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businesses running
and communities strong®

2019 10-Year Assessment Summary

Stakeholder and Customer Webcast
Chris Hagman, System Planning

Topics

- Messages
- Capital forecast
- Larger projects by zone

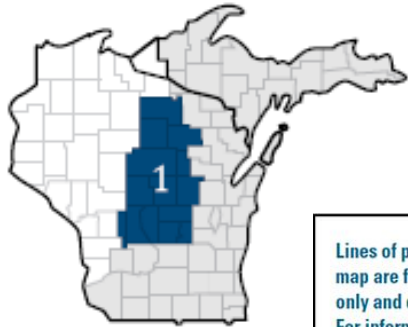
Messages

- Load forecast has about the same growth rate as the 2018 Assessment
- Changing generation mix
 - ~6 GW of solar and 1 GW of wind in MISO's generation interconnection queue for ATC.
- Modest amount of new network projects
 - New customer interconnections main reason for new network projects
- Asset Renewal
 - Approximately half of projects are dedicated to maintaining and reinforcing the system and improving its resiliency

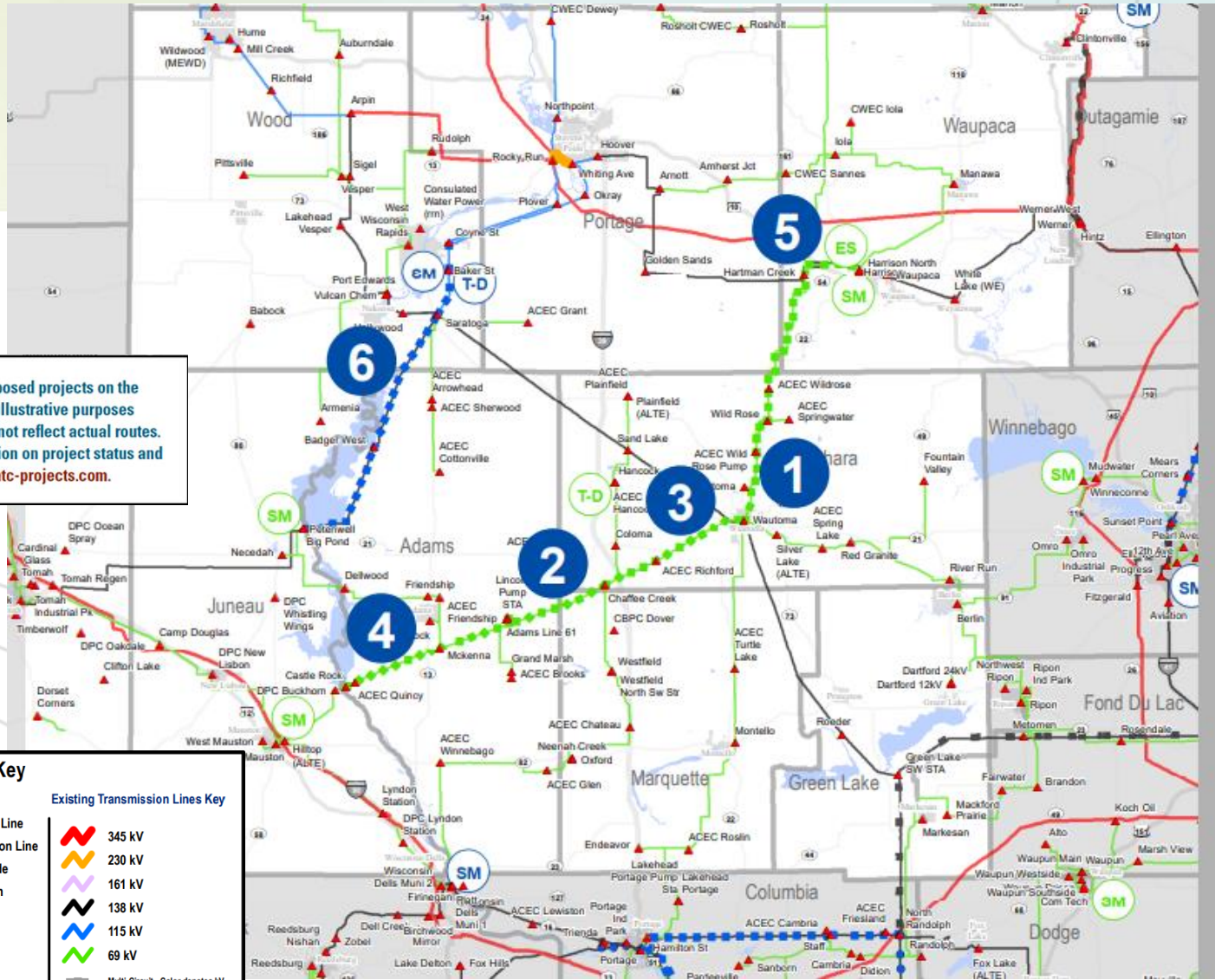
Capital Forecast

	2015	2016	2017	2018	2019
Specific Network Projects	\$1.4B	\$1.3B	\$0.7B/\$1.0B	\$0.5B	\$0.4B
Regional Multi-Value Projects	\$0.5B	\$0.5B	\$0.4B	\$0.3B	\$0.2B
Asset Maintenance	\$1.4B	\$1.4B	\$1.4B	\$1.5B	\$1.7B
Other Capital Categories	\$0.4B/\$1.2B	\$0.4B/\$1.2B	\$0.3B/\$0.8B	\$0.5B/\$1.1B	\$0.6B/\$1.3B
Total 10-Year Capital Cost	\$3.7B/\$4.5B	\$3.6B/\$4.4B	\$2.8B/\$3.6B	\$2.8B/\$3.4B	\$2.9B/\$3.6B

Zone 1



Lines of proposed projects on the map are for illustrative purposes only and do not reflect actual routes. For information on project status and routes, see atc-projects.com.



