Report on Existing and Potential Electric System Constraints and Needs

December, 2009

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1. Executive Summary

The annual Electric System Constraints and Needs report is provided by the Electric Reliability Council of Texas, Inc. (ERCOT) to identify and analyze existing and potential constraints in the transmission system that pose reliability concerns or may increase costs to the electric power market and, ultimately, to Texas consumers. This report satisfies the annual reporting requirements of Public Utility Regulatory Act (PURA) Section 39.155(b) and Public Utility Commission Substantive Rule 25.361(c)(15) and a portion of the requirements of Substantive Rule 25.505(c).

Background

ERCOT prepares this report to summarize the continuing efforts to plan a reliable and efficient transmission system. It provides highlights of completed improvements from 2008 through August 2009 and of planned improvements for 2010 through 2014 as well as an analysis of the impact of these cumulative improvements on future congestion.

As the transmission planning authority for the region, ERCOT works with its stakeholders to identify the need for new transmission facilities based on engineering analysis of four principal factors:

Operational Results - The results of actual ERCOT operations are analyzed on a continual basis in order to identify areas of recurring congestion and to identify activities that can and should be taken to meet reliability standards while gaining efficiency from the existing network.

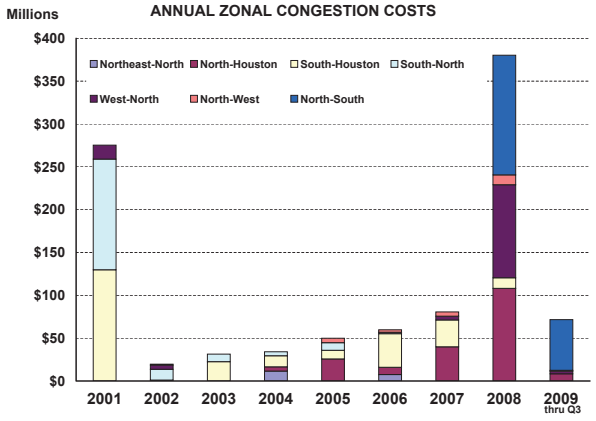
Load Forecasting - Load forecasts developed by ERCOT planning staff using econometric modeling techniques, as well as delivery point forecasts developed by Transmission Service Providers (TSPs), are used to study projected system needs due to customer load growth.

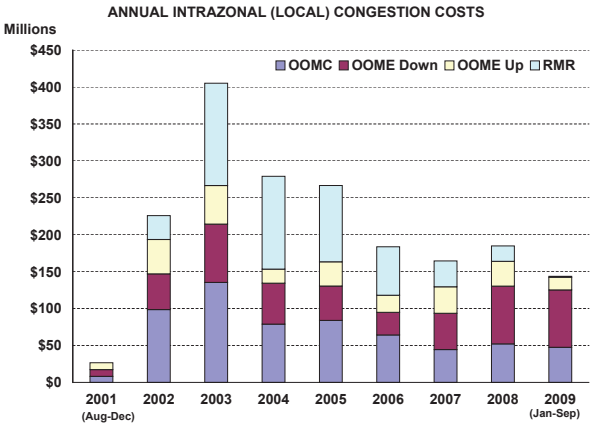
Generation Interconnections - ERCOT processes requests to interconnect, change, or decommission generation throughout the ERCOT Region. Studies of these requests enable planning staff to analyze and respond to the impact of the resulting changes in power injection into the system.

Transmission and System Studies - ERCOT planning staff, with input from stakeholders through the Regional Planning Group (RPG), evaluates and endorses transmission improvements required to meet North American Electric Reliability Corporation (NERC) and ERCOT reliability criteria and to reduce expected congestion based on ERCOT's economic planning criteria.

Highlights

This report presents data and updates for each area of the ERCOT Region, including defined congestion zones, intra-zonal (local) congestion areas, and weather zones. Zonal congestion costs returned to 2007 levels, recovering from a high of over $375 million in 2008, in part due to a combination of events, including high fuel costs, revised market rules, and increased wind generation. Intra-zonal (local) congestion costs are also approximately the same as they were in 2007, after a slight rise in 2008.





Since 2008, ERCOT Transmission Service Providers (TSPs) have completed numerous improvement projects affecting approximately 1,137 circuit miles of transmission and about 8,511 MVA of autotransformer capacity, with an estimated capital cost of over $1.38 billion.

SUMMARY OF MAJOR COMPLETED TRANSMISSION IMPROVEMENTS

Weather Zone	Completed Improvements	Year In Service	Voltage (kV)	Circuit Miles
Coast	Crosby Dynamic Reactive Device	2008	138	0.0
Coast	Bellaire South Dynamic Reactive Device	2008	138	0.0
East	Singleton New Switching Station	2009	345	0.5
East	Tyler Grande New Switching Station and New Auto	2009	345	0.0
East	Jack Creek New Substation and Auto	2008	345	0.0
North Central	Temple Pecan Creek - Lake Creek Line Upgrade	2008	138	28.5
North Central	Putnam Phase Shift Transformer Addition	2008	138	0.0
North Central	Parkdale SVC installation	2009	138	0.0
South Central	Sandow Switch - Salty - Thorndale North - Taylor Line Upgrade	2009	138	21.9
South Central	Taylor - Taylor West - Hutto Switch 138 kV line upgrade	2009	138	10.1
All Areas	Total Lines	2008-2009	69/138/345	1137
All Areas	Total Autotransformers	2008-2009	138/345	8,511 MVA

The planned projects included in this report to serve the electric system are estimated to cost approximately $8.2 billion over the next five years and are expected to improve or add 5,729 circuit miles of transmission lines and 19,172 MVA of autotransformer capacity to the ERCOT system. These totals include that portion of the planned CREZ additions that are planned to be in service by 2013.

SUMMARY OF MAJOR PLANNED TRANSMISSION IMPROVEMENTS				
Weather Zone	**Major Planned Improvement**	**Voltage (kV)**	**Year in Service**	**Circuit Miles**
Coast	Garrott - Midtown - Polk Upgrade	138	2011	2.4
Coast	Zenith Substation Addition	345	2011	0.5
South	Laredo Lobo New Substation And Laredo Lobo-San Miguel New Line	345/138	2010	87.0
South Central	Salado Switching Station New And Hutto Switch - Salado Switch New Line	345	2010	73.8
South Central	Zorn/Clear Springs - Hutto Switch New Line	345	2011	172.5
North Central	Waco West - Waco Woodway - Waco Atco Rebuild	138	2010	5.8
North Central	Goldthwaite- Evant Rebuild	138	2010	24.0
North Central	Renner Static Var Compensators	138	2011	-
East	Robertson - Watson Chapel Rebuild	138	2010	21.6
East	Bell County East - TNP One Additional Line And Bell County East Substation	345	2011	82.6
All Areas	Total Lines	69/138/345	2010-2015	5,729
All Areas	Total Autotransformers	138/345	2010-2015	19,172 MVA

Additionally, this Constraints and Needs report contains an update of the Competitive Renewable Energy Zone process, as well as a summary of the 2009 review of the 2008 Long-Term System Assessment.

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2.0 Transmission Planning Process

The ERCOT transmission planning process integrates requests for transmission service to interconnect new power producers and consumers, as well as supports continued safe and reliable service while accommodating growth for existing customers. In collaboration with Transmission Service Providers (TSPs) and other interested stakeholders, ERCOT staff assesses the electric needs of existing and potential transmission system users, on both an individual and collective basis, to determine whether transmission upgrades are required and to respond to the need. All ERCOT recommendations are supported by a series of detailed technical analyses in accordance with industry-accepted performance criteria and practices and the Regional Planning Group (RPG) Charter and Procedures.

For this planning process, ERCOT seeks input from all market participants and stakeholders about options and possible solutions. The ERCOT-led RPG is a forum for market participants, as well as the general public, to provide input. Participants of the RPG have the opportunity to highlight needs and to propose solutions, which ERCOT staff will evaluate as a part of the overall system plan. The RPG also provides participants a way to review and comment on proposed projects that address transmission constraints and other system needs.

By utilizing the RPG forum, ERCOT is committed to being inclusive - to share proposals openly and to listen to a diverse spectrum of interested entities - in the development of transmission improvement proposals. Potential projects to be reviewed by ERCOT and the RPG can be proposed by ERCOT staff, individual TSPs, other market participants, the Public Utility Commission of Texas (PUC), or the general public. The RPG meets eight to twelve times a year, as well as exchanges information via e-mail. Agendas and presentations are available publicly, and project files are posted to a secure web site.

As stated in the RPG Charter and Procedures[1], major projects must be be endorsed by the ERCOT Board of Directors. Following the RPG review, ERCOT staff will complete an independent review of the projects and make recommendations to the ERCOT Board of Directors for approval. The ERCOT Board will be asked to endorse major projects that have met the following criteria:

- ERCOT staff has recommended the proposed transmission project based on its analyses of identified constraints, including proposals from TSPs and any necessary requirements to integrate new generation facilities.
- The project has been reviewed and considered through the open RPG process.
- ERCOT staff has determined the designated provider of the additions.

Following the Board of Director review, ERCOT will notify the PUC of all ERCOT Board-endorsed transmission facility additions and their designated providers.

[1] The RPG Charter and Procedures document is available at http://www.ercot.com/committees/other/rpg/

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3. Load

Forecasting electrical demand and energy is one of the most significant factors in determining the future infrastructure needs of the ERCOT power system. Should the forecast understate the actual load growth, adequate facilities may not be in place in time to reliably serve the load. On the other hand, if the forecast overstates the actual growth, facilities may be built before they are necessary, resulting in inefficient use of resources and unnecessary costs for consumers.

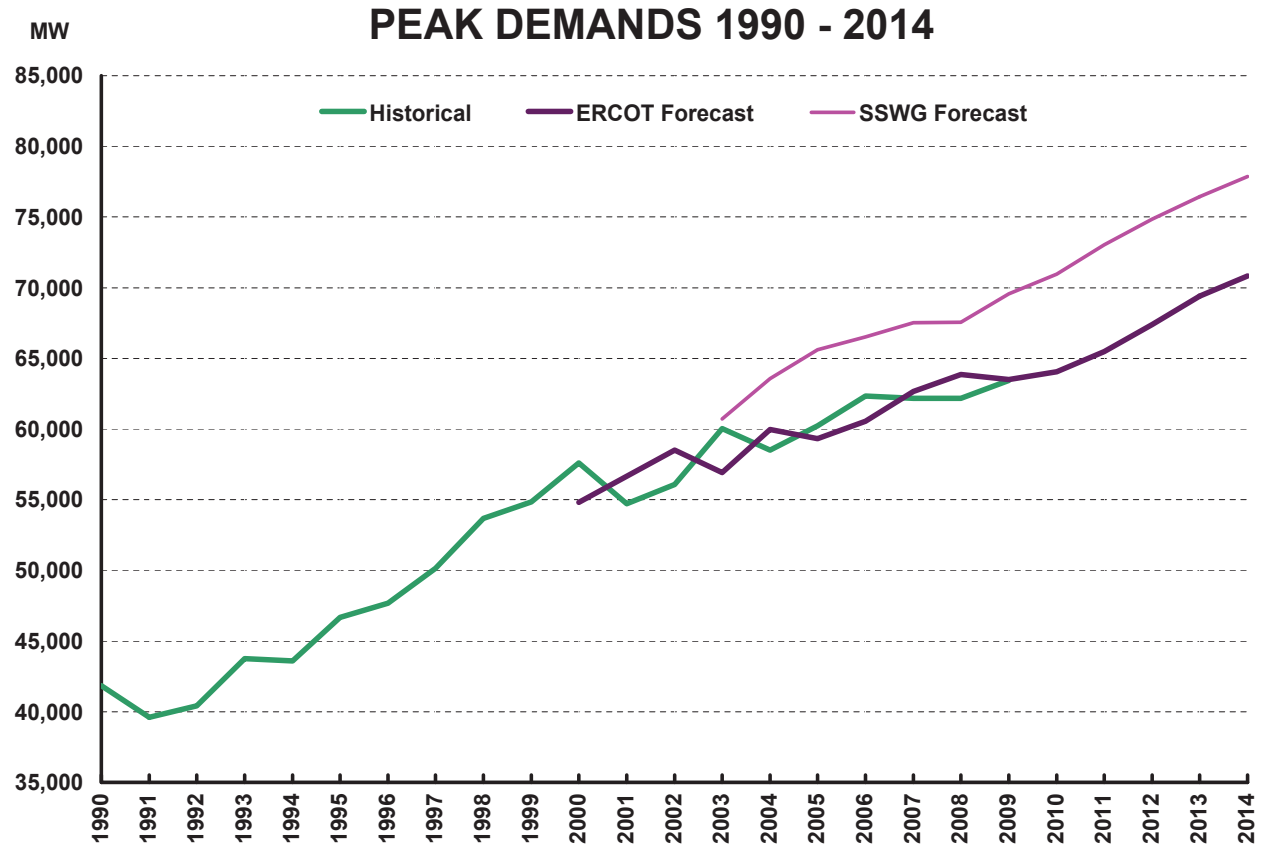
To develop the most reasonable load projections for the system, ERCOT load forecasters consider a wide range of variables such as population, weather, land usage, general business economy, governmental policy, and societal trends in terms of both historical load data and the best predicted future indicators available.

3.1 Peak Demand

The 2010 summer peak demand forecast of 64,056 MW represents an increase of approximately 1.00% from the 2009 actual peak demand of 63,534 MW. The ERCOT system forecast for 2010 as reported in the 2009 Long-Term Hourly Demand and Energy Forecast (LTDEF) is 5.3% lower than last year's forecast for 2010 (as reported in the 2008 LTDEF), mainly due to the current deep economic recession as reflected in the economic outlook for the state of Texas.

The key factor driving the lower peak demands and energy consumption is the overall health of the economy as measured by economic indicators such as the real per capita personal income, gross domestic product (GDP), and various employment measures, including non-farm employment and total employment.

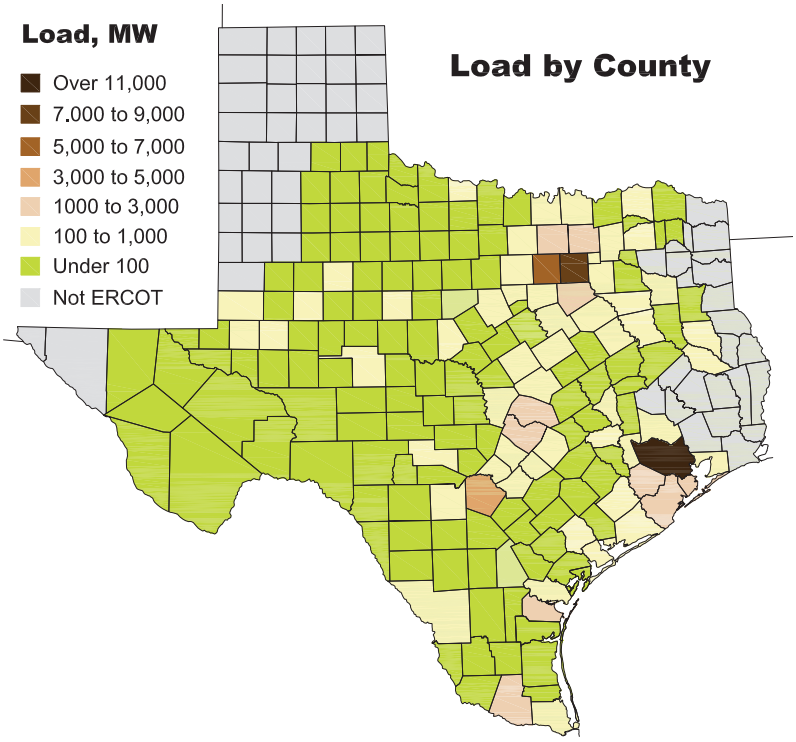
The figure below shows the historical peak demand from 1990 through 2009 and the forecasted peak demand through 2014. The historical compound growth rate for the last eight years has been approximately 1.83%. The forecasted growth rate between 2009 and 2014 is 2.21% due to a strong economic recovery reflected in the economic forecast after 2011. The all-time peak demand for ERCOT of 63,534 was recently set this past summer, occuring on July 13, 2009.

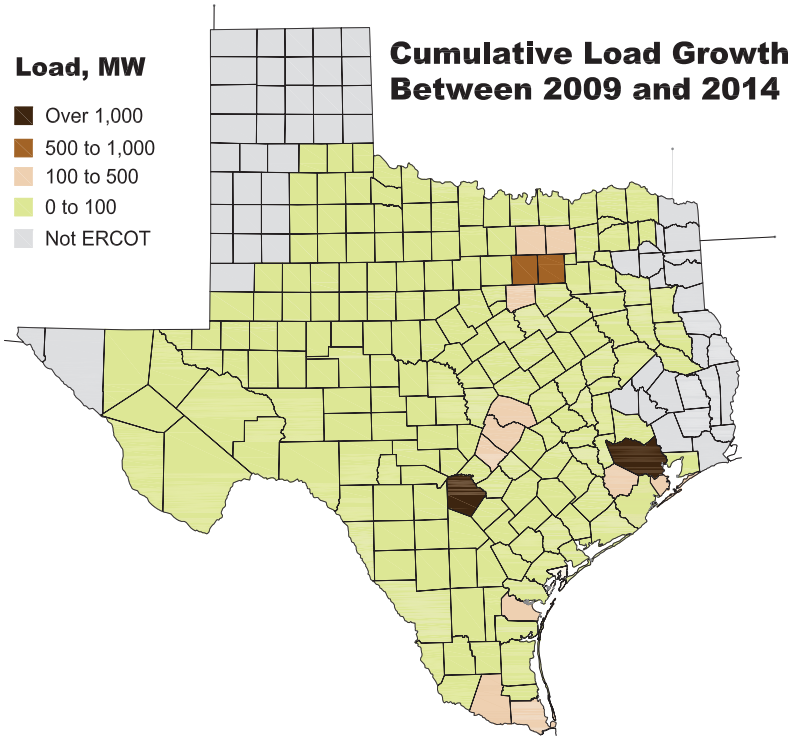


The Steady-State Working Group (SSWG) load forecast is developed by the aggregation of the load forecasts provided by each Transmission and Distribution Service Provider (TDSP). The TDSPs provide their individual forecasts in the Annual Load Demand Request (ALDR) filing to ERCOT on March 1 of each calendar year. The SSWG forecast provided is the non-coincident peak of the individual TDSPs. The SSWG load forecast, depicted above, was modified to remove the Private Use Network (PUN) load that is also excluded from the ERCOT load forecast. This forecast is used to determine the reliability needs of the ERCOT transmission system.

3.2 Non-coincident Peak by County

The loads by county shown to the right are non-coincident peak demand forecasts provided by the TDSPs in the 2009 ALDR. The counties with the greatest peak demands are Harris, Dallas, Tarrant, and Bexar. These four counties comprise roughly 48% of the load within ERCOT.





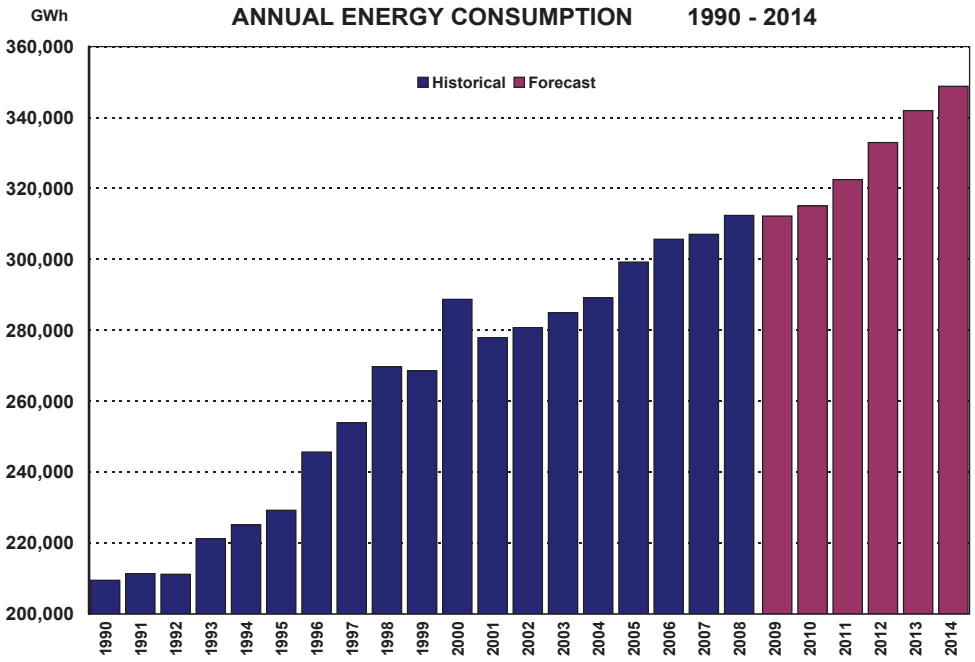
While ERCOT's overall peak demand forecast calls for a 2.1% annual growth rate, some areas within the state are experiencing growth as high as 6.5% per year. As expected, the greatest growth is around the metropolitan areas. The counties with the greatest expected cumulative load growth are Bexar, Harris, Dallas, and Tarrant. Other areas expected to experience significant load growth include the counties along Interstate 35 between San Antonio and Waco, counties near Dallas and Houston, and the lower Rio Grande Valley.

3.3 Energy

While the peak demand forecast provides an indication of the size of electrical facilities that should be constructed to serve the expected peak demand, the energy usage forecast assists in determining the usage of these facilities over all hours of the year.

The overall energy forecast growth rate from 2009 to 2019 is 2.04%. The forecasted energy growth rate from the actual energy in 2008 to the forecast for 2009 is - 0.07%. The key factor driving the lower energy consumption is the outlook of the overall health of the economy as captured by economic indicators such as the real per capita personal income, gross domestic product (GDP), population, and various employment measures including non-farm employment and total employment.

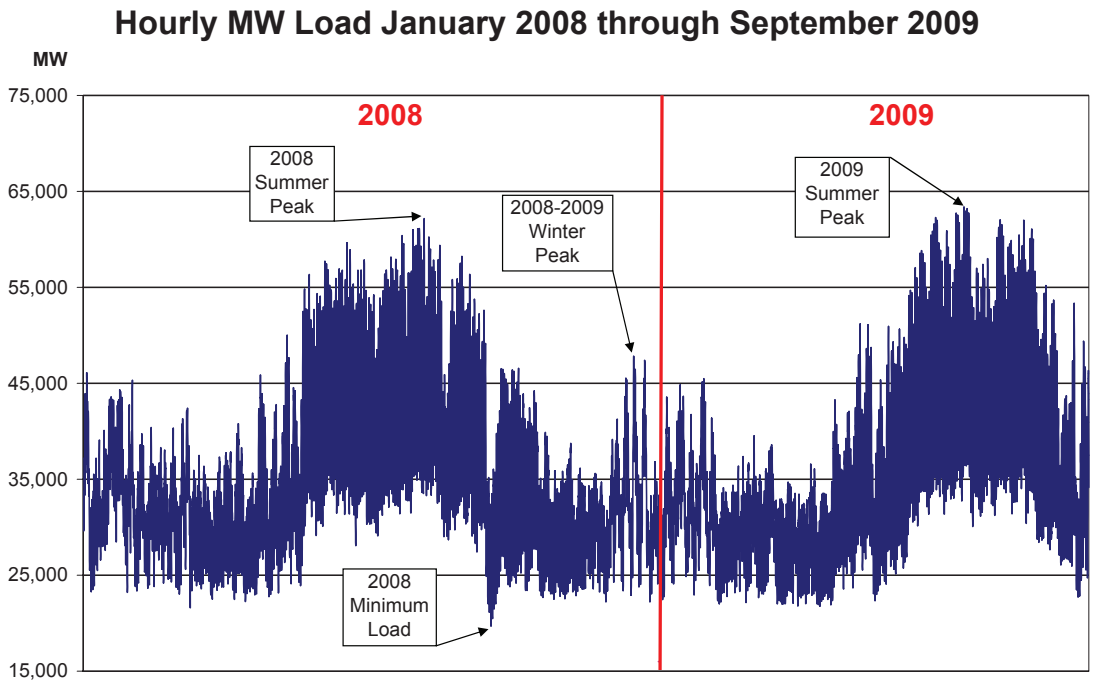
The figure below shows the historical and forecasted energy consumption. The historical growth rate between 1998 and 2008 is 1.48%, and the forecasted growth rate between 2009 and 2014 is 1.76%.



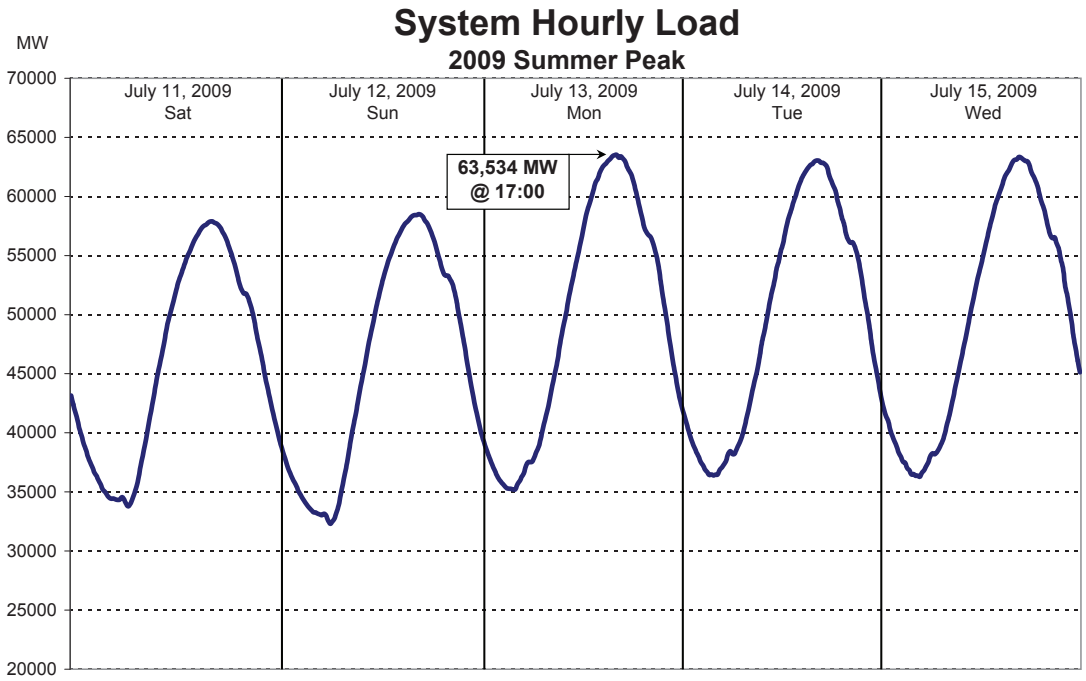
3.4 Hourly Load

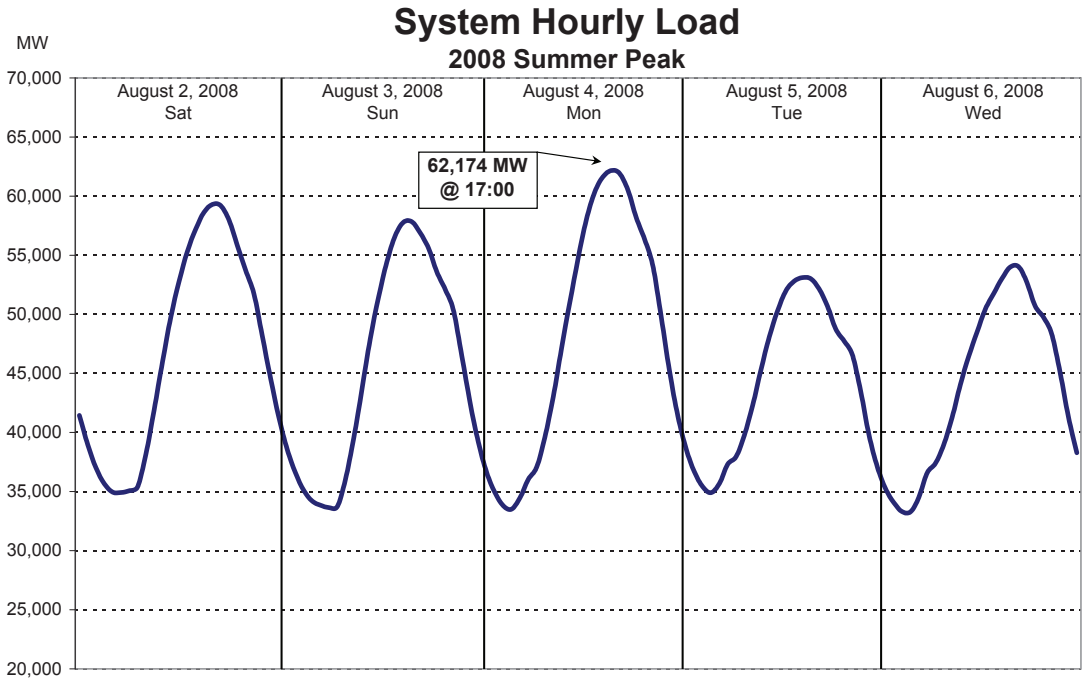
Hourly load is an extremely useful tool for understanding the magnitude change and the pattern of the load being served over a specific time. The following pages illustrate some of the varying load shapes encountered while operating the grid.

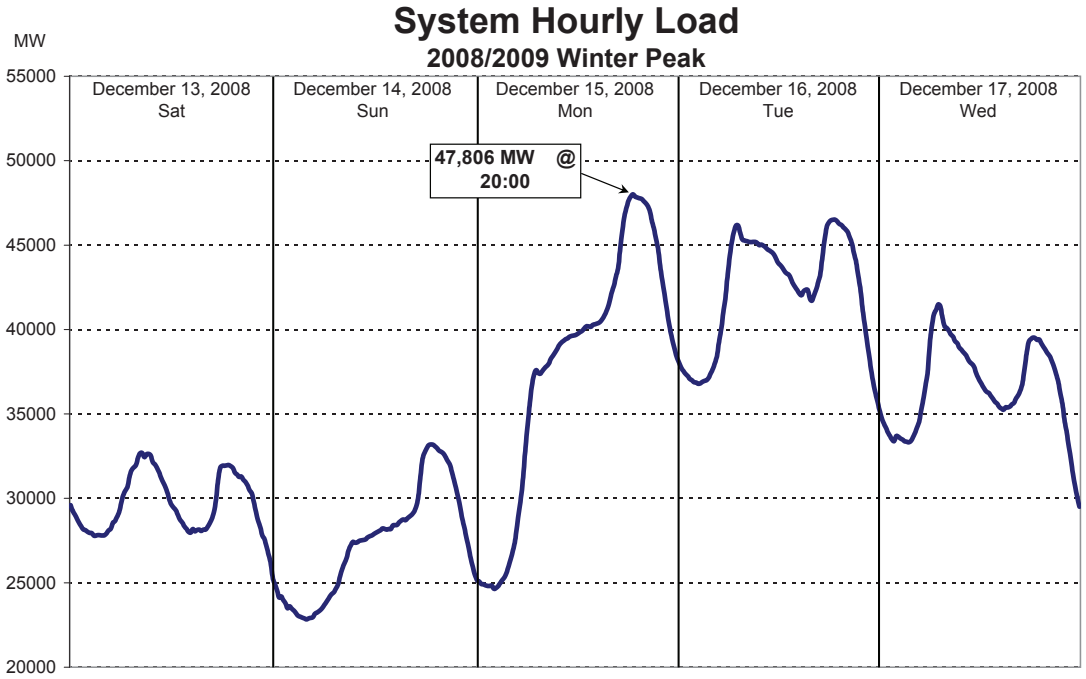
This chart shows the load shapes over the time frame of this report.

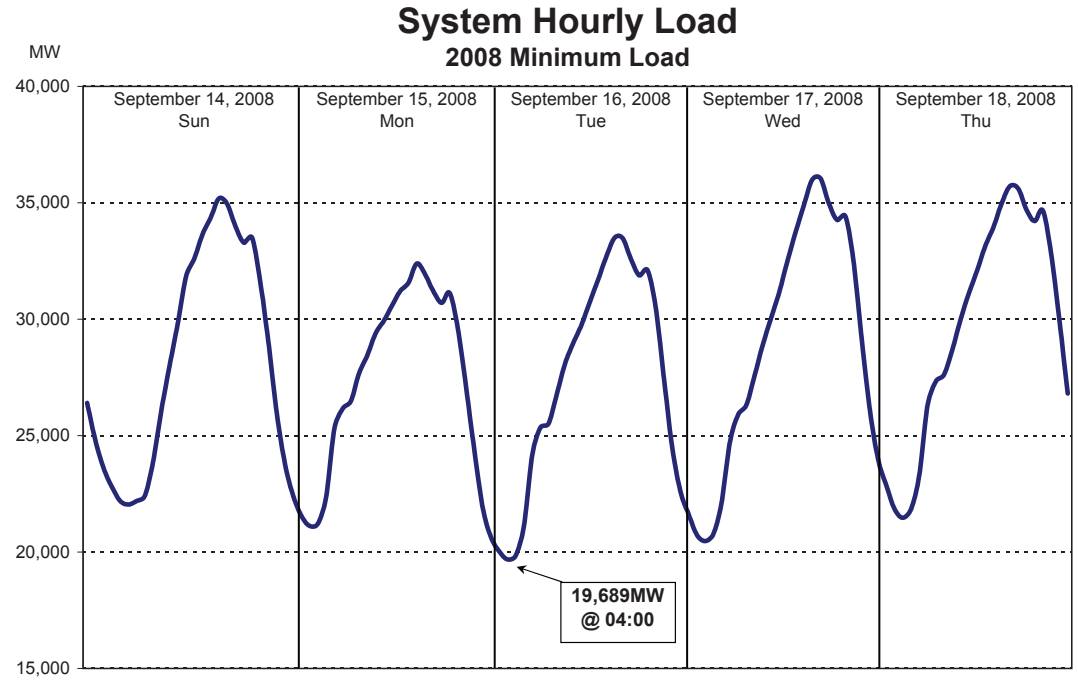


The following four charts are close up views around the minimum load and the seasonal peaks.






System Hourly Load
2008/2009 Winter Peak
MW
55000
50000
45000
40000
35000
30000
25000
20000
December 13, 2008
Sat
December 14, 2008
Sun
December 15, 2008
Mon
December 16, 2008
Tue
December 17, 2008
Wed
47,806 MW @
20:00


System Hourly Load
2008 Minimum Load
MW
40,000
35,000
30,000
25,000
20,000
15,000
September 14, 2008
Sun
September 15, 2008
Mon
September 16, 2008
Tue
September 17, 2008
Wed
September 18, 2008
Thu
19,689MW
@ 04:00

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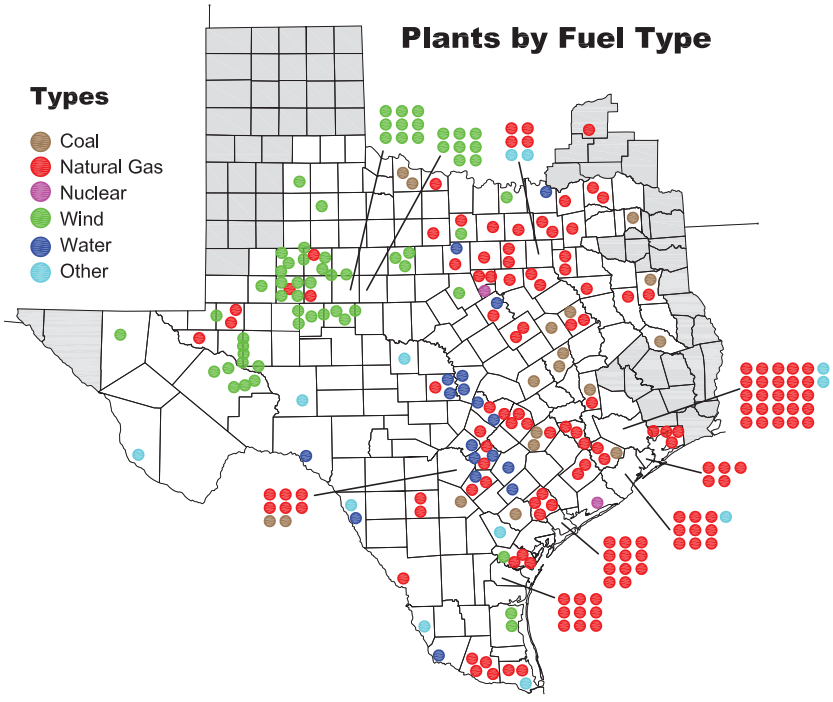
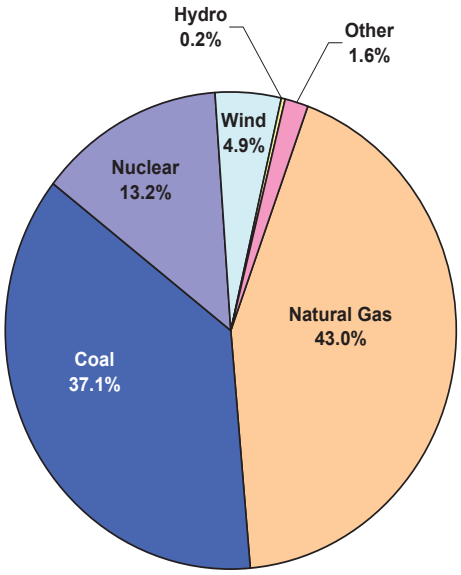
4. Generation

Current installed generation capacity[2] in the ERCOT Region is about 84,000 MW, which includes about 3,000 MW of generation that has suspended operations or been "mothballed".

