

2010 Assessment Preliminary Solutions Customer and Stakeholder Meeting

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May 10, 2010

Pewaukee





Purpose

- Multiple Need Drivers Reminder
- Review Preliminary Solutions
- Next Steps

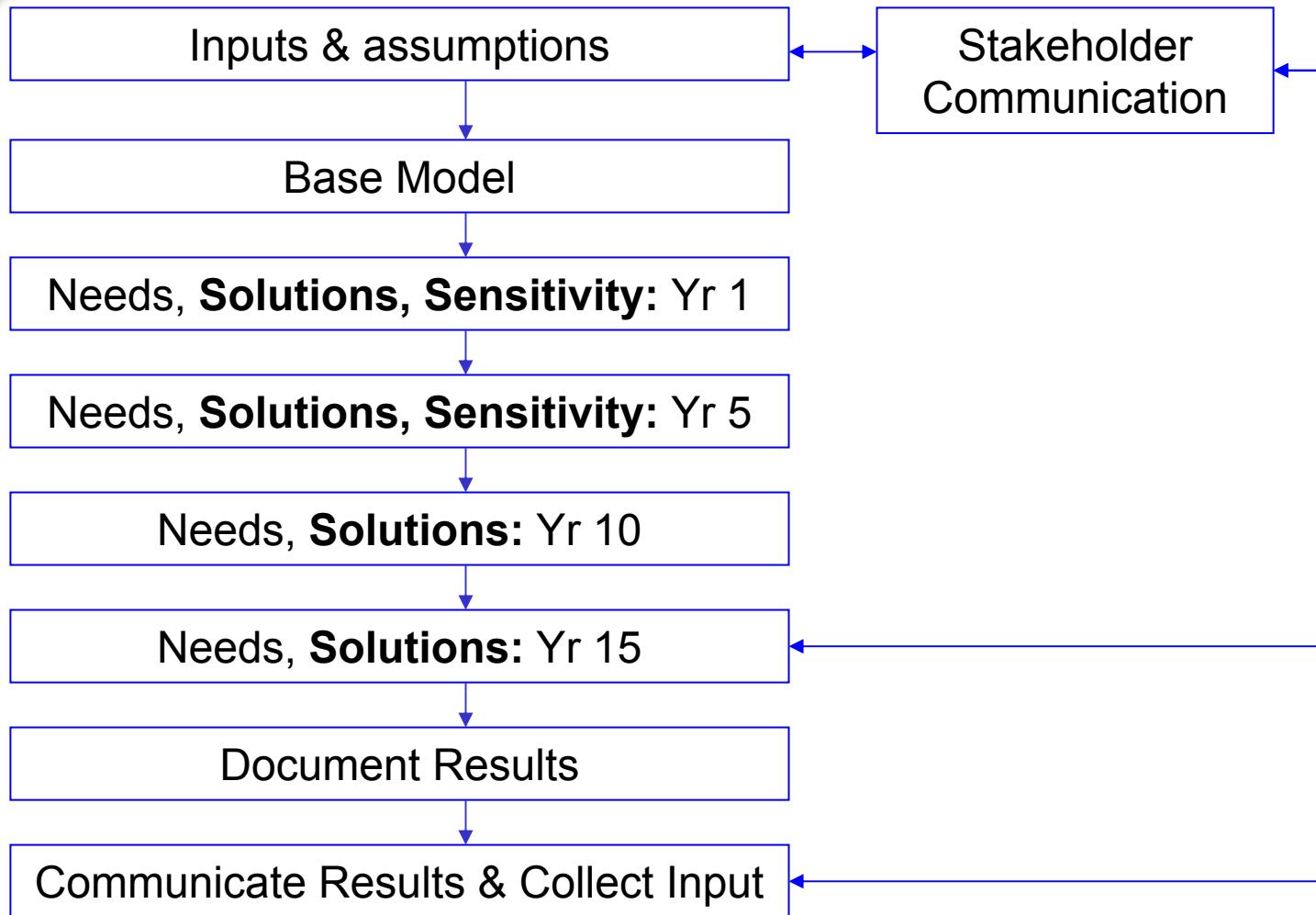


Multiple Need Drivers

- Safety
- Performance / Condition
- Traditional Reliability Analysis
- Multiple Contingency
- Economic Benefits
- Access
- Public Policy Implementation
- Mandatory NERC Standards



