



An excerpt from ATC's 2010 10-Year Transmission System Assessment
An annual report describing economic and regional solutions to electric reliability needs



Zone 2 Michigan's Upper Peninsula and Northern Wisconsin

- ALGER, MICH.
- BARAGA, MICH.
- CHIPPEWA, MICH.
- DELTA, MICH.
- DICKINSON, MICH.
- FLORENCE, WIS.
- FOREST, WIS. (northern portion)
- GOGEBIC, MICH. (eastern portion)
- HOUGHTON, MICH.
- IRON, MICH.
- KEWEENAW, MICH.
- LUCE, MICH.
- MACKINAC, MICH.
- MARINETTE, WIS. (northern portion)
- MARQUETTE, MICH.
- MENOMINEE, MICH. (northern portion)
- ONTONAGON, MICH. (eastern portion)
- SCHOOLCRAFT, MICH.
- VILAS, WIS. (northern portion)





Helping to **keep the lights on,**
businesses running and communities strong®

Economics, renewables increasingly in focus

Planning for regional solutions

American Transmission Co. was formed in 2001 to plan, permit, build, own, operate and maintain a high-voltage electric grid that meets the reliability and economic needs of our customers. Our planners continually conduct engineering studies on the electric transmission system, looking for potential problems that may affect future performance. Our studies identify and prioritize future projects needed to improve the adequacy and reliability of the system and meet evolving public priorities.

After nearly 10 full years of operation and \$2.2 billion in new and upgraded infrastructure investment, electric system reliability remains our top priority. But looking forward, we see an increasing need for an expanded regional transmission system. Consequently, our planning focus has broadened to consider projects that provide economic and public policy benefits as well. Several factors, including the emerging wholesale market and federal and state policy, play a larger role in our planning process today than they did when we first began operation in 2001.

The majority of the grid's regional interconnections were made in the late 1950s through the early 1970s to accommodate local reliability needs. Nationally, the transmission system was not designed to accommodate the expanded energy flows required by the current wholesale marketplace.

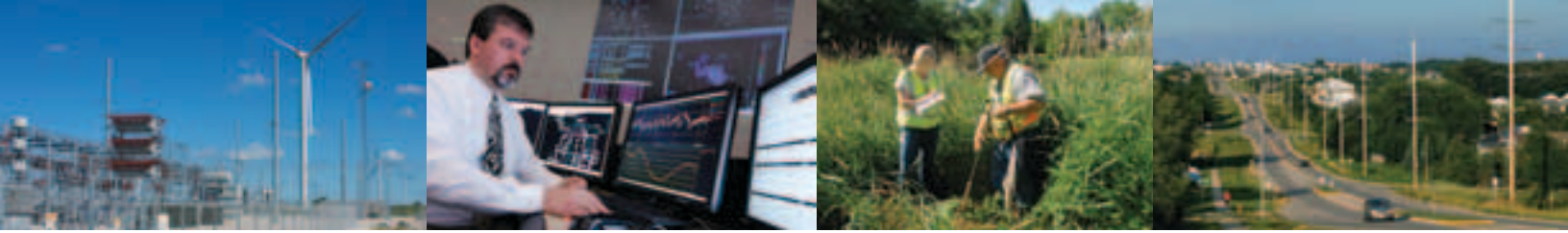
Renewable portfolio standards also call for a more robust regional grid to move power from wind-rich areas west of Wisconsin to population centers where the electricity is consumed. The changed marketplace and increasing importance of renewable energy sources necessitate a broader view of the system, which influences planning policies and studies.

Since our inception, load growth and operational issues were the primary drivers for transmission improvements, and planning studies were conducted accordingly. Today, finding a way to build the system to allow states to meet their renewable energy standards and getting the full benefit of the Midwest ISO market for ATC customers have become more significant transmission needs. We continue to collaborate with customers and other stakeholders to plan best-value projects that meet system needs and provide multiple benefits.

The 2010 Assessment covers the years 2010 to 2019, and for the second year, we have included asset renewal projects through the full 10-year horizon. Our studies indicate \$3.4 billion in necessary transmission system improvements. The total includes \$1.0 billion for transmission network upgrades, \$0.7 billion for regional multi-value projects, along with \$1.7 billion in interconnection and asset renewal projects, infrastructure replacement and relocation, and other smaller network reliability improvements.

