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2014 10-Year Assessment Summary

October 2014

Topics

- Key Messages
- Capital Forecast
- Potential Projects
- Larger Projects by Zone

Key Messages

- Load forecast growth rate similar to 2013 Assessment
- Generation assumption changes
- Some new or advanced projects
- Some projects delayed or cancelled
- Participating in regional studies
- Considering potential projects
 - Generation Retirements
 - SE Wisconsin – NE Illinois reinforcement

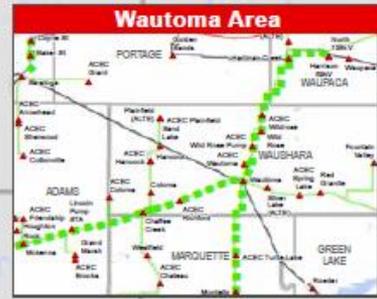
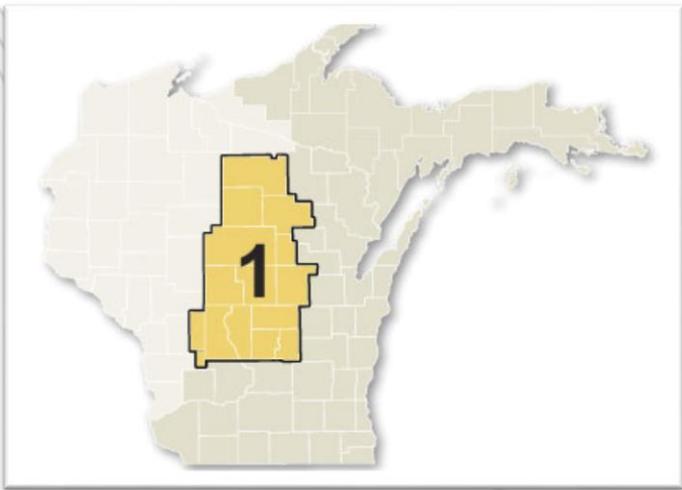
Capital Forecast

	2010	2011	2012	2013	2014
Specific Network Projects	\$1.0B	\$1.0B	\$1.9B	\$1.2B	\$1.4B
Regional Multi-Value Projects	\$0.7B	\$0.7B	\$0.8B	\$0.5B	\$0.5B
Asset Maintenance	\$0.7B	\$1.0B	\$1.1B	\$1.1B	\$1.2B
Other Capital Categories	\$1.0B	\$1.1B/\$1.7B	\$0.1B/\$1.0B	\$0.2B/\$0.8B	\$0.2B/\$0.8B
Total 10-Year Capital Cost	\$3.4B	\$3.8B/\$4.4B	\$3.9B/\$4.8B	\$3.0B/\$3.6B	\$3.3B/\$3.9B