In terms of energy produced within ERCOT in 2008, approximately 43% was fueled by natural gas, followed by coal at 37%, nuclear at 13% and wind at 5%. The map below is an indicator of generating facilities across the region by fuel type, and the pie chart shows the energy produced by fuel type.



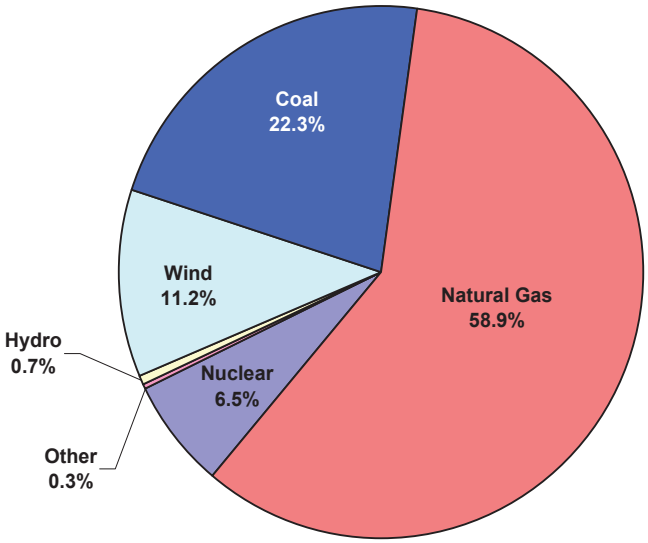


2008 Energy Generated by Fuel Type

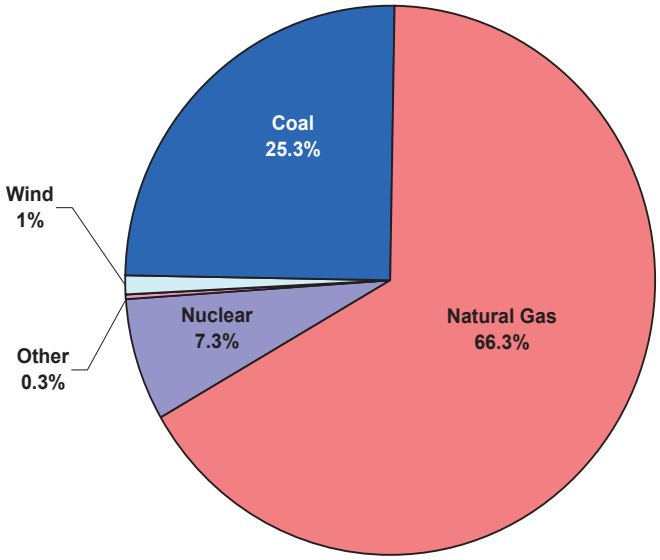
[2] For additional information, please see the Capacity, Demand and Reserve report posted at http://www.ercot.com/news/presentations.

It is important to highlight the distinction between installed capacity and available capacity. Power from some fuel types, such as wind and water, may not be available coincident with system need.

In terms of installed capacity within ERCOT, approximately 59% is fueled by natural gas, followed by coal at 22%, wind at 11%, and nuclear at 6.5%. The pie chart to the right shows the installed capacity by fuel type.



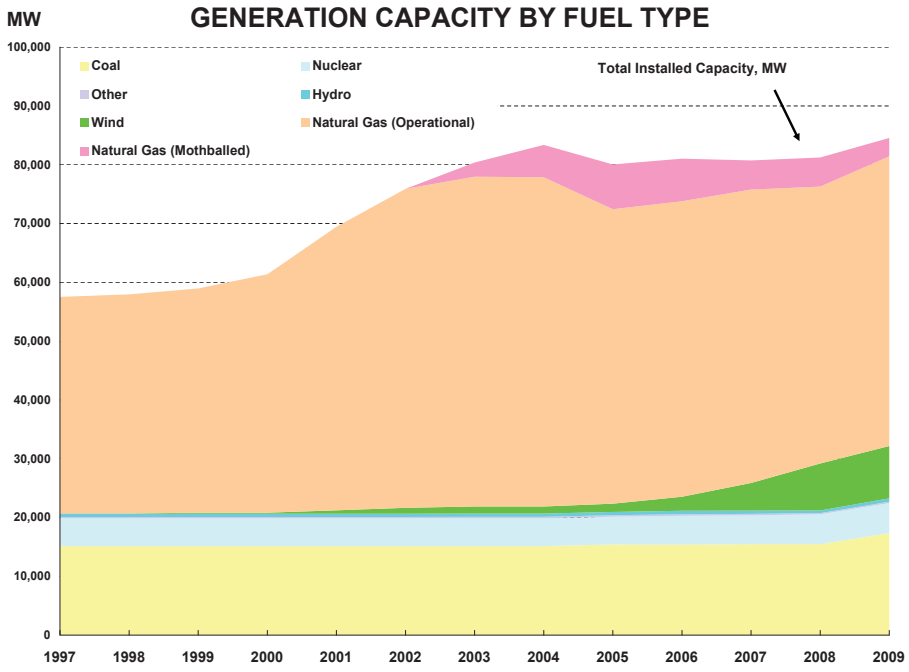
2009 Generation Capacity by Fuel Type



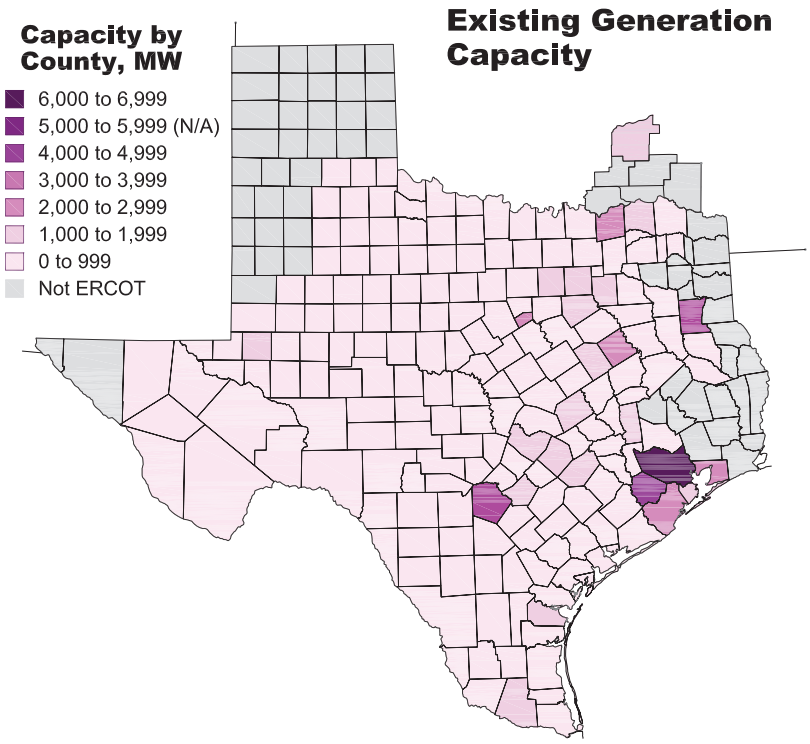
2009 Generation Availability by Fuel Type

In terms of available generation, the chart to the left illustrates the proportion of generation available after the wind and hydro sources have been discounted using availability factors of 8.7% and 0% respectively, giving a more realistic view of expected generation by fuel during system peak load conditions.

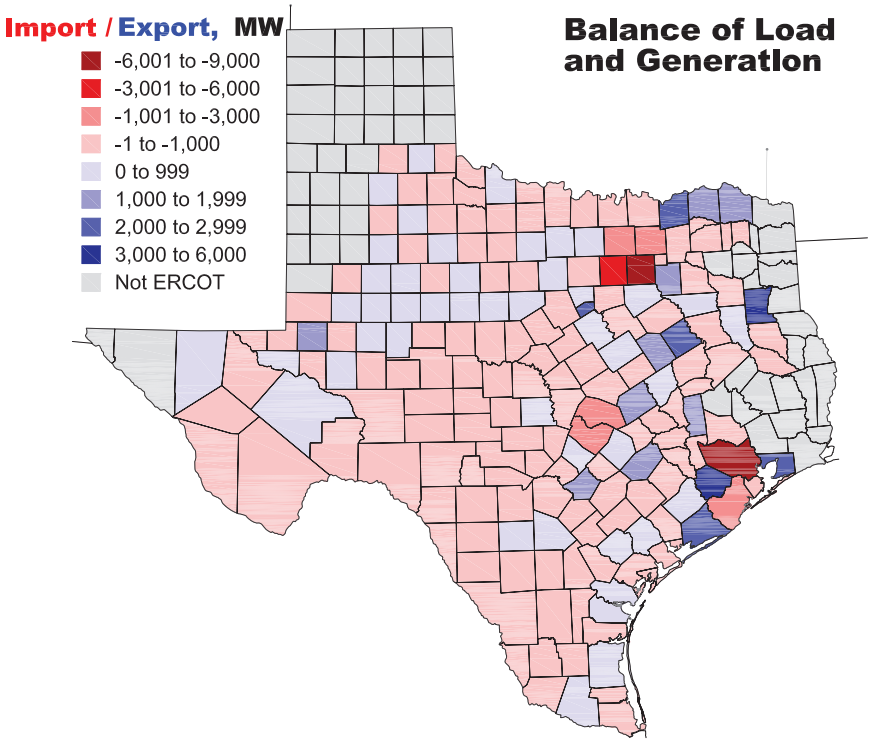
In 2009, most generation capacity additions were wind facilities, although new gas and coal fired generators have been added. The chart below depicts installed capacity additions by fuel type.



The existing generation capacity by county shown on this map is based on information from the generation companies and includes asynchronous ties to other regions, private network generation, distributed generation that is registered with ERCOT, and all Switchable Resources, which are Resources that can be connected to either the ERCOT Transmission Grid or a grid outside the ERCOT Region.

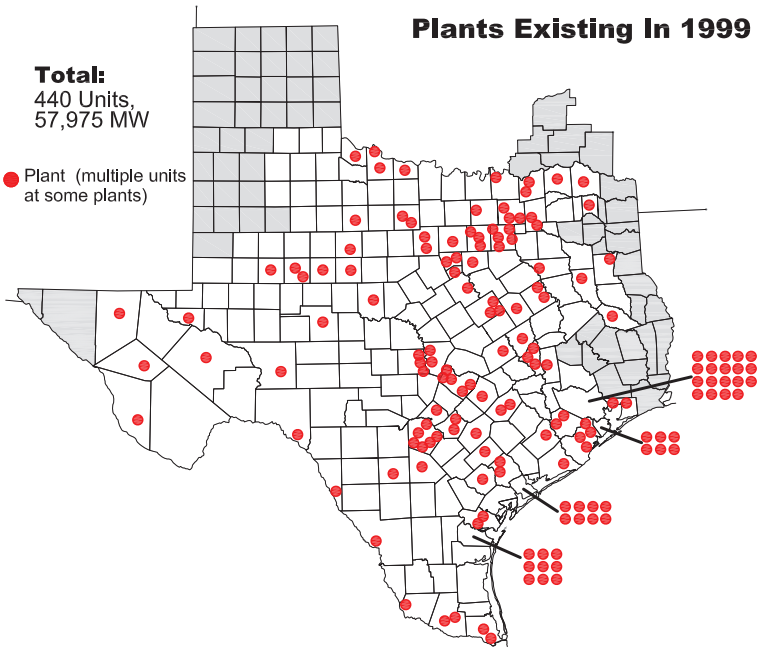


The map below illustrates the balance of load and generation within each county in the ERCOT Region for the summer of 2009. A county with more generation than load will export generation to other counties; comparatively, a county with more load than generation will import generation from other counties. Please note this map is for general illustrative purposes only, however it clearly shows that the Dallas/Fort Worth area, the Houston area, and the Austin/Round Rock area are importers and dependent on transmission to serve load.

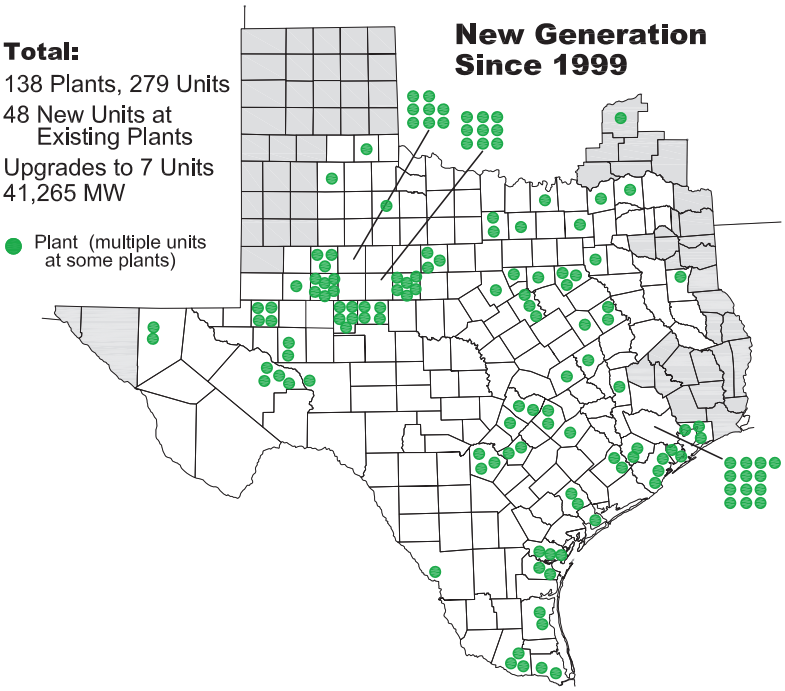


4.1 Historical Generation

In 1999, ERCOT had approximately 58,000 MW of installed generation capacity. Much of that generation was concentrated in the metropolitan areas of Houston, Dallas/Fort Worth, San Antonio, and Corpus Christi. The map to the right shows generation within the ERCOT Region as of 1999.



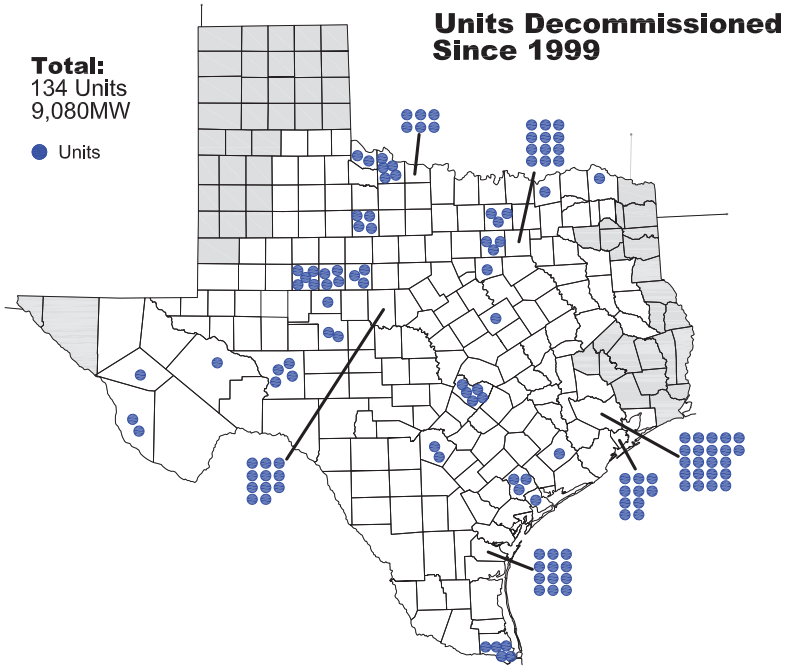
Dots do not reflect actual location of the unit within the county



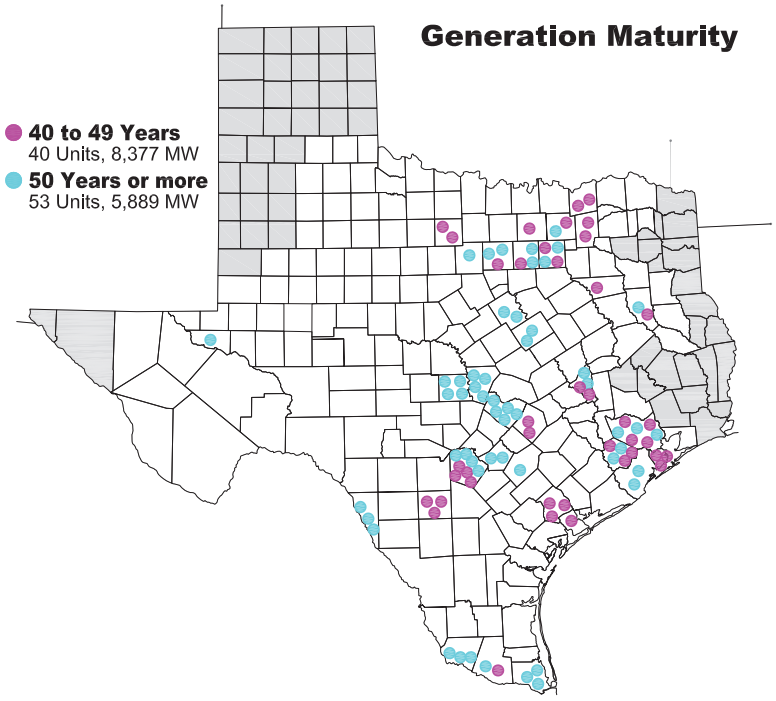
Dots do not reflect actual location of the plants within the county

Since 1999, ERCOT capacity has grown by adding new generation sites, expanding existing sites, and upgrading or repowering existing units. The additional generation totals over 41,000 MW. Much of the new installed generation capacity added in the last few years is from large wind projects built in West Texas. This significant change in the generation portfolio has placed new challenges on the adequacy and the reliability of the existing transmission system. The map to the left shows generation added within the ERCOT Region between 1999 and September 2009.

Since 1999 a total of 134 units have been decommissioned. The map to the right shows generation within the ERCOT Region that has been decommissioned since of 1999. Decommissioning of older plants near metropolitan areas due to economics or environmental restrictions requires ERCOT to undertake an assessment of system reliability needs and to propose maintaining certain units under Reliability Must-Run (RMR) contracts and any transmission alternatives to these RMR sources.



Dots do not reflect actual location of the unit within the county

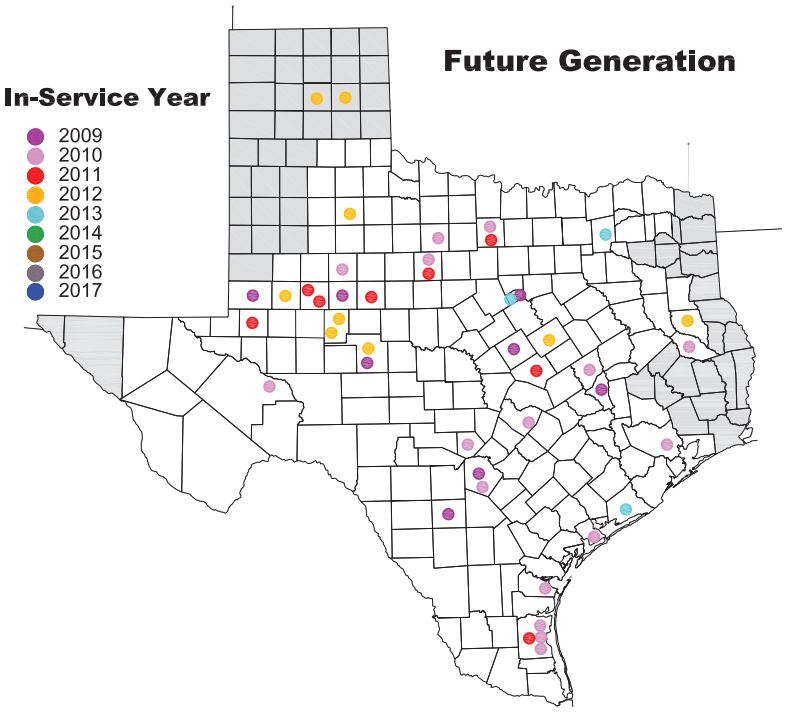


Dots do not reflect actual location of the unit within the county

Many factors, including fuel cost, O&M cost, efficiency, environmental requirements and revenues, influence whether a generating unit will remain in service or be decommissioned. Age, as an indication of the relative efficiency and maintenance cost of a generating unit, has been used to provide some limited insight into some of the factors that are considered in the decommissioning of units. Currently there is over 14,000 MW of generation within ERCOT that is over 40 years in age. Most of the older capacity is located in and around the larger metropolitan areas of the state. The map to the left shows generation that is over 40 years in age.

4.2 Future Generation

ERCOT has received interconnection requests for proposed generation having aggregate nameplate capacity over 79,000 MW. Of this capacity, over 20,000 MW is public and is shown on the map to the right.



Dots do not reflect actual location of the unit within the county

The following table shows the interconnection requests for proposed capacity by fuel type.

ACTIVE GENERATION INTERCONNECTION REQUESTS BY FUEL TYPE (MW)			
Fuel	**Non-Public**	**Public**	**Total**
Gas-CC	13,096	3,881	16,977
Gas-CT	650	527	1,177
Nuclear	0	5,986	5,986
Coal	3,712	2,958	6,670
Wind	37,509	7,092	44,601
Solar	1,095	0	1,095
Biomass	108	145	253
Other	2,326	0	2,326
Total	58,496	20,589	79,085

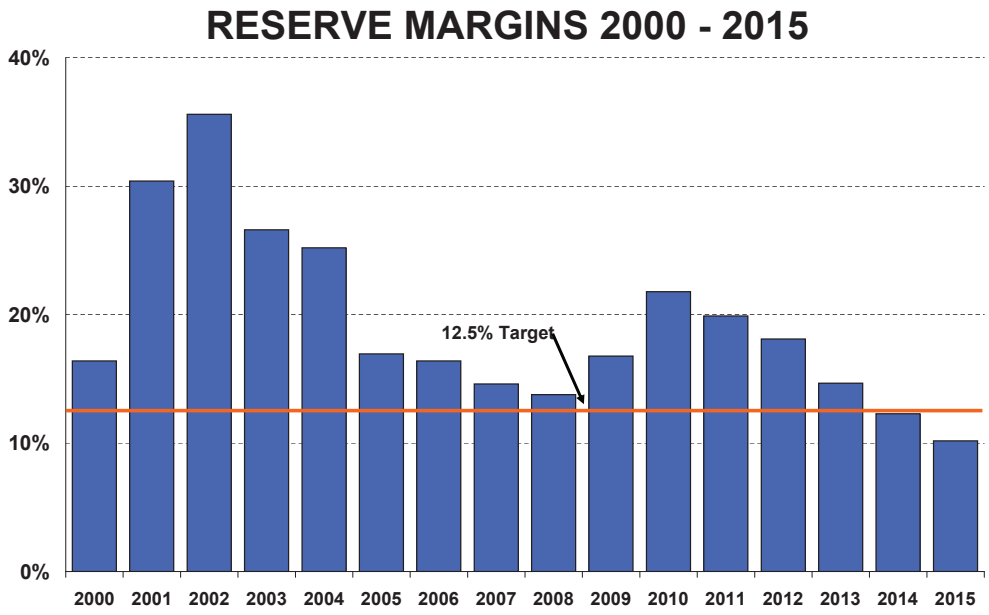
The following table shows the requests for new generation in ERCOT between November 2008 and September 2009.

GENERATION INTERCONNECTION REQUEST ACTIVITY IN 2009						
FUEL	SCREENING STUDIES REQUESTED		INTERCONNECTION STUDIES REQUESTED		INTERCONNECTION AGREEMENTS SIGNED	
	Number	MW	Number	MW	Number	MW
Coal	1	15	1	1,200	1	263
Gas-CC	2	1,279	3	1,226	1	50
Gas-CT	0	0	2	600	11	1,930
Wind	48	14,447	35	11,771	0	0
Solar	17	1,095	4	459	0	0
Other	5	1,184	0	0	0	0
Total	73	18,020	45	15,256	13	2,243
Projects may appear in more than one category						

Continued load growth, a vibrant wholesale market, and renewal of the federal production tax credit for renewable generation continue to attract merchant plant developers to the Texas market, resulting in a high volume of interconnection requests. However, there is much uncertainty associated with many of the proposed interconnections. One reason is that multiple interconnection requests may be submitted representing alternative sites for one proposed facility. For this and other reasons, it is possible that much of this capacity will not be built.

5. Reserve Margin

Reserve margin[3] is the percentage by which the available generating capacity in a system exceeds the peak demand. The chart below shows the historical and projected reserve margins for the ERCOT system from 2000 through 2015, as well as the 12.5% target. Between 1999 and 2004, different methodologies were used to calculate ERCOT's margins, which accounts for some of the wide variation of the margins shown. In 2005, the ERCOT Board of Directors approved a methodology that recognizes a generator's contribution to reserve is determined more by availability than by capacity and approved a 12. 5% target reserve margin. The reserve margins for 2006 through 2015 were calculated using this methodology.



[3] Reserve margin is calculated by the following formula: ((generation – demand) / demand). The Capacity, Demand and Reserve report reflects these calculations.

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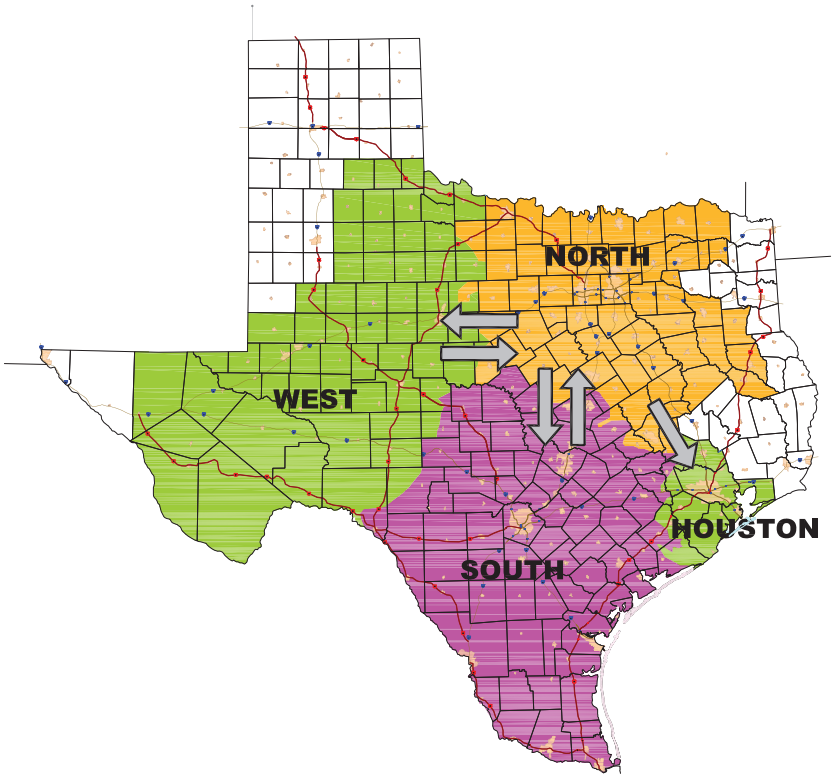
6. Congestion

Transmission congestion occurs whenever the economic need for power transfer exceeds the secure transfer capability of a transmission facility or facilities. Congestion costs are incurred when more expensive generation is deployed in order to maintain the reliable operation of the system. The differences in generation costs quantify the amount of congestion and are ultimately borne by the consumer.

To ensure reliability, ERCOT system operators perform a Real-Time Contingency Analysis (RTCA) approximately every five minutes. This analysis identifies when the loss of any single transmission element in the system would result in exceeding the capability limits of another transmission element. RTCA assists the system operators in determining the course of action to remedy the identified congestion. ERCOT categorizes congestion in two ways: inter–zonal or zonal congestion and intra-zonal or local congestion.

6.1 Zonal Congestion and Costs

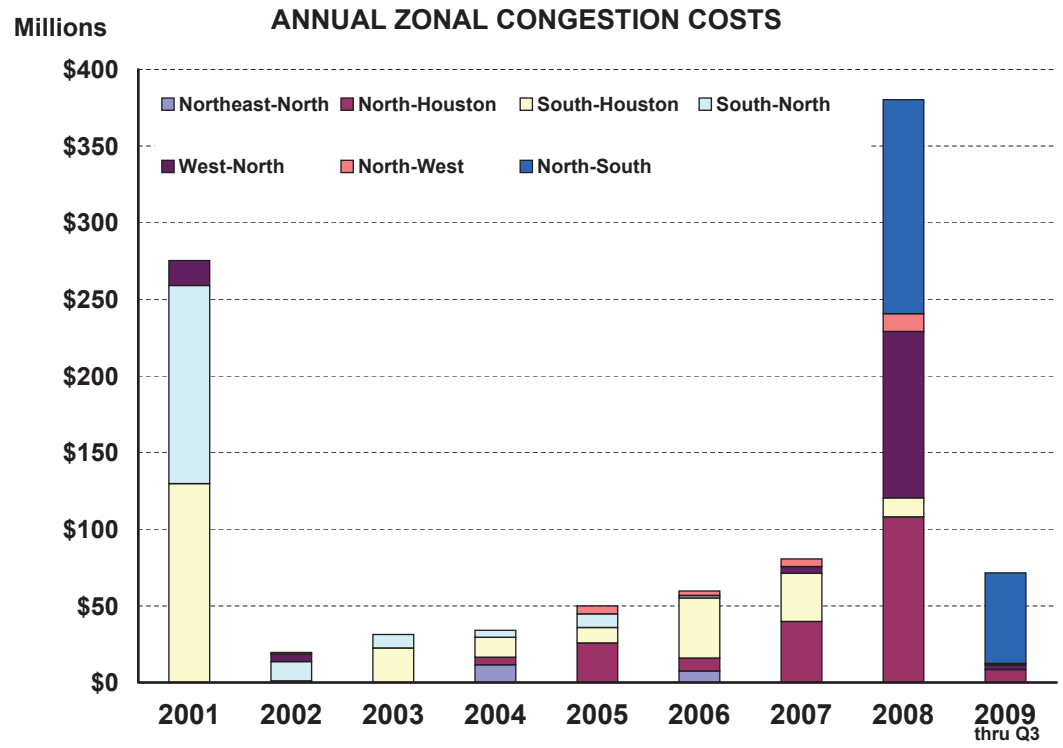
ERCOT currently operates a zonal balancing energy market for the resolution of transmission congestion between Congestion Zones. Commercially Significant Constraints (CSC) are constraints that are selected annually due to their potential to result in congestion and to limit the flow of energy within the ERCOT market to a commercially-significant degree. A CSC is generally a 345 kV transmission facility that is representative of the flow between two zones.

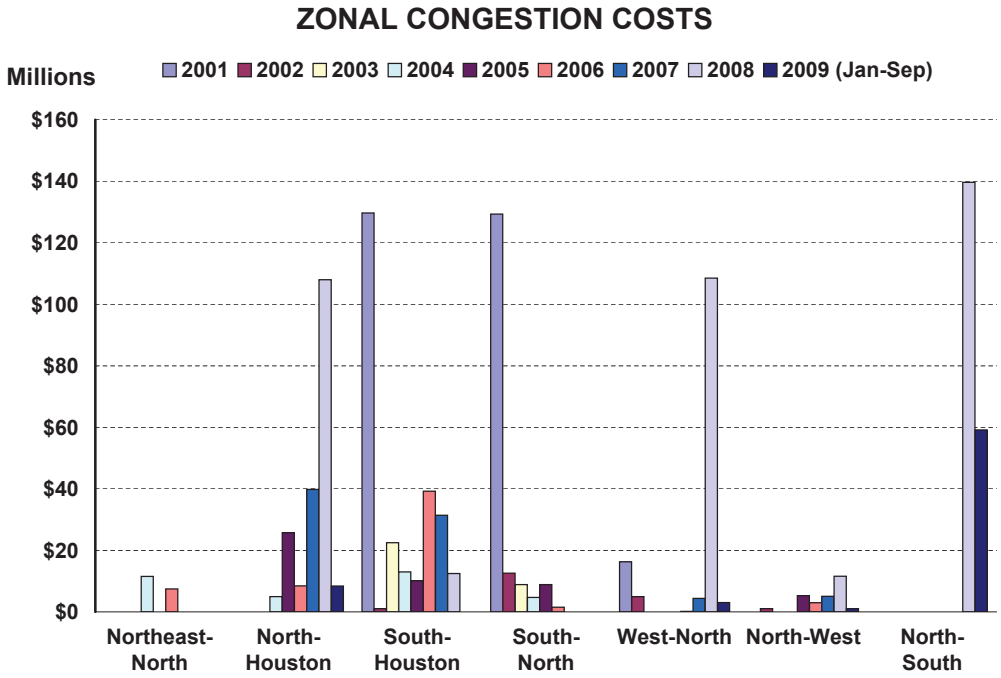


Each year studies are made to determine the Congestion Zones. For 2009 there were four congestion zones and five CSCs as illustrated to the right.

When an ERCOT system operator determines a CSC is congested, the operator reduces line loading by issuing instructions to increase the generation in the zone importing power and to decrease generation in the zone exporting power. The instructions are based upon the generator bids available in the balancing market. The resulting costs are defined as zonal congestion costs and are directly assigned on a pro-rata basis to those market participants scheduling energy over the CSC.

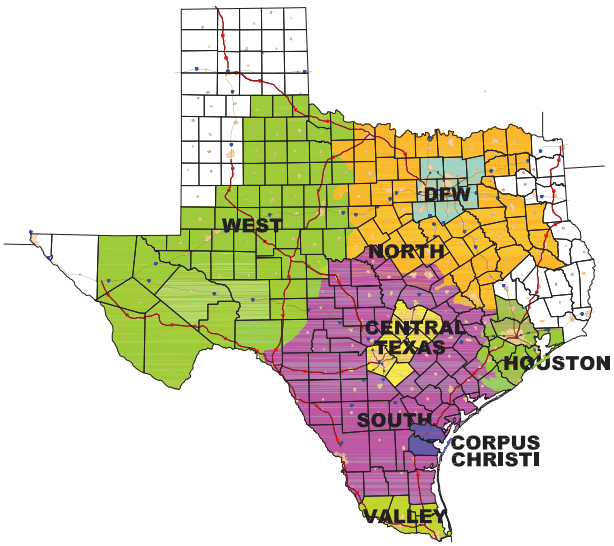
The following graphs show the zonal congestion costs from 2001 through September 2009 by CSC.