Cost estimate of system improvements

	2006	2007	2008	2009	2010
Total 10-Year Capital Cost	\$3.1B	\$2.8B	\$2.7B	\$2.5B	\$3.4B



Michigan's Upper Peninsula and Northern Wisconsin – Zone 2

Electric System Overview

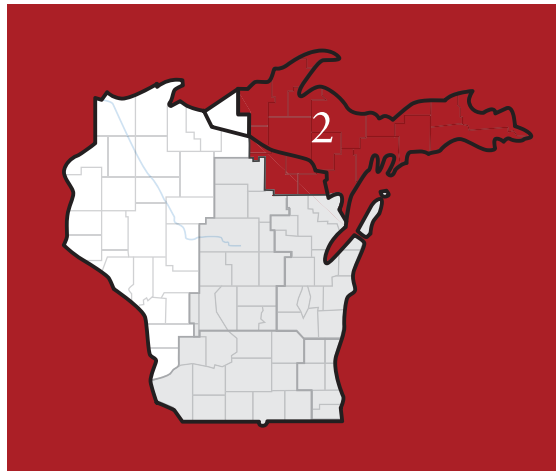
Small increases in population, employment

Population in Zone 2 is projected to grow about 0.2 percent annually between now and 2020, and employment is expected to grow about 0.8 percent each year in the same time period. Marquette County, Mich., is projected to realize the largest increase in employment, while Luce County is projected to have the highest growth rate.

Electricity usage growing

Zone 2 typically experiences peak electric demands during the winter months. Ore mining and paper mills are the largest electricity users in the zone.

Electric load is projected to increase by 0.75 percent annually through 2019.

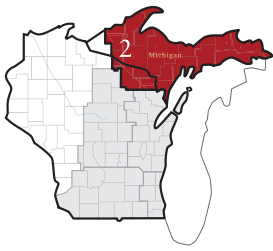


www.atc10yearplan.com



Transmission is the vital link in bringing power to communities

Transmission lines move electricity at high voltages over long distances – from power plants to communities where local utilities deliver power to homes and businesses via distribution lines. A reliable transmission network provides access to many sources of power, whether they are local or regional. Having multiple paths to get power from producers to consumers lessens the chance that they will experience service interruptions. With an increasing emphasis on renewable energy, transmission system planning will become even more important to put the power of wind on the wires.



System Limitations Michigan's Upper Peninsula and Northern Wisconsin – Zone 2

Transmission system characteristics of Zone 2

ATC delivers power in Zone 2 through various transmission facilities including:

- Morgan-Plains and Plains-Dead River 345-kV lines,
- Plains-Stiles 138-kV double-circuit line,
- Conover-Plains 138-kV line, and
- 138-kV facilities tying the Upper Peninsula of Michigan to the Lower Peninsula.

