



Zone 5 – Southeast Wisconsin

November 2006

An excerpt from ATC's
2006

10-Year Transmission System Assessment

A look at electric transmission system
limitations and proposed solutions for
improving electric system reliability

A map of Wisconsin is shown with its county boundaries. A thick black outline highlights the southeastern portion of the state, which is shaded in light gray. Within this shaded area, a red outline highlights a specific region. Labels with leader lines point to the following counties: WASHINGTON, OZAUKEE, WAUKESHA, MILWAUKEE, RACINE, and KENOSHA.

WASHINGTON
OZAUKEE
WAUKESHA
MILWAUKEE
RACINE
KENOSHA

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Looking at tomorrow's electric needs today

Advances in technology powered by electricity are improving our quality of life. At the same time, it's created a dependence on and expectation for an uninterrupted supply of electricity. We rarely notice how plugged in we are...unless the lights go out.

At ATC, we are helping to keep the lights on, businesses running and communities strong. However, the age of the electric transmission system and changes in the regional wholesale electricity market are impacting the reliability of the electric system upon which people and businesses have become so dependent.

To address the issues, ATC continually conducts engineering studies on the electric transmission system looking for potential problems that may affect the future performance of the system. As part of our technical studies, we take a comprehensive look at various factors affecting electricity utilization in the region, such as business development, employment trends, population and projected growth in electricity usage.

Our findings are summarized in an annual 10-Year Transmission System Assessment, which identifies and begins to prioritize future projects needed to improve the adequacy and reliability of the electric transmission system. We look 10 years into the future because it can take up to eight years to plan, study route options, get approvals and build new transmission lines.

Studies indicate need for \$3.1 billion investment over 10 years

In our assessment of the electric transmission system needs through 2016, we estimate \$3.1 billion in system improvements including 360 miles of new transmission lines and upgrades to more than 840 miles of existing lines across our service area. Summarized in this booklet are highlights of the electric transmission system issues in Southeast Wisconsin.

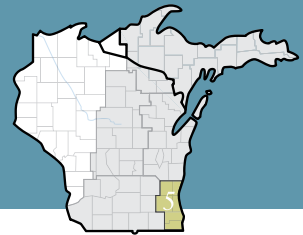
For complete information from our 2006 10-Year Assessment, go to: www.atc10yearplan.com

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 local electric 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. Multiple major transmission lines also give power generators and local utilities the flexibility to access regions where they can sell and buy electricity to control overall costs for everyone.



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Zone 5 – Southeast Wisconsin

Electric System Overview

Population, employment increasing

- Population in Zone 5 is projected to grow 0.6 percent annually through 2011. From 2001 to 2006, Waukesha County realized the largest increase in population, while Washington County had the highest growth rate.
- Employment in Zone 5 is projected to grow 1.2 percent annually through 2011. From 2001 to 2006, Waukesha County realized the largest increase in employment and had the highest growth rate.

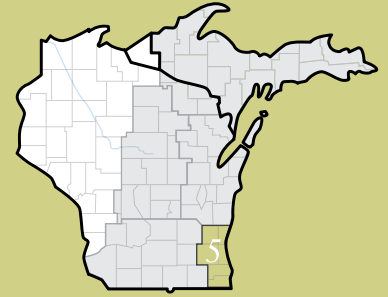
Electricity usage growing

- Peak electric demands typically occur during the summer months. Large industrial loads in the Milwaukee metropolitan area (such as Charter Steel, Miller Brewing) are among the largest electricity users in the zone.
- Electric load is projected to grow approximately 1.6 percent annually through 2015.

Transmission projects address electric needs

Our 2006 10-Year Transmission System Assessment outlines more than 20 projects to ensure electric system reliability in Southeast Wisconsin. These projects are in various stages of development. The following pages describe the system limitations in Southeast Wisconsin and our planned, proposed and provisional projects to address those limitations.

Zone 5 – Southeast Wisconsin



Transmission system characteristics in Zone 5

ATC delivers power in Zone 5 with various transmission facilities including:

- north-south 345-kV lines extending from Edgewater, Point Beach and Sheboygan Energy Center power plants,
- 345-kV lines from Pleasant Prairie Power Plant,
- 345-kV, 230-kV and 138-kV lines from Oak Creek Power Plant and
- numerous 138-kV lines in and around the metro Milwaukee area.

Transmission system reinforcements needed to interconnect and deliver new generation at Port Washington and Oak Creek power plants comprise much of the expansion in Zone 5. Significant load growth in Waukesha, Walworth and Washington counties is projected to exceed the capabilities of the existing 138-kV system in those areas, signaling the need for transmission system reinforcements.