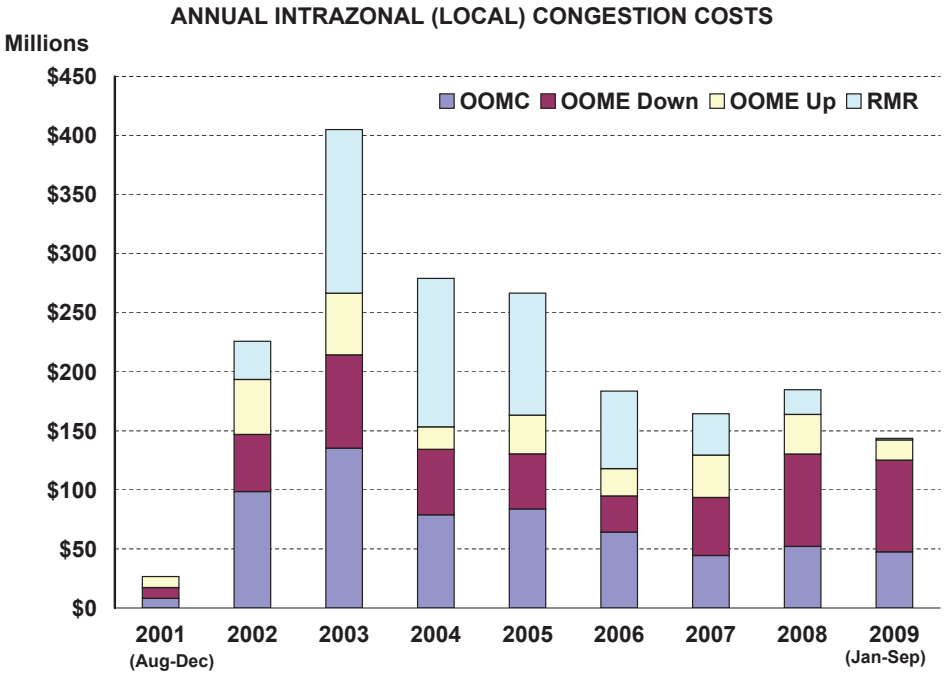


6.2 Local Congestion and Costs

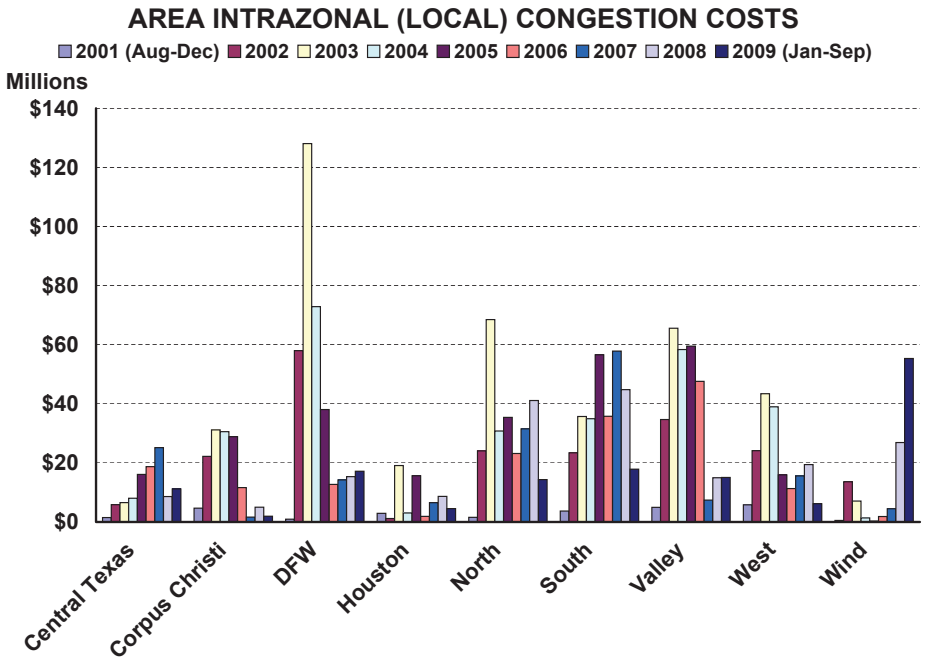
Intra-zonal or local congestion is the congestion that occurs within a congestion management zone. For reporting purposes, ERCOT has grouped local congestion into eight congestion areas with local constraints as illustrated on this map. The congestion associated with wind power is not limited to a specific geographic area. Intra-zonal congestion is usually remedied by running higher cost, less efficient generation in the local area to reduce transmission flows and to improve the voltage profiles in the area. To resolve intra-zonal congestion, ERCOT uses three different market services to deploy specific generating units. These services are Out-of-Merit Energy (OOME), Out-of-Merit Capacity (OOMC), and Reliability Must-Run (RMR). The cost of providing these services is collectively defined as intra-zonal congestion costs and is uplifted on a load-ratio share to all load-serving entities within the ERCOT Region.

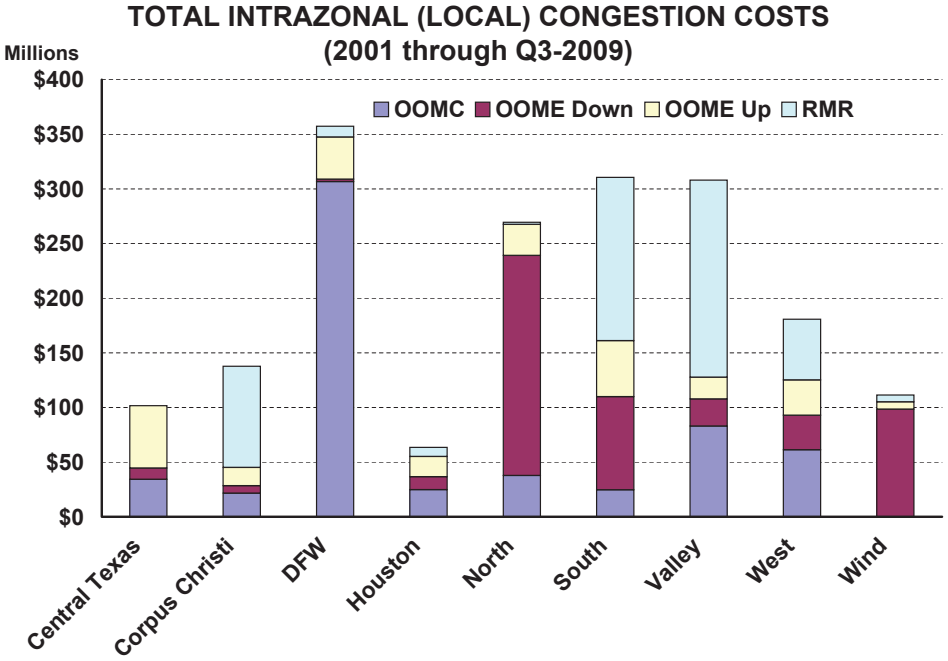


As described above, intra-zonal congestion costs are highly dependent on local generation availability, the limits of the current transmission infrastructure, the impact of scheduled and non-scheduled outages, and local area demand. ERCOT is working diligently with market participants to develop both short-range and long-range plans to minimize intra-zonal congestion costs. As a result of transmission and other operational improvements, annual intra-zonal congestion costs have been reduced from over $405 million in 2003 to $185 million in 2008 and $144 million through September 2009, as shown below.



Congestion costs are allocated to the eight different zones with wind resources isolated as shown below. Prior reports showed the wind allocation as the McCamey area.





7. Transmission Improvements

In order to improve grid reliability and power deliverability as well as to reduce congestion and the associated congestions costs, ERCOT and the ERCOT TSPs perform system planning studies of the ERCOT transmission system. Since January of 2007, ERCOT TSPs have completed major projects estimated at over $2.2 billion as well as numerous smaller projects not reported through ERCOT transmission project tracking. The major projects that are being considered through years 2010 – 2015 and beyond to meet the growing electricity needs are estimated to cost over $8.8 billion. This estimate includes projects necessary to deliver energy from five Competitive Renewable Energy Zones (CREZ) to ERCOT load, as ordered by the Public Utility Commission of Texas (PUCT) in Docket 33672.

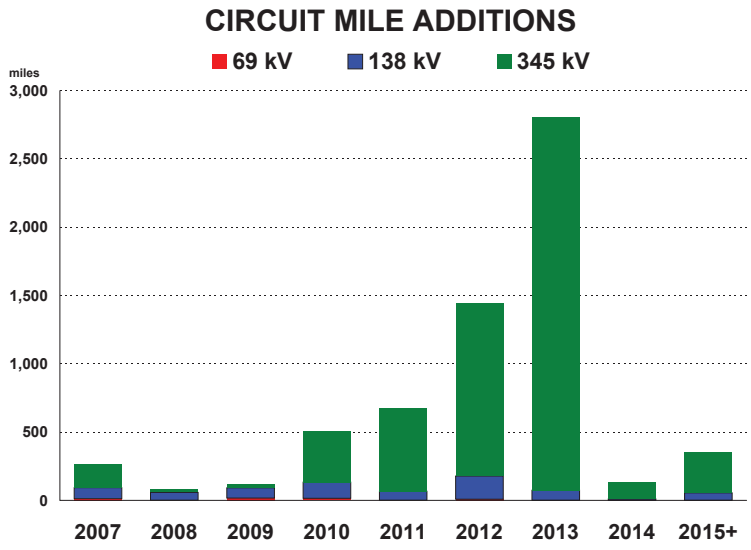
Transmission system improvements and expansions are built by transmission owners and paid for by consumers. In addition to load growth and congestion reduction, interconnection of new generation and decommissioning of generation may also require upgrades or additions to the transmission system elements in order to maintain reliability.

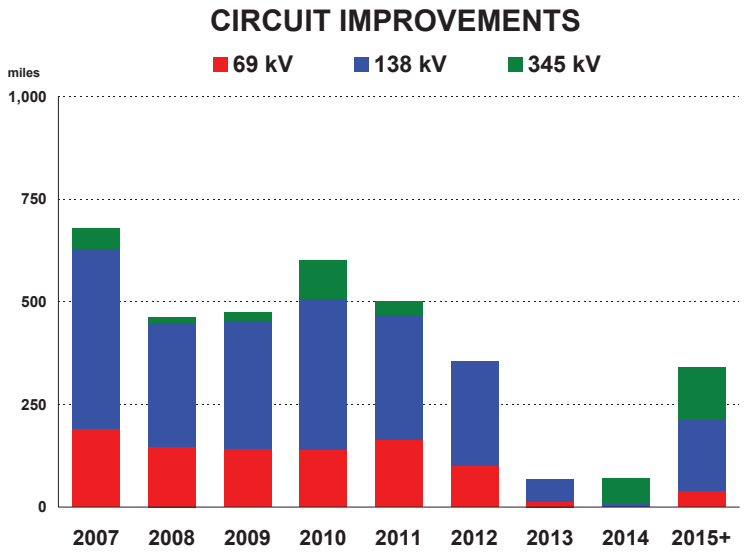
7.1 Improvement Projects

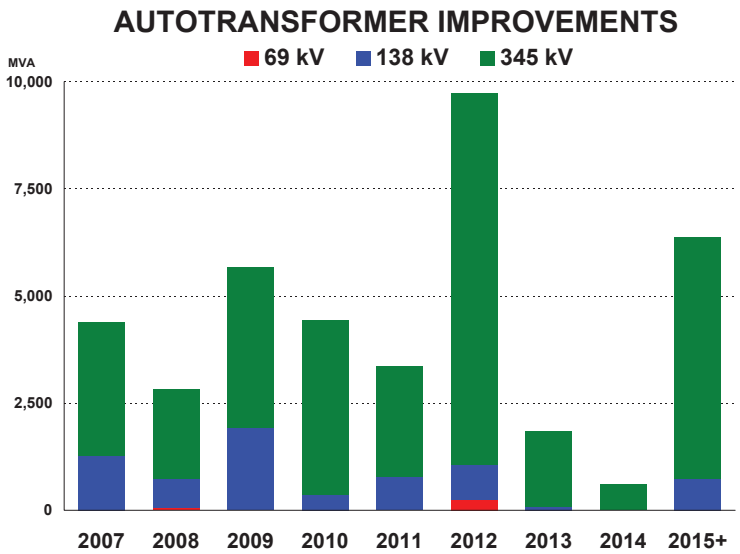
By studying current congestion costs and projected congested elements, ERCOT identifies the portions of the transmission grid prone to persistent congestion and proposes the most cost-effective solutions to resolve those constraints and thus lower the cost of power to consumers. Reliability Must-Run (RMR) requirements are also taken into consideration. There are currently two units in the West zone under RMR contracts.

Since 2007, TSPs have completed projects adding over 460 miles of new circuits, upgrading over 1,600 miles of transmission lines, adding over 4,000 MVAR of reactive capability, and installing over 12,890 MVA of autotransformer capacity. The planned projects that are being considered are expected to add over 5,900 miles of new circuits, upgrade or improve over 1,930 circuit miles of transmission lines, add almost 2,000 MVAR of reactive capability, and add over 26,300 MVA of autotransformer capacity.

The following three charts on the next page provide a breakdown of both completed and recommended projects by new transmission, improved transmission, and autotransformer capacity additions by in-service year. The figures do not include the incremental transmission projects that resulted from the recently completed five-year transmission plan.


CIRCUIT MILE ADDITIONS
69 kV
138 kV
345 kV
miles
3,000
2,500
2,000
1,500
1,000
500
0
2007
2008
2009
2010
2011
2012
2013
2014
2015+

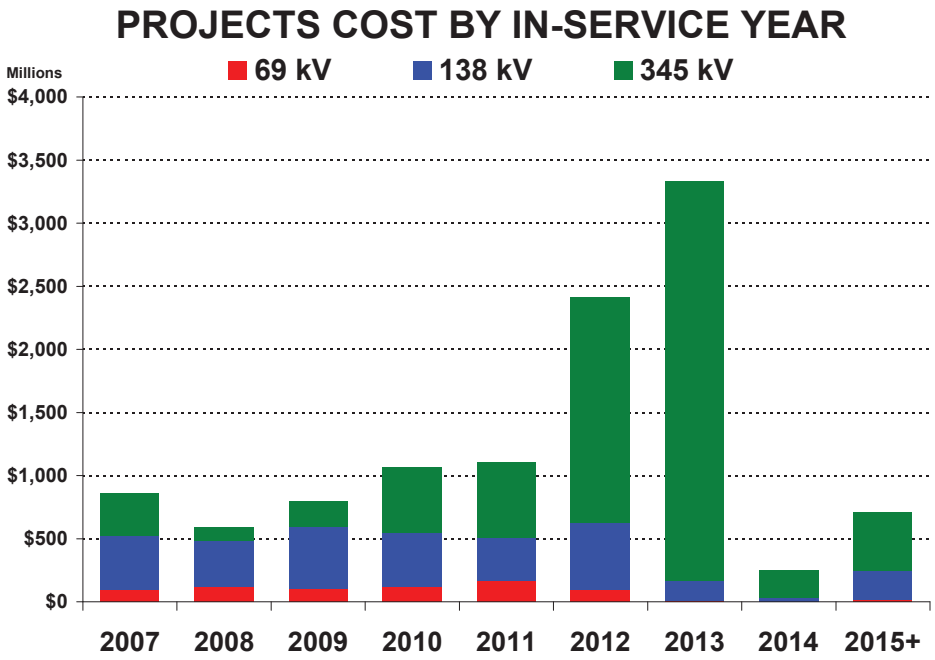

CIRCUIT IMPROVEMENTS
69 kV
138 kV
345 kV
miles
1,000
750
500
250
0
2007
2008
2009
2010
2011
2012
2013
2014
2015+


AUTOTRANSFORMER IMPROVEMENTS
69 kV
138 kV
345 kV
MVA
10,000
7,500
5,000
2,500
0
2007
2008
2009
2010
2011
2012
2013
2014
2015+

7.2 Improvement Costs

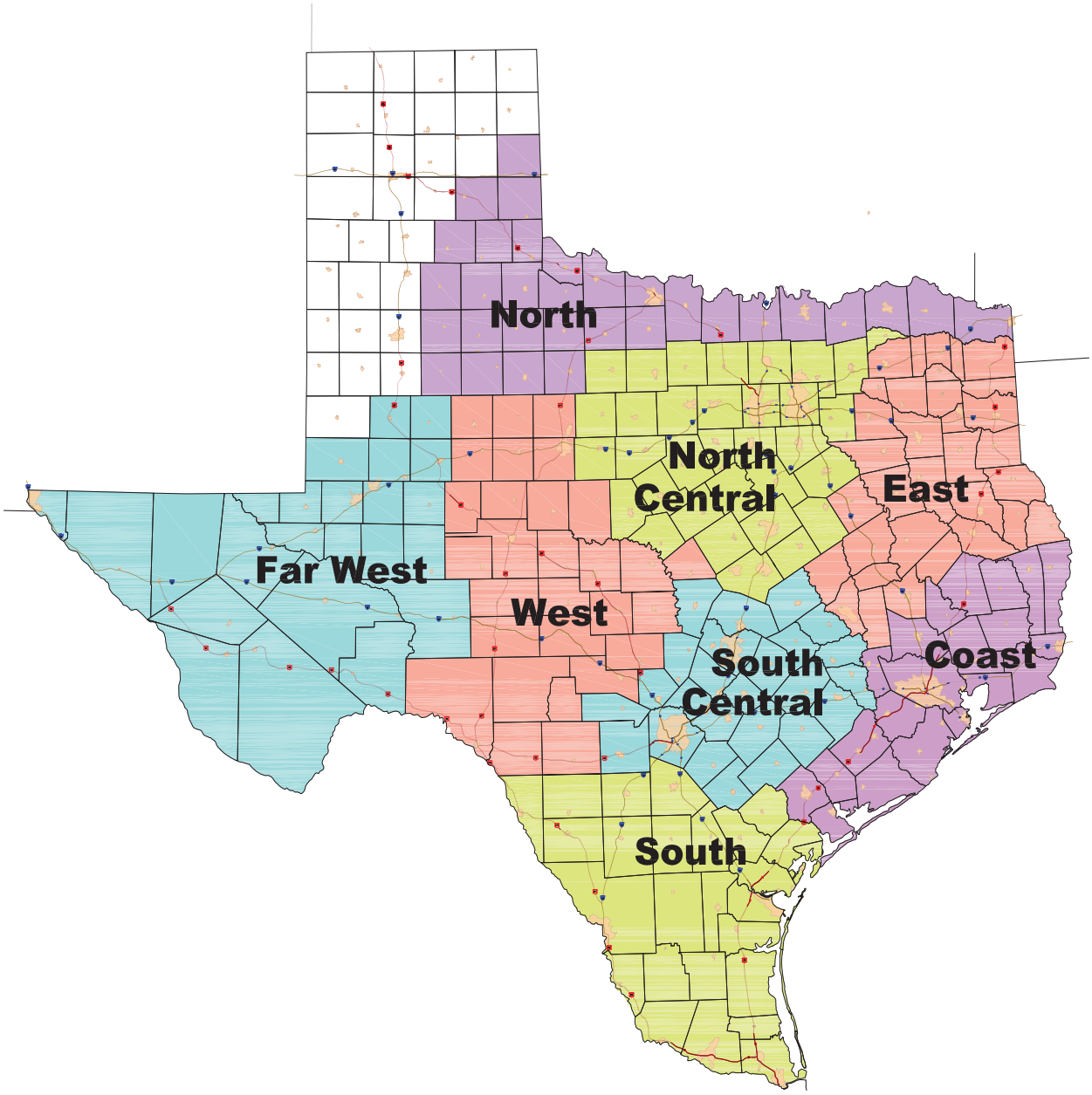
While transmission improvements are often needed to reduce congestion, it is difficult to produce a side-by-side comparison of transmission improvement costs against congestion costs. This is mainly due to the time inconsistencies – improvement costs are spread over many years while congestion costs are paid for on an annual basis. Due to this, there are no direct allocations of project costs to congestion costs, but each is shown separately.

The following figures show improvements based on completed and planned projects[4] and do not reflect actual overall transmission cost, including operations and maintenance, in a given year. The actual costs for a single project will be spread over several years to account for engineering, regulatory approvals, material, right-of-way procurement, construction, etc. In addition, the figures do not include the incremental transmission projects that resulted from the recently completed five-year plan. The graph below provides a breakdown of both completed and recommended project costs by in-service year.



[4] The projects included in these graphs are listed in ERCOT's Transmission Project Information Tracking (TPIT) spreadsheet found at http://planning.ercot.com/reports/tpit. This is located on the secure Planning and Operations web site, http://planning.ercot.com. There may be additional minor projects that are not reported to ERCOT by the TSPs through this spreadsheet.

ERCOT WEATHER ZONES



8. Area Constraints and Improvements

This section highlights recent constraints, completed improvements, planned improvements, and projected constraints on the ERCOT power system by weather zone, which are shown on the map to the left. Each section includes a brief discussion of issues along with supporting tables and maps. This chapter does not identify planned CREZ projects, however the CREZ projects were incorporated into the reliability and economic planning studies. The default CREZ projects were included according to the TSP-projected in-service dates. The remaining CREZ projects were included as of 2013.

Recent Constraints – the elements that have caused local congestion on the system at some point during 2009, as reported in monthly operations reports.

> The illustrated constraints were not necessarily experienced throughout this period; constraints may change due to generation changes, transmission and generation outages, construction schedules for transmission improvements, and changing load patterns.

Completed Improvements – the major additions to the transmission system made in 2008 and 2009.

Planned Improvements – the additions currently underway or being studied in ERCOT and TSP analyses.

> The planned improvements listed in each weather zone section are generally the largest projects in that area. The in-service year is the first year that the improvement will be available for the summer peak. The ERCOT Review designation in the right column of the associated table refers to projects which have been reviewed by the RPG or ERCOT Board of Directors, pursuant to the ERCOT RPG Charter and Procedures.

Projected Constraints – constraints based on a computer simulation of an hourly security-constrained unit-commitment and economic-dispatch model for a forecasted annual period.

> The computer model determines an optimal unit commitment and dispatch based on the assumption that units will be bid into a nodal market at their variable cost of generation and does not consider transmission outages. Security constraints can cause the model to deviate from the most economic dispatch on an hourly basis. The measure of this deviation is marginal congestion which is defined as the rating of the line multiplied by the shadow price on the limiting transmission element in the hour the congestion occurs.

Congestion Color Key	
	None
	Low
	Medium
	High

> The amount of annual marginal congestion for each element is categorized by color. Dark brown represents the most severe congestion. Yellow represents the least congestion. Light brown represents a level of severity between yellow and dark brown. If color coding is missing, no congestion is expected for that element.

> Congestion may exist until planned improvements can be put in place to alleviate it. In addition, some level of congestion may acceptably continue to be experienced on some elements of the system where it is uneconomic to construct the improvements that could be required to eliminate the constraints.

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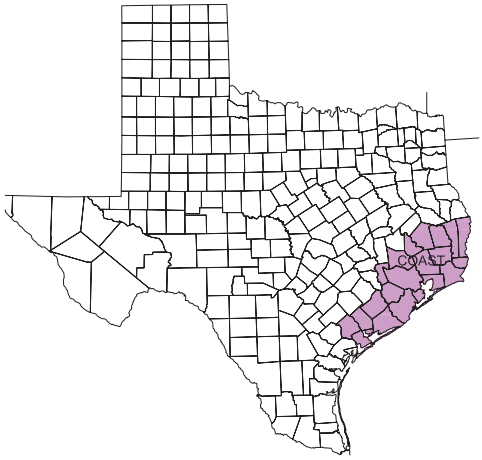
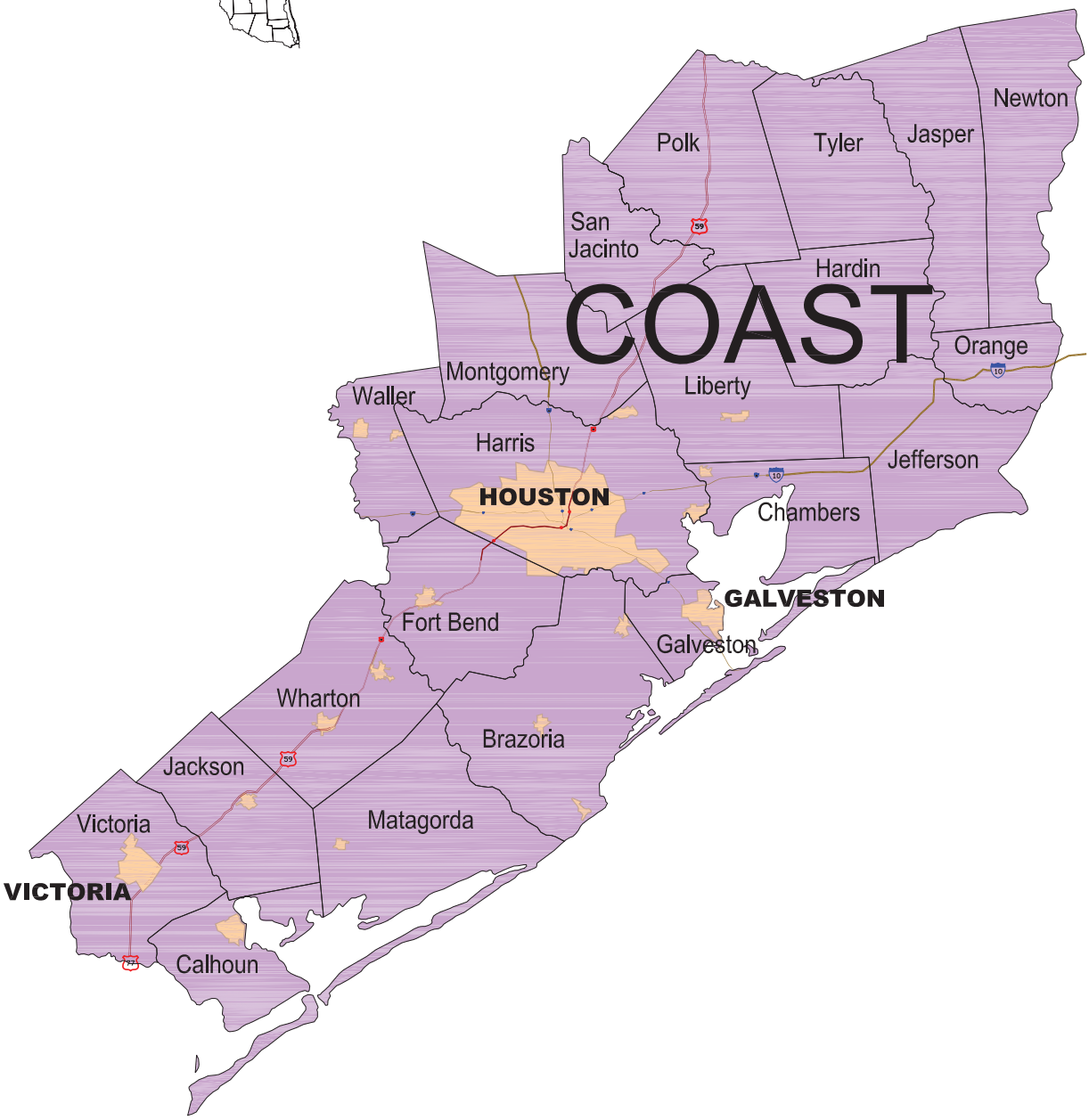
8.1 Area Constraints and Improvements – Coast Weather Zone

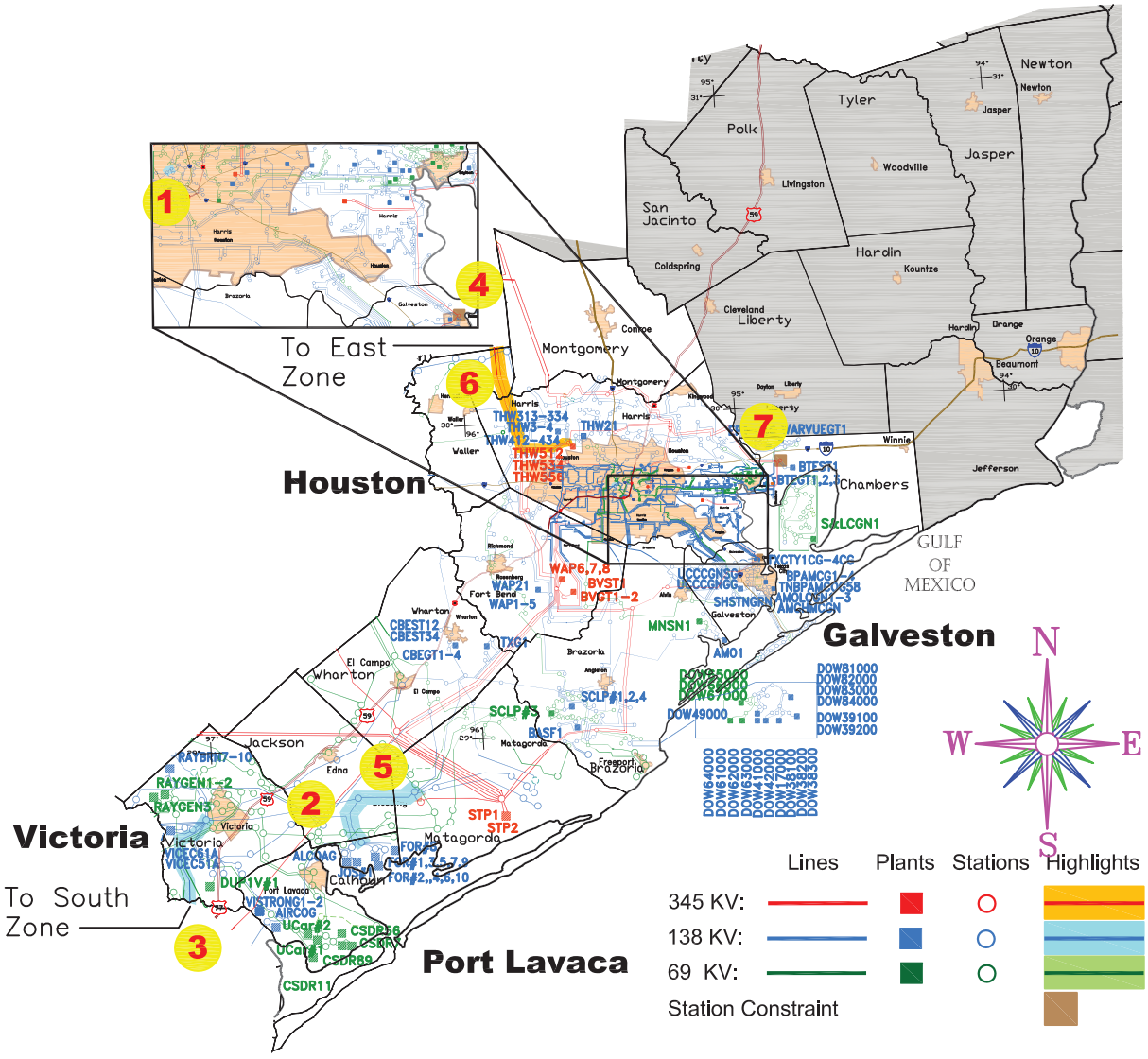


The Coast weather zone is primarily composed of the Houston metropolitan area, which is one of ERCOT's largest load centers. The map below highlights the counties included in the Coast weather zone.



8.1.1 Recent Constraints Map – Coast Weather Zone

The map below identifies the location of the recent constraints for the Coast weather zone.



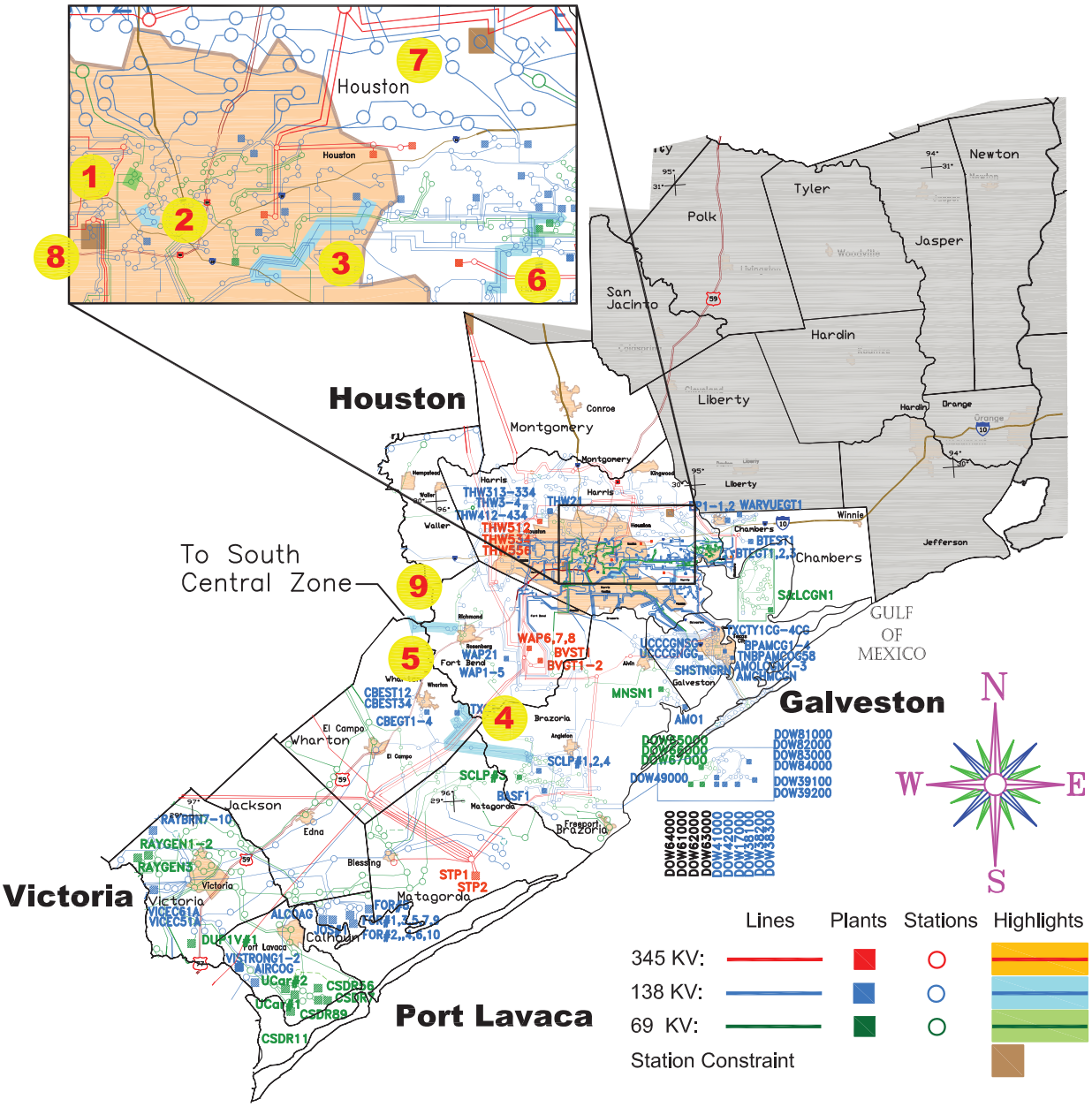
8.1.2 Recent Constraints – Coast Weather Zone

Transmission constraints in the Coast weather zone are primarily due to transmission construction outages. Congestion occurs when transmission paths into Houston are out of service for project improvements or maintenance. The table below highlights the constrained elements for 2009.

Map Index	Constraining Element	Voltage (kV)
1	Garrott - Midtown	138
2	Formosa - Lolita	138
3	Victoria - Warburton	138
4	P H Robinson T1	345/138
5	Blessing - Lolita	138
6	Singleton - TH Wharton	345
7	Baytown Energy Autotransformer 2	345/138

8.1.3 Completed Improvements Map – Coast Weather Zone

The map below identifies the location of the completed improvements for the Coast weather zone.