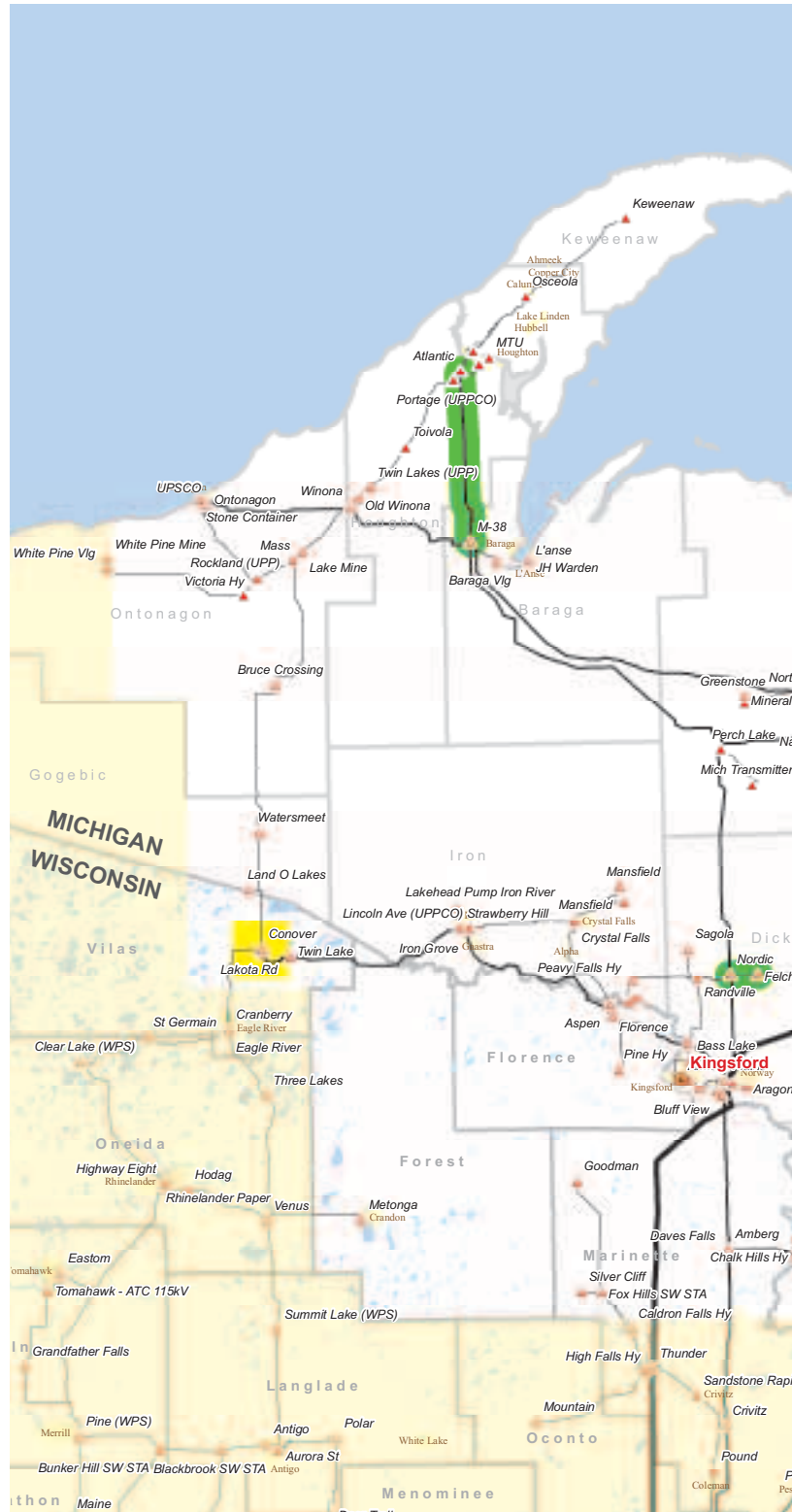
There are a number of transmission system performance issues in Zone 2 including limited ability to import or export power, generator instability, overloaded lines and equipment, low system voltages and chronic limitations to transmission service. Primary drivers of these issues include a mismatch of load to generation in the Upper Peninsula and aging facilities in poor or obsolete condition.

Our recently completed Northern Umbrella Plan projects (Cranberry-Conover-Plains) began to address some of the identified issues, but efforts to upgrade the area are ongoing. To vet our planning assumptions for the intermediate- and long-term periods, we've engaged stakeholders in a collaborative process (known as the ATC Energy Collaborative – Michigan) to examine the bounds of several plausible futures. Please refer to www.atc10yearplan.com, ATC Energy Collaborative – Michigan for details.

