

**Congestion Severity Index**

The lists on the following tabs are sorted by the Congestion Severity Index of the constraints. The Congestion Severity Index is based on the theoretical potential maximum number of dollars paid into the market by load serving entities due to congestion on the constraint in question. It is the maximum potential amount of money (in millions of dollars) that could have been saved over the course of this time period had the constraint not been bound. Both directions of the constraint are captured (there are a few constraints in ATC that have been bound in different directions at different times).

**Hours**

The "hours" measurements provided on the table is a measure duration of constraint binding. The number given is the total number of "hours" that the constraint occurred. RT data may have partial hours since RT constraints are bound in five minute intervals.

**Day Ahead and Real Time**

Day Ahead (DA) constraints indicate that MISO committed generation out of economic order in the Day Ahead market, meaning that more expensive generation is committed for the next day in order to avoid constraints that would occur if only the cheapest generation was scheduled to run. Real Time (RT) constraints show up when MISO did not anticipate overloads on the system in the Day Ahead market. Adjustments must be made to the generation mix during the operating day in order to mitigate constraints.

**Potential Solution**

Potential solutions have been provided for some constraints listed. These solutions may not have been designed for the sole purpose of alleviating the listed constraints and therefore will not necessarily fully mitigate the constraints, but will reduce the constraint's frequency and severity under normal operating conditions.

Severity Index	Hours	Constraint	Potential Solution
<b>70.96</b>	<b>11,164</b>	<b>Total for all ATC Day Ahead constraints 4-1-2011 thru 3-31-2012</b>	<b>Solutions listed in ATC TYA unless otherwise noted</b>
24.98	1,868	Kenosha - Lakeview 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
6.57	2,055	Flow South PTDF	Flow Control Device (Proposed 2014) Bay Lake Project (Proposed 2016)
4.75	571	Lakeview - Zion 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
4.59	284	Minnesota to Wisconsin Exports Interface (MWEX)	Monroe County - Council Creek 161 kV line (Proposed 2013) Badger - Coulee 345 kV line (Proposed 2018)
3.39	73	Pleasant Prairie - Zion 345 kV flo Zion - Arcadian 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
3.23	214	Rockdale 345/138 kV Transformer T21 flo Rockdale 345/138 kV Transformer T22	Rockdale - West Middleton 345 kV (Planned 2013)
2.69	219	Granville - Butler 138 kV flo Granville - Arcadian 345 kV	Terminal Equipment Replacement at Butler Substation (Proposed 2012)
2.03	1,351	Nordic - Felch Tap 69 kV flo Chandler 138/69 kV Transformer T1	Second Chandler 138/69 kV Transformer (Proposed 2012) Chandler - 18th Road 138 kV line (Proposed 2014) Arnold 345/138 kV Transformer (Provisional 2015) Bay Lake Project (Proposed 2016)
1.45	316	Sheepskin - Stoughton 69 kV flo Paddock 345/138 kV Transformer T21	Rockdale - West Middleton 345 kV (Planned 2013)
1.36	18	Granville - Butler 138 kV flo Granville - Tosa 138 kV	Terminal Equipment Replacement at Butler Substation (Proposed 2012)
1.26	181	Indian Lake 138/69 kV Transformer T2 flo Indian Lake 138/69 kV Transformer T1	Indian Lake - Hiawatha 138kV line (Proposed, 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
1.25	307	Nordic - Felch Tap 69 kV flo Plains - Arnold 138 kV	Second Chandler 138/69 kV Transformer (Proposed 2012) Chandler - 18th Road 138 kV line (Proposed 2014) Arnold 345/138 kV Transformer (Provisional 2015) Bay Lake Project (Proposed 2016)
1.06	49	North Appleton - Werner West 345 kV flo Weston Unit4	
1.01	328	Masonville - Lakehead Rapid River 69 kV flo Chandler - Delta 69 kV	Chandler - 18th Road 138 kV line (Proposed 2014)
0.75	81	Stiles - Pulliam 138 kV (64451) flo Highway 22 - Morgan 345 kV	
0.67	24	Arcadian 345/138 kV Transformer T2 flo Arcadian 345/138 kV Transformer T1	Replace Arcadian Transformers T2 and T3 (Provisional 2020)
0.63	63	Pleasant Prairie - Zion 345 kV flo Cherry Valley - Silver Lake 345 kV (ComEd)	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.59	31	Rocky Run 345/115 kV Transformer T4 flo Rocky Run 345/115 kV Transformer T1	Monroe County - Coucil Creek 161 kV line (Proposed, 2014)
0.58	72	Presque Isle Area Load	
0.58	17	Arcadian - Waukesha 138 kV flo Arcadian - Granville 345 kV	Rebuild Arcadian - Waukesha 138 kV lines KK9942 and KK9962 (Proposed, 2016)
0.58	25	Kansas - Harbor 138 kV flo Kansas - Norwich 138 kV	
0.54	73	Nelson Dewey 161/138 kV Transformer T91	
0.51	237	Manrap - Shoto 69 kV flo Northeast - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional, 2022)
0.49	481	New Holstein - St. Nazianz 69 kV flo Northeast - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.45	25	Zion - Arcadian 345 kV flo Zion - Pleasant Prairie 345 kV	
0.37	18	Nicholson - Ramsey 138 kV flo Oak Creek - Pennsylvania 138 kV	
0.36	19	Cedar Ridge - Ohmstead 138 kV flo South Fond Du Lac 345 kV Transformers T21 + T22	
0.32	67	Stiles - Pulliam 138 kV (64441) flo Highway 22 - Morgan 345 kV	
0.27	117	Cedar Ridge - Ohmstead 138 kV flo Edgewater - South Fond Du Lac 345 kV	

