energy/renewable-energy/renewable-energy-academy>

83 Resources on PA 233: <https://graham.umich.edu/project/MI-energy-siting>.

84 Michigan Legislature. (2023). Public Act 233 of 2023, Section 225(1)(f). <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0233.pdf>

85 Michigan Department of Environment, Great Lakes, and Energy (EGLE). Renewables Ready Communities Award. <https://www.michigan.gov/egle/about/organization/materials-management/energy/rfps-loans/renewables-ready-communities-award>

86 The definition of a CREO is one of several questions raised in a November 2024 lawsuit (COA #373259), which was still pending as of the publication of this guide.

OPTION 2: LET LARGE SES PROJECTS BE PERMITTED BY THE MICHIGAN PUBLIC SERVICE COMMISSION

The law allows communities to “request the MPSC to require” all large-scale SES to seek approval from the MPSC.⁸⁷ This process offers the same provisions laid out in Section 226(8) of PA 233 as well as additional evaluation criteria and conditions, such as ground cover. For the most current information, consult the MPSC’s Renewable Energy and Storage Facility Siting web page⁸⁸ and review available resources for local governments navigating the MPSC renewable energy siting process.⁸⁹

Pros: This option requires minimal effort from the local government in terms of establishing zoning or evaluating projects. It allows experts at the State to assess proposed projects and, in communities where SES may be contentious, pushes any controversy to the State. Additionally, the local government will receive a one-time payment of \$2,000/MW after entering into a host community agreement with the SES developer.⁹⁰

Cons: The final decision for a project will be made by the MPSC, although affected local governments can intervene in the MPSC contested case process and can receive intervenor funding to hire legal representation to aid them in the process. There may be limited opportunity for community members who are not granted intervenor status to influence the outcome of the proposal or to incorporate local community priorities into the approval process. Additionally, projects approved by the MPSC are not eligible for the Renewables Ready Communities Award.⁹¹



Ground-mounted SES with grazing sheep. Photo by Mary Reilly.

87 Michigan Legislature. (2023). Public Act 233 of 2023, Section 222(2). <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0233.pdf>

88 Michigan Public Service Commission (MPSC). Renewable Energy and Storage Facility Siting. <https://www.michigan.gov/mpsc/regulatory/facility-siting/renewable-energy-and-storage-facility-siting>

89 Access a checklist for local governments navigating the MPSC siting process at <https://graham.umich.edu/project/MI-energy-siting>.

90 Michigan Legislature. (2023). Public Act 233 of 2023, Section 227(1). <https://www.legislature.mi.gov/documents/2023-2024/publicact/pdf/2023-PA-0233.pdf>

91 Michigan Department of Environment, Great Lakes, and Energy (EGLE). Renewables Ready Communities Award. <https://www.michigan.gov/egle/about/organization/materials-management/energy/rfps-loans/renewables-ready-communities-award>



Calhoun Solar Energy Center in Calhoun County. Photo by Kelly Jones.

OPTION 3: ADOPT A WORKABLE INCOMPATIBLE ZONING ORDINANCE

PA 233 does not define a workable ordinance, but it is generally understood as a local zoning ordinance that is somewhat more restrictive than a CREO (therefore, it is considered “incompatible”) yet still preferable to MPSC approval for developers. For more information on why a developer might favor permitting a project through a workable ordinance rather than the MPSC process (Option 2) and how a community can strike the balance of workability, refer to available resources, including recorded Renewable Energy Academy workshop webinars⁹² and FAQs.⁹³

Pros: This option allows local governments to incorporate local preferences for SES development within their ordinance, provided these preferences are not overly burdensome for developers (otherwise, the ordinance would not be considered “workable”). Additionally, large SES projects approved at the local level, including through a workable ordinance, are eligible for the Renewables Ready Communities Award.⁹⁴

Cons: There is no guarantee that a developer will choose local approval over MPSC approval. Additionally, there is no consensus among SES developers on what constitutes a workable ordinance, meaning that what one developer considers workable may not be seen the same way by another.

92 Access EGLE’s Renewable Energy Academy workshop recordings at <https://www.michigan.gov/egle/about/organization/materials-management/energy/renewable-energy/renewable-energy-academy>.

93 Resources on PA 233, including FAQs: <https://graham.umich.edu/project/MI-energy-siting>.

94 Michigan Department of Environment, Great Lakes, and Energy (EGLE). Renewables Ready Communities Award. <https://www.michigan.gov/egle/about/organization/materials-management/energy/rfps-loans/renewables-ready-communities-award>

Table 3. Comparison of Zoning Items Between Zoning Pathways for Large SES

	Compatible Renewable Energy Ordinance (CREO)	MPSC	Workable Incompatible Ordinance (WIO)
Process	Use by right with site plan review by Zoning Administrator or Planning Commission [A]	Michigan Public Service Commission (MPSC) contested case [B]	Use by right with site plan review or special land use (SLU)
Location Control	All districts, subject to locally adopted CREO [A]	Sec. 226(7)(f), Sec. 225(1)(n) All districts + Evaluation Criteria: 1) Will not unreasonably diminish prime farmland/ farmland devoted to specialty crops. 2) Shall consider feasible alternative development locations. 3) Shall consider the impact on local land use, including the % of land dedicated to energy generation.	Locally designated zoning districts or overlay as long as it provides ample and suitable land for development [C, D]
Setbacks	Sec. 226(8)(a) Non-Participating (NP) property line: 50 feet NP structure (outer wall): 300 feet Public road right-of-way: 50 feet	Sec. 226(8)(a) Non-Participating (NP) property line: 50 feet NP structure (outer wall): 300 feet Public road right-of-way: 50 feet	Varies widely, see [D]
Height	Sec. 226(8)(a) 25 feet at full tilt	Sec. 226(8)(a) 25 feet at full tilt	Varies from about 16 to 25 feet, per local ordinance

[A] PA 233 is silent on this specific item, but this represents the most conservative interpretation of CREO, meaning provisions are no more restrictive than those outlined in Section 226(8) of PA 233. The definition of a CREO is one of several questions raised in a November 2024 lawsuit (COA #373259), which was still pending as of the publication of this guide.