System Solutions Key		
Substation Key	Transmission Line Key	Existing Transmission Lines Key
(C) Capacitor Bank or Reactor	— New Transmission Line	⚡ 345 kV
(SS) New Substation	▣ Rebuilt Transmission Line	⚡ 230 kV
(SM) Substation Modification	● Line Rating Upgrade	⚡ 161 kV
(T) Transformer	⚡ Voltage Conversion	⚡ 138 kV
(T-D) T-D Interconnection	⚡ Communication	⚡ 115 kV
(TL) Transmission Line	Color denotes kV	⚡ 69 kV
(T-T) T-T Interconnection	⚡ 345 kV	— Multi-Circuit - Color denotes kV
(ES) Energy Storage	⚡ 230 kV	— Underground - Color denotes kV
(G-T) G-T Interconnection	⚡ 161, 138, 115 kV	⚡ 345 kV Maintained by Others
	⚡ 69 kV	



Zone 1 Projects

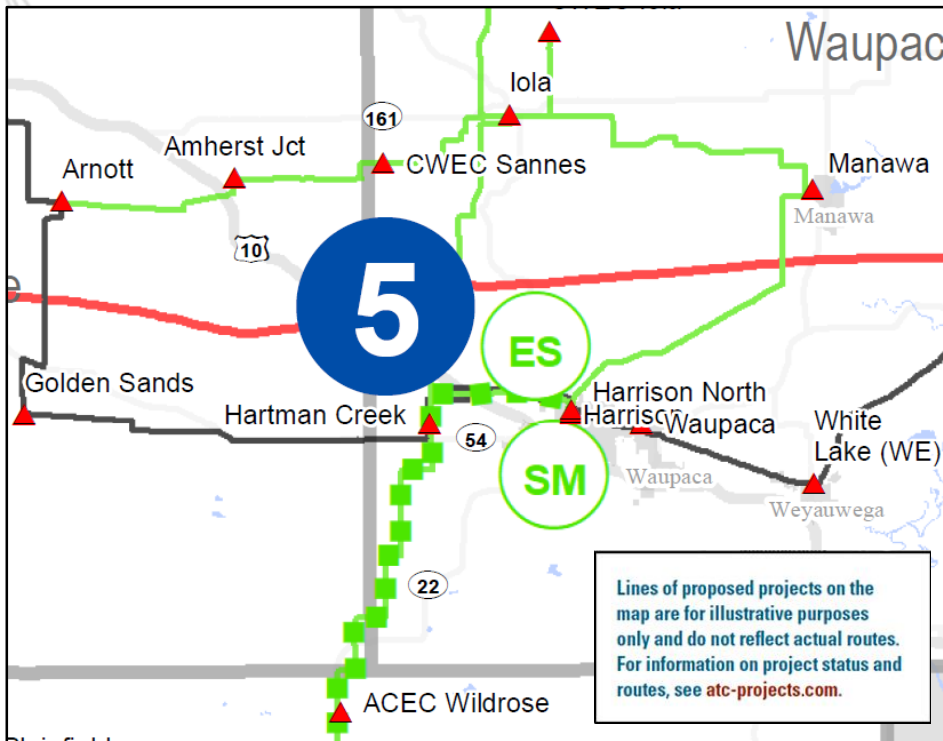
Zone 1 Planned Projects

Project Description	Project #	In-service year	Need driver
Wild Rose – Harrison 69-kV line (Y-19) partial rebuild	1	2020	Condition and performance
Chaffee Creek SS – Lincoln Pump Station 69-kV line (Y-18) rebuild	2	2023	Condition and performance
Wautoma – Chaffee Creek 69-kV line (Y-49) rebuild	3	2023	Condition and performance
McKenna - Castle Rock 69-kV line (Y-47), rebuild	4	2025	Condition and performance

Zone 1 Proposed Projects

Project Description	Project #	In-service year	Need driver
Waupaca area energy storage project	5	2021	Operational flexibility
Petenwell - Saratoga 138-kV line (X-43), rebuild	6	2022	Reliability and economic

