Report on Existing and Potential Electric System Constraints and Needs

December, 2008

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1.0 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 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 2007 through August 2008 and of planned improvements for 2009 through 2013, in addition to providing 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 maximum efficiency from the existing network.

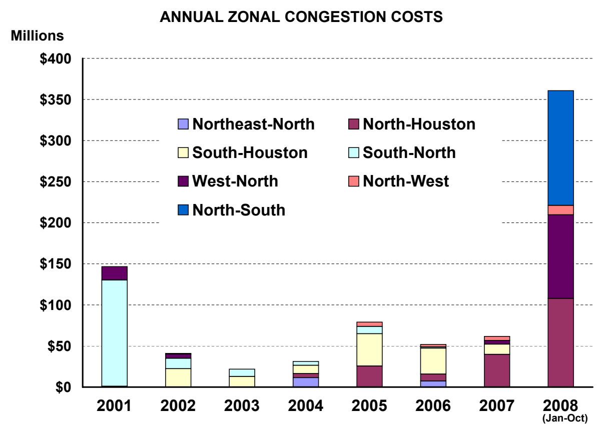
Load Forecasting - Load forecasts developed by ERCOT planning staff using econometric modeling techniques, as well as delivery point forecasts developed by Transmission Service Providers (TSPs), are used to study projected system needs due to customer load growth.

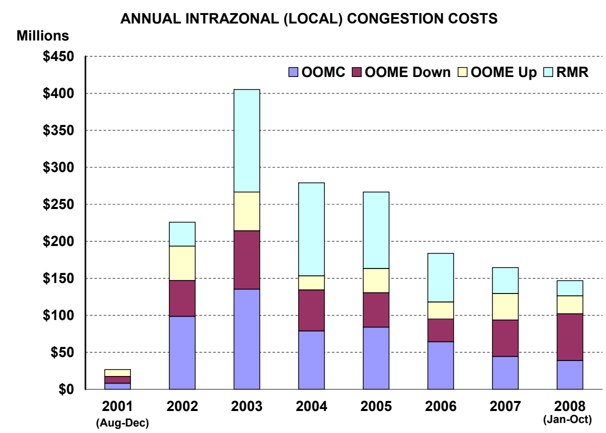
Generation Interconnections - ERCOT processes requests to interconnect, change, or decommission generation throughout the ERCOT Region. Studies of these requests enable planning staff to analyze and respond to the impact of the resulting changes in power injection into the system.

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 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 had been trending downward over the past few years, from a high of approximately $146 million in 2001 to approximately $52 million in 2007. However in 2008, a combination of events, including high fuel costs, revised shadow prices, and increased wind generation, may be attributed to the higher inter-zonal congestion costs, approximately $360 million. Intra-zonal (local) congestion costs are approximately the same as they were in 2007.





Since 2007, ERCOT Transmission Service Providers (TSPs) have completed numerous improvement projects of approximately 1,294 circuit miles of transmission and about 6,613 MVA of autotransformer capacity , with an estimated capital cost of over $1.2 billion.

SUMMARY OF MAJOR COMPLETEDTRANSMISSION IMPROVEMENTS				
Weather Zone	**Major Completed Improvements**	**Voltage (kV)**	**Year in Service**	**Circuit Miles**
Coast	Hillje Switching Station and New Lines to STP and WAP	345	2007	117
East	Jack Creek New Station and Auto, Tabor Substation Upgrade to 138kV	345/138	2008	
North Central	Copperas Cove – Ding Dong New Line	138	2008	16
North Central	Temple Pecan Creek – Lake Creek Upgrade	138	2008	29
North Central	Euless – Keller Upgrade	138	2007	29
South Central	Cagnon – TX Research – Lytle New Line	138	2008	22
South Central	Kendall – CPS Cagnon New Line	345	2007	45
West	Lampasas – Adamsville – Evant Upgrade	138	2008	26
West	Asphalt Mines – Brackettville Rebuild	138	2007	39
All areas	Total Lines	69/138/345	2007-2008	1,294
All areas	Total Autotransformers	69/138/345	2007-2008	6,613 MVA

The planned projects included in this report to serve the electric system through 2013 are estimated to cost approximately $3 billion over the next five years and are expected to improve or add 2,888 circuit miles of transmission lines and 17,185 MVA of autotransformer capacity to the ERCOT system.

SUMMARY OF MAJOR PLANNED TRANSMISSION IMPROVEMENTS				
Weather Zone	**Major Planned Improvements**	**Voltage (kV)**	**Year in Service**	**Circuit Miles**
Coast	Waller-Prairie View-Seaway-Macedonia Reconductor	138	2010	22
Coast	Zenith Switching Station	345	2011	
East	Singleton Switching Station	345	2009	
East	Robertson - Watson Chapel Rebuild	138	2010	21.6
East	Bell County SE New Station	345	2011	
East - North Central	Twin Oaks - Bell County SE	345	2011	88
North	Oklaunion - Bowman New Line	345	2012	50
North Central	Parkdale Dynamic Project	138	2009	
North Central - South Central	Hutto Switch - Salado Switch New Line and Switching Station	345	2010	73.8
North Central	Renner Dynamic Project	138	2010	
South Central - West	Uvalde Area Project	138	2011	77.5
South Central	Zorn/Clear Springs-Gilleland Creek-Hutto Switch New Line	345	2012	172.5
All areas	Total Lines	69/138/345	2009-2013	2,888
All areas	Total Autotransformers	69/138/345	2009-2013	17,185 MVA

Additionally, this Constraints and Needs report contains a summary of the Competitive Renewable Energy Zone process and results, as well as a summary 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.

For this planning process, ERCOT seeks input from all market participants and stakeholders about options and possible solutions. The ERCOT-led Regional Planning Group (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 consider 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 five to ten 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 also 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 being revised. The most recent version is available at http://www.ercot.com/calendar/2008/11/20081114-RPG and the final approved version will be available at http://www.ercot.com/committees/other/rpg.

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3.0 Load

Forecasting electrical demand[2] and energy is one of the most significant factors in determining the future infrastructure needs of the ERCOT power system. If the forecast understates 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. This year, the key factor driving the lower peak demands and energy consumption (MWh) is the overall outlook of the economy, as measured by economic indicators such as the real per capita personal income, population, gross domestic product, and various employment measures including non-farm employment and total employment.

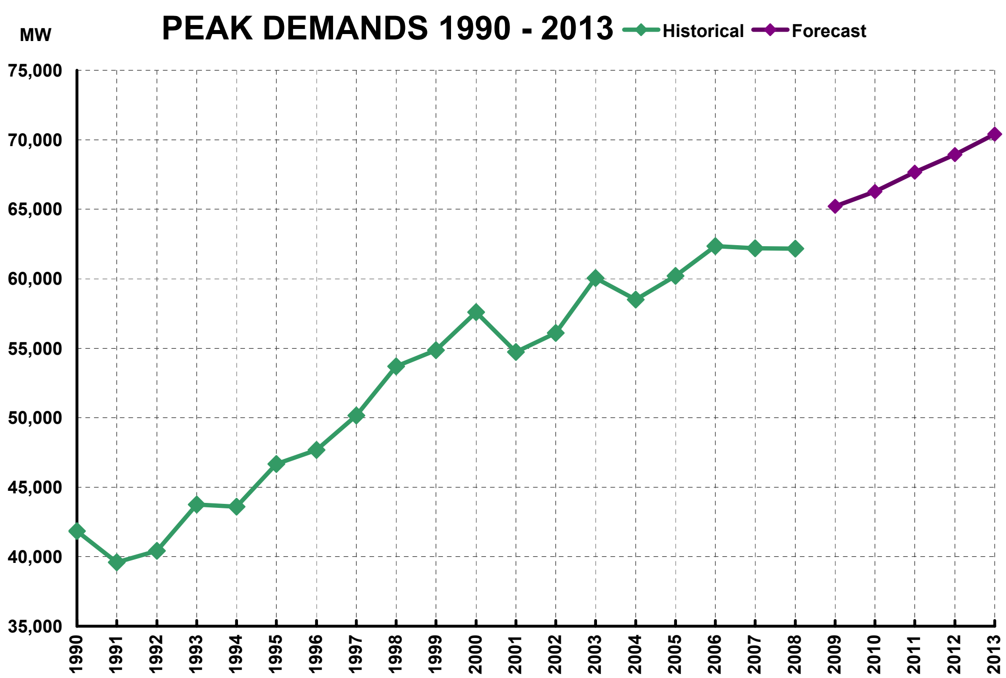
ERCOT develops peak demand and energy forecasts that reflect the outcome of differing economic and weather outlooks and uncertainties and, in cooperation with TSPs, selects a most probable scenario for planning purposes.

2 The 2008 Long-Term Hourly Peak Demand and Energy Forecast can be found at http://www.ercot.com/news/presentations.

3.1 Peak Demand

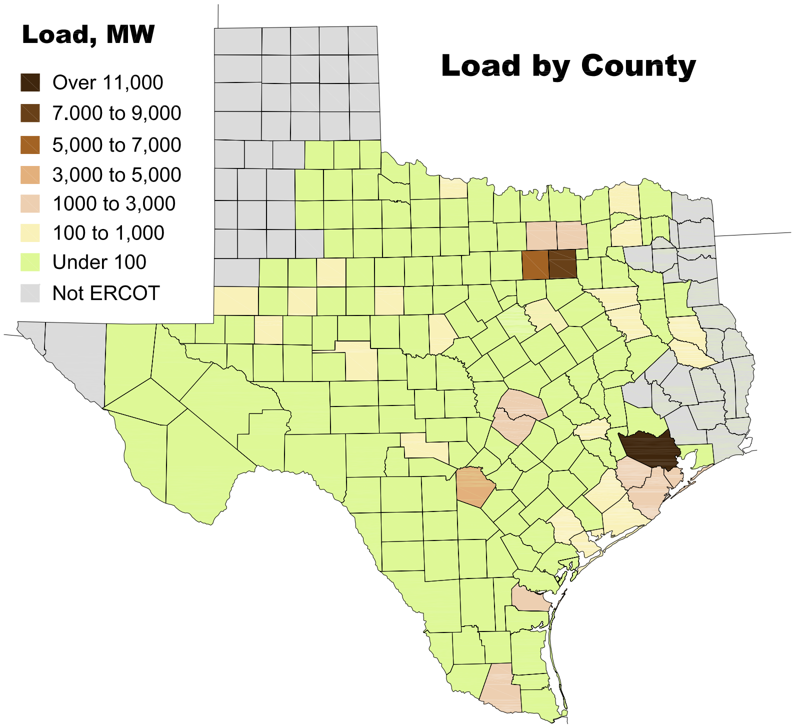
The 2009 summer peak demand forecast of 65,222 MW represents an increase of less than 1% over the 2008 summer peak forecast of 64,927 MW and an increase of 4.8% from the 2008 actual peak demand of 62,190 MW. The 2008 peak demand was lower than expected, possibly due in part to tropical storm impacts on weather patterns. ERCOT is evaluating the 2008 actual peak results and will provide an analysis in the 2009 Long-Term Demand Forecast due in May.

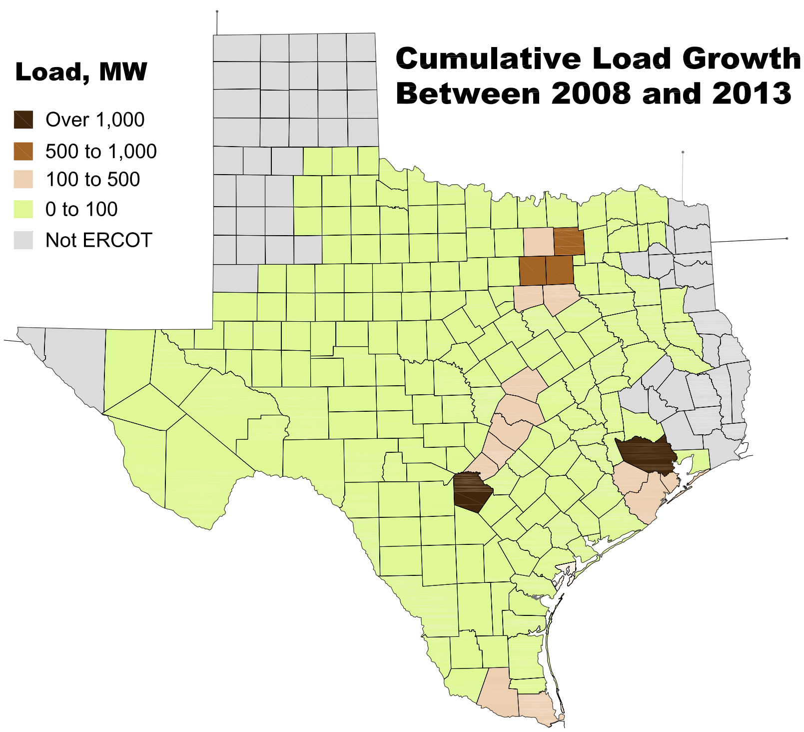
The figure below shows the historic peak demand from 1990 through 2008 and the forecasted peak demand through 2013. The historic compound growth rate for the last ten years has been just under 1.5%. The forecasted growth rate between 2009 and 2013 is approximately 1.8%. The all-time peak demand for ERCOT occurred on August 17, 2006 and was 62,339 MW.



3.2 Non-coincident Peak by County

The loads by county shown to the right are non-coincident peak demand forecasts provided by the TSPs in the 2008 Annual Load Data Request (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.



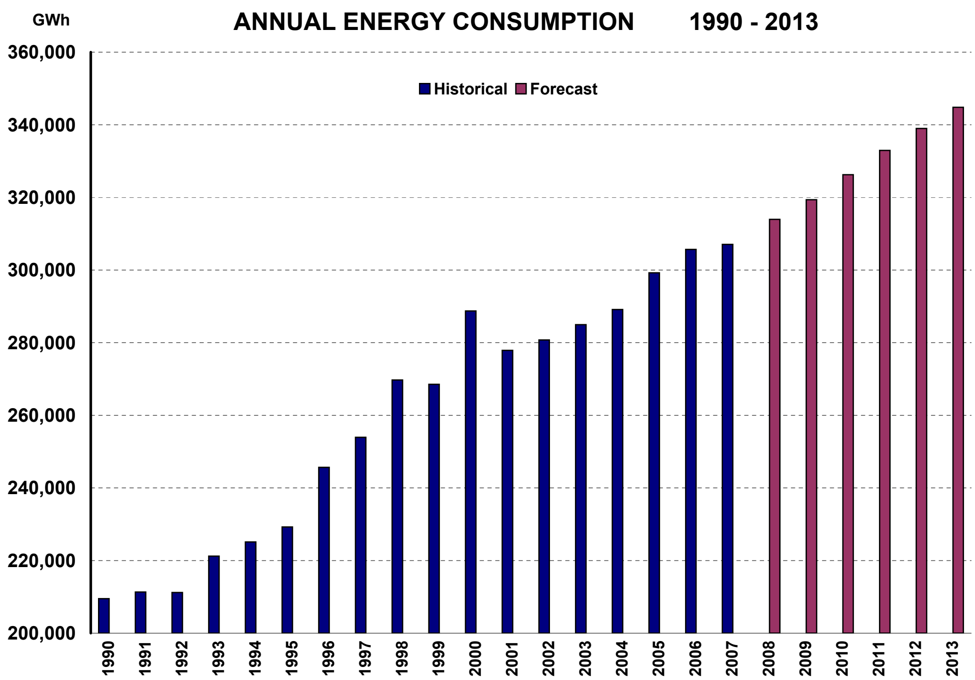


While ERCOT's overall peak demand forecast from 2008 predicts a 1.8% annual growth rate, some areas within the state are experiencing growth over 6%, and some areas are experiencing slight declines. As expected, the greatest growth is around the metropolitan areas. The counties with the greatest expected cumulative load growth are Harris, Bexar, Dallas, Tarrant, and Collin. Other areas expected to experience significant load growth include the counties along the Interstate 35 corridor between San Antonio and Waco, counties near Dallas and Houston areas, and the counties in the lower Rio Grande Valley.

3.3 Energy

While the peak demand forecast provides an indication of the size electrical facilities 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 figure below shows the historical and forecasted energy consumption. The ten-year historical growth rate from 1995 through 2007[3] was approximately 2.47%, and the forecasted growth rate between 2008 and 2013 is 1.94%.

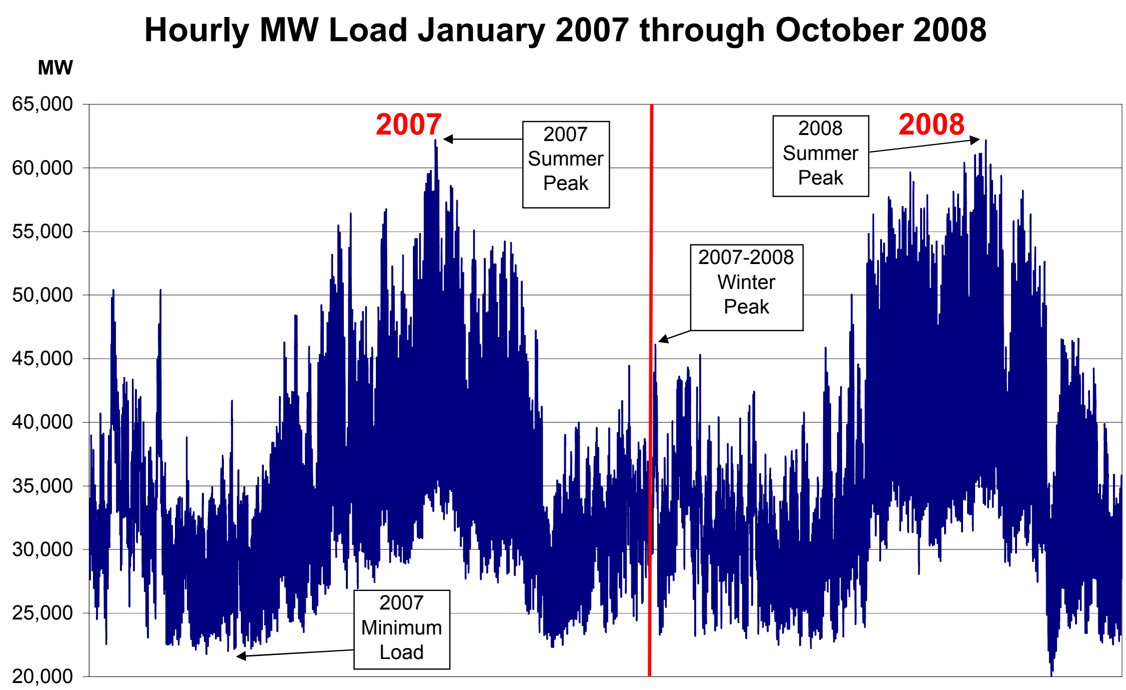


3 Historical energy data for 2008 is not available at the time of the writing of this report.

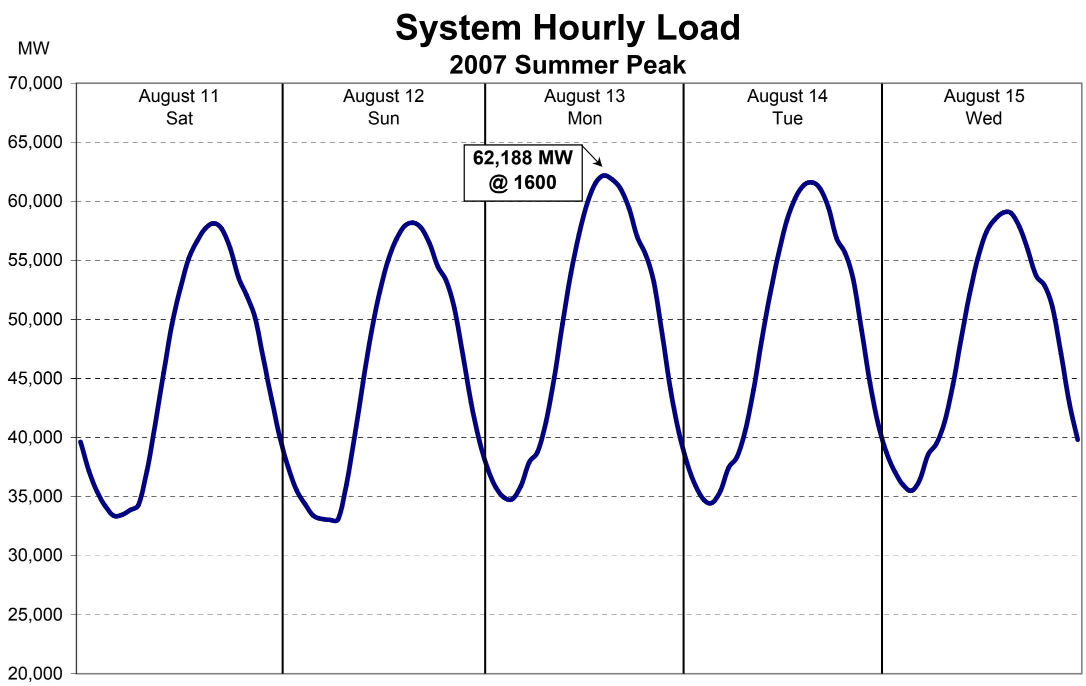
3.4 Hourly Load

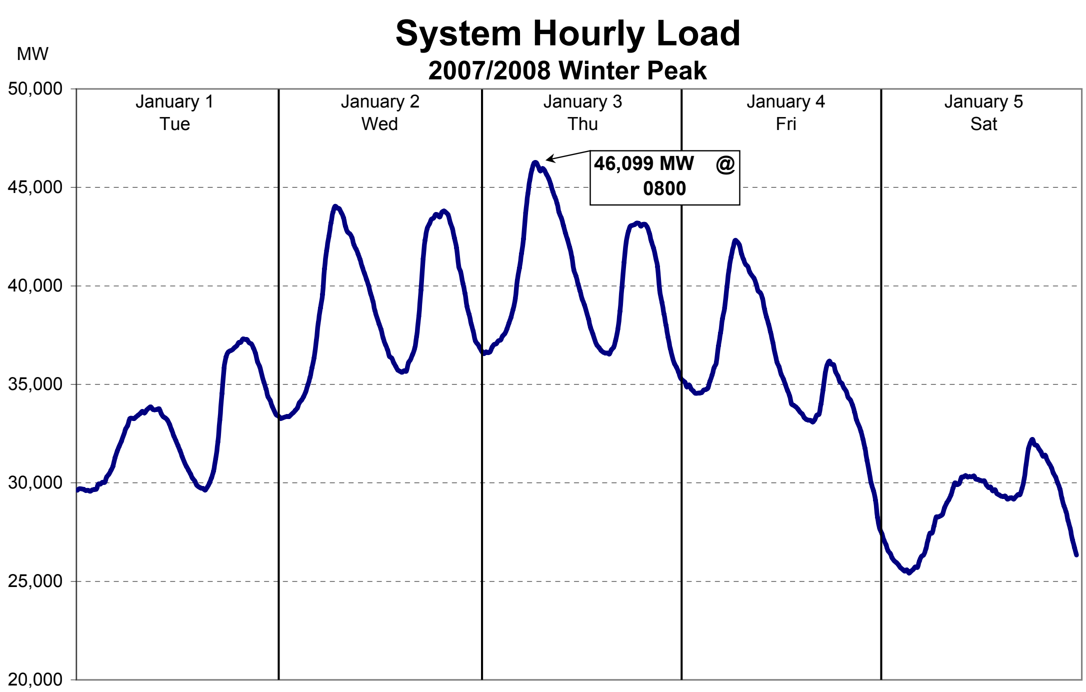
Hourly load is an extremely useful tool for understanding the magnitude change and the pattern of the load being served over a specific time. The following pages illustrate some of the varying load shapes encountered while operating the grid.

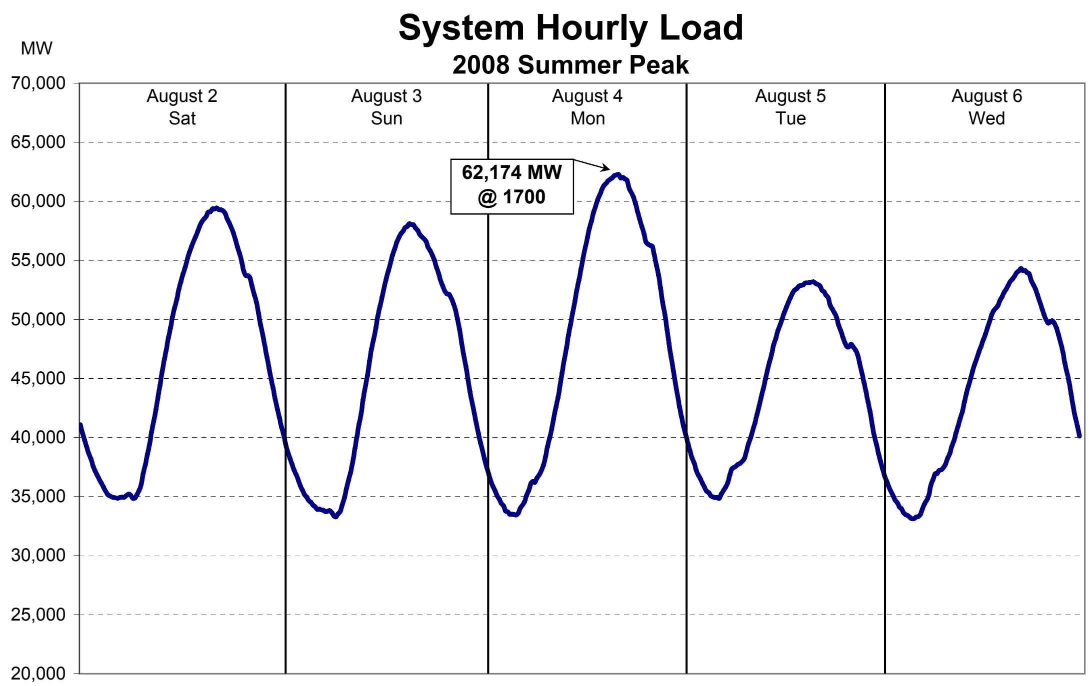
This chart shows the load shapes over the time frame of this report.

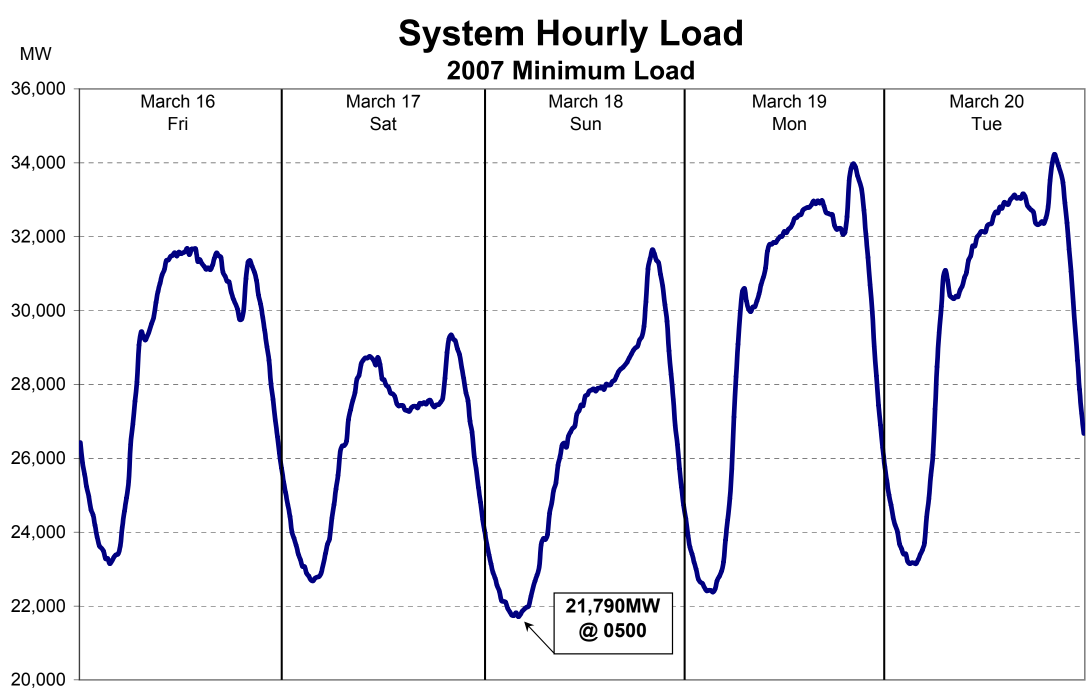


The following four charts are close up views around the minimum load and the seasonal peaks.






System Hourly Load
2008 Summer Peak
MW
70,000
65,000
60,000
55,000
50,000
45,000
40,000
35,000
30,000
25,000
20,000
August 2
Sat
August 3
Sun
August 4
Mon
August 5
Tue
August 6
Wed
62,174 MW
@ 1700


System Hourly Load
2007 Minimum Load
MW
36,000
34,000
32,000
30,000
28,000
26,000
24,000
22,000
20,000
March 16
Fri
March 17
Sat
March 18
Sun
March 19
Mon
March 20
Tue
21,790MW
@ 0500

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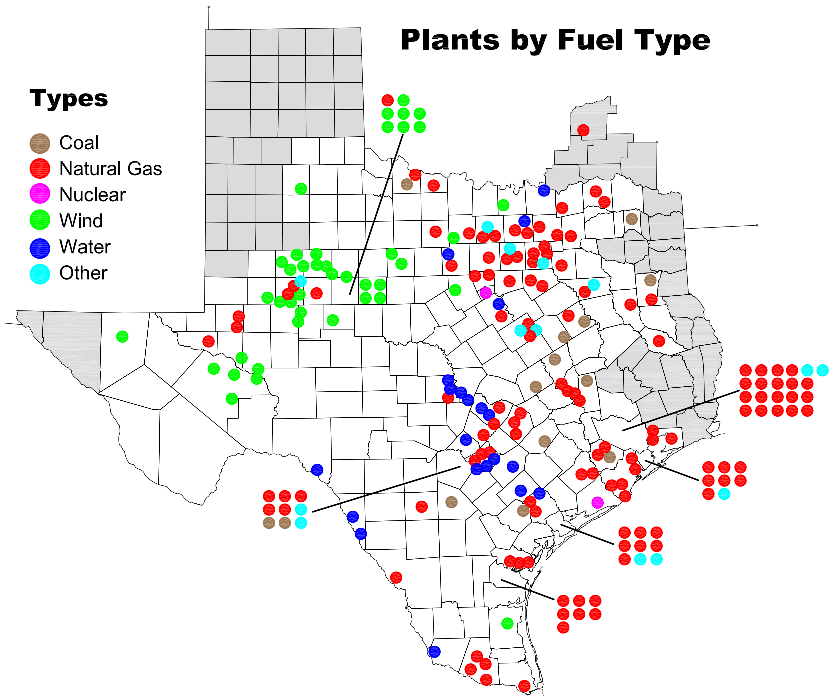
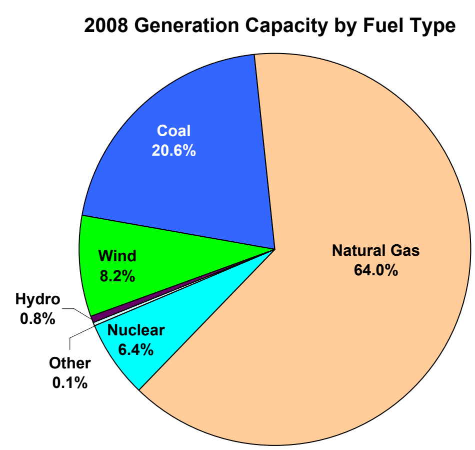
4.0 Generation

Current installed generation capacity[4] in the ERCOT Region is about 83,000 MW, which includes about 5,000 MW of generation that has suspended operations or been "mothballed".

In terms of installed capacity within ERCOT, approximately 64% is fueled by natural gas, followed by coal at 20.6%, wind at 8.2% and nuclear at 6.4%. The map below is an indicator of generating facilities across the region by fuel type, and the pie chart shows the installed capacity by fuel type.