[B] A contested case is a quasi-judicial process administered by the MPSC that allows local jurisdictions, and other parties, to intervene in the review of an application before the MPSC.

[C] If an applicant determines the location controls are unworkable (prohibitive), they may apply to the MPSC. See Zoning Pathways on Page 21.

[D] See “Guidance on ‘Workable’ Renewable Energy Ordinances” at <https://graham.umich.edu/project/MI-energy-siting>

	Compatible Renewable Energy Ordinance (CREO)	MPSC	Workable Incompatible Ordinance (WIO)
Sound	Sec. 226(8)(a)(iv) Non-Participating (NP) structure (outer wall): 55 dBA Leq (1-hour)	Sec. 226(8)(a)(iv) Non-Participating (NP) structure (outer wall): 55 dBA Leq (1-hour) Conditions of Approval: 1) Contract with a third-party acoustics expert for post-construction sound monitoring. 2) Demonstrate compliance and maintain compliance through sound mitigating measures if necessary.	Varies widely, see [D]
Screening	None [A]	Sec. 226(6) Condition of Approval: Agreement to implement screening, approved on a case-by-case basis by the Commission.	Varies widely, see [D]
Groundcover	None [A]	Sec. 226(6)(a,b) Evaluation Criteria: Vegetative ground cover in consideration of MSU’s Michigan Pollinator Habitat Planning Scorecard for Solar Sites + condition of approval.	May be a condition of approval, established and maintained for the life of the facility (e.g., pollinator, forage, conservation cover). Brownfield exception may apply.
Decommissioning	Sec. 226(8)(r) Financial assurance after deducting salvage value: 25% on operation, 50% by 5th year, 100% by 10th year	Sec. 225(1)(r) Same as CREO plus Conditions of Approval: 1) Repair all drainage systems damaged during construction and decommissioning. 2) Demonstrate that financial assurance has been acquired and will be maintained.	Varies widely, see [D]

[A] PA 233 is silent on this specific item, but this represents the most conservative interpretation of CREO, meaning provisions are no more restrictive than those outlined in Section 226(8) of PA 233. The definition of a CREO is one of several questions raised in a November 2024 lawsuit (COA #373259), which was still pending as of the publication of this guide.

[B] A contested case is a quasi-judicial process administered by the MPSC that allows local jurisdictions, and other parties, to intervene in the review of an application before the MPSC.

[C] If an applicant determines the location controls are unworkable (prohibitive), they may apply to the MPSC. See Zoning Pathways on Page 21.

[D] See “Guidance on ‘Workable’ Renewable Energy Ordinances” at <https://graham.umich.edu/project/MI-energy-siting>

SAMPLE ZONING FOR SOLAR ENERGY SYSTEMS

This sample zoning language is meant to be a starting point for dialogue between officials, staff, and residents before or during a zoning amendment process related to SES. (See Page 21 for a discussion on Zoning Pathways for Large-Scale SES.) Communities can (and should) work with their municipal attorney and a knowledgeable planner to modify the sample zoning language to develop regulations that fit a community's unique circumstances, meet identified community goals, and are tied to master plan objectives, upon which zoning must be based. To aid these modifications, the commentary throughout this section provides additional context, including how individual zoning standards compare to PA 233, Michigan's siting legislation affecting zoning for large SES projects.

DEFINITIONS

The definitions below are needed for the SES provisions. Select, modify, and add these definitions to the Definitions Section/Article of your zoning ordinance as appropriate. Not all ordinances will require all these terms. Note that some may already be included in the Definitions Section/Article of your zoning ordinance with similar or identical meanings (e.g., Participating Property, Decommissioning).

Alternatively, you may adopt the Sample Zoning as its own Article or Section within your code, using the following:

The following definitions apply only to the provisions of _____ [e.g., Article or Section for Solar Energy Systems, depending on the naming convention in your jurisdiction's zoning ordinance].

Accessory Ground-Mounted Solar Energy System: A ground-mounted solar energy system with the purpose primarily of generating electricity for the principal use or building on the site.

Building-Integrated Solar Energy System: A solar energy system that is an integral part of a principal or accessory building or structure (rather than a separate mechanical device), replacing or substituting for an architectural or structural component of the building or structure. Building-integrated systems include, but are not limited to, photovoltaic or water heating solar energy systems that are contained within roofing materials, windows, and skylights.

Ground-Mounted Solar Energy System: A solar energy system mounted on support posts, like a rack or pole, that are attached to or rest on the ground.

Invasive Plant: Non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Maximum Tilt: The maximum angle of a solar array (i.e., most vertical position) for capturing solar radiation as compared to the horizon line.

Minimum Tilt: The minimal angle of a solar array (i.e., most horizontal position) for capturing solar radiation as compared to the horizon line.

Non-Participating Property: Land that is not a participating property.

Participating Property: Land that either is owned by an applicant or is the subject of an agreement that provides for the payment by an applicant to a landowner of monetary compensation related to an SES regardless of whether any part of the SES is constructed on the property.

Photovoltaic (PV) System: A semiconductor material that generates electricity from sunlight.

Principal-Use Solar Energy System: A commercial solar energy system that converts sunlight into electricity for the primary purpose of off-site use through the electrical grid or export to the wholesale market.

- **Small Principal-Use Solar Energy System:** A Principal-Use Solar Energy System with a nameplate capacity less than _____ [e.g., 5] MW AC.
- **Medium Principal-Use Solar Energy System:** A Principal-Use Solar Energy System with a nameplate capacity _____ [e.g., 5] MW AC and greater but less than 50 MW AC.
- **Large Principal-Use Solar Energy System:** A Principal-Use Solar Energy System with a nameplate capacity of 50 MW AC and more, any portion of which is on property regulated by this zoning ordinance.

Repowering: Replacement of all or substantially all of the SES for the purpose of increasing the power rating of the project.

Roof-Mounted Solar Energy System: A solar energy system mounted on racking that is attached to or ballasted on the roof of a building or structure.

