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businesses running
and communities strong

2014 Market Congestion Year in Review

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Agenda

- Congestion Severity Index
- Top Ten Constraints
- Customer's Use of System

Congestion Severity Index

- Measures severity of constraints through the theoretical congestion cost (upper bound)
 - Theoretical maximum number of dollars (in millions) that could have been paid into the market due to the constraint
- The Congestion Severity Index takes into account:
 - 1) The amount of time a constraint is bound
 - Hours for Day Ahead and 5 minute intervals for Real Time
 - 2) The financial impacts of the constraint during those times
 - Severity of constraint impact captured in shadow price
- $$CSI = \sum_{\text{All binding hours}} \frac{[\text{Binding Line Rating} \times \text{Shadow Price}]}{1,000,000}$$

CSI History

Year	ATC DA Severity Index	ATC RT Severity Index
2008	179.3	179.9
2009	116.4	110.2
2010	109.2	111.7
2011	91.3	78.2
2012	71.0	54.8
2013	66.9	53.3
2014	100.5	59.2

Congestion Severity Index (CSI) measures severity of constraints through the theoretical congestion cost (an upper bound).

Monthly updates for ATC's congested elements are posted on ATC's OATI Oasis site:

http://www.oasis.oati.com/woa/docs/ATC/ATCdocs/market_constraints.mhtml

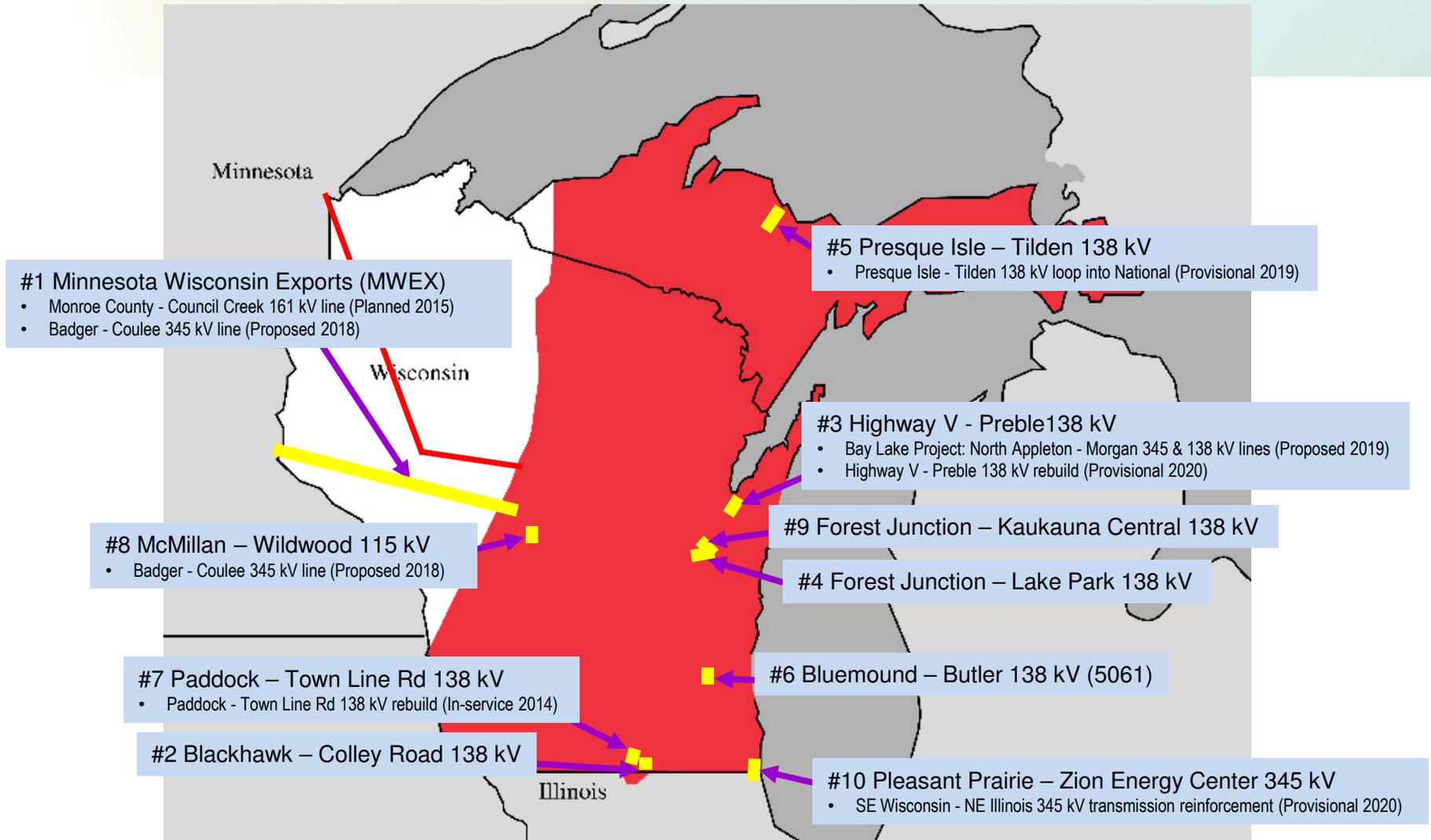


Day Ahead Top Ten in 2014