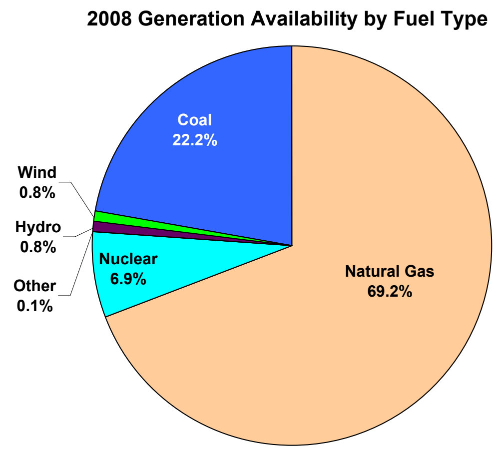


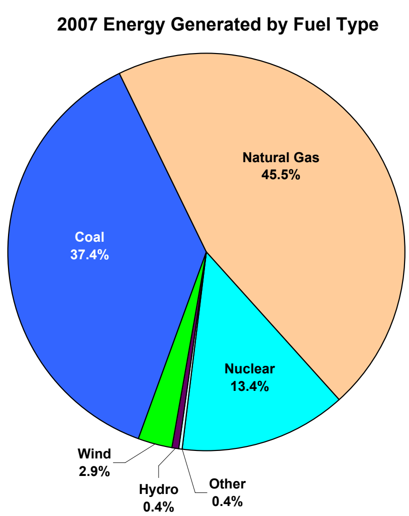
Dots do not reflect actual location of the unit within the county



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

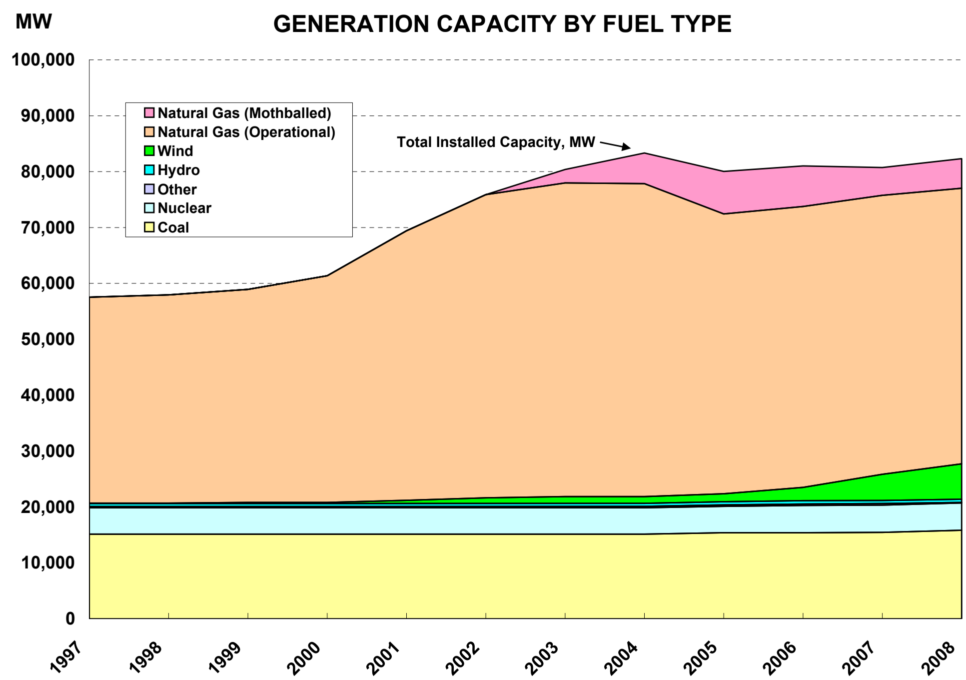
It is important to highlight the distinction between installed capacity and available capacity. Power from some fuel types, such as wind and water, may not be available coincident with system need. In terms of expected available capacity within ERCOT, approximately 69.2% is fueled by natural gas, followed by coal at 22.2%, and nuclear at 6.9%. Wind is only 0.8% when taking availability factor of 8.7% into account. The pie chart to the right shows the available capacity by fuel type.



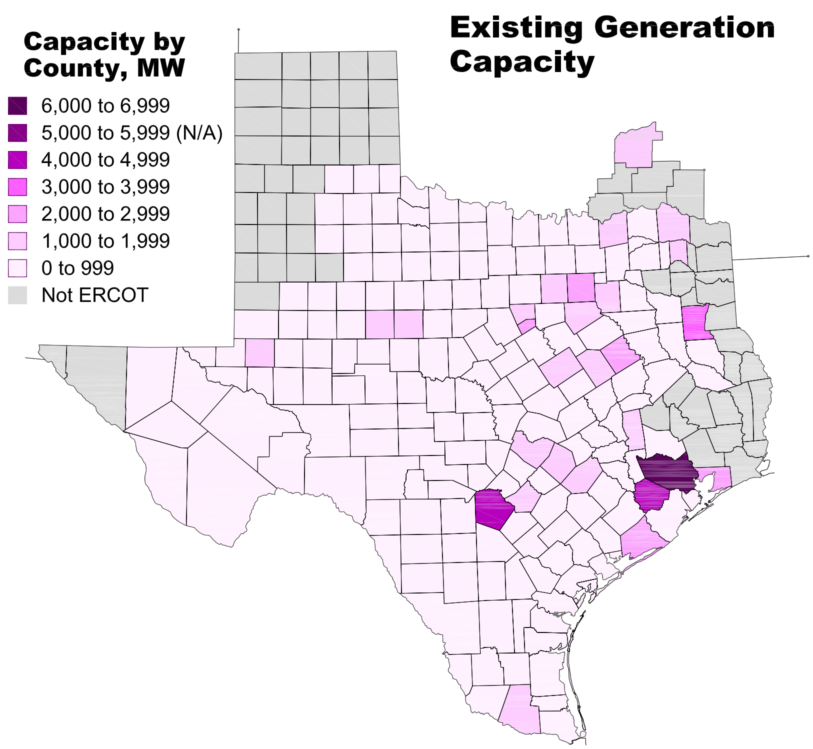


In terms of actual energy generated, the chart to the left shows that 45.5% of the energy generated in ERCOT in 2007 was from natural gas, 37.4% from coal, and 13.4% from nuclear, and 2.9% from wind.

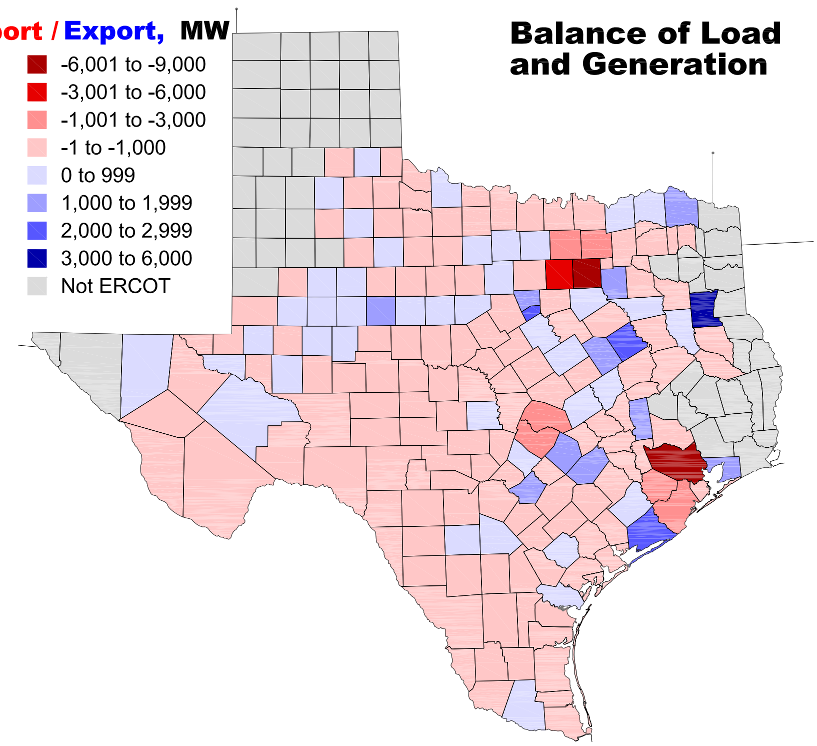
In 2008, most generation capacity additions were wind facilities, although several new gas generators have been added. The chart below trends installed capacity additions by fuel type.



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.

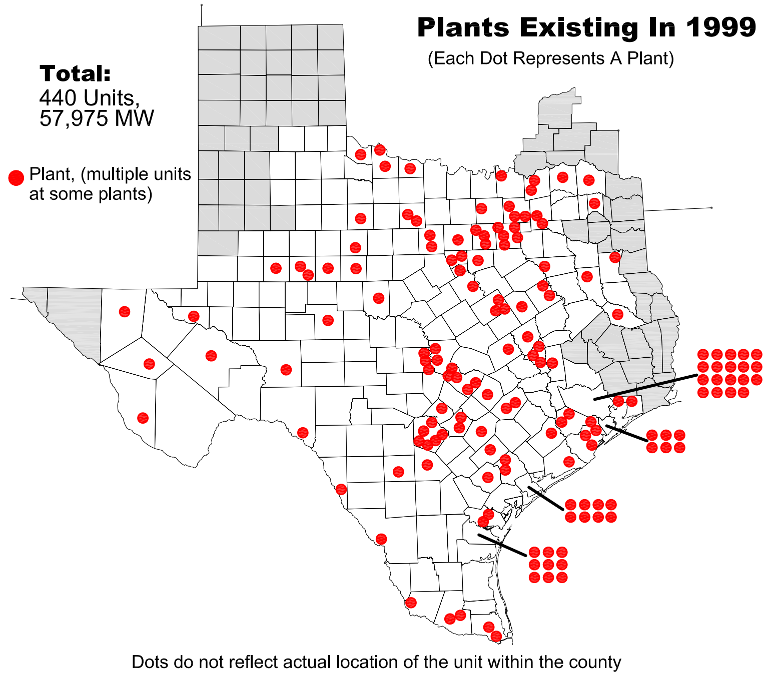


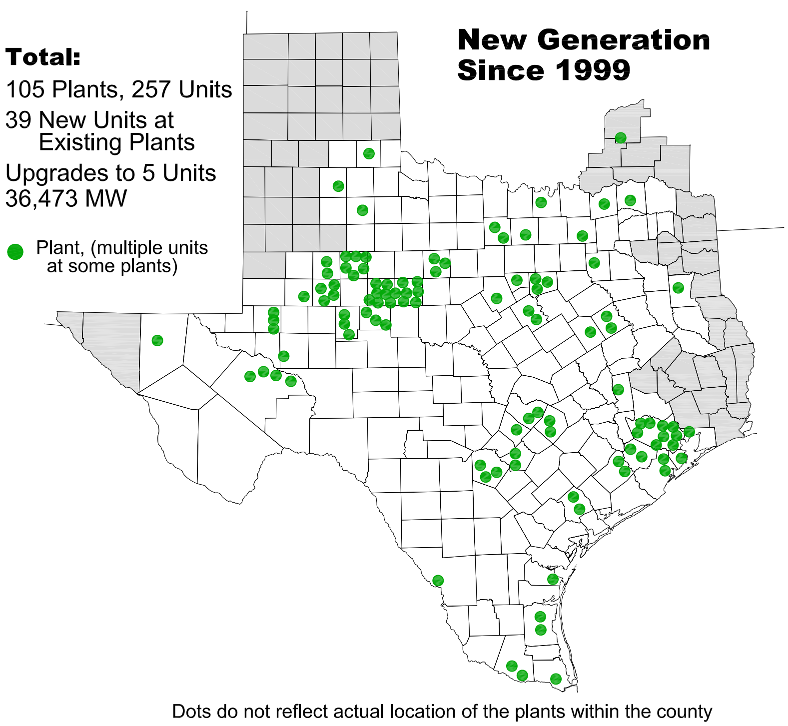
The map below illustrates the balance of load and generation within each county in the ERCOT region for the summer of 2008. A county with more generation than load will export generation to other counties; comparatively, a county with more load than generation will import generation from other counties. 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.

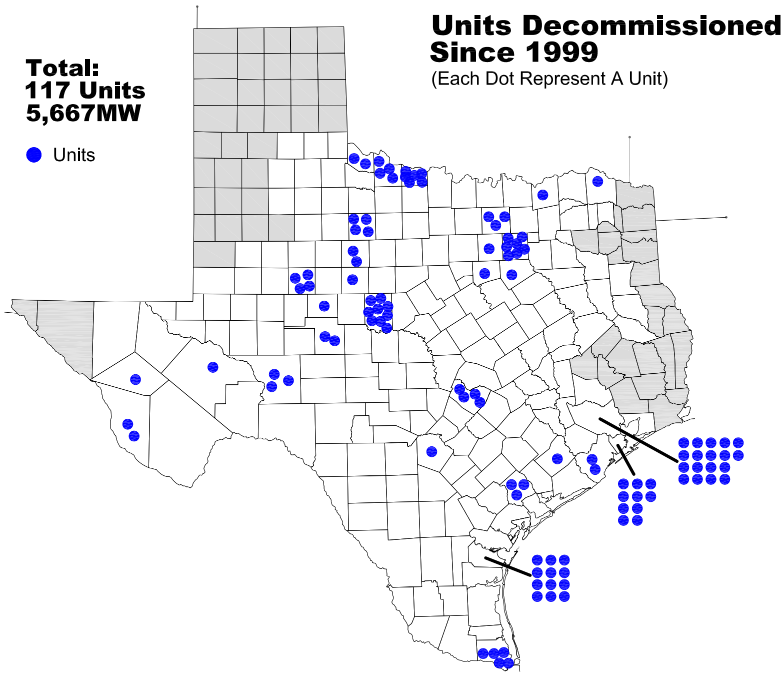




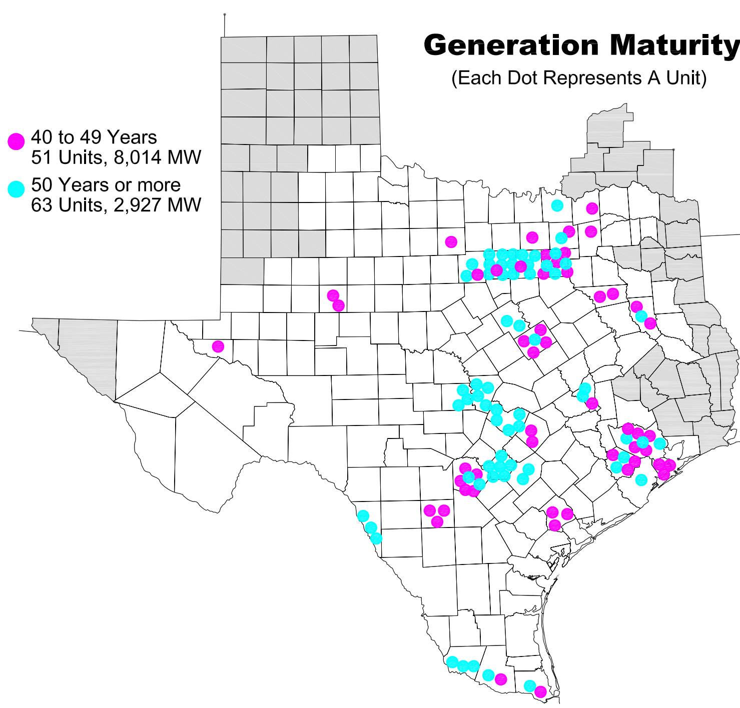
Since 1999, ERCOT capacity has grown by adding new generation sites, expanding existing sites, and upgrading or repowering existing units. The additional generation totals over 36,000 MW. Much of the new installed generation capacity added in the last few years is from large wind projects built in West Texas. This significant change in the generation portfolio has placed new challenges on the adequacy and the reliability of the existing transmission grid. The map to the left shows generation added within the ERCOT region between 1999 and November 2008.

Since 1999 a total of 108 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 a careful assessment of the reliability needs 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

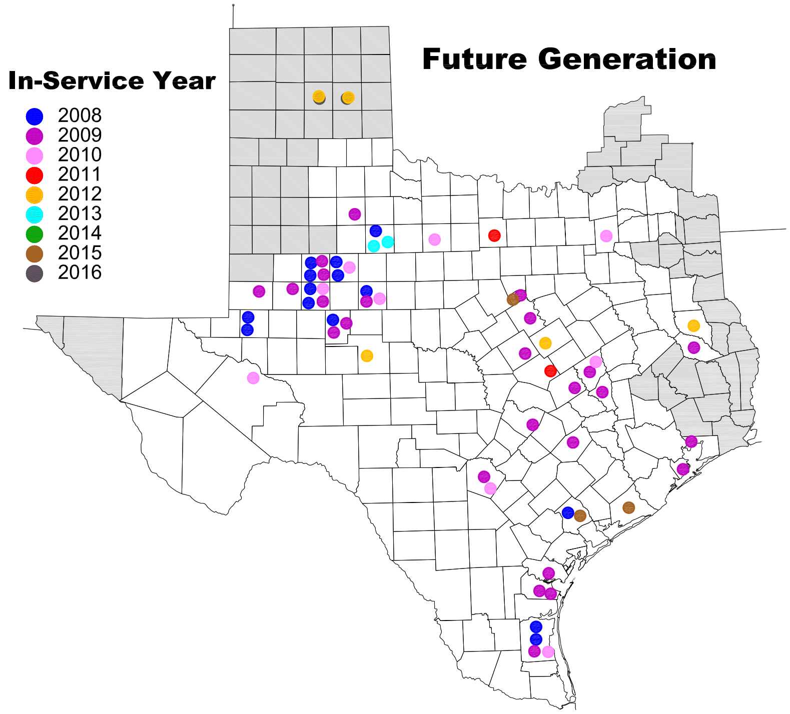


Dots do not reflect actual location of the unit within the county

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 are almost 11,000 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 a nameplate capacity over 102,000 MW . Of this capacity, over 26,000 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	**22,790**	**5,187**	**27,977**
Gas-CT	**1,353**	**505**	**1,858**
Nuclear	**3,200**	**9,186**	**12,386**
Coal	**5,375**	**4,131**	**9,506**
Wind	**40,690**	**7,194**	**47,884**
Solar	**863**	**0**	**863**
Biomass	**50**	**145**	**195**
Other	**1,480**	**0**	**1,480**
Total	**75,802**	**26,348**	**102,149**

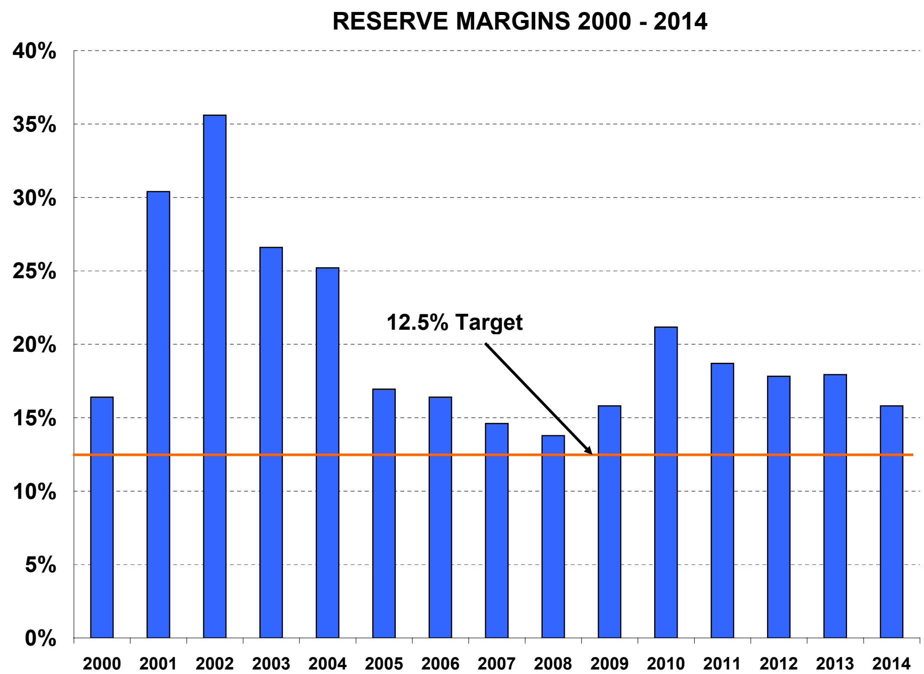
The following table shows the requests for new generation in ERCOT between January 2007 and November 2008.

GENERATION INTERCONNECTION REQUEST ACTIVITY IN 2008						
FUEL	SCREENING STUDIES REQUESTED		INTERCONNECTION STUDIES REQUESTED		INTERCONNECTION AGREEMENTS SIGNED	
	Number	MW	Number	MW	Number	MW
Coal	6	3,467	5	2,412	0	0
Gas-CC	11	8,154	14	13,080	5	1,802
Gas-CT	6	998	3	98	1	178
Wind	68	19,797	36	13,315	6	1,066
Solar	7	863	0	0	0	0
Other	1	1,200	1	1,200	0	0
Total	99	34,479	59	30,105	12	3,046
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.

5.0 Reserve Margin

Reserve margin[5] is the percentage by which the available generating capacity in the area exceeds the peak demand. The chart below shows the historical and projected reserve margins from 2000 through 2014, 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% reserve margin. The reserve margins for 2006 through 2014 were calculated using this new methodology.



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

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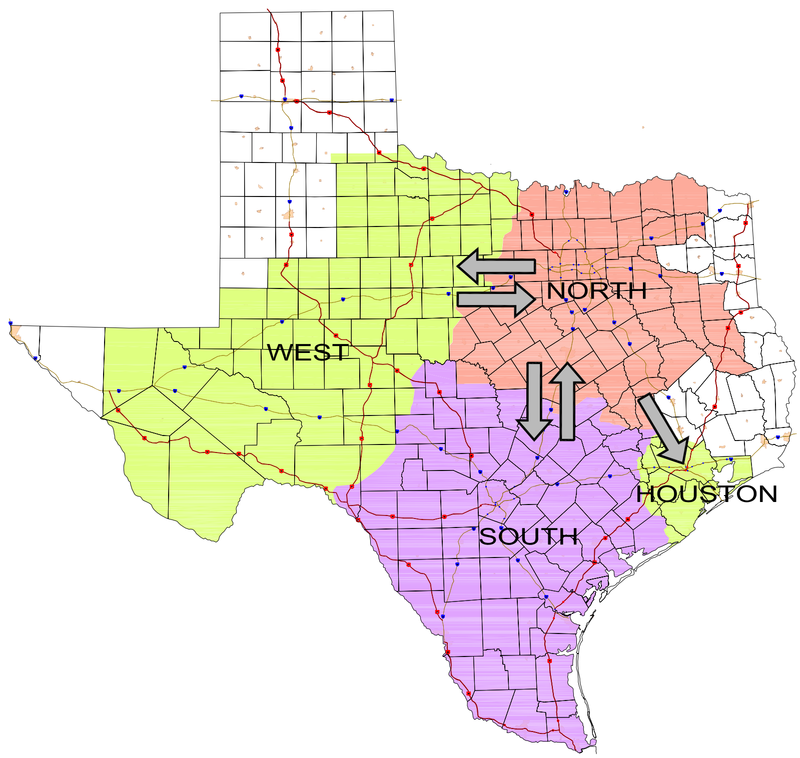
6.0 Congestion

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) 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

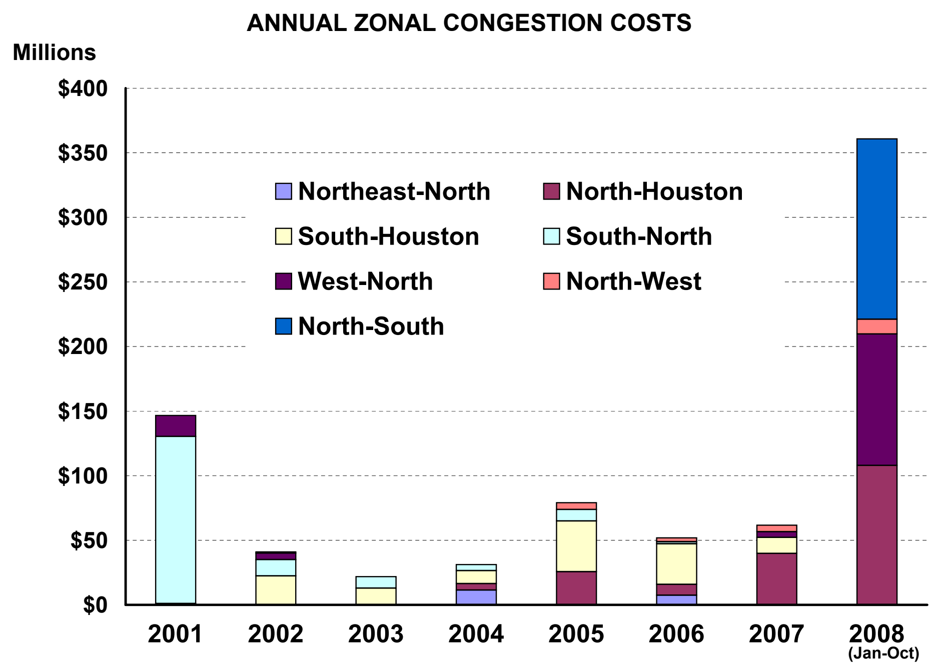
ERCOT currently operates a zonal balancing energy market for the resolution of transmission congestion between Congestion Zones. A Commercially Significant Constraint (CSC) is a constraint that is found to result in Congestion and may limit the flow of energy within the ERCOT market to a commercially-significant degree. The CSC is generally a 345-kV transmission facility that is representative of the flow between two zones.

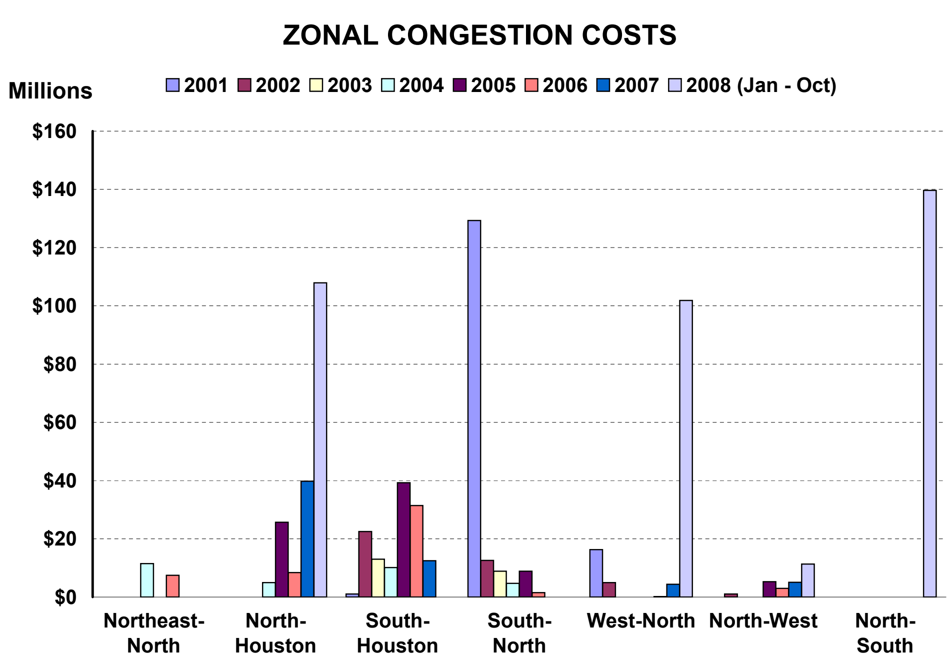


Each year studies are made to determine the Congestion Zones. For 2008 there were four congestion zones and five CSCs as illustrated to the right.

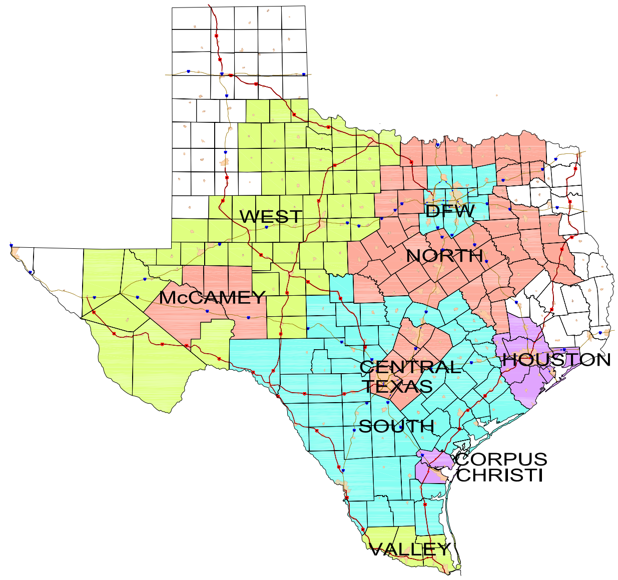
When an ERCOT system operator determines a CSC is congested, the operator reduces line loading by issuing instructions to increase the generation in the zone importing power and to decrease generation in the zone exporting power. The instructions are based upon the generator bids available in the balancing 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 2008 by CSC.





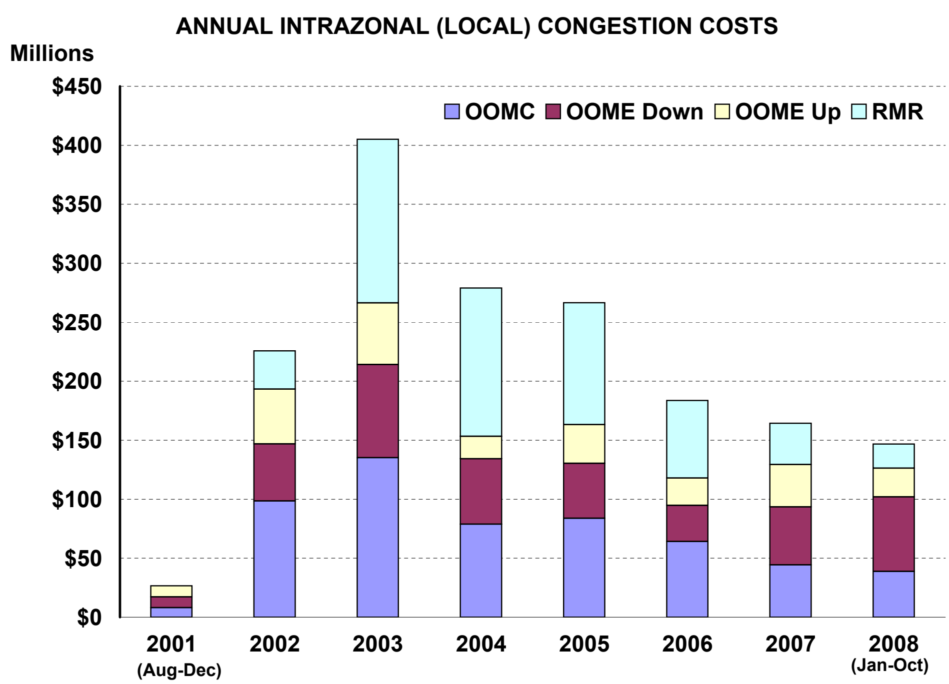
6.2 Local Congestion and Costs

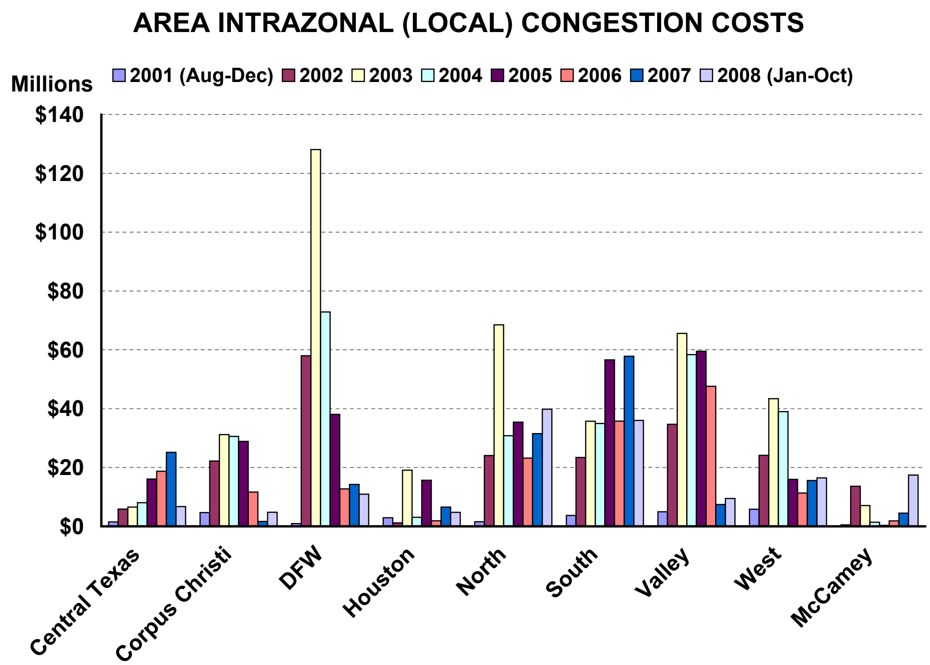


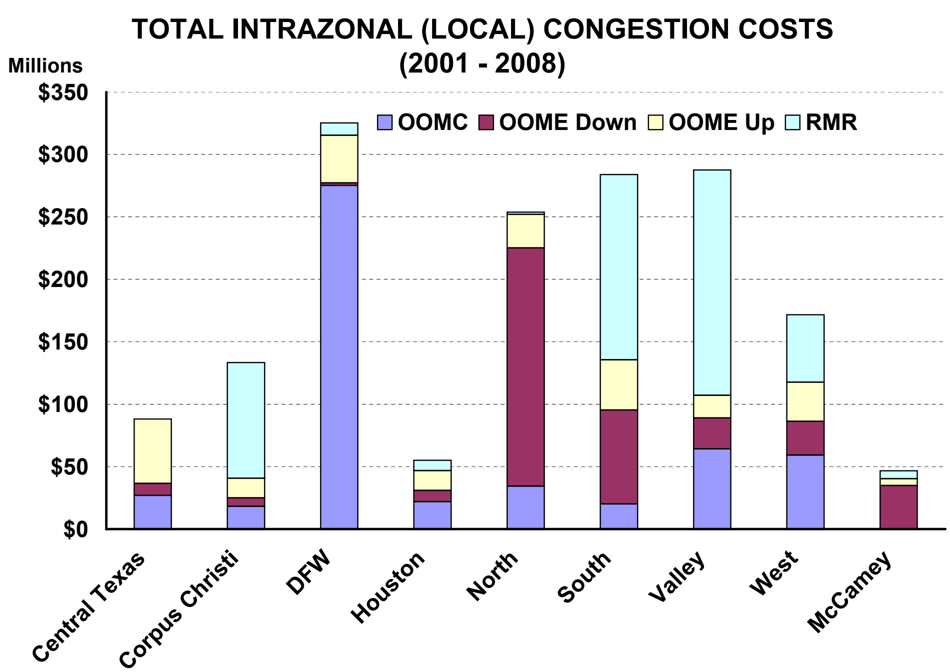
Intra-zonal or local congestion is the congestion that occurs within a congestion management zone. For reporting purposes, ERCOT has grouped local congestion into nine congestion areas with local constraints as illustrated on this map.

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 $164.4 million in 2007 and $146.8 million through October 2008, as shown below.




