

SOLAR FARMS

- **Setbacks**

- Lot lines 150'
- Environmental corridors
- Residences 275'
- Road ROW & centerline

NOTE: CHISAGO COUNTY DEVELOPER
PURCHASED SURROUNDED HOMES- AVG.
\$84,000 LOSS

inverters - minimum 500' from lot lines (need to be 500' from residences to ensure no

- **Height/size limitations**

broadcast tv interference based on Badger Hollow application)

- Maximum height 8-10'
- Impervious service
- Minimum/maximum acreage 800 acres
- Percentage/portion of A-1 property/parce/lot that is allowed to be developed as solar farm

- **Buffer zone and/or fencing around solar farm required?**

- Minimum buffer zone size requirement
- Specifications for vegetative buffer (e.g. types of trees/shrubs, minimum height of vegetation, location, when required) there should be a specific plan for each residence on view of the
- Height of fencing project- not fair to require property owners to negotiate themselves
- Fencing material deer fencing - not chain-link and barbed wire

- **Drainage**

- Drainage ditches
- Approval from drainage board

- **Construction**

- Grading of land to place solar panels
- Tree removal see Chisago Cty ordinance

- **Glare**

- Keeping projected glare away from homes

- **Noise**

- Maximum dBA levels 35dB
- Noise cancellation/suppression practices

- **Lifespan of farm**

- Removal of panels/farm after lifespan is over
- To be returned to tillable farm land
- Timeline for removal
- Who pays for removal

sides of a property surrounded - 2 maximum but then setbacks should be 250' from lot line
view - not sited on hillsides surrounding homes or where a home would look at a "sea" of panels