Waupaca Area Energy Storage Project



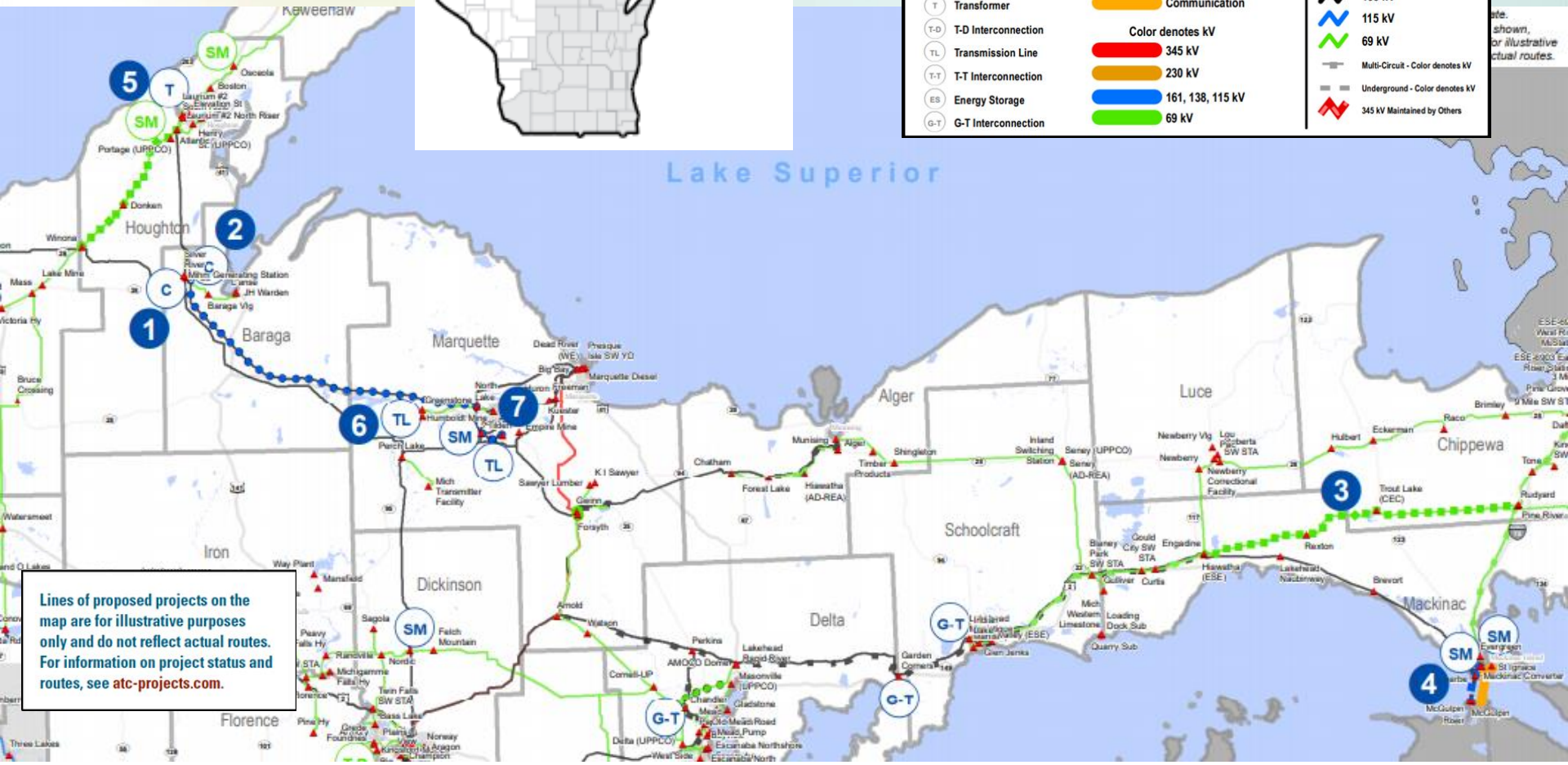
- 2021 In-service Date
- MTEP19 Appendix A, ID 15947
- Status: Proposed
- Cost: \$8M
- Needs
 - Operational flexibility and reliability
- Scope:
 - Install 2.5 MW/5 MWh battery at Harrison North substation
 - Install 8 MVAR capacitor bank at Arnott substation
 - Install 6 MVAR capacitor bank at Harrison North substation
 - Upgrade Wautoma – Wild Rose 69 kV line

Zone 2



System Solutions Key

Substation Key	Transmission Line Key	Existing Transmission Lines Key
(C) Capacitor Bank or Reactor	— New Transmission Line	345 kV
(SS) New Substation	▒ Rebuilt Transmission Line	230 kV
(SM) Substation Modification	●●●● Line Rating Upgrade	161 kV
(T) Transformer	— Voltage Conversion	138 kV
(T-D) T-D Interconnection	— Communication	115 kV
(TL) Transmission Line	Color denotes kV	69 kV
(T-T) T-T Interconnection	345 kV	Multi-Circuit - Color denotes kV
(ES) Energy Storage	230 kV	Underground - Color denotes kV
(G-T) G-T Interconnection	161, 138, 115 kV	345 kV Maintained by Others
	69 kV	