AREA INTRAZONAL (LOCAL) CONGESTION COSTS
Millions
2001 (Aug-Dec)
2002
2003
2004
2005
2006
2007
2008 (Jan-Oct)
$140
$120
$100
$80
$60
$40
$20
$0
Central Texas
Corpus Christi
DFW
Houston
North
South
Valley
West
McCamey


TOTAL INTRAZONAL (LOCAL) CONGESTION COSTS
(2001 - 2008)
Millions
$350
$300
$250
$200
$150
$100
$50
$0
OOMC
OOME Down
OOME Up
RMR
Central Texas
Corpus Christi
DFW
Houston
North
South
Valley
West
McCamey

7.0 Transmission Improvements

In order to improve grid reliability and power deliverability, as well as to reduce congestion and the associated congestions costs, ERCOT completes system planning studies of the ERCOT transmission system. Since January of 2006, ERCOT TSPs have completed major projects estimated at over $2 billion, as well as numerous smaller projects not reported through ERCOT transmission project tracking. The major projects that are being considered over the next five years to meet the growing electricity needs are estimated at almost $3 billion. In addition, the PUC has issued an order in Docket 33,672 which provides for transmission construction necessary to deliver energy from several Competitive Renewable Energy Zones (CREZs) to ERCOT load. The projects and project costs of this CREZ transmission are not included in this report.

Transmission system improvements and expansions that are needed 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 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. RMR requirements are also taken into consideration, but as of this report, there are no RMR units under contract for 2009.

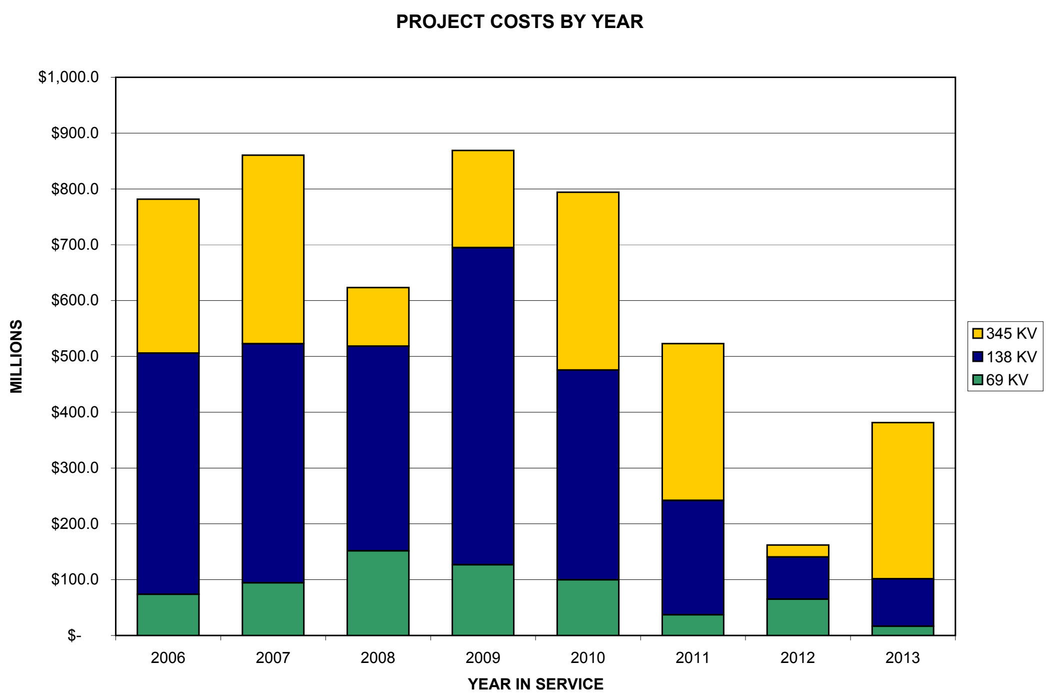
Since 2007, TSPs have completed projects adding over 315 miles of new circuits, upgrading almost 980 miles of transmission lines, and installing over 6,600 MVA of autotransformer capacity. The projects that are now being considered over the next five years are expected to add almost 1,300 miles of new circuits, improve almost 1,600 circuit miles of transmission lines, and add over 17,000 MVA of autotransformer capacity.

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.

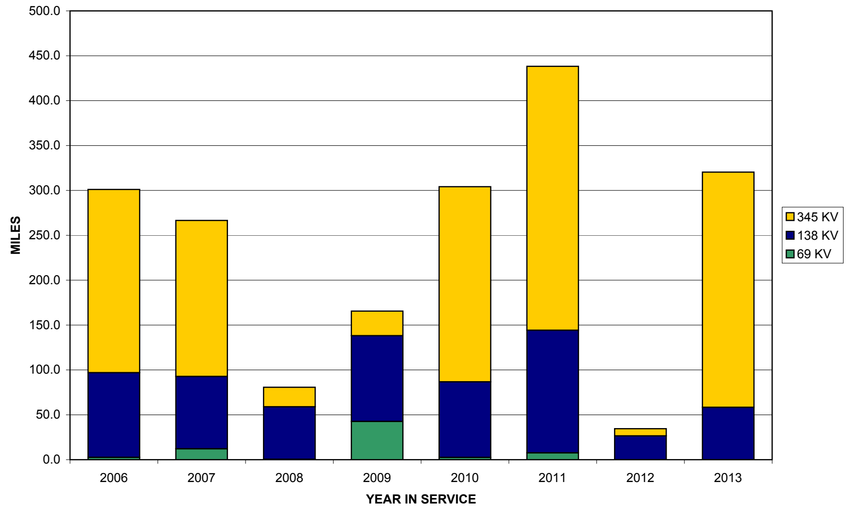
The following figures show improvements based on completed and planned projects[6] and do not reflect actual overall transmission cost, including operations and maintenance, in a given year. The actual costs for a single project will be spread over several years to account for engineering, regulatory 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 through 2013.

The following three charts provide a breakdown of both completed and recommended projects by new transmission, improved transmission, and autotransformer capacity additions by in-service year through 2013.

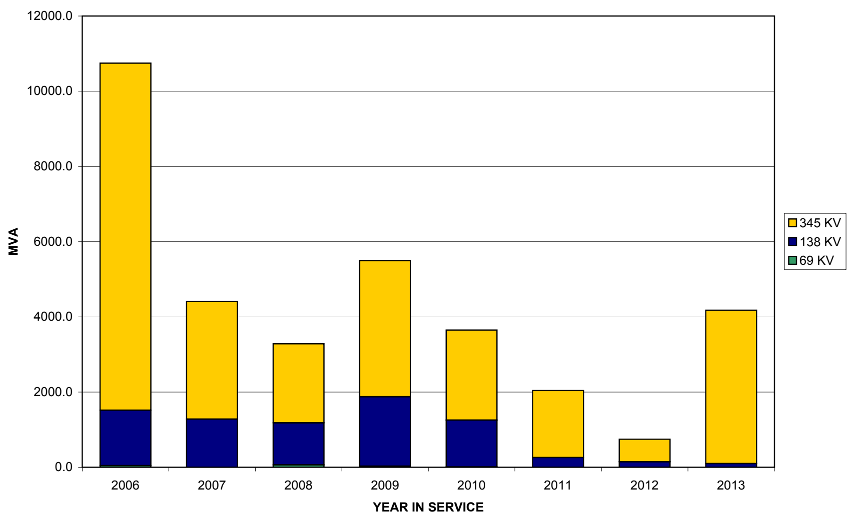


6 The projects included in these graphs are listed in ERCOT's Transmission Project Information Tracking (TPIT) spreadsheet found at http://planning.ercot.com/reports/tpit. This is located on the secure Planning and Operations web site, http://planning.ercot.com/login/login. There may be additional minor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

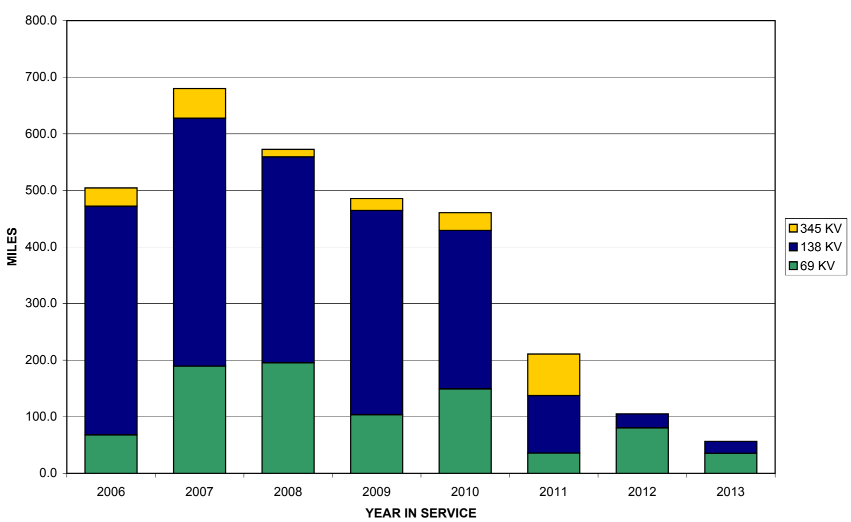
CIRCUIT MILE ADDITIONS BY YEAR



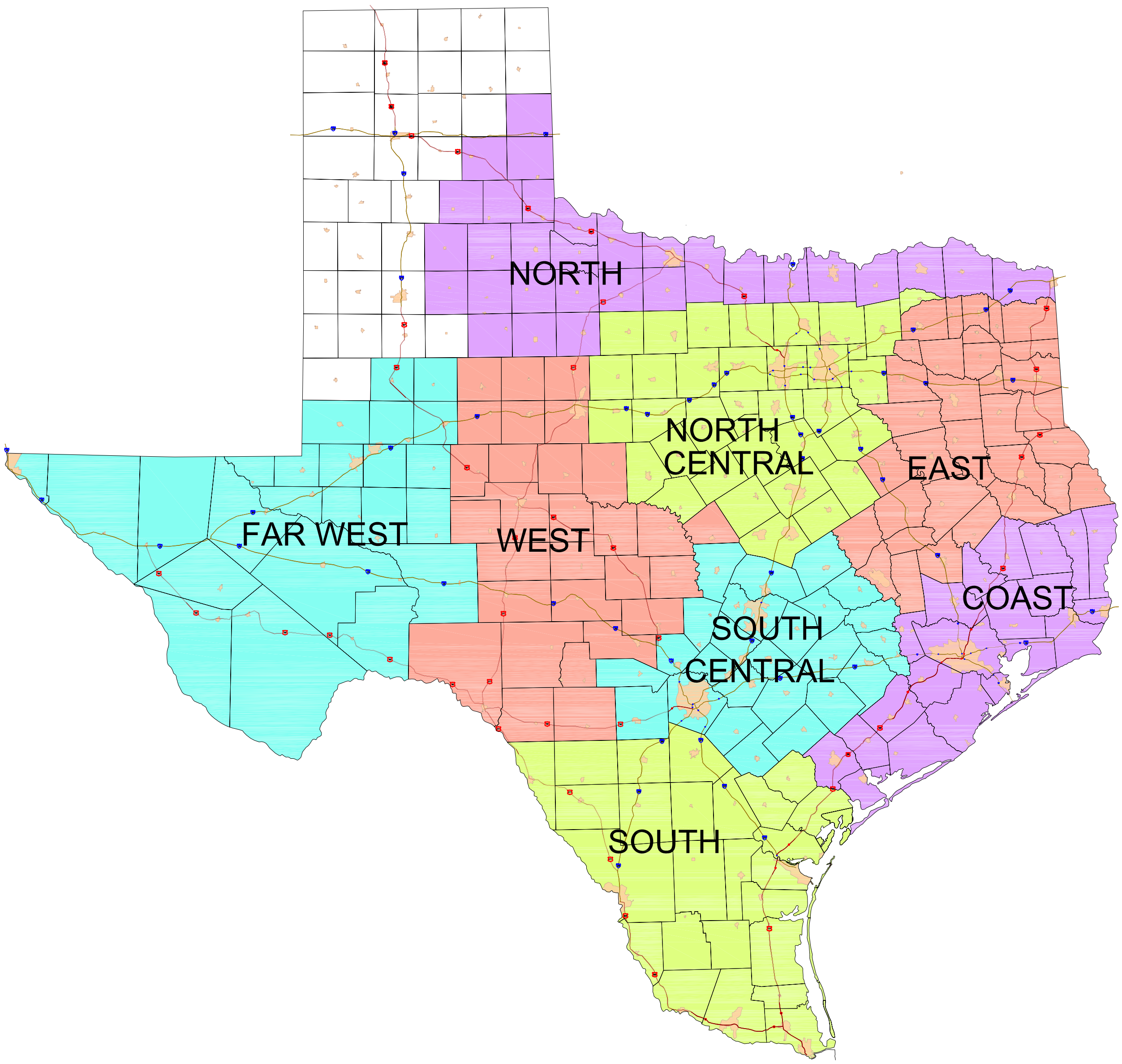
AUTOTRANSFORMER IMPROVEMENTS BY YEAR



CIRCUIT IMPROVEMENTS BY YEAR



ERCOT WEATHER ZONES



8.0 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 brief discussions of issues along with supporting tables and maps. Elements at 345 kV are illustrated in red, 138 kV are in blue, and 69 kV are in green. Power plants are illustrated with square blocks, and substations and switching stations are indicated with circles.

Recent Constraints – the elements that have caused local congestion on the system at some point during 2008, 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 2007 and 2008.

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	
(yellow)	*Low*
(orange)	*Medium*
(dark brown)	*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.

> 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 would be required to eliminate the constraints.

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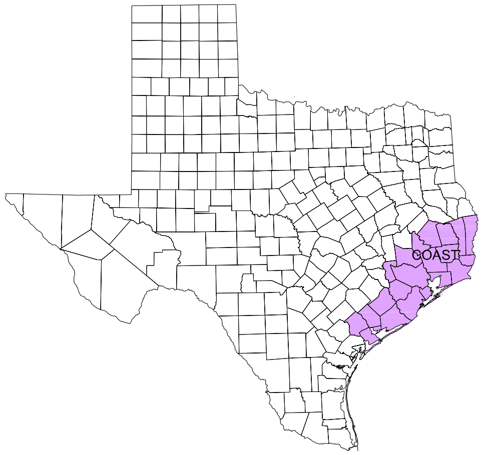
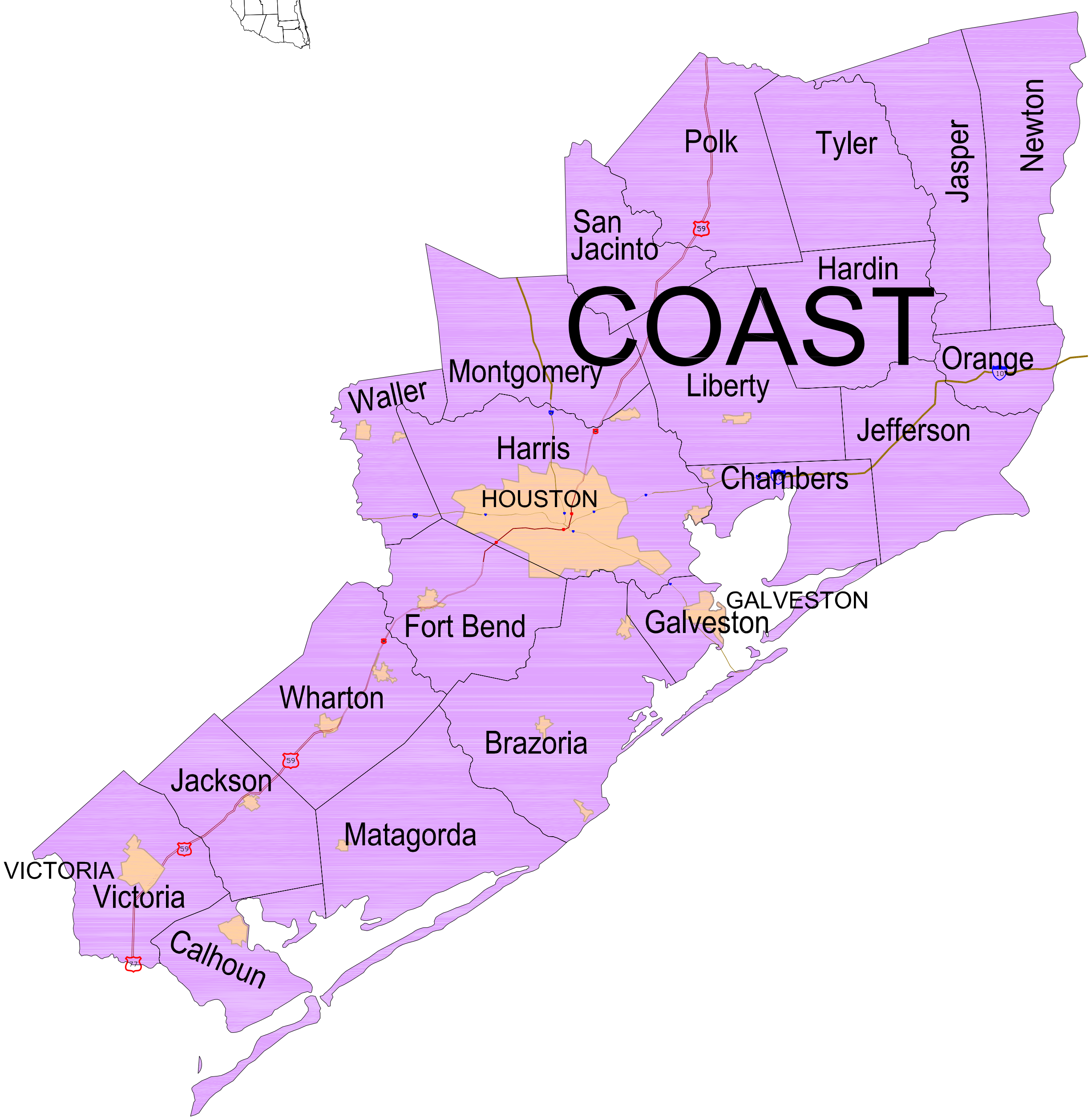
8.1 Area Constraints and Improvements – Coast Weather Zone

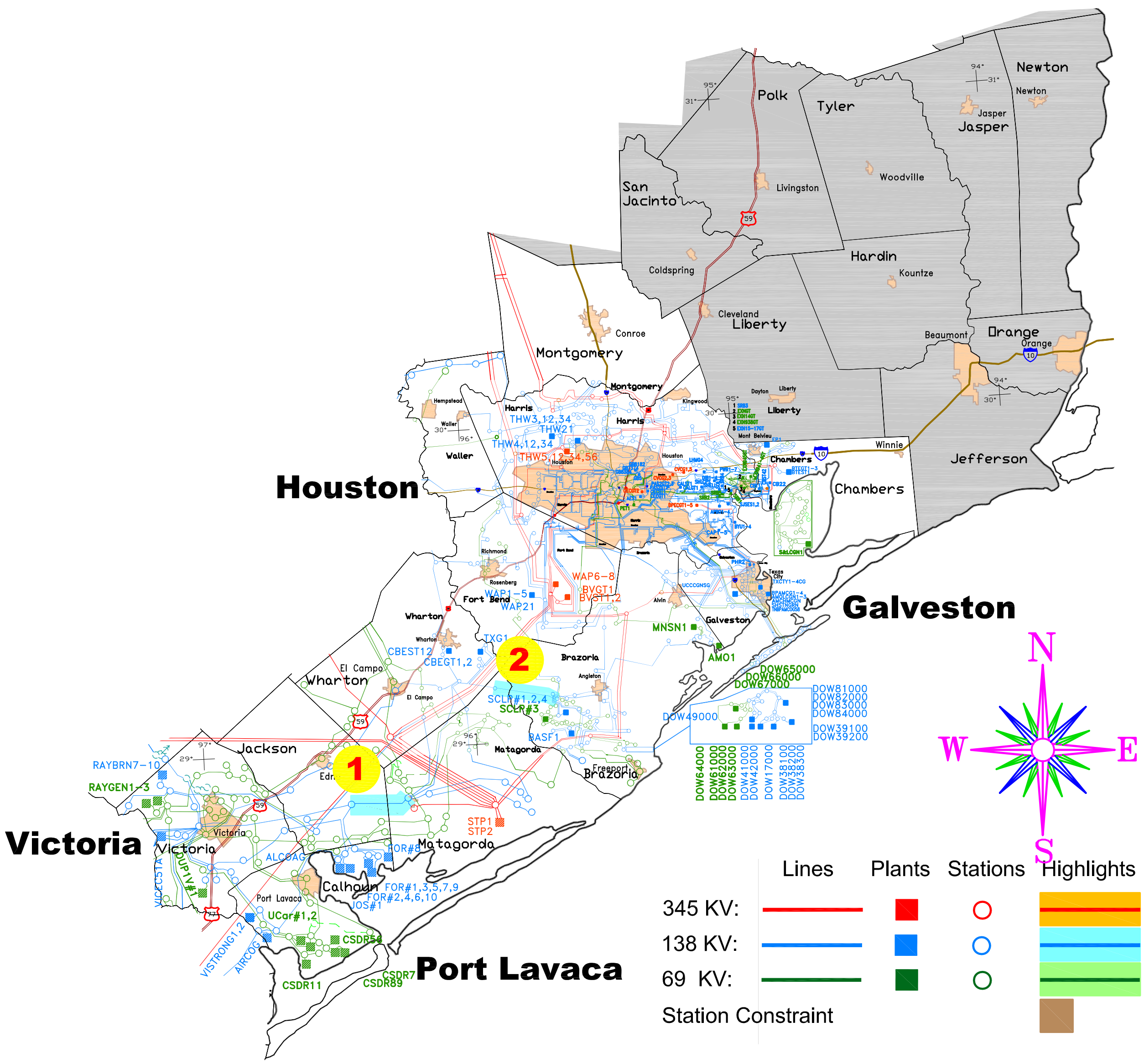


The Coast weather zone is primarily composed of the Houston metropolitan area, which is one of ERCOT's largest load centers. The map below highlights the counties included in the Coast weather zone.



8.1.1 Recent Constraints Map – Coast Weather Zone

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



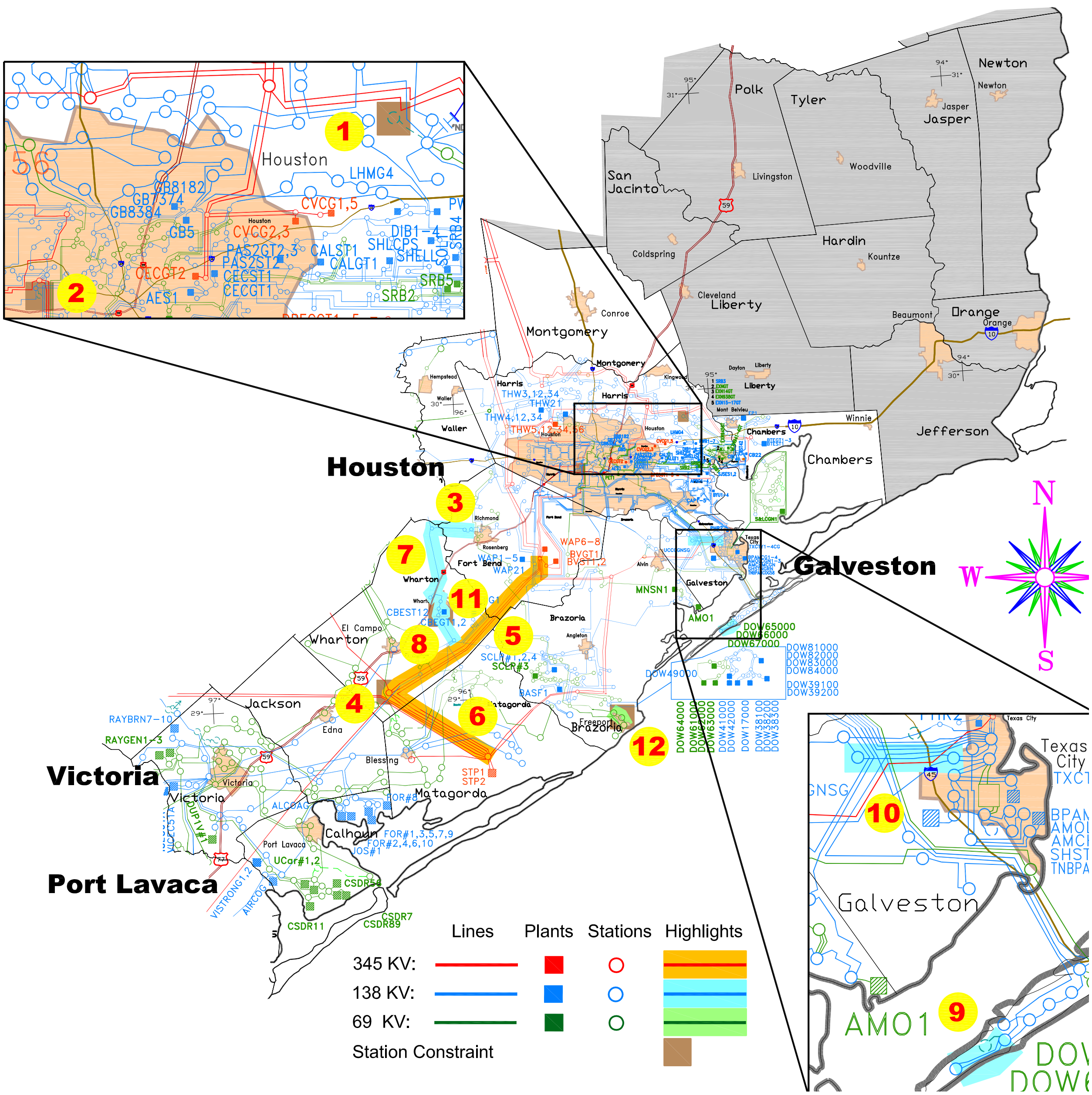
8.1.2 Recent Constraints – Coast Weather Zone

Transmission constraints in the Coast weather zone are caused by continuing load growth. Congestion also occurs when transmission paths into Houston are out of service for project improvements or maintenance. The table below highlights the constraining elements for 2008.

Map Index	Constraining Element	Voltage (kV)
1	Blessing - Lolita	138
2	West Columbia - Pledger	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.



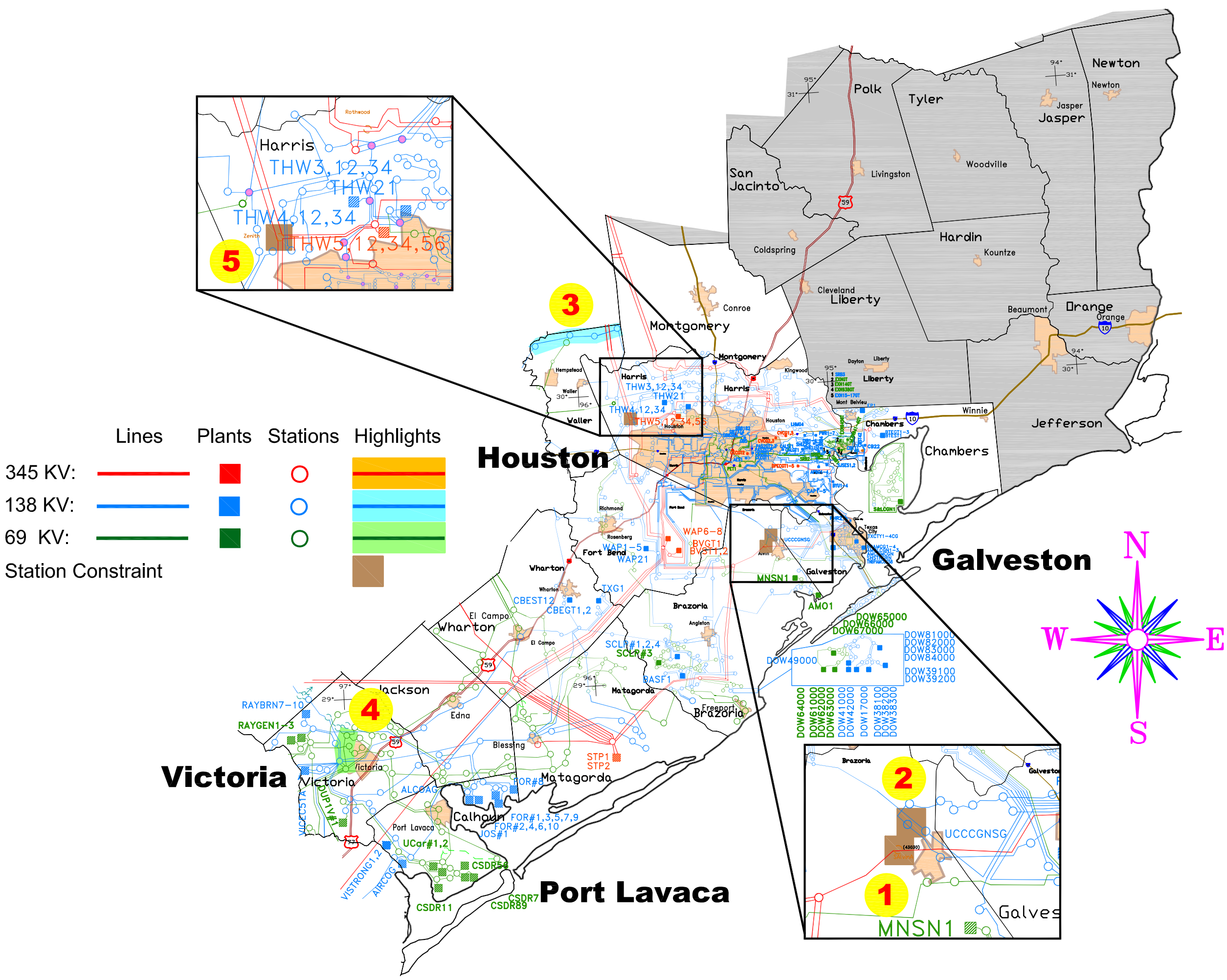
8.1.4 Completed Improvements – Coast Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2007 and 2008 in the Coast weather zone. The elements consist of 205 miles of transmission, two dynamic reactive devices, and several new substations. There were 147 miles of new transmission (117.2 miles at 345kV) and 58 miles of upgraded lines (49.2 miles at 138kV). Many of these upgrades were accomplished by raising the voltage of the circuit or replacing the existing conductor. The dynamic reactive devices help regulate the system voltage, while the new Hillje switching station and WAP-Hillje double circuit lines enhance the transfer capability from south Texas into Houston and surrounding areas.

Map Index	Completed Improvements	Year in Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Crosby Dynamic Reactive Device	2008	138		
2	Bellaire South Dynamic Reactive Device	2008	138		
3	East Bernard – Orchard – Fort Bend Reconductor	2008	138		18.3
4	Hillje Switching Station New Substation	2007	345		
5	WAP – Hillje New Line	2007	345	97.8	
6	STP – Hillje New Line	2007	345	19.4	
7	Wharton – Caney – East Bernard Upgrade	2007	138		14.9
8	Wharton – South Lane Upgrade	2007	138		10.9
9	Stewart – West Bay New Line	2007	138	28	
10	Freeway Park – Dickinson Reconductor	2007	138		5.6
11	Dyann New Substation	2007	138		
12	Quintana New Substation and Line Upgrade	2007	69		7.8

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 the East weather zone by removing thermal constraints.

Two new 345-kV switching stations will be added to optimize the flow into Houston from the North congestion management zone: the Singleton switching station north of Houston will be an improvement in the East weather zone; the Zenith switching station will reduce congestion into Houston from the north.

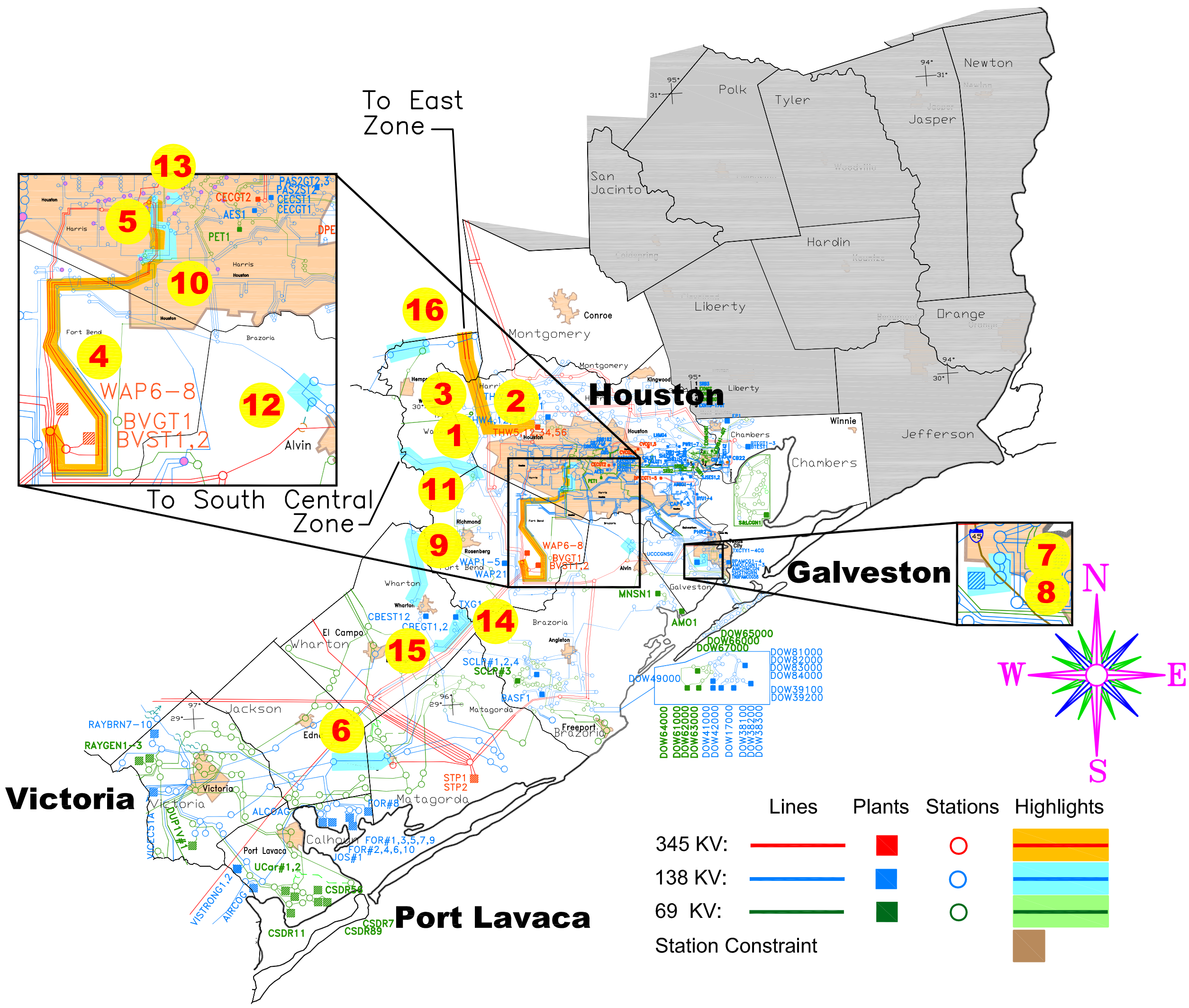
A new Rothwood 345/138-kV substation will be added to north Houston to alleviate overload of the Tomball autotransformers once the congestion on the Singleton to Wharton circuit is resolved.