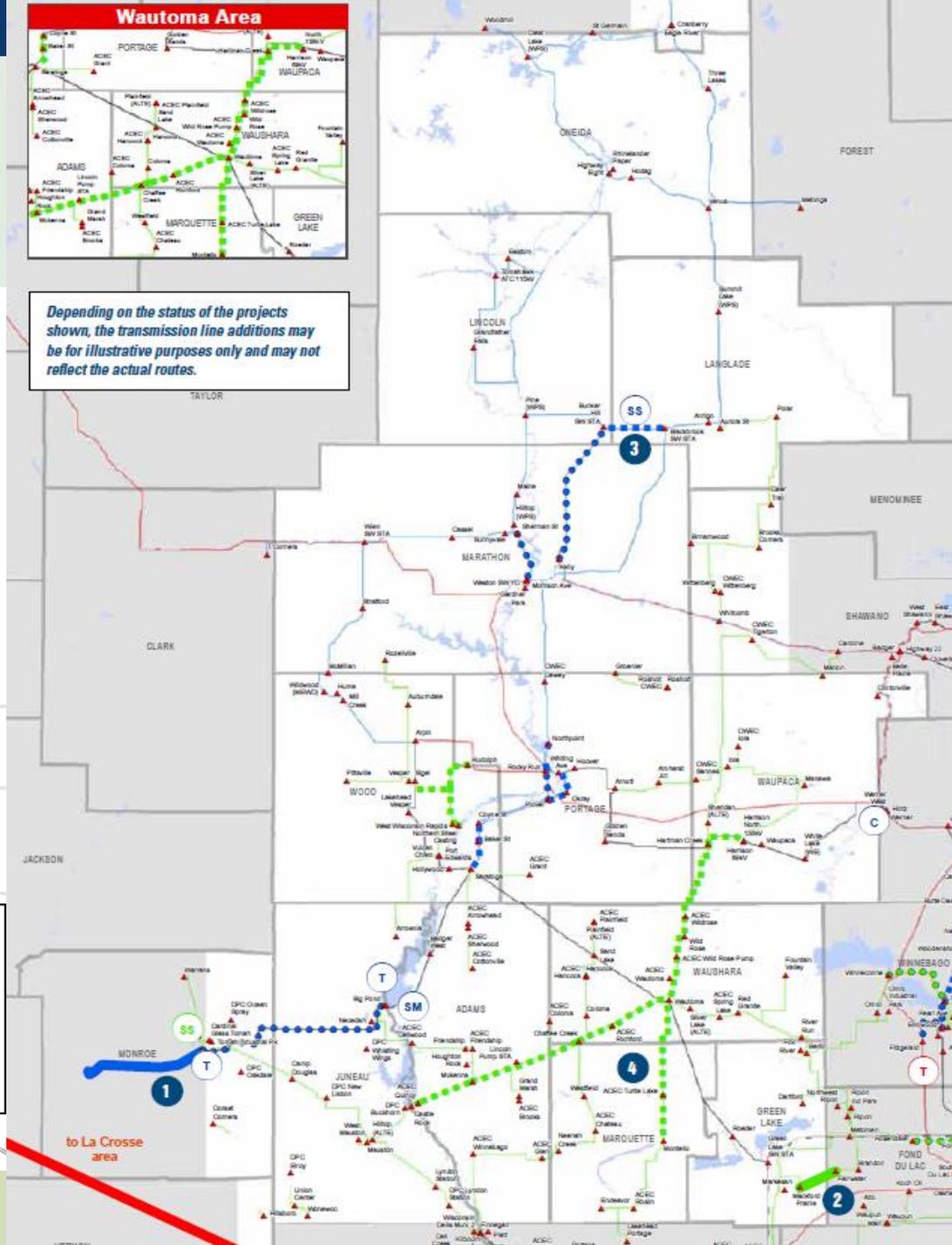
Potential Projects

- Not specifically in project list, yet
- Generation Retirement Driven
 - Lakota-Winona 69 to 138 kV Conversion
 - Plains-National Project
 - Morgan-Crivitz Project
 - Green Bay Area Uprates or Rebuilds
 - Rhinelander Area Upgrades
- SE Wisconsin – NE Illinois 345-kV reinforcement project

Zone 1



Depending on the status of the projects shown, the transmission line additions may be for illustrative purposes only and may not reflect the actual routes.



System Solutions Key

- | | | |
|---|--|--|
| SS New substation
Supports transmission system expansion | TRANSMISSION LINE KEY | EXISTING TRANSMISSION LINES KEY |
| SM Substation modifications
Upgrades equipment ratings to avert facility overloads | 345-kV transmission line | 69 kV |
| T Transformer
Supports local growth and improves voltage levels | 115-, 138- or 161-kV transmission line | 161 kV |
| C Capacitor bank or reactor
Relieves low voltages or high voltages | 69-kV transmission line | 115 kV |
| T-D T-D interconnection
Supports local growth | Rebuilt 115- or 138-kV transmission line | 230 kV |
| | Rebuilt 69-kV transmission line | 138 kV |
| | 115- or 138-kV transmission line rating upgrade | 345 kV |
| | 69-kV transmission line rating upgrade | |