Solar Array: A photovoltaic panel, solar thermal collector, or collection of panels or collectors in a solar energy system that collects solar radiation.

Solar Carport: A solar energy system of any size that is installed on a structure that is accessory to a parking area and which may include electric vehicle supply equipment or energy storage facilities. Solar panels affixed on the roof of an existing carport structure are considered a Roof-Mounted SES.

Solar Energy System (SES): A photovoltaic system for generating electricity, including all above- and below-ground equipment or components required for the system to operate properly and to be secured to a roof surface, structure, or the ground. This does not include any operations or maintenance buildings, temporary construction offices, substation(s), or other transmission facilities between the SES and the point of interconnection to the electric grid.

Wall-Mounted Solar Energy System: A solar energy system mounted or attached to the wall of a building or structure.

Commentary on Large Principal-Use SES: This language addresses the possibility that a large principal-use SES may span zoning jurisdictions. Solar energy facilities greater than 50 MW are subject to PA 233, regardless of whether they span zoning jurisdictions. A developer may, for example, propose a 100 MW solar facility, only 10 MW of which is in your jurisdiction. This language says that the large principal-use SES regulations would apply to the 10 MW portion in your jurisdiction.

GENERAL PROVISIONS

A. BUILDING-INTEGRATED SES

1. Building-Integrated SES are subject only to zoning regulations applicable to the structure or building and not subject to Roof-Mounted, Wall-Mounted, or Accessory Ground-Mounted SES permits.

B. ROOF-MOUNTED SES

1. Roof-Mounted SES are permitted in all zoning districts where buildings or structures are allowed, are considered part of the building or structure to which they are attached.
2. **Height:** Roof-Mounted SES shall not exceed _____ [e.g., 5–10] feet above the finished roof and are exempt from any rooftop equipment or mechanical system screening.
3. **Nonconformities:** A Roof-Mounted SES installed on a nonconforming building, structure, or use does not constitute an expansion of the nonconformity.
4. **Application:** All SES applications must include _____ plan [e.g., plot or site, whichever is required for a zoning compliance review]. Applications for Roof-Mounted SES must include horizontal and vertical elevation drawings that show the location and height of the SES on the building and the dimensions of the SES.

C. WALL-MOUNTED SES

1. Wall-Mounted SES are permitted in all zoning districts where buildings or structures are allowed and are considered a part of the building or structure to which they are attached.
2. Wall-Mounted SES are subject to only those regulations applicable to the structure or building to which they are attached.
3. **Nonconformities:** A Wall-Mounted SES installed on a nonconforming building, structure, or use shall not be considered an expansion of the nonconformity.

Commentary on Height (Roof-Mounted SES): Because of concerns over wind load, most roof-mounted systems are not the same dimensions as ground-mounted SES. Given current SES design considerations, 10 feet is sufficient to accommodate most roof-mounted systems. If a zoning ordinance has height exceptions for other mechanical equipment, it might alternatively just include roof-mounted SES in this exception. In addition to listing this in the section of your ordinance with those exceptions, you could also use the following language in this section of the solar provisions: *Roof-Mounted SES shall be given an equivalent exception to height standards as building- or roof-mounted mechanical devices, chimneys, antennae, or similar equipment, as specified in Section _____ [height exceptions] of the _____ [municipality name] Zoning Ordinance.*

Commentary on Nonconformities: Nonconformities may be addressed within the General Provisions as indicated or in a chapter addressing nonconformities.

D. ACCESSORY GROUND-MOUNTED SES

1. Accessory Ground-Mounted SES are permitted as an accessory structure in all zoning districts where buildings or structures are allowed.
2. **Height:** Accessory Ground-Mounted SES shall not exceed _____ [e.g., 20 or maximum height for accessory structures in the district] feet measured from the ground to the top of the system when oriented at maximum tilt.
3. **Setbacks:** An Accessory Ground-Mounted SES must be a minimum of _____ [e.g., 5] feet from the property line or _____ [e.g., ½] the required setback for accessory structures in a side or rear yard in the respective zoning district, whichever is greater. Setback distance is measured from the property line to the closest point of the SES at minimum tilt.
4. **Lot Coverage (Residential):** The area of the solar array in residential districts [list districts here] shall not exceed _____ [e.g., 50] % of the square footage of the principal building of the lot or parcel unless it is sited over required parking (i.e., solar carport), in which case there is no maximum lot coverage for the Accessory Ground-Mounted SES. An Accessory Ground-Mounted SES shall not be included when calculating the maximum square footage of buildings or structures allowed on site or maximum impervious surface area limits if the ground under the array is pervious.
5. **Visibility (Residential):** An Accessory Ground-Mounted SES in residential districts [list districts here] shall be located in the side or rear yard to minimize visual impacts from the public right-of-way(s).
 - a. Accessory Ground-Mounted SES may be placed in the front yard with administrative approval, where the applicant can demonstrate that placement of the SES in the rear or side yard will:
 - i. Decrease the efficiency of the SES due to topography, accessory structures, or vegetative shading from the subject lot or adjoining lots;
 - ii. Interfere with septic system, accessory structures, or accessory uses; or
 - iii. Require the SES to be placed on the waterfront side of the building housing the primary use [where applicable].
6. **Exemptions:** An SES used to power a single device or specific piece of equipment such as a lawn ornament, lights, weather station, thermometer, clock, well pump, or other similar singular device is exempt from Section _____ [Ground-Mounted SES provisions].
7. **Nonconformities:** An Accessory Ground-Mounted SES installed on a nonconforming building, structure, or use shall not be considered an expansion of the nonconformity.
8. **Application:** All Accessory Ground-Mounted SES applications must include a _____ plan [e.g., plot or site, whichever is required for a zoning compliance review]. Applications must include drawings that show the location of the system on the property, height, tilt features (if applicable), the primary structure, accessory structures, and setbacks to property lines.