Transmission system limitations in Zone 5

In the analysis of Zone 5 for 2007, we identified low voltages, transmission facility overloads and transmission service limitations. In addition, chronic transmission service limitations within Zone 5 need to be addressed.

The areas identified as vulnerable to low voltages are Washington County and areas west of Milwaukee. When we ran our planning models, numerous line overloads were identified throughout the zone. Most of the overloads and low voltages in Zone 5 are caused by low probability outages at substations. We are evaluating alternatives to address these issues. The low-voltage situation to the west of Milwaukee is an indication that load growth will exceed the load-serving capabilities of the 138-kV network serving that area, and the existing network will be insufficient without significant reinforcements.

Accommodating new generation at Port Washington and Oak Creek power plants is driving the need for most of the system reinforcements in the Milwaukee area.

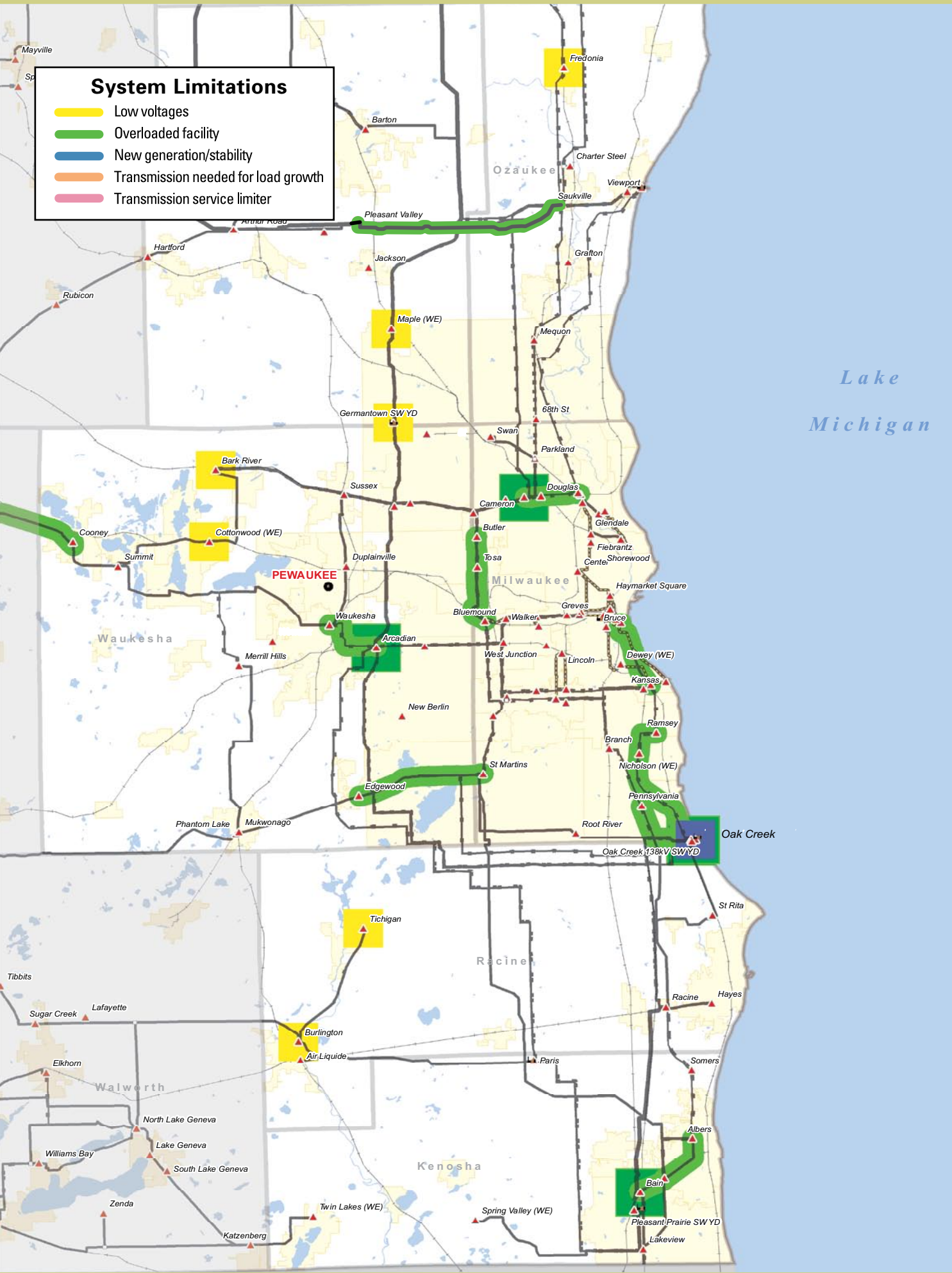
The most chronic transmission service limitations in Zone 5 are caused by the loss of the Wempletown-Paddock 345-kV line in Zone 3. In 2005, we added a new Wempletown-Paddock 345-kV circuit and reconfigured the existing Wempletown-Paddock and Paddock-Rockdale 345-kV lines to create a Wempletown-Rockdale 345-kV line to address these limitations.