Transmission system limitations in Zone 2

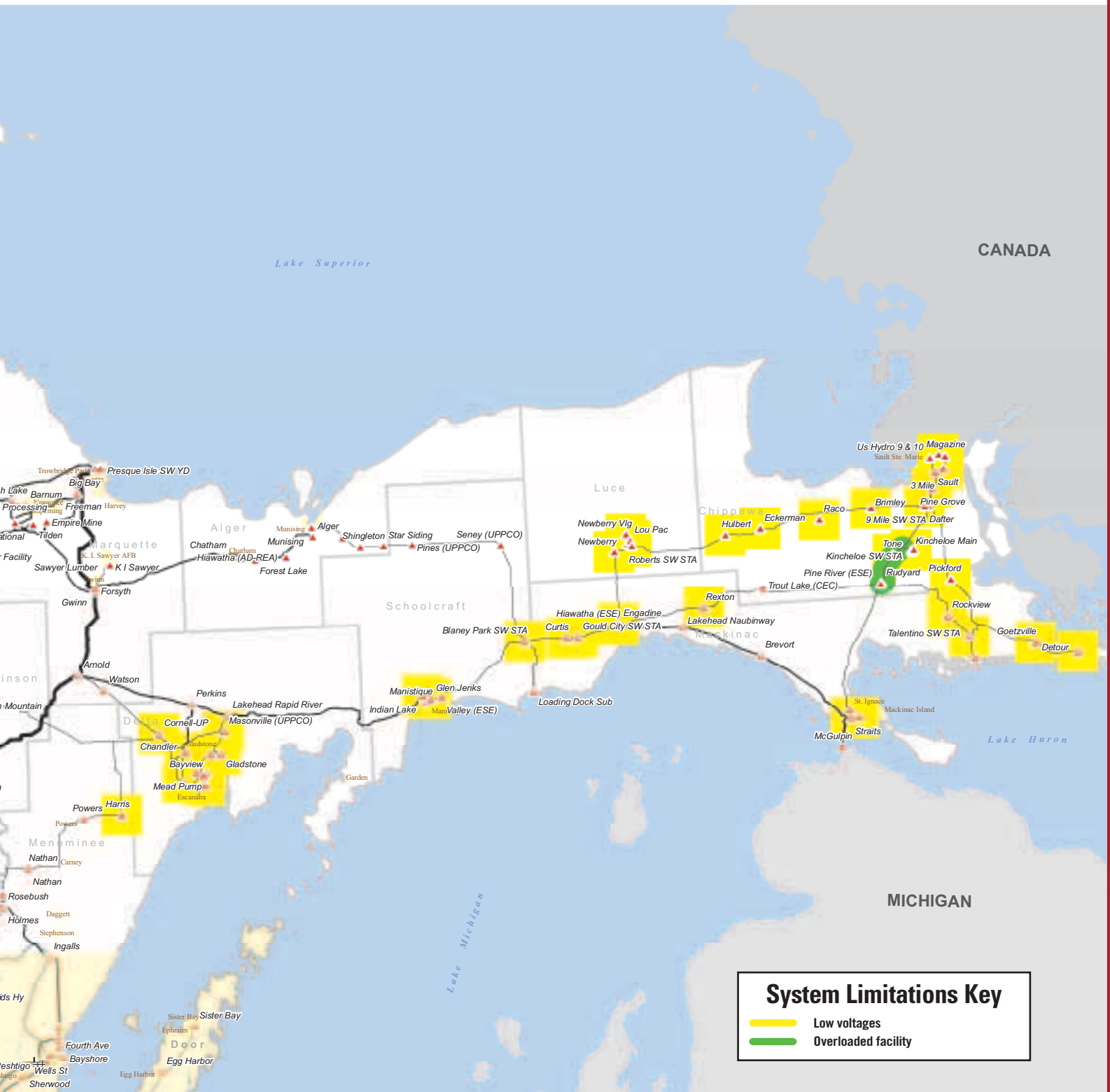
In the analysis of Zone 2, we identified low voltages, transmission facility overloads and transmission service limitations. In addition, heavily loaded facilities during off-peak periods, especially when the Ludington Pumped Storage Facility in Lower Michigan is pumping, continue to keep the system working with very small operating margins.

The potential for generation at Presque Isle Power Plant becoming unstable after certain disturbances to the transmission system has been a long-standing limitation and the reason for an automated tripping scheme in place at the plant. We are continuing to evaluate alternatives to this complex scheme. As part of the ATC Energy Collaborative – Michigan, we are also evaluating potential generation retirement scenarios. Please refer to www.atc10yearplan.com, ATC Energy Collaborative – Michigan for details.



Zone 2 includes the counties of:

ALGER, MICH.	DICKINSON, MICH.	HOUGHTON, MICH.	MACKINAC, MICH.	MENOMINEE, MICH. (northern portion)	SCHOOLCRAFT, MICH.
BARAGA, MICH.	FLORENCE, WIS.	IRON, MICH.	MARINETTE, WIS. (northern portion)	VILAS, WIS. (northern portion)	
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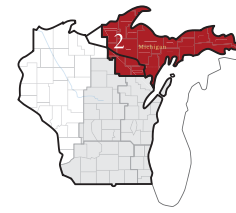


System Limitations Key

- Low voltages
- Overloaded facility

Transmission projects in Zone 2

Michigan's Upper Peninsula and Northern Wisconsin – Zone 2



Transmission projects in Zone 2

We have implemented ten projects in Zone 2 since the 2009 Assessment, most notably the rebuild and conversion of the Conover-Plains 69-kV line to 138-kV operation.