The upgrade of the Waller to Prairie View to Macedonia 138-kV circuit has been scheduled for late 2009. That circuit is currently operating with an SPS to protect it from contingency overloads and still allow increased imports.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	CenterPoint Energy/TNMP Alvin Interconnection - 345 kV Autotransformer and New Station	345/138	2010	X
2	Rothwood New Station	345/138	2010	X
3	Waller-Prairie View-Seaway-Macedonia Reconductor	138	2010	
4	North Victoria - Magruder Reconductor	69	2010	
5	Zenith Switching Station	345	2011	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

Recent transmission upgrades have helped reduce zonal congestion into the Houston area as well as improve reliability for that area. However, import limits into the Houston area continue to be a source of transmission congestion. Scheduled projects, such as the Rothwood 345/138-kV station, should help reduce congestion. The new Singleton 345-kV switching station, the Zenith 345-kV switching station, and 138-kV work near Tomball will further raise the North to Houston limit. However, as load continues to grow in the Houston area, more import capability into Houston will eventually be needed.

Map Index	Projected Constraining Element	Voltage (kV)	2009	2010	2011	2012	2013
1	Singleton - Zenith 98	345					
2	Singleton - Zenith 99	345					
3	TH Wharton - Singleton	345					
4	WA Parish - Bellaire	345					
5	Bellaire - Brays	138					
6	Blessing - Lolita	138					
7	Caney Creek - East Bernard	138					
8	Clarke, Hiram O Plant Sub - Knight	138					
9	Flewellen - Peters Reit	138					
10	Hastings Sub - Alvin Tie Sw Station	138					
11	Kirby Reit - Garrott	138					
12	New Gulf - CSW Energy	138					
13	New Gulf - South Lane City	138					
14	Waller LCRA - Prairie View	138					

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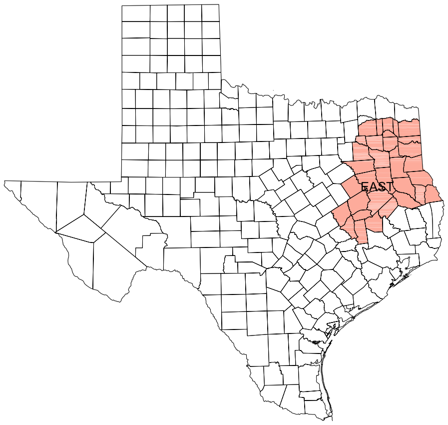
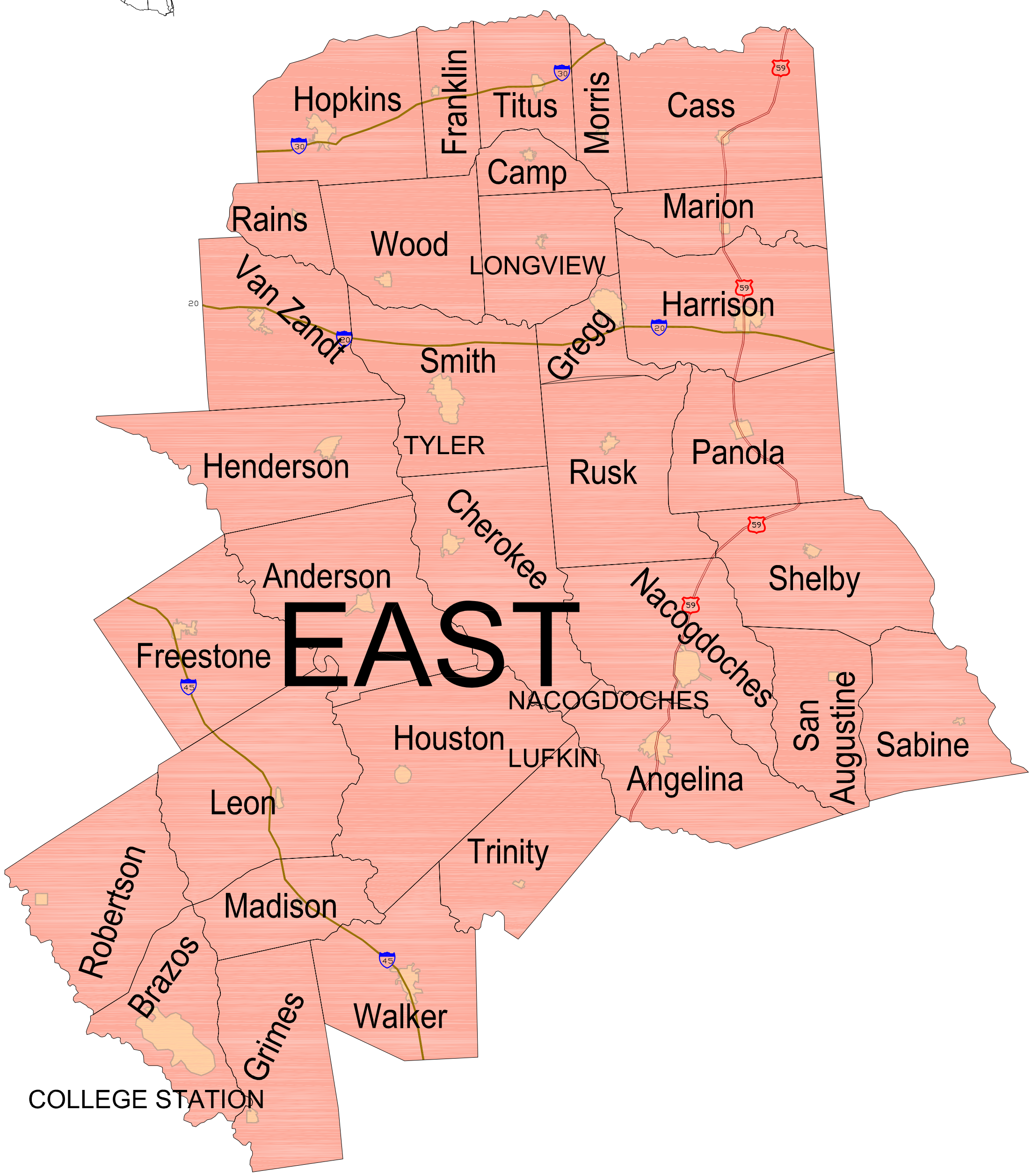
8.2 Area Constraints and Improvements – East Weather Zone

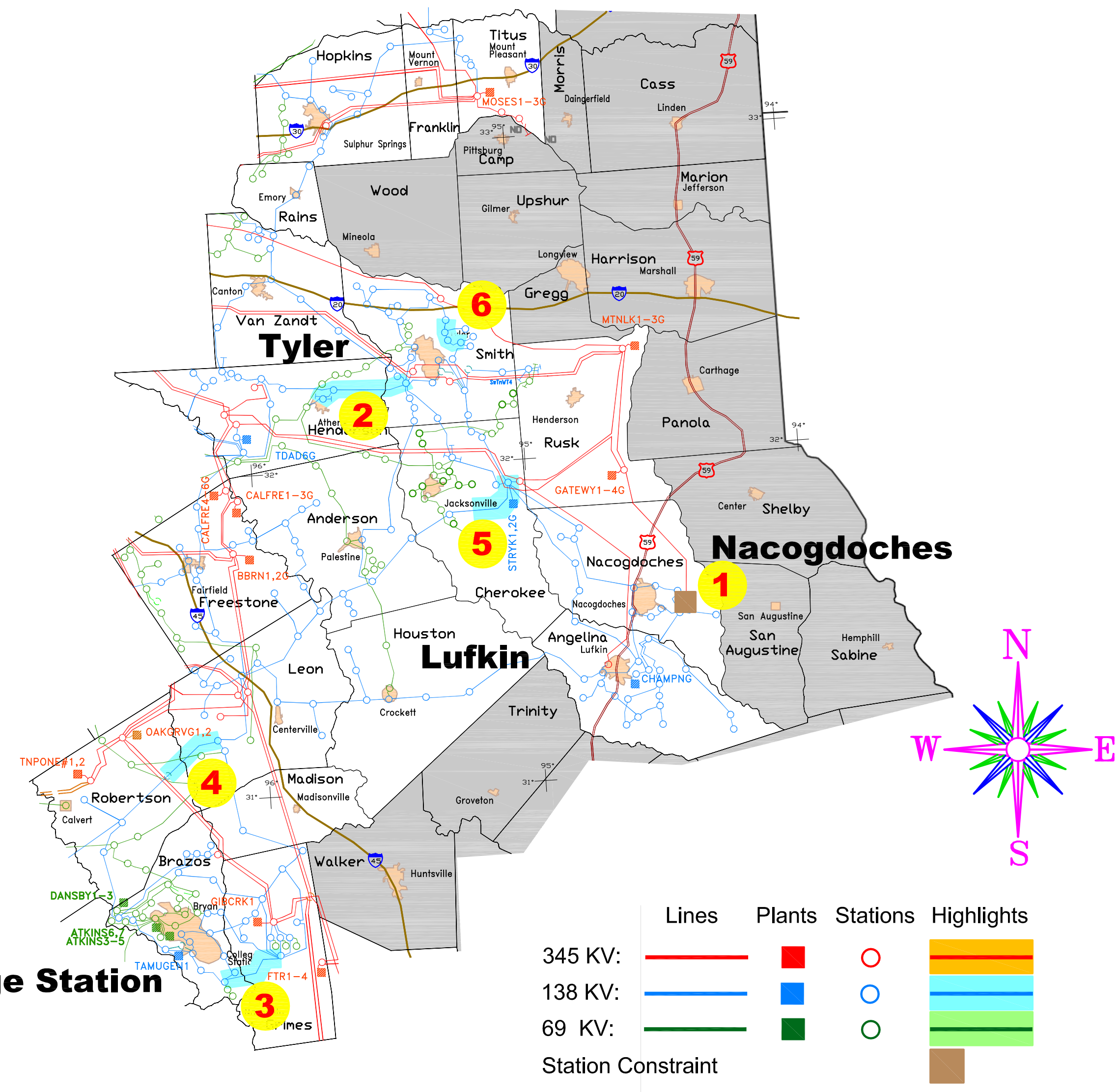


The East weather zone includes the town of Bryan, College Station, Tyler, Nacogdoches, and Lufkin. The map below highlights the counties included in the East weather zone.



8.2.1 Recent Constraints Map – East Weather Zone

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



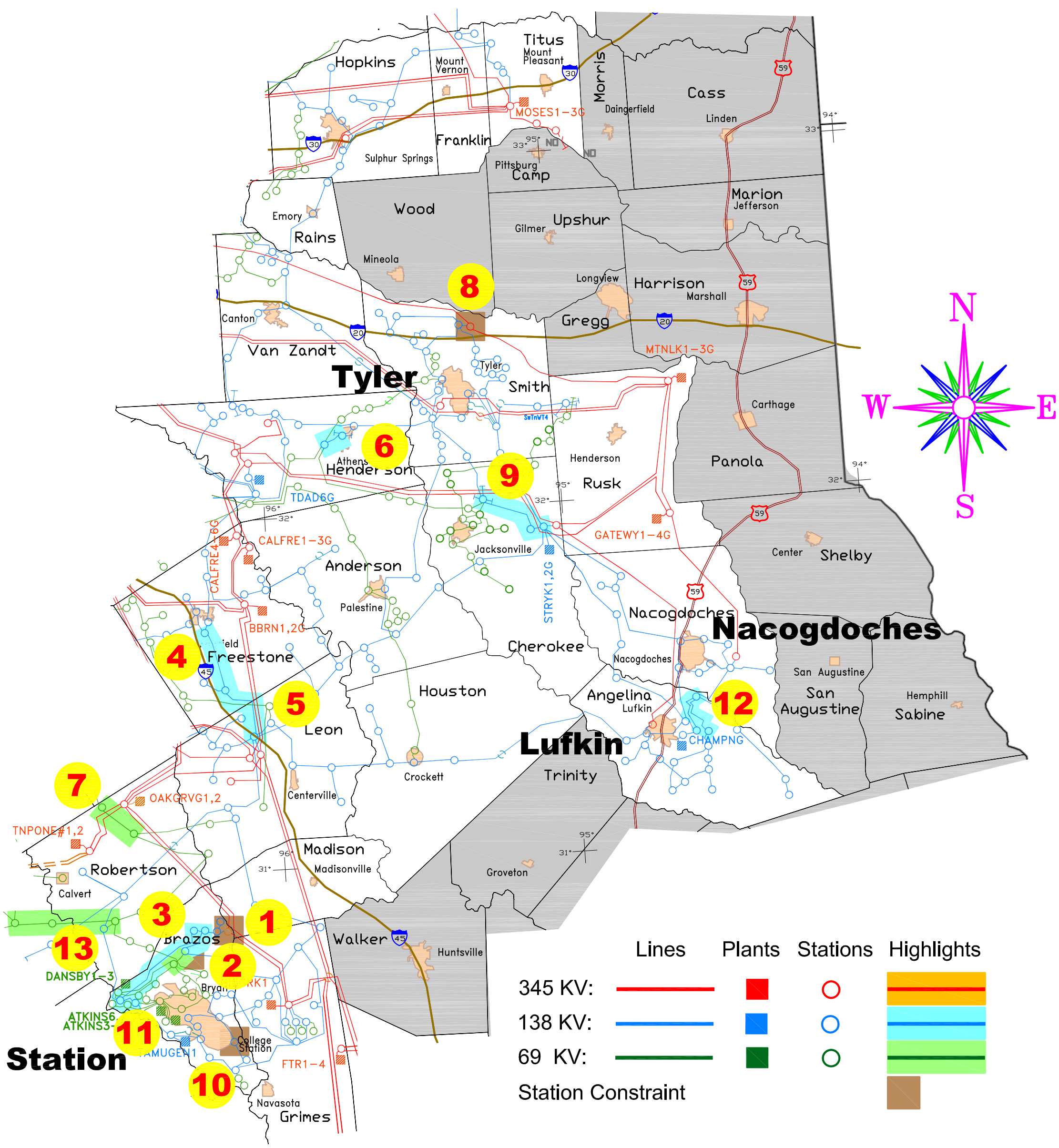
8.2.2 Recent Constraints – East Weather Zone

The East weather zone has seen moderate load growth in recent years. Transmission constraints in this area are primarily due to transmission construction outages.

Map Index	Constraining Element	Voltage (kV)
1	Nacogdoches SE Autotransformer #1	345/138
2	Elkton - Athens	138
3	Gibbons Creek – Greens Prairie	138
4	Ridge - Watson Chapel	138
5	Stryker Creek - Stryker Cherokee POI	138
6	Tyler Northeast - Delek	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.



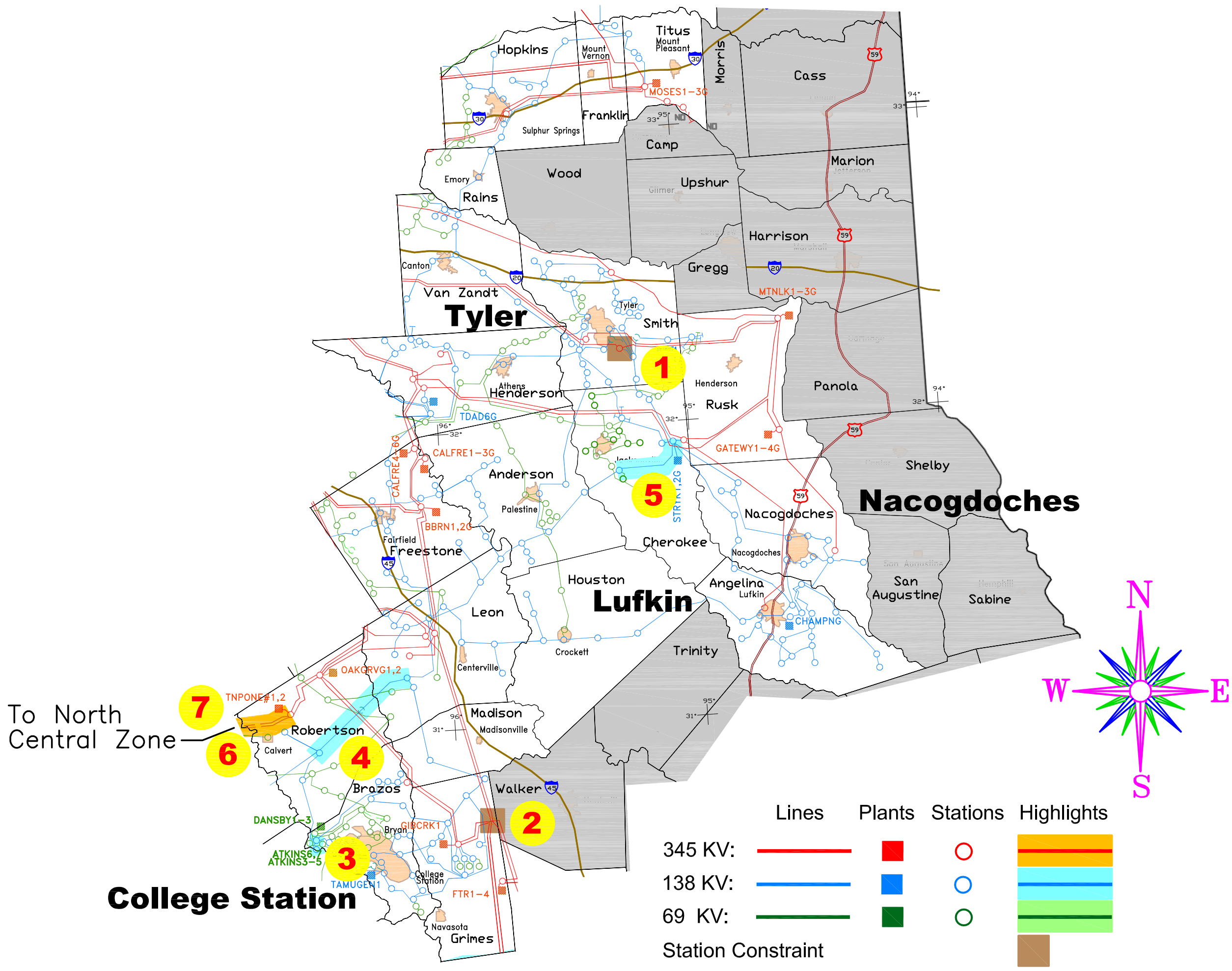
8.2.4 Completed Improvements – East Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2007 and 2008 in the East weather zone. The elements consist of 94.6 miles of transmission, several new substations and autotransformers, and load that has been converted from a 69 to 138kV bus. There were 10 miles of new 138kV transmission and 84.6 miles of upgraded lines (66.7 miles at 138kV). Many of these upgrades were accomplished by raising the voltage of the circuit or replacing the existing conductor. The majority of the upgrades made in the Bryan/College Station area were spurred by the major outage in the Bryan/College Station area in April 2003 and local load growth. These upgrades improve the reliability of the system in the region.

Map Index	Completed Improvements	Year in Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Jack Creek New Station and Auto	2008	345/138		
2	Tabor Substation Upgrade and New Auto	2008	138/69		
3	Jack Creek – Tabor Upgrade and Addition	2008	138	6	8
4	Seaway Teague – W. Fairfield Upgrade	2008	138		13
5	Jewett – Seaway Teague Upgrade	2008	138		10.8
6	Athens Conversion to 138kV	2008	138		
7	Hilltop Lakes – Petteway Rebuild	2008	69		8.3
8	Shamburger Auto Upgrade	2007	345/138		
9	Stryker Creek – Jacksonville Upgrade	2007	138		16.4
10	College Station Spring Creek New Substation	2007	138		
11	Dansby – Atkins Reconductor	2007	138		9
12	North Herty – Lufkin East Upgrade	2007	138		9.5
13	Hearne – Branchville Rebuilt	2007	69		9.6

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

In the East weather zone, a new 345-kV double-circuit line from the Twin Oaks plant to a new 345-kV station named Bell County will allow additional exit capability for new coal units planned north of the Bryan/College Station area. The Bell County 345-kV station will be located approximately 5 miles southeast of the Temple 345-kV switch station in the Sandow to Temple 345-kV double-circuit line.

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. Two new 138-kV substations will be built in the Bryan/College Station area due to the load growth: Jones Road Substation and CSU Northgate Substation.

The addition of the 345-kV Singleton switching station in northern Grimes County will add outage flexibility to Gibbons Creek and, when coupled with other projects discussed in the Coast weather zone in the north Houston area, will reduce reliability problems in Houston. This new switching station will be located at the intersection of the Jewett to Tomball/Wharton and Gibbons Creek to O'Brien/Roans Prairie 345-kV double-circuit lines.

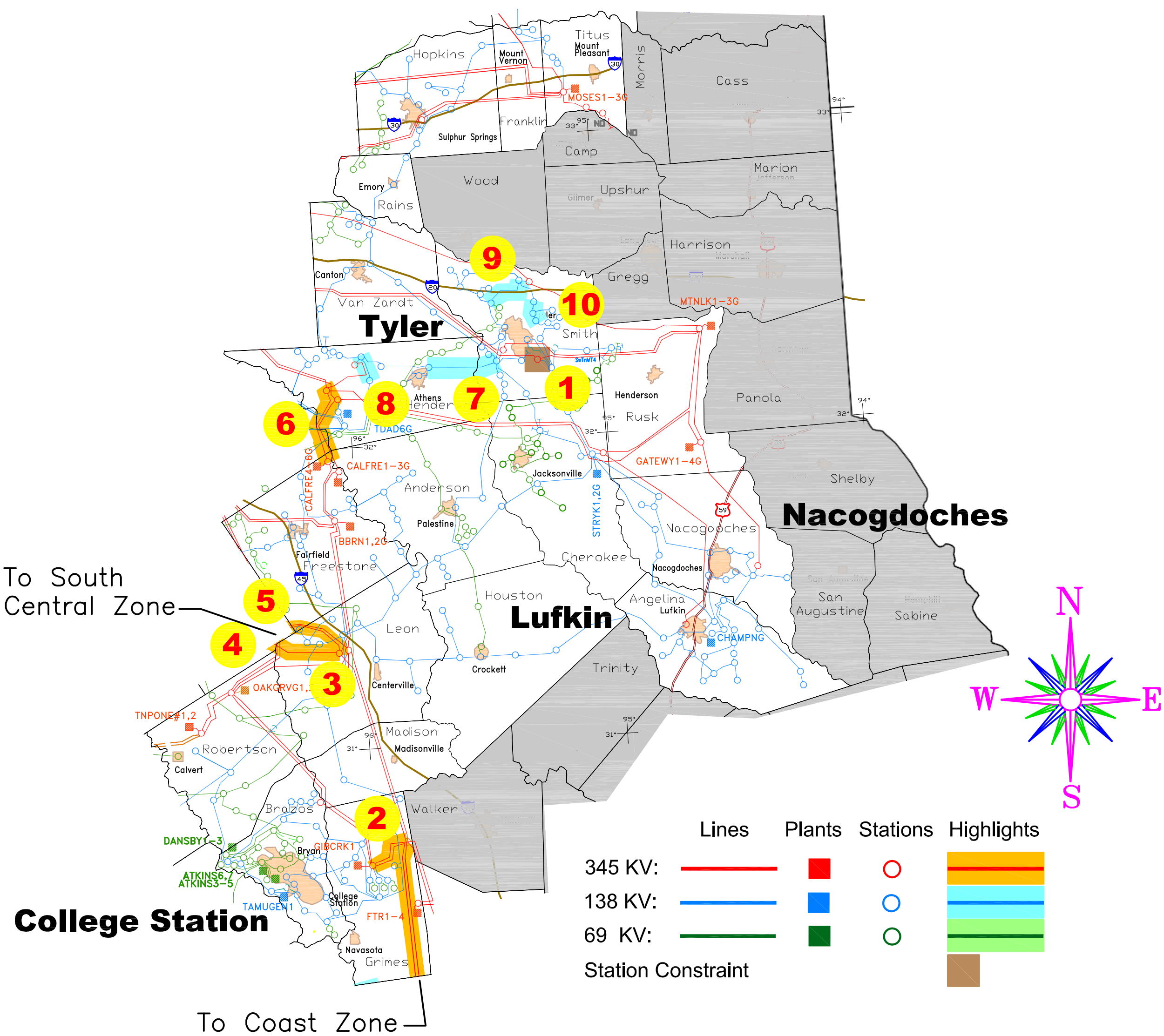
In East Texas, the Stryker Creek to Dialville 138-kV line will be built to increase the transfer capability from generators in the area.

In the Tyler area, several 138-kV line upgrades and a new autotransformer at Tyler Grande are planned to solve reliability problems. Many of these improvements should be completed by the end of 2008. One of the projects to be completed by 2009 is the Tyler Grande 345/138-kV switching station.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Tyler Grande Switching Station	345/138	2009	X
2	Singleton Switching Station	345	2009	X
3	Jones Road - Dansby New Line	138	2010	
4	Robertson - Watson Chapel Rebuild	138	2010	
5	Stryker Creek - Dialville Upgrade	138	2010	
6	Bell County SE (TNMP)	345	2011	X
7	Twin Oaks - Bell County SE (Oncor)	345	2011	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

Several 345-kV and 138-kV lines in the East weather zone are expected to have some degree of congestion in future years. Congestion is anticipated on the 345-kV system near Jewett. Some 138-kV congestion is expected near the Elkton and Tyler areas.

Map Index	Projected Constraining Element	Voltage (kV)	2009	2010	2011	2012	2013
1	Tyler Grande Autotransformer	345/138					
2	Gibbons Creek - Singleton	345					
3	Jewett - Lake Creek	345					
4	Jewett - Rattle Snake	345					
5	Jewett South - Limestone Plant	345					
6	Trinidad Ses - Richland Chambers SS 2	345					
7	Elkton - Athens Tap	138					
8	Forest Grove Switch - Malakoff	138					
9	Shamburger - Tyler Northwest	138					
10	Tyler Northeast - Tyler East	138					

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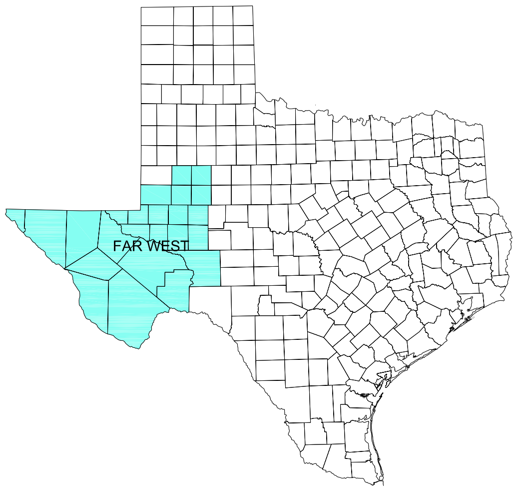
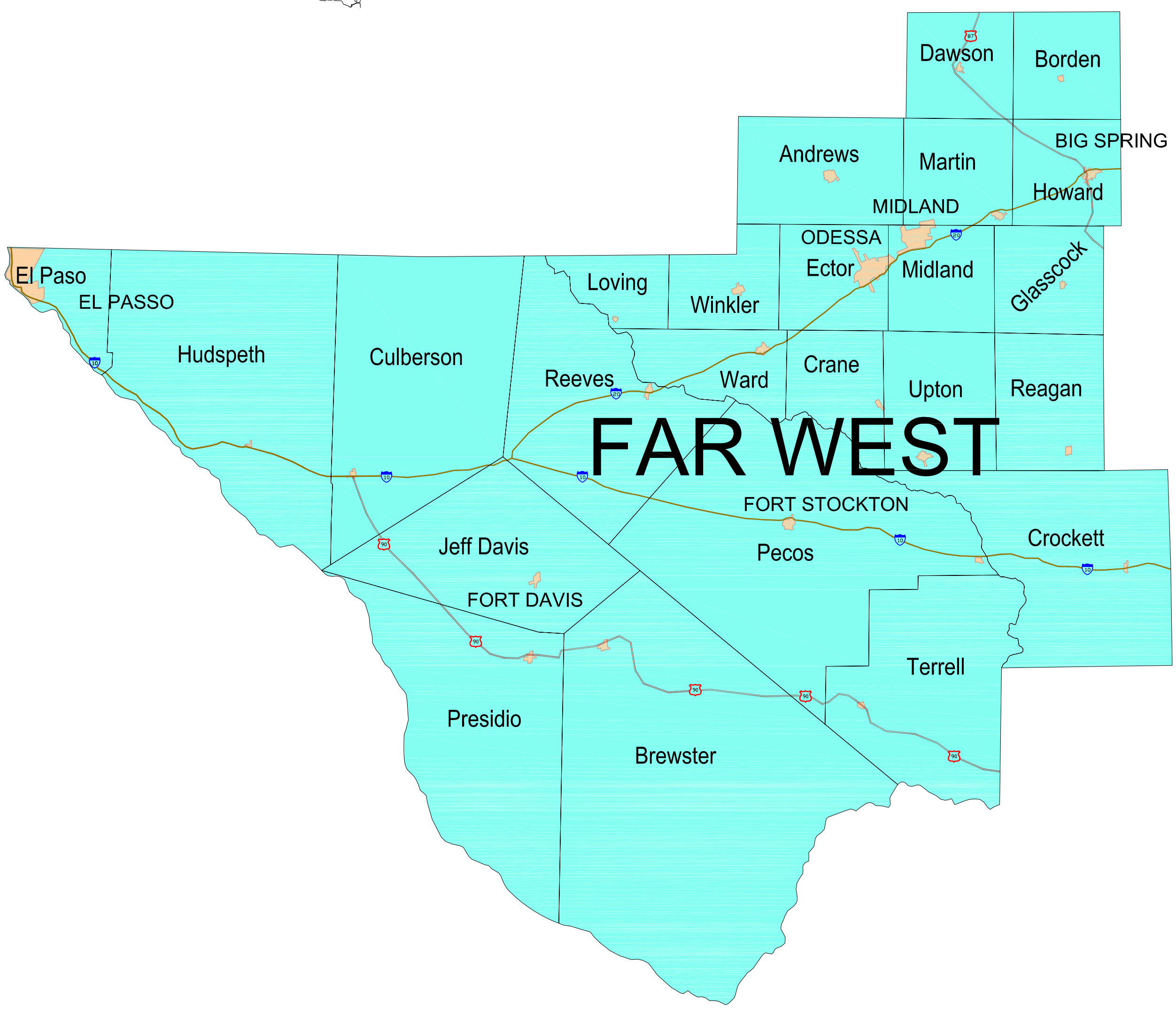
8.3 Area Constraints and Improvements – Far West Weather Zone

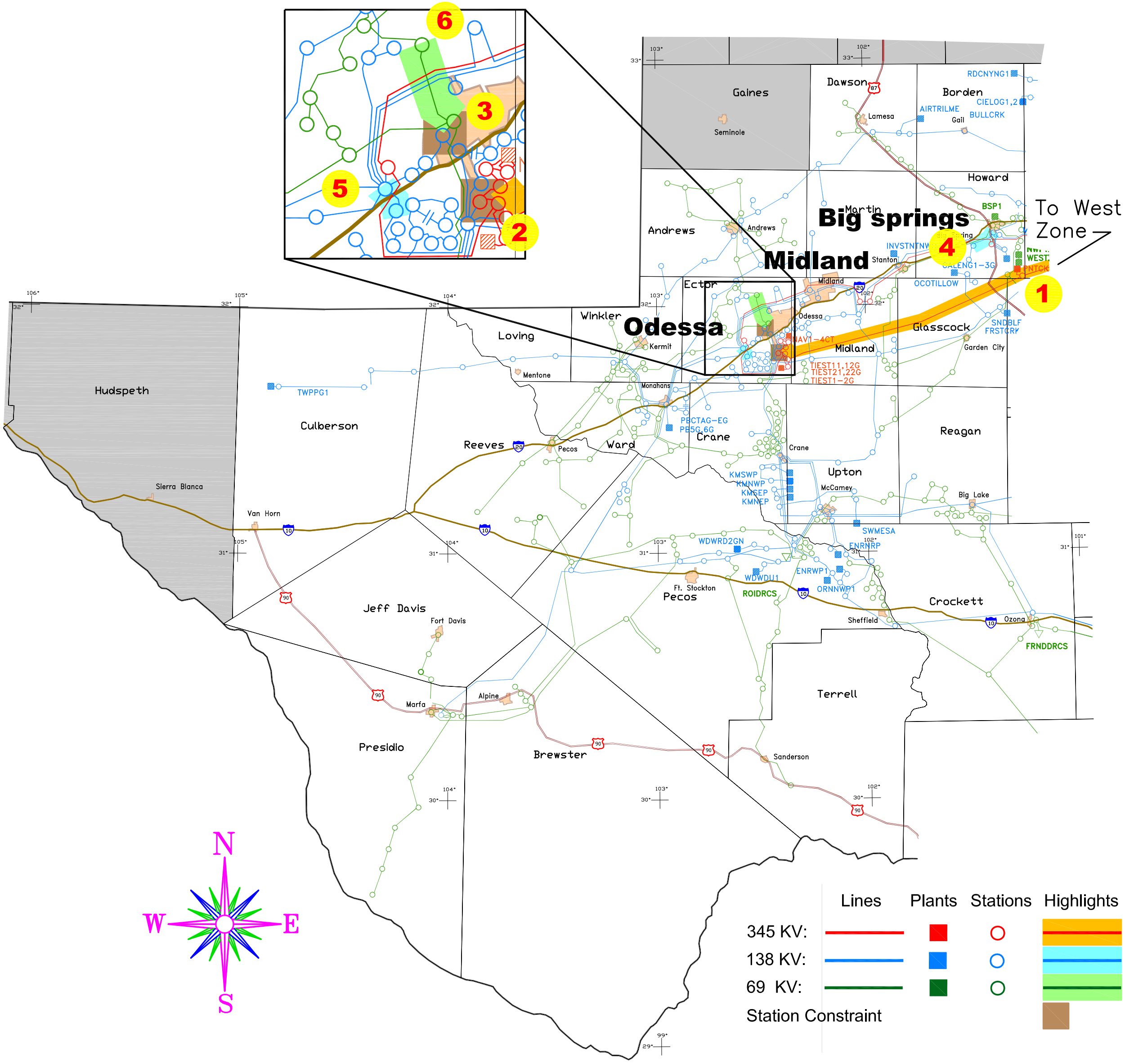


The main cities in the Far West weather zone include Midland and Odessa. This zone stretches to include Big Bend and the McCamey area. The map below highlights the counties included in the Far West weather zone.