to La Crosse area

Zone 1 projects

PROJECT DESCRIPTION

IN-SERVICE YEAR

NEED DRIVER

Planned Projects

- 1 Monroe County – Council Creek
161-kV line construction

2015

Low-voltage, economics, avoid reconfiguration during emergencies

Proposed Projects

- 2 Fairwater – Mackford Prairie
69-kV line construction

2018

Network service, condition, overloads and low voltages

- 3 M13 Reinforcement Bunker Hill-Blackbrook

2019

Overloads and condition

Provisional Projects

None

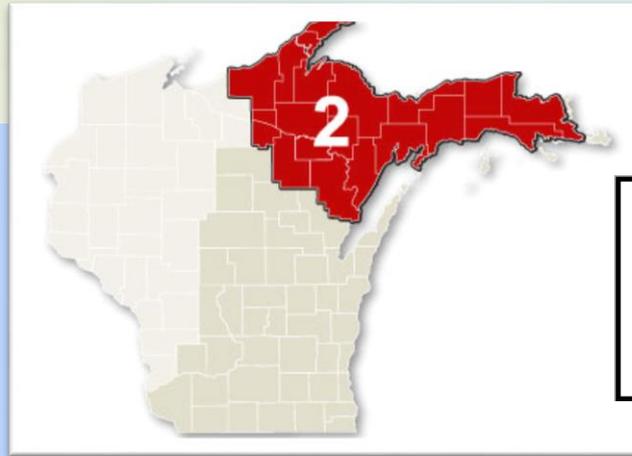
Asset Renewal Projects

- 4 Montello – Wautoma 69-kV line rebuild

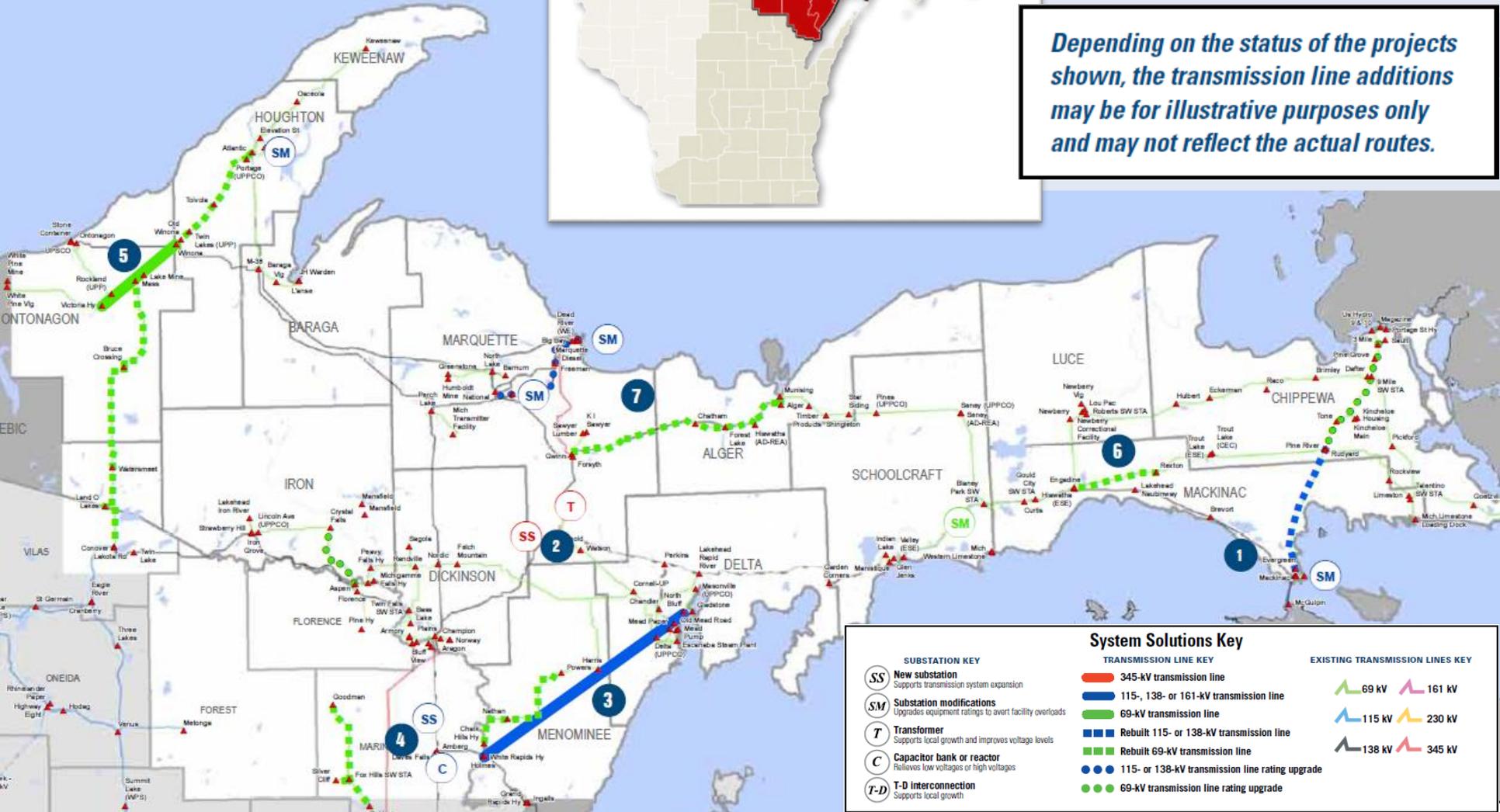
2016

Condition and performance

Zone 2



Depending on the status of the projects shown, the transmission line additions may be for illustrative purposes only and may not reflect the actual routes.