Commentary on Height (Accessory Ground-Mounted SES): Height of a ground-mounted SES can vary from 4 to 15 feet, depending on how many rows of panels are installed and the maximum tilt height, if applicable. If the SES is co-located with an active agricultural operation, such as livestock grazing or crop production, it may need as much as 8 feet of clearance, which can increase the overall height to up to roughly 20 feet. Similarly, a solar carport would need additional clearance to accommodate vehicle access. The carports at Michigan State University are 14'6" to accommodate snow removal and paving trucks. A relatively straightforward way to regulate the height of SES and account for this range of applications is to apply the same height standard as other accessory buildings or structures within the zoning district.

In addition to the General Provisions (above), also add the following standards for Principal-Use SES to the General Provisions or Supplemental Regulations (wherever you have use-specific standards) article of the zoning ordinance.

Also add “Small Principal-Use SES,” “Medium Principal-Use SES,” and “Large Principal-Use SES” to the list of permitted or special land uses in the appropriate districts. Based on Table 2 on Page 20, this might include:

Small Principal-Use SES:

- Are a permitted (by right) use in non-residential zoning districts subject to Site Plan Review.
- Are a Special Land Use in residential zoning districts.

Medium Principal-Use SES:

- Are a permitted (by right) use in industrial zoning districts subject to Site Plan Review.
- Are a Special Land Use in agricultural, low-density residential, and commercial zoning districts.

Large Principal-Use SES:

- [Workable Pathway] If you have chosen a workable path (see Page 23 for zoning pathway options), add “Large Principal-Use SES” as a special land use in your chosen districts (e.g., typically all districts).
- [CREO Pathway] If you have chosen the CREO pathway, add “Large Principal-Use SES” as a [permitted/special land] use in all districts.⁹⁵ Also, using the sample language for CREOs,⁹⁶ create a new section within your ordinance. This section should include all relevant definitions, as well as the standards and procedures applicable to SES and any other energy technologies (e.g., wind, battery energy storage systems) that you wish to include in your ordinance.
- [MPSC Pathway] If you have chosen the MPSC pathway, omit any reference to “Large Principal-Use SES” throughout your ordinance (e.g., use tables or definitions) but do include the appropriate “Applicability” provision below.

E. PRINCIPAL-USE SES

1. Applicability [Pick one of the following three actions]:

[Workable Pathway: Delete this “Applicability” provision]

[OR]

[CREO Pathway] Large Principal-Use SES are not subject to the provisions or procedures in this section. Instead, Large Principal-Use SES are subject to the provisions and procedures for _____ [e.g., Large Principal-Use Solar Energy Systems (SES)] laid out in the Compatible Renewable Energy Ordinance section of this ordinance.

[OR]

[MPSC Pathway] Large Principal-Use SES are not subject to the provisions or procedures in this section and are not regulated by this zoning ordinance. Instead, Large Principal-Use SES shall require a siting certificate from the Michigan Public Service Commission pursuant to Public Act 233 of 2023, Section 222(2).

95 There are some districts that may be patently incompatible for a large-scale solar energy project. But these are also very likely patently infeasible for a developer to find enough land to develop a project. While PA 233 and MPSC Application Filing Instructions and Procedures are silent on whether a CREO can restrict locations or limit the overall size of an energy facility, doing so within the context of a CREO may be risky. If your community wishes to place locational or footprint restrictions on renewables projects, it should weigh the risks of labeling your ordinance as a CREO.

96 A sample CREO is available on our website at <https://graham.umich.edu/project/MI-energy-siting>. Other organizations have created sample CREOs as well, such as the Michigan Townships Association at <https://michigantownships.org/renewable-energy-siting-and-permitting/> (members only).

2. Hybrid Energy Projects: If a Principal-Use SES is to be established together with another energy facility, such as a wind or battery energy storage system, both land uses may be included in one application, and each component shall be reviewed for compliance with the appropriate standards.

3. Use Standards

a. Setbacks:

- i. Setback distances shall be measured from the nearest edge of the perimeter fencing, or, where there is no perimeter fence, setback distances shall be measured from the property line or edge of a road right-of-way to the closest point of the solar array at minimum tilt or any SES components.
- ii. Principal-Use SES are not subject to property line setbacks for common property lines of two or more participating properties, except _____ [i.e., "road right-of-way" or "front property line"] setbacks shall apply.
- iii. Small Principal-Use SES: A Small Principal-Use SES shall follow the setback distance for principal buildings or structures for the district in which it is sited.
- iv. Medium Principal-Use SES: The following minimum setback distance shall apply to any Medium Principal-Use SES:
 1. _____ [e.g., 300] feet from any community buildings and occupied dwellings on a non-participating property.
 2. _____ [e.g., underlying zoning district or 50] feet from _____ [i.e., "the nearest edge of a public road right-of-way" or "the front property line"].
 3. _____ [e.g., 50] feet from the side or rear property line of a non-participating property.
- v. Large Principal-Use SES: _____. [For a Workable path, see [Table 3](#) on Pages 24-25 to inform options. For CREO or MPSC paths, delete this provision.]

b. Fencing: A Principal-Use SES may [shall] be secured with perimeter fencing to restrict unauthorized access. If installed, perimeter fencing shall be a minimum height of _____ [e.g., 7] feet [and shall not be subject to the fencing requirements in Section _____ of this zoning ordinance]. [Barbed wire is prohibited.]

c. Height: Total height of a Principal-Use SES shall not exceed _____ [e.g., 25] feet measured from the ground to the top of the system when oriented at maximum tilt.

Commentary on Setbacks: The setback standards for large principal-use SES in Public Act 233 of 2023 are measured from the nearest edge of the perimeter fencing (see Section 226(8)(a)(i)). For more information on the kinds of setbacks and the values, refer to [Table 3](#) on Pages 24-25.

Commentary on Fencing: PA 233 calls for fencing to comply with the latest version of the National Electrical Code (NEC). The current NEC standards call for a 6-foot fence with three lines of barbed wire, or a 7-foot fence with no barbed wire. A community may decide to ban the use of barbed wire at an SES and still allow for compliance with the NEC, as long as the fencing is allowed to be at least 7 feet. While some communities have aesthetic concerns about taller fences, taller fences (e.g., those taller than 8 feet) may be more effective at excluding deer. Voluntary best management practices from Michigan's Department of Natural Resources that address deer interaction with fences surrounding solar farms were not yet available as of May 2025 but were expected imminently.