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.



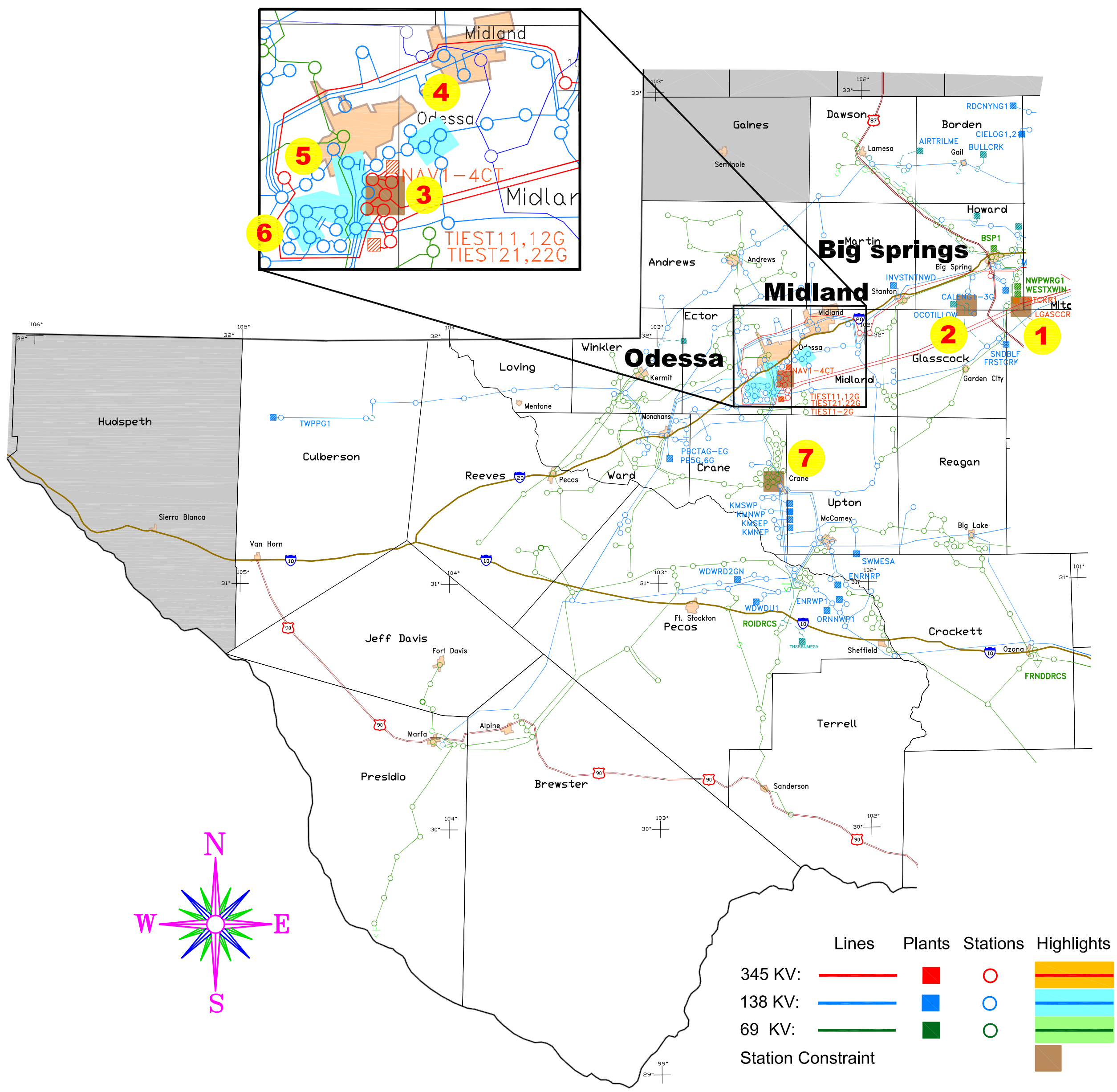
8.3.2 Recent Constraints – Far West Weather Zone

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	Morgan Creek SES - Cal Energy	345
2	Odessa EHV Switch Autotransformer #1	345/138
3	Odessa North Autotransformer	138/69
4	Big Springs Switch – Big Spring West	138
5	Odessa Southwest – Moss Switch	138
6	Odessa North - North Cowden	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.



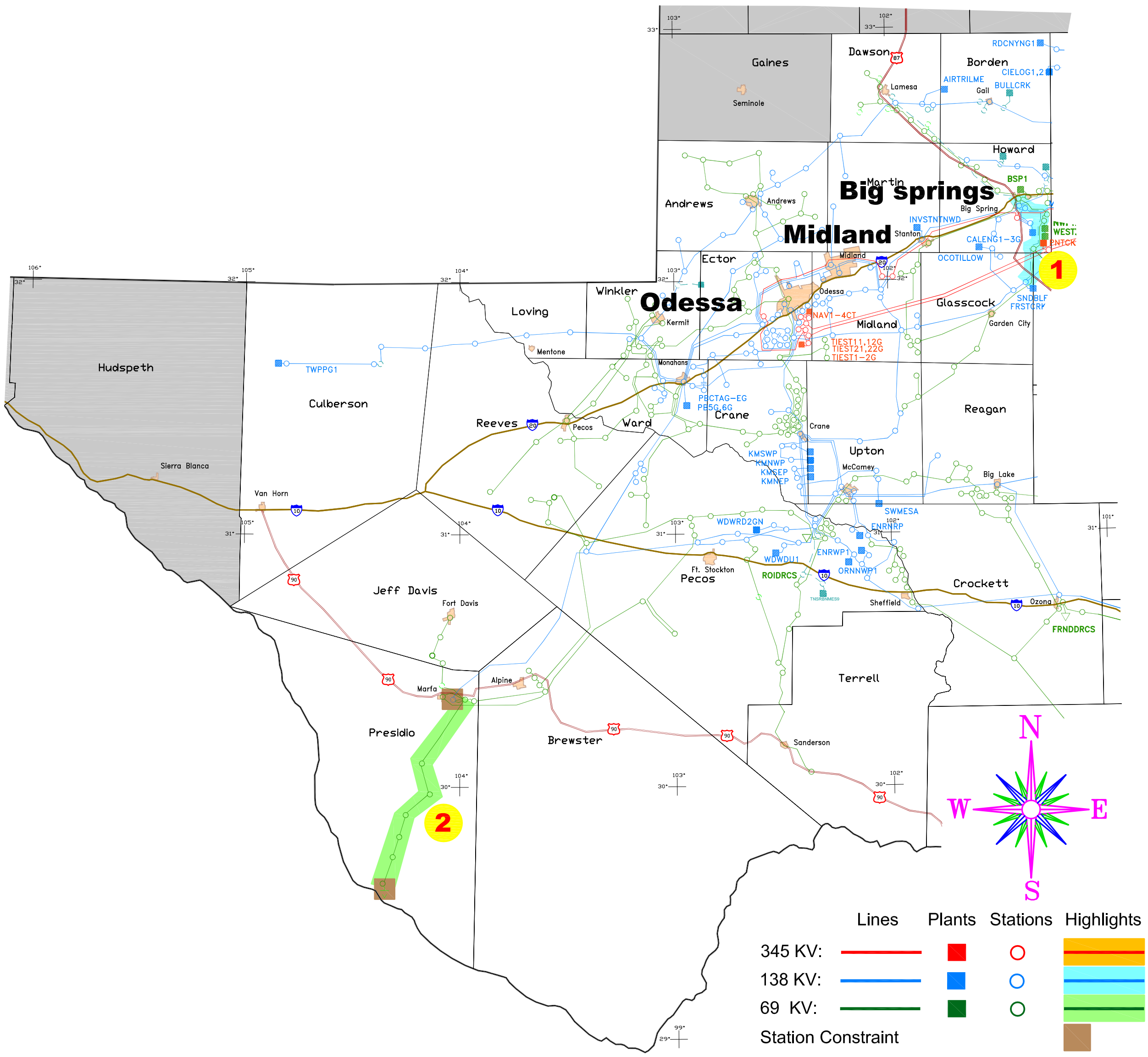
8.3.4 Completed Improvements – Far West Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2007 and 2008 in the Far West weather zone. The elements consist of 11.8 miles of upgraded transmission, three new substations, and a dynamic reactive device. There were 10.9 miles of upgraded 138kV transmission which was accomplished by raising the voltage of the circuit or replacing the existing conductor. The dynamic device helps regulate system voltage which has been negatively impacted by the fluctuations in wind generation. This device absorbs or provides the system with reactive power depending on the voltage profile. The Longshore and Drumright Switching Stations are hubs to new wind generation in the region, while the Quail Switching Station is a hub for new natural gas generation. 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		
2	Drumright Switching Station	2008	138		
3	Quail Switching Station	2007	345		
4	Midessa – Midland Airport Upgrade	2007	138		7.2
5	Odessa EHV – Odessa 2 Upgrade	2007	138		2.3
6	Nylon Tap – Olefin – General Tire Upgrade	2007	138		1.4
7	Crane Dynamic Device Upgrade	2007	69		

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

Transmission improvements planned for the Far West weather zone are primarily associated with increasing the exit capability for several wind projects.

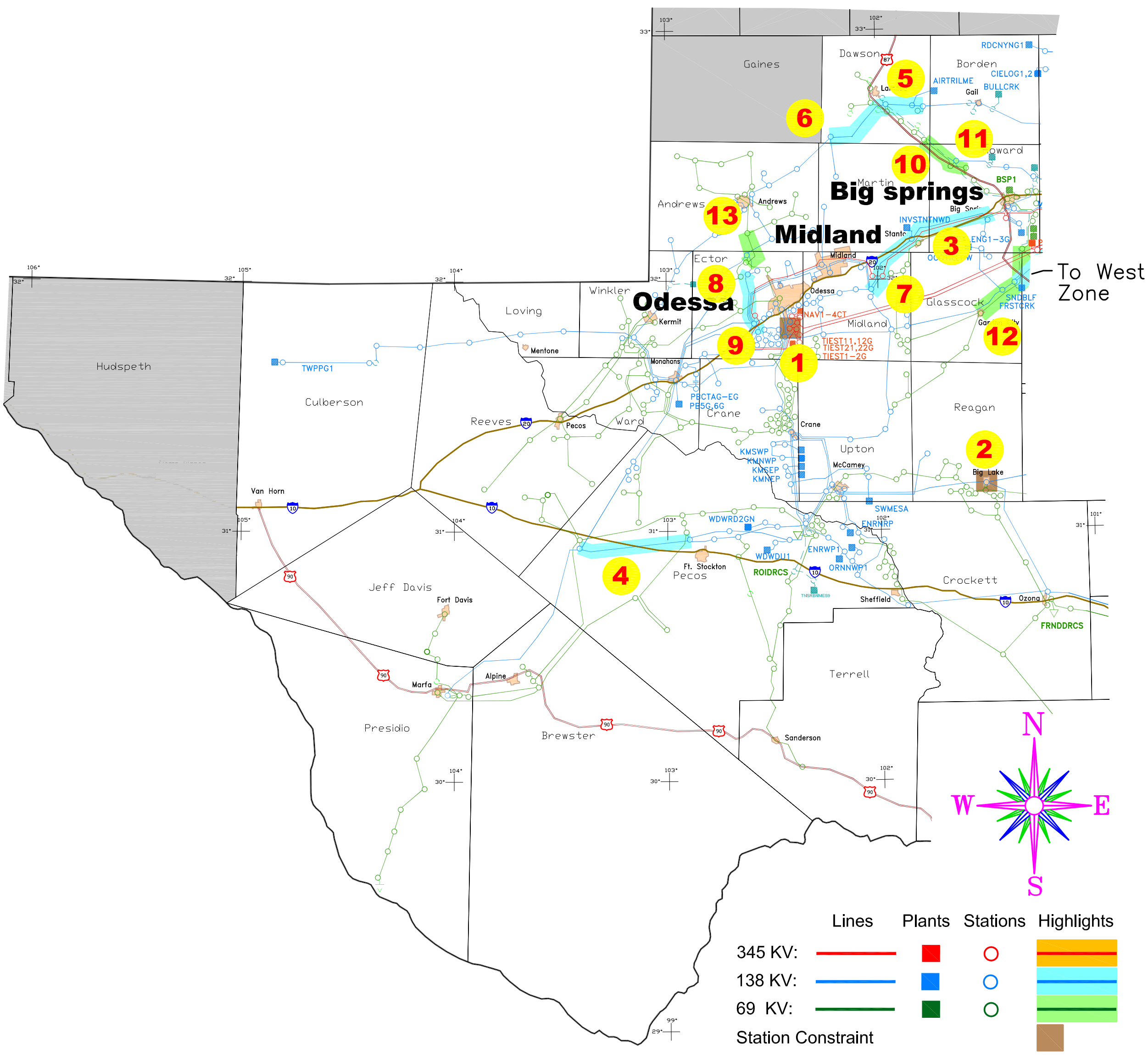
The AEPSC Presidio Area Reliability Improvements have been planned to prevent the pre-contingency and post-contingency voltage at Presidio from falling below criteria, which include adding a second 138/69-kV autotransformer at Alamito Creek, replacement of the Alamito Creek to Presidio 69-kV line, and adding a NaS battery at Presidio Substation.

In addition, the upgrade of the Big Spring to Chalk to McDonald Road line will allow exit of a special protection scheme that had been put in place to allow maximum wind output.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Big Spring - Chalk - McDonald Upgrade	138/69	2009	X
2	AEP Presidio Area Reliablity Improvements	138/69	2009 2012	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. This is due to the fact that new generation development continues to increase before major transmission upgrades required to allow full generation output can be completed.

Map Index	Projected Constraining Element	Voltage (kV)	2009	2010	2011	2012	2013
1	Odessa EHV 1 Tap Autotransformer	345/138					
2	Big Lake - North	138					
3	Big Spring West - Stanton Wind Energy Center	138					
4	Fort Stockton Plant - Barrilla Junction	138					
5	Lamesa - Keylyntegar Coop	138					
6	Lamesa - Paul Davis Tap	138					
7	Midland East - Stanton Wind Energy Center	138					
8	Moss - Amoco North Cowden Tap	138					
9	Moss - Odessa Southwest	138					
10	Ackerly Vealmoor - Ackerly	69					
11	Ackerly Vealmoor - Ackerly Chevron	69					
12	Garden City - Chalk	69					
13	Holt SS - Emma Tap	69					

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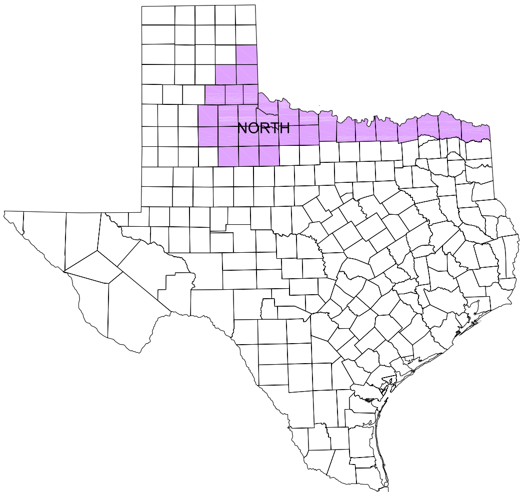
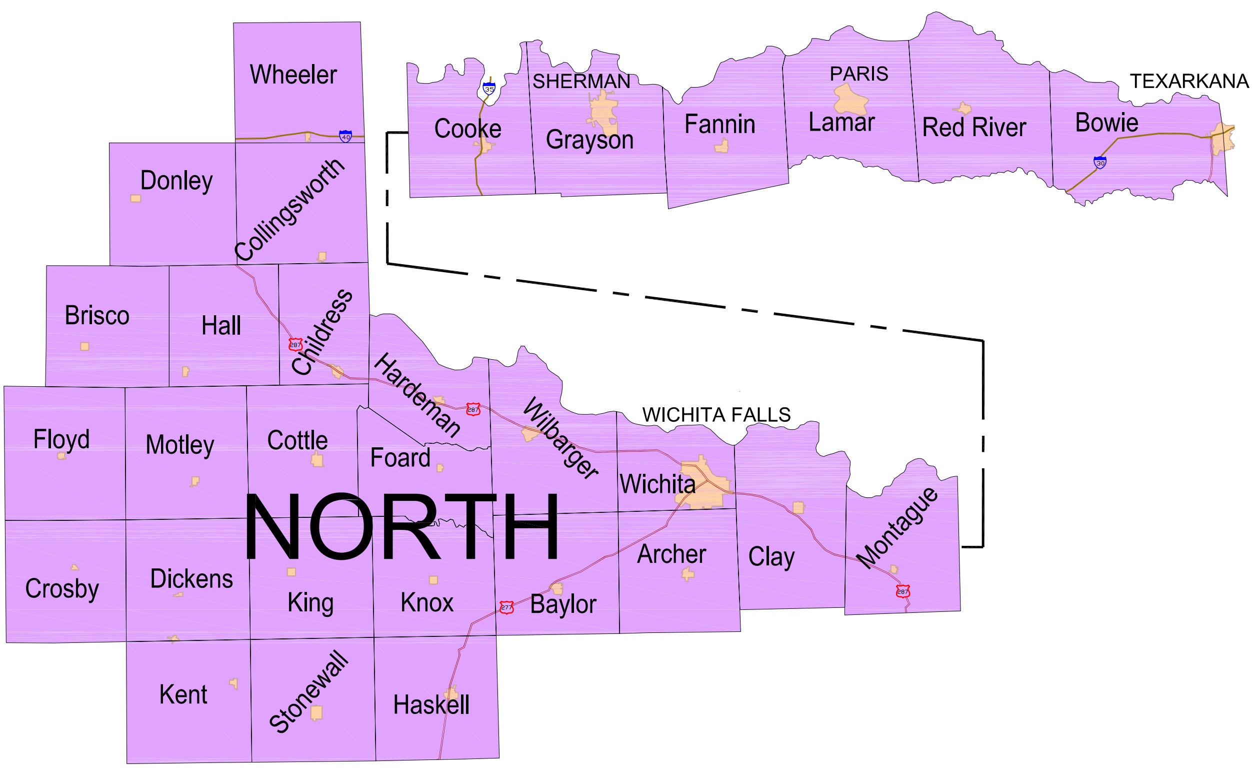
8.4 Area Constraints and Improvements – North Weather Zone

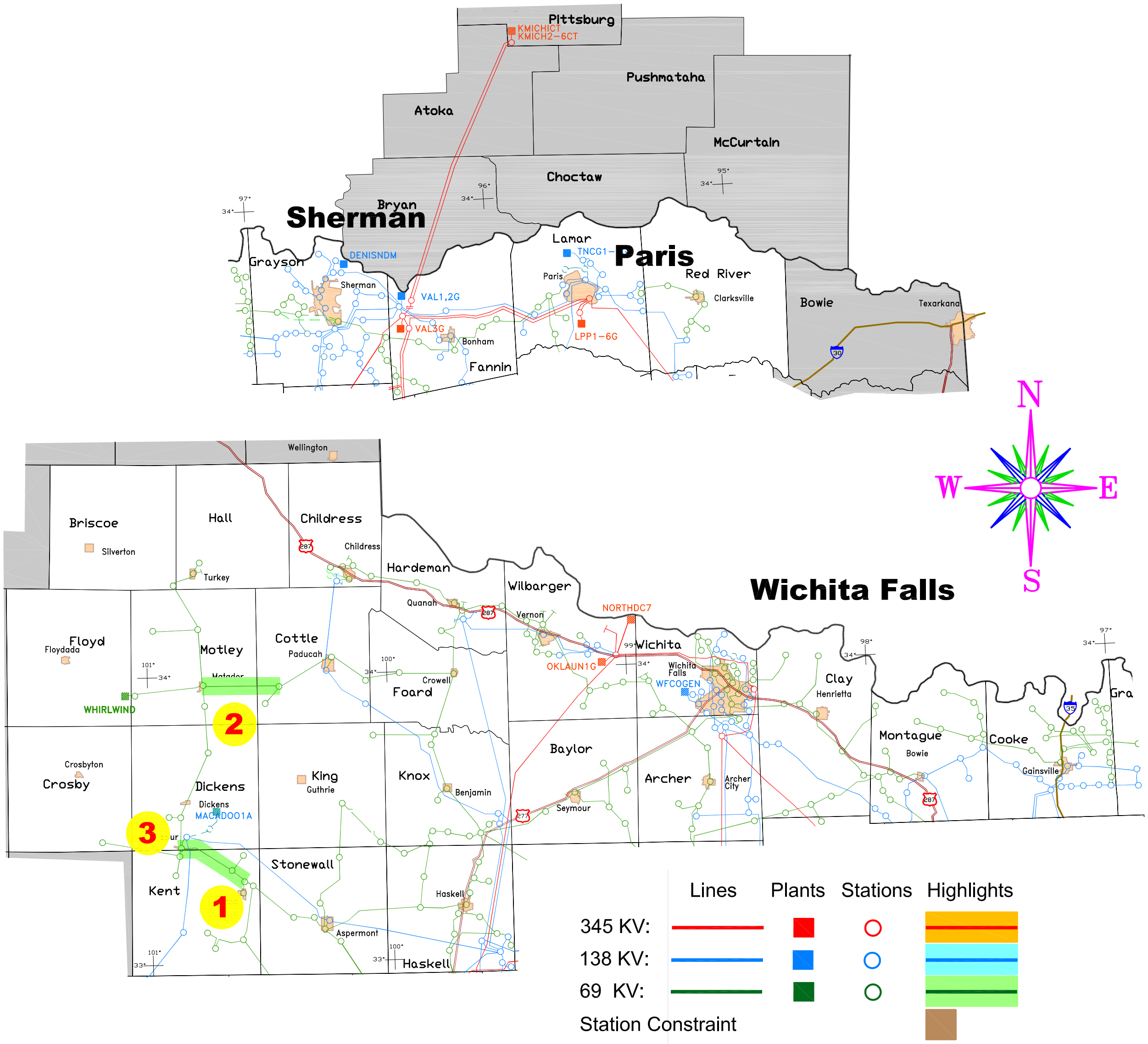


The North weather zone covers the northern counties of ERCOT's territory, including the cities of Wichita Falls and Paris. The map below highlights the counties included in the North weather zone.



8.4.1 Recent Constraints Map – North Weather Zone

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



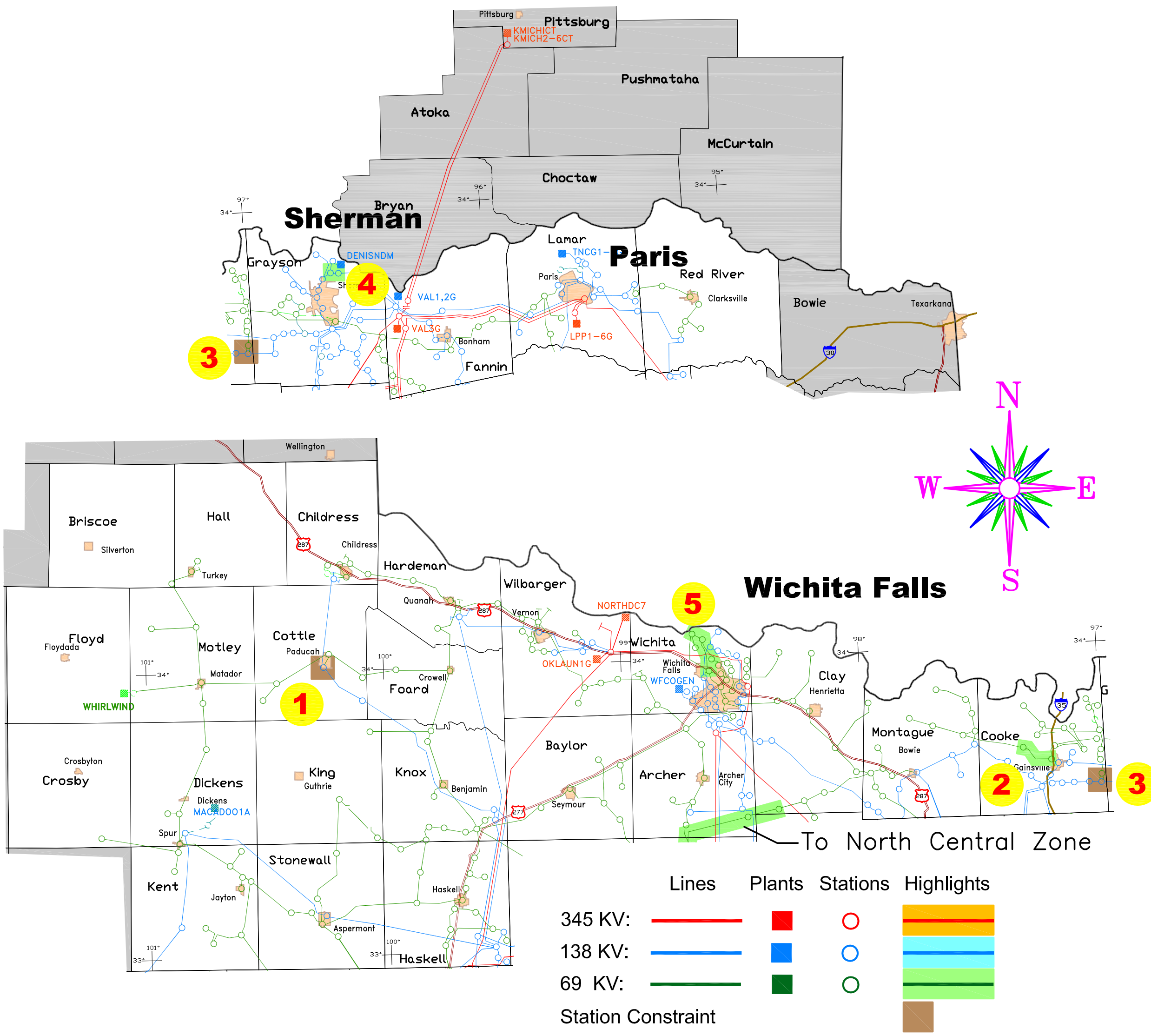
8.4.2 Recent Constraints – North Weather Zone

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

Map Index	Constraining Element	Voltage (kV)
1	Girard Tap – DKEC Jayton	69
2	Matador - Paducah REA Tap	69
3	Spur - Girard Tap	69

8.4.3 Completed Improvements Map – North Weather Zone

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



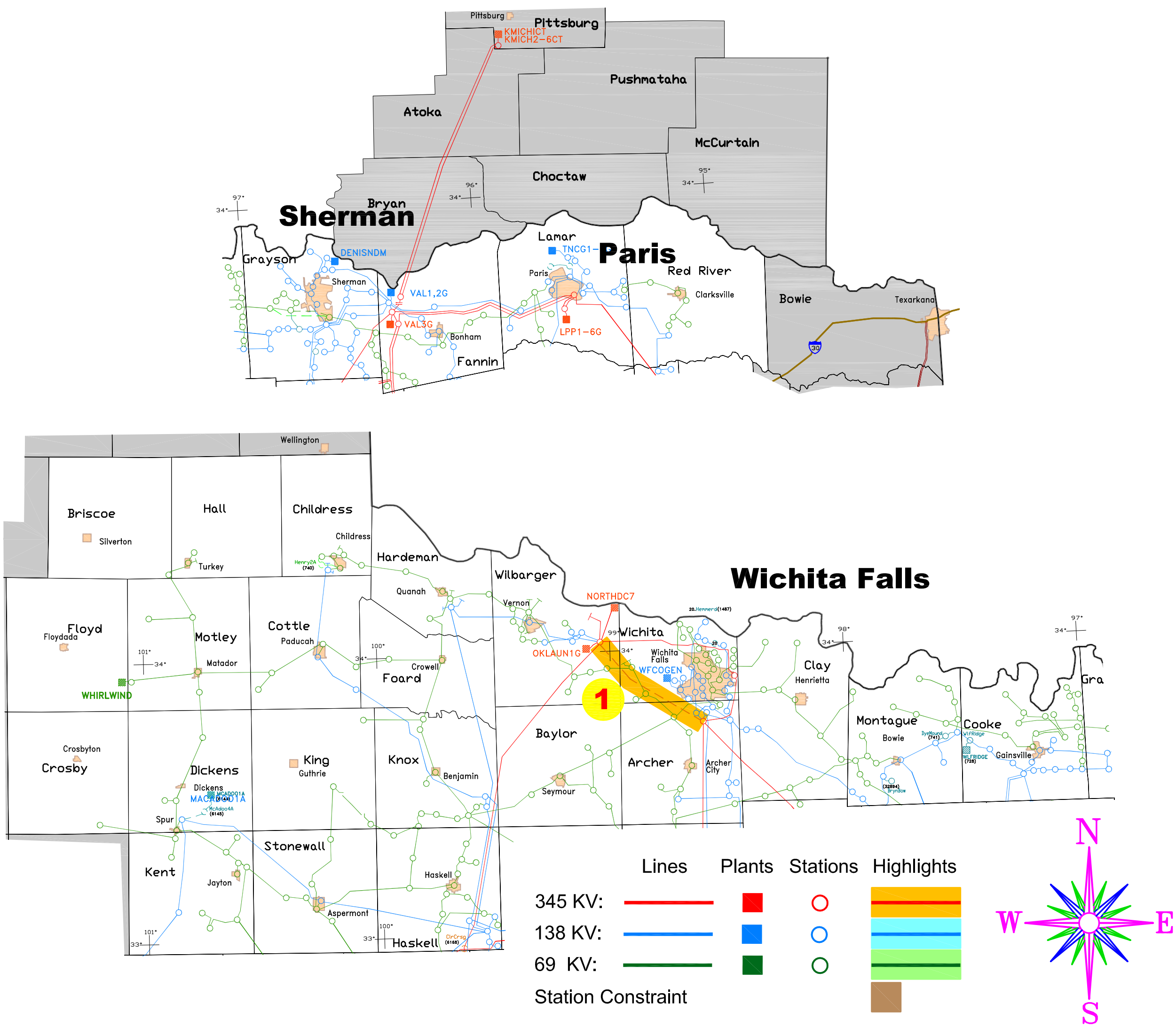
8.4.4 Completed Improvements – North Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2007 and 2008 in the North weather zone. The elements consist of 28.1 miles of transmission, two reactive devices, and a new autotransformer. There were 12.2 miles of new 69kV transmission and 15.9 miles of upgraded lines (13.8 miles at 69kV). These upgrades were accomplished by raising the voltage of the circuit or replacing the existing conductor. The capacitors help regulate the local system voltage. The new and 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	Paducah Reactor	2008	138		
2	Gainesville – Muenster Upgrade and Muenster New Capacitor	2008	69		13.8
3	Hawkins Additional Auto	2007	138/69		
4	Denison North – Denison Tap Upgrade	2007	138		2.1
5	Pleasant Valley – Iowa Park Tap New Line	2007	69	12.2	

8.4.5 Planned Improvements Map – North Weather Zone

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



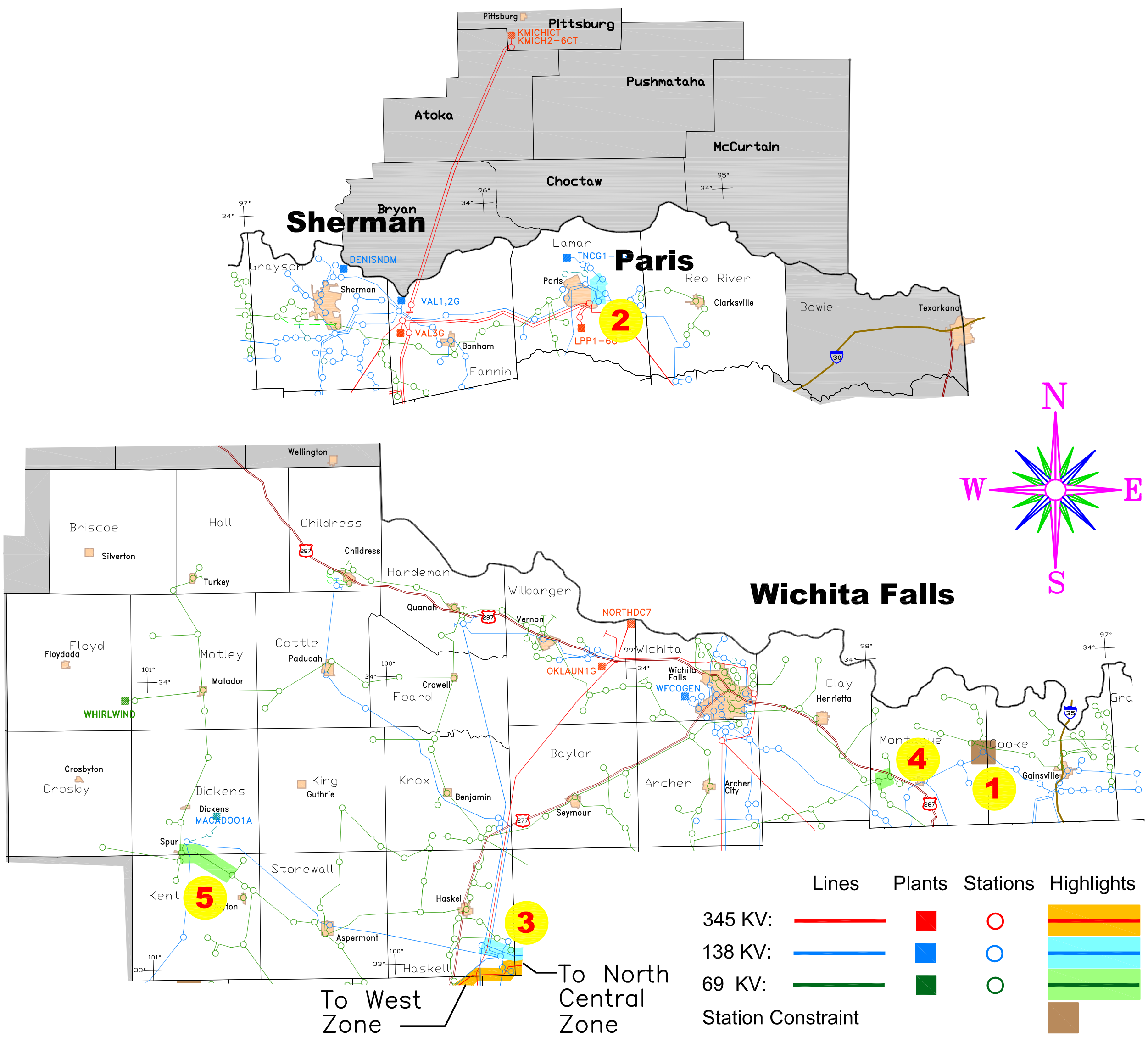
8.4.6 Planned Improvements – North Weather Zone

The major planned improvement for the North weather zone is a new 345-kV line from Oklaunion to Bowman that will complete a 345-kV loop around the Wichita Falls area.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Oklaunion - Bowman New Line	345	2012	

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 North weather zone is projected to experience moderate congestion in various areas, mainly on the 69-kV and 138-kV systems. Most of this congestion is due to new wind generation plants interconnecting within the zone.