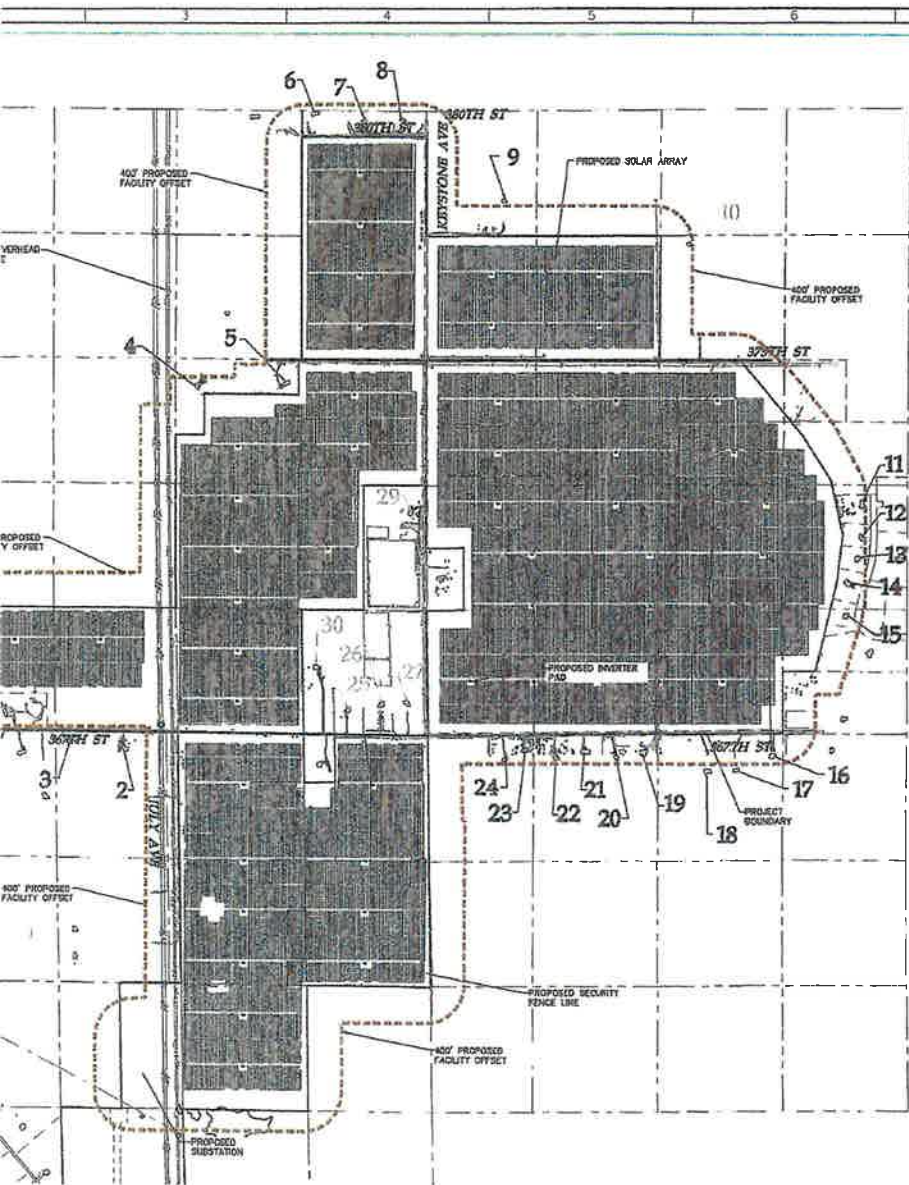
SOUND LEVELS	DECIBEL EFFECTS	dB	SPEECH	COMPARITIVE EXAMPLES OF NOISE LEVELS
Loudest sounds possible	Permanent hearing impairment/loss	134	Speech impossible	Shock waves
Draffening sounds	Eardrum rupture	130	Speech impossible	Pistol Jet take-off in runway Cap gun
	Possible immediate hearing impairment/loss	140	Speech impossible Nausea felt after a few minutes	Aircraft carrier deck Rifle Fire cracker
	Pain threshold Eardrum vibration	130	Loudest recommended exposure with hearing protection	Propeller aircraft Balloon popping Jackhammer
	Discomfort threshold Painfulness (32 times as loud as 70dB)	120	Speech possible Maximum vocal effort	Oxygen torch Pneumatic hammer Thunderclap
Extremely loud sounds	Average human pain threshold (16 times as loud as 70 dB)	110	Speech possible but impossible to understand	Live rock music Riveting machine
Very loud sounds	Serious hearing impairment in 8 hr exposure (8 times as loud as 70 dB)	100	Speech possible but impossible to understand	Power lawn-mover Disco
	Likely hearing impairment in 8 hr exposure (4 times as loud as 70 dB)	90	Conversation almost impossible	Motorcycle, Diesel truck Food blender Noisy factory, Construction site
	Possible hearing impairment in 8 hr exposure (2 times as loud as 70 dB)	80	Conversation difficult	Freight train at a distance of 15 m Whistle, Hair-drier Average factory, Milling machine
Loud sounds	Arbitrary base of comparison (annoyingly loud noise over 70 dB)	70	Conversation possible but with raised voice	Vacuum-cleaner Shower, Piano practice Heavy street noise
Low sounds	No detrimental effects (1/2 as loud as 70 dB)	60	Conversation in restaurant	Business office Laser/Inject printer Light street noise
	No detrimental effects (1/4 as loud as 70 dB)	50	Conversation at home	Refrigerator Moderate rainfall Quiet suburbs
Faint sounds	No detrimental effects (1/8 as loud as 70 dB)	40	Quiet conversation	Library Private office Lowest limit of urban ambient sound
Very faint sounds	No detrimental effects (1/16 as loud as 70 dB)	30	Whisper	Bedroom Very quiet rural area
	No detrimental effects	20	Barely audible sounds	Empty theatre Watch ticking Mosquito
Quiet sounds	No detrimental effects	10	Barely audible sounds	Normal breathing Pin drop falling from 1 centimetre, heard in a distance of 1 meter Rustling leaves
Weakest sounds possible	No detrimental effects	0	Silence	

Operational Noise Sources

Noise sources associated with the operation of the Project include 125 inverters located throughout the Project site, approximately 3,150 solar tracker motors on the site, and two 105/140/175 MVA transformers located central to the site. Table 5-2 lists the sound power levels for each source. The overall sound power level for the inverters was based on data for the SMA 2.5 MW Inverter – Model SC2200. This model was selected for modeling because it is louder than the HEM 3 MW inverter that is the current base case model being considered for use in the project. Although smaller at 2.5 MW each, inclusion of this inverter model in the sound modeling was done to produce conservative results. The solar tracker motor overall sound power level was provided by the manufacturer, and we assumed a typical electrical motor spectrum. The sound power levels of the transformers were estimated using the procedures outlined in NEMA TR 1-1993 and IEEE C57.12.90-1993. The inverters and transformers were modeled at 10 feet above the ground, and all solar tracker motors were modeled at approximately four feet above the ground. It was assumed that all operational equipment would be in use at all times, with the solar trackers operating according to the schedule described in Section 7 below. It was also assumed that the inverters would be operating at full power.