Assessment Process





2010 Assessment Process

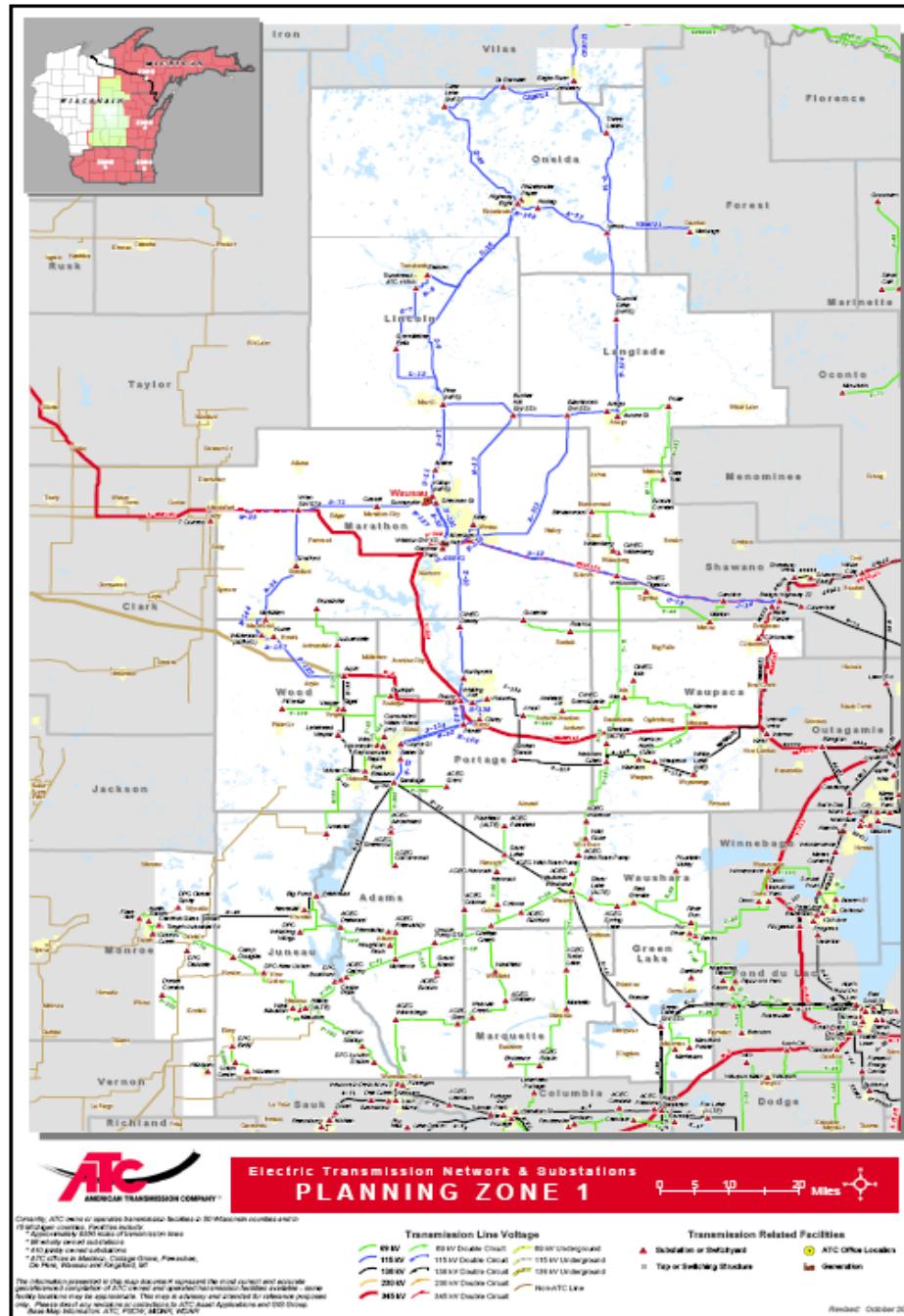
- Preliminary Needs
 - 4 summer peaks (2011, 2015, 2020, 2025)
 - ID near term impacts
- Additional Needs Sensitivity
 - Load Forecast +5% (2015)
 - West-to-East Bias at 70% load (2011,15)
 - East-to West Bias at 90% load (2011,15)
 - Sensitivities
 - Minimum load (2011)
 - High wind generation impact (2015)