Map Index	Projected Constraining Element	Voltage (kV)	2009	2010	2011	2012	2013
1	St Jo Autotransformer	138/69					
2	Lamar Tap - Paris East	138					
3	Murray BEC POD - Paint Creek	138					
4	Johnson Switch - Montague	69					
5	Spur - Girard Tap	69					

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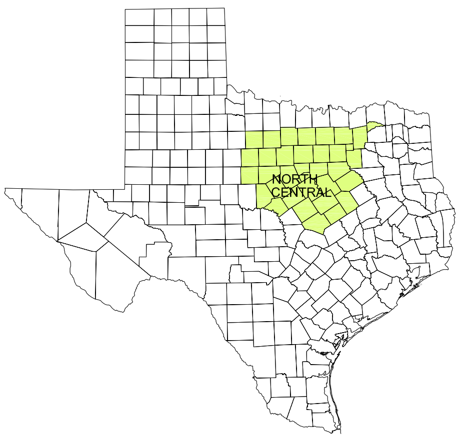
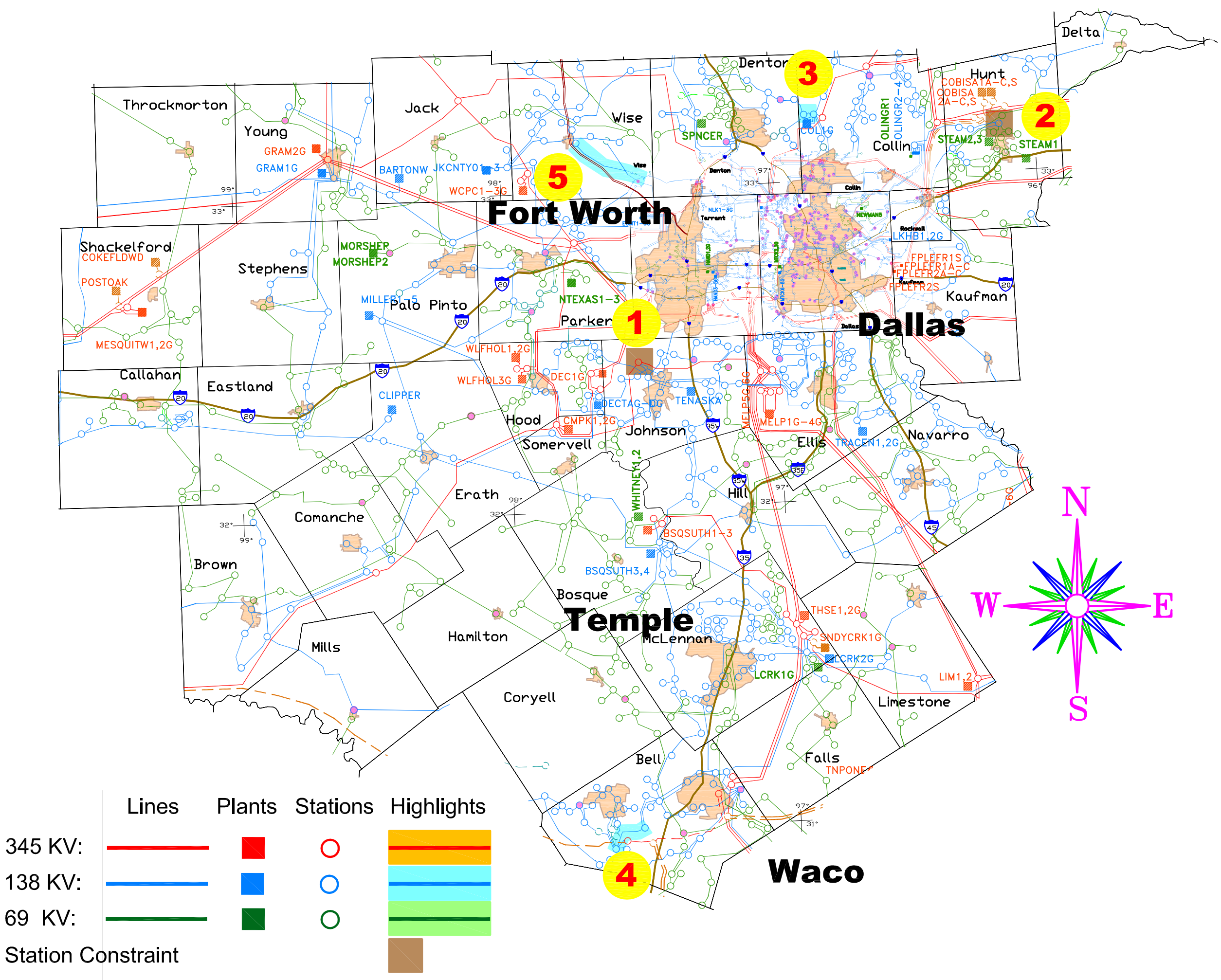
8.5 Area Constraints and Improvements – North Central Weather Zone



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.



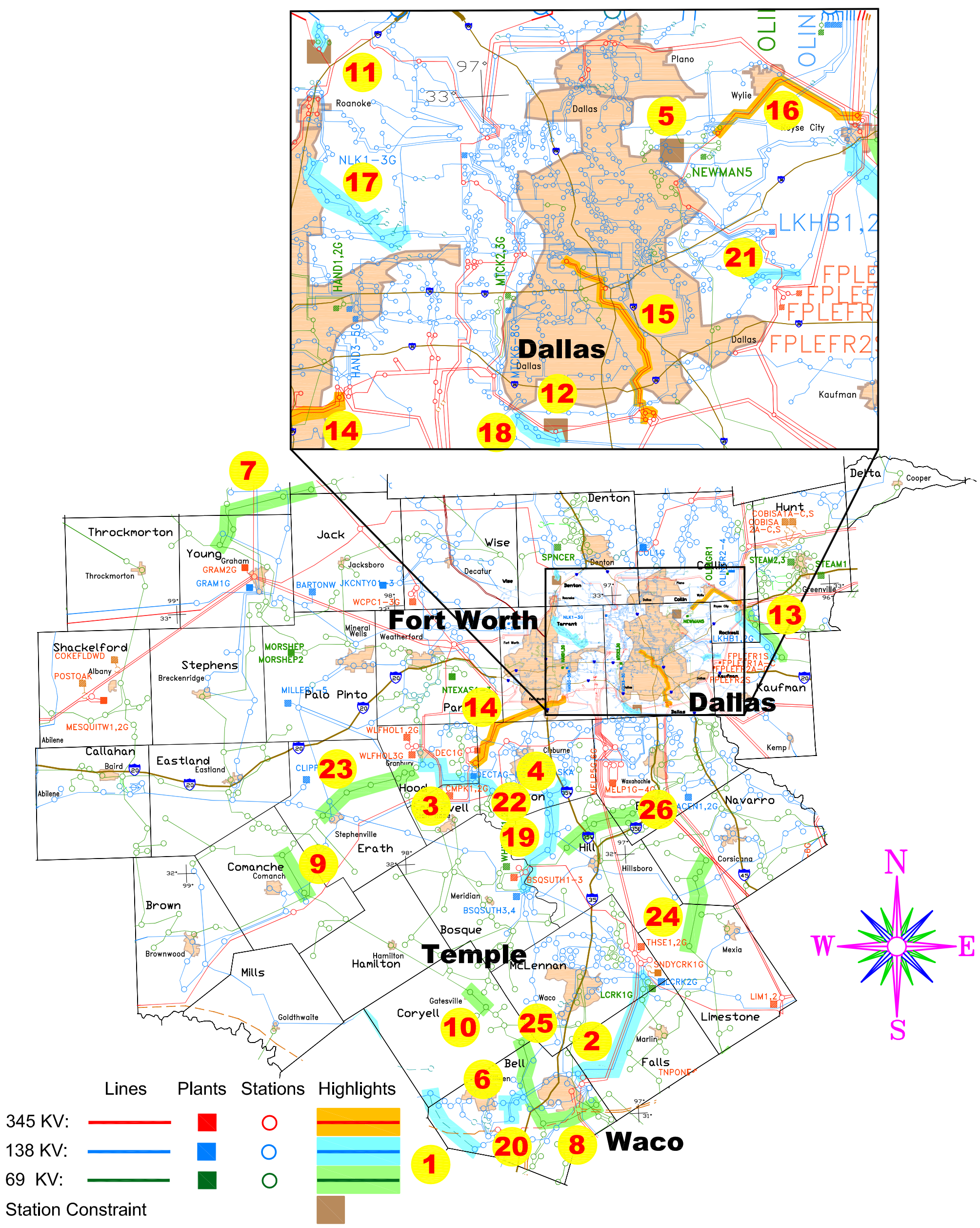
8.5.2 Recent Constraints – North Central Weather Zone

This zone has considerable load growth, particularly in the DFW area. The combination of decreased local generation and the significant increase in load in the areas outside 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	Greenville Steam Autotransformer #2	138/69
3	Collin - Frisco	138
4	Killeen Switch - Harker Heights South	138
5	Rhome - Decatur	138

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.



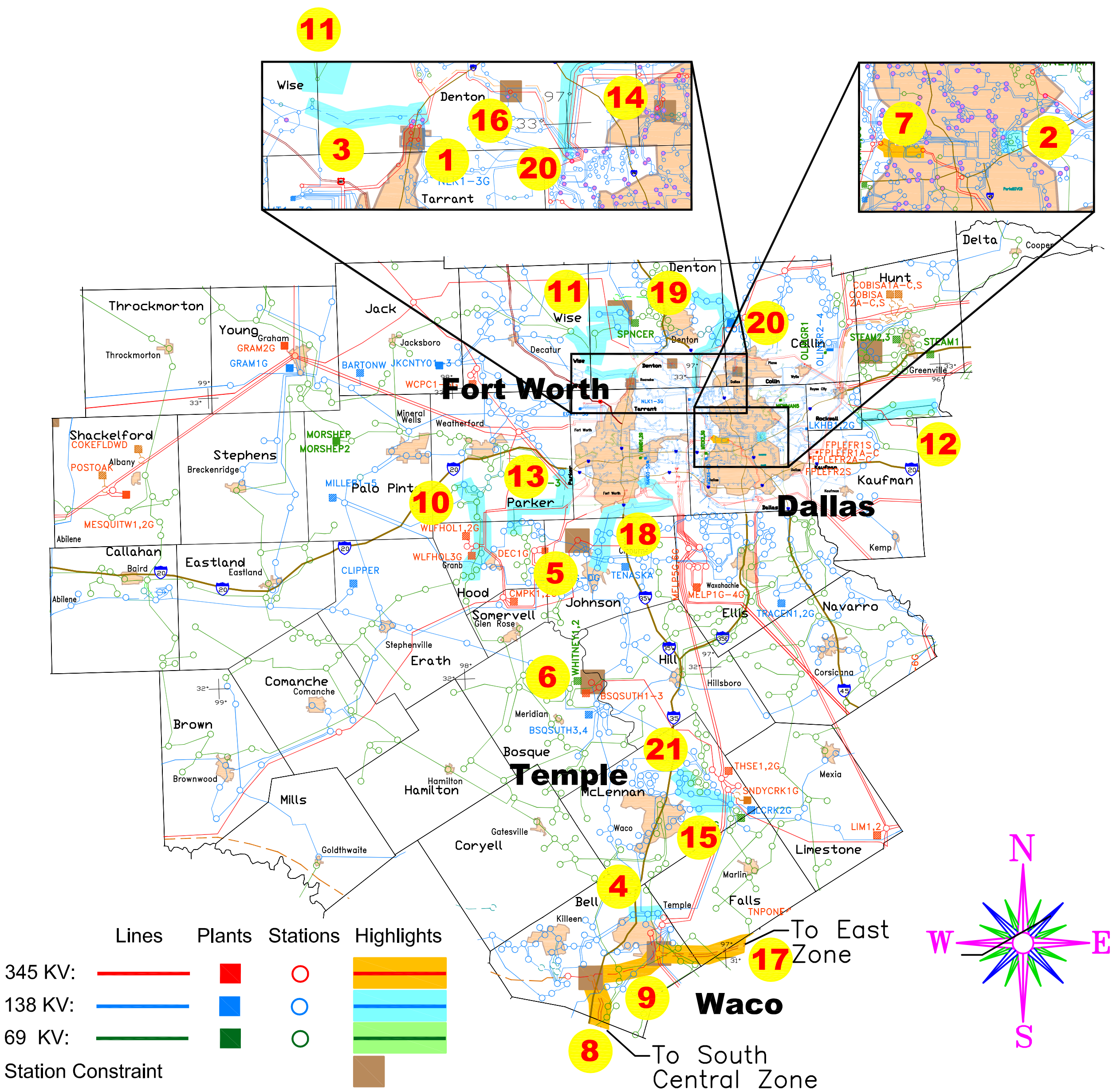
8.5.4 Completed Improvements – North Central Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2007 and 2008 in the North Central weather zone. The elements consist of 428.6 miles of transmission, one new substation, and two new autotransformers. There were 49.4 miles of new transmission (9 miles at 345kV and 40.4 miles at 138kV) and 379.2 miles of upgraded lines (51.4 miles at 345kV, 148.7 miles at 138kV, and 179.1 miles at 69kV). Many of these upgrades were accomplished by raising the voltage of the circuit or replacing the existing conductor. The new and upgraded lines will help 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. With the completion of the Royse – Ben Davis 345kV transmission upgrade, the Centerville Switch SPS was removed.

Map Index	Completed Improvements	Year in Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Copperas Cove – Ding Dong New Line	2008	138	15.7	
2	Temple Pecan Creek – Lake Creek Upgrade	2008	138		28.5
3	Bunker – Hood Rebuild	2008	138		9.1
4	Covington – Grandview Rebuild	2008	138		9.9
5	Plastipak New Substation	2008	138		
6	Nolanville – Harker Heights Upgrade	2008	138		7
7	Olney – Shannon Rebuild	2008	69		28.5
8	Seaton – Poage Upgrade	2008	69		11.9
9	Hasse – Downing Upgrade	2008	69		7.3
10	Gatesville – Fort Gates Switch Rebuild	2008	69		7.5
11	West Denton Substation Rebuild and Auto Addition	2007	345/138		
12	DeSoto 600MVA autotransformer new	2007	345/138		
13	Royse - Terrell Switch Rebuild and Addition	2007	138/69	18.5	18.5
14	DeCordova – Everman Upgrade	2007	345		34.4
15	Watermill – W. Levee Addition	2007	345	9	
16	Ben Davis – Royse Reconductor	2007	345		17
17	Euless – Keller Upgrade	2007	138		28.8
18	Cedar Hill – DeSoto Rebuild and Addition	2007	138	6.2	6.2
19	Whitney – Covington Rebuild	2007	138		27.9
20	Belton – South Harker Heights Upgrade	2007	138		11.9
21	Forney – East Mesquite Upgrade	2007	138		10.6
22	Hood – Spunky Rebuild	2007	138		8.8
23	Granbury – Stephenville Rebuild	2007	69		26.2
24	Prairie Hill – Purdon Rebuild	2007	69		24.2
25	Poage – Leon Junction Rebuild	2007	69		24
26	Peoria – Forreston Rebuild	2007	69		31

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

Numerous improvements are planned in the DFW area to relieve congestion and allow the growing load to be more efficiently served. In the central DFW area, the West Levee to Norwood 345-kV line will be added by the end of 2009. Dynamic reactive devices will be added to Parkdale in 2009 and to Renner in 2010 to restore reactive capability lost by the shutdown of generation in the DFW area.

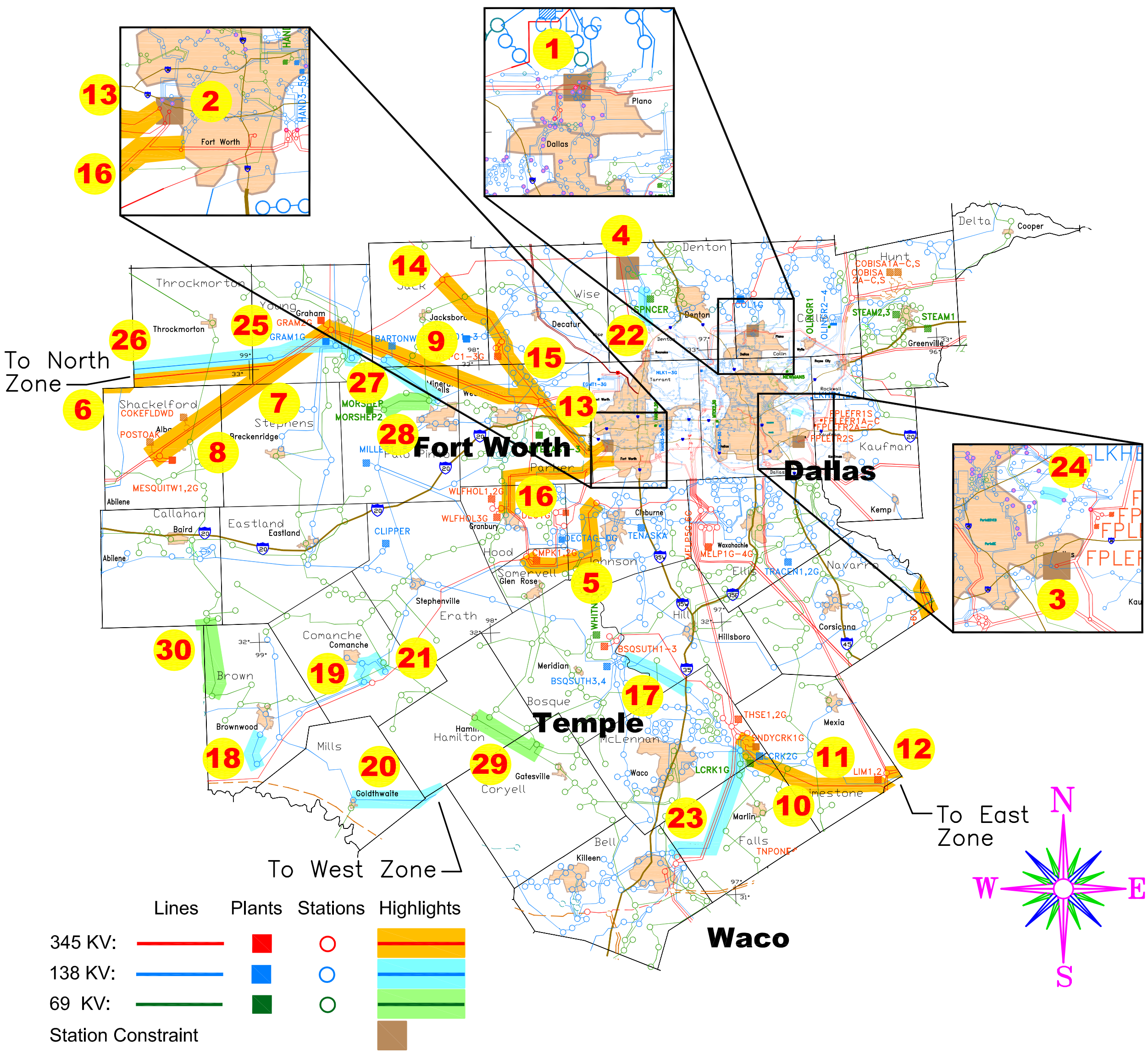
The Roanoke area will have several upgrades throughout the 2009 to 2011 time frame, including a 345/138-kV autotransformer replacement and a few 138-kV line upgrades. In addition, many projects in the Denton area have been proposed including constructing new substations and lines, and upgrading existing lines.

Planned improvements in the Waco and Temple areas include the upgrade of the 138-kV circuit between Lake Creek and Robinson, the Lake Creek to West Waco 138-kV line, and the Temple Switch to Salado Switch 345-kV line, all in 2010. In addition, the Temple North to Temple Elm Creek double circuit will be reconfigured to separate structures in 2009.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Roanoke Switching Station Auto Replacement	345/138	2009	X
2	Parkdale Dynamic Project	138	2009	X
3	Rhome - Roanoke Rebuild	138	2009	
4	Temple Elm Creek Switch - Temple North Upgrade	138	2009	
5	Concord Autotransformer Addition	345/138	2010	
6	Whitney Autotransformer Addition	345/138	2010	
7	West Levee - Norwood New Line	345	2010	X
8	Hutto Switch - Salado Switch New Line and Switching Station	345	2010	X
9	Temple Switch - Salado Upgrade	345	2010	X
10	Fox - Granbury Upgrade	138	2010	
11	Krum Tap - Krum - Allison - Decatur New Line and New Krum Tap Switching Station	138	2010	X
12	Ables Springs New Line and POI (Oncor)	138	2010	X
13	Fairview - Aledo New Line	138	2010	X
14	Renner Dynamic Project	138	2010	X
15	Lake Creek - Robinson Upgrade	138	2010	
16	Lewisville Autotransformer Addition	345/138	2011	
17	Twin Oaks - Bell County SE (Oncor)	345	2011	X
18	Everman - Cleburne Switch Rebuild	138	2011	
19	Frisco - Kruegerville Reconductor	138	2011	
20	Northwest Carrollton - Collin Rebuild	138	2011	
21	Lake Creek - East Waco Line Upgrade	138	2011	

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

Several lines in the North Central weather zone are expected to experience significant congestion over the next several years as wind energy imports from the west increase. The majority of this congestion will occur on the 345-kV system and 345/138-kV autotransformers. The 345-kV lines coming into Graham and into Parker from the west are still expected to be heavily congested until the CREZ lines are implemented.

The DFW area is expected to experience congestion typical of the largest load center in ERCOT. However, recent transmission upgrades and additional 345/138-kV autotransformer capacity will minimize these effects.

The Denton area is also expected to encounter some congestion. The recently planned transmission upgrades and additional 345/138-kV autotransformer in that area should help reduce this congestion.

Map Index	Projected Constraining Element	Voltage (kV)	2009	2010	2011	2012	2013
1	Allen Switching Station Autotransformer	345/138					
2	Benbrook B Autotransformer	345/138					
3	Seagoville SS Autotransformer	345/138					
4	RD Wells (Iron Horse) Autotransformer	138/69					
5	Comanche Peak West - Johnson SS	345					
6	Graham - Tonkawa Switch	345					
7	Graham - Cokefield	345					
8	Graham - Long Creek Switching Station	345					
9	Graham - Parker	345					
10	Jewett - Lake Creek	345					
11	Jewett - Rattle Snake	345					
12	Jewett South - Limestone Plant Substation	345					
13	Parker - Benbrook A Tap	345					
14	Willow Creek Sw - Jacksboro SS	345					
15	Willow Creek Sw - Parker	345					
16	Wolf Hollow - Rocky Creek	345					
17	Bosque Switch - Rogers BEC POD	138					
18	Brownwood South- Brady Highway	138					
19	Comanche SS - Comanche Tap	138					
20	Evant - Goldthwaite	138					
21	Hasse BEC POD - Comanche Tap	138					
22	Jim Christal - West Denton	138					
23	Lake Creek SES - Temple Pecan Creek	138					
24	Mesquite West - Mesquite Western Electric	138					
25	Murray BEC POD - Graham SES	138					
26	Murray BEC POD - Paint Creek	138					
27	Oran - Barton	138					
28	Morris Sheppard - Oran	69					
29	Pancake - Hamilton	69					
30	Santa Anna Tap - Dressy Tap	69					

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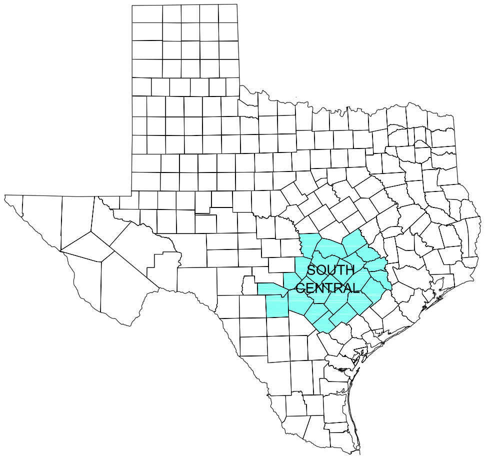
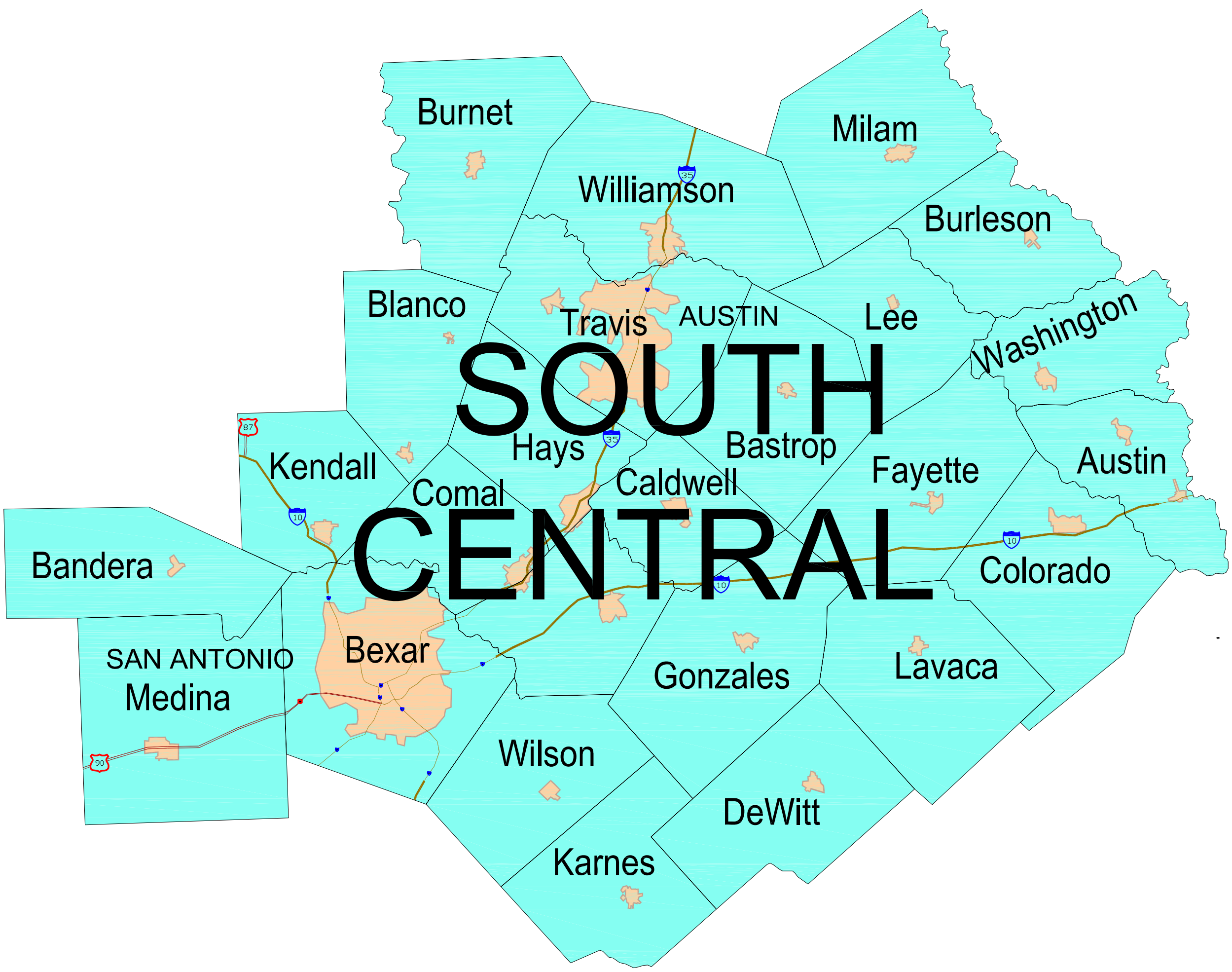
8.6 Area Constraints and Improvements –South Central Weather Zone

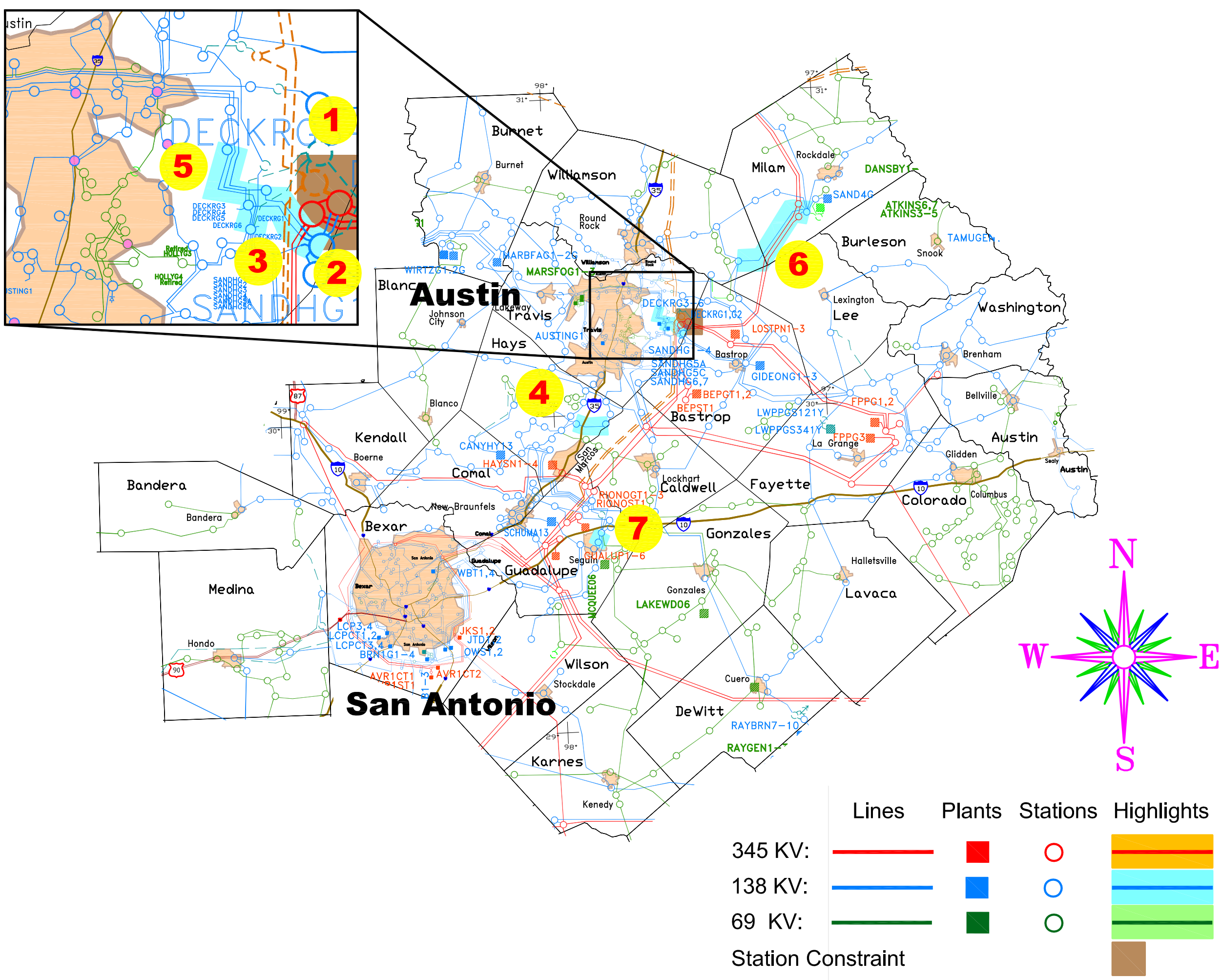


Austin, San Antonio, and the surrounding suburbs make up the South Central weather zone. The map below highlights the counties included in the South Central weather zone.