Our current plans in Zone 2 include 18 system reliability and economic projects between 2010 and 2024. These projects are in various stages of development. The most notable planned, proposed, provisional and asset renewal projects in Zone 2, along with their projected year of completion and the factors driving the need for the projects, are listed right.



System Solutions Key

SUBSTATION KEY

- SS** New substation
Supports transmission system expansion
- SM** Substation modifications
Upgrades equipment ratings to avert facility overload
- T** Transformer
Supports local growth and improves voltage levels
- C** Capacitor bank or reactor
Relieves low voltages or high voltages
- T-D** T-D interconnection
Supports local growth

TRANSMISSION LINE KEY

- 345-kV transmission line
- ▬ 115-, 138- or 161-kV transmission line
- ▬ Rebuilt 115- or 138-kV transmission line
- ▬ Transmission line voltage conversion
- ▬ 69-kV transmission line
- ▬ Rebuilt 69-kV transmission line

EXISTING TRANSMISSION LINES KEY

▬ 69 kV	▬ 161 kV
▬ 115 kV	▬ 230 kV
▬ 138 kV	▬ 345 kV

	Project description	In-service year	Need driver
Proposed projects			
1	Install reactors at Straits Substation	2010	High voltages
2	Straits-Pine River double-circuit 69-kV line rebuild	2014	Overloads and low voltages
Provisional projects			
3	Install power flow control at Straits 138-kV Substation	2014	Addresses/controls flow across eastern U.P., overloads and low voltages
4	Construct Chandler-18th Road double-circuit 138-kV lines	2014	Overloads and low voltages
5	Uprate Munising-Seney-Blaney Park 69-kV line	2014	Overloads, low voltages, condition and performance
6	Uprate and asset renewal of Pine River-Nine Mile 69-kV line	2016	Overloads, condition and performance
7	Increase ground clearance of M38-Atlantic 69-kV line and asset renewal	TBD	Overloads, low voltages, condition and performance
Asset Renewal projects			
8	Nine Mile-Roberts 69-kV line rebuild	2011	Condition and performance
9	Forsyth-Munising 138-kV line re-insulate	2012	Condition and performance
10	Gwinn-Munising 69-kV line rebuild	2013	Condition and performance
11	Straits-McGulpin 138-kV lines submarine cable replacements	2020	Condition and performance





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Helping to **keep the lights on**, businesses running and communities strong®

ATC AT A GLANCE

- Formed in 2001 as the first multi-state, **transmission-only utility**
- Owner and operator of approximately **9,400 miles of transmission line and 510 substations**
- Meeting electric needs of more than **five million people** in 72 counties in four states: Wisconsin, Michigan, Minnesota and Illinois
- \$2.75 billion** in total assets

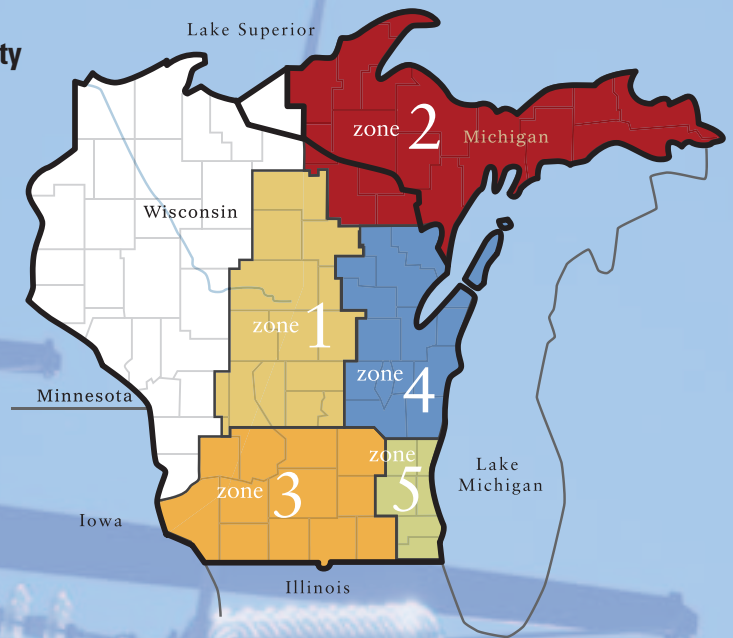
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**Would you like a speaker from ATC to address your group?
Give us a call, toll-free, at 1.866.899.3204, ext. 6922.**