Severity Index	Hours	Day Ahead Element	
83.03	3,894	Most limiting ATC Day Ahead constrained elements in 2014	Potential Solutions
43.08	822	Minnesota to Wisconsin Exports Interface (MWEX)	Monroe County - Council Creek 161 kV line (Planned 2015) Badger - Coulee 345 kV line (Proposed 2018)
14.33	546	Blackhawk - Colley Road 138 kV	Transmission status may have contributed to this constraint
9.33	1,093	Highway V - Preble 138 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019) Highway V - Preble 138 kV rebuild (Provisional 2020) Transmission status may have contributed to this constraint
4.59	104	Forest Junction - Lake Park 138 kV	Transmission status may have contributed to this constraint
2.71	227	Presque Isle - Tilden 138 kV	Presque Isle - Tilden 138 kV loop into National (Provisional 2019) Transmission status may have contributed to this constraint
2.36	207	Bluemound - Butler 138 kV (5061)	Transmission status may have contributed to this constraint
1.98	230	Paddock - Town Line Road 138 kV	Paddock - Town Line Road 138 kV rebuild (In-service 2014) Generation and transmission status may have contributed to this constraint
1.73	509	McMillan - Wildwood 115 kV	Badger - Coulee 345 kV line (Proposed 2018)
1.60	98	Forest Junction - Kaukauna Central 138 kV	Transmission status may have contributed to this constraint
1.33	58	Pleasant Prairie - Zion Energy Center 345 kV	SE Wisconsin - NE Illinois 345 kV transmission reinforcement (Provisional 2020)