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Zone 2 Projects

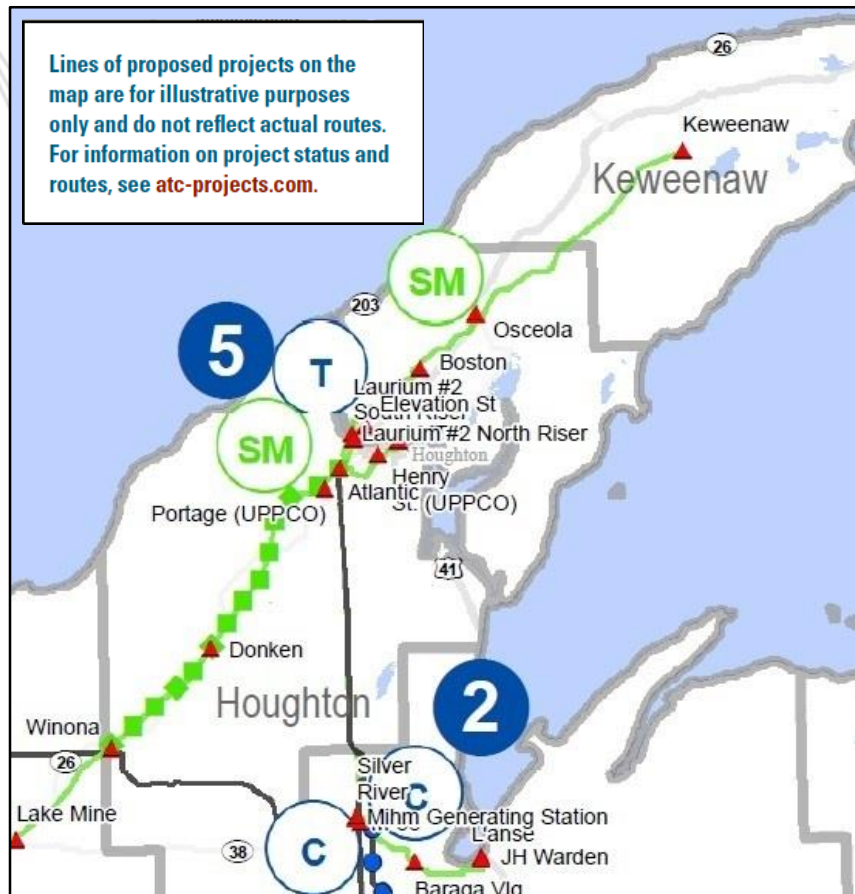
Zone 2 Planned Projects

Project Description	Project #	In-service year	Need driver
M-38 SS, new 138-kV inductor bank	1	2019	Reliability
Silver River SS, new 138-kV inductor bank	2	2019	Reliability
Hiawatha - Pine River 69-kV line (ESE_6908), replace select poles, cross arms	3	2020	Condition and performance
Mackinac - McGulpin 138-kV line (9901 and 9903), submarine cable replacement	4	2021	Condition and performance

Zone 2 Proposed Projects

Project Description	Project #	In-service year	Need driver
Atlantic SS, 138/69 kV bus reconfiguration and transformer addition	5	2022	Operational flexibility
NLKG31 Tap - Greenstone 138-kV line, construct new transmission line	6	2022	Condition and T-D interconnection
Presque Isle - Tilden 138-kV line, loop and uprate	7	2022	Reliability

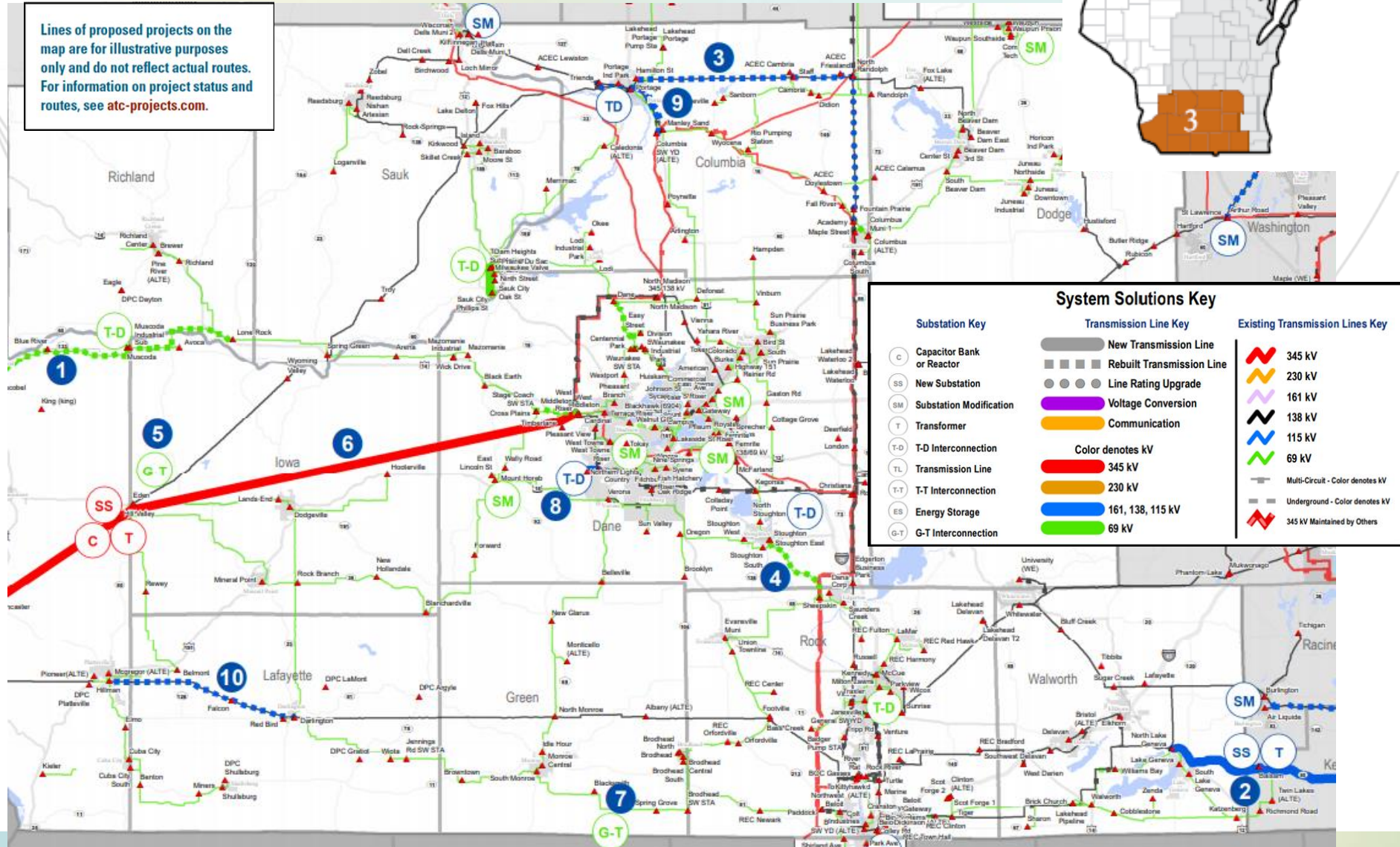
Atlantic SS, 138/69 kV bus reconfiguration and transformer addition (5)