Zone 1 Projects

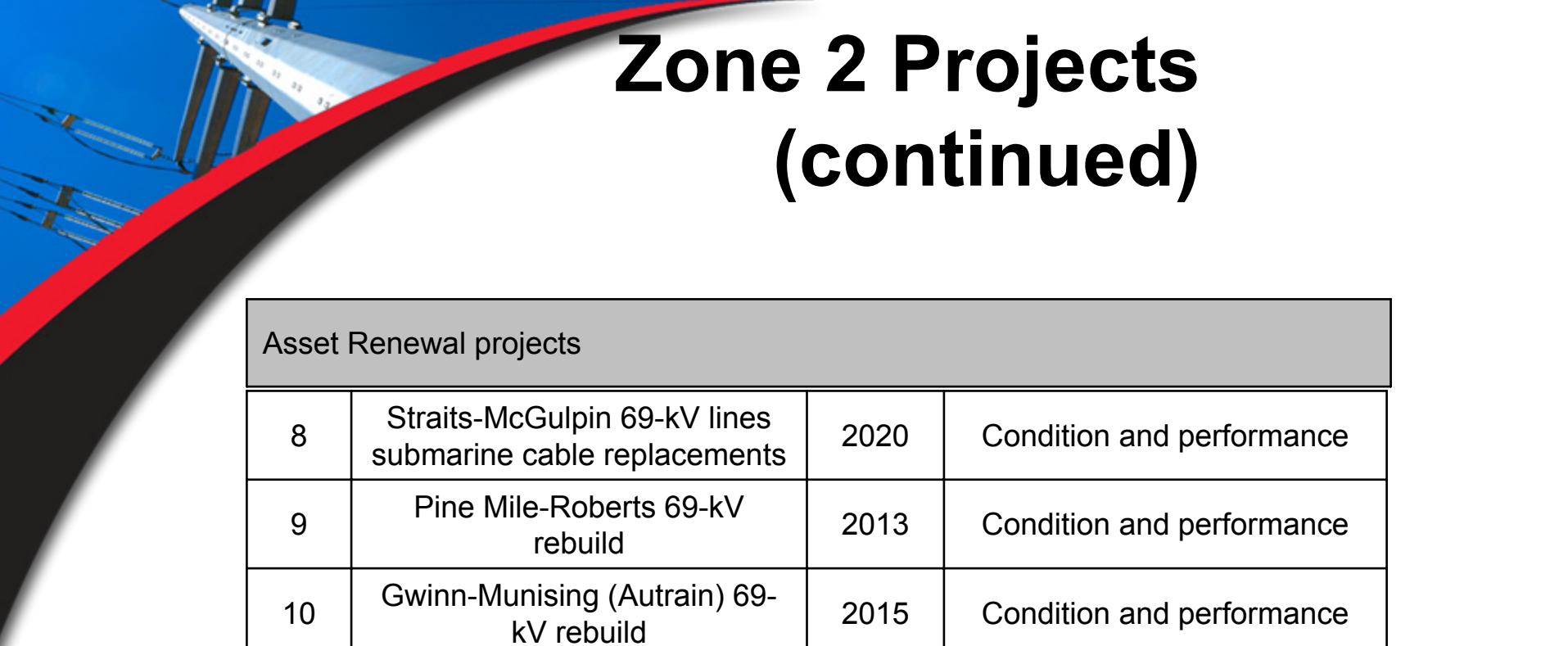
	Project description	In-service year	Need driver
Proposed projects			
1	Monroe County-Council Creek 161-kV line	2013	low-voltage, import capability, avoids reconfiguration during emergencies
2	Construct 115-kV line from new Woodmin Substation to the Clear Lake Substation	2012	T-D interconnection
Asset Renewal projects			
3	Whitcomb-Deer Trail 69-kV rebuild	2011	Condition and performance
4	Montello-Wautoma 69-kV rebuild	2017	Condition and performance
5	Plover-Whiting 115-kV rebuild	2019	Condition and performance

Zone 1 Map



Zone 2 Projects

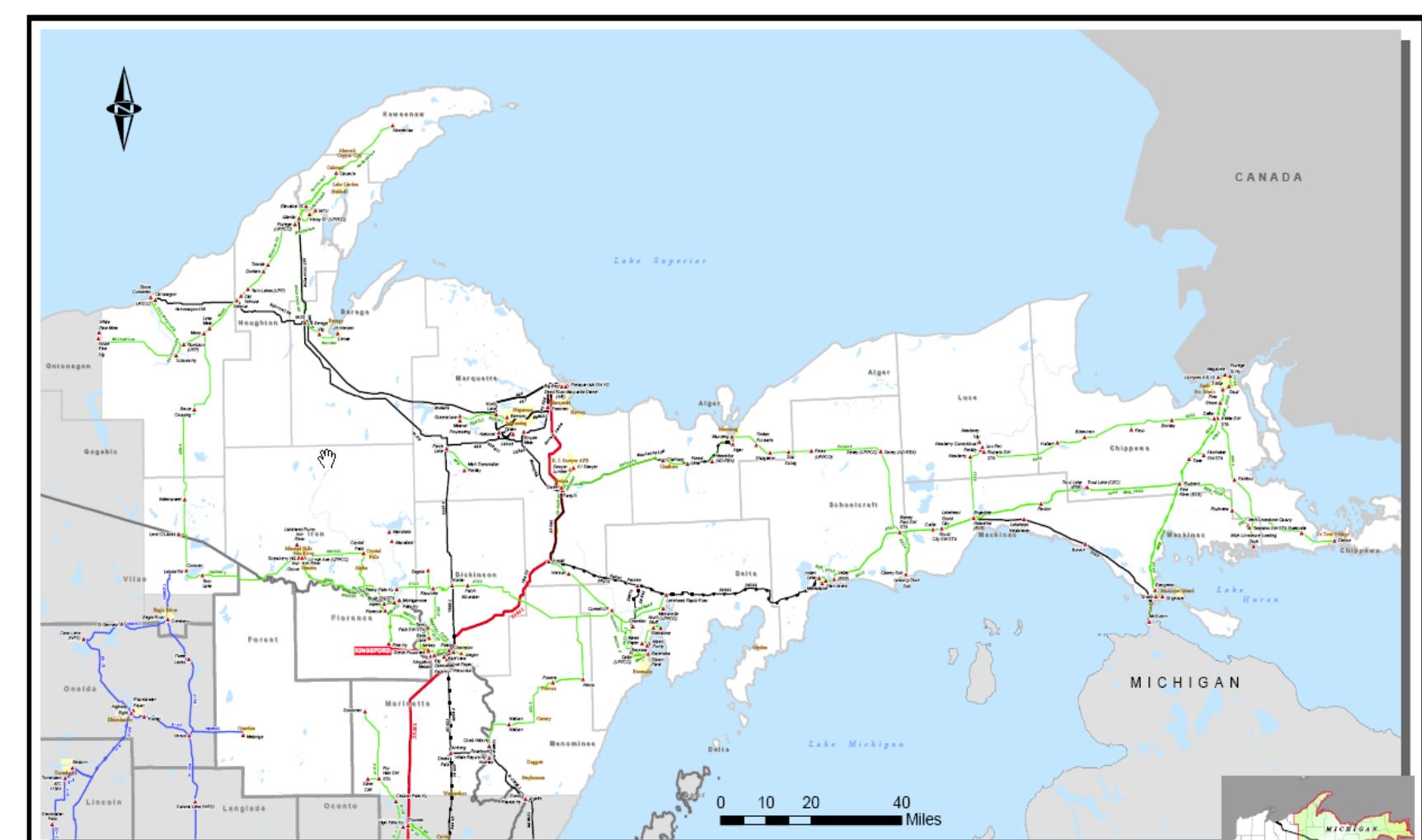
	Project description	In-service year	Need driver
Proposed projects			
1	Install reactor at Straits Substation	2010	High voltages
Provisional projects			
2	Increase ground clearance of M38-Atlantic 69-kV line from 120 to 167 degrees F	2013	Overloads, condition and performance
3	Straits-Pine River 138-kV line rebuild/conversion	2014	Overloads and low voltages
4	Kinross load-Pine River/Nine Mile 69-kV line	2014	T-D interconnection
5	Pine River-Nine Mile 69-kV rebuild to double-circuit 138/69-kV line	2014	Overloads and low voltages
6	Install power flow control at Straits 138-kV Substation	2014	Addresses/controls flow across eastern U.P., overloads and low voltages
7	Construct Chandler-18 th Road double-circuit 138-kV lines	2014	Overloads and low voltages