0.22	24	Kewaunee 345/138 kV Transformer T10	
0.21	228	Tone Tap - Rudyard Tap 69 kV flo Pine River - Nine Mile 69 kV	
0.19	12	Granville - Tosa 138 kV flo Granville - Butler 345 kV	Upgrade and Replace Terminal Equipment at Tosa Substation (Proposed 2012)
0.18	10	Woodenshoe - Mears Corners 138 kV flo Fitzgerald 345/138 kV Transformer T1	
0.18	12	Forest Junction - Cypress 345 kV flo Granville - Sheboygan 345 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.18	290	Rudyard Tap - Pine River 69 kV flo Pine River - Nine Mile 69 kV	Uprate Pine River - Nine Mile 69 kV line (Proposed 2016) ATC Northern Plan Projects
0.15	18	Stiles - Pulliam 138 kV (64441) flo Morgan - Plains 345 kV	
0.15	50	Badger 138/115 kV Transformer T1 flo Highway22 - Gardner Park 345 kV	
0.15	67	Blaney Park Sw Str - Curtis Tap 69 kV flo Indian Lake - Hiawatha 69 kV	
0.14	13	Lakeview - Zion 138 kV flo Zion - Arcadian 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.13	20	Saukville - Edgewater 345 kV flo Point Beach - Sheboygan Energy Center 345 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.13	38	Indian Lake Transformer 138/69 kV T1 flo Indian Lake Transformer 138/69 kV T2	Indian Lake - Hiawatha 138kV line (Proposed, 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.12	98	University - Whitewater 138 kV	
0.09	4	Cassel - Sunnyvale 115 kV flo Eau Claire - Arpin 345 kV + Op. Guide	
0.08	31	Chandler - Delta 69 kV CKT2 flo Delta - North Bluff 69 kV	Chandler - 18th Road 138 kV line (Proposed 2014) Bay Lake Project (Proposed 2016)
0.07	29	Nordic 138/69 kV Transformer T8 flo Armory - Big Quin Falls 69 kV	Arnold 345/138 kV Transformer (Provisional, 2015) Second Chandler 138/69 kV Transformer (Proposed, 2012) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.07	9	East Krok - Kewaunee 138 kV flo Point Beach - Kewaunee 345 kV	
0.06	16	Racine - Oak Creek 138 kV flo Elm Road - Racine 345 kV	
0.06	3	Edgewood - St. Martins 138 kV flo Paddock 345/138 kV Transformer	
0.05	2	Bluemound 230/138 kV Transformer T2 flo Bluemound 230/138 kV Transformer T1	
0.05	12	Dam Heights - Okee Tap 69 kV flo Kegonsa - Femrite 138 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.05	5	Rockdale 345/138 kV Transformer T21 flo Werner West - Rocky Run 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.05	27	Nordic - Felch Tap 69 kV flo Arnold - Perkins 138 kV	Arnold 345/138 kV Transformer (Provisional, 2015) Second Chandler 138/69 kV Transformer (Proposed, 2012) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.05	3	Ellington - Hintz 138 kV flo North Appleton - Werner West 345 kV	
0.05	7	Forest Junction - Cypress 345 kV flo Sheboygan - Granville 345 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.05	23	Nordic - Felch Tap 69 kV flo Plains - Arnold 138 kV <sup>1</sup>	Second Chandler 138/69 kV Transformer (Proposed 2012) Chandler - 18th Road 138 kV line (Proposed 2014) Arnold 345/138 kV Transformer (Provisional 2015) Bay Lake Project (Proposed 2016)
0.05	15	Shoto - Mirro 69 kV flo Manrap - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.05	29	Glenview 138/69 kV Transformer T1 flo Shoto 138/69 kV Line	Shoto - Custer 138 kV line (Provisional 2022)
0.04	7	Highway V - East Krok 138 kV flo Kewaunee - North Appleton 345 kV	