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.



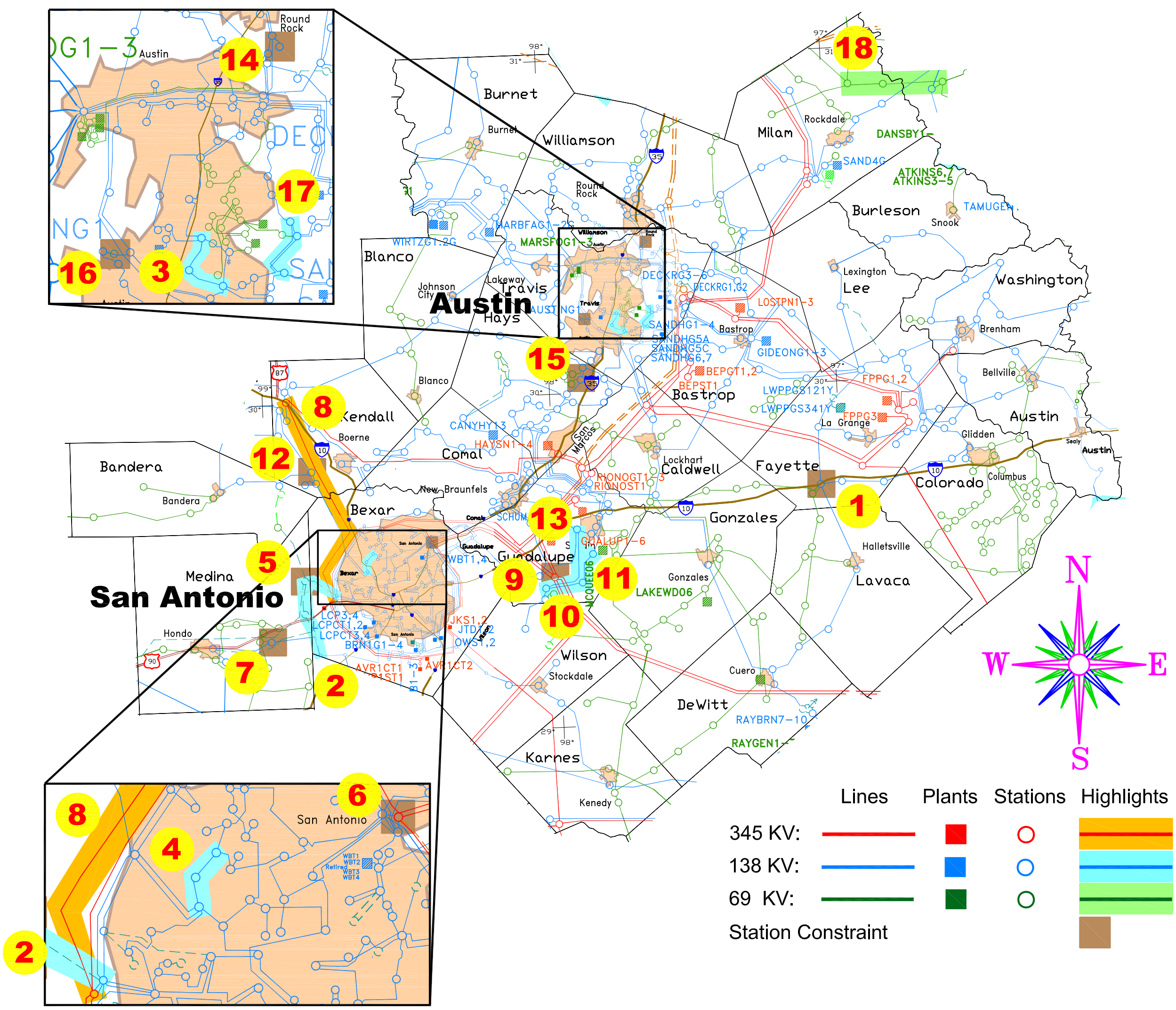
8.6.2 Recent Constraints – South Central Weather Zone

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 Autotransformer #1	345/138
2	Austrop Autotransformer #2	345/138
3	Austrop - Decker	138
4	Canyon - Rohr	138
5	Decker - Sprinkle	138
6	Sandow Switch - Elgin Switch	138
7	Seguin - Seguin West	138

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.



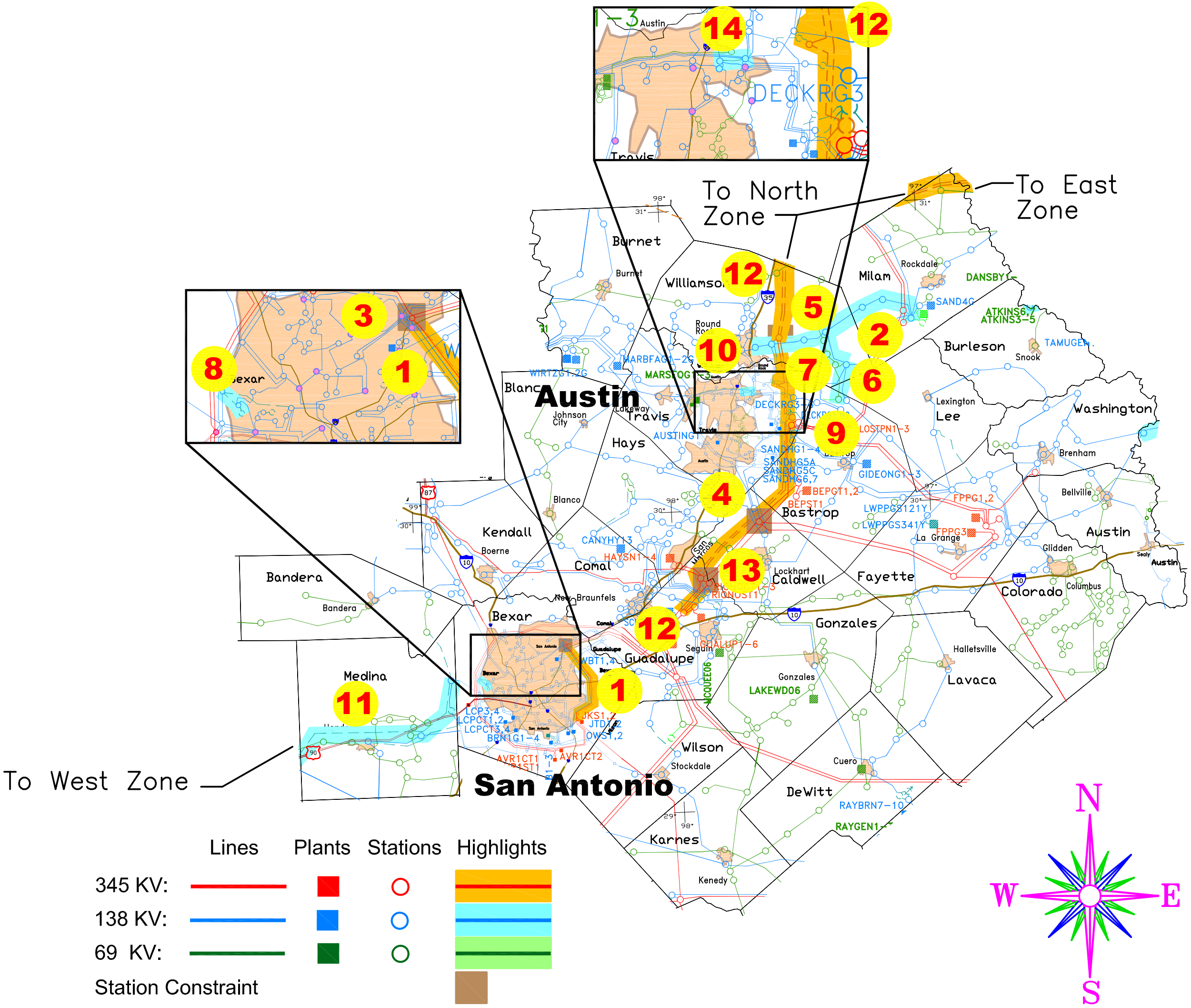
8.6.4 Completed Improvements – South Central Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2007 and 2008 in the South Central weather zone. The elements consist of 133.2 miles of transmission, seven new substations, and two new autotransformers. There were 72 miles of new transmission (46 miles at 345kV and 26 miles at 138kV) and 61.2 miles of upgraded lines (51.3 miles at 138kV). Many of these upgrades were accomplished by raising the voltage of the circuit or replacing the existing conductor. The Kendall to Cagnon 345 kV line will help maintain reliable service to the growth of the Hill Country load and help to remove the SPS on the Hays Energy Facilities. The Elm Creek Switching Station was constructed as a hub to reroute power. The seven 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	Flatonia New Auto	2008	138/69		
2	Cagnon – TX Research – Lytle New Line	2008	138	21.7	
3	Burleson – Cardinal Lane – Seaholm Upgrade	2008	138		5.7
4	Bandera – Hamilton Wolfe – Med. Center Reconductor	2008	138		1.7
5	Texas Research Park New Station	2008	138		
6	Skyline Auto Upgrades	2007	345/138		
7	Pearson New Switching Station and Auto	2007	138/69		
8	Kendall – CPS Cagnon New Line	2007	345	45	
9	Elm Creek Switching Station	2007	345		
10	Elm Creek Switching Station Line Reroutes - STP, Marion, Hill Country, Skyline, San Miguel	2007	345	1	
11	New Berlin – Hickory Forest – Capote – Seguin Upgrade	2007	138		31.7
12	Menger Creek New Substation	2007	138		
13	McQueeney – New Berlin Upgrade	2007	138		8.2
14	Wells Branch New Substation	2007	138		
15	Lehigh New Substation	2007	138		
16	Vega New Substation	2007	138		
17	Bergstrom – Kingsbery Reconductor	2007	138		4
18	Branchville – Silver City Rebuild	2007	69		9.9

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

The most significant improvement in the South Central weather zone will be the completion of the Clear Springs to Salado 345-kV double circuit by 2011. This project will help deliver energy to Central Texas load and address transmission reliability needs in that area. The project will parallel the existing north to south 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.

The 138-kV transmission system northeast of Austin will also undergo several noteworthy upgrades in order to distribute the power being injected from the 345-kV system at Hutto and Gilleland Creek, as well as deliver power from the new Sandow 5 coal-fired power plant. These improvements include the rebuilding of the Sandow Switch to Taylor 138-kV line in 2009, the rebuilding of the Taylor to Hutto Switch 138-kV line and the Elgin Switch to Taylor 138-kV line by the end of 2009, and the rebuilding of the Hutto to Round Rock Northeast 138-kV line in 2010. Additionally, the Elgin Switch Station to Elgin Substation 69-kV line will be rebuilt for 138-kV operation in 2010.

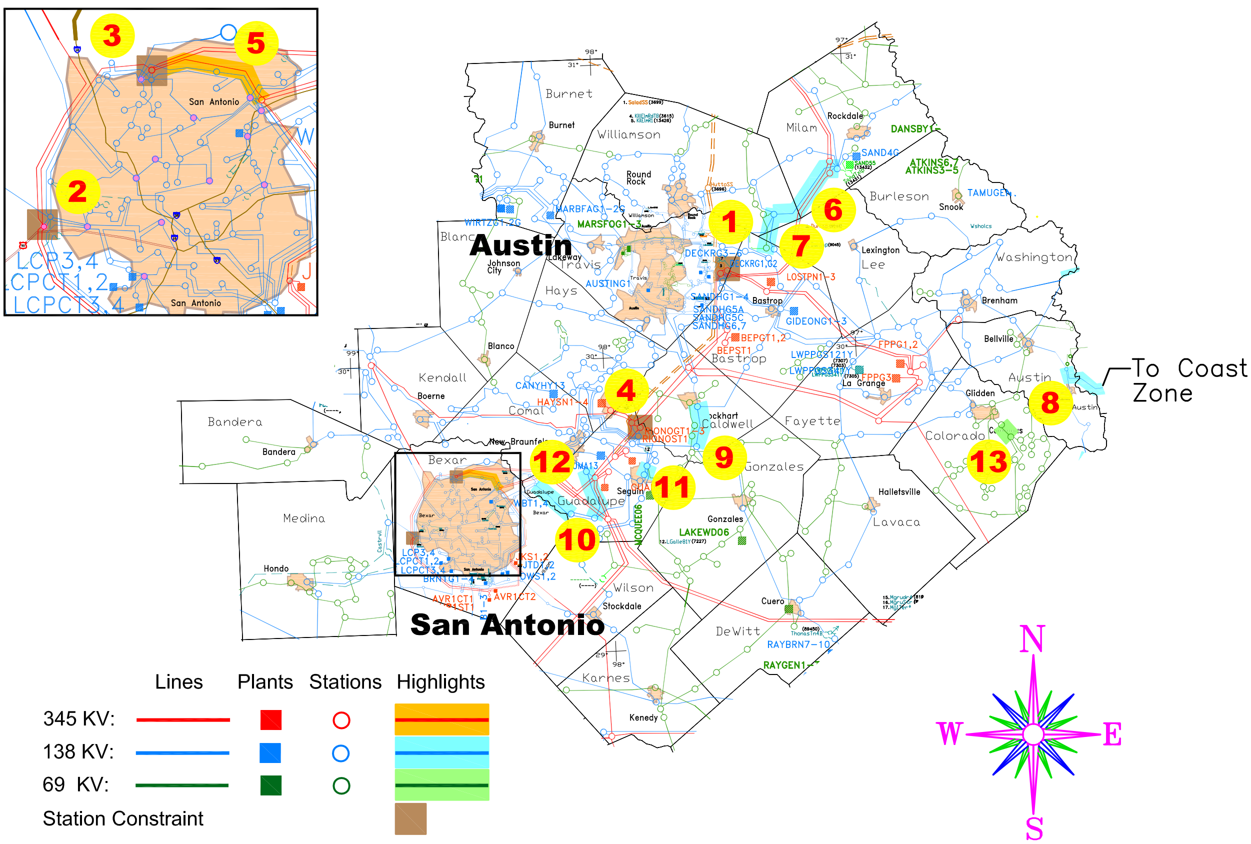
Due to the load growth in the area between Austin and San Antonio, additional 345/138-kV autotransformer capacity will be added at Lytton Springs in 2010 and Zorn in 2013.

The San Antonio area has several 345-kV upgrades scheduled including a second Skyline to Spruce 345-kV circuit which will be installed in 2009, a year ahead of new generation at Spruce in 2010. A third 345/138-kV autotransformer is planned at Skyline in 2009. A new 138-kV line from Anderson to Westover Hills will be built in 2010 to serve growing load in west and northwest San Antonio.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Spruce - Skyline Line Addition	345	2009	X
2	Sandow Switch - Salty - Thorndale North - Taylor Upgrade	138	2009	X
3	Skyline Autotransformer Addition	345/138	2010	X
4	Lytton Springs Autotransformer Addition	345/138	2010	X
5	Hutto Switch - Salado Switch New Line and Switching Station	345	2010	X
6	Elgin Switch - Taylor Upgrade	138	2010	
7	Taylor - Taylor West - Hutto Switch Upgrade	138	2010	X
8	Anderson - Westover Hills New Line	138	2010	X
9	Elgin Switching Station - Elgin Upgrade	138	2010	
10	Hutto Switch - Roundrock NE / Roundrock	138	2010	
11	Uvalde Area Project	138	2011	X
12	Zorn/Clear Springs-Gilleland Creek-Hutto Switch New Line	345	2012	X
13	Zorn Auto Addition	345/138	2013	X
14	McNeil - Summit Additional Line	138	2014	

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

The majority of the expected constraints in the South Central weather zone relate to the rapidly growing Central Texas load. Heavy congestion is expected on Austrop Autotransformer 1 in Year 2009 and Year 2010. After the installation of the new 345/138-kV autotransformers at Dunlap and other upgrades, no further congestion is expected on this autotransformer. The Elgin area is expected to continue encountering congestion on the 138-kV Sandow to Elgin Switching Station line. This congestion will be reduced with the new autotransformer at Hutto and other planned projects in Central Texas.

Map Index	Projected Constraining Element	Voltage (kV)	2009	2010	2011	2012	2013
1	Austrop Autotransformer 1	345/138					
2	Cagnon Autotransformer	345/138					
3	Hill Country West Autotransformer	345/138					
4	Zorn Bus 2 Autotransformer	345/138					
5	Hill Country - Skyline	345					
6	Elgin SS - Sandow	138					
7	Elgin Tap - Elgin Tap LCRA	138					
8	Flewellen - Peters Reit	138					
9	Lockhart - Luling	138					
10	Marion - Cibolo	138					
11	Seguin -Seguin West	138					
12	Shertz - Parkway	138					
13	Altair - Stafford Hill	69					

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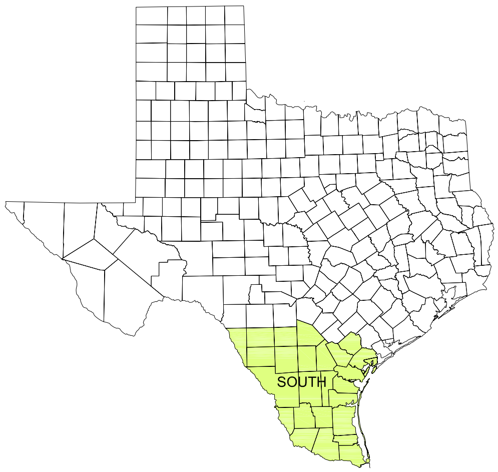
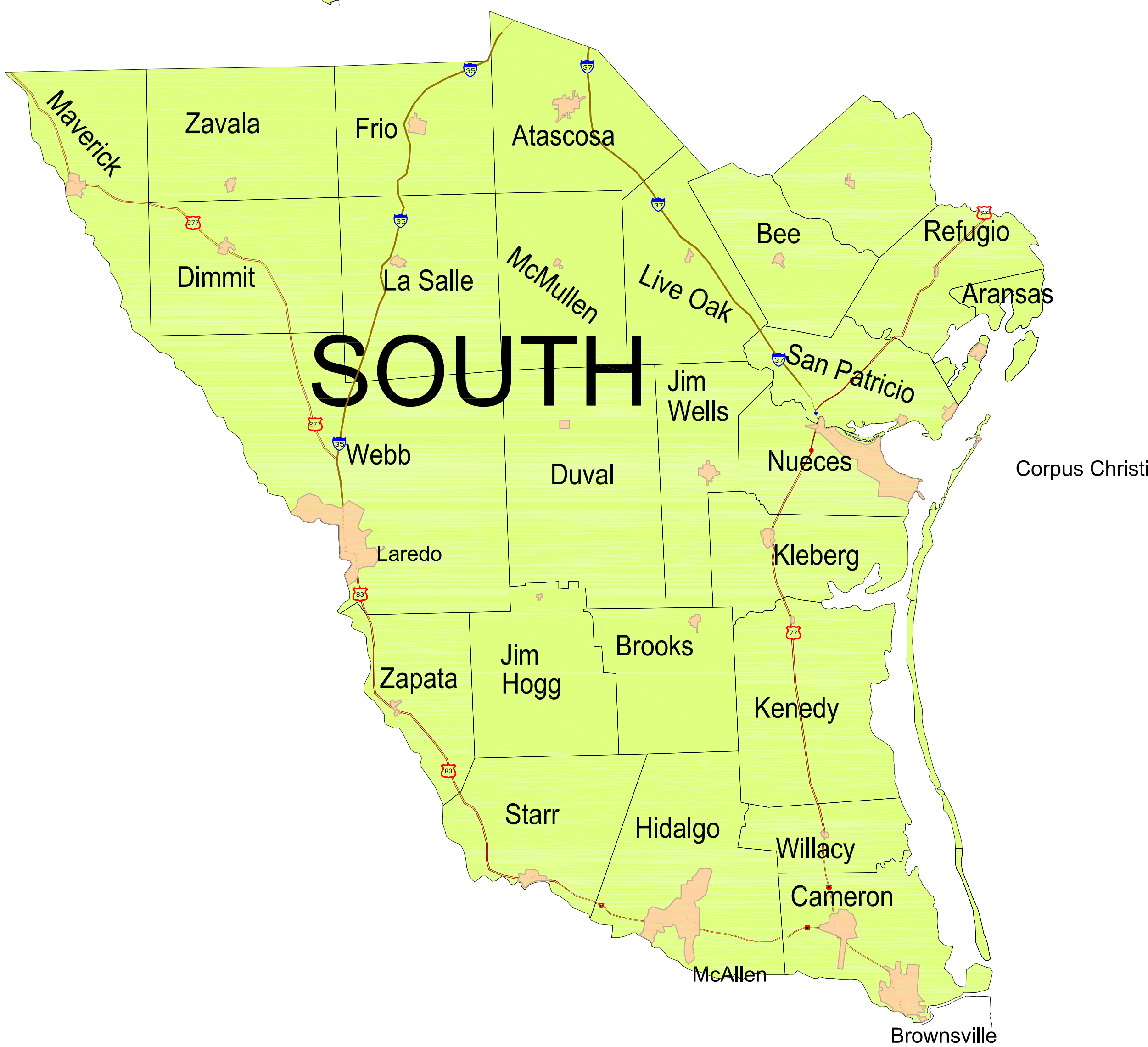
8.7 Area Constraints and Improvements – Southern Weather Zone

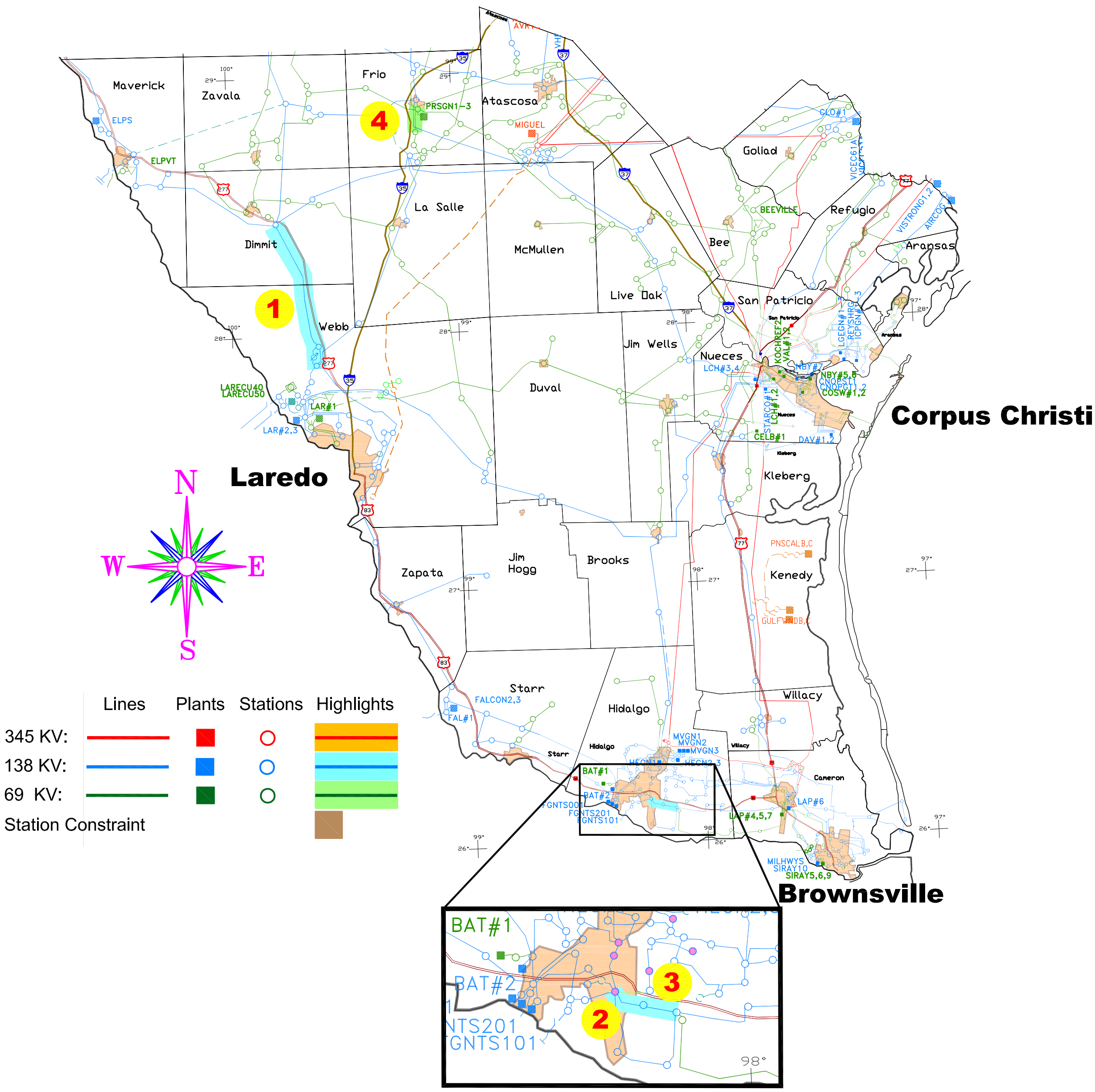


The Southern weather zone covers the south Texas plains and contains the cities of Laredo, Corpus Christi, McAllen, and Brownsville. The map below highlights the counties included in the Southern weather zone.



8.7.1 Recent Constraints Map – Southern Weather Zone

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



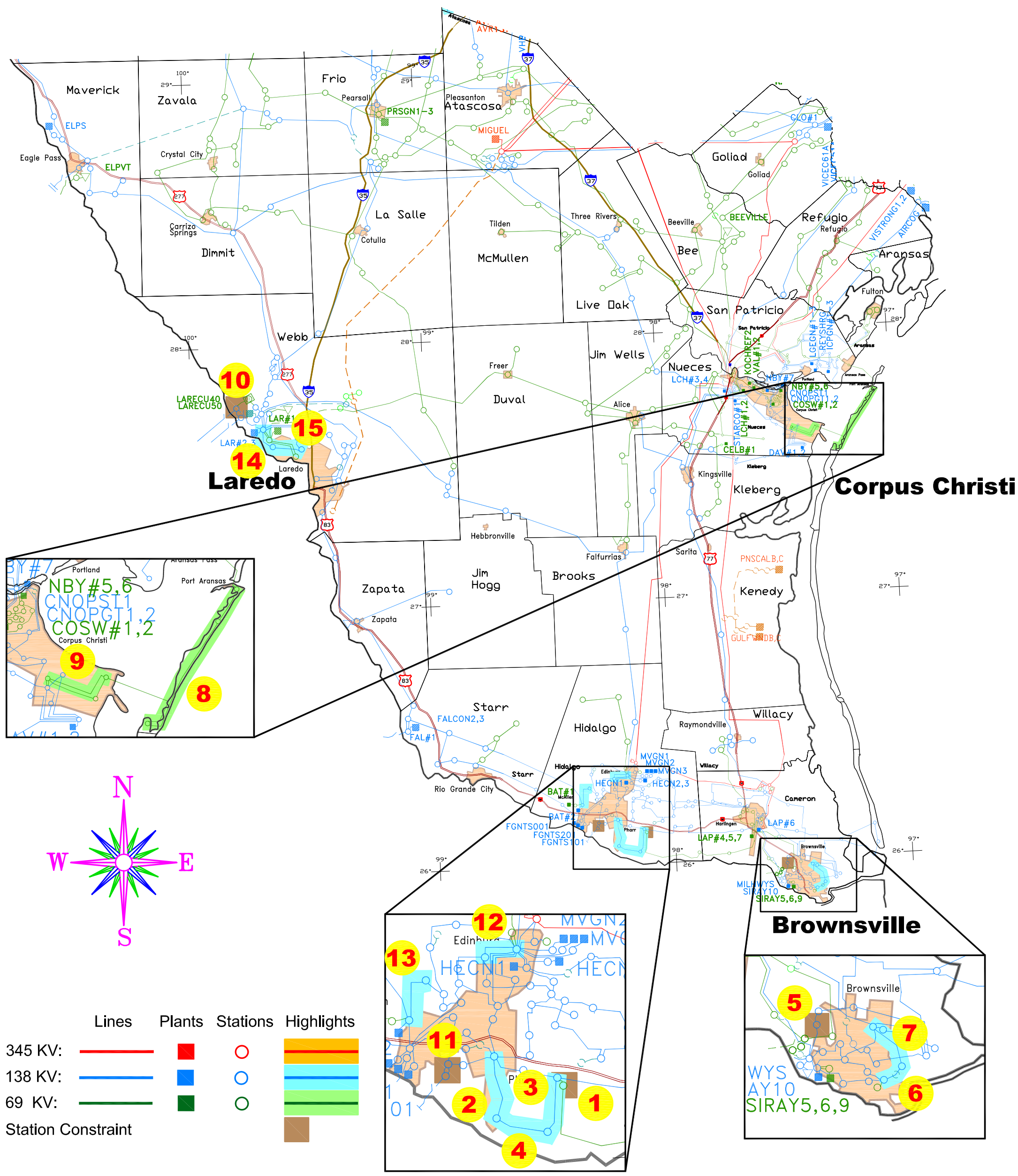
8.7.2 Recent Constraints – Southern Weather Zone

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

Map Index	Constraining Element	Voltage (kV)
1	North Laredo - Asherton	138
2	South McAllen - Las Milpas	138
3	South McAllen - Stewart Road	138
4	Derby - Pearsall	69

8.7.3 Completed Improvements Map – Southern Weather Zone

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



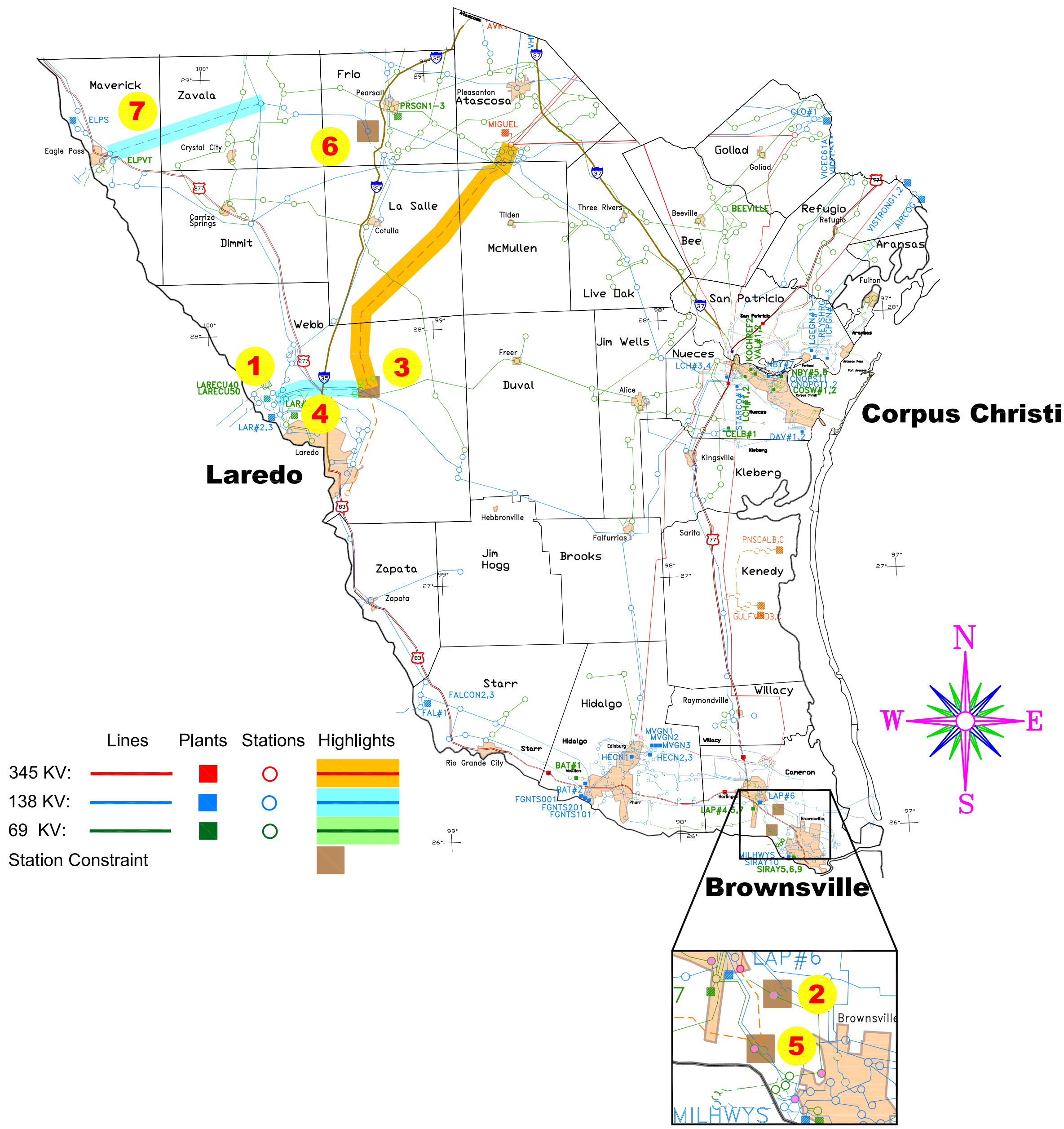
8.7.4 Completed Improvements – Southern Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2007 and 2008 in the Southern weather zone. The elements consist of 52.1 miles of transmission, two new substations, and non-synchronous ties to Comision Federal De Electricidad (CFE) in Mexico. There were 3.8 miles of new 138kV transmission and 48.3 miles of upgraded lines (33.6 miles at 138kV). Many of these upgrades were accomplished by raising the voltage of the circuit or replacing the existing conductor. The Stewart Road Switching Station was built so the circuit from South McAllen – Hidalgo – Hi-Line – Stewart could be upgraded to 138kV, thus providing more reliable power to that area. The two ties to CFE allow power to be transferred with Mexico which makes the system more reliable along the border.