Zone 2 Projects (continued)

Asset Renewal projects			
8	Straits-McGulpin 69-kV lines submarine cable replacements	2020	Condition and performance
9	Pine Mile-Roberts 69-kV rebuild	2013	Condition and performance
10	Gwinn-Munising (Autrain) 69-kV rebuild	2015	Condition and performance
11	Munising-Blaney Park (Inland line) 69-kV line re-insulate	2014	Condition and performance
12	Forsyth-Munising 138-kV line re-insulate	2015	Condition and performance

Zone 2 Map



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Electric Transmission Network & Substations PLANNING ZONE 2

Currently, ATC owns or operates transmission facilities in 50 Wisconsin counties and in 15 Michigan counties. Facilities include:
 • 15 county boundaries of transmission areas
 • 96 transmission substations
 • 470 jointly owned substations
 • ATC offices in Madison, College Grove, Pewaukee, De Pere, Wausau and Kingsford, MI

Transmission Line Voltage

69 KV	115 KV	138 KV	230 KV	245 KV	115 KV Double Circuit	138 KV Double Circuit	230 KV Double Circuit	245 KV Double Circuit	115 KV Underground	138 KV Underground	230 KV Underground	135 KV Underground
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Non-ATC Line

Last Revision: October 2009

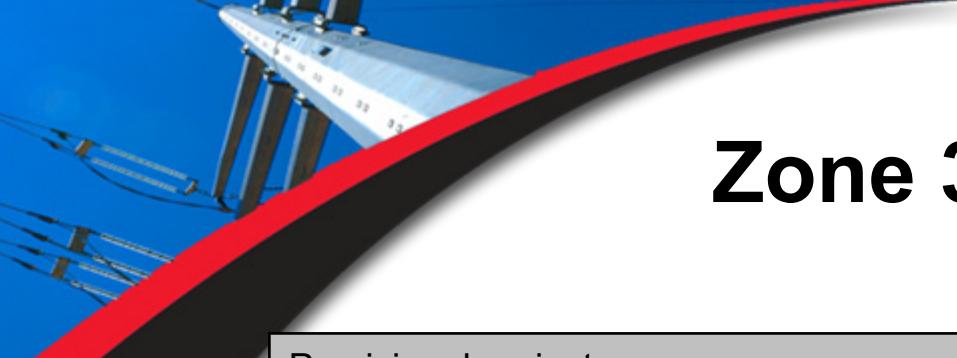
Transmission Related Facilities

- ▲ Substation or Switchyard
 - Tap or Switching Structure
 - Generation
 - ATC Office Location
- The information presented in this map document represent the most current and accurate information available to ATC. ATC makes no guarantee as to the accuracy of the information, and some facility locations may be approximate. This map is advisory and intended for reference purposes only. Please direct any revisions or corrections to ATC Asset Applications and GIS Group.
- Base Map Information: ATC, PSCW, MDNR, WDNR



Zone 3 Projects

	Project description	In-service year	Need driver
Planned projects			
1	Oak Ridge-Verona 138-kV line	2010	Overloads and low voltages
2	Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line	2011	Completion of earlier project per agreement with the City of Madison
3	Brodhead-South Monroe 69-kV line rebuild	2011	Overloads and low voltages
4	Rockdale-West Middleton 345-kV line	2013	Overloads and low voltages, improves transfer capability to Madison area, averts voltage collapse, lowers system losses
Proposed projects			
5	Verona-Oregon 69-kV line rebuild	2014	Improve area voltages and address overloads
6	North Lake Geneva-South Lake Geneva 138-kV line	2016	Overloads and low voltages, transmission to distribution interconnection



Zone 3 Projects (continued)