0.04	12	White Clay - Morgan 138 kV flo Highway 22 - Morgan 345 kV	
0.04	24	Nordic - Perch Lake 138 kV flo Empire - Forsyth 138 kV	Arnold 345/138 kV Transformer (Provisional, 2015) Second Chandler 138/69 kV Transformer (Proposed, 2012) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.04	8	Arcadian 345/138 kV Transformer T3 flo Sheboygan - Granville 345 kV	Replace Arcadian Transformers T2 and T3 (Provisional 2020)
0.04	3	Kewaunee 345/138 kV Transformer T10 flo Kewaunee - North Appleton 345 kV	
0.04	96	New Holstein - St. Nazianz 69 kV flo Lakefront - Revere Drive 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.04	6	Cornell - Range Line 138 kV (61443) flo Cornell - Range Line 138 kV (61451)	
0.03	18	North East - Revere Drive 69 kV flo Manrap - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.03	4	Bain 345/138 kV Transformer T4 flo Pleasant Prairie - Arcadian 345 kV	
0.02	17	Sheepskin - Stoughton 69 kV flo Columbia Unit #1	Rockdale - West Middleton 345 kV (Planned 2013)
0.02	3	Depere - Glory Road 138 kV flo Highway V - Tower Drive 138 kV	
0.02	21	McGulpin - Straits 138 kV ckt 3 flo McGulpin - Straits 138 kV ckt 1	Flow Control Device (Proposed, 2014)
0.02	8	Felch - Cornell - Chandler 69 kV flo Chandler 138/69 kV Transformer T1	ATC Northern Plan Projects
0.02	77	Rock River 138/69 kV Transformer T42	
0.02	8	Caledonia SW STR - Merrimac SW STR 69 kV flo Dam Heights - Kirkwood 69 kV	
0.02	8	New Holstein - St. Nazianz 69 kV flo Shoto 138/69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.02	65	New Holstein - St. Nazianz 69 kV flo Manrap - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.01	4	Plains 345/138 kV Transformer T1	Arnold 345/138 kV Transformer (Provisional, 2015) ATC Northern Plan Projects
0.01	17	Straits 138/69 kV Transformer T1 flo Straits - Hiawatha 138 kV + Hiawatha 138/69 kV Transf	Flow Control Device (Proposed, 2014)
0.01	24	Straits - Evergreen 69 kV flo Straits - Pine River 69 kV	Flow Control Device (Proposed, 2014)
0.01	5	Bluemound 230/138 kV Transformer T2 flo Oak Creek 345/230 kV Transformer T895 & Oak	Creek Bus 9
0.01	12	Footville SW STR - REC Center Tap 69 kV flo Kegonsa 138/69 kV T31 Transformer	
0.01	8	Cornell Tap - Harris Tap flo Chandler 138/69 kV Transformer T1	
0.01	7	Brevort - Straits - McGulpin 138 kV flo Morgan - Plains 345 kV	Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.01	2	Sheepskin - Dana Corp SW STR 69 kV flo Stoughton - Kegonsa 69 kV	
0.00	3	Tecumseh Road 138/69 kV Transformer T1 flo Kewaunee - Shoto 138 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.00	2	Kenosha - Lakeview 138 kV flo Pleasant Prairie - Zion 345 kV + Zion -Arcadian 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	9	Nine Mile - Kincheloe Main Tap 69 kV	Uprate Pine River - Nine Mile 69 kV line (Proposed 2016) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	6	Newberry Correctional Facility Tap - Roberts SW STA 69	Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	1	Rockdale 345/138 kV Transformer T21 flo Rockdale 345/138 kV Transformer T23	Rockdale - West Middleton 345 kV (Planned 2013)
0.00	9	Evergreen - Pine River 69 kV flo Straits - Hiawatha 138 kV + Hiawatha 138/69 kV Transform	Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	9	Nine Mile - Kincheloe Main Tap 69 kV flo Hiawatha - Roberts 69 kV	Uprate Pine River - Nine Mile 69 kV line (Proposed 2016) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects

0.00	4	Northeast - Mirro SW STR 69 kV flo Manrap - Shoto 69 kV	
0.00	2	University - Whitewater 138 kV flo University - Sugar Creek 138 kV	
0.00	14	New Holstein - St. Nazianz 69 kV flo Glenview - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	2	Cedar Ridge - Kettle Morrairie 138 kV flo Edgewater - South Fond Du Lac 345 kV	
0.00	8	Mass - Bruce Crossing 69 kV flo Atlantic - Winona 69 kV	ATC Northern Plan Projects
0.00	2	Hiawatha - Roberts 69 kV	Pine River-Straits 69kV rebuild (Proposed 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	7	Pine Grove Tap - 3 Mile 69 kV	
0.00	6	Rock River - Turtle 69 kV	
0.00	8	St. Nazianz - Custer 69 kV flo Glenview - Shoto 138 kV	
0.00	7	Chandler - Delta 69 kV CKT1 flo Chandler - Delta 69 kV CKT2	Chandler - 18th Road 138 kV line (Proposed 2014)
0.00	5	Petenwell 138/69 kV Transformer T31	
0.00	2	Rexton Tap - Trout Lake Tap 69 kV flo Hiawatha - Pine River 69 kV	Indian Lake - Hiawatha 138kV line (Proposed, 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	13	Hiawatha - Engadine Tap 69 kV	Pine River-Straits 69kV rebuild (Proposed 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	1	McCue - REC Harmony Tap 69 kV flo Christiana - Kegonsa 138 kV	Construct 69-kV double-circuit line between McCue and Lamar (Provisional, 2022)
0.00	2	Hiawatha - Engadine Tap 69 kV flo Pine River - Nine Mile 69 kV	Pine River-Straits 69kV rebuild (Proposed 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	2	Brimley Tap - Raco Tap 69 kV flo Hiawatha - Roberts 69 kV	Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	4	Chandler 138/69 kV Transformer T1 flo Plains 345/138 kV Transformer TR1 <sup>1</sup>	Second Chandler 138/69 kV Transformer (Proposed, 2012)
0.00	3	M38 - Atlantic 138 kV flo M 38 - Winona 138 kV	ATC Northern Plan Projects
0.00	1	Kelly - Bunker Hill 115 kV flo Gardner Park - Blackbrook - Aurora 115 kV	
0.00	4	Roberts - Lou Pac Tap 69 kV	
0.00	1	Indian Lake 138/69 kV Transformer T1	Indian Lake - Hiawatha 138kV line (Proposed, 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	1	Kaukauna Central - Forest Junction 138 kV flo Fox River - North Appleton 345 kV	
0.00	2	Manrap - Custer 69 kV flo Shoto 138/69 kV Transformer T1	Shoto - Custer 138 kV line (Provisional, 2022)
0.00	1	Kaukauna North - Kaukauna Central 138 kV flo Forest Junction - Melissa 138kV	
0.00	1	Cornell - Chandler 69 kV flo Empire - Forsyth 138 kV + MINE LOAD	Arnold 345/138 kV Transformer (Provisional, 2015) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	1	Pine - Grandfather Falls 115 kV	
0.00	1	M38 - Atlantic 138 kV	ATC Northern Plan Projects
0.00	4	Western UP Import (North Lake - M 38 ; Bruce Crossings Line)	ATC Northern Plan Projects
0.00	2	City Limits - Lake Park 138 kV flo Fox River - North Appleton 345 kV	
0.00	1	Glenview 138/69 kV Transformer T1 flo Kewaunee - Shoto 138 kV Line	Shoto - Custer 138 kV line (Provisional 2022)