System Solutions Key

SUBSTATION KEY		TRANSMISSION LINE KEY		EXISTING TRANSMISSION LINES KEY	
SS	New substation Supports transmission system expansion		345-kV transmission line		69 kV
SM	Substation modifications Upgrades equipment ratings to avert facility overloads		115-, 138- or 161-kV transmission line		115 kV
T	Transformer Supports local growth and improves voltage levels		69-kV transmission line		230 kV
C	Capacitor bank or reactor Relieves low voltages or high voltages		Rebuilt 115- or 138-kV transmission line		115- or 138-kV transmission line rating upgrade
T-D	T-D interconnection Supports local growth		Rebuilt 69-kV transmission line		69-kV transmission line rating upgrade
			138 kV		345 kV

Zone 2 projects

PROJECT DESCRIPTION

IN-SERVICE YEAR

NEED DRIVER

Planned Projects

1	Mackinac 138-kV Substation: Install back-to-back HVDC flow control device	2014	Address/Control flow across eastern U.P., overloads and low voltages
2	Arnold 345-kV Substation construction and 345/138-kV transformer	2015	Overloads and low voltages
3	Bay Lake: Holmes-Old Mead Road 138-kV project	2016	Overloads and low voltages
4	Bay Lake: Benson Lake 138-kV Substation – Installation of SVC	2019	Overloads and low voltages

Proposed Projects

None

Provisional Projects

5	Victoria – Winona 69-kV line construction	2019	Overloads and low voltages
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Asset Renewal Projects

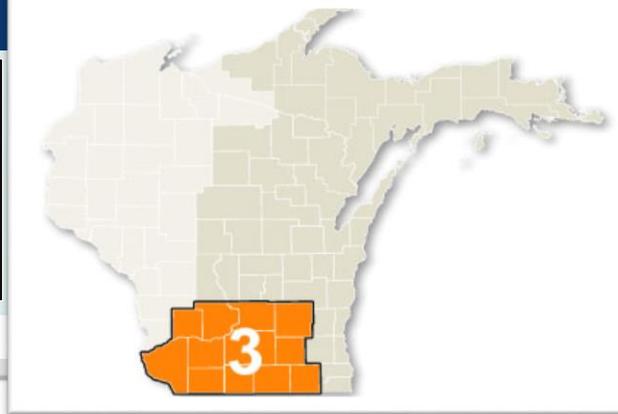
6	Pine River – Hiawatha 69-kV line partial rebuild	2015	Condition and performance
7	Munising – Gwinn 69-kV line partial rebuild	2017	Condition and performance