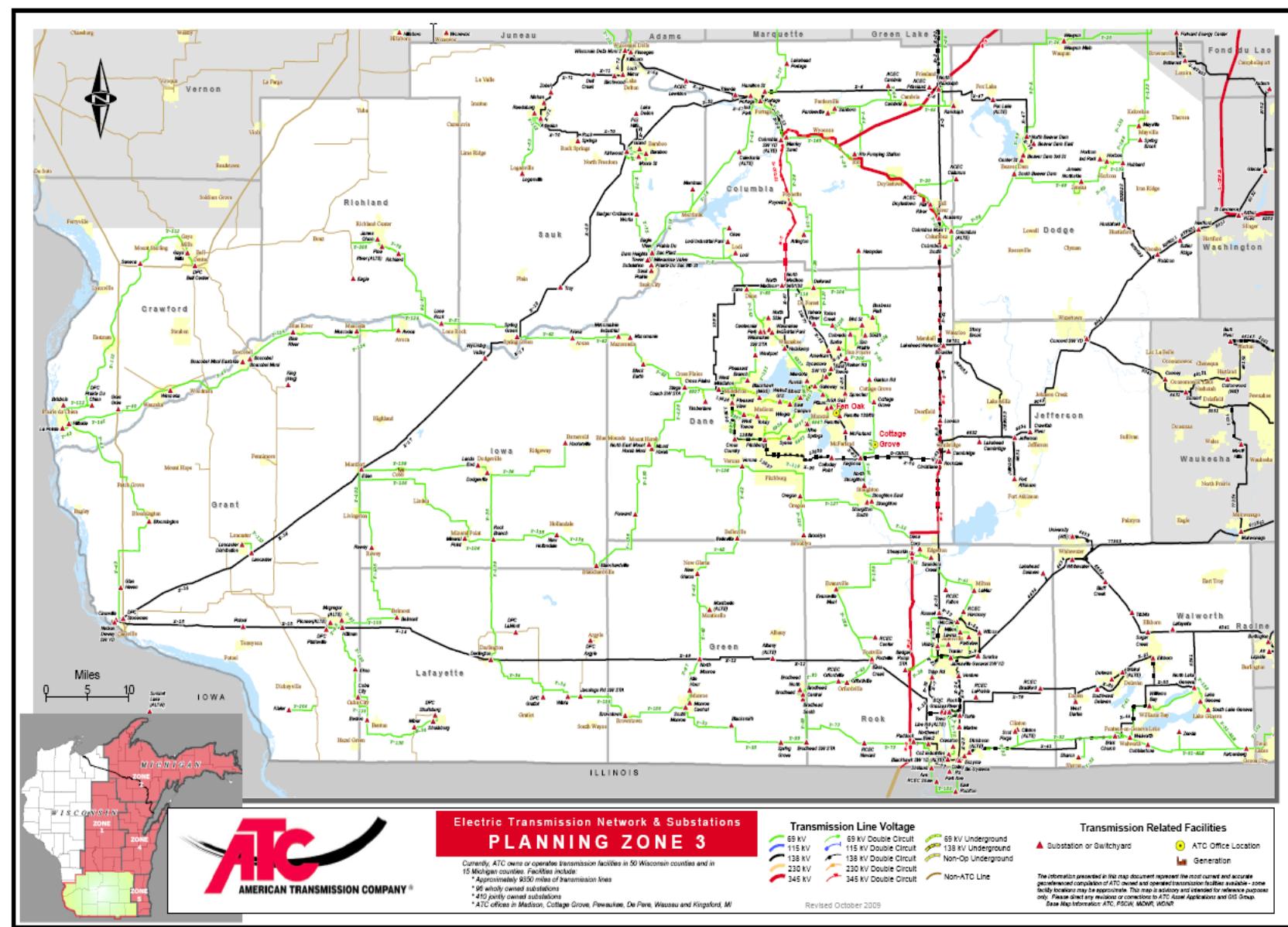
Provisional projects			
7	Colley Road-Brick Church 69-kV line rebuild	2018	Overloads and low voltages
8	Spring Valley-Twin Lakes-South Lake Geneva 138-kV line	2018	Overloads and low voltages
9	Lake Delton-Birchwood 138-kV line	2020	Overloads and low voltages
10	Cardinal-Blount 138-kV line	2020	Overloads and low voltages
11	Hubbard-East Beaver Dam 138-kV line	2022	Overloads and low voltages
12	North La Crosse-North Madison-Cardinal 345 kV line	2018	Economic benefits, Regional reliability, Policy Implementation
13	Dubuque-Spring Green-Cardinal 345 kV Line	2020	Economic benefits, Regional reliability, Policy Implementation,