0.00	1	Chandler - Cornell 69 kV flo Chandler 138/69 kV Transformer T1	Second Chandler 138/69 kV Transformer (Proposed, 2012)
0.00	1	Gateway - Sycamore SW YD 69kV flo Sycamore - Blount 138 kV	
0.00	1	Mass - Bruce Crossing 69 kV flo M-38 - Perch Lake 138 kV	ATC Northern Plan Projects
0.00	1	Nine Mile - Pine Grove 69 kV	Uprate Pine River - Nine Mile 69 kV line (Proposed 2016) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	28	Detour Transformer T2	No solution - virtual activity causing congestion
0.00	235	Manistique Transformer T1	No solution - virtual activity causing congestion
0.00	3	Weston Unit G31 Output	No solution - virtual activity causing congestion

Severity Index	Hours	Constraint	Potential Solution
0.00	0	<b>ACEC Quincy - Castle Rock 69 kV flo Kilbourn - Hilltop 69 kV</b>	<b>Solutions listed in ATC TYA unless otherwise noted</b>
0.00	1	Albers - Bain 138 kV flo Pleasant Prairie - Zion 345 kV	
0.00	33	Albers - Kenosha 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	1	Albers - Paris 138 kV	
0.00	3	Albers - Paris 138 kV flo Pleasant Prairie - Racine 345 kV	
0.00	5	Arcadian 345/138 kV Transformer T2 flo Arcadian 345/138 kV Transformer T1	Replace Arcadian Transformers T2 and T3 (Provisional 2020)
0.00	6	Arcadian 345/138 kV Transformer T3 flo Arcadian 345/138 kV Transformer T1	Replace Arcadian Transformers T2 and T3 (Provisional 2020)
0.00	0	Arcadian 345/138 kV Transformer T3 flo Pleasant Prairie - Zion 345 kV	Replace Arcadian Transformers T2 and T3 (Provisional 2020)
0.00	14	Arpin - Sigel 138 kV flo Arpin - Rocky Run 345 kV + Op. Guide	Monroe County - Coucil Creek 161 kV line (Proposed, 2014) North La Crosse - Madison 345 kV line (Proposed 2018)
0.00	0	Arpin 345/138 kV Transformer T21 flo Arpin - Rocky Run 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2014) North La Crosse - Madison 345 kV line (Proposed 2018)
0.00	0	Arrowhead - Stone Lake 345 kV	Monroe County - Council Creek 161 kV line (Proposed, 2013) North La Crosse - Madison 345 kV line (Proposed 2018)
0.00	1	Badger 138/115 kV Transformer T1 flo Highway22 - Gardner Park 345 kV	
0.00	0	Bain - Kenosha 138 kV flo Pleasant Prairie - Zion 345 kV	Upgrade of Bain - Kenosha 138 kV (Provisional 2013)
0.00	0	Bain 345/138 kV Transformer T4 flo Pleasant Prairie - Zion 345 kV	
0.00	1	Blount - Ruskin 69 kV (6903) flo Blount - Ruskin 69 kV (6904)	Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line (Planned, 2011)
0.00	4	Bluemound - Butler 138 kV (5051) flo Elm Road - Arcadian 345 kV	
0.00	2	Bluemound 230/138 kV Transformer T2 flo Bluemound 230/138 kV Transformer T1	
0.00	8	Bluestone - Wesmark 69 kV flo Glenview 138/69 kV Transformer T69	Shoto - Custer 138 kV line (Provisional 2022)
0.00	6	Bluestone - Wesmark 69 kV flo Kewaunee - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	3	Bunker Hill - Blackbrook 115 kV flo Pine - Highway 8 - Eastom 115 kV	
0.00	27	Cedar Ridge - Ohmstead 138 kV flo Edgewater - Saukville 345 kV	
0.00	52	Cedar Ridge - Ohmstead 138 kV flo Edgewater - South Fond Du Lac 345 kV	
0.00	1	Cedar Ridge - Ohmstead 138 kV flo South Fond Du Lac 345/138 kV Transformer TR21 & TR22	
0.00	5	Chandler - Cornell 69 kV flo Chandler 138/69 kV Transformer T1	Second Chandler 138/69 kV Transformer (Proposed, 2012)
0.00	256	Chandler - Delta 69 kV CKT2 flo Chandler - Delta 69 kV CKT1	Chandler - 18th Road 138 kV line (Proposed 2014)
0.00	1	Chandler - Delta 69 kV CKT2 flo Delta - North Bluff 69 kV	Chandler - 18th Road 138 kV line (Proposed 2014) Bay Lake Project (Proposed 2016)
0.00	6	Chandler - Goodman SW STR flo Chandler - Delta 69 kV	Chandler - 18th Road 138 kV line (Proposed 2014)
0.00	1	Cornell - Chandler 69 kV flo Plains - Arnold 138 kV	Arnold 345/138 kV Transformer (Provisional, 2015) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	15	Cornell - Range Line 138 kV (61443) flo Range Line - Granville 138 kV (61453)	
0.00	3	Dam Heights - Okee Tap 69 kV flo Columbia - North Madison 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.00	4	Danz Ave - Henry St Tap 69 kV flo Finger Road - Highway V 69 kV	
0.00	1	Danz Ave - Pulliam 69 kV flo Highway V 138/69 kV Transformer T1	