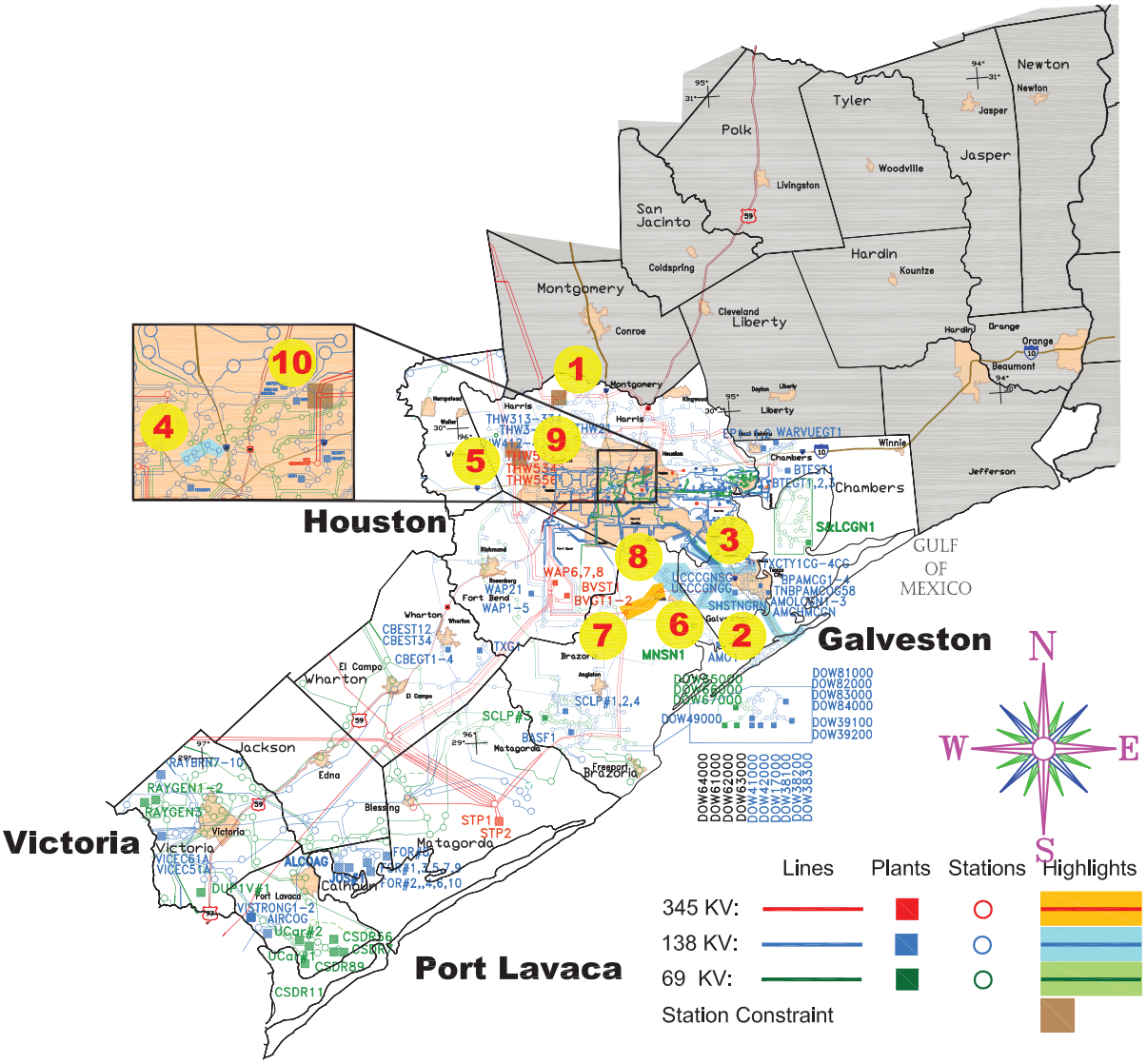
8.1.4 Completed Improvements – Coast Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2008 and 2009 in the Coast weather zone. The elements consist of 79.8 miles of transmission and two dynamic reactive devices. There were 79.8 miles of upgraded lines (77.4 miles at 138 kV). Many of these upgrades were accomplished by raising the conductors of the circuit, upgrading the limiting equipments or replacing the existing conductor. The dynamic reactive devices help regulate the system voltage, while most of the upgrades are done to increase the thermal ratings of the line.

Map Index	Completed Improvements	Year In Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Dunlavy - Heights Line Upgrade	2009	69	0	2.4
2	Blodgett - Garrott Line Upgrade	2009	138	0	1.6
3	Jefferson - College Tap - Pasadena Reconductor	2009	138	0	4.7
4	Gulftap-PledgerTap-West Columbia Line Upgrade	2009	138	0	27.5
5	East Bernard - Orchard - Fort Bend Line Upgrade	2008	138	0	18.3
6	S.R. Bertron - Fairmont Partial Reconductor	2008	138	0	0
7	Crosby Dynamic Reactive Device	2008	138	0	0
8	Bellaire South Dynamic Reactive Device	2008	138	0	0
9	East Bernard - Wallis - Sealy - Peters Ckt.65 Rebuild	2009	138	0	25.3

8.1.5 Planned Improvements Map – Coast Weather Zone

The map below identifies the location of the planned improvements for the Coast weather zone.



8.1.6 Planned Improvements – Coast Weather Zone

Recent transmission upgrades in the Coast weather zone have focused on increasing the import capability into the Houston area from the North congestion management zone and increasing the 345/138 kV autotransformer capacity in the Houston area.

The Zenith switching station will reduce Houston import congestion on the Singleton to Wharton 345 kV line. A 345/138 kV autotransformer will later be added at Zenith switching station in order to relieve overloads of the Wharton autotransformers.

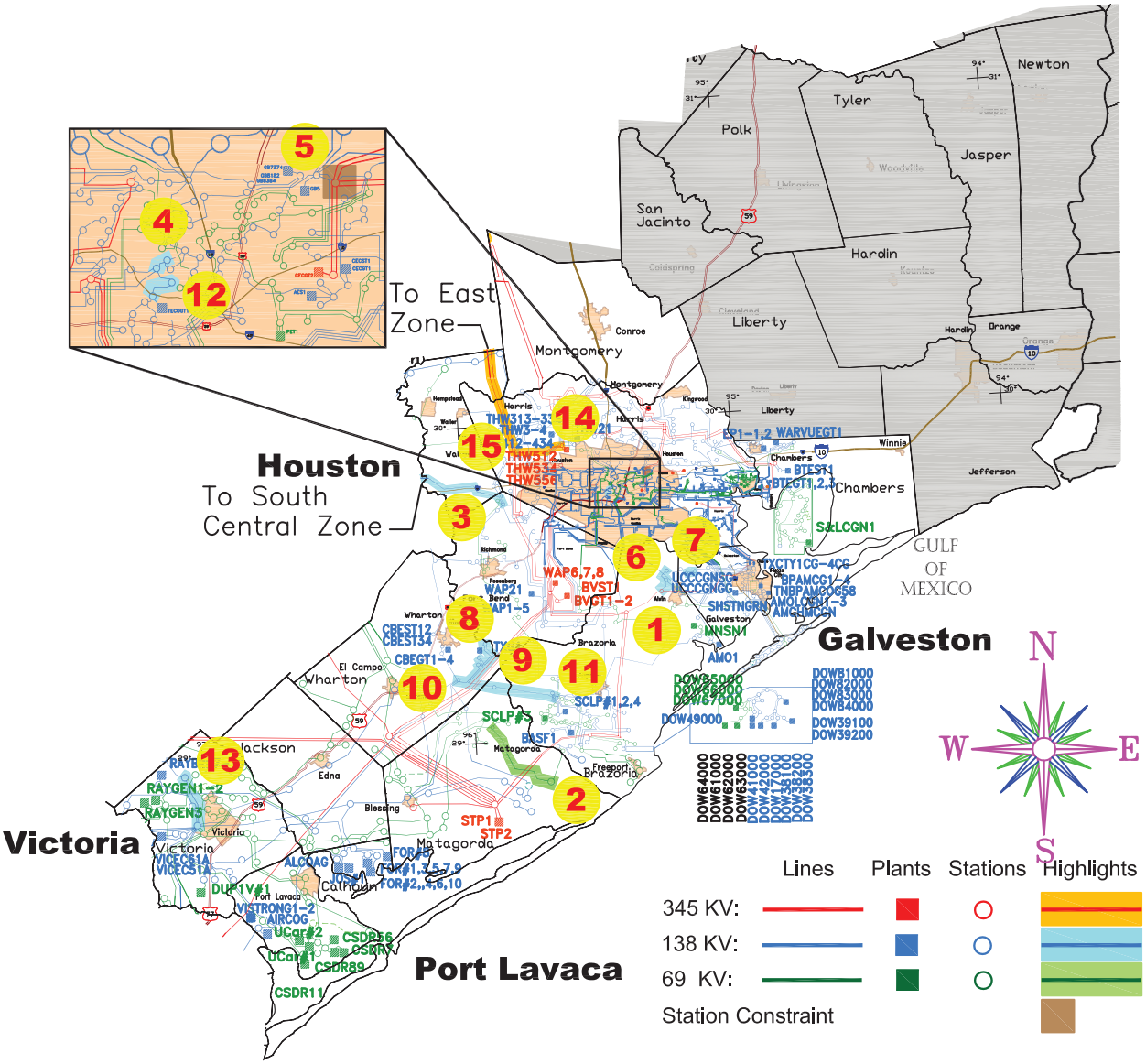
A new Rothwood 345/138 kV substation will be added in the north Houston area to alleviate overload of the Tomball autotransformers. The upgrade of a 345/138 kV autotransformer at Greens Bayou switching station will further add autotransformer capacity in the Houston area.

The upgrade of the Garrott-Midtown-Polk 138 kV circuit has been planned to relieve congestion and to improve the reliability in downtown Houston. Additionally, the 138 kV lines serving the Galveston island will be upgraded.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Rothwood New Substation And Autotransformer Addition	345/138	2010	X
2	Webster - Tikki - Galveston Upgrade	138	2011	X
3	Stewart - La Marque - Webster Upgrade	138	2011	X
4	Garrott - Midtown - Polk Upgrade	138	2011	X
5	Zenith Substation Addition	345	2011	X
6	PH Robinson - Alta Loma Upgrade	138	2012	X
7	Oasis – Meadow Second Circuit Addition	345	2012	X
8	Seminole - Friendswood Sub - Hastings Sub- Alvin Tie Sw Station – Alvin Sub Upgrade	138	2012	X
9	Zenith Substation Autotransformer And Zenith - Gertie Addition	345/138	2012	X
10	Greens Bayou Autotransformer Upgrade	345/138	2014	X

8.1.7 Projected Constraints Map – Coast Weather Zone

The map below identifies the location of the projected constraints for the Coast weather zone.



8.1.8 Projected Constraints – Coast Weather Zone

The import of power into the Houston area is projected to be constrained throughout the five-year period of this assessment. Proposals to resolve this constraint are currently under study. The planned Zenith switching station project, which will be completed in 2011, is expected to somewhat lessen this congestion, but constraints are anticipated to grow in the future.

The Garrott to Midtown underground 138 kV will congest the downtown Houston area until the line is upgraded in 2011. Southwest of Houston several 138 kV lines will be moderately congested due to generation in the area.

In order to maintain reliability in the Alvin area, a new 345/138 kV autotransformer will be installed in 2010 and several 138 kV line improvements will be implemented in later years. These 138 kV lines will be congested between the time the autotransformer is installed and the 138 kV line improvements are completed.

Map Index	Projected Constraining Element	Voltage (kV)	2010	2011	2012	2013	2014
1	Alvin Tie Switch Station - Alvin Sub	138					
2	Bay City Substation - Sargent Substation	69					
3	Flewellen - Peters	138					
4	Garrott - Midtown	138					
5	Greens Bayou Autotransformer	345					
6	Hastings Sub - Alvin Tie Switch Station	138					
7	Magnolia Sub - Seminole Sub	138					
8	New Gulf - Csw Energy	138					
9	New Gulf - Pledger	138					
10	New Gulf - South Lane City	138					
11	Pledger - West Columbia	138					
12	Thermal Energy Coop - Blodgett	138					
13	Victoria Plant - Magruder Switching Station	138					
14	Singleton - TH Wharton	345					
15	Singleton - Zenith	345					

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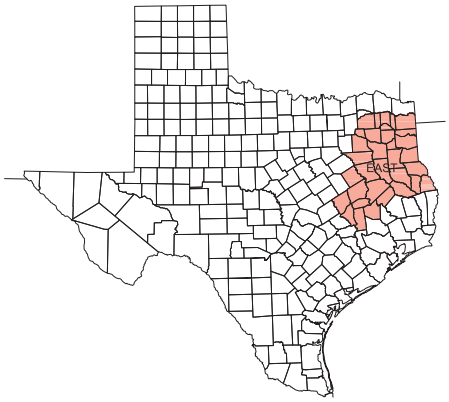
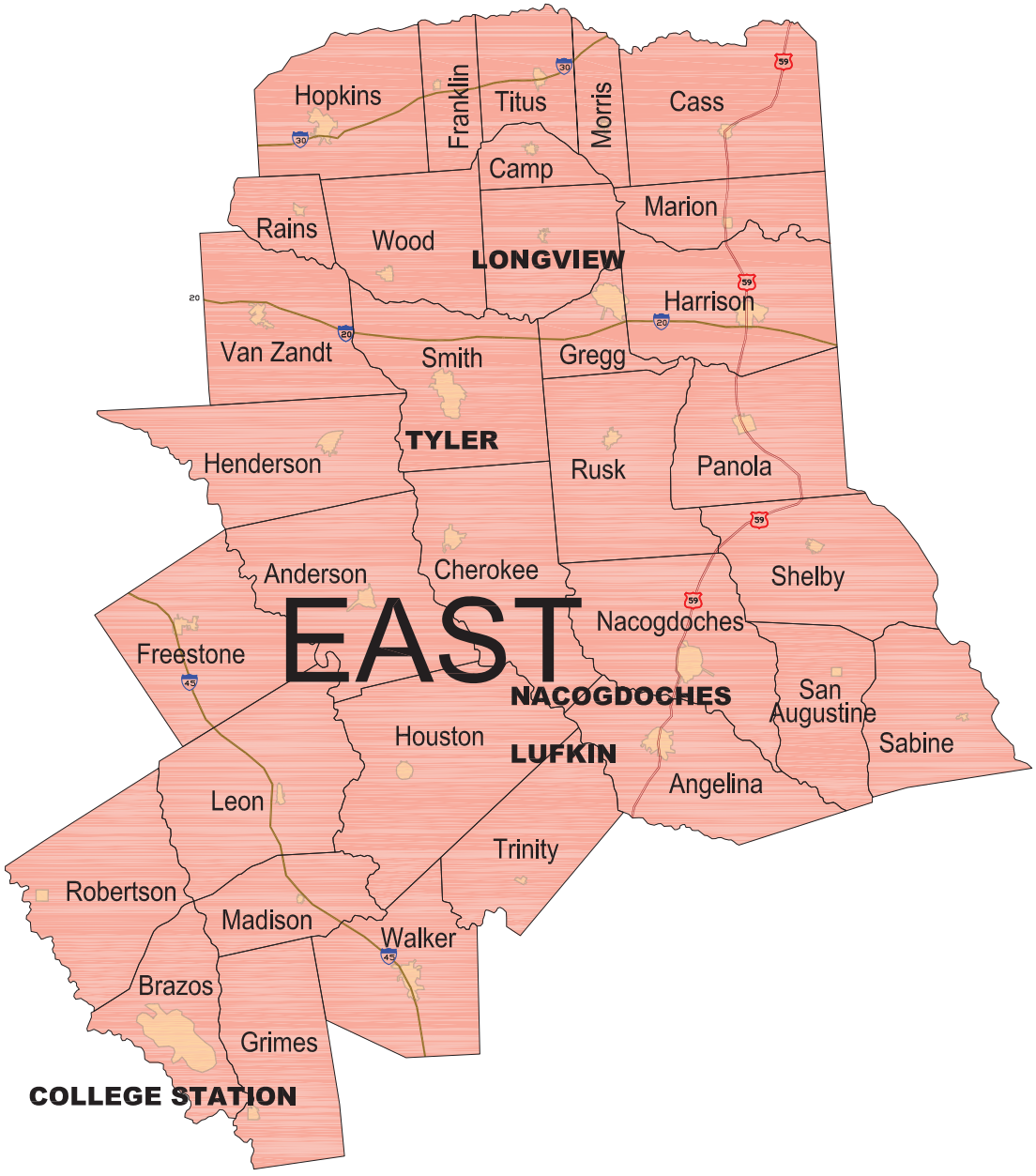
8.2 Area Constraints and Improvements – East Weather Zone

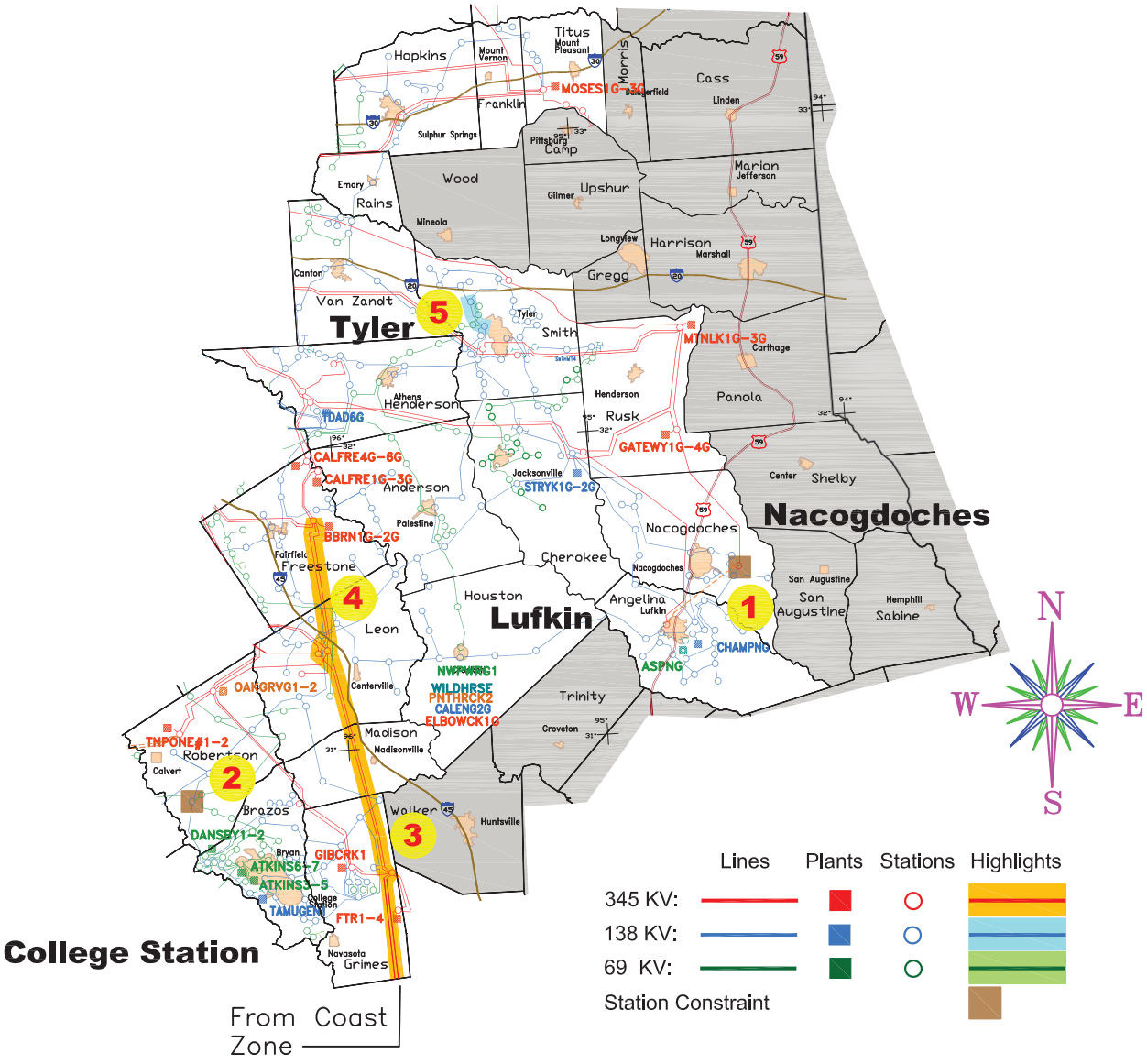


The East weather zone includes the cities of Bryan, College Station, Tyler, Nacogdoches, and Lufkin. The map below highlights the counties included in the East weather zone.



8.2.1 Recent Constraints Map – East Weather Zone

The map below identifies the location of the recent constraints for the East weather zone.



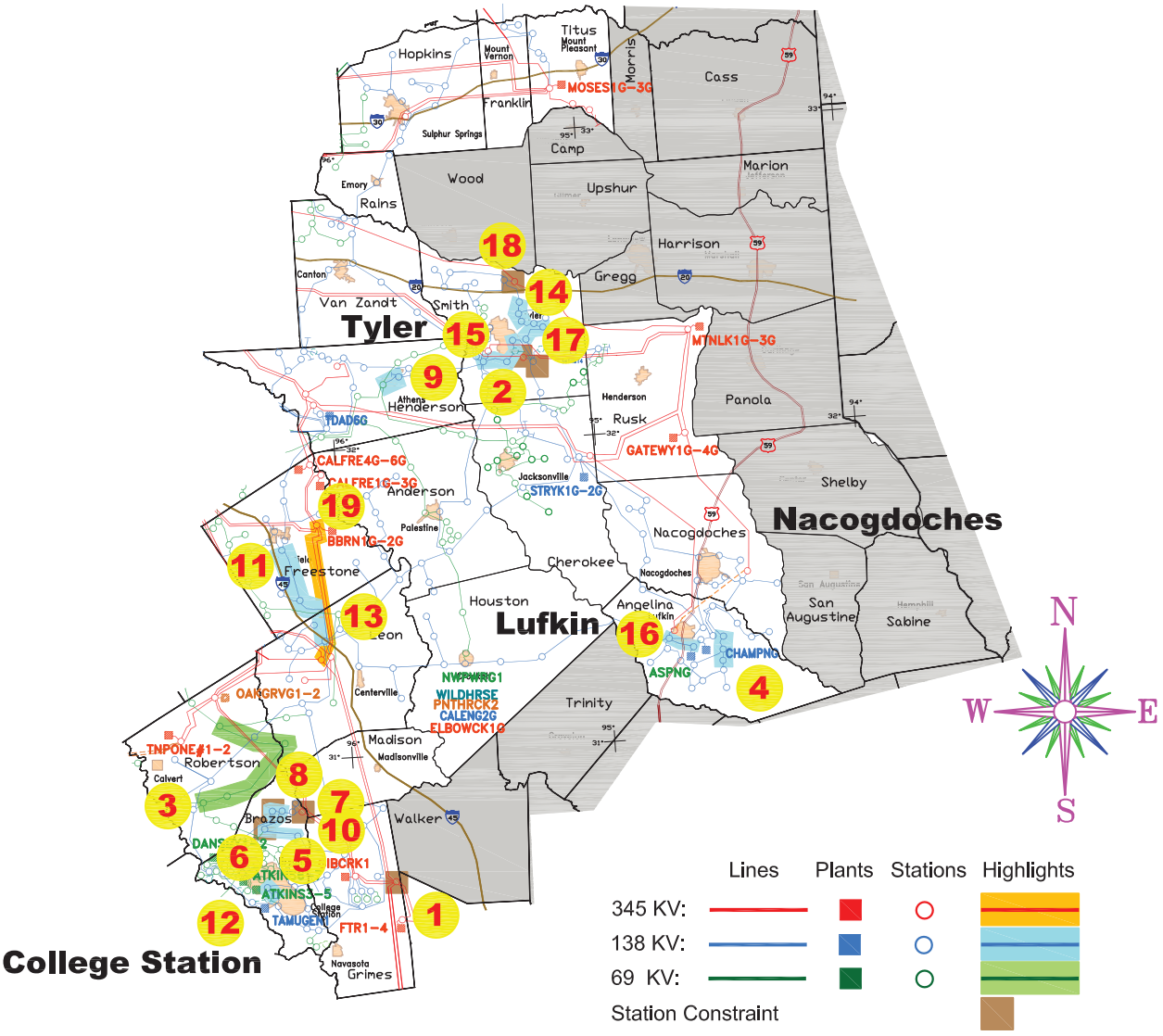
8.2.2 Recent Constraints – East Weather Zone

Transmission constraints in the East weather zone are primarily due to transmission construction outages for maintenance and transmission improvements.

Map Index	Constraining Element	Voltage (kV)
1	Nacogdoches Autotransformer	345/138
2	Hearne Autotransformer	138/69
3	Jewett - Singleton #2	345
4	Jewett - Big Brown	345
5	Tyler West - Tyler Northwest	138

8.2.3 Completed Improvements Map – East Weather Zone

The map below identifies the location of the completed improvements for the East weather zone.



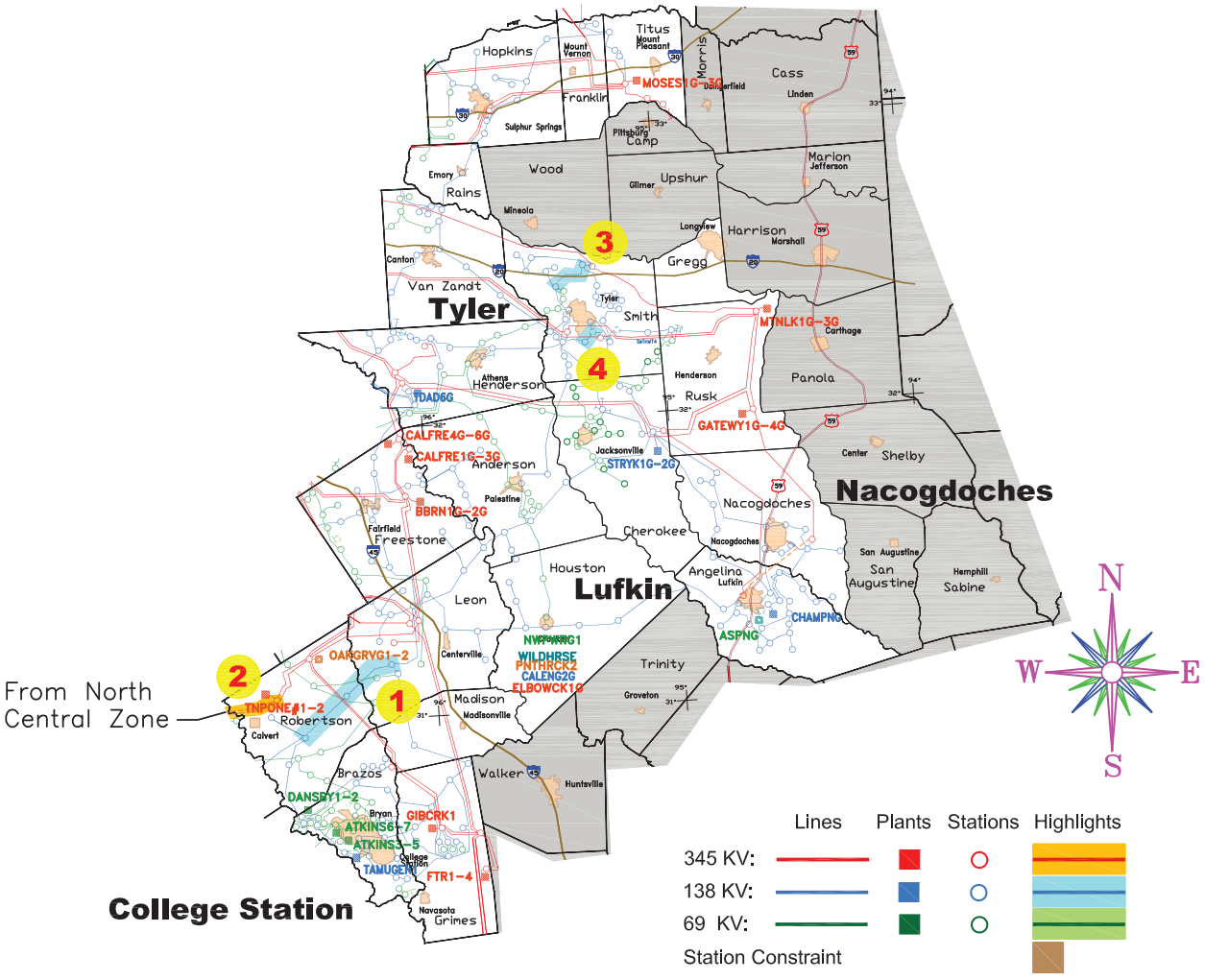
8.2.4 Completed Improvements – East Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2008 and 2009 in the East weather zone. The elements consist of approximately 77 miles of transmission, several new substations and autotransformers, and load that has been converted from a 69 kV to 138 kV bus. There were 12.2 miles of new 138 kV transmission and 64.5 miles of upgraded lines (46.5 miles at 138 kV). Many of these upgrades were accomplished by raising the line or replacing the existing conductor. The Singleton switching station is a part of Houston area constraint mitigation project.

Map Index	Completed Improvements	Year In Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Singleton New Switching Station	2009	345	0	0.5
2	Tyler Grande New Switching Station and New Auto	2009	345	0	0
3	Hilltop Lakes Sw. to Hearne Line Rebuild	2009	69	0	14.5
4	Lufkin E. - Lufkin S. Line Upgrade	2009	138	0	6.3
5	Jack Creek New Double Circuit Line	2008	138	6	8
6	Tabor Substation Upgrade and New Auto	2008	138	0	0
7	Jack Creek Ring Bus Addition and New Auto	2008	345	0	0
8	Kurten Substation Upgrade	2008	138	0	0
9	Athens Load Conversion and Addition for Second 138 kV Source	2008	138	2	0
10	Jack Creek New Substation and Auto	2008	345	0	0
11	Seaway Teague - W. Fairfield Line Upgrade	2008	138	0	13
12	College Station Post Oak Substation to Southwood Valley Substation Line Reconducter	2008	138	0	3
13	Jewett - Seaway Teague Line Upgrade	2008	138	0	10.8
14	Tyler NE - Tyler East 138 kV Upgrade	2009	138	0	3.7
15	Tyler Grande - Tyler S. 138 kV Rebuild	2009	138	2.3	2.3
16	Lufkin Switch - Aspen Power 138 kV line	2009	138	1.9	0
17	Tyler GE - Tyler Omen Road 138 kV Rebuild	2009	138	0	2.4
18	Shamburger Switch 138 kV capacitors	2009	138	0	0
19	Jewett - Big Brown 345 kV circuit #1 Upgrade	2009	345	0	0

8.2.5 Planned Improvements Map – East Weather Zone

The map below identifies the location of the planned improvements for the East weather zone.



8.2.6 Planned Improvements – East Weather Zone

Transmission improvements in the East weather zone include a new 345 kV double-circuit line from the TNP ONE plant to a new Bell County East 345 kV station south of Temple. This will allow additional exit capability for new coal units planned north of the Bryan/College Station area.

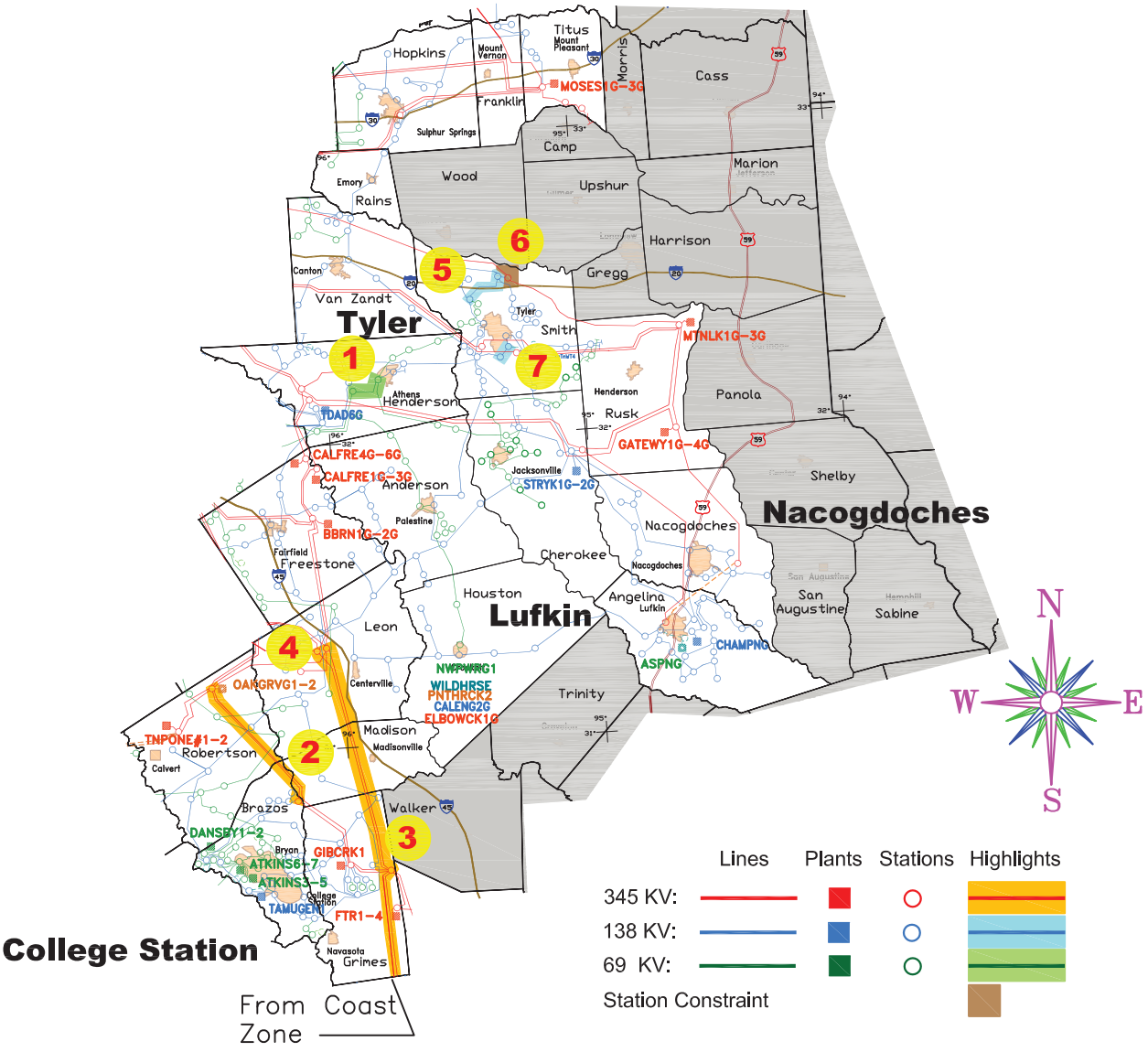
Also north of the Bryan/College Station area, the Robertson to Watson Chapel 138 kV line will be rebuilt to alleviate congestion in this area.

In the Tyler area, several 138 kV line upgrades are planned to relieve congestion and solve reliability problems.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Robertson - Watson Chapel Rebuild	138	2010	
2	Bell County East - TNP One Additional Line And Bell County East Substation	345	2011	X
3	Shamburger – Tyler Northwest Line Upgrade	138	2014	X
4	Tyler Bullard Rd – Tyler Loop South Tap Upgrade	138	2014	X

8.2.7 Projected Constraints Map – East Weather Zone

The map below identifies the location of the projected constraints for the East weather zone.



8.2.8 Projected Constraints – East Weather Zone

The addition of several new coal-fired plants will cause congestion on the 345 kV system between central Texas and the Houston area. This congestion is expected to persist until a long-term solution is developed for importing power into the Houston area. Proposals for this solution are currently under study. Load growth in the Tyler area and the addition of two biomass generation plants in the Lufkin and Nacogdoches area will cause some moderate congestion in the East weather zone. The addition of the Nacogdoches Southeast to Lufkin Switch 345 kV line and other planned improvements in the area will relieve the majority of this congestion.