ATC Top Ten DA Constraints

Annual 2014

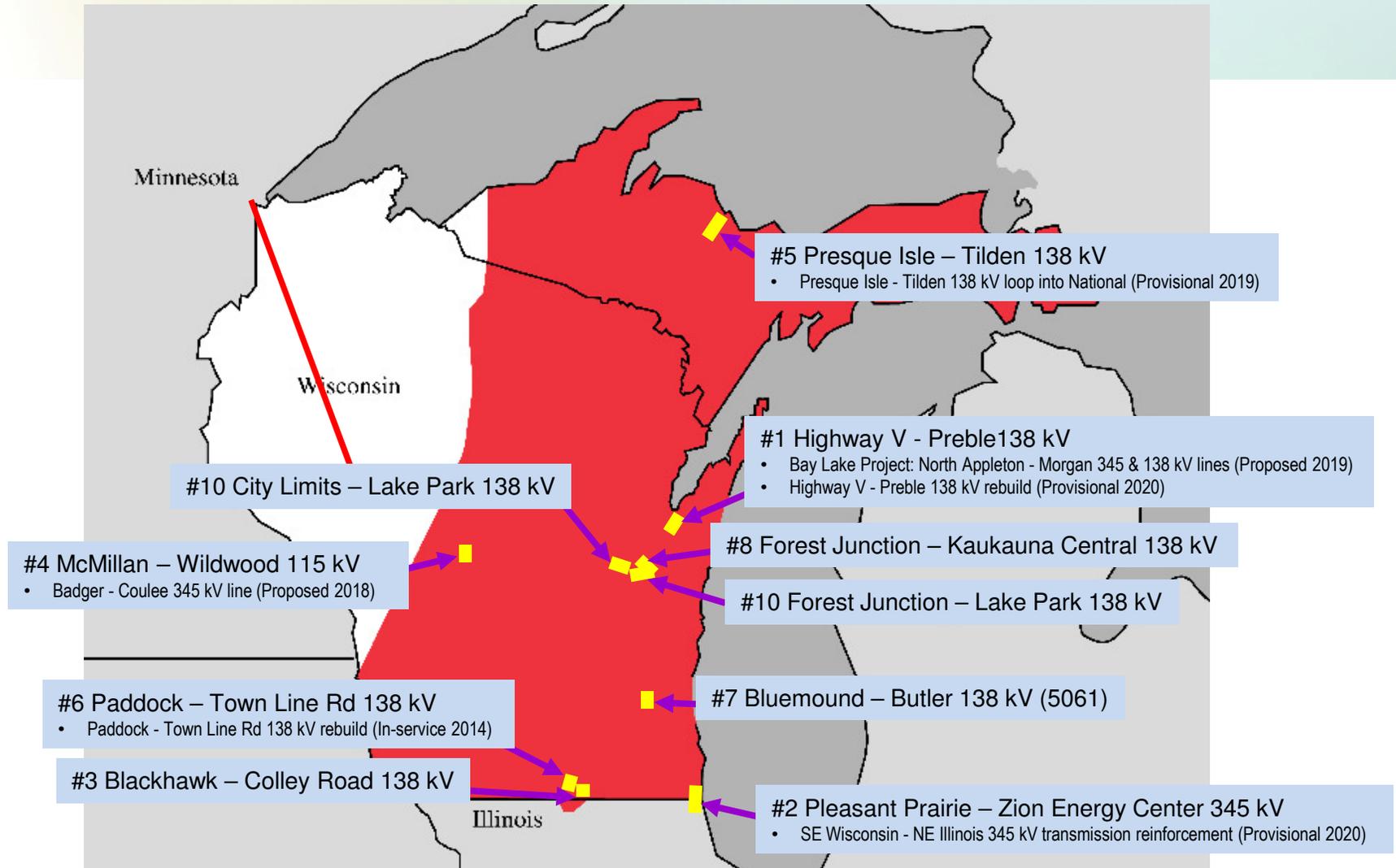


Real Time Top Ten in 2014

Severity Index	Hours	Real Time Element	Potential Solutions
41.76	593.2	Most limiting ATC Real Time constrained elements 2014	Potential Solutions
13.72	185.9	Highway V - Preble 138 kV	Bay Lake Project: North Appleton - Morgan 345 & 138 kV lines (Proposed 2019) Highway V - Preble 138 kV rebuild (Provisional 2020) Transmission status may have contributed to this constraint
6.12	61.2	Pleasant Prairie - Zion Energy Center 345 kV	SE Wisconsin - NE Illinois 345 kV transmission reinforcement (Provisional 2020)
4.68	98.7	Blackhawk - Colley Road 138 kV	Transmission status may have contributed to this constraint
4.16	91.3	McMillan - Wildwood 115 kV	Badger - Coulee 345 kV line (Proposed 2018)
3.47	48.8	Presque Isle - Tilden 138 kV	Presque Isle - Tilden 138 kV loop into National (Provisional 2019) Transmission status may have contributed to this constraint
3.05	43.3	Paddock - Town Line Road 138 kV	Paddock - Town Line Road 138 kV rebuild (In-service 2014) Generation and transmission status may have contributed to this constraint
1.92	31.8	Bluemound - Butler 138 kV (5061)	Transmission status may have contributed to this constraint
1.77	14.9	Forest Junction - Kaukauna Central 138 kV	Transmission status may have contributed to this constraint
1.46	9.6	Forest Junction - Lake Park 138 kV	Transmission status may have contributed to this constraint
1.43	7.7	City Limits - Lake Park 138 kV	Transmission status may have contributed to this constraint

ATC Top Ten RT Constraints

Annual 2014



ATC Customers Use of System

ATC Customer Use of Transmission System: Energy Flow Summary					
Interface Import Hours%	2010	2011	2012	2013	2014
ATC Net	89%	85%	86%	79%	87%
Western Interface	92%	92%	89%	82%	94%
South Central Interface	100%	99.9%	99.8%	100%	99.9%
Southeast Interface	5%	5%	10%	4%	16%
Northeast (MI) Interface*	95%	96%	99.9%	99.5%	92%

- In 2014 ATC served approximately 13% of the load from imports

*Split UP system is contributing to import – Mackinac HVDC Flow Control was substantially complete in August of 2014
All data above from hourly sampled data



Contact Information

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