Zone 3

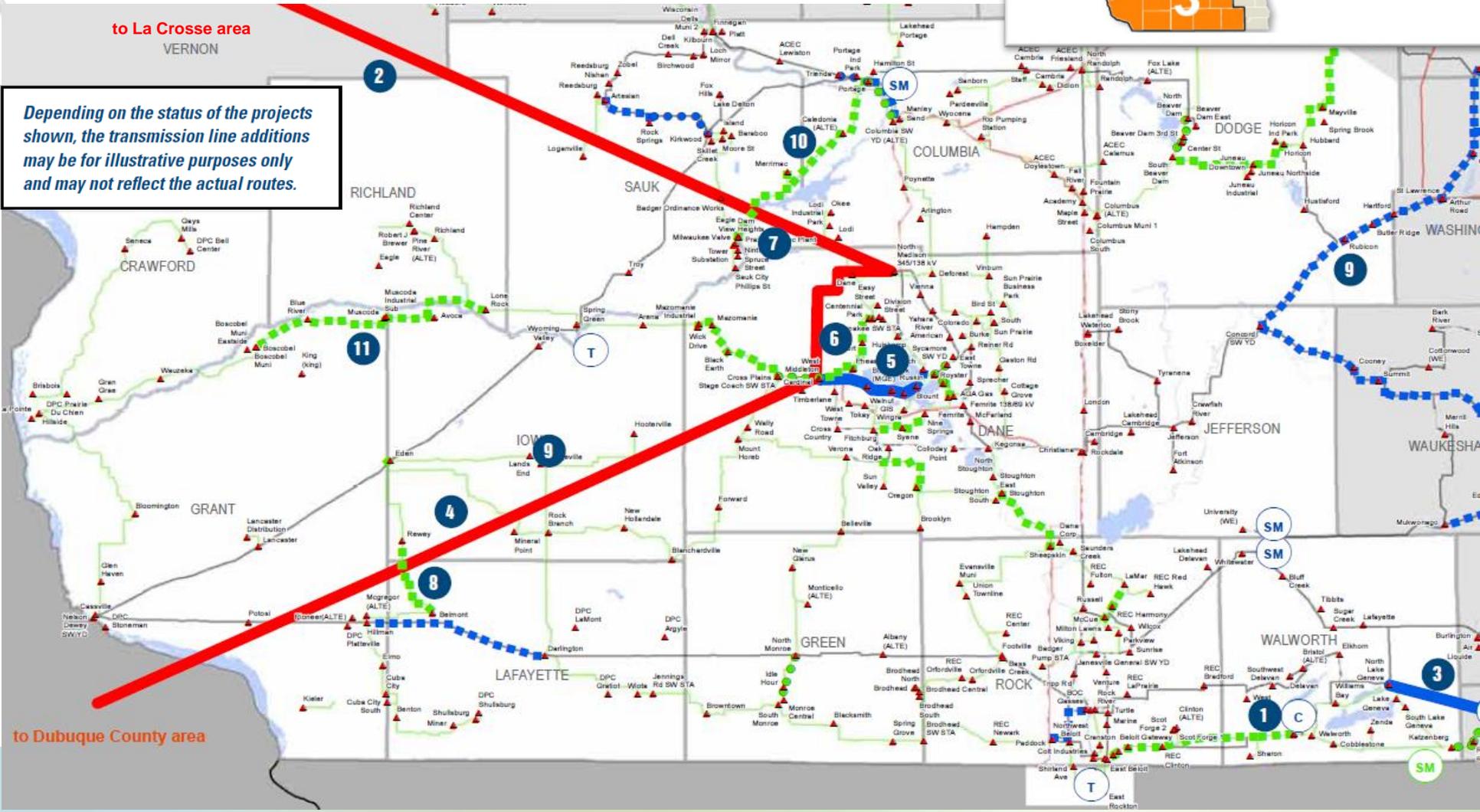
System Solutions Key

SUBSTATION KEY	TRANSMISSION LINE KEY	EXISTING TRANSMISSION LINES KEY
SS New substation Supports transmission system expansion	Red line 345-kV transmission line	Green line 69 kV
SM Substation modifications Upgrades equipment ratings to avert facility overloads	Blue line 115-, 138- or 161-kV transmission line	Pink line 161 kV
T Transformer Supports local growth and improves voltage levels	Green dashed line 69-kV transmission line	Blue line 115 kV
C Capacitor bank or reactor Relieves low voltages or high voltages	Blue dashed line Rebuilt 115- or 138-kV transmission line	Orange line 230 kV
T-D T-D interconnection Supports local growth	Green dashed line Rebuilt 69-kV transmission line	Black line 138 kV
	Blue circles 115- or 138-kV transmission line rating upgrade	Red line 345 kV
	Green circles 69-kV transmission line rating upgrade	



to La Crosse area
VERNON

Depending on the status of the projects shown, the transmission line additions may be for illustrative purposes only and may not reflect the actual routes.



to Dubuque County area

Zone 3 projects

PROJECT DESCRIPTION

IN-SERVICE YEAR

NEED DRIVER

Planned Projects

1	Colley Road – Brick Church 69-kV line	2018	Overloads, low voltages, condition, rebuild and provide line sectionalizing
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Proposed Projects

2	Badger Coulee: La Crosse area – North Madison – Cardinal 345-kV line construction	2018	Reliability, economics and public policy
3	Spring Valley – North Lake Geneva 138-kV line construction	2019	Overloads and low voltages, provide network service
4	Cardinal – Hickory Creek	2020	Reliability, economics and public policy