Map Index	Projected Constraining Element	Voltage (kV)	2010	2011	2012	2013	2014
1	Athens - Malakoff	69					
2	Jack Creek - Twin Oak	345					
3	Jewett North - Singleton	345					
4	Jewett South - Singleton	345					
5	Shamburger - Tyler Northwest	138					
6	Shamburger Autotransformer	345					
7	Tyler Bullard Rd - Tyler Loop South Tap	138					

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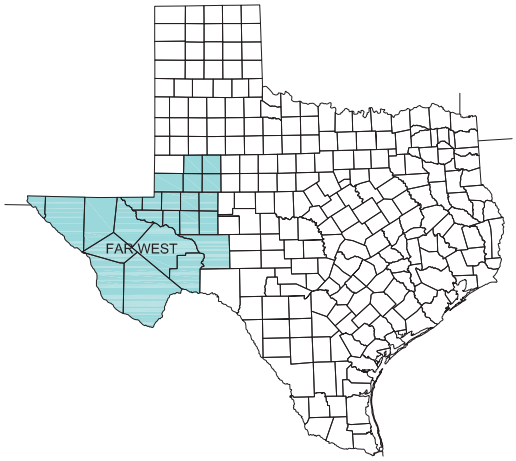
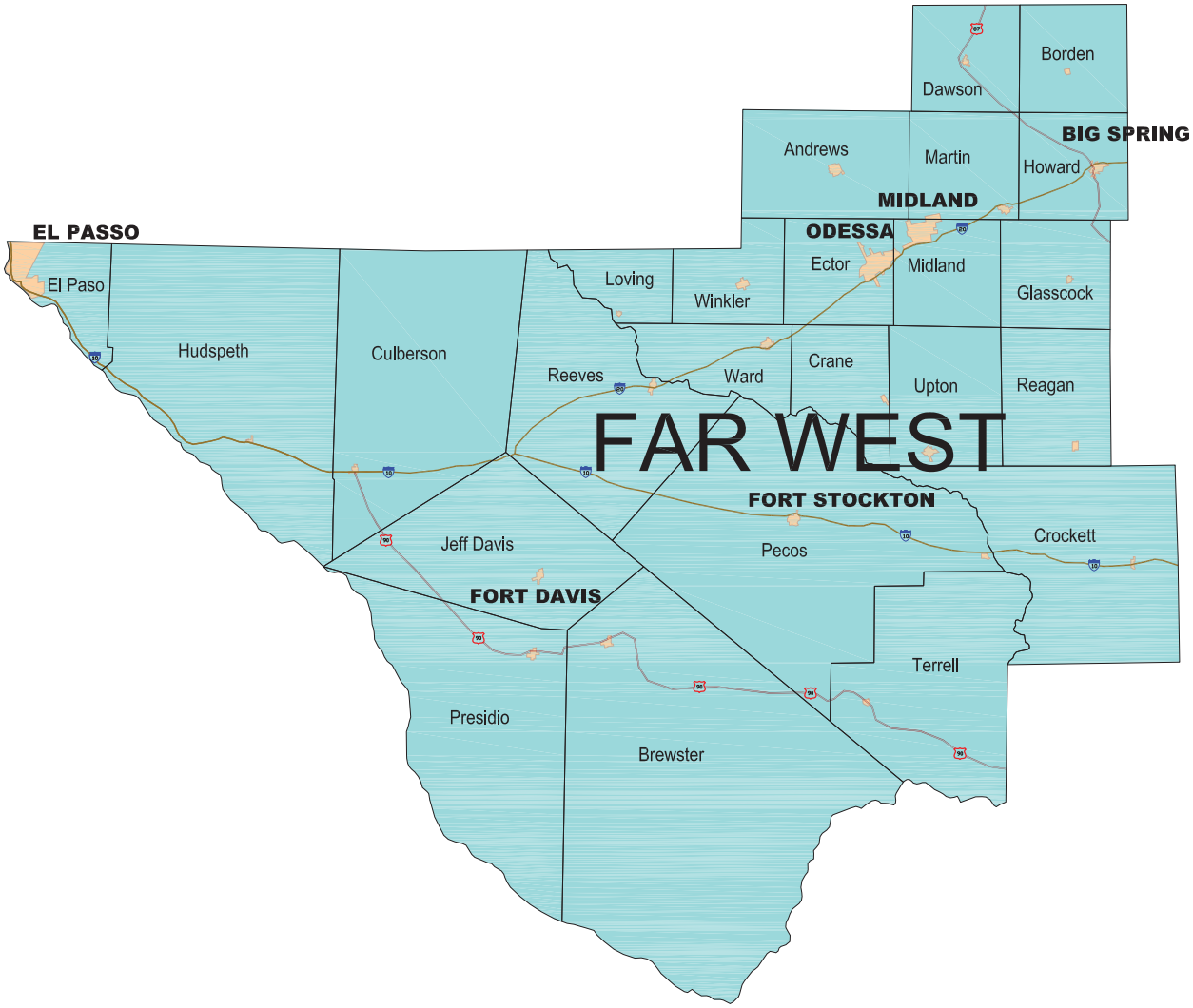
8.3 Area Constraints and Improvements – Far West Weather Zone

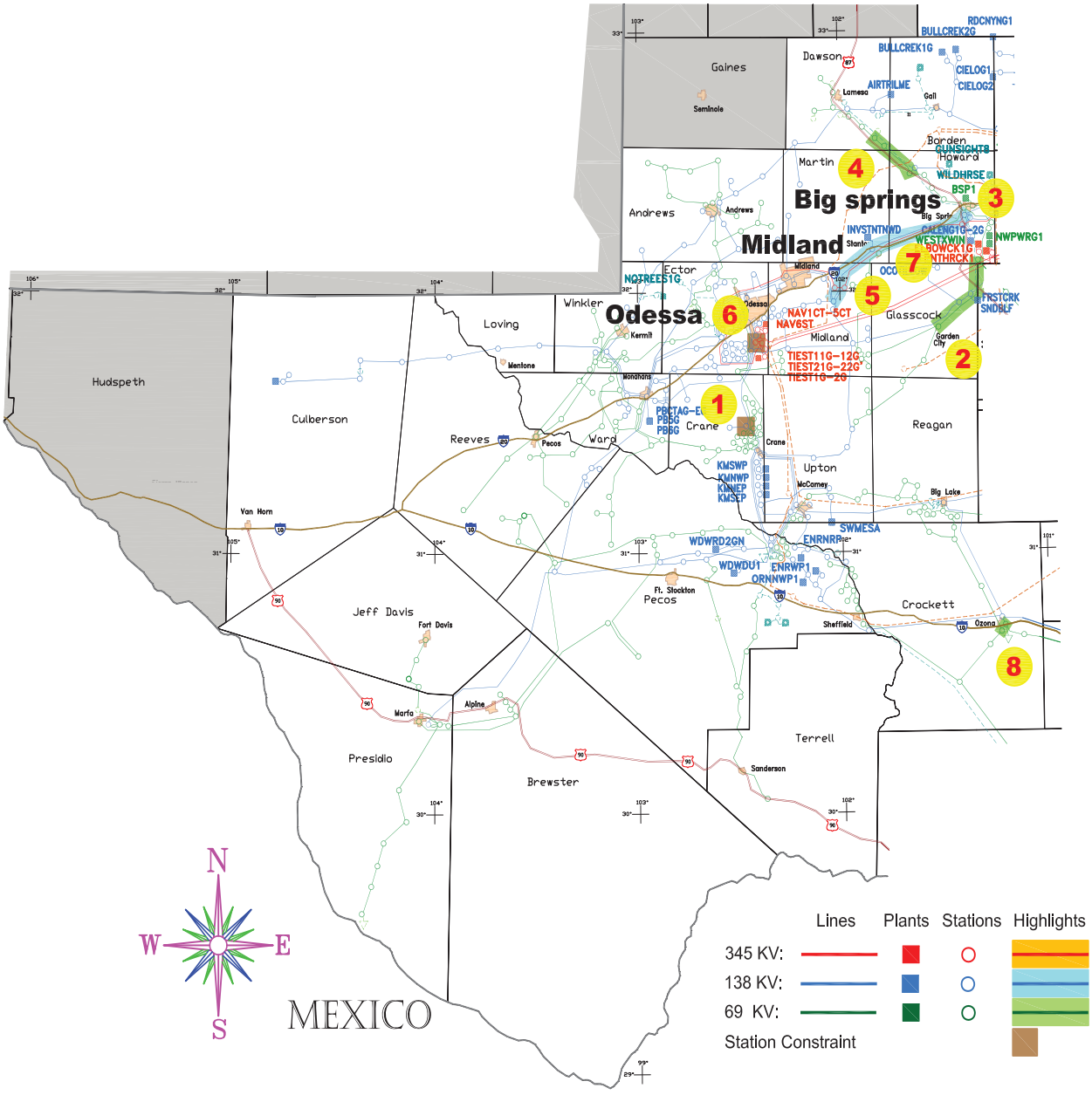


The main cities in the Far West weather zone include Midland and Odessa. This zone stretches to include Big Bend and the McCamey area. The map below highlights the counties included in the Far West weather zone.



8.3.1 Recent Constraints Map – Far West Weather Zone

The map below identifies the location of the recent constraints for the Far West weather zone.



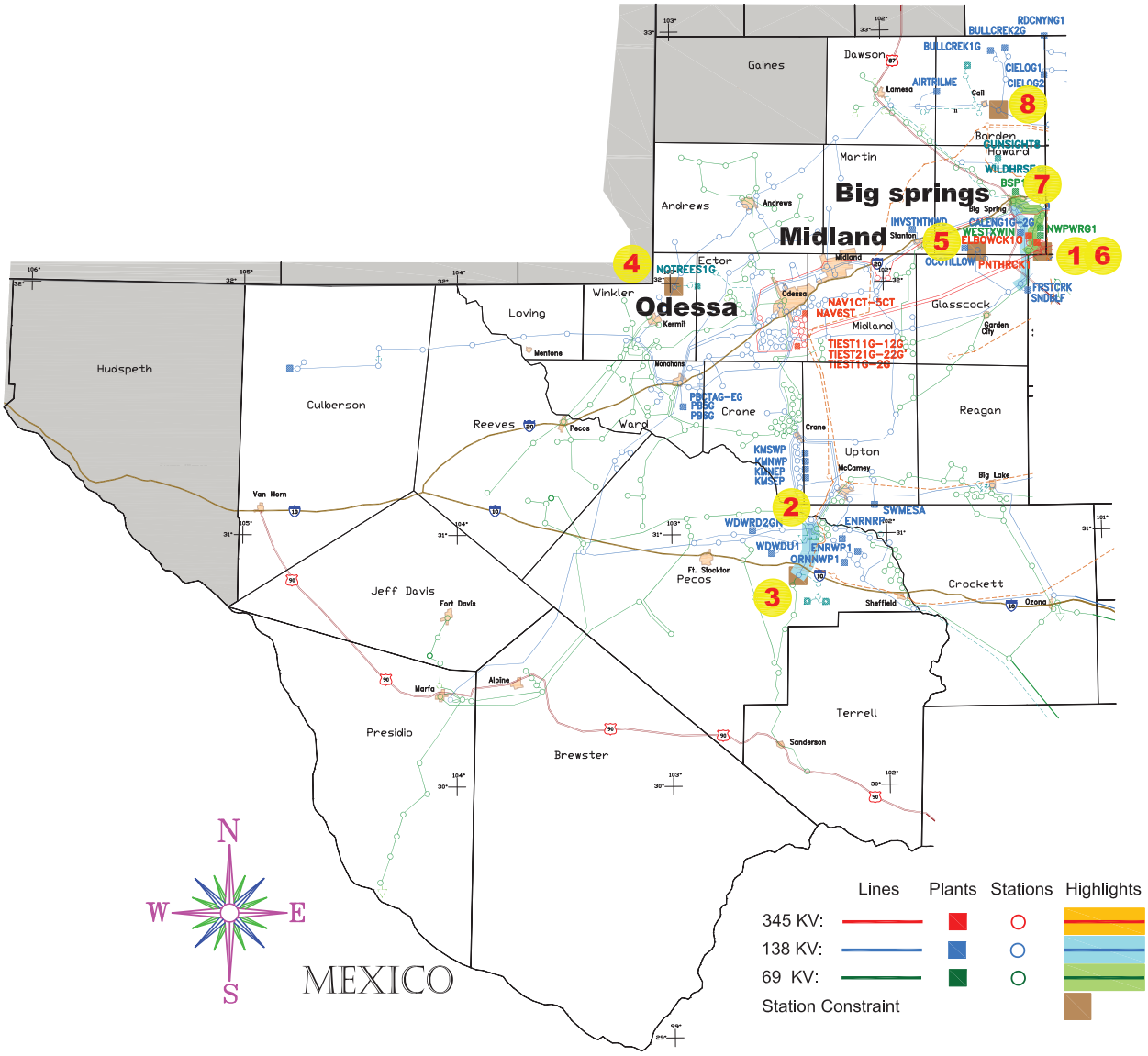
8.3.2 Recent Constraints – Far West Weather Zone

The Far West weather zone constraints are due, in part, to moderate load growth. However, the primary cause for congestion is the increase of wind generation in the area and the limited ability to export the power to load centers to the east.

Map Index	Constraining Element	Voltage (kV)
1	Crane LCRA - Crane Arco Tap	138
2	Chalk - Garden City	69
3	Big Spring Switch - Big Spring West	138
4	Ackerly Vealmoor - Ackerly	69
5	Stanton - Midland East	138
6	Odessa EHV Autotransformer #1	345/138
7	Stanton East - Big Spring West	138
8	Friend Ranch - Ozona	69

8.3.3 Completed Improvements Map – Far West Weather Zone

The map below identifies the location of the completed improvements for the Far West weather zone.



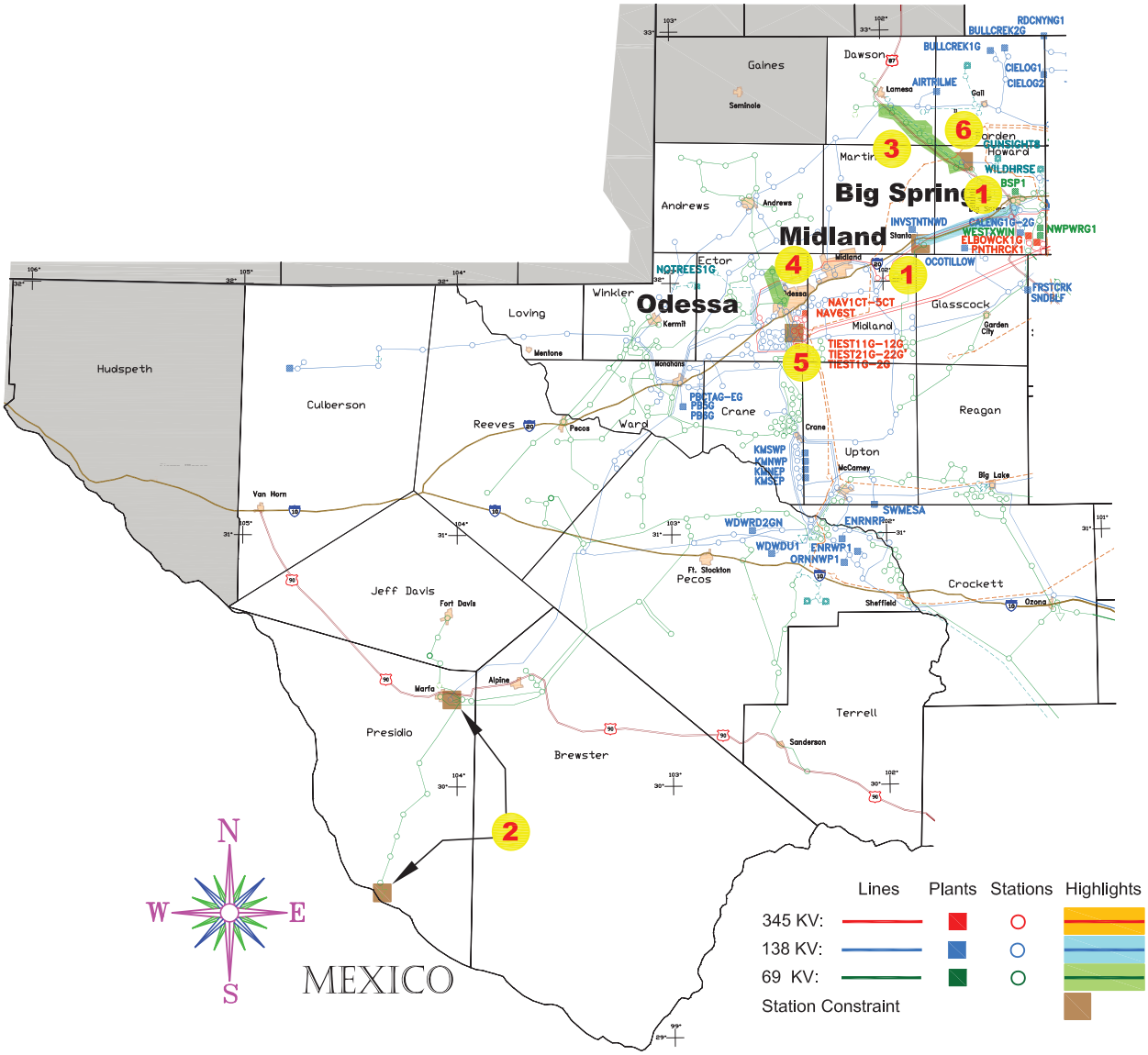
8.3.4 Completed Improvements – Far West Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2008 and 2009 in the Far West weather zone. The elements consist of approximately 50 miles of transmission and three new substations. There were 17.6 miles of new 138 kV transmission and 32 miles of upgraded lines (17.8 miles at 138 kV). Many of these upgrades were accomplished by raising or replacing the existing conductor. The Willow Valley, Longshore and Drumright Switching Stations are hubs to new wind generation in the region. The upgraded circuits increase the line capacity for export of additional generation.

Map Index	Completed Improvements	Year In Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Longshore Switching Station	2008	345	0	0.2
2	White Baker - Rio Pecos Line Rebuild	2008	69	0	14
3	White Baker Substation	2008	138	0	0
4	No Trees Switching Station	2008	138	0	0
5	Drumright Switching Station	2008	138	0	0
6	Longshore Switching Station Expansion	2008	345	0	0
7	Big Spring - Chalk - McDonald 69 kV Rebuild	2009	138	17.6	17.6
8	Willow Valley New Switching Station	2008	138	0	0.2

8.3.5 Planned Improvements Map – Far West Weather Zone

The map below identifies the location of the planned improvements for the Far West weather zone.



8.3.6 Planned Improvements – Far West Weather Zone

In the Far West weather zone, several transmission improvements are planned to enable the exit of the Reliability Must-Run (RMR) agreements for Permian Basin units 5 and 6. In order to maintain reliability with these plants no longer in-service, a third 345/138 kV autotransformer is planned to be installed at the Odessa switching station and the Ackerly-Lamesa 69 kV line is planned to be rebuilt.

Also in the Ackerly area, the Ackerly 138/69 kV autotransformer will be upgraded in order to relieve congestion due to wind generation.

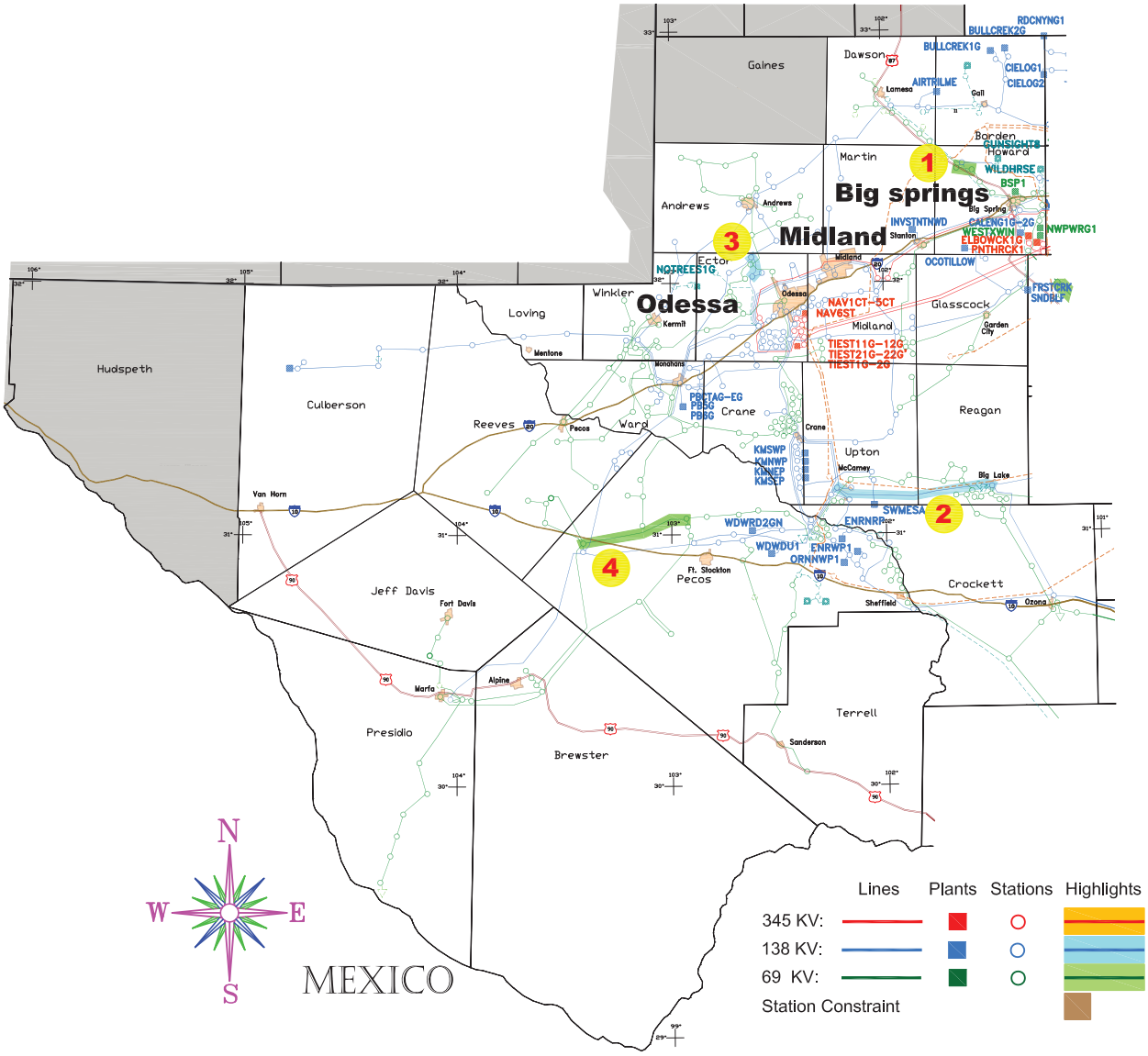
An additional wind generation congestion reduction project is the creation of a 69 kV bus at Stanton East, looping the Stanton to Big Spring 69 kV line into the new bus and upgrading and converting to 138 kV service the new Stanton East to Big Spring circuit.

The planned Presidio Area Reliability Improvements Project will prevent the pre-contingency and post-contingency voltage at Presidio from falling below criteria. This project includes replacement of the Alamito Creek to Presidio 69 kV line and adding a NaS battery at Presidio Substation.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Stanton East - Big Spring Switch Rebuild And Stanton East Susbtation New Autotransformer	138;138/69	2010	X
2	Alamito Creek Susbtation Second Autotransformer And NaS Battery At Presidio	138/69	2010	X
3	Ackerly - Ackerly Vealmoor- Ackerly Lyntegar- Sparenburg - Lamesa Upgrade	69	2011	X
4	Odessa North - North Cowden Upgrade	69	2011	X
5	Odessa Substation Third Autotransformer	345/138	2011	X
6	Ackerly Vealmoor Substation Autotransformer Upgrade	138/69	2013	X

8.3.7 Projected Constraints Map – Far West Weather Zone

The map below identifies the location of the projected constraints for the Far West weather zone.



8.3.8 Projected Constraints – Far West Weather Zone

Projected congestion in the Far West weather zone is mainly related to the development of new wind generation. Some of the constraints will be mitigated with the implementation of the major transmission upgrades associated with CREZ. The congestion on the Big Lake to North McCamey 138 kV line and the Fort Stockton Switching Station to Barilla Junction 69 kV line will limit power exports out of the McCamey area but these constraints will be relieved once the CREZ facilities are in service.

Map Index	Projected Constraining Element	Voltage (kV)	2010	2011	2012	2013	2014
1	Ackerly Vealmoor - Ackerly Chevron	69					
2	Big Lake - North McCamey	138					
3	Holt SS - Amoco North Cowden Tap	138					
4	RGEC Ft Stockton Switching Station - Barrilla Junction	69					

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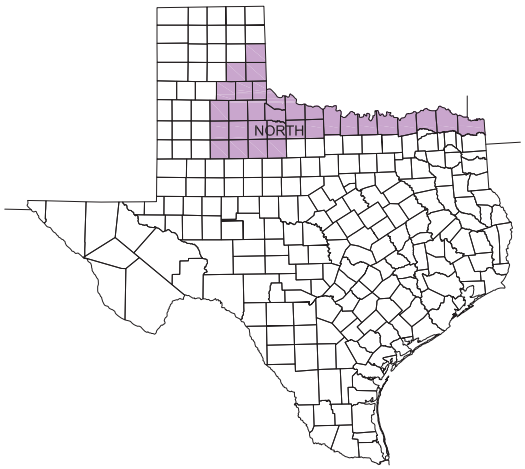
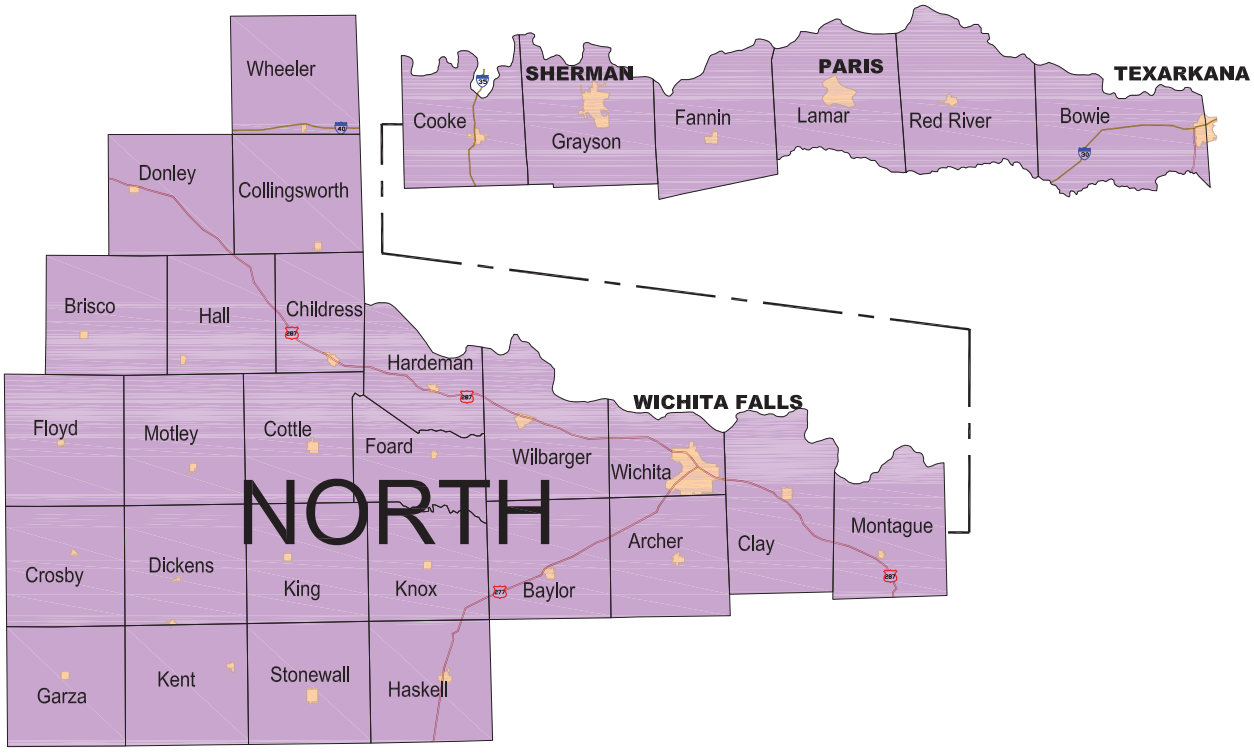
8.4 Area Constraints and Improvements – North Weather Zone

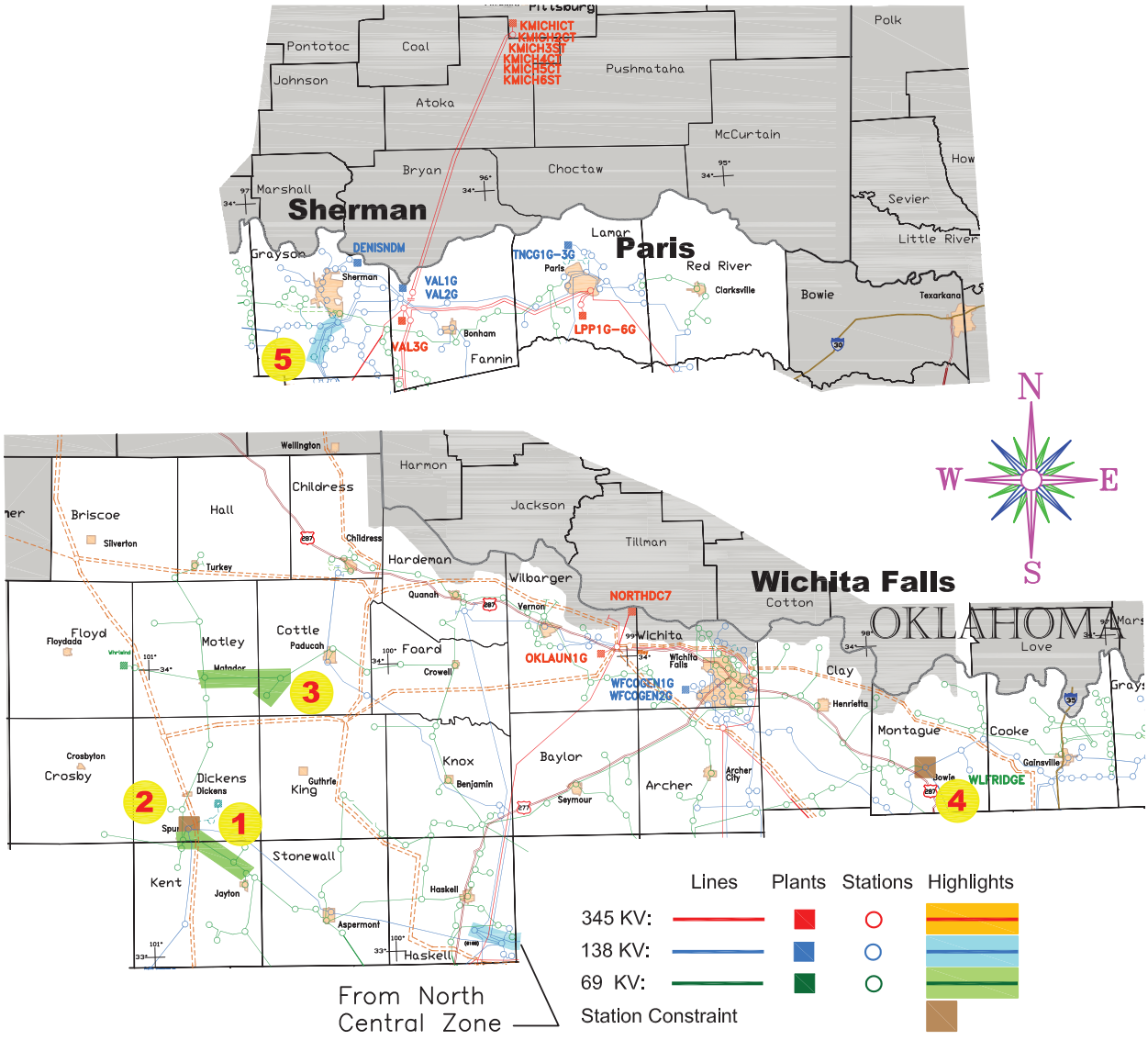


The North weather zone covers the northern counties of ERCOT's territory, including the cities of Wichita Falls and Paris. The map below highlights the counties included in the North weather zone.



8.4.1 Recent Constraints Map – North Weather Zone

The map below identifies the location of the recent constraints for the North weather zone.



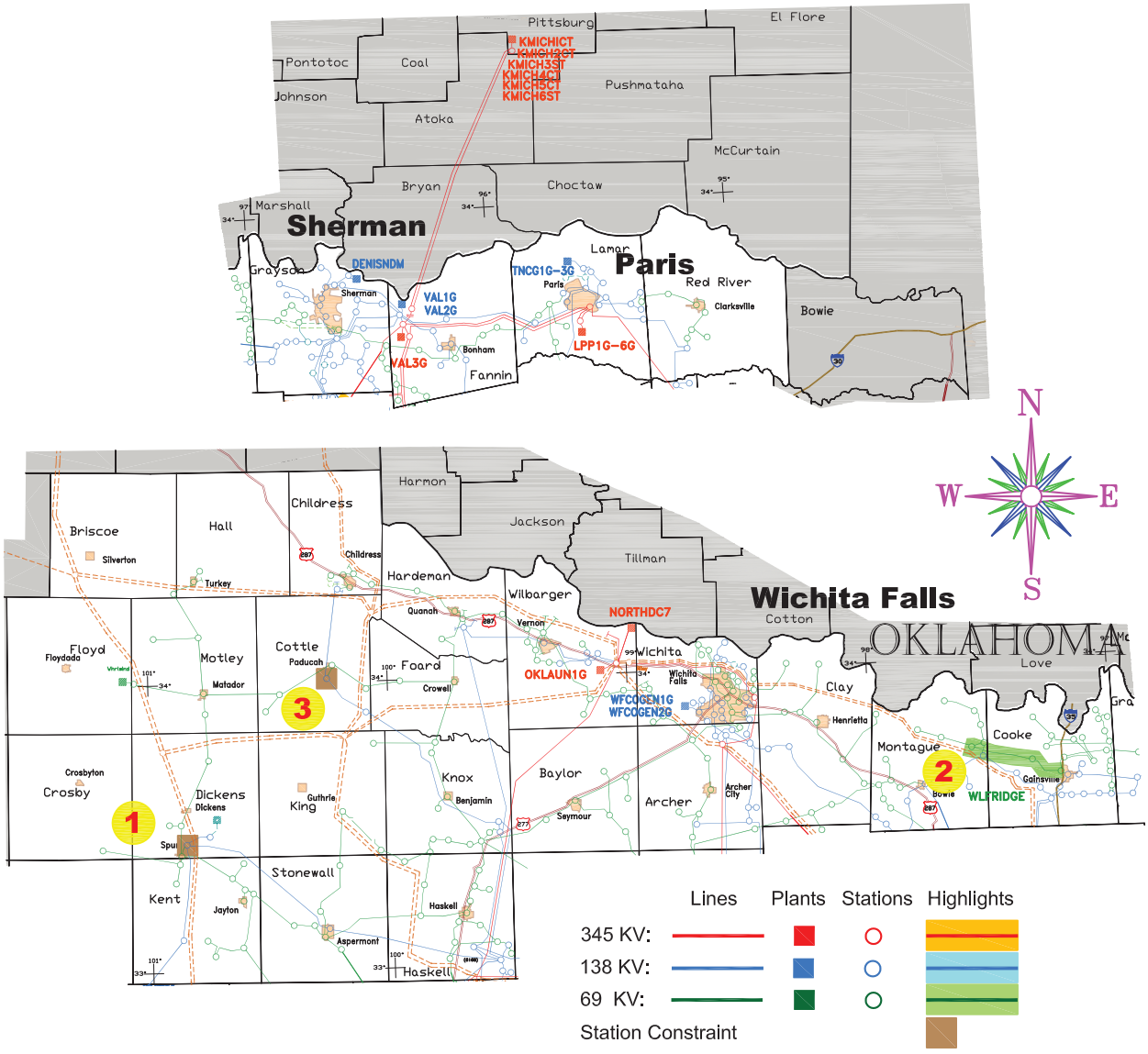
8.4.2 Recent Constraints – North Weather Zone

The recent constraints for the North weather zone are located are due primarily to transmission outages.

Map Index	Constraining Element	Voltage (kV)
1	Jayton - Spur	69
2	Spur Autotransformer	138/69
3	Matador - Paducah	69
4	Bowie Autotransformer	138/69
5	Payne Switch - EPCO POI	138

8.4.3 Completed Improvements Map – North Weather Zone

The map below identifies the location of the completed improvements for the North weather zone.