Table 5-2. Noise Emission Factors for Full Operation of the Project

Equipment Type (quantity)	Usage Factor (%)	Octave-Band Sound Power Level (dB)									Overall Sound Power Level (dBA)
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz	
Solar Inverter (125)	100	–	86	87	89	88	83	81	86	75	91
Solar Tracker Motor (~ 3,147)	100	54	71	69	69	66	65	64	63	59	71
Transformer (2)	100	95	101	103	97	98	92	86	82	75	98



LEGEND:

- 400' PROPOSED FACILITY OFFSET
 - DENOTES HOUSES WITH IN APPROXIMATE FACILITY OFFSET (30 TOTAL)
 - PROPOSED SOLAR ARRAY
 - PROPOSED SUBSTATION LOCATION
 - PROPOSED ACCESS ROAD
 - PROPOSED INVERTER PAD
 - PROPOSED SECURITY FENCE LINE
 - EXISTING FENCE LINE
 - EXISTING OVERHEAD POWER
 - SECTION LINE
 - EXISTING PARCEL LINE
- PROJECT LOCATION:
 LAT: 46.4940
 LON: -92.8993

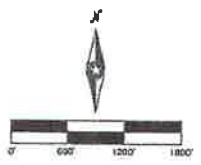


Designed:	MTM
Checked:	CCV
Drawn:	MTM
Scale Drawing System:	
Project No.:	160400000

Prepared For:
NORTH STAR SOLAR PV LLC
 Three Radnor Corporate Center - Suite 200
 120 Malsomford Road
 Radnor, PA 19087

North Star Solar Project
 Chisago County, MN

Final Landscape Buffer
 Plan & Section
 Cover Sheet



Date: 02/18/16
 Drawing No: C-900



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Designer	JTM
Checker	GM
Drawn	WTC
Scale/ Drawing Type	
Revision	
Project No.	160407101

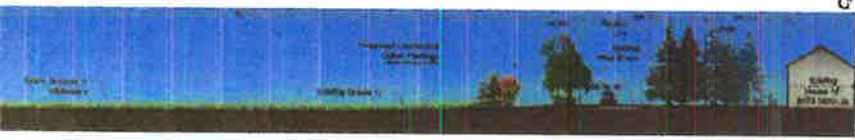
Prepared for
NORTH STAR SOLAR PV LLC
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 Radnor, PA 19087

LEGEND:
 [Solid Line] PROJECT BOUNDARY
 [Dashed Line] INSET PLAN LOCATION
 * HOUSE LOCATION

Buffer Planting Materials

SIZE	SPACING O.C.	MATURE HEIGHT
6" JET SET	As shown	30'-35'
1.5" JET SET	As shown	30'-35'
1.5" COFFY	8'-12' O.C. TYP.	8'-10'

IN THE EVENT OF A DISCREPANCY,



North Star Solar Project
 Chisago, MN

Final Landscape Buffer Plan & Section:
 9675 567th St.

Date: 02/18/16
 Drawing No: C.803

DRAFT Public Participation Plan

Jefferson County Comprehensive Plan and Agricultural Preservation and Land Use Plan

A successful Comprehensive Plan is one that weaves participation from residents and stakeholders throughout the entire project duration and is built from the input that is received through all phases. This Public Participation Plan represents the process that was designed to gather input from the public to inform all phases of the plan development. The plan outlines the goals for the participation process, the target audience, the notification requirements, and the specific outreach efforts.

Background

Jefferson County has embarked on a process to update its Comprehensive Plan and Agricultural Preservation and Land Use Plan. The current Jefferson County Comprehensive Plan sets the vision and positioning framework to guide decision making in Jefferson County. The plan was updated in February of 2012 to incorporate the Agricultural Preservation and Land Use Plan. This plan outlines the County's vision and goals for the preservation of agricultural land and future development decisions.