- 2022 In-service Date
- MTEP19 Appendix A, ID 7586
- Status: Planned
- Cost: \$6.6M
- Needs:
 - Operational flexibility, reliability, asset renewal, and substation security
- Scope:
 - 69 kV bus circuit breaker improves reliability during fault or maintenance conditions
 - Replace existing 138/69 kV transformer
 - System protection upgrades
 - Substation asset renewal
 - Substation security upgrade

Zone 3

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System Solutions Key

Substation Key	Transmission Line Key	Existing Transmission Lines Key
C Capacitor Bank or Reactor	▬ New Transmission Line	▬ 345 kV
SS New Substation	▬ Rebuilt Transmission Line	▬ 230 kV
SM Substation Modification	▬ Line Rating Upgrade	▬ 161 kV
T Transformer	▬ Voltage Conversion	▬ 138 kV
T-D T-D Interconnection	▬ Communication	▬ 115 kV
TL Transmission Line	Color denotes kV	▬ 69 kV
T-T T-T Interconnection	▬ 345 kV	▬ Multi-Circuit - Color denotes kV
ES Energy Storage	▬ 230 kV	▬ Underground - Color denotes kV
G-T G-T Interconnection	▬ 161, 138, 115 kV	▬ 345 kV Maintained by Others
	▬ 69 kV	

Zone 3 Projects

Zone 3 Planned Projects

Project Description	Project #	In-service year	Need driver
Boscobel - Lone Rock 69-kV (Y-124), rebuild	1	2019	Condition and performance
Spring Valley - North Lake Geneva 138-kV line	2	2019	T-D interconnection and reliability
Portage - Staff - North Randolph 138-kV lines (X-6) (X-98), rebuild	3	2020	Condition and performance
Sheepskin - Stoughton 69-kV (Y-12), rebuild	4	2021	Condition and performance
Cardinal SS - Hickory Creek SS 345-kV, line construction	5	2023	Reliability, economic and policy

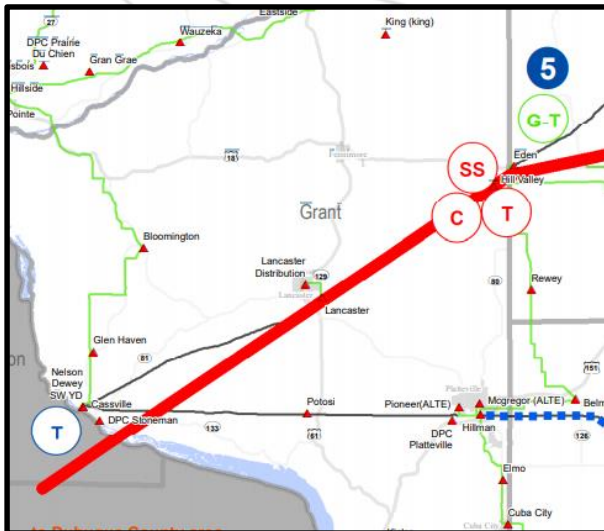
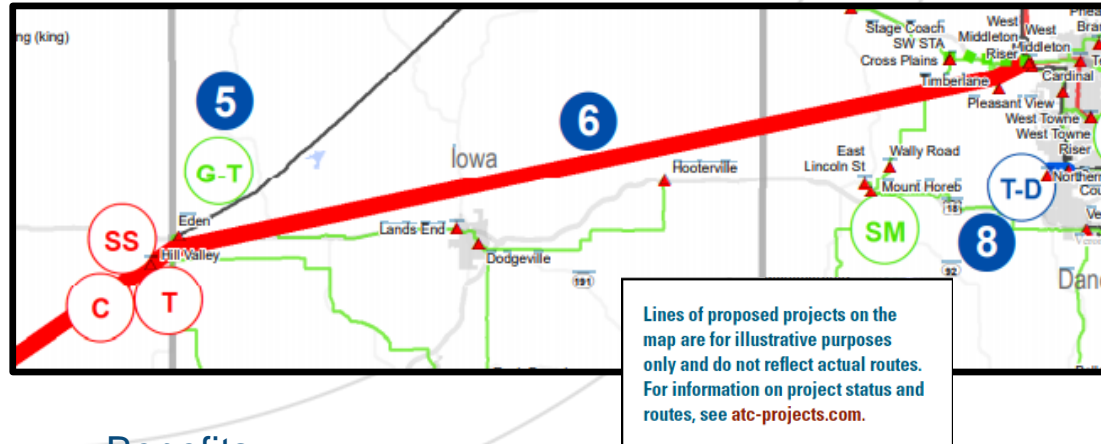
Zone 3 Proposed Projects

