The Long-Range Transmission Plan
2009 – 2018

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Long-Range Transmission Plan

- Driver of Plan is maintaining reliability
- 10-year planning horizon
- Order 890 compliance
  - Criteria, assumptions and methodology were posted early (June 2008 to March 2009)
  - Plan posted prior to presentations at NYISO

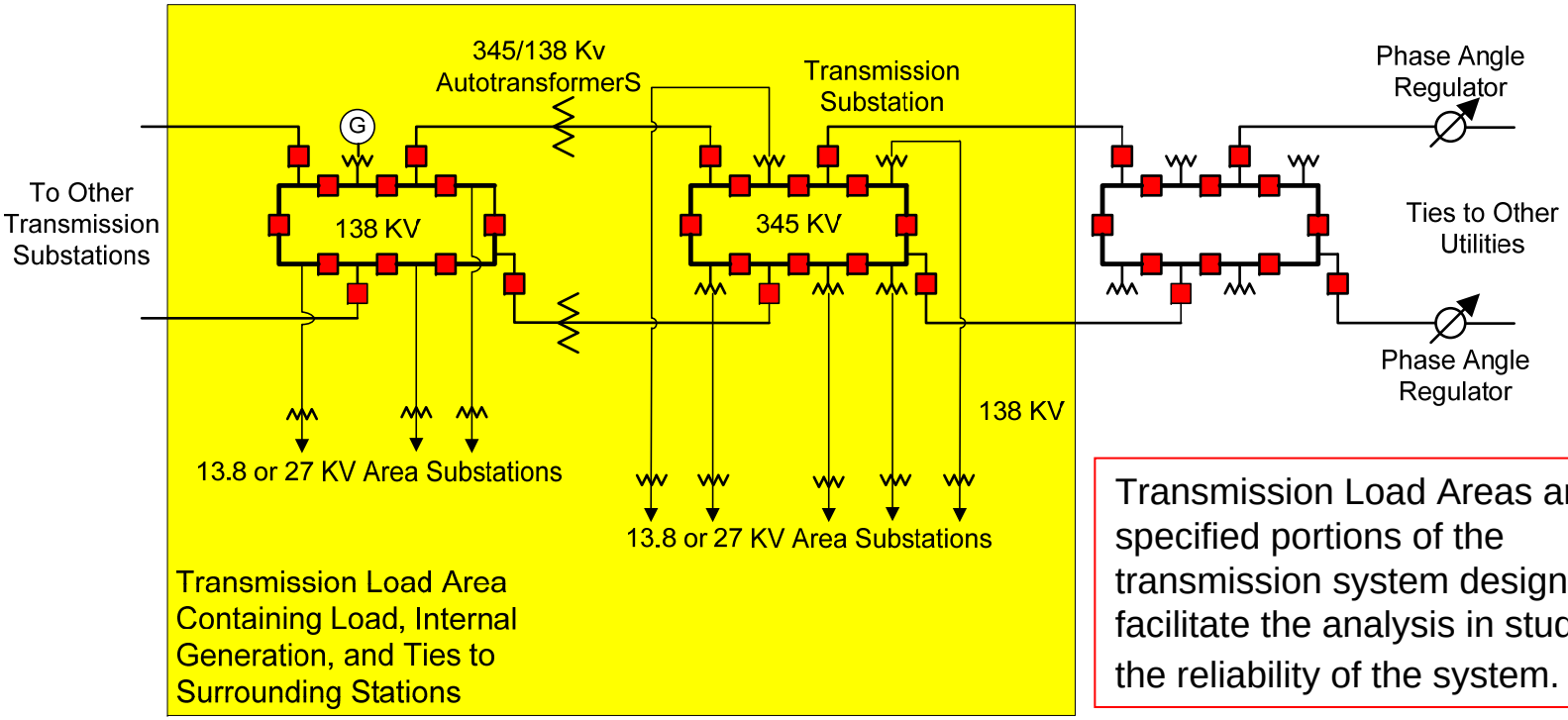
Assessments

- **System Performance**
- **Transmission Load Area (TLA)**
- **Transmission Substation**
- **Interconnection of New Generation Resources**

System Performance

- Thermal
- Voltage
- Short Circuit, including mechanical stresses
- Stability
- Critical Clearing Time
- Underfrequency Load Shedding
- Transient Switching Surge and Lightning Withstand Capabilities
- Extreme Contingencies

Transmission Load Area



Transmission Load Areas are specified portions of the transmission system designated to facilitate the analysis in studying the reliability of the system.