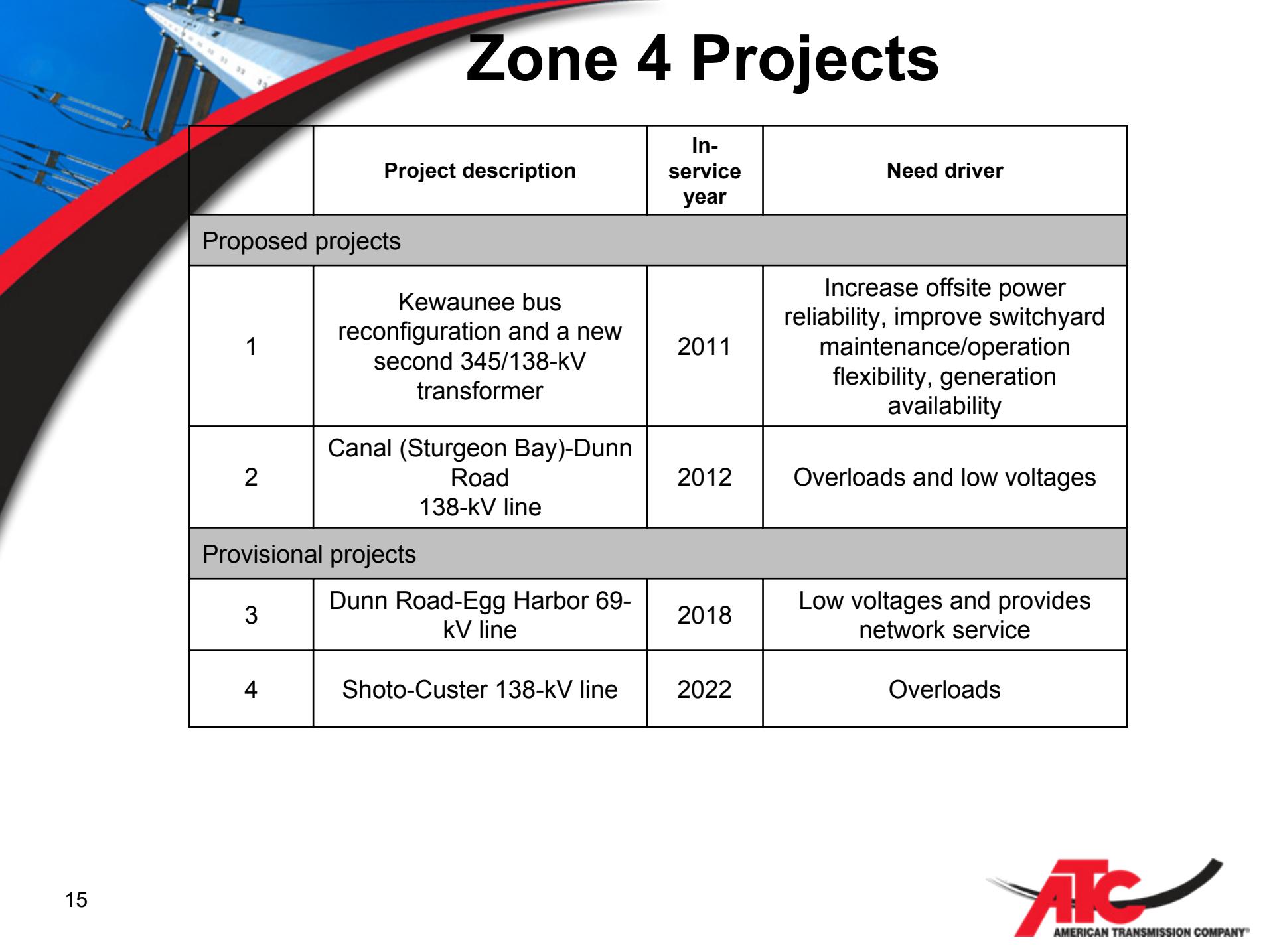


Zone 3 Projects (continued)

Asset Renewal projects			
14	Rock River-Forward 69-kV line rebuild	2010	Condition and performance
15	Spring Green-Stagecoach 69-kV line rebuild	2011	Condition and performance
16	Sycamore-East Towne 69-kV replace underground cables	2012	Condition and performance
17	Dam Heights-Portage 69-kV line rebuild	2018	Condition and performance
18	Concord-Rubicon 138-kV line rebuild	2013	Condition and performance
19	West Middleton-Stagecoach 69-kV underground cable replacement	2019	Condition and performance
20	Hillman-Eden 69-kV line rebuild	2018	Condition and performance