Project Description	Project #	In-service year	Need driver
J870/J871 GIC Highland, generator interconnection facilities and network upgrades	6	2020	G-T interconnection
J584 GIC Jordan SS, generator interconnection facilities and network upgrades information	7	2021	G-T interconnection
Northern Lights Substation, new T-D interconnection	8	2021	T-D interconnection
Portage SS - Columbia SS 138 kV (X-13/X-20), rebuild existing double circuit	9	2024	Reliability
Hillman - Darlington 138-kV line (X-14/X-101), rebuild	10	2026	Condition and performance



Cardinal SS - Hickory Creek SS 345-kV, line construction (6)

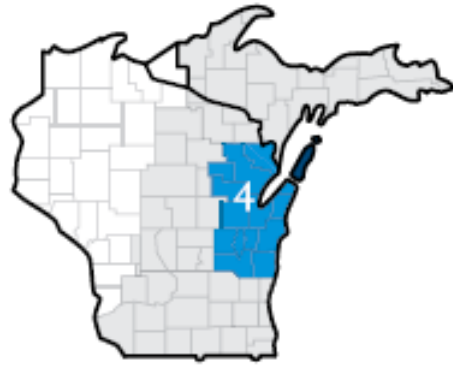
- 2023 In-service Date
- MTEP Appendix A, ID 3127
- Status: Planned
- Cost: \$492M
- Scope:
 - Hickory Creek – Hill Valley – Cardinal 345 kV line (~102 miles).
 - New Hill Valley 345/138 kV Substation.



- **Benefits:**
 - Connecting the electric transmission system in the Upper Midwest and enabling up to 30 gigawatts of cost effective, renewable energy to be delivered across the region,
 - Providing \$23 million to \$350 million in net economic benefits to Wisconsin customers, and
 - Improving local and regional electric system reliability.
- **Other Information:**
 - ATC, ITC Midwest, and Dairyland Power Cooperative project.
 - Approved by the PSCW in 2019.
 - If approved by Iowa and federal regulators, the project is expected to be in service in 2023.

Zone 4

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(C) Capacitor Bank or Reactor	— New Transmission Line	345 kV
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(SM) Substation Modification	● Line Rating Upgrade	161 kV
(T) Transformer	— Voltage Conversion	138 kV
(T-D) T-D Interconnection	— Communication	115 kV
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(ES) Energy Storage	230 kV	— Underground - Color denotes kV
(G-T) G-T Interconnection	161, 138, 115 kV	345 kV Maintained by Others
	69 kV	



Zone 4 Projects

Zone 4 Planned Projects

Project Description	Project #	In-service year	Need driver
Caldron Falls - Goodman 69-kV line (J-88), rebuild	1	2020	Condition and performance
Cedar Ridge Wind Generation - Mullet River 138-kV line (X-97) rebuild	2	2020	Condition and performance
Finger Road - Canal 69-kV line (J-10) rebuild	3	2020	Condition and performance
Ogden St. SS, network project: Ogden St. - Bayshore 69-kV line construction	4	2020	T-D interconnection
Packaging SS, new DIC	5	2020	T-D interconnection
Redwood - First Ave. 69-kV line (T-46), replace the submarine cable	6	2021	Condition and performance
Butte Des Morts - Sunset Point (40321, 80952, A-79, MCRG21) 138-kV line, rebuild	7	2021	Condition and performance
Edgewater SS, 345-kV bus reconfiguration	8	2022	Condition and performance
New Holstein - Custer 69-kV line (P-68), rebuild	9	2022	Condition and performance
Danz Ave. SW STA - University (WPS) 69-kV line (O-15), underground rebuild & OPGW	10	2023	Condition and performance
Finger Road SW STA - Wesmark- Rapids, 69-kV line (FIRY11/R-44), rebuild	11	2023/2024	Condition and performance
Oak St - Hwy V 69-kV line (Z-26), rebuild	12	2025	Condition and performance