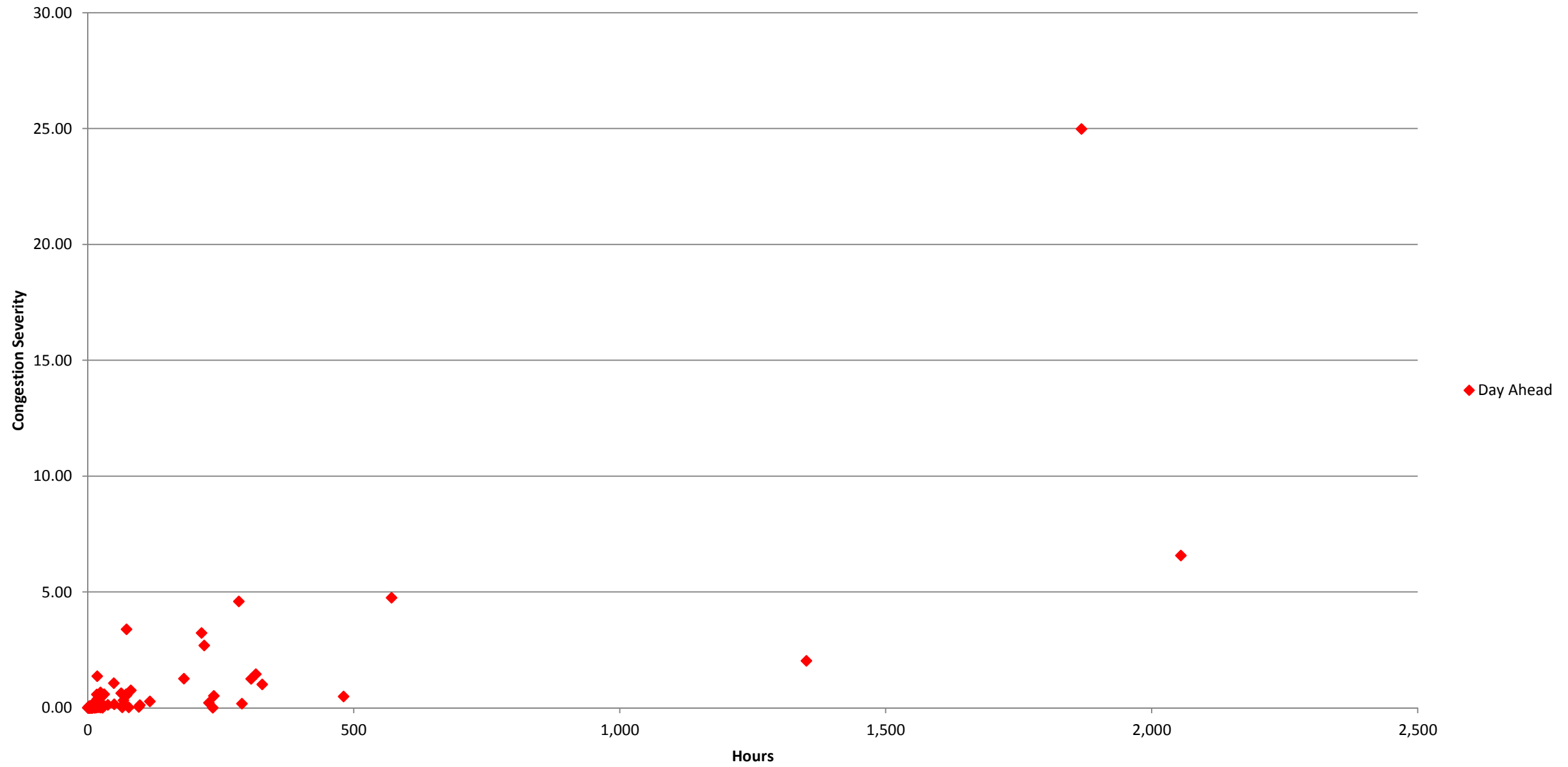
0.00	3	Eden - Mineral Point 69 kV flo Hillman - Darlington 138 kV	
0.00	1	Edgewood - St. Martins 138 kV flo Wempletown - Paddock 345 kV	
0.00	24	Elkhart Lake - Forest Junction 138 kV flo Point Beach - Sheboygan Energy Center 345 kV +	Upgrades associated with G611 (Planned 2010) ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.00	6	Elkhart Lake - Saukville 138 kV flo Sheboygan Energy Center - Granville 345 kV	ATC is investigating a future 345 kV N-S path in the Fox Valley corridor
0.00	1	Ellington - Hintz 138 kV flo North Appleton - Werner West 345 kV	
0.00	3	Enzyme Bio Systems - RCEC Clinton 69 kV flo Colley Road - Brick Church 138 kV	
0.00	4	Finger Road - Bluestone 69 kV flo Shoto 138/69 kV Transformer T1	Shoto - Custer 138 kV line (Provisional 2022)
0.00	6	Finger Road - Bluestone 69 kV flo Shoto 138/69 kV Transformer T2	Shoto - Custer 138 kV line (Provisional 2022)
0.00	62	Flow South	Flow Control Device (Proposed 2014) Bay Lake Project (Proposed 2016)
0.00	2	Forest Junction - Arcadian 345 kV flo Point Beach - Sheboygan 345 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.00	9	Forest Junction - Arcadian 345 kV flo Sheboygan Falls - Granville 345 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.00	2	Forest Junction - Cypress 345 kV flo Point Beach - Sheboygan 345 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.00	2	Forest Junction - Kaukauna Central 138 kV flo Kewaunee - North Appleton 345 kV	
0.00	1	Glenview - Gravesville 69 kV flo Forest Junction - Tecumseh Road 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	2	Glenview 138/69 kV Transformer T1 flo Kewaunee - Shoto 138 kV Line	Shoto - Custer 138 kV line (Provisional 2022)
0.00	0	Glenview 138/69 kV Transformer T1 flo Tecumseh Road 138/69 kV Transformer	Shoto - Custer 138 kV line (Provisional 2022)
0.00	1	Gran Grae - Boscobel 69 kV flo Nelson Dewey - Hillman 138 kV	Uprate Y-40 Gran Grae-Boscobel 69-kV line (Provisional 2012)
0.00	63	Granville - Butler 138 kV flo Granville - Arcadian 345 kV	Terminal Equipment Replacement at Butler Substation (Proposed 2012)
0.00	82	Granville - Butler 138 kV flo Granville - Tosa 138 kV	Terminal Equipment Replacement at Butler Substation (Proposed 2012)
0.00	0	Granville - Tamarack 138 kV flo Arcadian - Granville 345 kV	
0.00	12	Granville - Tosa 138 kV flo Granville - Butler 345 kV	Upgrade and Replace Terminal Equipment at Tosa Substation (Proposed 2012)
0.00	1	Granville 345/138 kV Transformer T3 flo Saukville 345/138 kV Transformer T1	
0.00	2	Gravesville - Glenview 69 kV flo New Holstein - Tecumseh RD 69 kV	
0.00	0	Gravesville - Glenview 69 kV flo Shoto 138/69 kV transformer T1	
0.00	0	Gravesville - Glenview 69 kV flo Tecumseh Rd 138/69 kV Transformer T1	
0.00	9	Hiawatha 138/69 kV Transformer T1 flo Wilton Center 765/345 kV Transformer	Indian Lake - Hiawatha 138kV line (Proposed, 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	5	Indian Lake - Valley Tap 69 kV flo Indian Lake Hiawatha 69 kV	Indian Lake - Hiawatha 138kV line (Proposed, 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	71	Indian Lake 138/69 kV Transformer T2 flo Indian Lake 138/69 kV Transformer T1	Indian Lake - Hiawatha 138kV line (Proposed, 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	5	Indian Lake Transformer 138/69 kV T1 flo Indian Lake Transformer 138/69 kV T2	Indian Lake - Hiawatha 138kV line (Proposed, 2014) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	11	Kansas - Harbor 138 kV flo Kansas - Norwich 138 kV	
0.00	0	Kansas - Harbor 138 kV flo Norwich - Harbor 138 kV	
0.00	5	Kenosha - Lakeview 138 kV flo Arcadian - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)