Zone 3 Map





Zone 4 Projects

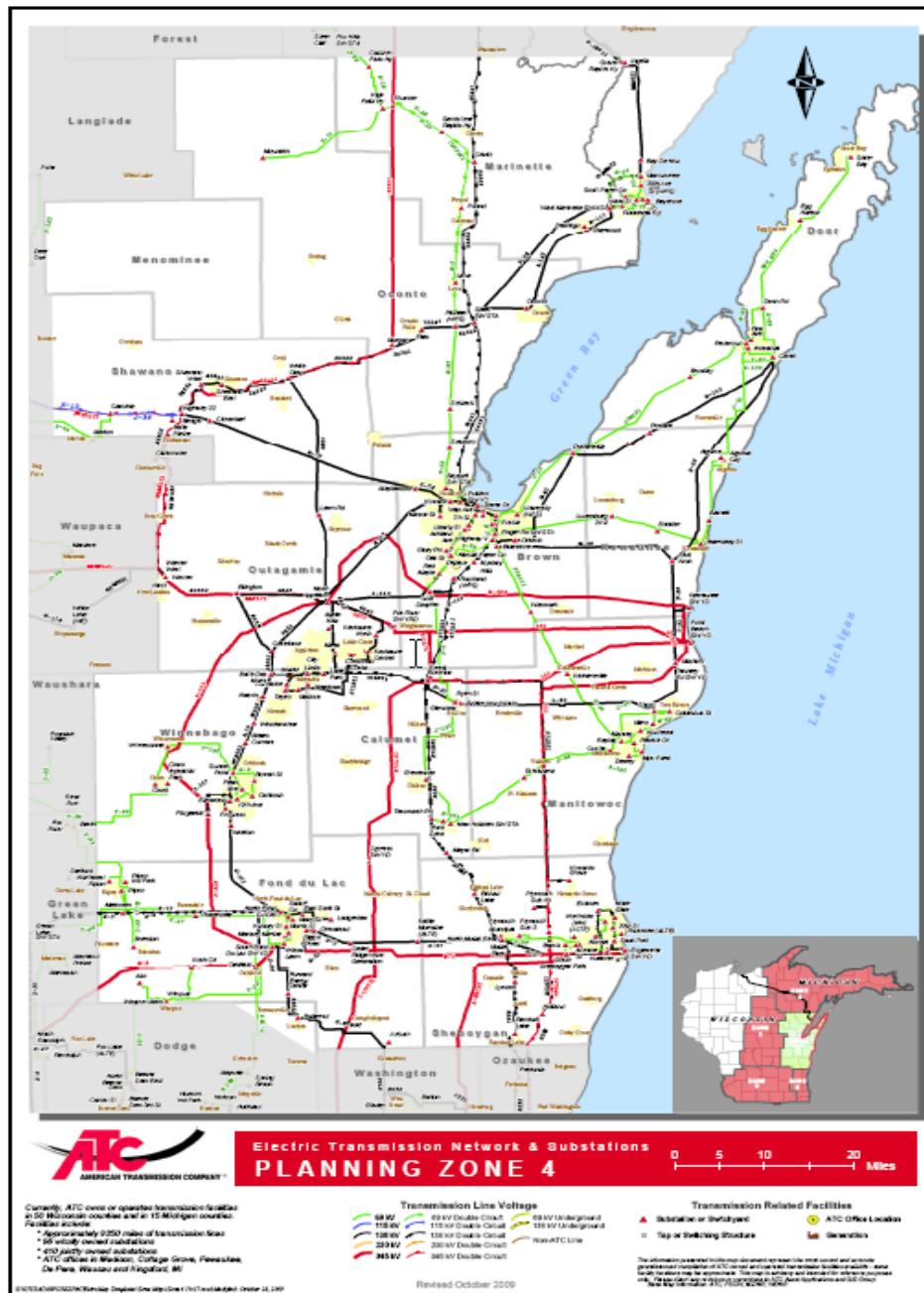
	Project description	In-service year	Need driver
Proposed projects			
1	Kewaunee bus reconfiguration and a new second 345/138-kV transformer	2011	Increase offsite power reliability, improve switchyard maintenance/operation flexibility, generation availability
2	Canal (Sturgeon Bay)-Dunn Road 138-kV line	2012	Overloads and low voltages
Provisional projects			
3	Dunn Road-Egg Harbor 69-kV line	2018	Low voltages and provides network service
4	Shoto-Custer 138-kV line	2022	Overloads

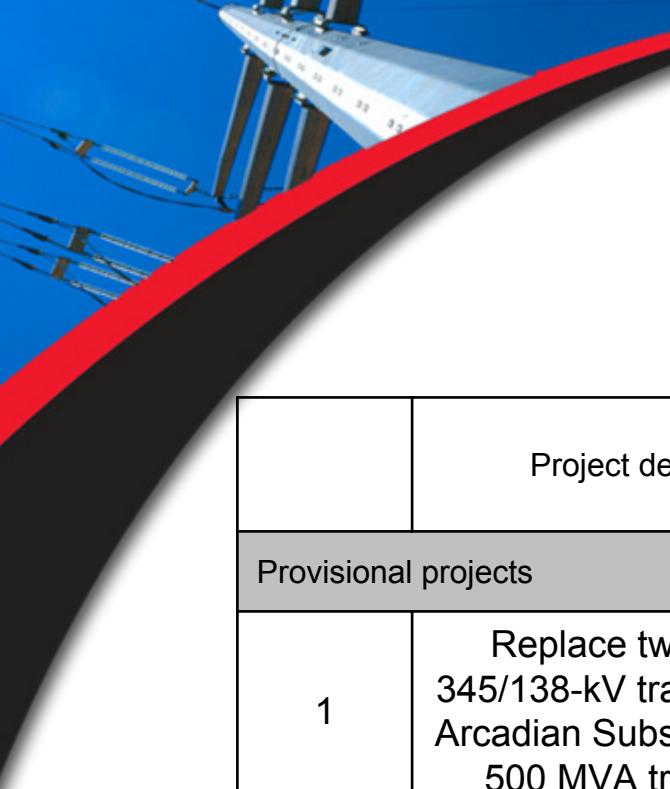


Zone 4 Projects (continued)

Asset Renewal projects			
5	Mears Corners-Sunset Point 138-kV line rebuild	2016	Condition and performance
6	Dyckesville-Sawyer 69-kV line rebuild	2015	Condition and performance
7	Butte des Morts-Neevin 138-kV line rebuild	2015	Condition and performance
8	Neevin-Woodenshoe 138-kV line rebuild	2016	Condition and performance
9	North Appleton-Butte des Morts 138-kV line rebuild	2017	Condition and performance