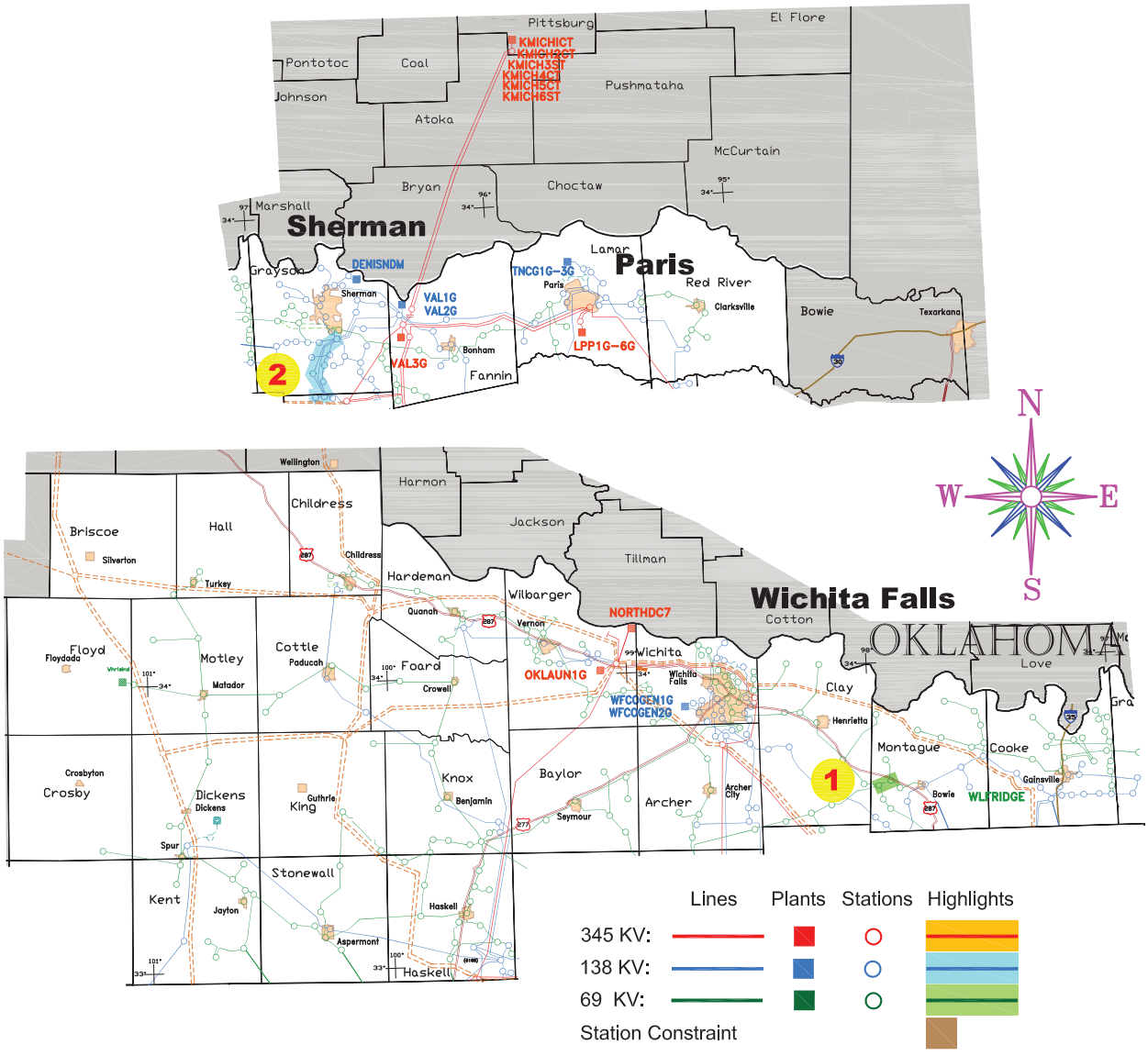
8.4.4 Completed Improvements – North Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2008 and 2009 in the North weather zone. The elements consist of 13.8 miles of transmission at 69 kV, a substation upgrade, and a reactive addition. Many of these upgrades were accomplished by replacing the existing conductor. The installed reactor and capacitor help regulate the local system voltage. The upgraded transmission will help serve the growing load in north Texas when the local generation is off-line.

Map Index	Completed Improvements	Year In Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Spur Substation Upgrade	2008	138	0	0
2	Gainesville - Muenster Upgrade and Muenster New Capacitor	2008	69	0	13.8
3	Paducah Reactor	2008	138	0	0

8.4.5 Planned Improvements Map – North Weather Zone

The map below identifies the location of the planned improvements for the North weather zone.



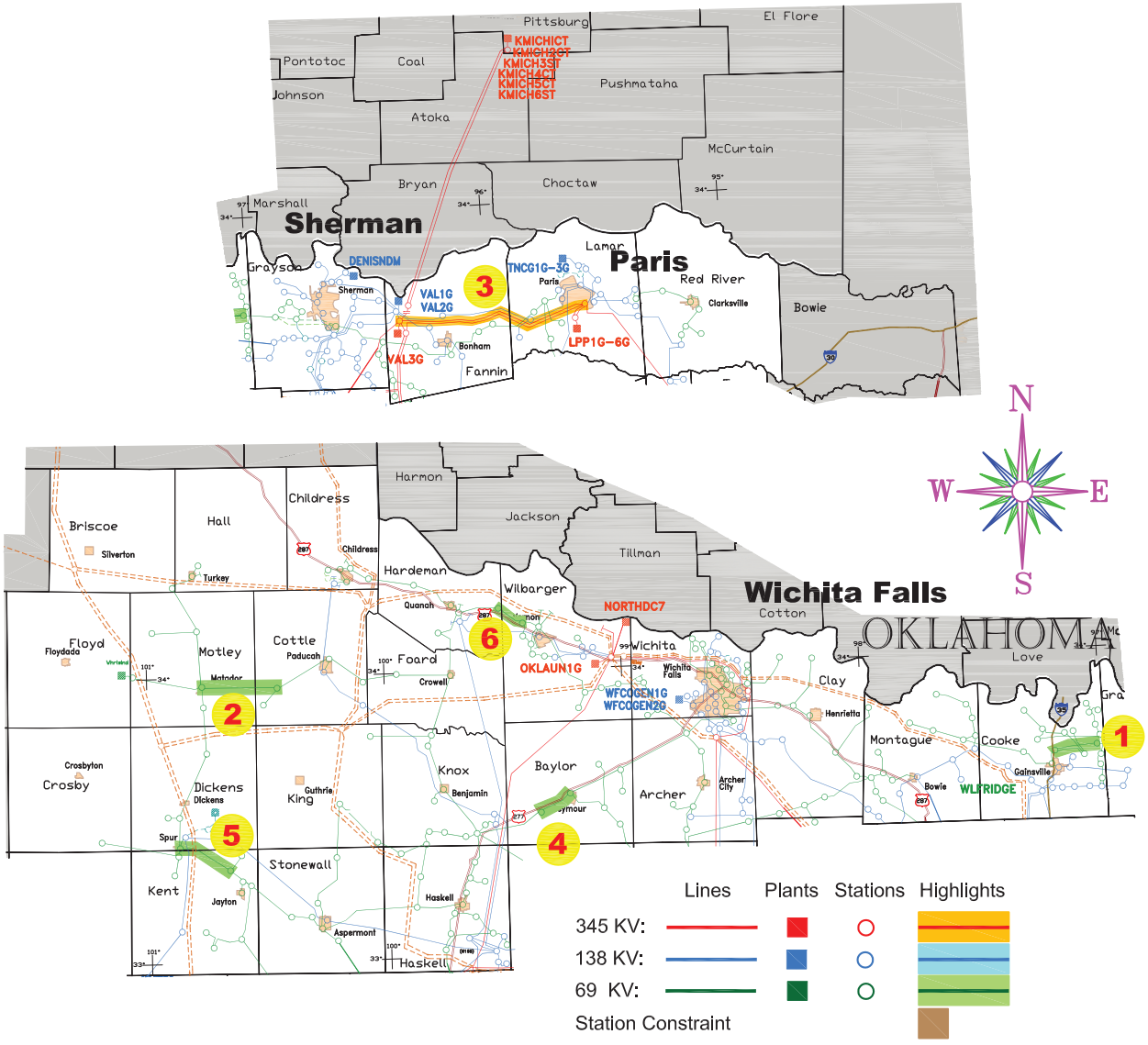
8.4.6 Planned Improvements – North Weather Zone

Planned improvements for the North weather zone focus on improving reliability in the region. A 138 kV line upgrade from the Sherman area to the northern part of the Dallas/ Fort Worth (DFW) metroplex will improve reliability for the area. Additionally, the Montague-Johnson Switch-Bowie 69 kV line is planned to be upgraded in order to maintain reliability.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Montague - Johnson Switch - Bowie Upgrade	69	2011	X
2	Payne - Epco - M&M - Alla Hubbard Upgrade	138	2012	X

8.4.7 Projected Constraints Map – North Weather Zone

The map below identifies the location of the projected constraints for the North weather zone.



8.4.8 Projected Constraints – North Weather Zone

The most significant congestion in the North weather zone is expected to be due to wind generation constraints on the 69 kV system in the western portion of the weather zone. The Spur to Girard Tap 69 kV line is expected to be the most heavily congested due to the recent addition of wind generation plants in the area. The transmission system in this area was originally designed to serve the relatively small load at the edge of the ERCOT Region and may require substantial improvements in order to relieve the congestion. The addition of the CREZ facilities will alleviate some of the constraints such as the congestion on the Seymour-Bomarton 69 kV line and the Vernon City Plant Tap to Chillicothe 69 kV line.

Map Index	Projected Constraining Element	Voltage (kV)	2010	2011	2012	2013	2014
1	Gainsville East Tap - Gainsville Tap	69					
2	Paducah Rea Tap - Matador	69					
3	Paris Switch Autotransformer	345					
4	Seymour - Bomarton	69					
5	Spur - Girard Tap	69					
6	Vernon City Plant Tap1 - Chillicothe	69					

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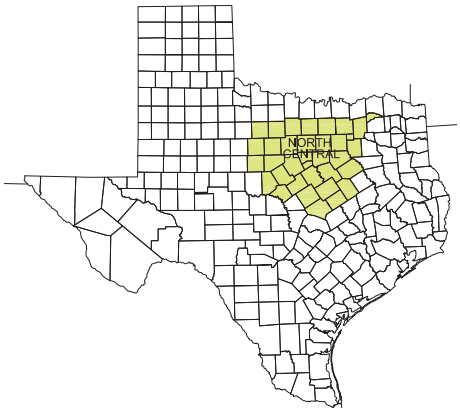
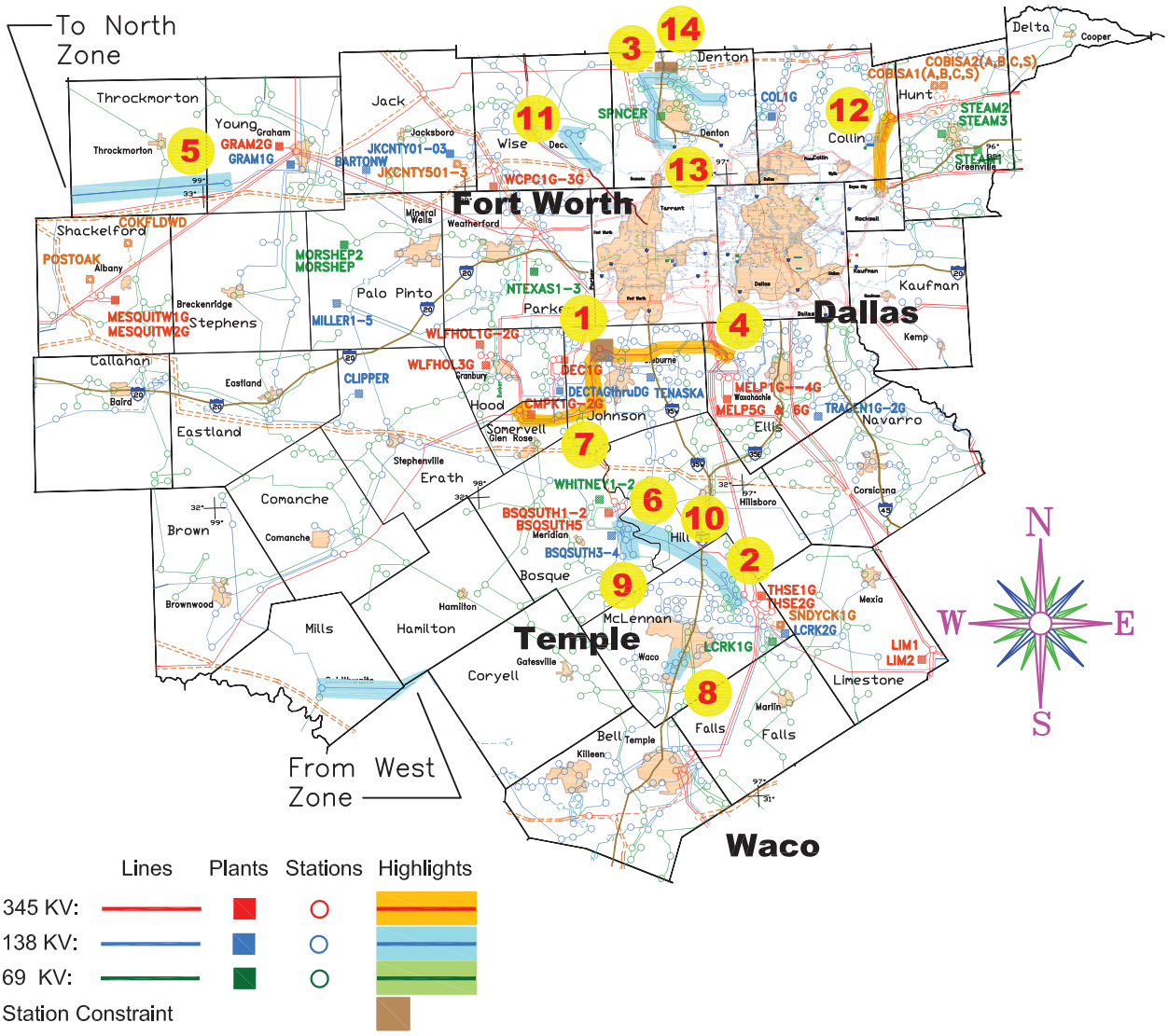
8.5 Area Constraints and Improvements – North Central Weather Zone



The North Central weather zone is comprised of the Dallas/ Fort Worth (DFW) metroplex, Waco, Temple and Killeen. This zone also extends west to the eastern edge of Abilene. The map below highlights the counties included in the North Central weather zone.

8.5.1 Recent Constraints Map – North Central Weather Zone

The map below identifies the location of the recent constraints for the North Central weather zone.



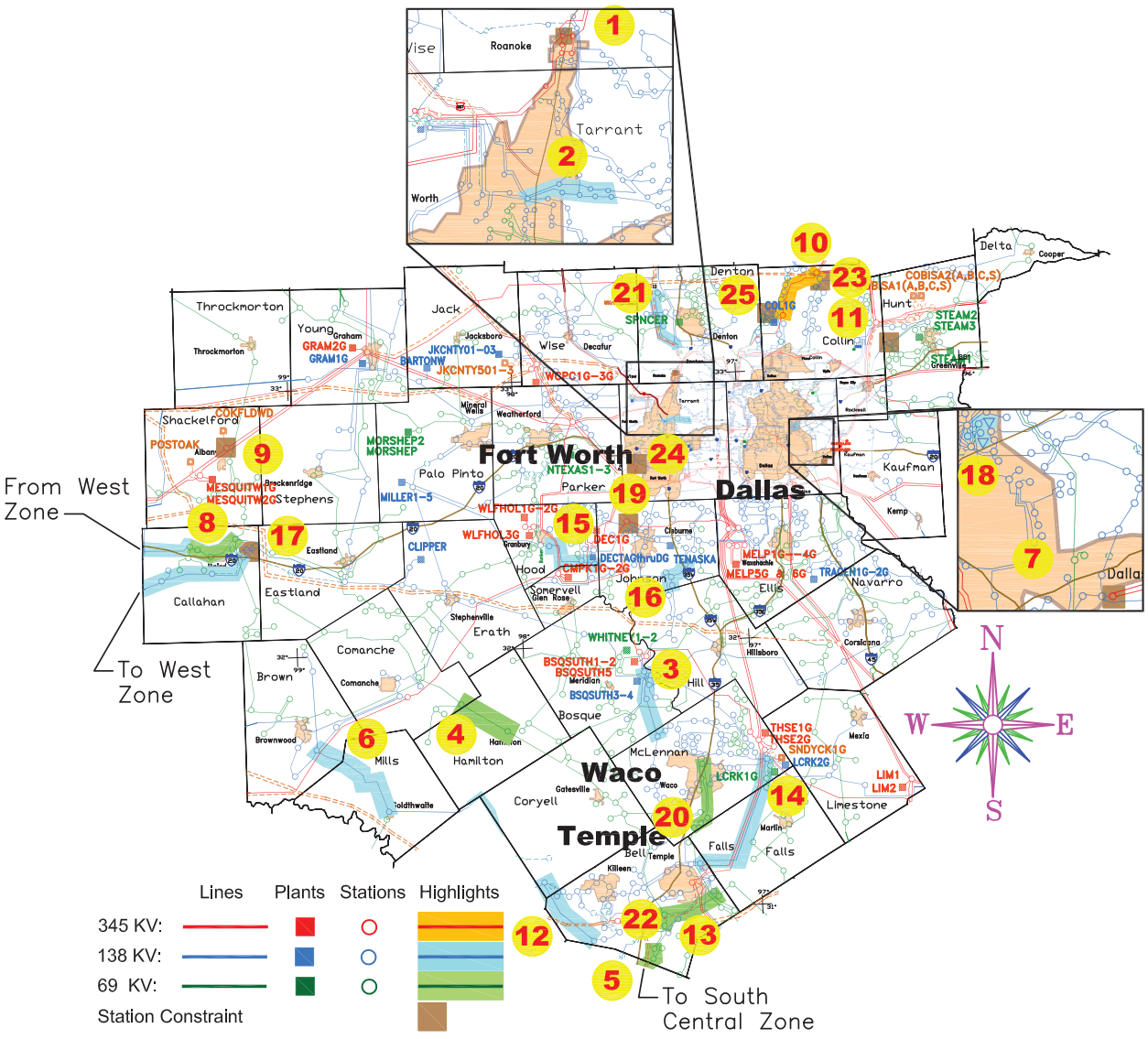
8.5.2 Recent Constraints – North Central Weather Zone

This zone has moderate load growth, particularly in the DFW area. The combination of decreased local generation and the significant increase in load in the areas ouside of DFW led to congestion on the lines and transformers into the area. Additionally, power transfers from west Texas have caused transmission constraints in the western part of the zone.

Map Index	Constraining Element	Voltage (kV)
1	Concord Autotransformer	345/138
2	Elm Mott - Rogers Hill	138
3	West Denton - Airport	138
4	Venus Switch - Johnson Switch TU	345
5	Murray - Paint Creek	138
6	Bosque Switch - Lake Whitney	138
7	Venus Switch - Comanche Peak	345
8	Waco Woodway - Waco Atco	138
9	Whitney - Lake Whitney	138
10	Rogers Hill TU - Bosque Switch	138
11	Rhome TU - Decatur Tap	138
12	Farmersville - Royse Switch	345
13	Teasley - West Denton	138
14	North Denton Auto #2	138/69

8.5.3 Completed Improvements Map – North Central Weather Zone

The map below identifies the location of the completed improvements for the North Central weather zone.



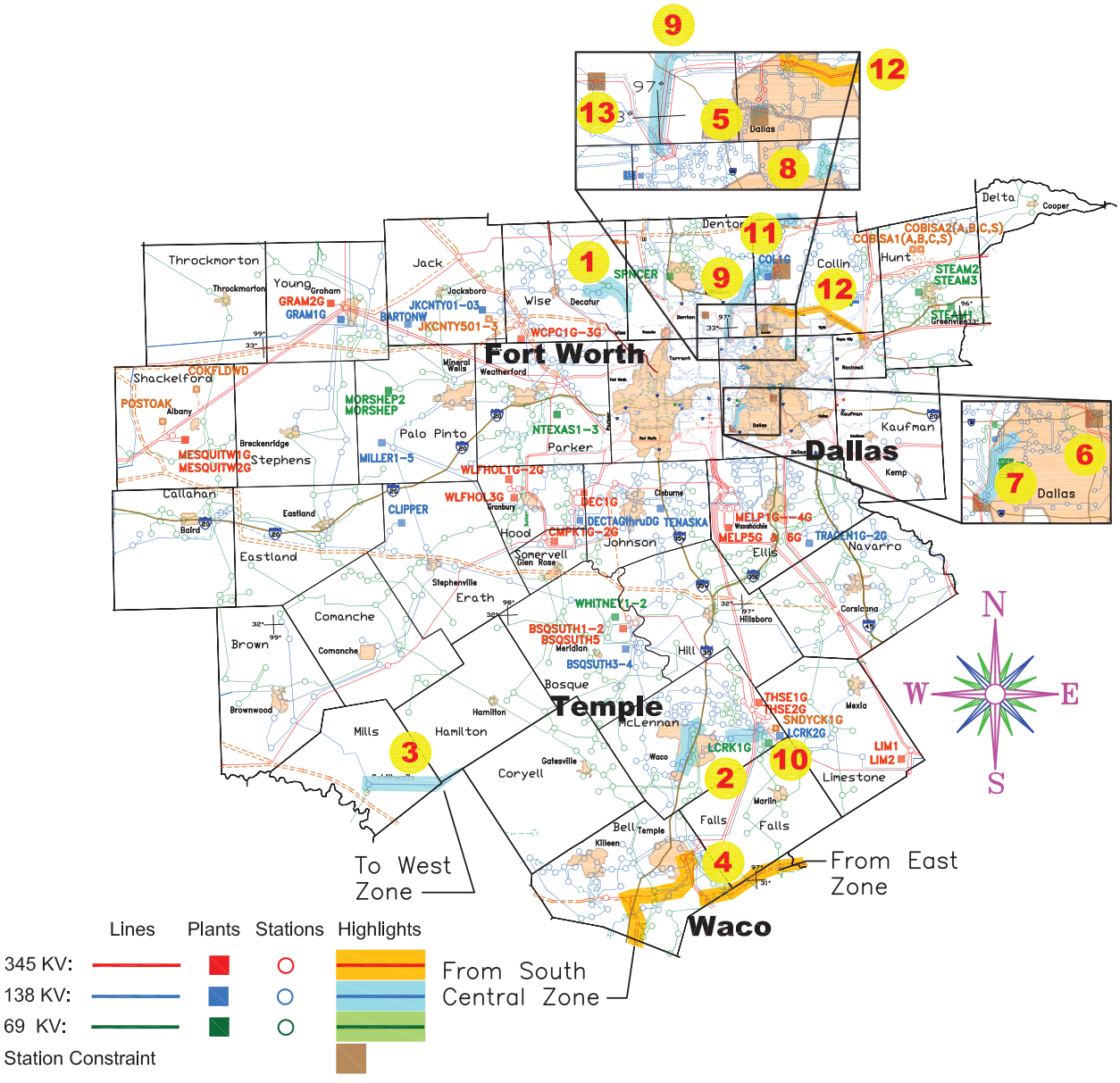
8.5.4 Completed Improvements – North Central Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2008 and 2009 in the North Central weather zone. The elements consist of 226.8 miles of transmission, one new substation, two new autotransformers, capacitors, reactors and one phase shift transformer. There were 24.3 miles of new transmission at 138 kV and 202.5 miles of upgraded lines (13.2 miles at 345 kV, 107.8 miles at 138 kV, and 81.5 miles at 69 kV). Many of these upgrades were accomplished by upgrading the limiting equipment, installing capacitors or by replacing the existing conductor. The new and upgraded lines help to bring power from the west Texas wind generation to the DFW area, relieve local and zonal congestion, and serve the growing load in the region more reliably.

Map Index	Completed Improvements	Year In Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Roanoke Switching Station Auto Transformer Replacement	2009	345	0	0
2	Saginaw - Euless/Roanoke Switch Line Upgrade	2009	138	0	17.4
3	Whitney - Bosque Reconductor	2009	138	0	13.4
4	Gustine - Hamilton Rebuild	2009	69	0	17.1
5	Bell County - Schwertner Rebuild	2009	69	0	13.7
6	Brownwood Switch - Goldthwaite Line Reconductor	2008	138	0	29.5
7	Seagoville Switch Auto Transformer Replacement	2008	345	0	0
8	Clyde - Putnam Line Rebuild	2008	69	0	19.1
9	Cook Field Switching Station	2008	345	0	0
10	Anna Switch - Collin Switch Line Upgrade	2008	345	0	13.2
11	Greenville New Substation and Auto	2008	138	4	0
12	Copperas Cove - Ding Dong New Line	2008	138	15.7	0
13	Seaton - Poage line Upgrade	2008	69	0	11.9
14	Temple Pecan Creek - Lake Creek Line Upgrade	2008	138	0	28.5
15	Bunker - Hood Line Rebuild	2008	138	0	9.1
16	Covington - Grandview Line Upgrade	2008	138	0	9.9
17	Putnam Phase Shift Transformer Addition	2008	138	0	0
18	Parkdale SVC installation	2009	138	0	0
19	Second Concord 345/138 Autotransformer	2009	345	0	0
20	West Waco - Lorena - Eddy 69 kV line upgrade	2009	69	0	16.3
21	Denton West to RD Wells 138 kV Transmission new Line	2009	138	4.6	0
22	Poage - Temple Taylors Valley - Bell County 69 kV line upgrade	2009	69	0	3.4
23	Anna Switch 138 kV capacitors	2009	138	0	0
24	Benbrook series reactors	2009	138	0	0
25	Collin Switch 138 kV capacitors	2009	138	0	0

8.5.5 Planned Improvements Map – North Central Weather Zone

The map below identifies the location of the planned improvements for the North Central weather zone.



8.5.6 Planned Improvements – North Central Weather Zone

Several new 345/138 kV autotransformers are planned for the DFW area in order to serve the high load growth in the area. These include the construction of the new Lavon switching station with an autotransformer and second autotransformers being added at Collin switching station, Lewisville switching station, Cedar Hill switching station, and Sargent Road switching station.

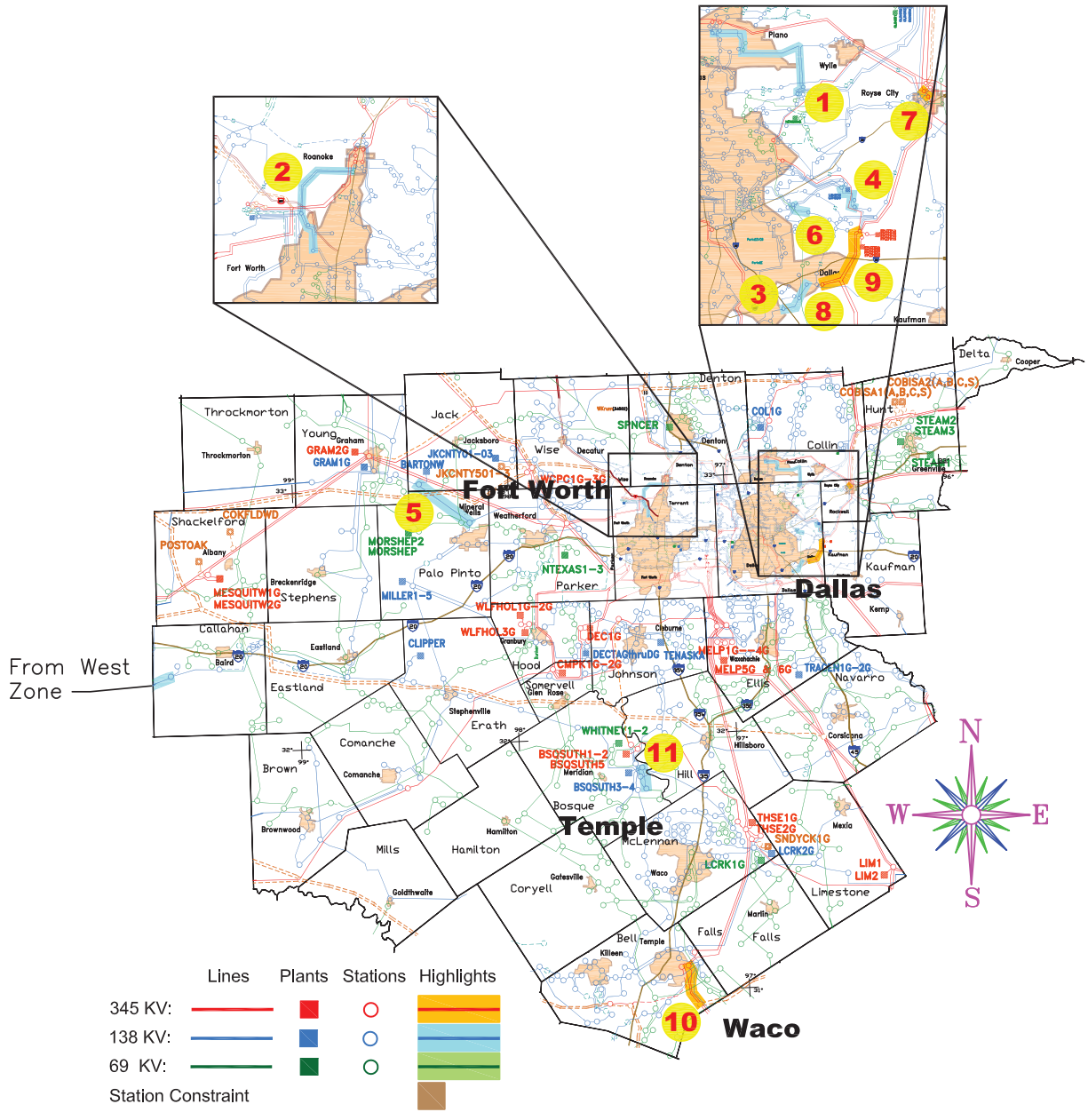
In order to maintain voltage stability in the DFW area, two 300 MVAR static var compensators (SVC) are planned to be installed at the Renner switching station in addition to the Parkdale SVCs installed in 2009.

There are numerous 138 kV line upgrades in the DFW area to improve reliability and to relieve congestion to allow the growing load to be more efficiently served. Planned improvements in the Waco area include the upgrade of the Waco West to Waco Woodway to Waco Atco and Lake Creek to Robinson 138 kV lines. West of the Waco area, the Goldthwaite to Evant 138 kV line is proposed to be upgraded in order to allow for greater export of power out of west Texas. South of Waco, the Temple Switch to Salado 345 kV line will be upgraded.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Krum Tap New Substation And Krum Tap - Krum - Allison - Decatur Rebuild	138	2010	X
2	Waco West - Waco Woodway - Waco Atco Rebuild	138	2010	X
3	Goldthwaite- Evant Rebuild	138	2010	
4	Temple Switch - Salado Switch Rebuild	345	2011	X
5	Renner Static Var Compensators	138	2011	X
6	Sargent Road Switching Station New Autotransformer	345/138	2011	X
7	Cedar Hill Substation New Autotransformer And Mountain Creek - Cedar Hill Upgrades	345/138;138	2011	X
8	Lawler Tap-College -Jupiter-Apollo Upgrade	138	2011	X
9	NW Carrollton - Collin Line Rebuild	138	2011	
10	Lake Creek - Robinson Upgrade	138	2011	
11	Frisco-Collin #1 Upgrade And Collin Switching Substation New Autotransformer	138;345/138	2012	X
12	Lavon Switching Station - Allen Switching Station -Royse Rebuild And Lavon Switching Station-Wylie Metering Point New Line	345	2013	X
13	Lewisville Sw New Autotransformer	345/138	2013	X

8.5.7 Projected Constraints Map– North Central Weather Zone

The map below identifies the location of the projected constraints for the North Central weather zone.



8.5.8 Projected Constraints – North Central Weather Zone

Recent upgrades and planned improvements, including CREZ facility additions, are expected to significantly reduce the congestion in the North Central weather zone. The majority of the remaining congestion is projected to be in the DFW area, which is consistent with it being the largest demand area in ERCOT. The most significant DFW congestion is projected to be in the Seagoville area ahead of some planned improvements in the area.

Map Index	Projected Constraining Element	Voltage (kV)	2010	2011	2012	2013	2014
1	Ben Davis 138 kV Bus # 8 - Allen Switching Station	138					
2	Blue Mound - Hicks	138					
3	Kleberg Tap - S.Side Wastwtr Treatmnt 2 Tap	138					
4	Lake Hubbard E Ses - Duck Creek Wwtp Tap	138					
5	Oran - Barton	138					
6	Prairie Creek - Mesquite Western Electric	138					
7	Royse North Bus - Royse Auto #1 Tap	345					
8	Seagoville - Kleberg Tap	138					
9	Seagoville SS - Forney	345					
10	Temple SS - Bell County East	345					
11	Whitney Tu - Lake Whitney Tnp	138					

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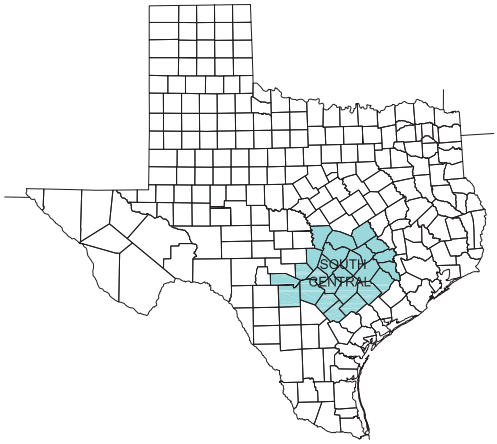
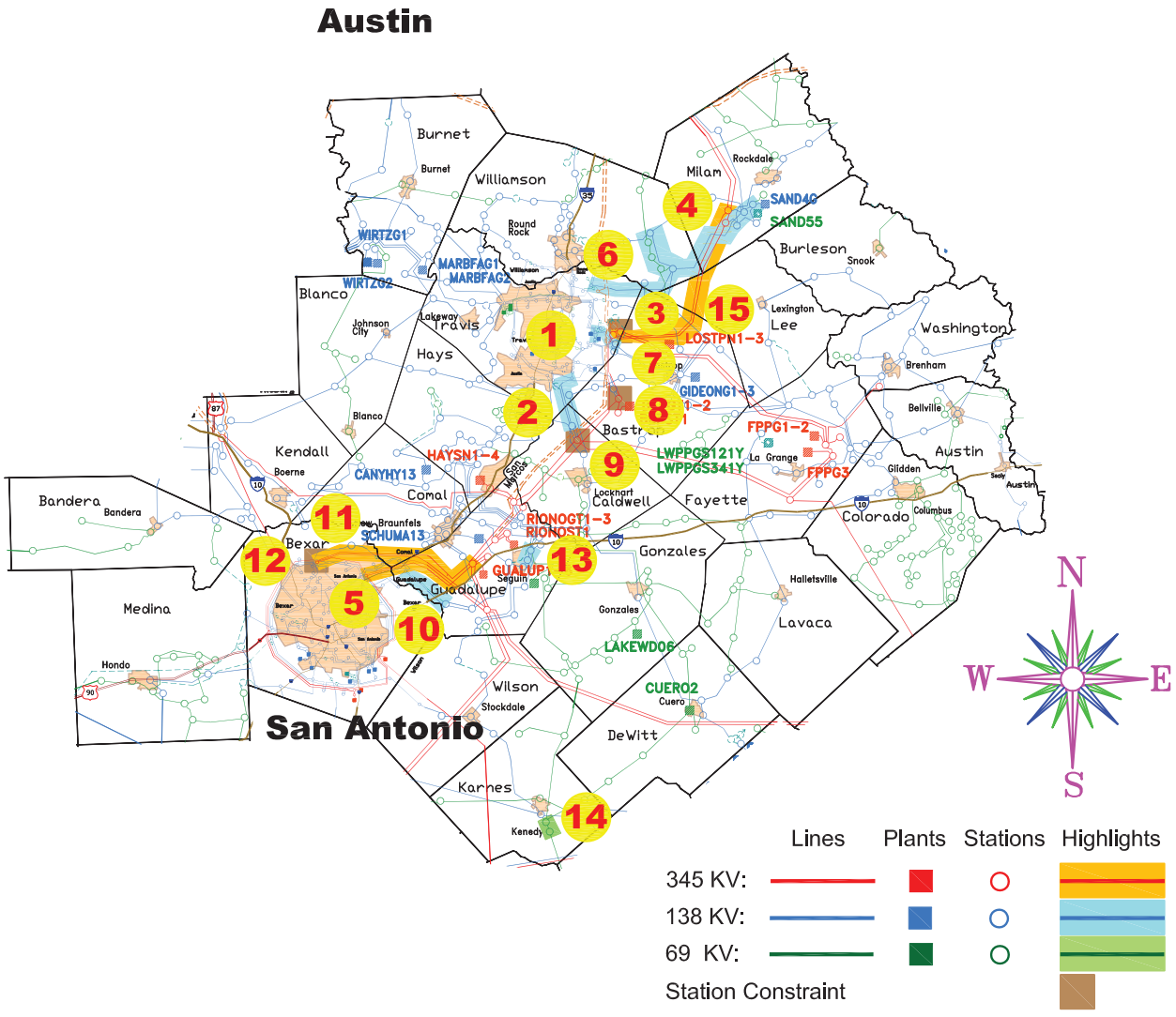
8.6 Area Constraints and Improvements –South Central Weather Zone



Austin, San Antonio, and the surrounding counties and suburbs make up the South Central weather zone. The map below highlights the counties included in the South Central weather zone.