Transmission Load Areas

	Transmission Load Areas	Contingency Level
1	New York City - 345 kV	2
2	West 49th Street - 345 kV	2
3	New York City - 138 kV	2
4	Astoria - 138 kV	2
5	East 13th Street - 138 kV	2
6	Astoria East / Corona - 138 kV	2
7	Astoria West / Queensbridge - 138 kV	2
8	Vernon - 138 kV	2
9	East River - 138 kV	2
10	Greenwood / Staten Island- 138 kV	1
11	Corona / Jamaica - 138 kV	1
12	Bronx- 138 kV	1
13	Eastview - 138 kV	1
14	Staten Island - 138 kV	1
15	Dunwoodie North / Sherman Creek - 138 kV	1
16	Dunwoodie South - 138 kV	1
17	Millwood / Buchanan - 138 kV	1

TLA Assessments

- Thermal
  - Complex power, or MVA, on a transmission path must not exceed its applicable emergency rating and be able to be returned to normal levels for that path.
- Voltage
  - Bus voltages exceed their limits either above or below their nominal ratings
- Short-Circuit
  - 3 phase, 2 phase to ground or single phase to ground faults create a short-circuit flow on a transmission path that should not exceed the appropriate short-circuit rating of any of the breakers that are necessary for the isolation of that transmission path