Zone 4 Map





Zone 5 Projects

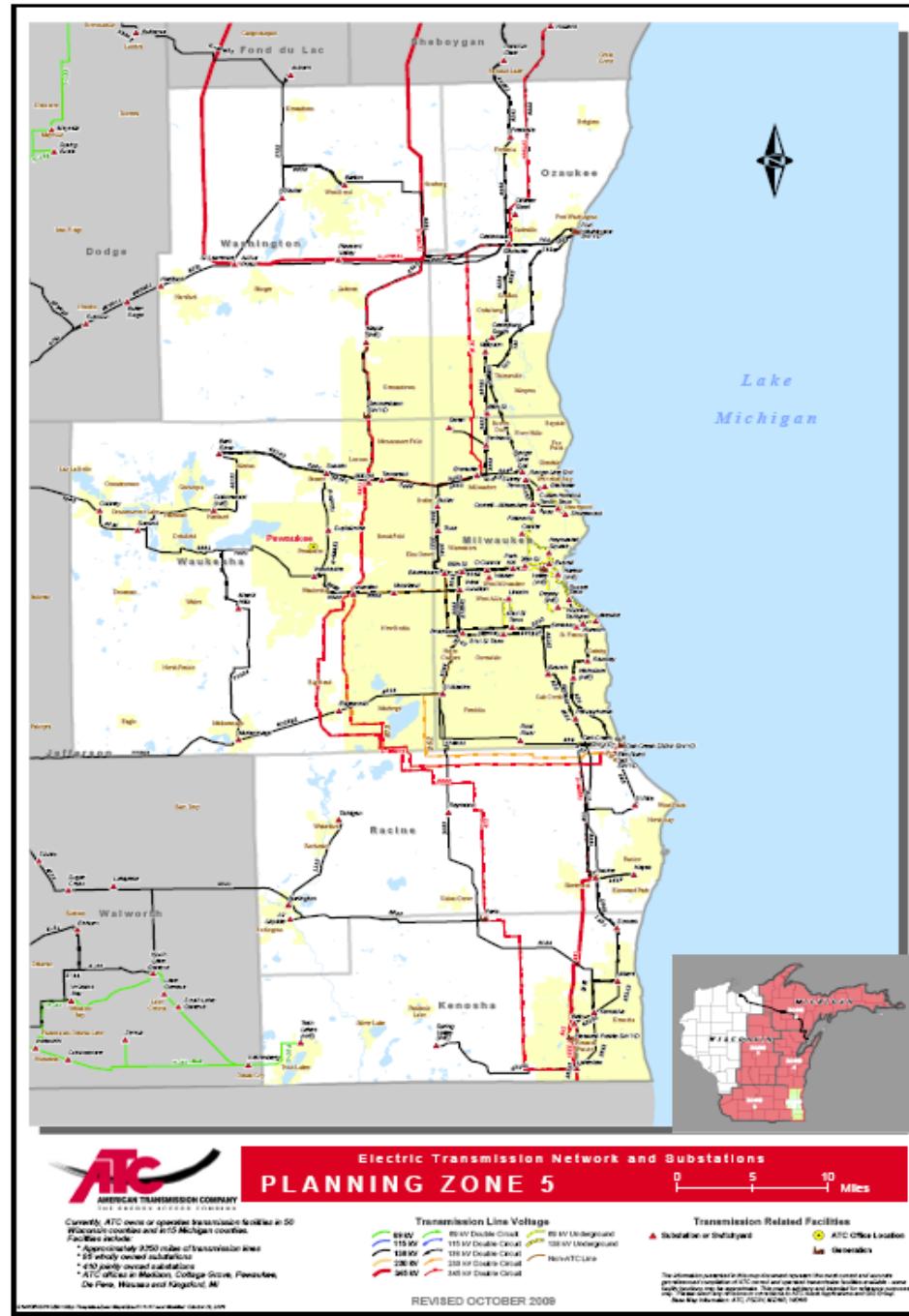
	Project description	In-service year	Need driver
Provisional projects			
1	Replace two existing 345/138-kV transformers at Arcadian Substation with 1- 500 MVA transformer	2015	Overloads under contingency conditions
2	Spring Valley-Twin Lakes-South Lake Geneva 138-kV line	2018	Overloads and low voltages



Zone 5 Projects (continued)

	Project description	In-service year	Need driver
Asset Renewal projects			
3	Replace Bluemound 230/138-kV transformers #1 and #3	2011-2012	Condition and performance
4	Edgewood-St. Martins 138-kV line rebuild	2014	Condition and performance
5	Mukwonago-Edgewood 138-kV line rebuild	2014	Condition and performance
6	Concord-Cooney 138-kV line rebuild	2014	Condition and performance
7	Paris-Albers 138-kV line rebuild	2014	Condition and performance
8	St. Lawrence-Hartford 138-kV line rebuild	2014	Condition and performance
9	Waukesha-Summit 138-kV line rebuild	2015	Condition and performance
10	Merrill Hills-Summit 138-kV line rebuild	2017	Condition and performance

Zone 5 Map





Schedule

- February – April 2009
 - Requested load forecast from LDCs
- July 10, 2009
 - Process and assumptions meeting
 - Suggested new sensitivity studies
- September 2009
 - Sent final load forecast back to LDCs
- February 2010
 - Stakeholder preliminary needs meeting
- May 2010
 - Stakeholder preliminary solutions meeting
- Autumn 2010
 - Documentation and Publication



For more information

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Or call at 920-338-6537