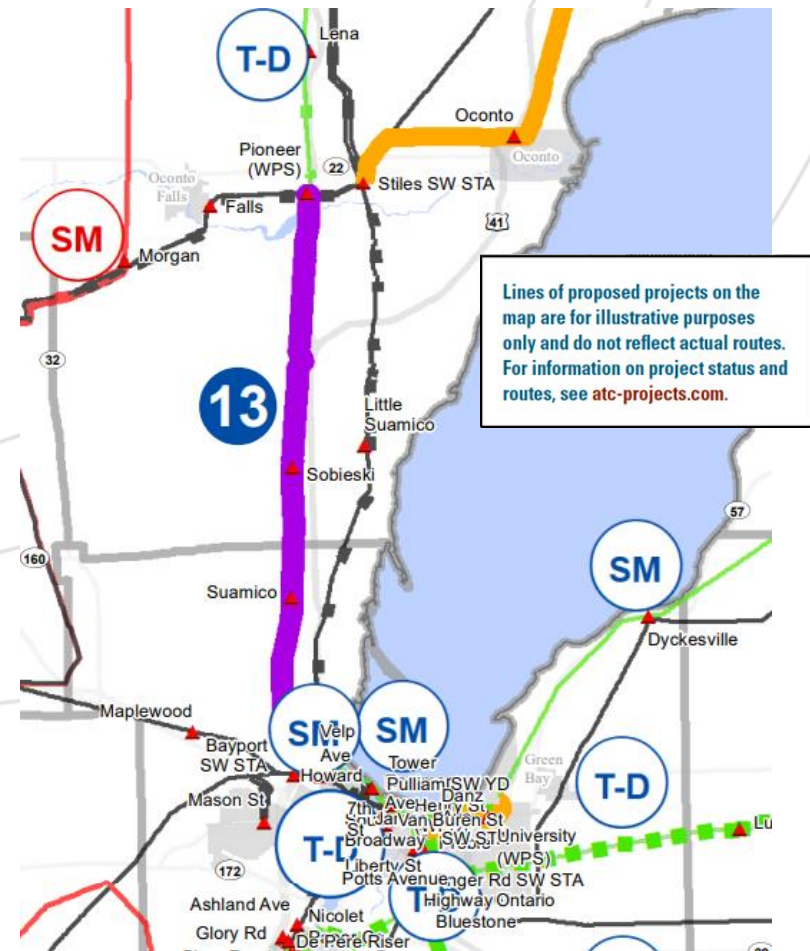
Zone 4 Proposed Projects

Project Description	Project #	In-service year	Need driver
Bayport SS - Pioneer SS 138-kV line rebuild as a double-circuit	13	2021	Condition and performance, T-D interconnection
Edgewater SS - Lodestar SS 138 kV (X-48/Y-31), underground cable rebuild	14	2022	Condition and performance
Pioneer SS - Crivitz SS 138-kV lone (E-83/B-2), retire 69-kV line and reconfigure load to 138-kV line	15	2022	Condition and performance, T-D interconnection

Identified Area Need : Bayport-Pioneer T-98/E-83

ATC and distribution provider assessed area needs

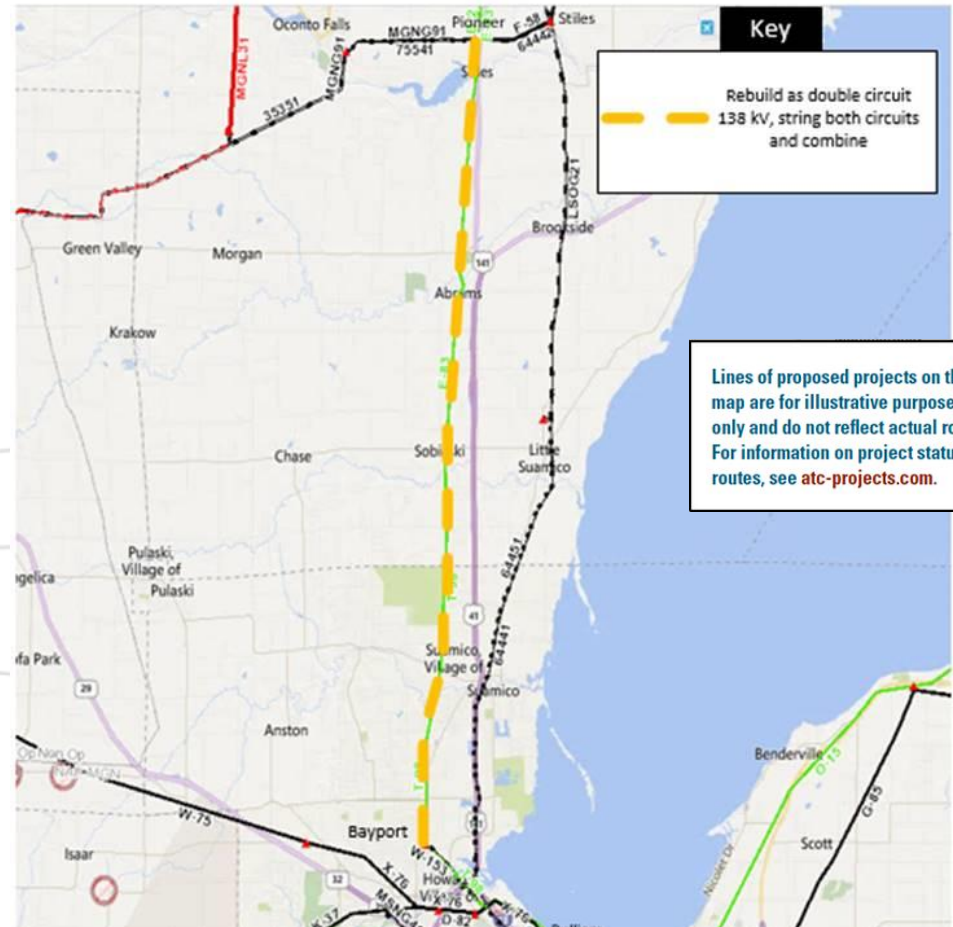
- Clearance Issues
- Condition of lines
- Bayport, Suamico and Sobieski loads
- Future asset renewal needs of Pulliam-Stiles



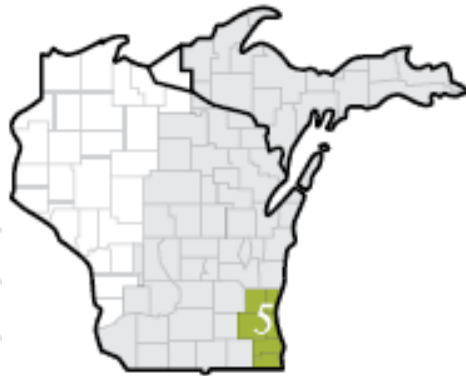
Rebuild Bayport-Pioneer as double-circuit 138 kV, string both lines: \$52M

- Best value solution
- Considers future Pulliam – Stiles asset renewal
- Minimizes land owner impact
- Filed CA May, 2019
- Order expected: November, 2019
- ISD: Late 2021, early 2022