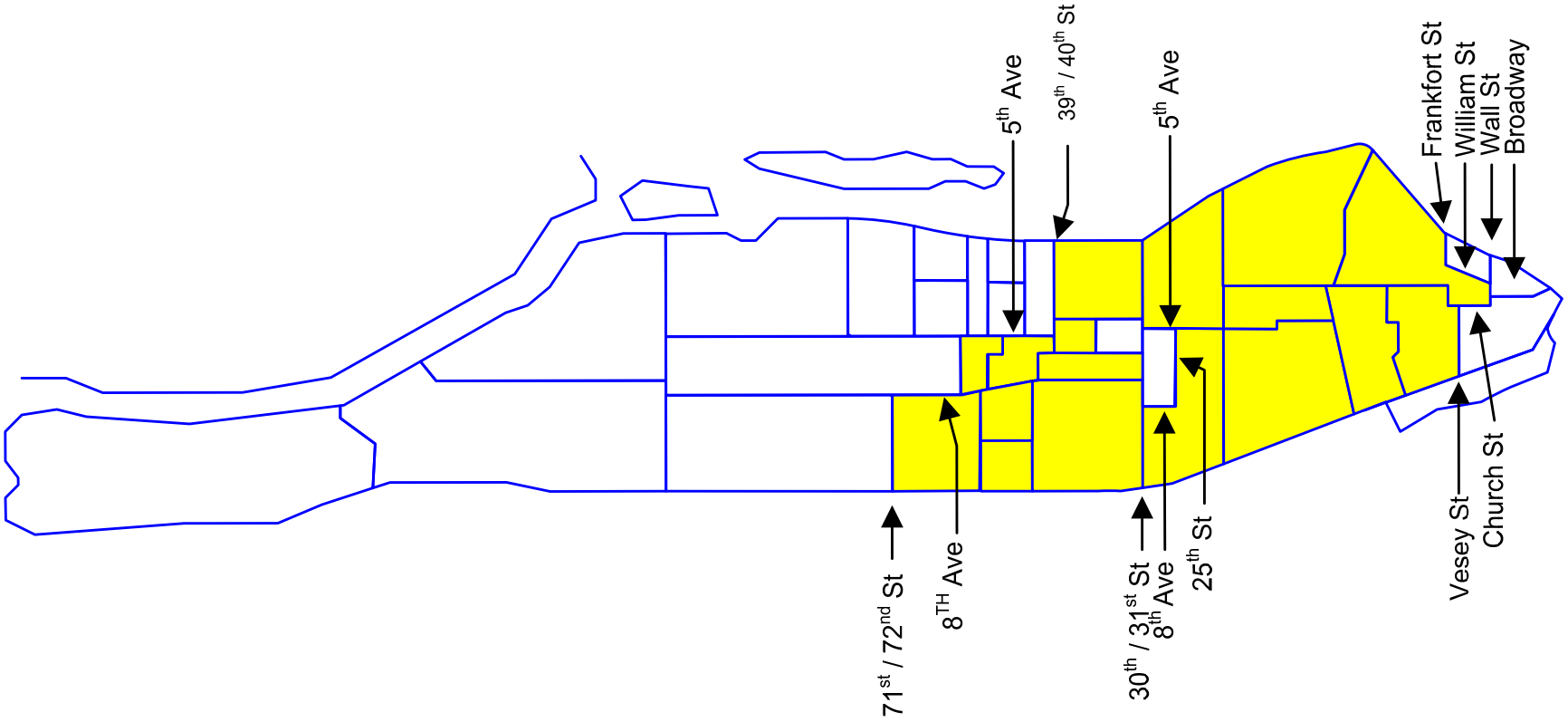
Assessment Assumptions

Study Year	Assumptions
2009	• Con Edison Load (Coincident Peak) = 13,586 MW
2013	• Con Edison Load (Coincident Peak) = 13,939 MW • 500 MW Generator connected at Feeders Q35L&M
2018	• Con Edison Load (Coincident Peak) = 14,464 MW • 500 MW Generator connected at Feeders Q35L&M

TLA Assessment Results

- Two TLAs show need for system reinforcements
  - West 49th Street - 345 kV TLA - Manhattan
  - Bronx 138 kV TLA - Bronx, Manhattan

Area Served By West 49th Street TLA



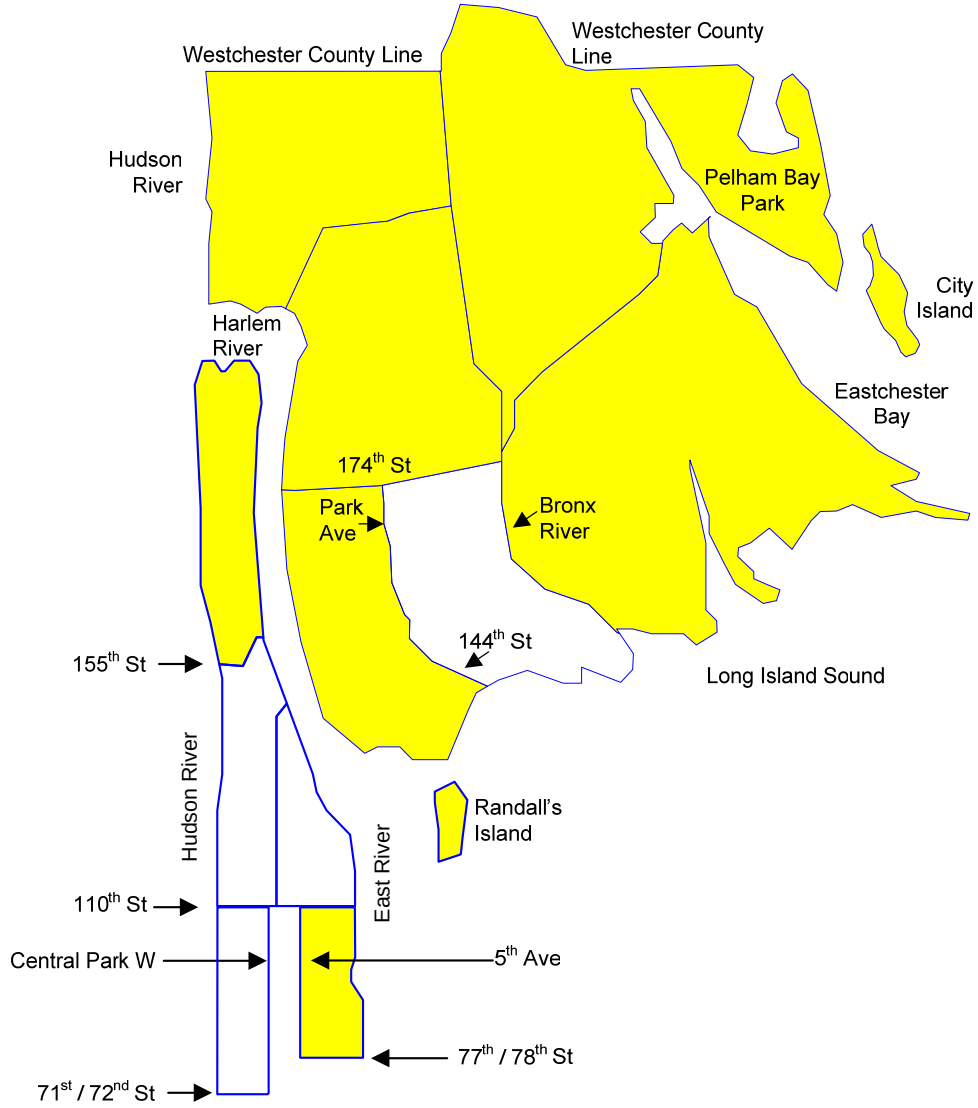
Assessment of West 49th St. TLA (1/2)