8.6.1 Recent Constraints Map – South Central Weather Zone

The map below identifies the location of the recent constraints for the South Central weather zone.



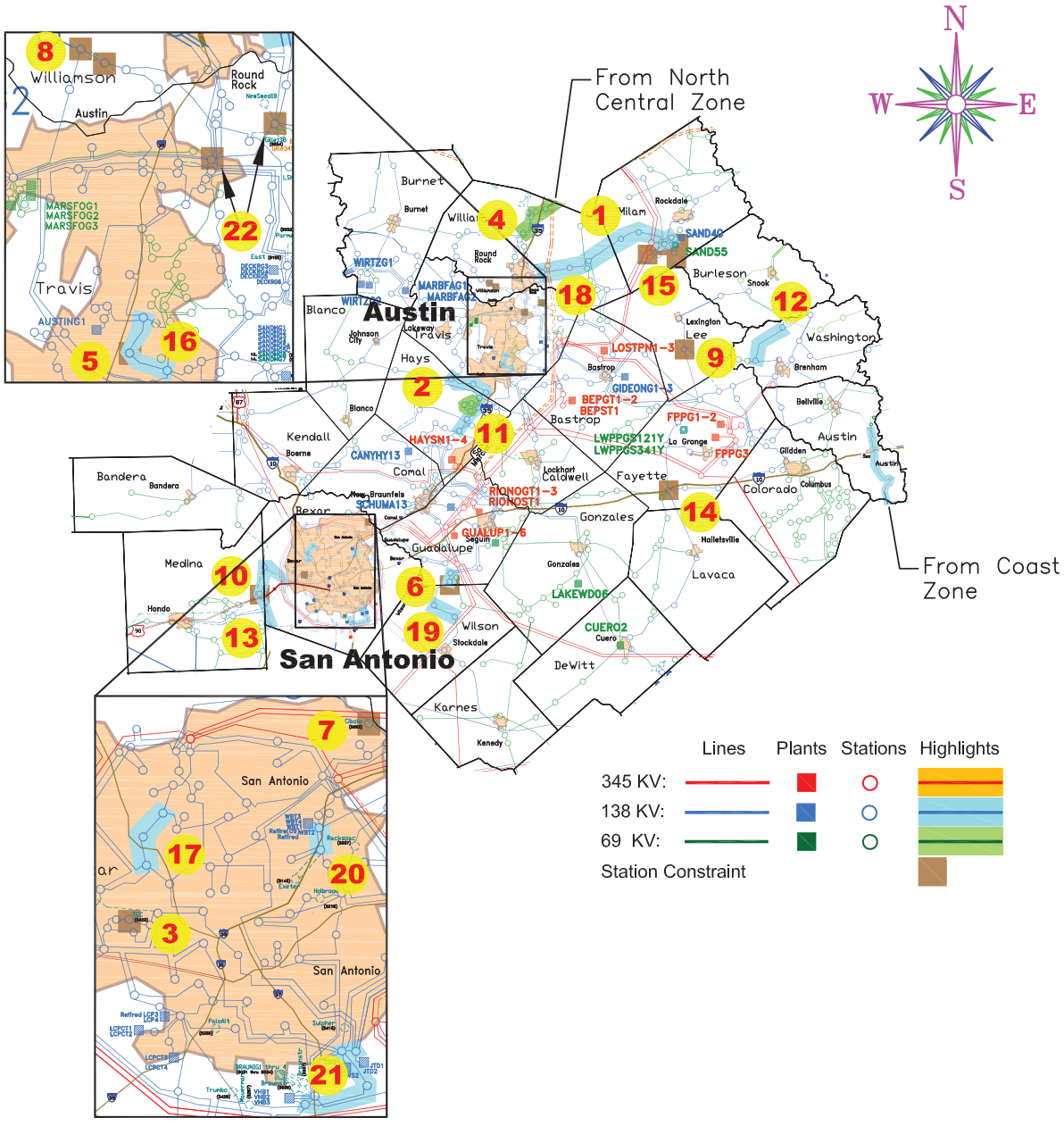
8.6.2 Recent Constraints – South Central Weather Zone

Transmission congestion in the South Central weather zone is due to a variety of factors including high load growth, which has resulted in transmission constraints. Congestion in this zone is also the result of construction outages on the transmission system.

Map Index	Constraining Element	Voltage (kV)
1	Austrop - Decker	138
2	Lytton Springs - Pilot Knob	138
3	Austrop Autotransformer #1	345/138
4	Sandow Switch - Elgin Switch	138
5	Skyline - Marion	345
6	Elgin Switch - Gilleland Creek	138
7	Austrop Autotransformer #2	345/138
8	Garfield Autotransformer T2	345/138
9	Lytton Springs Auto	345/138
10	Schertz - Parkway	138
11	Hill Country - Marion	345
12	Hill Country Autotransformer 2	345/138
13	Seguin - Sequin West	138
14	Kenedy - Kenedy Switch	69
15	Austrop - Sandow Switch	345

8.6.3 Completed Improvements Map – South Central Weather Zone

The map below identifies the location of the completed improvements for the South Central weather zone.



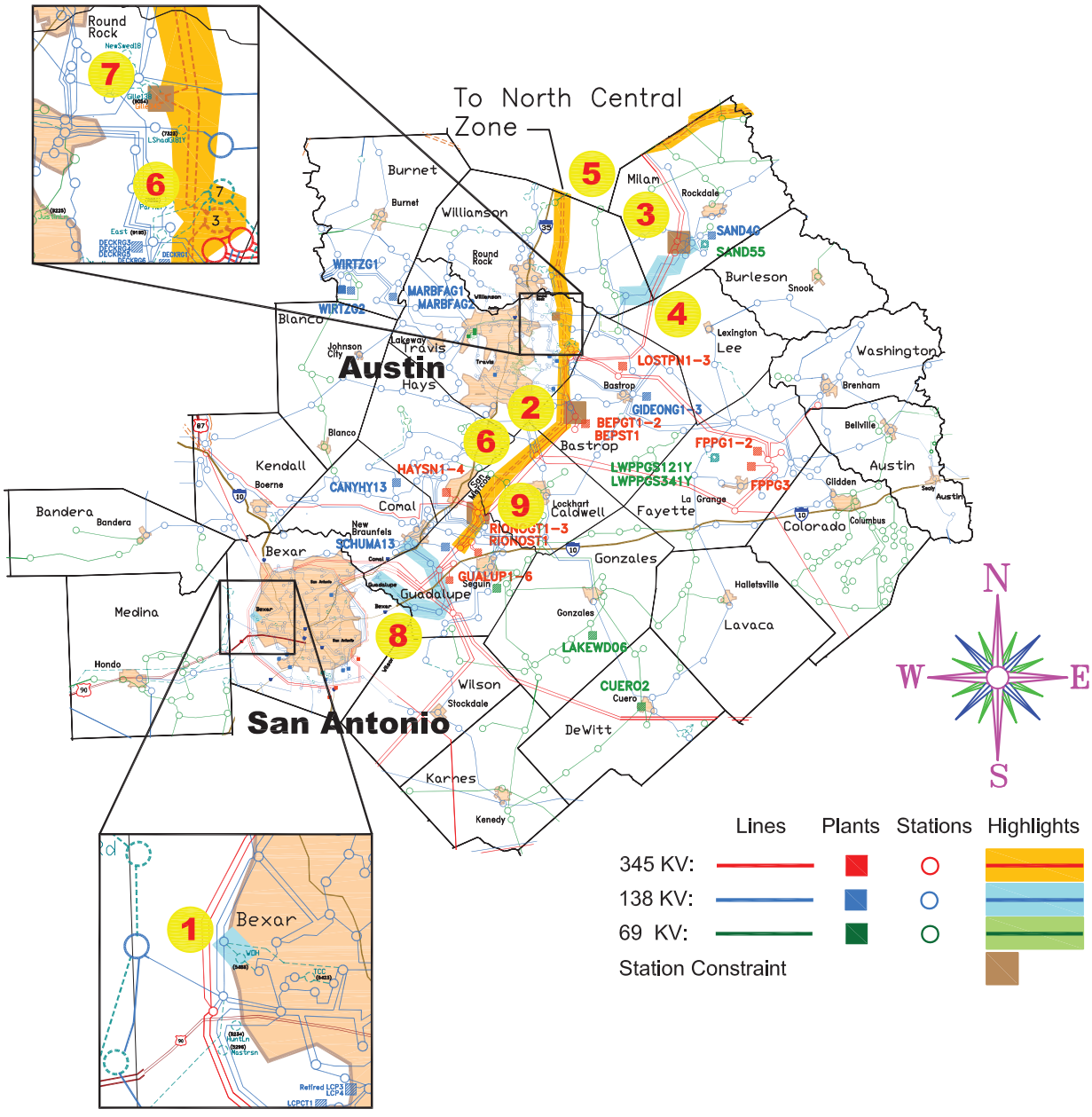
8.6.4 Completed Improvements – South Central Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2008 and 2009 in the South Central weather zone. The elements consist of 113.3 miles of transmission, three new substations, and one new autotransformer. There were 44.5 miles of new transmission at 138 kV and 68.8 miles of upgraded lines at 138 kV. Many of these upgrades were accomplished by replacing the existing conductor, building new lines or raising the voltage of the circuit. The Burleson - Cardinal Lane - Seaholm Line was upgraded from 69 kV to 138 kV to increase the line current carrying capacity. The three new substations were built to provide service to the growth in the area.

Map Index	Completed Improvements	Year In Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Sandow Switch - Salty - Thorndale North - Taylor Line Upgrade	2009	138	0	21.9
2	Friendship-Escarpment-Manchaca New Line	2009	138	8	0
3	TCC New Substation	2009	138	0.1	0
4	Gabriel to Schwertner Line Rebuild	2009	69	0	9.4
5	Cardinal Lane Substation Rebuild	2009	138	0	0
6	New Berlin - Olmos Line Rebuild	2008	138	0	6.1
7	Cibolo Creek new Substation	2008	138	0.1	0
8	Williamson County Capacitor Bank Additions	2008	138	0	0
9	Giddings Capacitor Bank Addition	2008	138	0	0
10	Castroville New Substation	2008	138	0.1	0
11	Buda-Centex-Lehigh-Kyle-Canyon Line Upgrade	2008	138	3.5	12.2
12	Mill Creek - Gay Hill Line Upgrade	2008	138	0	9.1
13	Cagnon - Lytle New Line	2008	138	21.7	0
14	Flatonia New Auto	2008	138	0	0
15	Sandow Switch New Circuit Breaker	2008	138	0	0
16	Burleson - Cardinal Lane - Seaholm Line Upgrade	2008	138	0	5.7
17	Bandera - Hamilton Wolfe - Med. Center Reconductor	2008	138	0	1.7
18	Taylor - Taylor West - Hutto Switch 138 kV line upgrade	2009	138	0	10.1
19	Wilson(7615)-CPS Sutherland Springs(5418) new line	2009	138	11	0
20	Austin to Tuttle - 138 kV Transmission Line Rebuild	2009	138	0	2
21	VH Braunig to Streich to OW Sommers - Trans Line Reroute	2009	138	0.1	0
22	McNeil-Gilleland equipment replacement	2009	138	0	0

8.6.5 Planned Improvements Map – South Central Weather Zone

The map below identifies the location of the planned improvements for the South Central weather zone.



8.6.6 Planned Improvements – South Central Weather Zone

A significant transmission improvement in the South Central weather zone will be the construction of the Clear Springs to Salado 345 kV double circuit during 2011. This project will help deliver energy to Central Texas load and address transmission reliability needs in that area. The project will generally follow a north-south path, similar to the existing 345 kV corridor, and provide new autotransformer capacity to area load at key sites including the Gilleland Creek station northeast of Austin and the Hutto station located in southern Williamson County.

Several improvements are planned in order to deliver power from the new Sandow coal-fired unit. These include adding a 345/138 kV autotransformer at Sandow and upgrading the Sandow to Elgin 138 kV line.

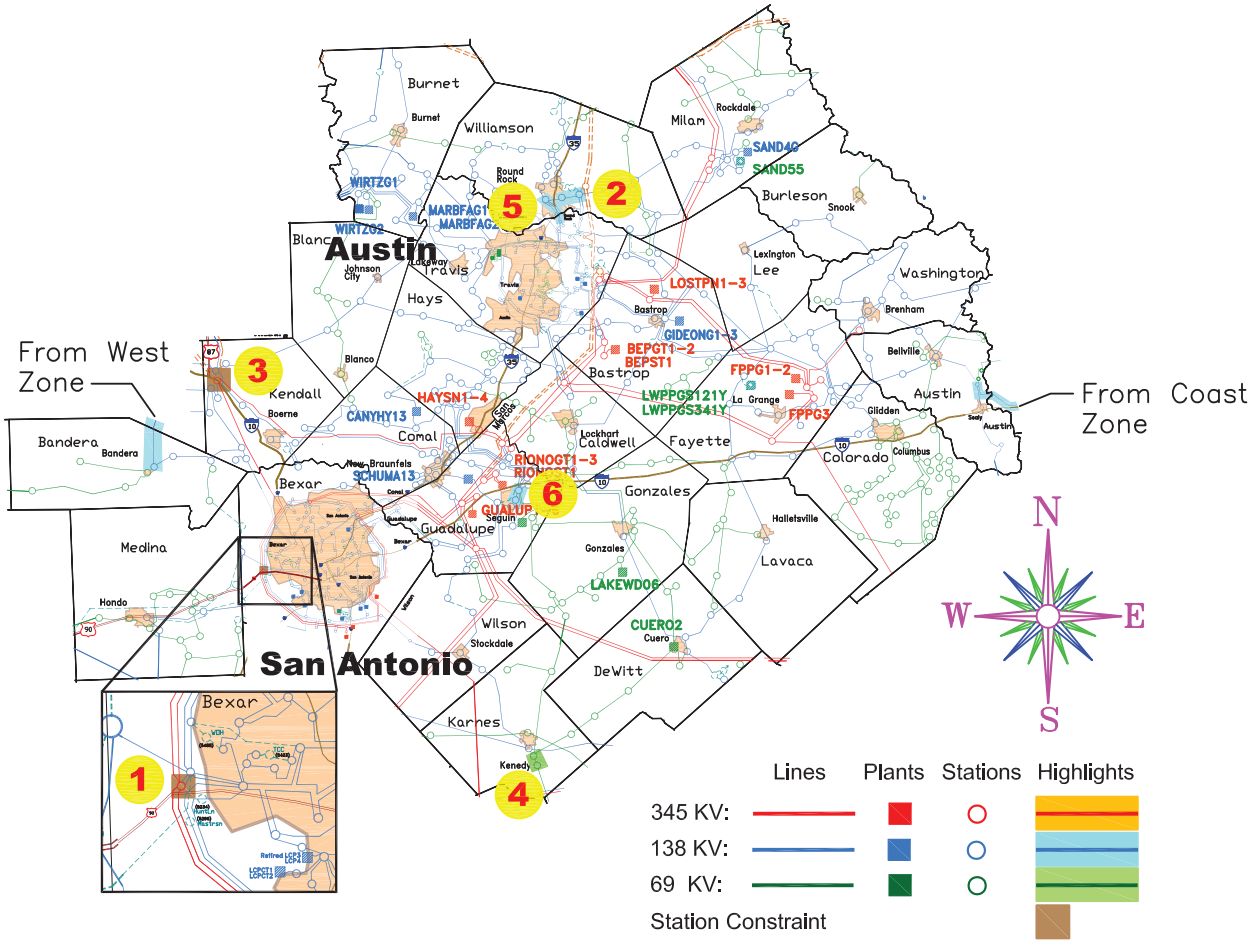
Due to the load growth in the area between Austin and San Antonio additional 345/138 kV autotransformer capacity will be added at both the Lytton Springs and Zorn switch stations.

A new 138 kV line from Anderson to Westover Hills will be built to serve growing load in west and northwest San Antonio. North of San Antonio a new 138 kV line will be constructed from GPI switching station to Parkway along with a new load serving station on the line.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Anderson - Westover Hills New Line	138	2010	X
2	Lytton Springs Substation New Autotransformer	345/138	2010	
3	Sandow Substation New Third Autotransformer	345/138	2010	X
4	Sandow Switch - Elgin Switch Rebuild	138	2010	X
5	Salado Switching Station New And Hutto Switch - Salado Switch New Line	345	2010	X
6	Zorn/Clear Springs - Hutto Switch New Line	345.0	2011	X
7	Gilleland Switching Substation New Autotransformer	345/138	2012	X
8	GPI Switching Station- FM 482 - Parkway New Line	138	2013	X
9	Zorn Substation New Autotransformer	345/138	2013	X

8.6.7 Projected Constraints Map – South Central Weather Zone

The map below identifies the location of the projected constraints for the South Central weather zone.



8.6.8 Projected Constraints – South Central Weather Zone

Load growth in the San Antonio and Austin metropolitan areas will continue to cause congestion in the South Central weather zone. In the west and northwest San Antonio area demand is expected to cause congestion on the Cagnon and Kendall 345/138 kV autotransformers. Southeast of San Antonio the Kenedy to Kenedy Switch Station 69 kV line is projected to experience some congestion before a new parallel line is constructed in 2014. Congestion is expected on several 138 kV lines in the Round Rock area north of Austin.

Map Index	Projected Constraining Element	Voltage (kV)	2010	2011	2012	2013	2014
1	Cagnon Autotransformer	345					
2	Hutto Switching - Round Rock Northeast	138					
3	Kendall Autotransformer	345					
4	Kenedy Switching Station #1 - Kenedy	69					
5	Round Rock - Wells Branch	138					
6	Seguin - Seguin West	138					

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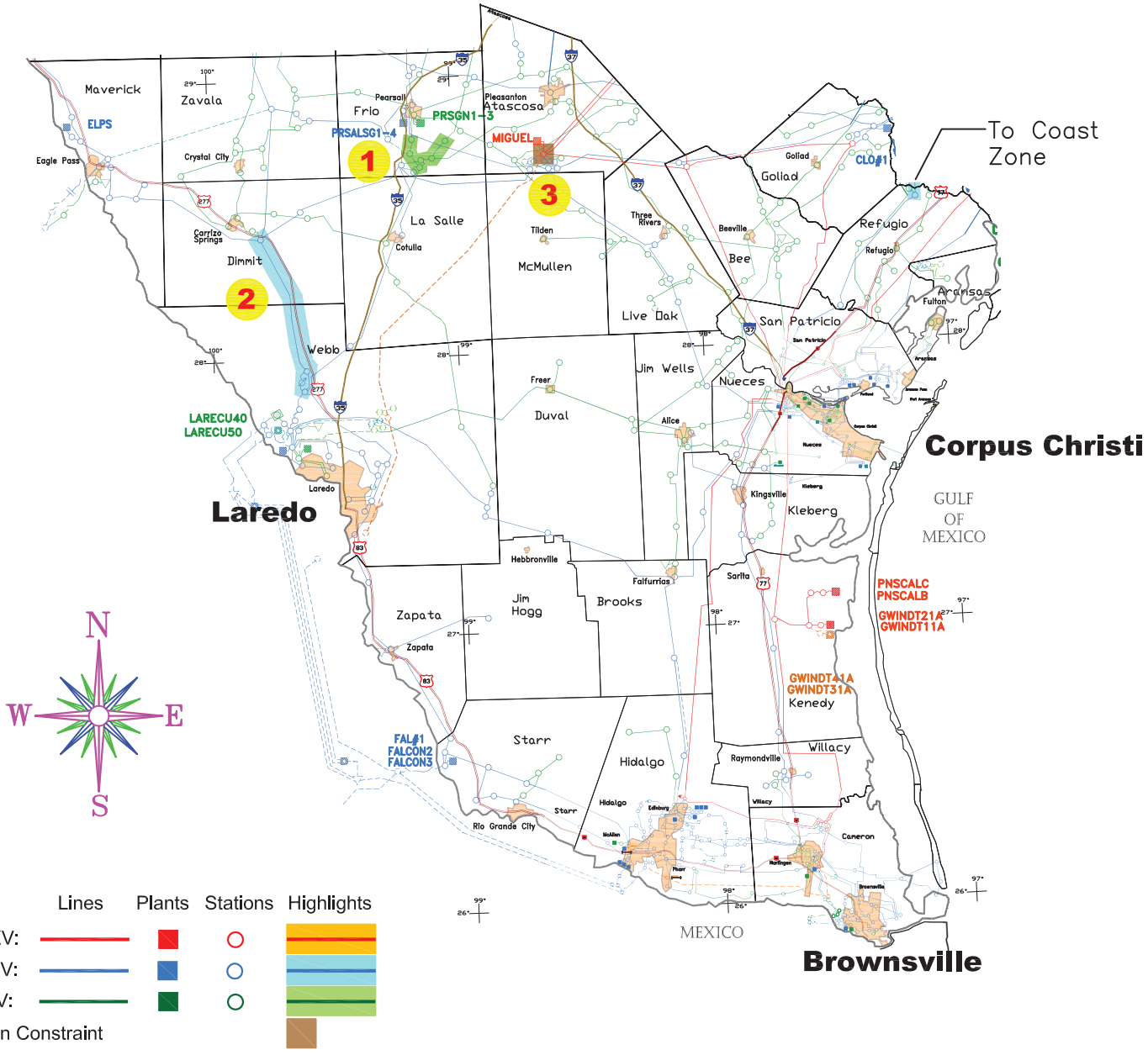
8.7 Area Constraints and Improvements – Southern Weather Zone

The Southern weather zone covers the south Texas plains and contains the cities of Laredo, Corpus Christi, McAllen, and Brownsville. The map below highlights the counties included in the Southern weather zone.

8.7.1 Recent Constraints Map – Southern Weather Zone

The map below identifies the location of the recent constraints for the Southern weather zone.



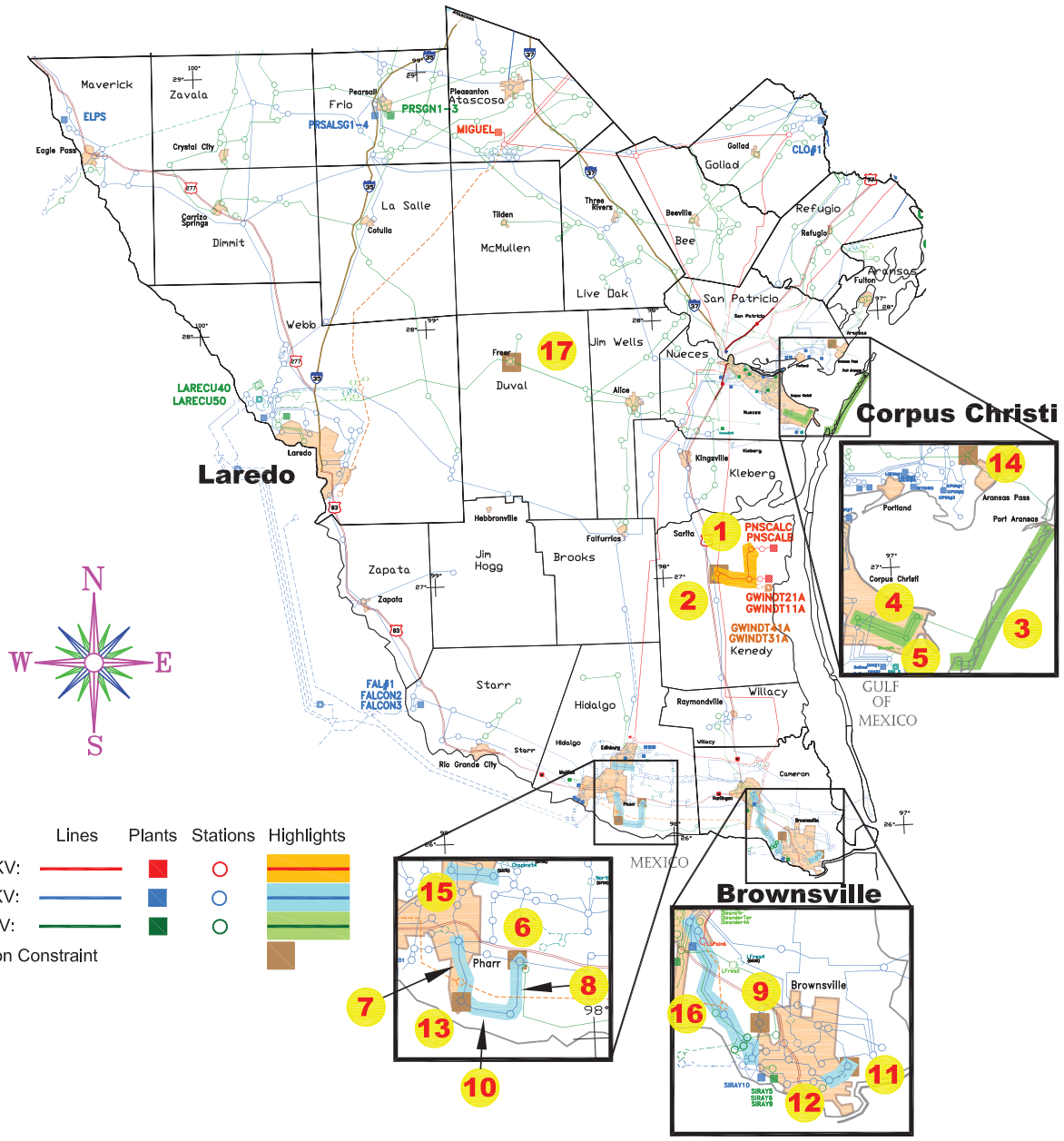
8.7.2 Recent Constraints – Southern Weather Zone

The primary cause for congestion in the Southern weather zone is the sizeable load growth.

Map Index	Constraining Element	Voltage (kV)
1	Derby - Pearsall	69
2	North Laredo - Asherton	138
3	San Miguel Switchyard autotransformer B	345/138

8.7.3 Completed Improvements Map – Southern Weather Zone

The map below identifies the location of the completed improvements for the Southern weather zone.



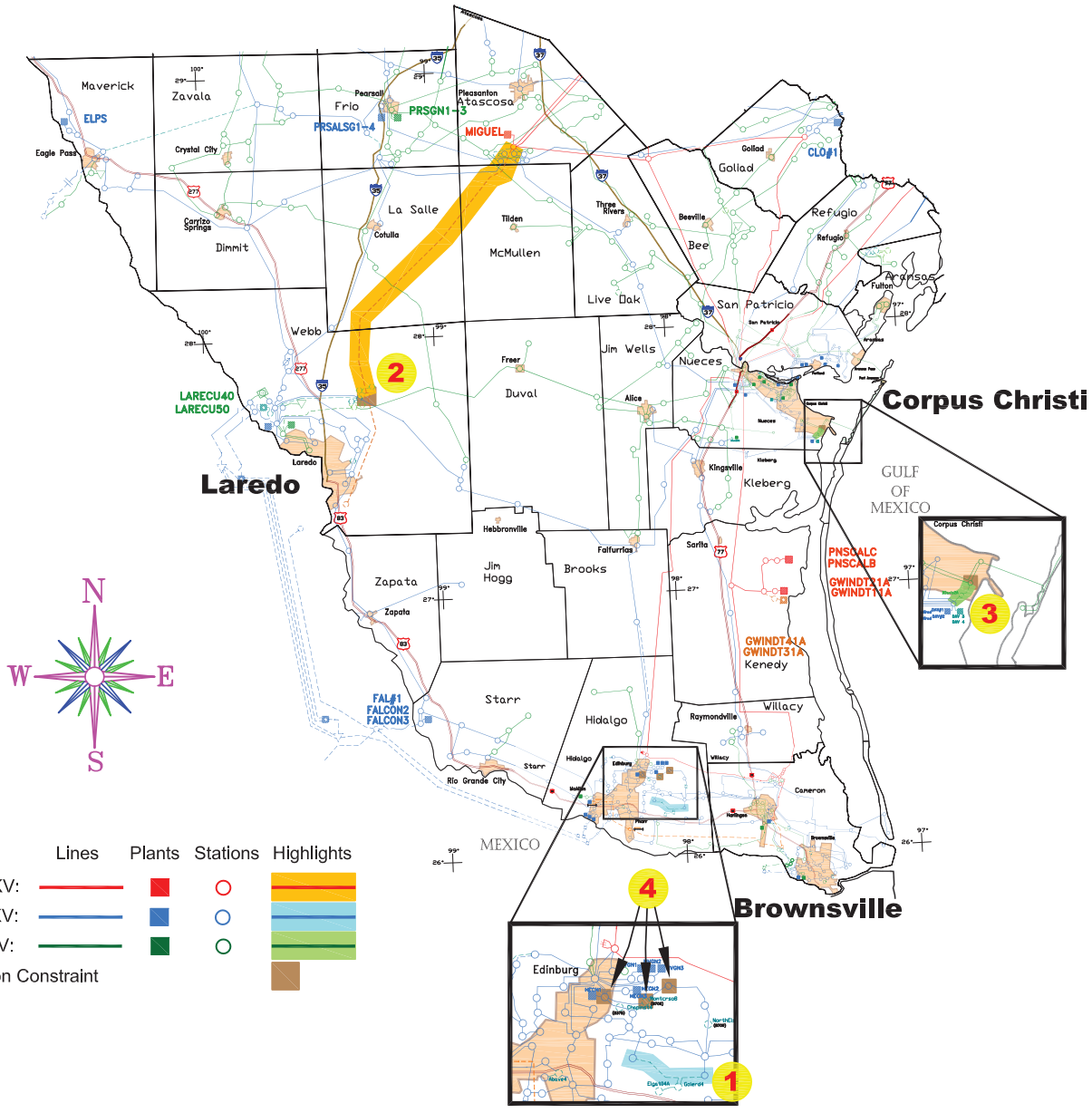
8.7.4 Completed Improvements – Southern Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2008 and 2009 in the Southern weather zone. The elements consist of 64.5 miles of transmission, six new substations, and one transformer. There were 21.6 miles of new 345 kV transmission and 42.8 miles of upgraded lines (16.7 miles at 138 kV and 26.1 miles at 69 kV). Many of these upgrades were accomplished by raising the voltage of the circuit or replacing the existing conductor.

Map Index	Completed Improvements	Year In Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Ajo - IPP New Line	2008	345	21.6	0
2	Ajo Switching Station	2008	345	0	0
3	North Padre - Mustang Line Rebuild	2008	69	0	6.7
4	Airline - Naval Base Line Rebuild	2008	69	0	8
5	Airline - Laguna Line Rebuild	2008	69	0	6.4
6	Stewart Road New Substation and Capacitors Addition	2008	138	0	0
7	Hidalgo - S McAllen Line Upgrade	2008	138	0	3.7
8	Hi-Line - Stewart Rd Tap Line Upgrade	2008	69	0	3
9	Olmito New Distribution Substation	2008	138	0	0
10	Hi-Line - Hidalgo Line Upgrade	2008	69	0	2
11	Waterport Substation Upgrade	2008	138	0	0
12	Airport - Waterport Line Upgrade	2008	138	0	8.8
13	Hidalgo Substation Upgrade	2008	138	0	0
14	Aransas Pass: Add 1-28.8 MVAR Cap Bank	2009	69	0	0
15	MVEC Palmhurst-MVEC Merett Rebuild	2009	138	0	4.2
16	La Palma to Military Highway	2009	138	0.1	0
17	Freer Static Capacitor Support	2009	69	0	0

8.7.5 Planned Improvements Map – Southern Weather Zone

The map below identifies the location of the planned improvements for the Southern weather zone.



8.7.6 Planned Improvements – Southern Weather Zone

The most significant transmission improvement in the Southern weather zone will be the completion of the San Miguel to Laredo Lobo 345 kV line in 2010. A number of supportive 138 kV upgrades are also planned between Laredo Lobo and the Laredo power plant.

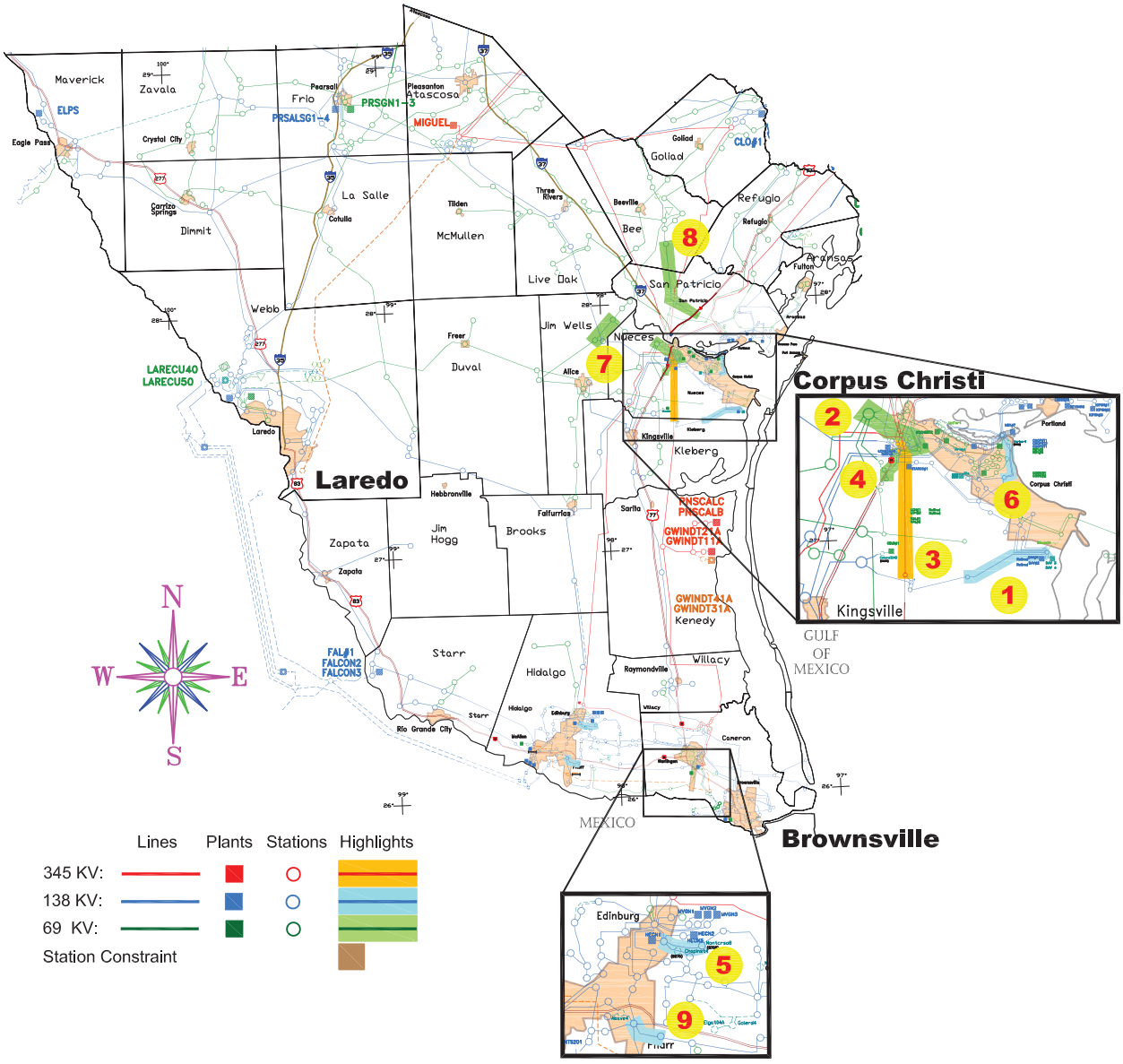
In the Corpus Christi area a new 138 kV line will be constructed between the Barney Davis plant and the Laguna substation. Also, a 138 kV bus will be added at Laguna with a 138/69 kV autotransformer. These upgrades are proposed to improve reliability in the area during maintenance outages.