Commentary on Height: This height standard is consistent with the height standard for large SES in PA 233 (see Section 226(8)(a)(iii)).

d. Sound:

- i. Small Principal-Use SES shall comply with the _____ [reference to existing noise ordinance].
 - ii. For Medium Principal-Use SES, the sound pressure level of all SES components and ancillary equipment shall not exceed a noise level of _____ [e.g., 45–55] dBA (Leq (1-hour)) at the nearest _____ [e.g., property line of an adjoining non-participating property; or, outer wall of the nearest dwelling located on a non-participating property]. Decibel modeling shall use the A-weighted scale with applicable standards from the American National Standards Institute.
 - iii. Large Principal-Use SES: _____. [For a Workable path, see [Table 3](#) on Pages 24-25 to inform options. For CREO or MPSC paths, delete this provision.]
- e. Lighting:** A Principal-Use SES shall implement dark sky-friendly lighting. Light fixtures shall have full cut-off, downlit shielding and be placed to keep light on-site and glare away from adjacent properties, bodies of water, and adjacent roadways. Flashing or intermittent lights are prohibited.
- f. Screening/Landscaping:** A Principal-Use SES shall follow the screening and/or landscaping standards for the zoning district of the project site. Screening shall be maintained throughout the life of the facility including replacing dead vegetation within _____ [e.g., 12] months or at the earliest feasible time of year dependent on the weather. Any screening and landscaping shall be placed outside the perimeter fencing. Screening is not subject to setbacks.
- i. In districts that call for screening or landscaping along rear or side property lines, these shall only be required where an adjoining non-participating property has a dwelling or community building.

Commentary on Sound: In communities with an existing noise ordinance, applying the current noise regulations to small principal-use SES may be the most reasonable and consistent approach. If your jurisdiction does not have a noise ordinance, you may choose to omit this provision or consider adapting language from medium principal-use SES regulations. However, be aware that such provisions might be cost-prohibitive for smaller systems, particularly if the community-wide noise ordinance applies to property lines rather than individual dwellings. When considering noise levels for medium and large principal-use SES, a community should determine the appropriate decibel amount and whether the noise levels will be measured from a property line or a dwelling. The zoning language above provides different options. To review how sound standards for large SES compare across different zoning pathways, see [Table 3](#) on Pages 24-25. Note that PA 233 measures sound from the “outer wall” of a dwelling unit, a location that is not common in most zoning ordinances and that requires relatively complex modeling methodology (see also the MPSC’s approach in the MPSC Application Filing Instructions and Procedures). Instead, it is more common to regulate sound at the property line, though doing so may be more restrictive for projects where there is no existing dwelling unit on a neighboring property.

Commentary on Lighting: The first sentence is consistent with the language in PA 233, Section 226(8)(a)(v). The subsequent sentences provide more detail, which may or may not be workable.

Commentary on Screening: Zoning requirements may impact the ability for the land to be returned to its original use. For example, required berming, substantial vegetative screening, or on-site stormwater detention/retention (which may be regulated by the Drain Commissioner, for example) may need to be removed or altered in order to return the land to its previous use. In considering whether to reduce, waive, or expand vegetation and screening standards, communities should take landowner considerations relating to reuse into account. For large SES, see [Table 3](#) on Pages 24-25 on how screening requirements compare between zoning pathways.

- ii. The _____ [e.g., Zoning Administrator or Planning Commission] may reduce or waive screening requirements provided that any such adjustment is in keeping with the intent of the Ordinance and is appropriately documented (e.g., abutting participating properties; existing vegetation).
 - iii. For Principal-Use SES that are a Special Land Use: When current zoning district screening and landscaping standards are determined to be inadequate based on a legitimate community purpose consistent with local government planning documents, the _____ [e.g., Zoning Administrator or Planning Commission] may require substitute screening consisting of non-invasive deciduous trees planted _____ [e.g., 30] feet on center, and non-invasive evergreen trees planted _____ [e.g., 15] feet on center along non-participating property lines with a dwelling or community building.
- g. Land Clearing:** Land grading or clearing shall be limited to what is minimally necessary for the installation and operation of the system and to ensure sufficient all-season access to the solar resource given the topography of the land. Topsoil distributed during site preparation (grading) on the property shall be retained on-site.
- h. Ground Cover:**
- i. Small and Medium Principal-Use SES shall include the installation of ground cover vegetation maintained for the duration of operation until the site is decommissioned. The applicant shall include a ground cover vegetation and management plan as part of the site plan. Vegetation establishment must include control of invasive plant species [and noxious weeds, if local regulation applies]. The following standards apply:
 1. Sites bound by a Farmland Development Rights Agreement must adhere to state laws and policies applicable to enrolled land.
 2. Ground cover at sites not enrolled must use one or more of the following:
 - a. **Ecovoltaics:** Solar sites shall include pollinator habitat, designed to meet a score of 76 or more on the Michigan Pollinator Habitat Planning Scorecard for Solar Sites. Alternatively, solar sites may utilize conservation cover, designed in consultation with the County Conservation District or other conservation organizations that focus on restoring native plants, grasses, and prairie with the aim of protecting specific species (e.g., bird habitat) or providing specific ecosystem services (e.g., carbon sequestration, soil health).
 - b. **Agrivoltaics:** Solar sites that have been intentionally planned and designed with agricultural producers and/or experts to achieve integrated and simultaneous production of both solar energy and marketable agricultural products throughout the life of the solar project. Agricultural products and activities may happen on land beneath and/or between rows of solar panels and can include crop production, grazing, or animal husbandry. Agricultural activities should commence as soon as agronomically feasible and optimal for the agricultural producer after the commercial solar operation date and continue until decommissioning. Pollinator habitat and apiaries (honey production) are excluded from the definition of agrivoltaics unless they are a temporary transition to another agricultural product.
 3. Land predominantly covered by an existing impervious surface or that is included in a brownfield plan adopted under the Brownfield Redevelopment Financing Act, PA 381 of 1996, as amended, is exempt from ground cover requirements. These sites must comply with the on-site stormwater requirements of the _____ [e.g., local government ordinance, County Drain Commissioner].
 - ii. Large Principal-Use SES: _____. [For a Workable path, see [Table 3](#) on Pages 24-25 to inform options. For CREO or MPSC paths, delete this provision.]