Geographic Coverage	Midtown and Lower Manhattan			
Design Criteria	Second Contingency			
Planned Changes In Load Area	2010	Retirement of Poletti.		
	2010	Installation of cooling infrastructure for Feeders 45 and 46 for an additional 100 MW on each		
	2010	Installation of Phase angle regulator on tie on Feeder 38M72 between Vernon East and W 49th St. transformer #1		
	2010	Transfer 25 MW from Cherry St. (E 13th St. S/S) to Seaport #1 (Farragut S/S)		
	2012	Transfer 20 MW from W 19th St. (W 49th St. S/S) to Murray Hill (Vernon S/S)		
Assessment	2009	First Contingency	Loss of M51	No deficit
		Second Contingency	Loss of M51 followed by the loss of M52 results in overloads on Feeders 45 and 46.	310 MW
	2013	First Contingency	Loss of M51	No deficit
		Second Contingency	Loss of M51 followed by the loss of M52 results in overloads on Feeders 45 and 46.	181 MW
	2018	First Contingency	Loss of M51	No deficit
		Second Contingency	Loss of M51 followed by the loss of M52 results in overloads on Feeders 45 and 46.	221 MW

Assessment of West 49th St. TLA (2/2)

Operational Remediation	2009	Utilization of 300 hour ratings to provide up to 213MW of additional capability.
		In addition, Switch out 1 transformer (fixed tap) at each E 13th St. 345 KV bus associated with Feeders 45 and 46, in order to de-load Feeders 45 and 46 by about 80 MW each, for a total of 160 MW. Remaining transformers at each E 13th St. 345 KV bus associated with Feeders 47 and 48 would pick up the load from the switched out transformers requiring the utilization of their 300 hour ratings.
	2013	Same as above
	2018	Non required
Planning Solution	2009	Installation of variable speed drives for oil circulation on Feeders 45 and 46 to improve their ratings by about 25 MW each.
	2010	Incorporate Cooling for Feeders 45 and 46 to improve ratings by 100 MW each
	2013	Establish phase angle regulator in 2010 on 38M72 emergency tie to maintain operability after the Poletti retirement.
	2014	Upgrade conductors for Feeders 45 and 46 to improve ratings by 200 MW each.
	2018	None Required
Short Circuit Issues	Require upgrade of Vernon East substation equipment by 2013 to accommodate potential short-circuit current magnitudes while 38M72 is in service.	

Area Served By West Bronx 138 KV TLA



Bronx 138 kV TLA

Geographic Coverage	Bronx and Manhattan			
Design Criteria	First contingency			
Planned Changes In Load Area[	2011	Establish 345 kV Feeder M29. Capability depends on the capacity of feeders 15031 / 15032 and Sherman Creek Load.		
Assessment	2009	First Contingency	Loss of Feeder X28.	58 MW deficit in 2009
	2013	First Contingency	Loss of Feeder X28.	No deficit
	2018	First Contingency	Loss of Feeder X28.	No deficit
Operational Remediation	2009	Overload may be remediated through the utilization of 300 hour ratings (230 MW)		
		Alternatively, load may be transferred to the spare transformers at the Hellgate and Bruckner substations. This would still require the use of 300 hour ratings while the required switching is performed. This reduces load in the area by 130 MW.		
	2013	None required in this year		
	2018	None required in this year		
Planning Solution	2009	None.		
	2013	None required following the establishment of M29 in 2011		
	2018	None required following the establishment of M29 in 2011		
Short Circuit Issues	None			

Transmission Substation

- No new transmission switching station was identified for this planning horizon

New Merchant Generation and Transmission Proposals

- New York City continues to attract significant amount of new generation and transmission capacity
- NYISO's interconnection queue listing, dated 7-31-09 shows
  - 7,540 MW of new generation
  - 6,460 MW of transmission projects

Contact Information

- Parties interested in commenting on Con Edison's Transmission Planning Process can e-mail comments and suggestions to TPTeam@coned.com.