Zone 5 includes the Wisconsin counties of:

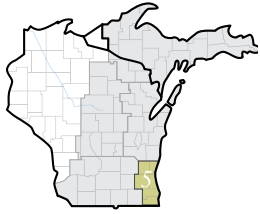
- Kenosha
- Milwaukee
- Ozaukee
- Racine
- Washington
- Waukesha

System Limitations

- Low voltages
- Overloaded facility
- New generation/stability
- Transmission needed for load growth
- Transmission service limiter



Lake
Michigan



Zone 5 – Southeast Wisconsin

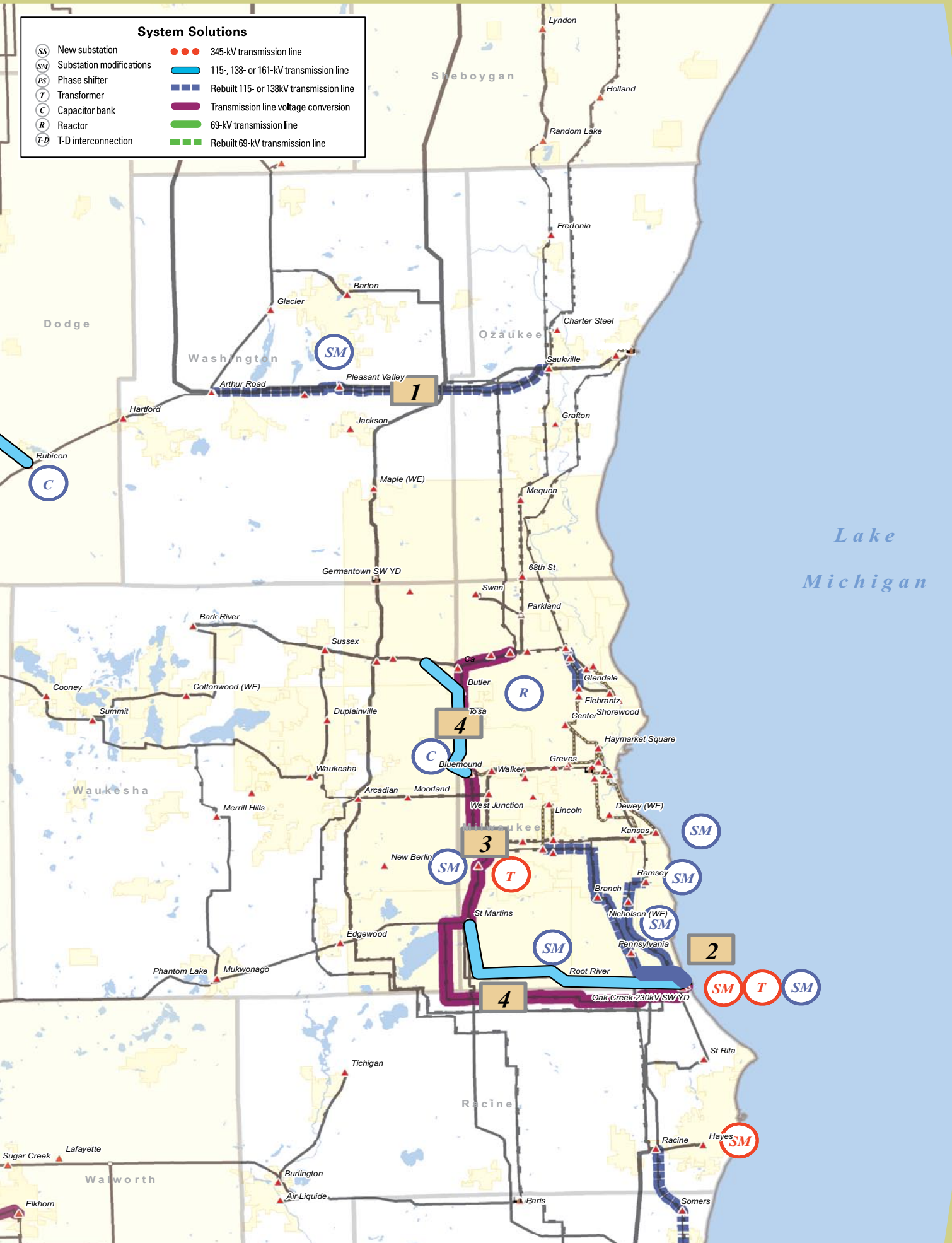
Transmission projects in Zone 5

Our current plans in Zone 5 include more than 25 projects between 2006 and 2016. These projects are in various stages of development. The most notable planned, proposed and provisional projects in Zone 5, along with their projected year of completion and the factors driving the need for the projects are listed below.