0.00	3	Kenosha - Lakeview 138 kV flo Arcadian 345/138 kV Transformer T3	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	270	Kenosha - Lakeview 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	18	Kenosha - Lakeview 138 kV flo Pleasant Prairie - Zion 345 kV + Zion -Arcadian 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	0	Kenosha - Lakeview 138 kV flo Zion - Northbrook (B) 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	1	Kilbourn 138/69 kV Transformer T32 flo Kilbourn 138/69 kV Transformer T31	
0.00	151	Lakeview - Zion 138 kV flo Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	0	Lakeview - Zion 138 kV flo Pleasant Prairie - Zion 345 kV + Arcadian - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	43	Lakeview - Zion 138 kV flo Zion - Arcadian 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	0	M38 - Atlantic 69 kV flo Atlantic - Winona 69 kV	ATC Northern Plan Projects
0.00	1	Manrap - Custer 69 kV flo North East - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional, 2022)
0.00	31	Manrap - Shoto 69 kV flo Northeast - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional, 2022)
0.00	32	Masonville - Lakehead Rapid River 69 kV flo Chandler - Delta 69 kV	Chandler - 18th Road 138 kV line (Proposed 2014)
0.00	1	McMillan - Wildwood 115 kV flo Arpin - Rocky Run 345 kV	Improve clearance on McMillan - Wildwood 115 kV (Planned, 2011)
0.00	8	McMillan - Wildwood 115 kV flo Arpin - Rocky Run 345 kV + Port Edwards SPS	Improve clearance on McMillan - Wildwood 115 kV (Planned, 2011)
0.00	11	Minnesota to Wisconsin Exports Interface (MWEX)	Monroe County - Council Creek 161 kV line (Proposed 2013) Badger - Coulee 345 kV line (Proposed 2018)
0.00	18	Morrison Avenue - Sherman Street 115 kV flo Gardner Park - Hilltop 115 kV	
0.00	2	Nelson Dewey - Glen Haven Tap 69 kV flo Nelson Dewey 138/115 kV Transformer T91	
0.00	2	Nelson Dewey 138/69 kV Transformer T32 flo Nelson Dewey 138/69 kV Transformer T31	
0.00	17	Nelson Dewey 161/138 kV Transformer T91	
0.00	0	New Holstein - Gravesville 69 kV flo Forest Junction - Glenview 138 kV	
0.00	0	New Holstein - St. Nazianz 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	8	New Holstein - St. Nazianz 69 kV flo Glenview - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	68	New Holstein - St. Nazianz 69 kV flo Kewaunee - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	6	New Holstein - St. Nazianz 69 kV flo Lakefront - Revere Drive 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	8	New Holstein - St. Nazianz 69 kV flo Manrap - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	47	New Holstein - St. Nazianz 69 kV flo Northeast - Shoto 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	184	New Holstein - St. Nazianz 69 kV flo Shoto 138/69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	2	Nordic - Felch Tap 69 kV flo Chandler - Forsyth 69 kV	Second Chandler 138/69 kV Transformer (Proposed 2012) Chandler - 18th Road 138 kV line (Proposed 2014) Arnold 345/138 kV Transformer (Provisional 2015) Bay Lake Project (Proposed 2016)
0.00	1,487	Nordic - Felch Tap 69 kV flo Chandler 138/69 kV Transformer T1	Second Chandler 138/69 kV Transformer (Proposed 2012) Chandler - 18th Road 138 kV line (Proposed 2014) Arnold 345/138 kV Transformer (Provisional 2015) Bay Lake Project (Proposed 2016)
0.00	0	Nordic - Felch Tap 69 kV flo Empire - Forsyth 138 kV	Arnold 345/138 kV Transformer (Provisional, 2015) Second Chandler 138/69 kV Transformer (Proposed, 2012) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects

0.00	110	Nordic - Felch Tap 69 kV flo Plains - Arnold 138 kV <sup>1</sup>	Second Chandler 138/69 kV Transformer (Proposed 2012) Chandler - 18th Road 138 kV line (Proposed 2014) Arnold 345/138 kV Transformer (Provisional 2015) Bay Lake Project (Proposed 2016)
0.00	2	Nordic - Perch Lake 138 kV flo Dead River - Plains 345 + Mine Load	Arnold 345/138 kV Transformer (Provisional, 2015) Second Chandler 138/69 kV Transformer (Proposed, 2012) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	18	Nordic 138/69 kV Transformer T8 flo Dead River - Plains 345 kV + Mine Load	Arnold 345/138 kV Transformer (Provisional, 2015) Second Chandler 138/69 kV Transformer (Proposed, 2012) Flow Control Device (Proposed, 2014) ATC Northern Plan Projects
0.00	1	North Appleton - Werner West 345 kV flo Sherbourne County Unit #3 (NSP)	
0.00	3	North Appleton - Werner West 345 kV flo Sherburne Co Units	
0.00	17	North Appleton - Werner West 345 kV flo Weston Unit4	
0.00	0	North Appleton 345/138 kV Transformer T2 flo North Appleton - Werner West 345 kV	
0.00	1	Northeast - Mirro SW STR 69 kV flo Manrap - Shoto 69 kV	
0.00	3	Oak Creek 345/230 kV Transformer T884 flo Oak Creek - Bluemound 230 kV	
0.00	1	Paddock - Northwest Beloit 138 kV	
0.00	1	Paddock - Town Line Road 138 kV flo Blackhawk - Colley Road 138 kV	
0.00	1	Petenwell - Badger West 138 kV flo Eau Claire - Arpin 345 kV	
0.00	9	Pleasant Prairie - Zion 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	278	Pleasant Prairie - Zion 345 kV flo Cherry Valley - Silver Lake 345 kV (ComEd)	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	244	Pleasant Prairie - Zion 345 kV flo Zion - Arcadian 345 kV	Pleasant Prairie - Zion Energy Center 345 kV line (Proposed 2014)
0.00	51	Presque Isle Area Load	
0.00	10	Presque Isle Output	ATC Northern Plan Projects
0.00	19	Racine - Oak Creek 138 kV flo Elm Road - Racine 345 kV	
0.00	41	Rockdale 345/138 kV Transformer T21 flo Rockdale 345/138 kV Transformer T22	Rockdale - West Middleton 345 kV (Planned 2013)
0.00	17	Rockdale 345/138 kV Transformer T21 flo Rockdale 345/138 kV Transformer T23	Rockdale - West Middleton 345 kV (Planned 2013)
0.00	14	Rocky Run - North Point 115 kV flo Rocky Run - Gardner Park 345 kV	
0.00	6	Rocky Run 345/115 kV Transformer T1 flo Rocky Run - Gardner Park 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2014)
0.00	34	Rocky Run 345/115 kV Transformer T1 flo Rocky Run 345/115 kV Transformer T4	Monroe County - Coucil Creek 161 kV line (Proposed, 2014)
0.00	11	Rocky Run 345/115 kV Transformer T1 flo Werner West - Rocky Run 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2014)
0.00	1	Rocky Run 345/115 kV Transformer T4 flo Arpin - Rocky Run 345 kV	Monroe County - Coucil Creek 161 kV line (Proposed, 2014)
0.00	8	Rocky Run 345/115 kV Transformer T4 flo Rocky Run 345/115 kV Transformer T1	Monroe County - Coucil Creek 161 kV line (Proposed, 2014)
0.00	13	Rocky Run 345/115 kV Transformer T4 flo Rocky Run 345/115 kV Transformer T2	Monroe County - Coucil Creek 161 kV line (Proposed, 2014)
0.00	1	Rudyard Tap - Pine River 69 kV flo Pine River - Nine Mile 69 kV	Uprate Pine River - Nine Mile 69 kV line (Proposed 2016) ATC Northern Plan Projects
0.00	6	Ryan Street - Glenview 69 kV flo Kewaunee - Shoto 138 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	22	Saukville - Edgewater 345 kV flo Point Beach - Sheboygan Energy Center 345 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.00	0	Saukville - Edgewater 345 kV flo Point Beach - Sheboygan Energy Center 345 kV (L111+SP)	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.00	1	Saukville - Edgewater 345 kV flo Sheboygan - Granville 345 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)