The updates to these two planning documents will provide guidance for County decision making based on updated vision statements, goals, objectives, and policies. Broadly, the planning efforts will focus on the following nine plan elements:

- Issues and Opportunities
- Housing
- Transportation
- Community Facilities and Utilities
- Agricultural, Natural and Cultural Resources
- Economic Development
- Intergovernmental Cooperation
- Land Use Plan and Regulations
- Implementation

GOALS

Public participation is a critical component of the Jefferson County Comprehensive Plan and Agricultural Preservation and Land Use Plan. The public participation goals for the long-range planning process include:

- Broad community engagement, connecting with stakeholder groups and the public throughout Jefferson County.
- An open and inclusive process.
- Receive guidance for how the county should grow and use land.
- Educate and inform the public about the Comprehensive Plan and Agricultural Preservation and Land Use Plan.

- Provide accessible opportunities for public participation, including meeting locations that are accessible for all and the provision of materials for those with disabilities as requested.
- Facilitate dialogue among the public, business owners, the County, local municipalities and other stakeholder groups to identify issues and craft policy solutions.

The engagement phases and strategies described below are intended to support these goals.

TARGET AUDIENCE

All residents of Jefferson County are actively encouraged to participate in the long-range planning process. Outreach efforts will be tailored to engage with all demographics and geographic areas of Jefferson County. This will include publishing the notice of upcoming events in many platforms (described on page 6). Additionally, engagement with the local municipalities throughout Jefferson County will be a key component of the plan's development. Overall, the participation plan is devised to provide accessible engagement options for all Jefferson County community members.

OUTREACH PROCESS

There are five phases of community outreach:

1. Steering Committee
2. Data Collection
3. Intergovernmental Interviews
4. Plan Analysis
5. Draft Plan Review

STEERING COMMITTEE

A Steering Committee will be used to guide the overall planning process. This group of residents and stakeholders is charged with providing input, reviewing documentation, and promoting the Comprehensive Plan and Agricultural Preservation and Land Use Plan.

The Steering Committee will be comprised of 18 individuals representing County and municipal leaders, residents, business/property owners, and other County stakeholders. The specific functional areas include:

- Planning and Zoning Committee Members (2)
- County Board Supervisor at-large
- Developer/Real Estate/Builder
- Large Agriculture Producer
- Small Agricultural Producer
- Environmental
- Tourism
- Business (Chair of Thrive)
- City
- Village
- Township (3)

**Jefferson County Comprehensive Plan and Agricultural Preservation and Land Use Plan
Public Participation Plan - DRAFT**

- K-12 Education
- Post-Secondary Education
- Non-Profit Entity
- Health/Human Services

The group will meet four times during the planning process at key milestones. The anticipated agenda items are outlined in the following table.

Steering Committee Meetings	Anticipated Agenda
1. Project Kick-Off	Discuss scope and approach Review public engagement plan Discuss existing conditions review Review online engagement tool
2. Early Public Engagement Review	Review public input from Data Collect Phase Visioning Exercises/SWOT Analysis Review County Context Report
3. Mid-Project Review	Review land use plan scenarios Review Focus Group meeting input Discuss plan element strategies Review Implementation Plan elements Prepare for 2 nd round of Focus Groups
4. Draft Plan Review	Review final draft plan

Materials will be provided to Steering Committee members at least a week in advance of each meeting for review. The Steering Committee may also be asked to review and comment on materials outside of scheduled meetings as deliverables are prepared.

DATA COLLECTION PHASE

The Data Collection Phase includes outreach and engagement efforts for gathering data and identifying issues. The engagement strategies employed in this phase include:

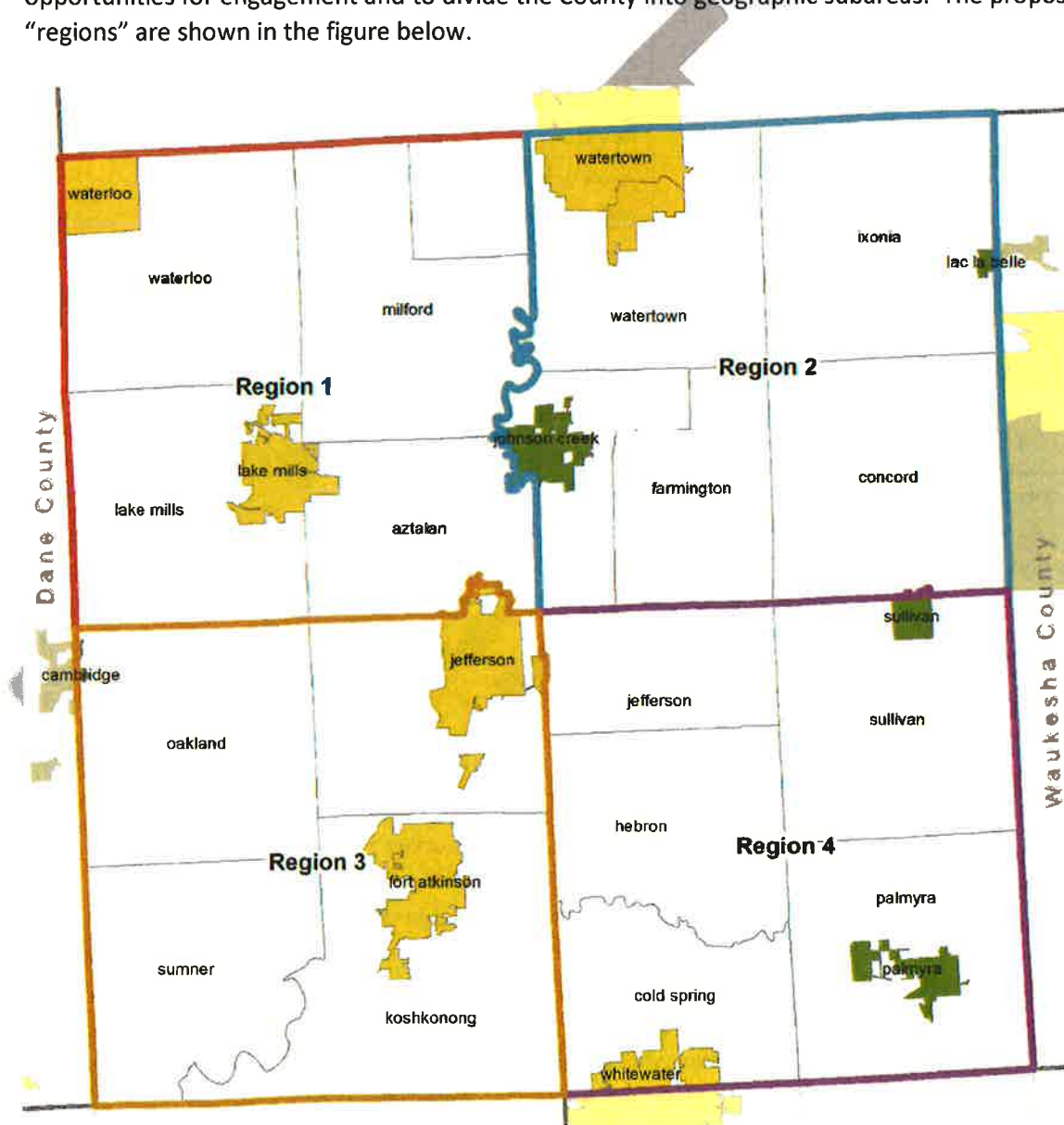
- **Online Community Survey** – An online community survey provides an opportunity to gain a wide range of feedback from residents about the strengths and weaknesses within an area. The survey will include questions that will gather input to guide the development of an overall vision for the plan, along with the goals and policies specific to each plan element. The Steering Committee will assist in the review and refinement of survey questions at their first meeting.

The survey will be hosted online via SurveyMonkey (or similar format) that can be accessed by residents on their phones, tablets or computers. Paper copies of the survey will also be created and available for those without internet access. Jefferson County will collect paper responses that will be entered into the online system.

**Jefferson County Comprehensive Plan and Agricultural Preservation and Land Use Plan
Public Participation Plan - DRAFT**

- **Regional Meetings** – Regional meetings will be held in the Data Collection phase to introduce residents and stakeholders to the planning process and gain initial feedback about the strengths and weaknesses within Jefferson County. The meeting will be held over a 2-hour window and will include a presentation to the group along with small group engagement activities. These activities will include a range of individual questionnaires, group discussion, dot mocracy exercises, and mapping activities.

The meetings will be held in four locations throughout the County to provide multiple opportunities for engagement and to divide the County into geographic subareas. The proposed “regions” are shown in the figure below.



All Jefferson County residents will be encouraged to participate in these engagement activities that will help identify needs and issues pertaining to planning for the future of the county.

INTERGOVERNMENTAL INTERVIEWS PHASE

Collaboration with the individual municipalities within Jefferson County is important for the long-range planning process. These interviews provide an opportunity to understand the opportunities and challenges of each local jurisdiction and to discuss their long-range planning goals. Each jurisdiction will be invited to an interview with the planning team to discuss the planning process, items that should be considered, and opportunities to improve or strengthen intergovernmental cooperation.