Commentary on Ground Cover: See [Table 3](#) on Pages 24-25 to compare ground cover standards for large SES across different zoning pathways.

- i. **Lot Area:** A Principal-Use SES shall not be subject to minimum or maximum lot area requirements.
- j. **Lot Coverage:** A Principal-Use SES shall not be included when calculating compliance with maximum lot coverage or impervious surface standards for the district.
- k. **Access Drives:** Access drives shall be maintained to enable year-round emergency vehicle access. Access drives shall be designed to minimize the extent of soil disturbance, water runoff, and soil compaction on the premises. The use of geotextile fabrics and gravel placed on the surface of the existing soil for the construction of temporary drives during the construction of the SES is permitted, provided that the geotextile fabrics and gravel are removed once the SES is in operation.
- l. **Environmental Impacts:** Medium and Large Principal-Use SES applications shall consider and address impacts to the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks, historic and cultural sites, and threatened or endangered species.
- m. **Stormwater Management:** Medium and Large Principal-Use SES applications shall consider and address impacts to drainage after consultation with the _____ [e.g., local government stormwater official, County Drain Commissioner].
- n. **Wiring:** SES wiring _____ [may/shall] be placed underground to the extent feasible.
- o. **Signage:** Any signage shall meet the requirements in _____ [reference to district or sign type standard of local government ordinance].
- p. **Repair and Repowering:** In addition to repairing or replacing SES components to maintain the system, a Principal-Use SES may at any time be repowered within the existing project footprint without the need to apply for a new zoning permit or to amend the special use permit.
 - i. A proposal to change the project footprint of an existing SES shall be considered a new application, subject to the ordinance standards at the time of the request.
- q. **Decommissioning:** A Decommissioning Plan is required for any Principal-Use SES at the time of application.
 - i. Prior to the start of construction, that is the on-site delivery of any component of an SES delivered to the site but not including land improvements or site preparation, the Principal-Use SES owner shall enter into a decommissioning agreement, including demonstration of the financial assurance. Every year, the Principal-Use SES owner must submit to the Zoning Administrator proof that the financial assurance requirements are satisfied along with a summary of the power generated for the preceding twelve (12) month period. If any portion of the project is bound by a Farmland Development Rights Agreement and a financial surety is held by the State, the SES owner must submit proof of that surety.
 - ii. An update of the Decommissioning Plan, including a review of the amount of the financial security based on inflation and the current removal costs [not to include salvage value], shall be completed every _____ [e.g., 5] years for the duration of commercial operations or when there is a change of ownership, and shall require approval by the _____ [legislative body]. The amount shall be calculated by a mutually agreed-upon third party with expertise in decommissioning, hired by the

Commentary on Lot Coverage: One of the reasons to exempt SES from maximum lot coverage or impervious surface standards is that there are practical challenges to measuring the overall footprint of principal-use systems, since they may include tilting panels and access drives. Communities that choose not to include this exemption must decide which elements of an SES count/do not count toward lot coverage and make clear how lot coverage should be calculated for co-located systems. If the community's intent through lot coverage regulation is to minimize a development's impervious surface area, these concerns are addressed both through the ground cover and stormwater management plan requirements in this sample ordinance.

SES owner. If any portion of the project is bound by a Farmland Development Rights Agreement and a financial surety is held by the State, the owner _____ [may/shall] deduct this portion from the financial security held by the _____ [township, city, village, county].

- iii. A Principal-Use SES owner may at any time:
 - 1. Proceed with the approved Decommissioning Plan and remove the system after prior notification of the Zoning Administrator, or
 - 2. Amend the Decommissioning Plan with _____ [legislative body] approval and proceed according to the revised plan.
 - iv. A Principal-Use SES that has not produced electrical energy for _____ [e.g., 12] consecutive months shall prompt an abandonment hearing. Decommissioning a Principal-Use SES, in accordance with an approved Decommissioning Plan, must be completed within _____ [e.g., 18 months] after abandonment and must commence in a manner to minimize soil compaction, for example, when the soil is dry, when there is ground cover established, and/or with the use of portable pads for equipment.
- 4. Application Requirements:** Principal-Use SES are not subject to site plan requirements in _____ [reference to the section in your zoning ordinance that includes general site plan requirements] but are instead subject to the following:
- a. **Site Layout and Context:** A site plan at a scale and format that allows details to be clear and legible (e.g., as separate maps, or by showing some areas at a larger scale), showing:
 - i. The location of all solar arrays, the width of arrays and distance between arrays plus total height and height to the lowest edge above grade;
 - ii. The location of existing structures on a participating property;
 - iii. The location of existing dwellings, primary structures, parks, and recreation areas on non-participating properties within _____ [e.g., 600-1,000] feet of the property boundary;
 - iv. Participating and non-participating property lines;
 - v. Setbacks;

Commentary on Decommissioning: This zoning language on decommissioning differs from the requirements of PA 233 for decommissioning large SES facilities permitted by the MPSC. The most significant differences depend on how the blanks in Sections (ii) and (iv) are filled. For example, the financial assurance amount for MPSC-permitted projects is determined after deducting salvage value (ii). Also, a jurisdiction may specify scenarios triggering decommissioning, such as abandonment (iv), or opt for shorter time frames, both of which could impose greater burdens on developers. Additionally, PA 233 requires that financial assurances for large SES facilities be posted in increments staggering over time. If your jurisdiction has policies for abandonment in other land uses, consider applying them to SES. If no such policies exist, consult with your municipal attorney. See [Table 3](#) on Pages 24-25 on how decommissioning standards compare across zoning pathways.