The Hidalgo to Aderhold 138 kV line is planned to be upgraded to relieve congestion in the Rio Grande Valley. Also, a new 138 kV line from Doedyns substation to Gandy substation is planned.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Doedyns-Gandy Substation New Line	138	2010	X
2	Laredo Lobo New Substation And Laredo Lobo- San Miguel New Line	345/138	2010	X
3	Laguna Substation New Line And Autotransformer Addition	69;138/69	2012	X
4	Hidalgo- HEC – Aderhold Substation Upgrade	138	2014	X

8.7.7 Projected Constraints Map – Southern Weather Zone

The map below identifies the location of the projected constraints for the Southern weather zone.



8.7.8 Projected Constraints – Southern Weather Zone

In the Southern weather zone significant congestion in the Corpus Christi area is projected ahead of several transmission improvements in the area. This is due to the re-powering of the Barney Davis and Nueces Bay power plants. Because of the lead time necessary to implement transmission improvements, the upgrades to relieve this congestion are expected to lag behind the generation additions.

Most of the remainder of the projected congestion in the Southern weather zone is related to moving power within the Rio Grande Valley area.

Map Index	Projected Constraining Element	Voltage (kV)	2010	2011	2012	2013	2014
1	Barney M. Davis - Alazan	138					
2	Calallen Substation - Lon Hill	69					
3	Lon Hill - Nelson Sharpe	345					
4	Lon Hill - Robstown	69					
5	Monte Cristo - Hidalgo	138					
6	Nueces Bay - Morris Street	138					
7	Orange Grove 69 kV Swtchyd - Orange Grove Dist Substn	69					
8	Skidmore - Sinton	69					
9	South McAllen - Las Milpas Substation	138					

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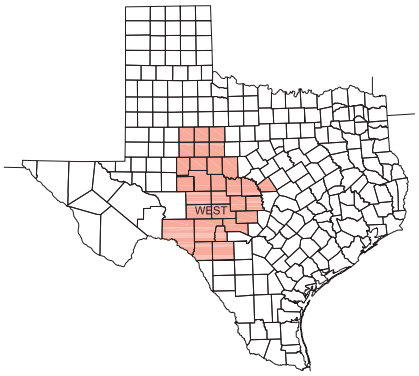
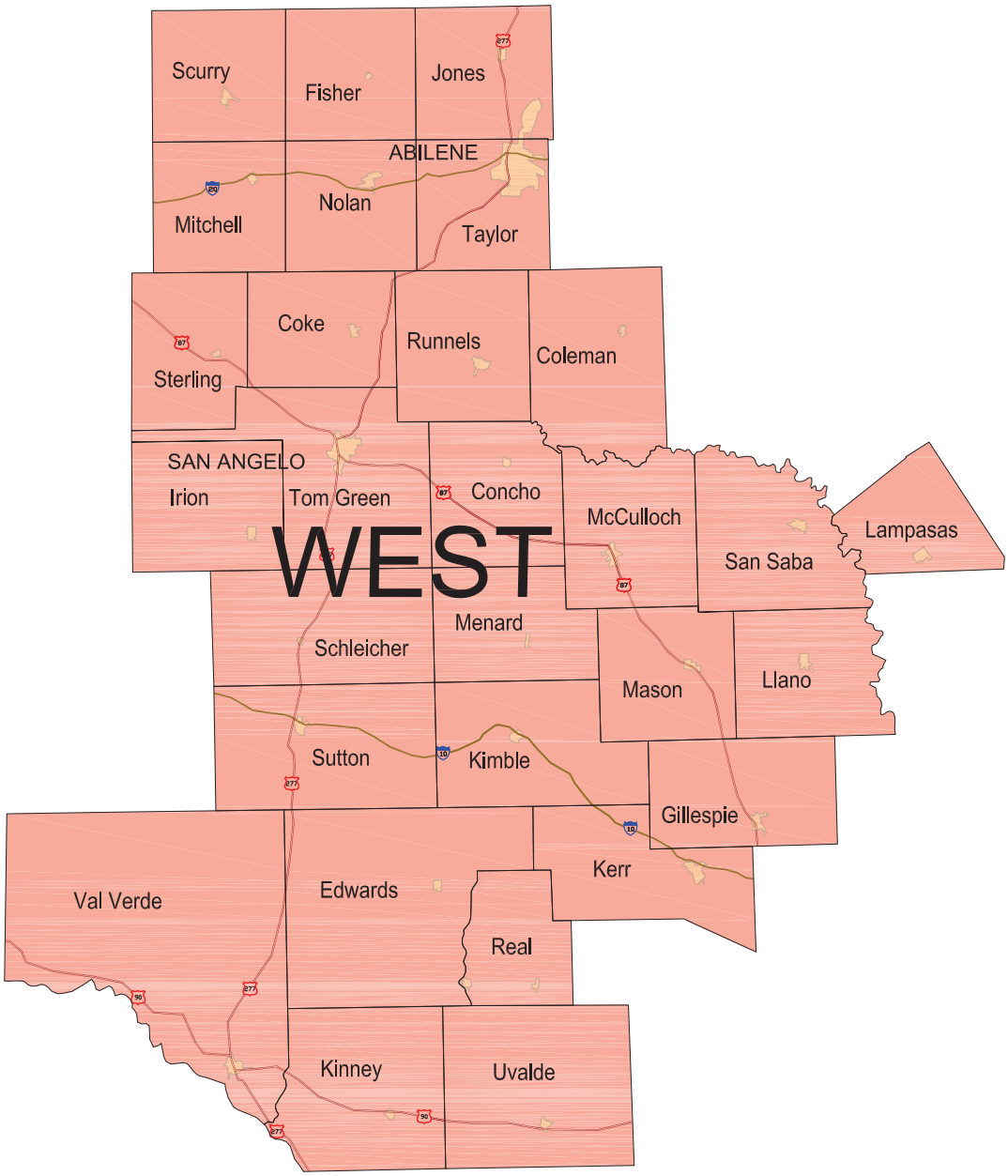
8.8 Area Constraints and Improvements – West Weather Zone

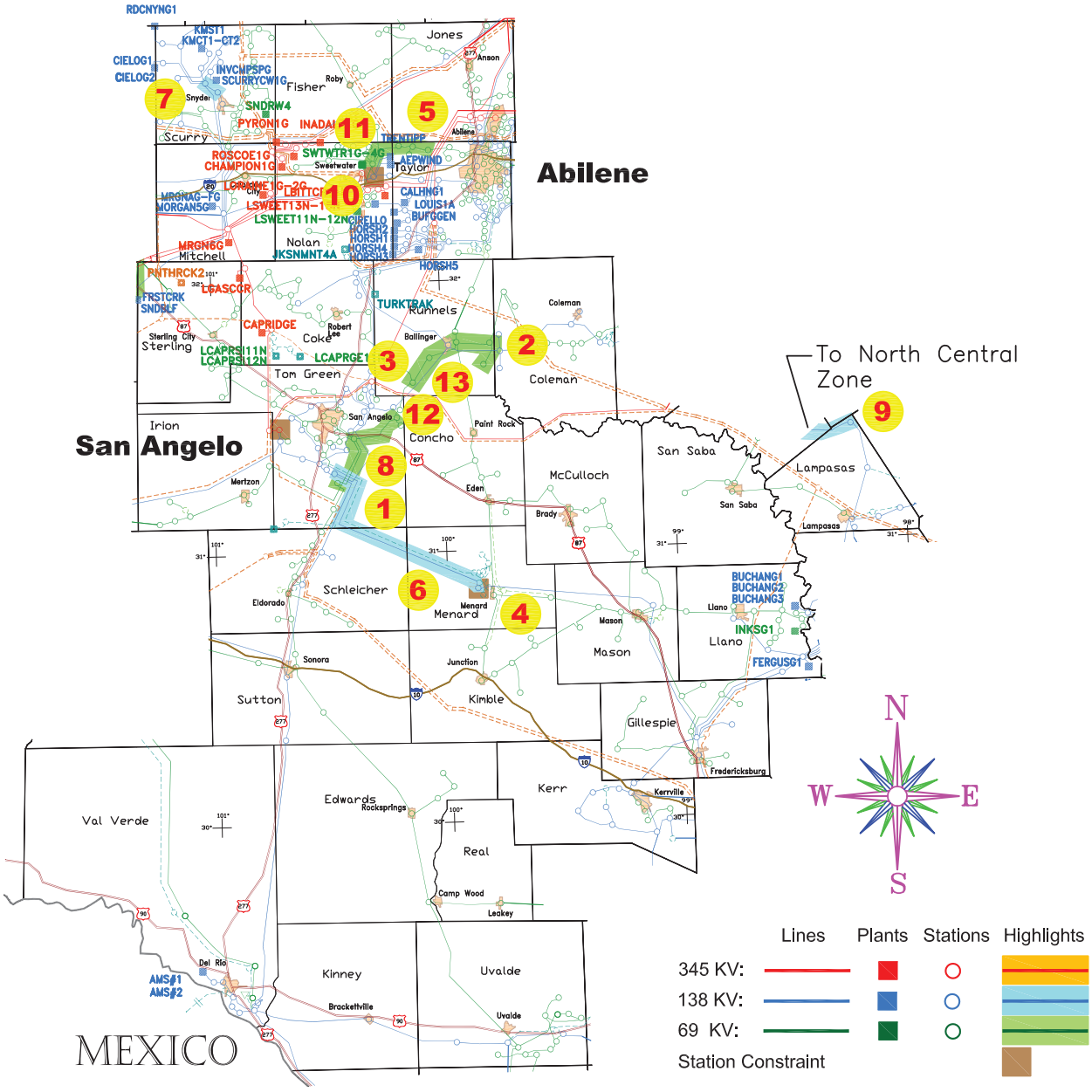


The West weather zone includes Del Rio, Abilene, San Angelo, and the western part of the Texas hill country. The map below highlights the counties included in the West weather zone.



8.8.1 Recent Constraints Map – West Weather Zone

The map below identifies the location of the recent constraints for the West weather zone.



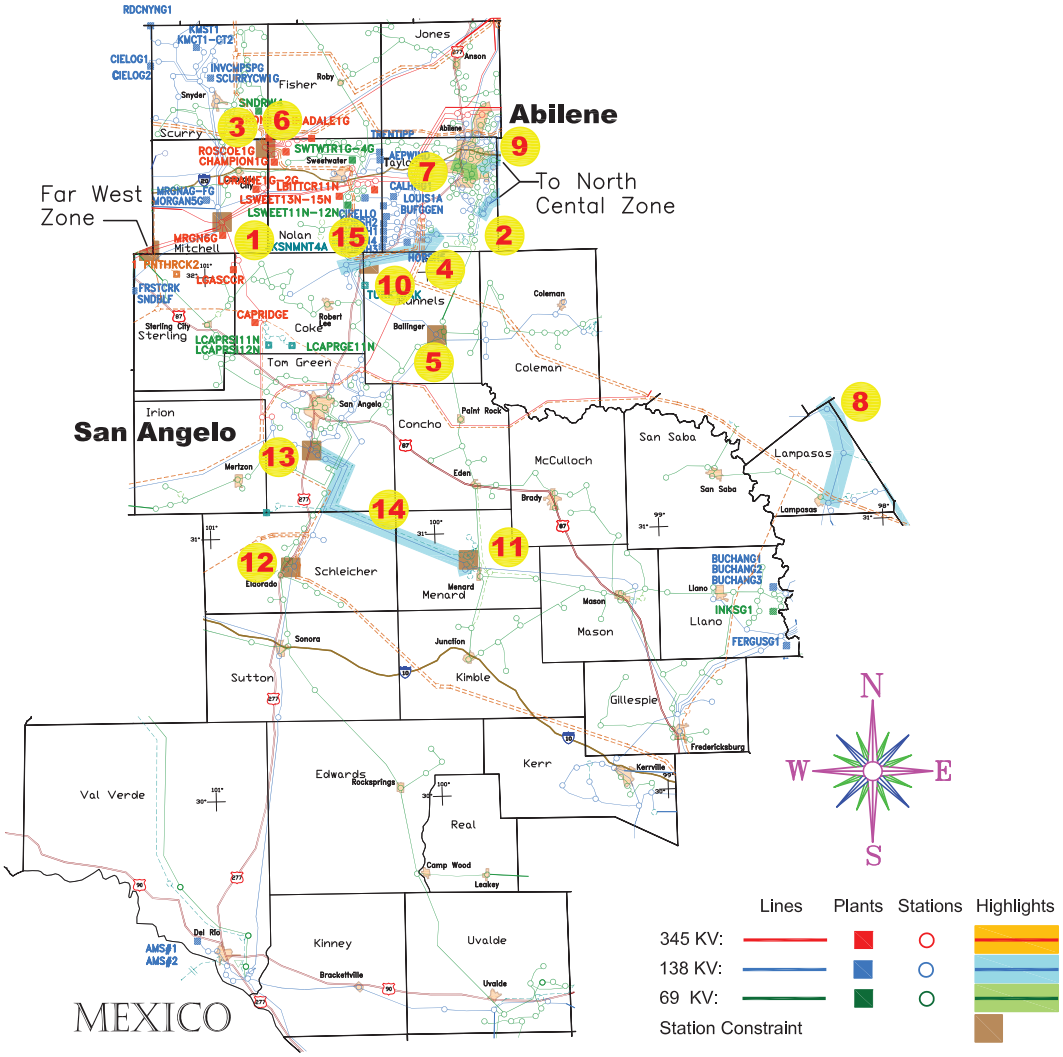
8.8.2 Recent Constraints – West Weather Zone

Congestion in the West weather zone is due to a large amount of wind generation capacity. Also, congestion occurs as a result of transmitting wind capacity from the far West to the high load growth central Texas area.

Map Index	Constraining Element	Voltage (kV)
1	San Angelo Power Station - Shrew Tap	138
2	Ballinger - Humble	69
3	Miles - Rowena	69
4	Menard Autotransformer	138/69
5	Trent - Merkel	69
6	Menard – San Angelo Power Station	138
7	Sun Switch - Sacroc	138
8	San Angelo Concho - San Angelo Lake Nasworthy	69
9	Evant - Goldwaite	138
10	Eskota Switch Autotransformer	138/69
11	Trent - Scott Rea Tap	69
12	San Angelo Concho - Veribest	69
13	Ballinger - Miles	69

8.8.3 Completed Improvements Map – West Weather Zone

The map below identifies the location of the completed improvements for the West weather zone.



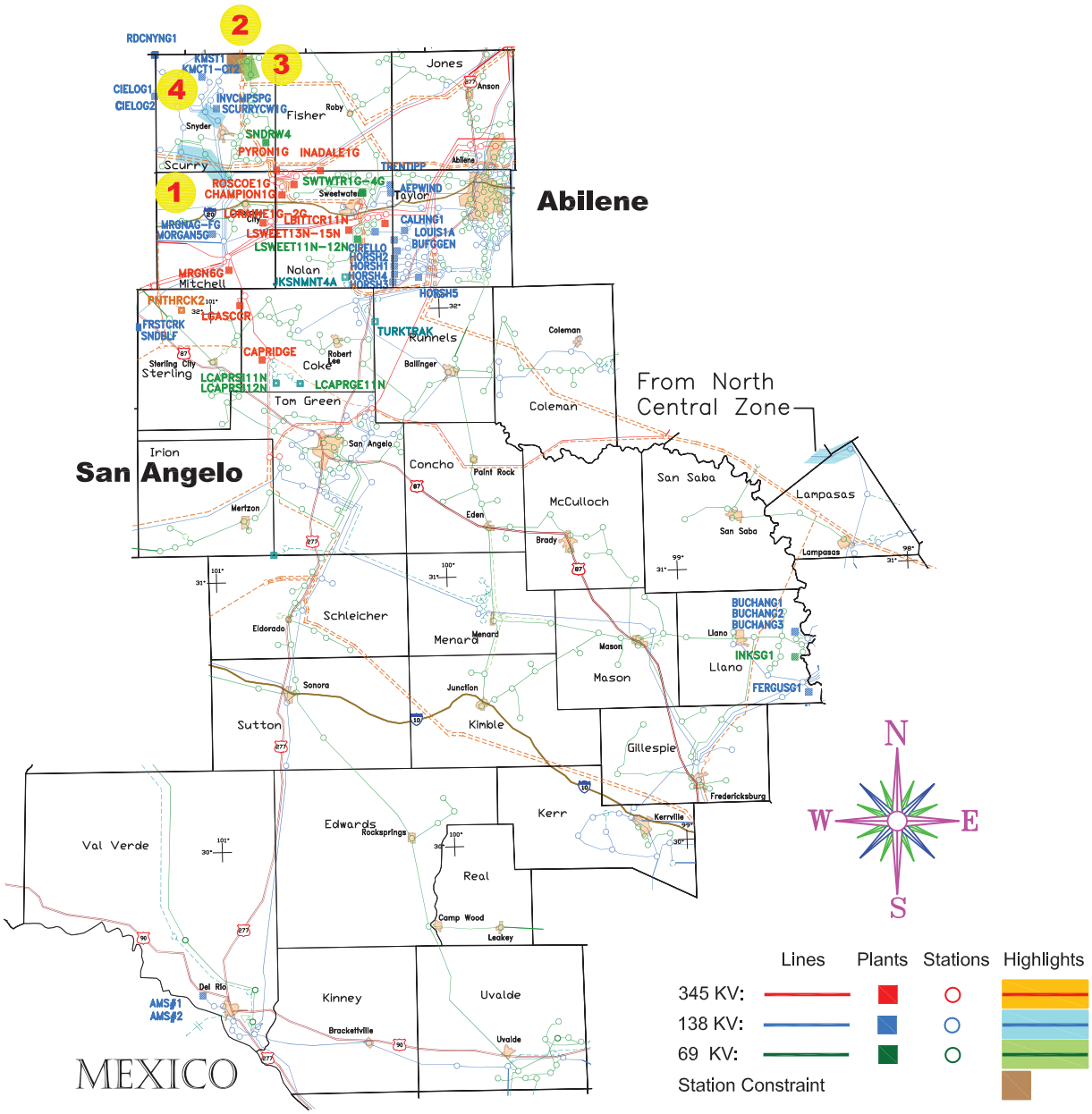
8.8.4 Completed Improvements – West Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2008 and 2009 in the West weather zone. The elements consist of 100 miles of upgraded transmission, two new substations, two new autotransformer, and two reactive devices. There were 100 miles of upgraded lines (84 miles at 138 kV and 16 miles at 69 kV). The transmission upgrades were accomplished by rebuilding the line or by replacing the existing conductor.

Map Index	Completed Improvements	Year In Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Morgan Creek Terminal Equipment Replacement	2009	345	0	0
2	Abilene South - Putnam Line Upgrade	2009	138	0	35.3
3	Tonkawa Switching Station New Shunt Reactor	2008	345	0	0
4	Bluff Creek - Oak Creek Line Rebuild	2008	138	0	20.8
5	Ballinger New Distribution Transformer and Capacitor	2008	138	0	0
6	Tonkawa Switching Station New Circuit Breaker Installation	2008	345	0	0
7	Abilene Elm Creek - Abilene Shelton Street Line Rebuild	2008	69	0	2.6
8	Lampasas - Adamsville - Evant Line Upgrade	2008	138	0	26
9	Abilene Plant to Clyde, Rebuild 69/138 kV Dbld Crkt Capable	2009	69	0	13
10	Nicole, Four Position Ring	2009	138	0	0
11	Yellowjacket, New 138/69 Station	2009	138	0	0
12	Live Oak, Add 69/138 kV Auto	2009	138	0	0
13	San Angelo Power Station, Reconfigure Station	2009	138	0	0
14	San Angelo Power Station, to Menard 138 kV line improvements	2009	138	0	0
15	Cut Bluff Creek to Oak Creek into Nicole Rebuild	2009	138	0	2

8.8.5 Planned Improvements Map – West Weather Zone

The map below identifies the location of the planned improvements for the West weather zone.



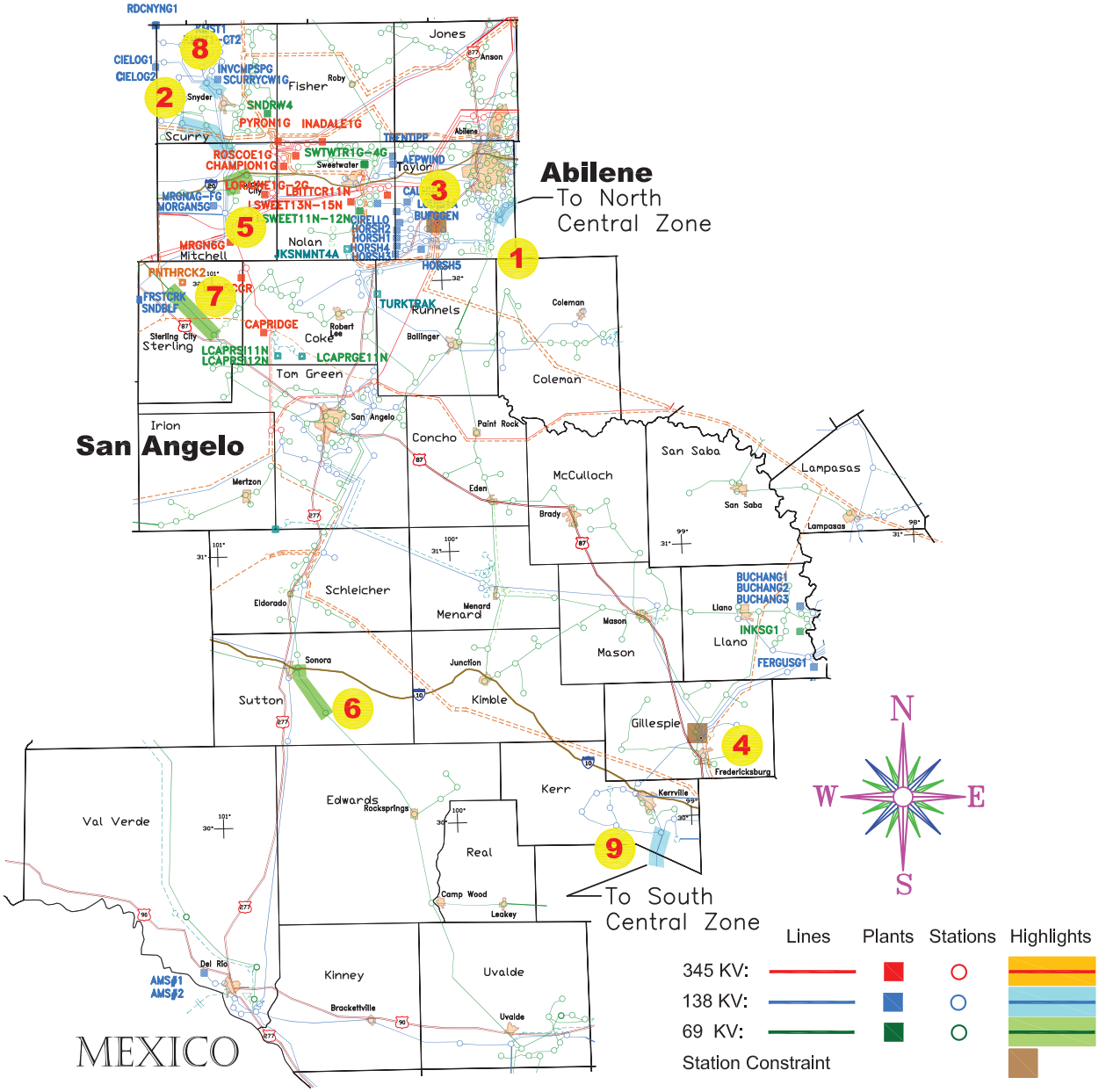
8.8.6 Planned Improvements – West Weather Zone

There are several planned improvements in the West weather zone that are designed to relieve congestion due to the considerable increase in wind generation in the west Texas region. The CREZ facilities will provide substantial relief to this congestion. Additional improvements include the Bluff Creek to China Grove 138 kV line upgrade, the Sun to Sacroc 138 kV line upgrade, the Ennis Creek 138/69 kV autotransformer upgrade, and the Ennis Creek to Cogdell Tap 138 kV line upgrade.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Sun Switch - Sacroc Rebuild	138	2011	
2	Ennis Creek– Cogdell Tap Upgrade	69	2013	X
3	Bluff Creek – China Grove Upgrade	138	2014	X
4	Ennis Creek SS Autotransformer Upgrade	138/69	2014	X

8.8.7 Projected Constraints Map – West Weather Zone

The map below identifies the location of the projected constraints for the West weather zone.



8.8.8 Projected Constraints – West Weather Zone

Significant congestion in the West weather zone continues to be mainly associated with the large increase in the wind generation capacity in ERCOT. Much of the congestion will be mitigated with the CREZ projects by 2013 and 2014.

The West to North Transient Stability Limit is the main constraint for transferring power out of west Texas in the years 2010, 2011 and 2012. This situation is expected to be relieved with the addition of the CREZ facilities. Additionally, there will be some local congestion which will constrain wind generation facilities until upgrades can be completed.

Map Index	Projected Constraining Element	Voltage (kV)	2010	2011	2012	2013	2014
1	Abilene South - Potosi Tap	138					
2	Bluff Creek - China Grove	138					
3	Bluff Creek Switching Station Autotransformer	345					
4	Gillespie Autotransformer	138					
5	Morgan Creek - Colorado City	69					
6	Sonora - Friess Ranch	69					
7	Sterling City - Sterling County Tap	69					
8	Sun - Sacroc	138					
9	Verde Creek - Bandera	138					
	Non-specific Element						
na	West to North Transient Stability Limit	345					

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9. Summary of CREZ Report

Brief History

In 2005, the Texas Legislature passed Senate Bill 20, which instructed the Public Utility Commission of Texas (PUC) to establish Competitive Renewable Energy Zones (CREZ) and to designate new transmission projects to serve these zones. To fulfill the requirements of Senate Bill 20, the PUC requested that ERCOT complete a study of wind generation potential throughout the State, and develop options for transmission improvements to connect the wind generation to load. This study was filed by ERCOT in December, 2007 under PUC Project No. 33577.

As a result of this study, the PUC, through Docket No. 33672, established five CREZ and instructed ERCOT to conduct a CREZ Transmission Optimization (CTO) study to identify transmission proposals that would allow integration of wind resources from the CREZ in the most cost-effective manner. The CTO study was filed by ERCOT in April, 2008 under PUC Docket 33672. In August, 2008, the PUC issued an order selecting the CREZ Transmission Plan (CTP) that would provide transmission capacity for 18,456 MW of renewable resources in the CREZ. This order also identified priority projects critical to relieving current congestion.

2009 Progress

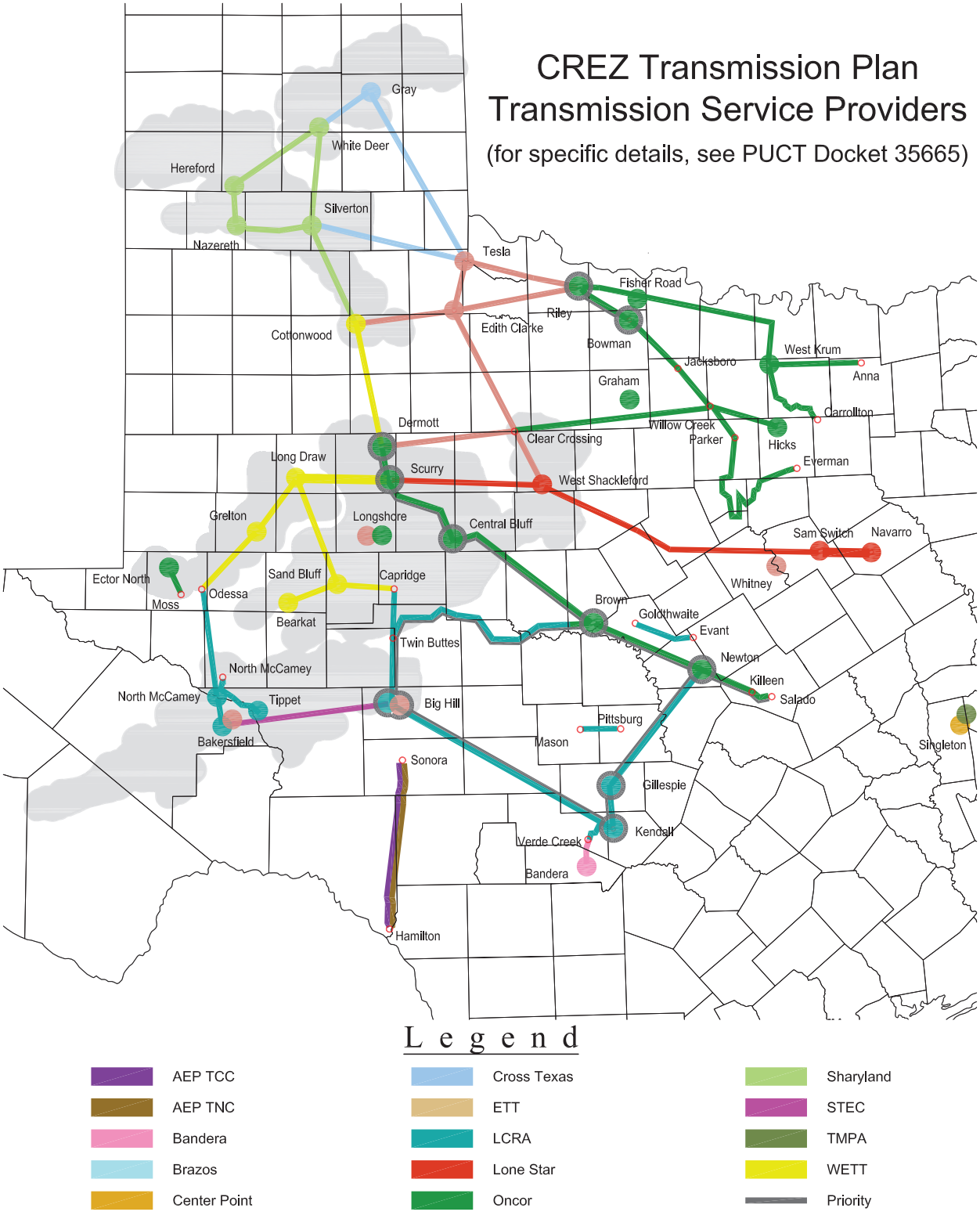
In order to implement the CTP, Docket No. 35665 established the Transmission Service Providers (TSP) responsible to construct and operate the transmission facilities identified in the CTP. The final order, issued in May, 2009, identified the CTP projects that required upgrades or modifications to existing facilities as default projects and were assigned to the TSP that owned the facility. These projects were severed from the proceeding .

The final order from Docket 35665 also assigned the priority projects and subsequent projects (non-priority, non-default) of the CTP to TSPs. The map on the following page depicts these TSP assignments. Several TSPs have requested alternative improvements to approved CTP projects, permissible if such improvements would reduce the cost of transmission or increase the amount of generating capacity that the CREZ can accommodate. These requests have been reviewed by ERCOT to determine whether they are cost-effective and consistent with the intent of the CTP.

In March, 2009, the PUC opened two dockets to manage the sequencing of the Certificates of Convenience and Necessity (CCNs) required for the non-default projects. In Docket 36801, the priority projects were grouped and condensed into 9 CCN applications, all originally scheduled to be submitted by October 28, 2009 . In Docket 36802, the subsequent projects were grouped and condensed into 23 CCN applications, scheduled to be submitted between March 1, 2010 and July 26, 2010.

Project No. 34577, the PUC was established to develop policies that ensure wind developer financial commitment for each CREZ. In October of 2009, the PUC found that installed generating capacity, continuing construction of new generation, and signed interconnection agreements are the best measures of wind-generator financial commitment to warrant the approval of CCNs for the CREZ transmission facilities. In the three CREZ located within the ERCOT Region (McCamey, Central, and Central West), the PUC determined that there is adequate financial commitment to proceed with CREZ CCNs. For the two CREZ located in the

Texas Panhandle (Panhandle A and Panhandle B), the PUC opened Docket 37567 to allow wind generators to provide evidence of financial commitment, such as an interconnection agreement, or to post collateral, which is refundable upon signing an interconnection agreement.



10. Long Term System Assessment Summary

Senate Bill 20 requires that the Public Utility Commission of Texas (PUC) and the Electric Reliability Council of Texas, Inc. (ERCOT) study the need for increased transmission and generation capacity throughout the state of Texas and report on these needs to the Legislature. This report is filed with the legislature each even-numbered year. In addition, the North American Electric Reliability Corporation (NERC) standards require annual long-term assessments for the ERCOT Region.

In even-numbered years, the LTSA complies with the requirements of both the PUC and NERC standards. In order to meet the NERC standard requirements in odd-numbered years, ERCOT has completed a review of the 2008 LTSA and provided an assessment below.

Background

The LTSA provides a 10-year-out assessment of transmission needs. This assessment is not conducted to provide specific recommendations for transmission projects, but to inform and improve the five-year planning process in two ways. First, the 10-year plan provides a longer term view of system reliability needs. For example, a small transmission improvement may appear to be sufficient in the five-year planning horizon, but the 10-year planning horizon may indicate that a larger project will be required. In this case the larger project may be more cost-effective than multiple smaller projects recommended in consecutive Five-Year Plans. Second, the 10-year plan can indicate system needs that require solutions that will take longer than 5 years to implement. In such cases, it is desirable to incorporate these projects into the 5-year evaluation process as early as possible.

2009 Assessment

In December, 2008, ERCOT completed the LTSA based on the most recently completed ERCOT Five-Year Plan. It incorporated all generation in operation and all generation for which there was a signed interconnection agreement. The base transmission topology included the transmission improvements ordered by the PUC in August 2008 as part of the designation of Competitive Renewable Energy Zones (CREZ), along with the wind generation facilities for which the CREZ transmission improvements were designed.

A comparison between the system conditions at the time of the 2008 LTSA and current system conditions indicate no significant change to the system conditions. The factors include:

- No significant change in the amount of available generation
- Continuing network topology improvements
- Reduction in long-range system demand forecast primarily due to economic conditions

Based on these conditions, no further review of long-term system needs is warranted as the most recent LTSA still adequately reflects the long-term outlook for the ERCOT system.

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11. Contacts and Links

11.1 Contacts and Information

For general communications and queries, the public can submit a request for information at: http://www.ercot.com/about/contact/inforequest.cfm

Media:	Regulatory:	Government Relations:
Dottie Roark	Matt Morais	Theresa Gage
512-225-7024	512-225-7177	512-225-7074

11.2 Internet Links

ERCOT Home Page: http://www.ercot.com

Operations and System Planning Data Area: http://planning.ercot.com

Users must register for access to this area. Folders in this area include data, procedures, reports and maps for both operations and planning purposes. Helpful information that can be found on this site includes:

- Capacity, Demand, and Reserves Reports
- Demand and Energy Reports (D&E) Monthly Actuals
- Generation Project Interconnection Information
- Regional Planning Group information
- Steady-State Base Cases
- System Protection Data
- Transmission Project and Information Tracking (TPIT)

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12. Disclaimer

This report was prepared by the Electric Reliability Council of Texas (ERCOT) staff. It is intended to be a report of the status of the transmission system in the ERCOT Region and ERCOT's recommendations to address transmission constraints. Transmission system planning is a continuous process. Conclusions reached in this report can change with the addition (or elimination) of plans for new generation, transmission facilities, equipment, or loads.

Information on congestion costs presented herein is based on the most recent settlement calculations at the time of the development of this report. Future settlements as well as ERCOT Board of Directors and Public Utility Commission of Texas directives may change the figures presented herein.

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