0.00	20	Saukville - Port Washington 138 kV flo Saukville - Port Washington 138 kV	
0.00	100	Sheepskin - Stoughton 69 kV flo Paddock - Rockdale 345 kV	Rockdale - West Middleton 345 kV (Planned 2013)
0.00	0	Sheepskin - Stoughton 69 kV flo Rock River 138/69 kV Transformer	Rockdale - West Middleton 345 kV (Planned 2013)
0.00	1	Shoto - Mirro 69 kV	Shoto - Custer 138 kV line (Provisional 2022)
0.00	6	Stiles - Pulliam 138 kV (64441) flo Morgan - Plains 345 kV	
0.00	1	Stiles - Pulliam 138 kV (64451) flo Highway 22 - Morgan 345 kV	
0.00	0	Straits - Evergreen 69 kV flo Straits - Pine River 69 kV	Flow Control Device (Proposed, 2014)
0.00	4	Tecumsah Road 138/69 kV Transformer T1 flo Forest Junction - Glenview 138 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.00	6	Tecumsah Road 138/69 kV Transformer T1 flo Kewaunee - Shoto 138 kV	Barnhart - Branch River Reliability Project (Provisional, 2018)
0.00	21	University - Whitewater 138 kV	
0.00	7	Verona - Oregon 69 kV flo Kegonsa 138/69 kV Transformer T31	
0.00	32	Watson Tap - Forsyth 69 kV flo Chandler 138/69 kV Transformer T1	Second Chandler 138/69 kV Transformer (Proposed, 2012)
0.00	3	Werner West - Rocky Run 345 kV flo Highway 22 - Gardner Park 345 kV	
0.00	0	Westmark - Kellnersville flo Shoto 138/69 kV Transformer T1	
0.00	16	Woodenshoe - Mears Corners 138 kV flo Fitzgerald 345/138 kV Transformer T1	
0.00	15	Zion - Arcadian 345 kV flo Zion - Pleasant Prairie 345 kV	
0.00	4,452	Total for all ATC Real Time constraints 4-1-2010 thru 3-31-2012	

### Day Ahead Hours Vs. Congestion Severity



### Real Time Hours Vs. Congestion Severity