Local governments should also consider how to handle the financial assurance for the portion of the project that is on land that is bound by a Farmland Development Rights Agreement (PA 116). PA 230 requires that the state hold financial sureties for decommissioning the SES, and the sample language above suggests that this portion be deducted from the financial surety held by the local government. However, the local government should have a mechanism to ensure that the financial surety is still being held by the State. For example, if the land is released from PA 116 due to the owner's death, the financial surety may be released, and so the financial surety to the local government should increase. The sample language requires the developer to show annually that the decommissioning sureties held by the local government and the State are in keeping with the decommissioning agreement.

- vi. Ancillary structures and electric equipment, utility connections, and buried or above-ground wiring;
 - vii. Permanent access drives;
 - viii. Details of proposed fencing and signage;
 - ix. Light fixture detail and a placement photometric plan;
 - x. Name, address, and contact information of proposed or potential system installer and the owner and/or operator;
 - xi. Elevation contours of existing terrain and and final grading;
 - xii. Erosion and sedimentation construction plan.
- b. Pre-development Sound Modeling Study:** A study including sound isolines extending from the sound resource(s) to all [property lines and] dwellings on non-participating properties within _____ [e.g., 1,000] feet of the property boundary. A Pre-development Sound Modeling Study is not required for Small Principal-Use SES.
- c. Landscaping and Screening Plan:** Plans for ground cover and screening/landscaping establishment and management. If applicable, a copy of the Michigan Pollinator Habitat Planning Scorecard for Solar Sites should be included.
- d. Land Clearing and/or Grading Plan:** A preliminary plan showing proposed clearing and/or land grading as required for the installation and operation of the system.
- e. Environmental Impact Analysis:** An environmental impact analysis prepared by a third-party qualified professional is required for Medium and Large Principal-Use SES at the time of application to identify and assess any expected direct impacts of the proposed energy facility on the environment and natural resources, including, but not limited to, sensitive habitats and waterways, wetlands and floodplains, wildlife corridors, parks, historic and cultural sites, and threatened or endangered species. The analysis shall identify all appropriate measures to minimize, eliminate, or mitigate adverse impacts identified and show those measures on the site plan, where applicable.
- f. Complaint Resolution Plan:** The plan shall be presented to the planning commission and approved prior to approval of a special land use permit. The plan will describe how the developer receives, responds, and resolves complaints that may arise from the operation of the SES. The plan will describe how mediation or arbitration is used to resolve complaints if needed. The plan shall include appropriate timelines for response and other detailed information (such as forms and contact information). As a condition of filing a complaint, a landowner must allow the _____ [local government] staff or designated agents and SES owner or agents on the subject property for further investigation. A Complaint Resolution Plan is not required for Small Principal-Use SES.

Commentary on Pre-development Sound Modeling Study: Jurisdictions with noise ordinances that apply broadly beyond SES often include sound limits measured from property lines. In jurisdictions without such ordinances, the bracketed text regarding property lines can be omitted. The MPSC has provided guidelines for modeling sound at the "outer wall" of a dwelling on a non-participating property. If this is the measuring location that you chose, you may want to reference that methodology in your ordinance. This methodology does not apply to other measuring locations, such as the property line. See MPSC Application Filing Instructions and Procedures, Attachment D.

g. Stormwater Management Assessment: A stormwater management assessment prepared by a third-party qualified professional is required for Medium and Large Principal-Use SES prior to approval of a special land use permit. The assessment shall _____ [See commentary box below]. The assessment shall describe measures to minimize, mitigate, and repair any drainage impacts and show those measures on the site plan, where applicable. Percolation tests or site-specific soil information shall be provided to demonstrate infiltration on-site without the use of engineered solutions. The Zoning Administrator or Planning Commission may require a stormwater management assessment for a Small Principal Use SES.

h. Decommissioning Plan:

- i. For a Small Principal-Use SES, a decommissioning plan should include a description of which above-grade and below-grade improvements will be removed, retained, or restored for viable reuse of the property consistent with the zoning district.
- ii. For a Medium Principal-Use SES, a decommissioning plan should include:
 - 1. A narrative description of the activities to be accomplished for removing the SES from service, including who will perform that activity and at what point in time, for complete physical removal of all SES components, structures, equipment, security barriers, and transmission lines from the site;
 - 2. A description of which above-grade and below-grade improvements will be removed, retained, or restored for viable reuse of the property consistent with the zoning district;
 - 3. The projected decommissioning costs for SES removal (not to include salvage value in current dollars), soil stabilization, and site restoration, minus the amount of the surety bond posted with the State of Michigan for decommissioning of panels installed on land bound by a Farmland Development Rights Agreement, and how said estimate was determined by a mutually agreed-upon third party with expertise in decommissioning, hired by the applicant;
 - 4. The method of ensuring that funds totaling _____ [e.g., 100–125 percent] of the projected cost will be available for site decommissioning, stabilization, and restoration (in the form of surety bond, irrevocable letter of credit, cash deposit);
 - 5. The method by which the decommissioning cost will be re-evaluated every _____ [e.g., 5] years, for the duration of commercial operations, or when there is a change of ownership. The amount shall be calculated by a mutually agreed-upon third party with expertise in decommissioning, hired by the SES owner.
- iii. For a Large Principal-Use SES: _____. [For a Workable path, see [Table 3](#) on Pages 24-25 to inform options. For CREO or MPSC paths, delete this provision.]

Commentary on Stormwater Management Assessment: Local governments should consider filling in the blank with one of the two following options:

- 1. be prepared in consultation with _____ [e.g., local government stormwater official, County Drain Commissioner].
- 2. take into account the proposed layout of the SES and how the spacing, row separation, and slope affect stormwater infiltration, including calculations for a _____ [e.g., 100 or 500]-year rain event (storm).

ZONING FEES AND ESCROW POLICY

The local resolutions governing permit fees and review costs should be updated to include SES upon adoption of a zoning amendment regulating the use. The Michigan Zoning Enabling Act authorizes the legislative body to adopt reasonable fees for zoning permits.⁹⁷ The permit fee amount must be set by the legislative body to cover the anticipated actual cost of the application review and not more.