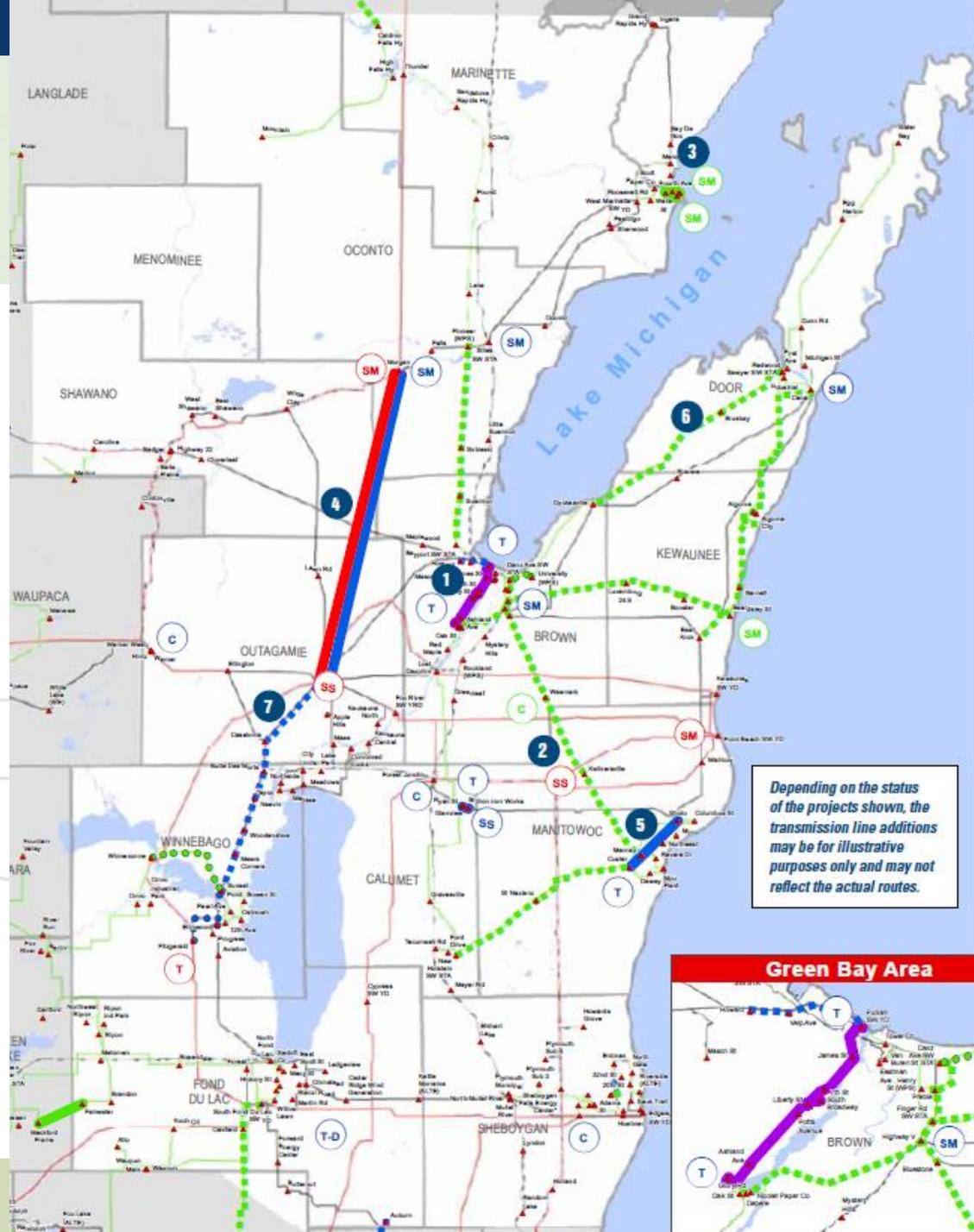
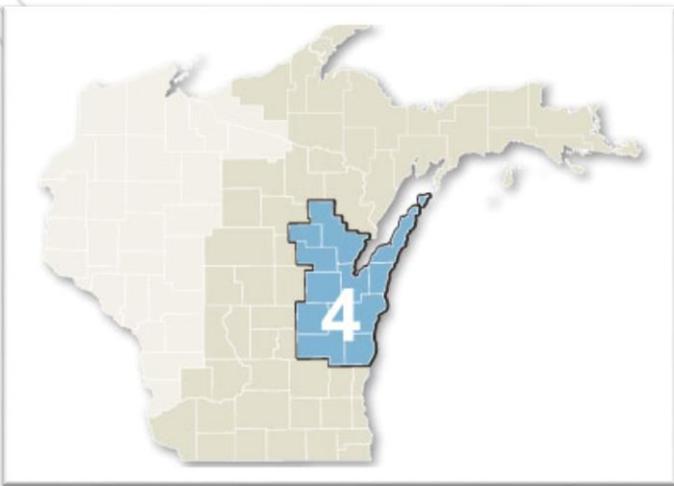
Provisional Projects