	Project description	In-service year	Need driver
	Planned projects		
1	St. Lawrence-Pleasant Valley-Sauville 138-kV line reconductor	2008	Accommodates new generation at Port Washington Power Plant
	Proposed projects		
2	Expand 345/230/138-kV Substation at Oak Creek	2009	Accommodates new generation at Oak Creek Power Plant
	Provisional projects		
3	Expand Brookdale Substation (Hale)	2013	Accommodates new generation at Oak Creek Power Plant
4	Oak Creek-Hale-Granville 345-kV line	2013	Accommodates new generation at Oak Creek Power Plant

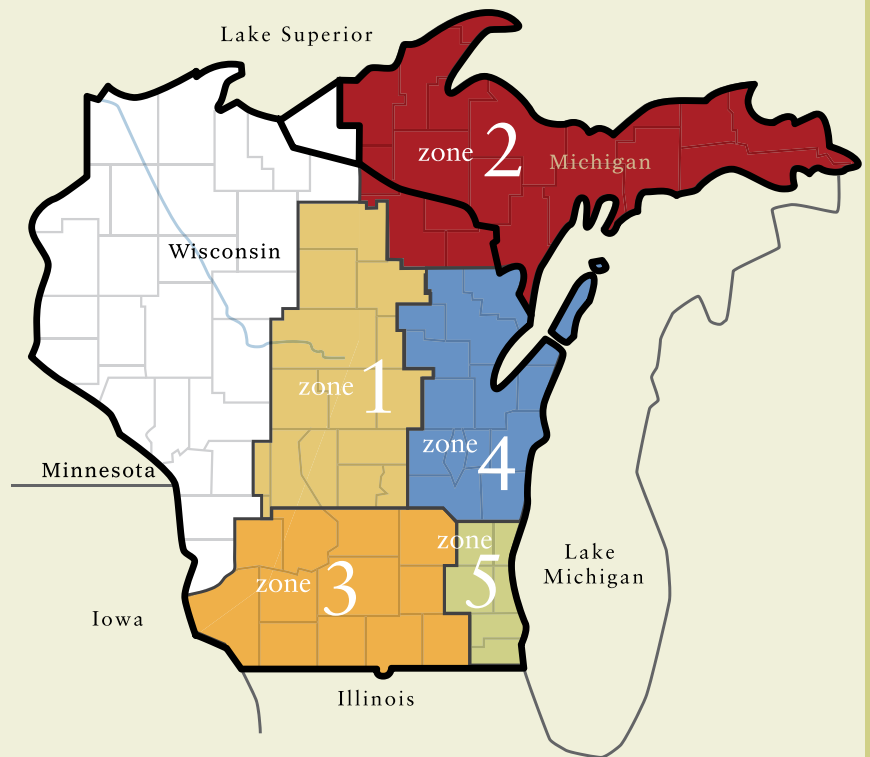
System Solutions

- | | | | |
|-------|--------------------------|-----|---|
| (SS) | New substation | ●●● | 345-kV transmission line |
| (SM) | Substation modifications | — | 115-, 138- or 161-kV transmission line |
| (PS) | Phase shifter | — | Rebuilt 115- or 138kV transmission line |
| (T) | Transformer | — | Transmission line voltage conversion |
| (C) | Capacitor bank | — | 69-kV transmission line |
| (R) | Reactor | — | Rebuilt 69-kV transmission line |
| (T-D) | T-D interconnection | | |



ATC at a glance

- Formed in 2001 as the first multi-state, **transmission-only utility**.
- Owner and operator of approximately **8,900 miles of transmission line and 480 substations**.
- Meeting electric needs of approximately **five million people**.
- Transmission facilities in **66 counties** in Wisconsin, Michigan and Illinois.
- **\$1.5 billion** in total assets.
- **Seven offices** in the communities of Cottage Grove, De Pere, Madison, Waukesha and Wausau, Wis.; Kingsford, Mich.; and Washington DC.



As a public utility, we have duties and responsibilities to:

- Operate the transmission system reliably,
- Assess the ability of the system to adequately meet current and future needs,
- Plan system upgrades to meet those needs in the most efficient, effective and economic ways,
- Construct upgrades in time to meet those needs,
- Maintain the transmission equipment and surroundings to minimize opportunity for failures.



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

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