To encourage the adoption of solar energy, some communities waive or reduce zoning fees for some types of systems. Within the SolSmart certification program, for example, communities can earn points toward certification by waiving or exempting fees for residential solar permit applications.

For large utility-scale SES, though, a community might consider using escrow funds deposited by the applicant to recover the expense of hiring outside reviewers, such as an attorney, engineer, or planning consultant. An escrow policy provides a mechanism for the community to anticipate the costs associated with reviewing a complex application. Prior to requiring escrow funds for a zoning application review, the legislative body must first adopt an escrow policy by resolution.^{98,99} Among other things, an escrow policy establishes administrative guidelines for spending, replenishing the escrow below a certain balance, and returning remaining funds.

Some communities require a performance guarantee for small and large principal-use SES for the cost of grading and on-site ground cover establishment in the form of a bond, letter of credit, or establishment of an escrow account. The rationale is that if a site is cleared of vegetation and graded, but the project is not completed, there is a financial guarantee that the site will be stabilized. Such a provision may be redundant with Soil Erosion and Sedimentation Control (SESC) bonding requirements for projects larger than one acre.

There is some dispute about whether or not developers of principal-use SES need to obtain building, electrical, or mechanical permits under the Michigan State Construction Code. Communities should consult with their municipal attorney in that regard.

97 Michigan Legislature. (2006). Michigan Zoning Enabling Act, PA 110 of 2006, MCL 125.3406. <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-act-110-of-2006>

98 *Forner v. Allendale Charter Township*: Michigan Court of Appeals, 2019 Mich. App. LEXIS 576, 2019 WL 1302094 (March 21, 2019, Decided), Unpublished Opinion No. 339072. <https://www.michbar.org/file/opinions/appeals/2019/032119/70094.pdf>

99 Michigan Legislature. (1947). Charter Township Act, PA 359 of 1947. <https://legislature.mi.gov/Laws/MCL?objectName=MCL-ACT-359-OF-1947>; and Revised Statutes of 1846. <https://legislature.mi.gov/Laws/MCL?objectName=MCL-R-S-1846-41-1-16>

OTHER PERMIT PROCESSES

In addition to zoning approval, developers may need to get a number of other permits. The planning commission may serve in a coordinating role to ensure additional required permits are obtained. For example, the application may include mitigation measures to minimize potential impacts on the natural environment, including but not limited to wetlands and other fragile ecosystems, historical sites, and cultural sites. Solar energy developments may require permits from other agencies, including:

- Department of Environment, Great Lakes, and Energy (EGLE) if the project affects waters of the state, such as wetlands, streams, or rivers.¹⁰⁰
- U.S. Fish and Wildlife Service (USFWS) for the Endangered Species Act or migratory flyways.¹⁰¹
- Federal Aviation Administration (FAA) for projects on or within the vicinity of an airport with air traffic control personnel, if applicable.¹⁰²
- Municipal or County Soil Erosion Permitting Agency if the project is one or more acres in size or is within 500 feet of a lake or stream.¹⁰³
- County Drain Commissioner, if applicable.
- Assessor or Zoning Administrator for land division approval if leasing less than 40 acres or the equivalent for more than one year.¹⁰⁴
- Building Department for required building, electrical, and mechanical permits, to the extent applicable.¹⁰⁵
- Local Airport Zoning, for projects within 10 miles of a local airport.^{106,107}

100 Michigan Legislature. (1994). Parts 301 and 303 of the Natural Resources and Environmental Protection Act, PA 451 of 1994. <https://legislature.mi.gov/Laws/MCL?objectName=MCL-451-1994-III-1-INLAND-WATERS>

101 Federal laws administered by the USFWS: Endangered Species Act (ESA); Bald and Golden Eagle Protection Act (BGEPA); Fish and Wildlife Coordination Act (FWCA). <https://www.fws.gov/page/energy-permits-policies-and-authorities>

102 Part 77 (Airspace Review) of Title 14 of the Code of Federal Regulations. <https://www.federalregister.gov/documents/2021/05/11/2021-09862/federal-aviation-administration-policy-review-of-solar-energy-system-projects-on-federally-obligated>

103 Soil Erosion and Sedimentation Control Program (SESC). <https://www.michigan.gov/egle/about/organization/water-resources/soil-erosion/sesc-overview>

104 Michigan Legislature. (1967). Michigan Land Division Act, PA 288 of 1967, definition of “Division”—MCL 560.102(d). <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-560-102>

105 There is some dispute about whether developers of principal-use SES need to pull building, electrical, or mechanical permits under the Michigan State Construction Code. If the project is owned by a regulated utility, then local building and electrical permits may not be required, but projects are instead regulated by the MPSC. See Stille-Derossett-Hale Single State Construction Code Act, PA 230 of 1972, MCL 125.1502a(1)(bb). <https://legislature.mi.gov/Laws/MCL?objectName=MCL-125-1502A>; and 2015 Michigan Building Code, 1.105.2.3 Public Service Agencies. <https://www.michigan.gov/en/lara/bureau-list/bcc/rules-acts/codes/code-books>.

106 Michigan Legislature. (1950). Airport Zoning Act, PA 23 of 1950. <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-Act-23-of-1950-Ex-Sess->

107 Michigan Legislature. (2006). Michigan Zoning Enabling Act, PA 110 of 2006, MCL 125.3203. <https://www.legislature.mi.gov/Laws/MCL?objectName=mcl-125-3203>

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The Michigan Department of Environment, Great Lakes, and Energy (EGLE) protects Michigan's environment and public health by managing air, water, land, and energy resources.

More information on how communities can plan for, regulate, and reduce barriers to SES is available through numerous Michigan agencies, universities, and organizations. Additional resources on solar energy, renewable energy, energy storage, and planning and zoning in Michigan are available from the Center for EmPowering Communities, MSU Extension, and the Michigan Department of Environment, Great Lakes, and Energy.



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