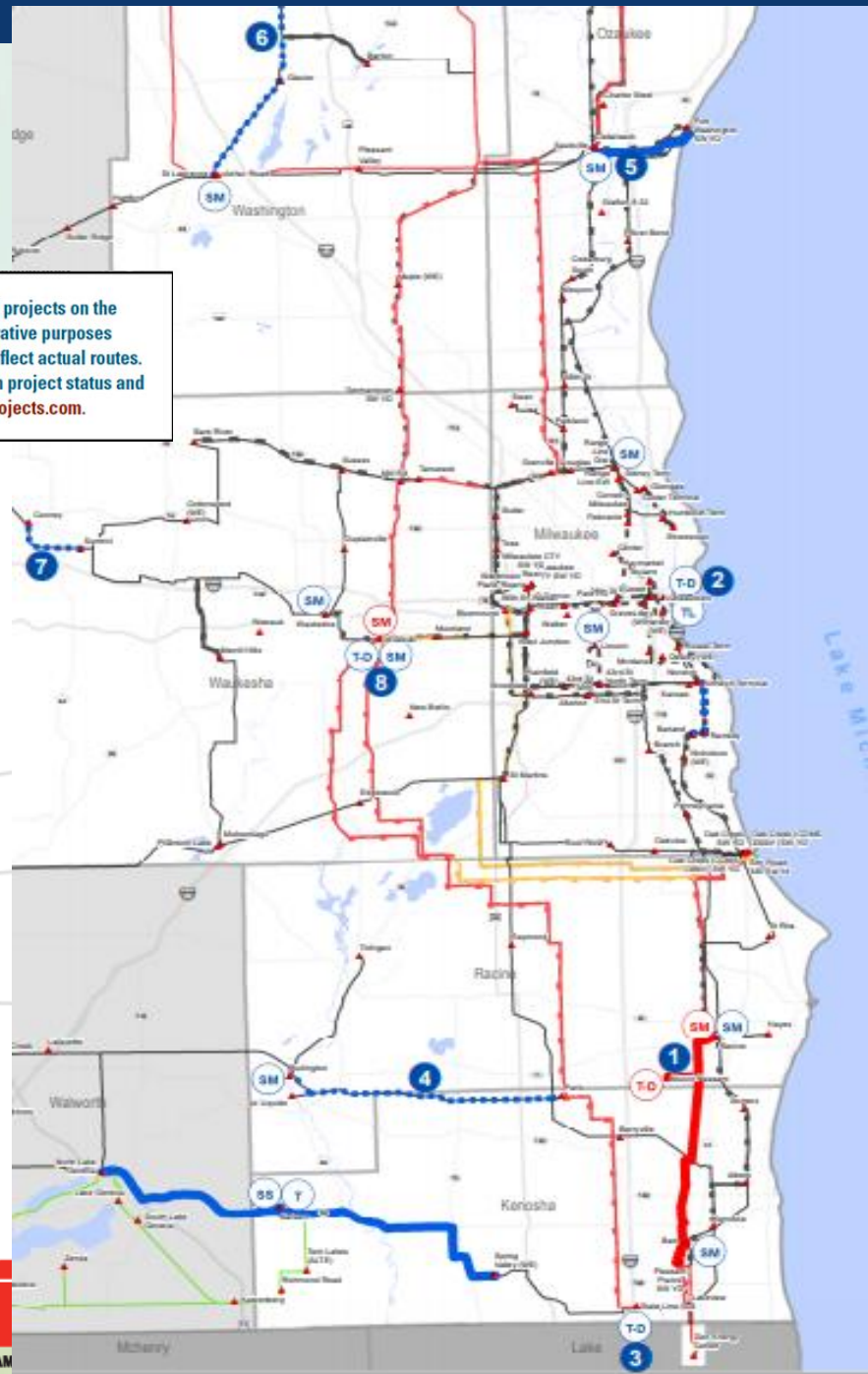
Alternative 3a: Bayport-Pioneer (2021)



Zone 5



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	69 kV	



Zone 5 Projects

Zone 5 Planned Projects

Project Description	Project #	In-service year	Need driver
Mount Pleasant Tech Interconnection Project	1	2019	T-D interconnection
Juneautown SS, new T-D interconnection rebuild	2	2020	T-D interconnection
State Line SS, new DIC	3	2020	T-D interconnection
Paris - Burlington 138-kV line (8962), rebuild	4	2021	Condition and performance
Port Washington SS - Saukville SS 138-kV line (762), rebuild to a double circuit	5	2021	Reliability
St. Lawrence-Barton-Auburn 138-kV lines (8032/9752), partial rebuild	6	2021	Condition and performance
Summit - Cooney 138-kV line (6431), rebuild	7	2023	Condition and performance

Zone 5 Proposed Projects

Project Description	Project #	In-service year	Need driver
Arcadian SS, power transformer and control house replacement and asset renewal	8	2023	Condition and performance

Port Washington SS – Saukville SS 138-kV line (762), Rebuild to Double Circuit Project



- 2021 In-service Date
- MTEP16 Appendix A, ID 9986
- Status: Planned – In Construction
- Cost: \$16M

- Need
 - Reliability

- Scope:
 - Rebuilds Port Washington – Saukville 138-kV line “762” to double circuit construction
 - Reconfigure Saukville Substation to accommodate new line termination

For More Information

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

Or contact

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