5	Cardinal – Blount 138-kV line construction	2025	Overloads and low voltages
6	West Middleton – Pheasant Branch 69-kV line rebuild	2028	Overloads and low voltages

Asset Renewal Projects

7	Dam Heights – Dane 69-kV line re-route at dam	2015	Condition and performance
8	Belmont - Rewey 69-kV line rebuild	2015	Condition and performance
9	Concord – Rubicon – Butler Ridge – Hartford 138-kV line rebuild (portion of Quad Counties project)	2016	Condition and performance
10	Dam Heights – Portage 69-kV line rebuild	2017	Condition and performance
11	Boscobel – Lone Rock 69-kV line rebuild	2018	Condition and performance

Zone 4



Depending on the status of the projects shown, the transmission line additions may be for illustrative purposes only and may not reflect the actual routes.

System Solutions Key	
SS New substation Supports transmission system expansion	TRANSMISSION LINE KEY
SM Substation modifications Upgrades equipment ratings to avert facility overloads	EXISTING TRANSMISSION LINES KEY
T Transformer Supports local growth and improves voltage levels	69 kV
C Capacitor bank or reactor Relieves low voltages or high voltages	115 kV
T-D T-D interconnection Supports local growth	138 kV
	161 kV
	230 kV
	345 kV
	345-kV transmission line
	115-, 138- or 161-kV transmission line
	69-kV transmission line
	Transmission line voltage conversion
	Rebuilt 345-kV transmission line
	Rebuilt 115- or 138-kV transmission line
	Rebuilt 69-kV transmission line
	115- or 138-kV transmission line rating upgrade
	69-kV transmission line rating upgrade



Zone 4 projects

PROJECT DESCRIPTION

IN-SERVICE YEAR

NEED DRIVER

Planned Projects

1	Pulliam – Glory Road 138-kV line conversion	2016	Overloads and low voltages
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Proposed Projects

2	Branch River 345-kV Substation construction	2018	Accommodate new generation
3	Ogden St. – Bayshore 69-kV line construction	2018	Provide network service
4	Bay Lake: North Appleton – Morgan 345-kV and 138-kV line construction	2019	Overloads and low voltages