PLAN ANALYSIS PHASE

The Plan Analysis Phase is intended to present initial findings of the long-range planning process to County stakeholders. This will include two rounds of engagement – focus groups and regional meetings. The engagement during this phase will focus specifically on the draft goals and policies for various plan elements, along with a review of the future condition for the County systems.

- **Focus Group Meetings** – The first engagement effort for this phase will include five (5) focus group meetings specific to elements of the plan. The intent of these meetings is to provide a review of the draft vision and goals of the plan element, discuss the existing conditions, policies and regulations, and collaborate on opportunities for the future of the topic at hand. The meetings may focus on the following topics (final topics will be discussed with County staff):
 - Housing
 - Transportation Facilities
 - Community Facilities & Utilities
 - Agricultural, Natural & Cultural Resources
 - Economic Development
 - Intergovernmental Cooperation
 - Land Use Plans & Regulations

A group of individuals will be invited to each focus group that represent the range of interests specific to a topic. For example, a housing focus group meeting should include individuals with interests ranging from large lot single-family homes to the provision of workforce housing, and everything in between). At least 12 individuals will be invited to each focus group meeting. The specific invitees and topics will be determined by County staff.

- **Regional Meetings (Round 2)** – A second round of regional meetings will be held during the Plan Analysis Phase to provide residents and stakeholders with an update of the plan findings. These meetings will be held after the focus group meetings, to allow the findings to be incorporated into the plan deliverables and findings. These meetings will use an open house format, allowing attendees to engage with the topics that interest them. The regions described in the Data Collection Phase will also be used for these meetings.

DRAFT PLAN REVIEW PHASE

The Draft Plan Review Phase provides an opportunity for community members to provide feedback on the draft plan, followed by the adoption of the plan. In this phase, engagement opportunities include:

- **Draft Plan Open House** – An open house will be held to review and collect comments on the draft Comprehensive Plan and Agricultural Preservation and Land Use Plan. The draft plans will

be released for review via the County’s website with hard copies available at the Jefferson County Courthouse prior to the open house. The open house meeting will provide an opportunity for residents and stakeholders to engage with staff about the plan and provide feedback. The information received during this meeting will be reviewed and incorporated into the final plan as warranted.

- **Planning Commission Public Hearing** – Following the review of the draft plans by the public, Steering Committee, and County staff, the plans will be finalized for adoption by Jefferson County. A public hearing of the Planning Commission will be scheduled to discuss the plan and to provide a recommendation for approval to the County Board. The proper notification requirements for a public hearing of the Planning Commission will be filed according to County ordinances.
- **County Board Public Hearing** – Following action of the Planning Commission, a public hearing of the County Board will be scheduled for the final adoption of the Comprehensive Plan and Agricultural Preservation and Land Use Plan. The proper notification requirements for a public hearing of the County Board will be filed according to County ordinances.

NOTIFICATION PROCESS

Proposed public notification methods include:

- **Notice of Intent** - A published notice by the County announcing the beginning of the process for updating its Comprehensive Plan and Agricultural Preservation and Land Use Plan.
- **Plan Webpage** - (www.JeffersonCountywi.gov) The establishment of the Jefferson County Comprehensive Plan and Agricultural Preservation and Land Use Plan webpage, used for updates, community engagement, and the posting of materials.
- **Printed Materials and Press Releases** – Newspaper advertisements and press releases will be created and distributed for each of the public meeting opportunities. The notices will be released at least two weeks prior to the event.
- **Social Media** - Utilizing the County’s existing social media platforms, information about the planning process and upcoming public engagement events will be shared to followers.
- **Online Survey** - A survey developed to solicit community feedback for Comprehensive Plan development. The survey will be sent out via County communications channels to connect with as many community members as possible.

MEETING ACCESSIBILITY

The project team will provide convenient engagement opportunities to the maximum extent practicable. All public engagement locations will feature ADA accessible facilities. Meeting materials and presentations will be presented in clear and accessible language. Specific accommodations can be made by contacting Jefferson County in advance of the meeting.

INFORMATION AVAILABILITY

Information about the plan development will be available throughout the planning process via the plan webpage and social media platforms. Contact information for County and Consultant staff will also be available for additional questions and comments from stakeholders and residents.