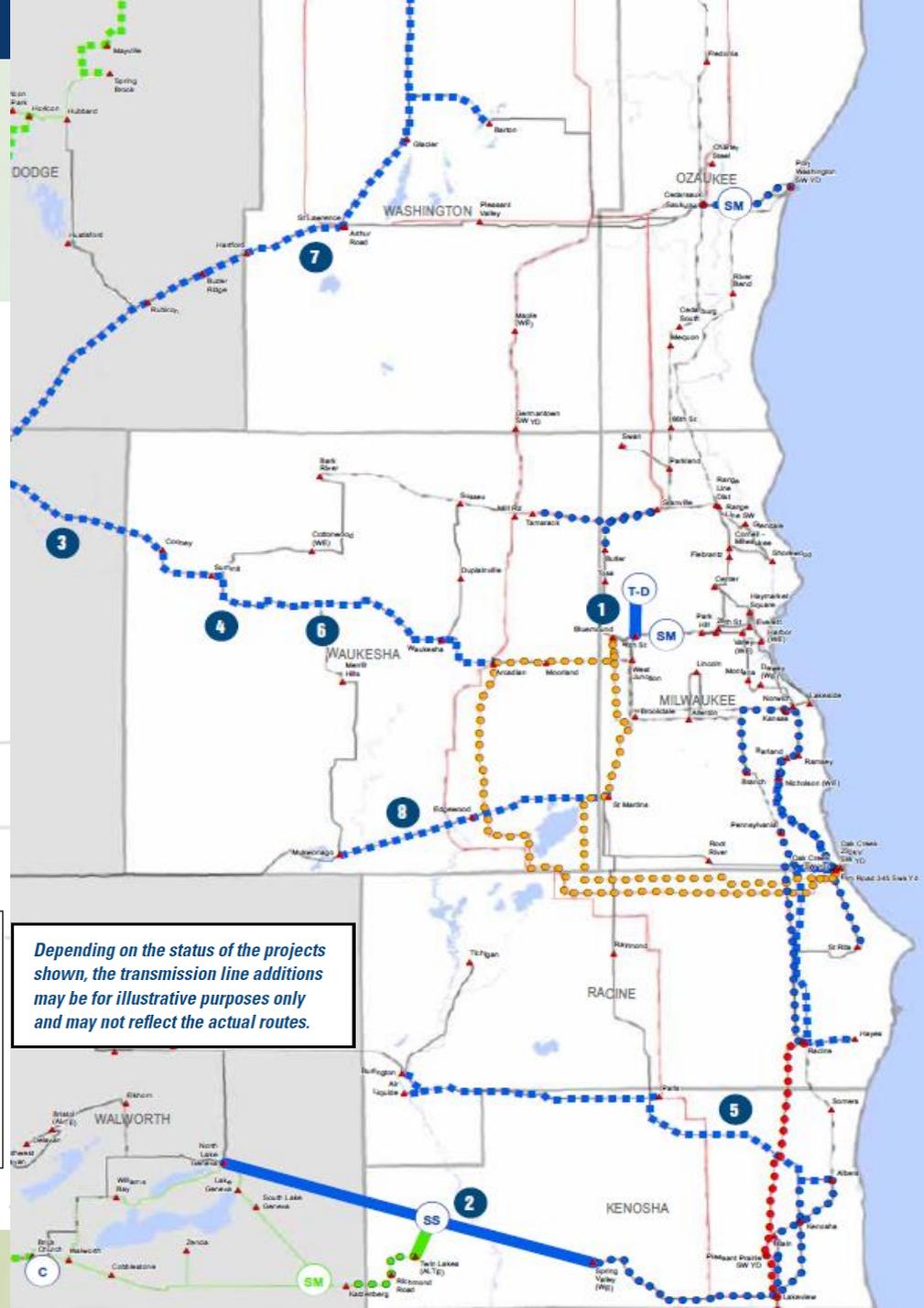
Provisional Projects

5	Shoto – Custer 138-kV line	2022	Overloads and low voltages
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Asset Renewal Projects

6	Dyckesville – Sawyer 69-kV line rebuild	2016	Condition and performance
7	North Appleton – Butte des Morts 138-kV rebuild	2017	Condition and performance

Zone 5



System Solutions Key

- | | | |
|--|--|--|
| <p>SS New substation
Supports transmission system expansion</p> <p>SM Substation modifications
Upgrades equipment ratings to avert facility overloads</p> <p>T Transformer
Supports local growth and improves voltage levels</p> <p>C Capacitor bank or reactor
Relieves low voltages or high voltages</p> <p>T-D T-D interconnection
Supports local growth</p> | <p>TRANSMISSION LINE KEY</p> <p>345-kV transmission line</p> <p>115-, 138- or 161-kV transmission line</p> <p>69-kV transmission line</p> <p>Rebuilt 115- or 138-kV transmission line</p> <p>Rebuilt 69-kV transmission line</p> <p>345-kV transmission line rating upgrade</p> <p>230-kV transmission line rating upgrade</p> <p>115- or 138-kV transmission line rating upgrade</p> <p>69-kV transmission line rating upgrade</p> | <p>EXISTING TRANSMISSION LINES KEY</p> <p>69 kV</p> <p>115 kV</p> <p>138 kV</p> <p>161 kV</p> <p>230 kV</p> <p>345 kV</p> |
|--|--|--|

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Zone 5 projects

	PROJECT DESCRIPTION	IN-SERVICE YEAR	NEED DRIVER
Planned Projects			
1	Milwaukee County T-D 138-kV lines	2015	T-D interconnection
Proposed Projects			
2	Spring Valley – North Lake Geneva 138-kV line construction	2019	Overloads and low voltages, provide network service
Provisional Projects			
None			
Asset Renewal Projects			
3	Concord – Cooney 138-kV line rebuild (portion of Quad Counties project)	2015	Condition and performance
4	Merrill Hills – Summit 138-kV line partial rebuild (portion of Quad Counties project)	2015	Condition and performance
5	Paris – Albers 138-kV line rebuild	2015	Condition and performance
6	Waukesha – Merrill Hills 138-kV line partial rebuild (portion of Quad Counties project)	2016	Condition and performance
7	St. Lawrence – Hartford 138-kV line rebuild (portion of Quad Counties project)	2016	Condition and performance
8	Mukwonago – Edgewood – St. Martins 138-kV line rebuild	2017	Condition and performance

For more information

Visit the ATC 10-Year Assessment
website: www.atc10yearplan.com

Or contact

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