Map Index	Completed Improvements	Year in Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Stewart Road Switching Station	2008	138		
2	Hidalgo – South McAllen Upgrade	2008	138		3.7
3	Hi-Line – Stewart Road Upgrade and Addition	2008	138	3	3
4	Hi-Line – Hidalgo Upgrade	2008	138		2
5	Olmito New Substation	2008	138		
6	Airport – Waterport Upgrade	2008	138		8.8
7	Waterport – Loma Alta New Line	2008	138	4.3	
8	North Padre – Mustang Island Rebuild	2008	69		6.7
9	Airline – Naval Base Rebuild	2008	69		8
10	Laredo CFE Tie	2007	138		
11	Sharyland CFE Tie	2007	138	0.8	
12	N. Edinburg – W. Edinburg Rebuild	2007	138		4.6
13	Bates – Palmview Upgrade	2007	138		2
14	Laredo – Anna Street Upgrade	2007	138		3.2
15	Laredo Heights – Anna Street Upgrade	2007	138		2

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 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.

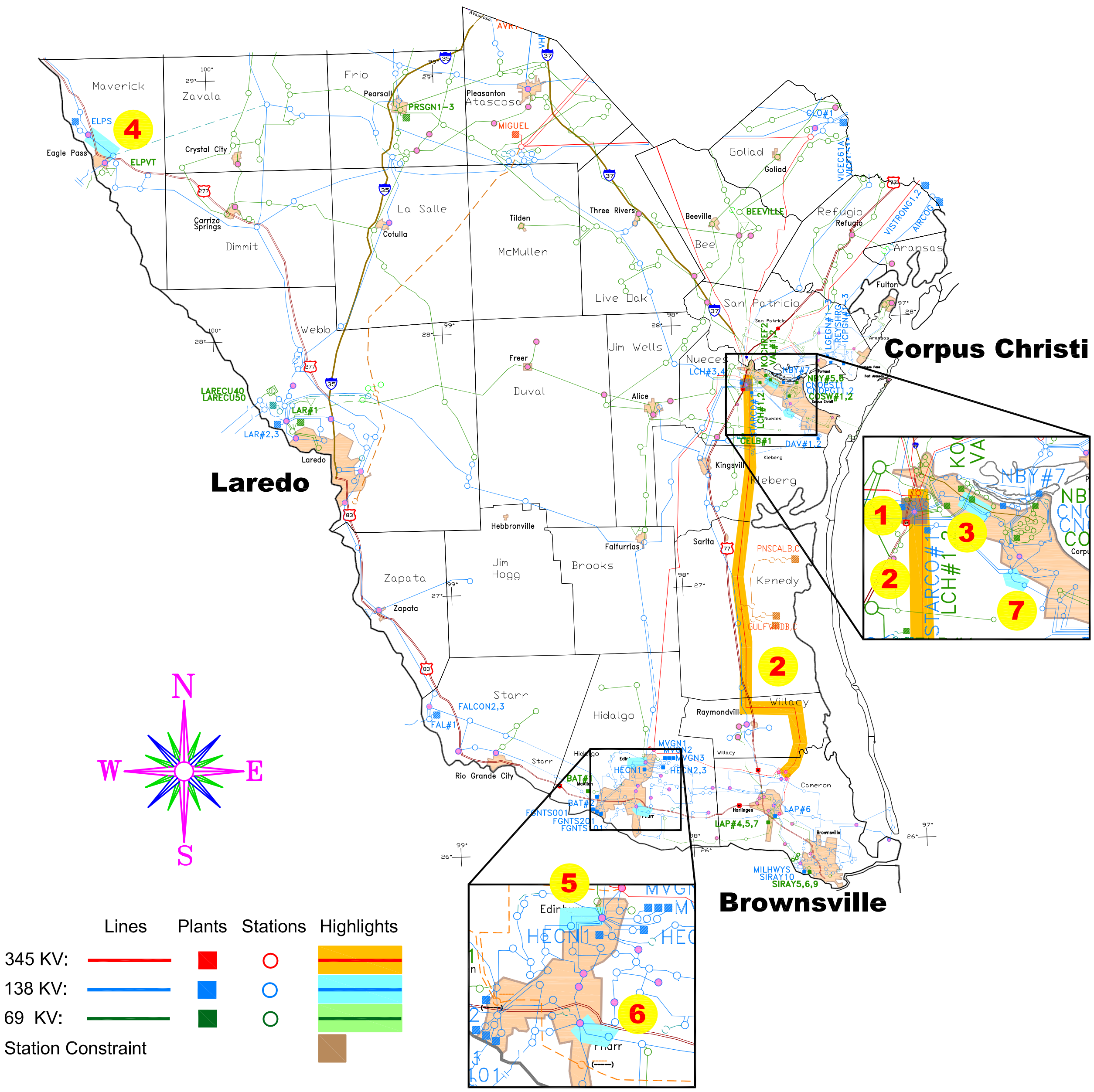
Several other improvements are scheduled for the area between San Antonio and Laredo to alleviate thermal overloads and problems with low voltage. These improvements, known as the Uvalde Area Project, include a new Escondido to West Batesville 138-kV line in 2013 and a new Palo Duro 138-kV station as well as 138-kV line from that station to Dilley by the end of 2009.

In the Rio Grande Valley, several 138-kV upgrades and 69-kV conversions will relieve local contingency overloads. On the east side of the Valley the improvements include the conversion of the Los Fresnos and Villa Cavazos stations from 69-kV to 138-kV operation by 2009.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Laredo Plant - Lobo Upgrade	138	2009	
2	Los Fresnos Conversion	138	2009	
3	Lobo - San Miguel New Line	345	2010	X
4	Laredo Plant - Lobo Rebuild	138	2010	
5	Villa Cavazos Conversion	138	2010	
6	Palo Duro Sitching Station	138	2011	X
7	Escondido - West Batesville New Line	138	2013	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

Congestion in the Southern weather zone will be reduced significantly. Most of the congestion in Southern weather zone will be in Rio Grande Valley. In addition, congestion on Lon Hill Autotransformer 1 is expected to increase gradually during 2010-2013.

Map Index	Projected Constraining Element	Voltage (kV)	2009	2010	2011	2012	2013
1	Lon Hill Autotransformer 1	138/69					
2	Rio Hondo - Lon Hill	345					
3	Citgo West - Weil Tract	138					
4	Escondido - Eagle Pass Hydro Tap	138					
5	North Edinburg - West Edinburg (MVEC)	138					
6	South McAllen - Las Milpas (MVEC)	138					
7	Westside - Cabaniss	138					

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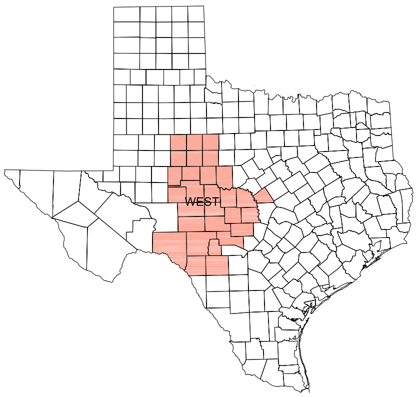
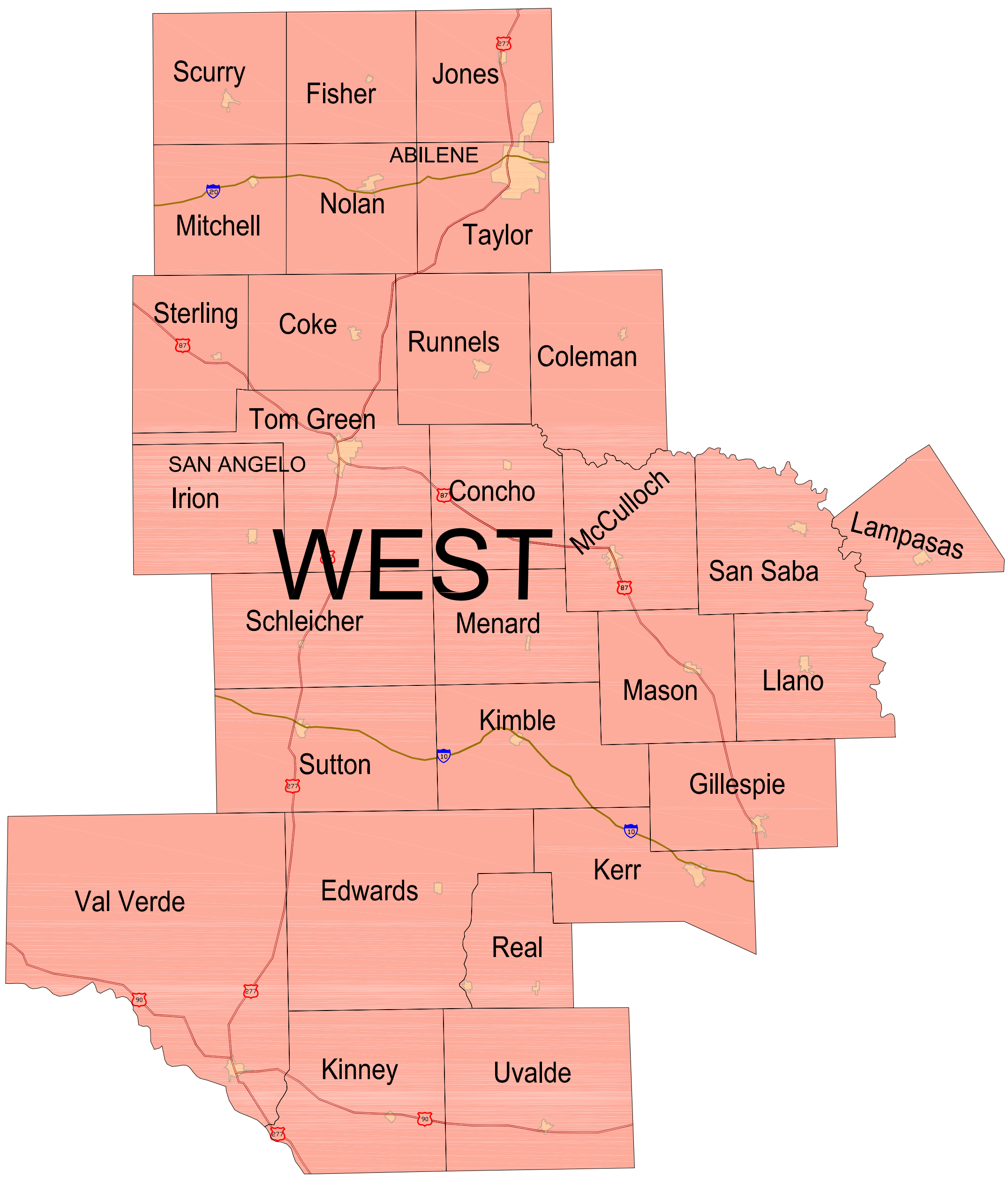
8.8 Area Constraints and Improvements – West Weather Zone

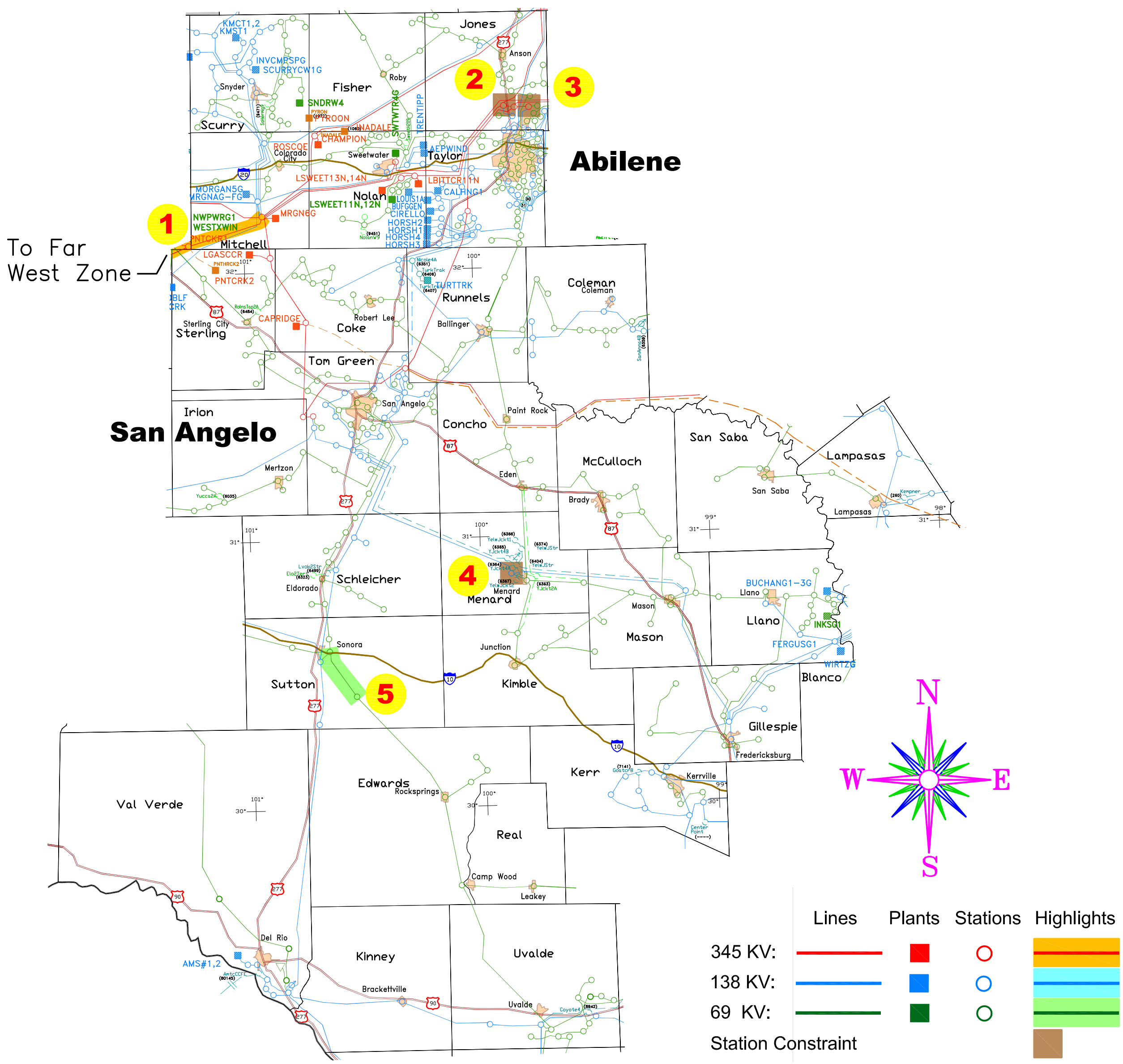


The West weather zone includes Del Rio, Abilene, San Angelo, and the western part of the Texas hill country. The map below highlights the counties included in the West weather zone.



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	Morgan Creek SES - Cal Energy	345
2	San Angelo Red Creek Autotransformer #1	345/138
3	San Angelo Red Creek Autotransformer #2	345/138
4	Menard Autotransformer #1	138/69
5	Sonora - Friess Ranch	69

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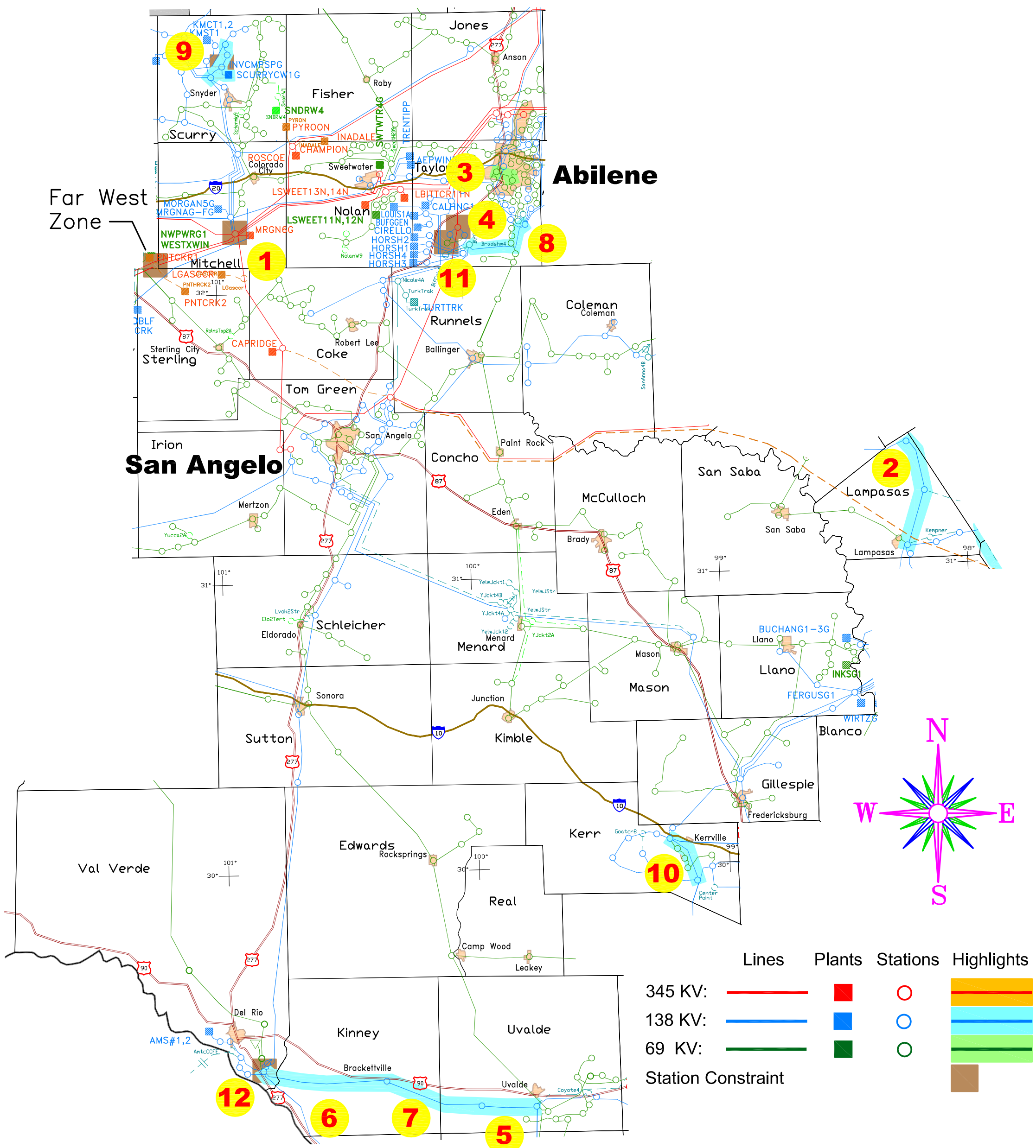
8.8.3 Completed Improvements Map – West Weather Zone

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



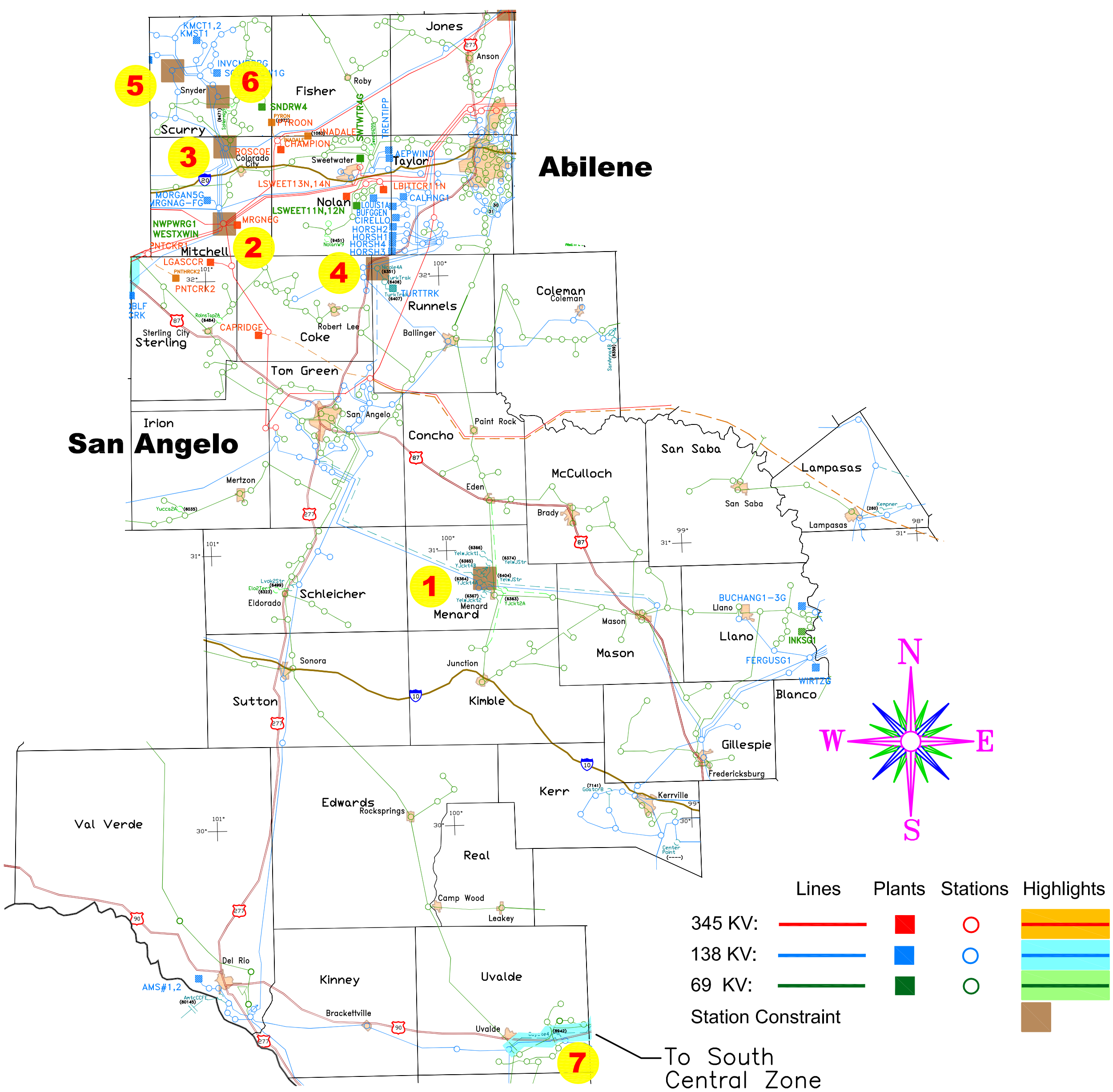
8.8.4 Completed Improvements – West Weather Zone

The map shows the most significant new and upgraded elements that were completed in 2007 and 2008 in the West weather zone. The elements consist of 143.3 miles of upgraded transmission (140.7 miles at 138kV), one new substation, one new autotransformer, and two reactive devices. Many of the transmission upgrades were accomplished by raising the voltage of the circuit or replacing the existing conductor. The two new reactive devices help regulate the system voltage which has been negatively impacted by the fluctuations in wind generation. These devices absorb or provide the system with reactive power depending on the voltage profile. The Golden Switching Station is a hub to new wind generation in the region, and the upgraded circuits were necessary to export the increased wind power. The Bluff Creek – South Abilene project helped remove the Bluff Creek SPS, and the rebuilt Uvalde – Hamilton Road project improves reliability in the sparse section of southwest Texas.

Map Index	Completed Improvements	Year in Service	Voltage (kV)	New Circuit (miles)	Circuit Upgrade (miles)
1	Morgan Creek New Auto	2008	345/138		
2	Lampasas – Adamsville – Evant Upgrade	2008	138		26
3	Abilene Elm Creek – Abilene Shelton Street Rebuild	2008	69		2.6
4	Bluff Creek Dynamic Reactive Device	2007	345		
5	Uvalde – Asphalt Mines Rebuild	2007	138		14.4
6	Brackettville – Hamilton Road Rebuild	2007	138		29
7	Asphalt Mines – Brackettville Rebuild	2007	138		38.6
8	Abilene South – Bluff Creek Reconductor	2007	138		18.5
9	Golden Switching Station New Substation	2007	138		
10	Verde Creek – Kerrville Stadium Upgrade	2007	138		14
11	Bluff Creek Switching Station Expansion	2007	138		
12	Hamilton Dynamic Reactive Device	2007	69		

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

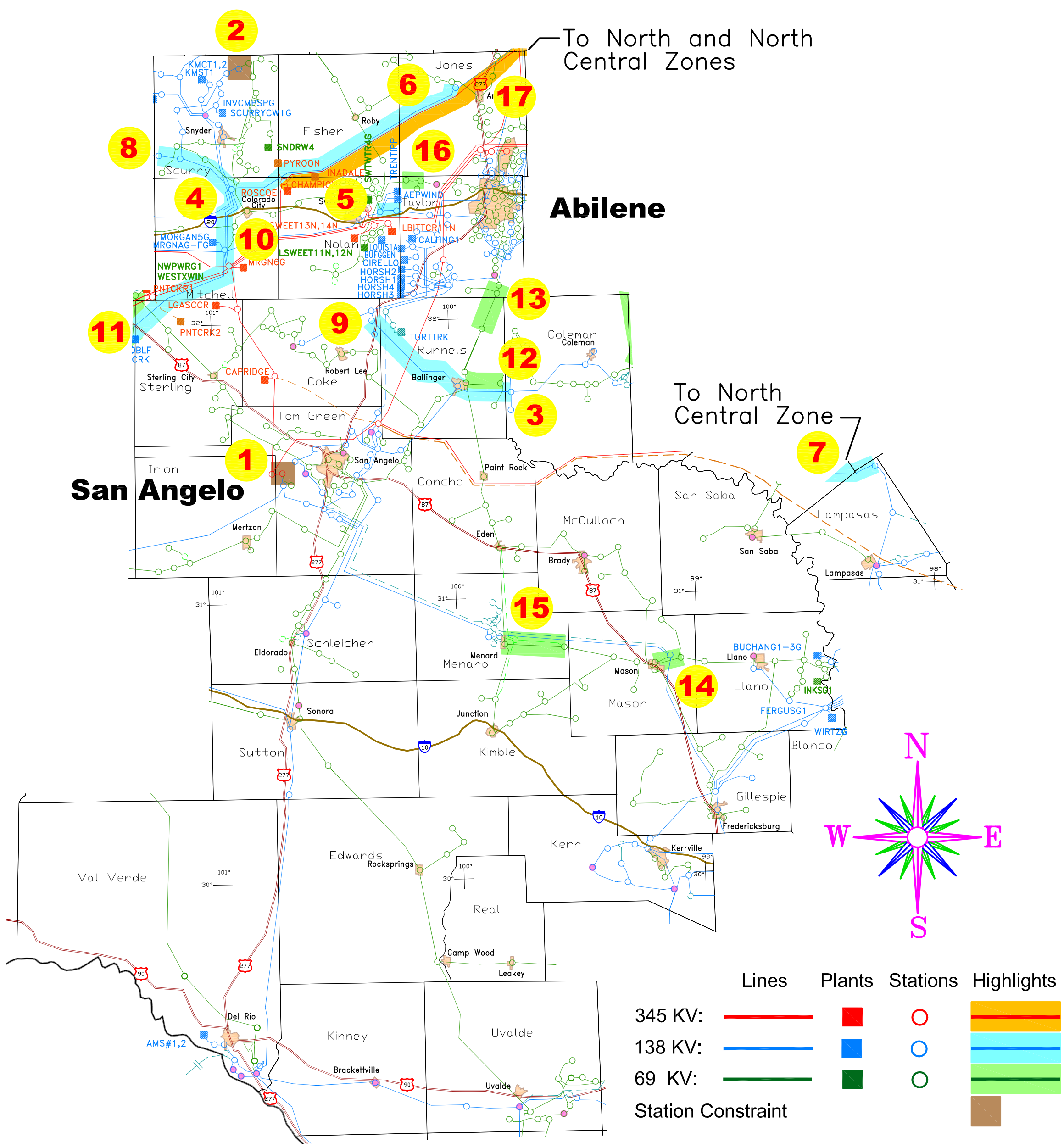
In addition to the CREZ facilities, several improvements are planned in the West weather zone. South of San Angelo, a 138-kV phase-shifting transformer (PST) is planned for a new 138/69-kV station named Yellowjacket in 2009 to control flow on the San Angelo Power Station to Mason 138-kV line. A new 138-kV station, Nicole, will be constructed in 2009 for wind generation interconnection. Terminal equipment at Morgan Creek, China Grove, Scurry Chevron, and Snyder will be upgraded in 2009 to relieve some wind generation congestion for the interim period before the CREZ facilities are built.

System improvements, known as the Uvalde Area Project, are planned between San Antonio and Del Rio in order to remove thermal overloads and improve the voltage characteristics of the Del Rio area. Improvements to be completed by 2011 include a new 138-kV line between Uvalde and Castroville, 138-kV improvements internal to the Del Rio area, and an emergency tie that will allow block load transfers to and from CFE.

Map Index	Planned Element	Voltage (kV)	Year in Service	ERCOT Review
1	Yellowjacket, New Station	138/69	2009	
2	Morgan Creek terminal equipment	345	2009	
3	China Grove terminal equipment	138	2009	
4	Nicole, Four Position Ring	138	2009	
5	Scurry Chevron terminal equipment	138	2009	
6	Snyder terminal equipment	69	2009	
7	Uvalde Area Project	138	2011	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 is still expected in the future years. The congestion is mainly associated with the massive increase in wind generation capacity in ERCOT. Much of this congestion should be mitigated with the CREZ projects completed.

Additionally, there will be some local congestion which will constrain new wind plants until the upgrades required to get the power to the bulk system can be completed.

Map Index	Projected Constraining Element	Voltage (kV)	2009	2010	2011	2012	2013
1	Twin Buttes Autotransformer	345/138					
2	Ennis Creek SES Autotransformer	138/69					
3	Ballinger - Lake Ivey Pump Tap	138					
4	Bluff Creek - China Grove	138					
5	Chgowner - Eskota	138					
6	China Grove - Radium M	138					
7	Evant - Goldthwaite	138					
8	Exxon Sharaon Ridge - Bluff Creek	138					
9	Fort Chadbourne Tap - Ballinger	138					
10	Morgan Creek SES - China Grove	138					
11	Morgan Creek SES - McDonald Rd SS	138					
12	Ballinger - Ballinger Humble Tap	69					
13	Bradshaw - Winters	69					
14	Fort Mason - Fredonia Tap	69					
15	Hext - Yellowjacket	69					
16	Tec Scott - Trent	69					
17	Graham - Tonkawa Switch	345					

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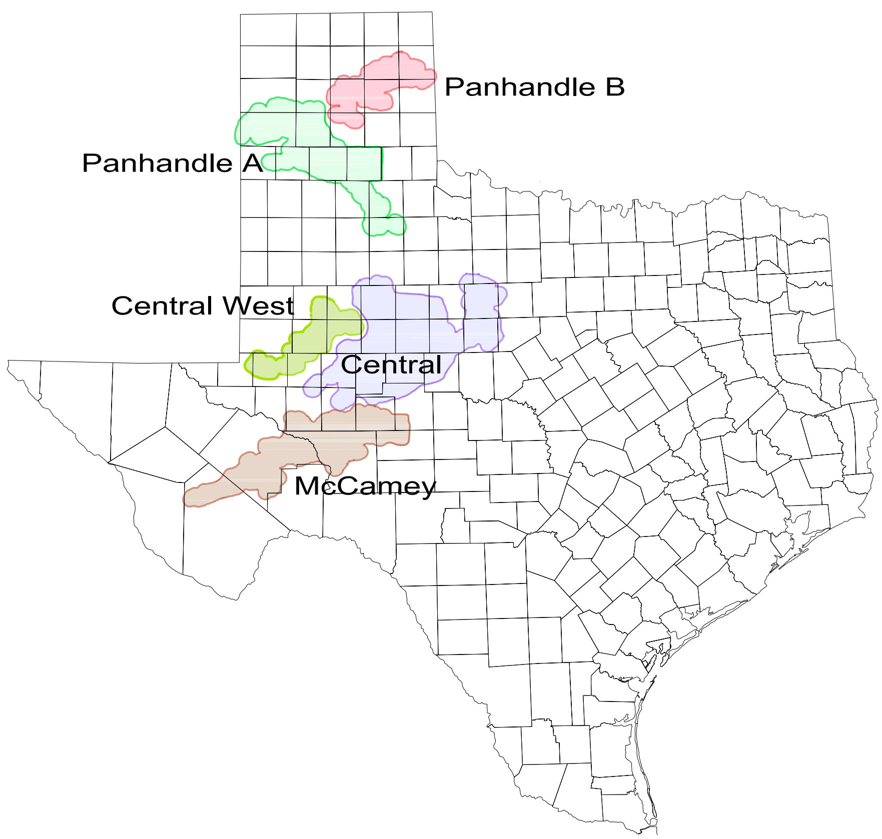
9.0 Summary of CREZ Report

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) throughout the State, and to designate new transmission projects to serve these zones. By statute, these new transmission projects will be constructed prior to development of the wind resources in the selected zones.

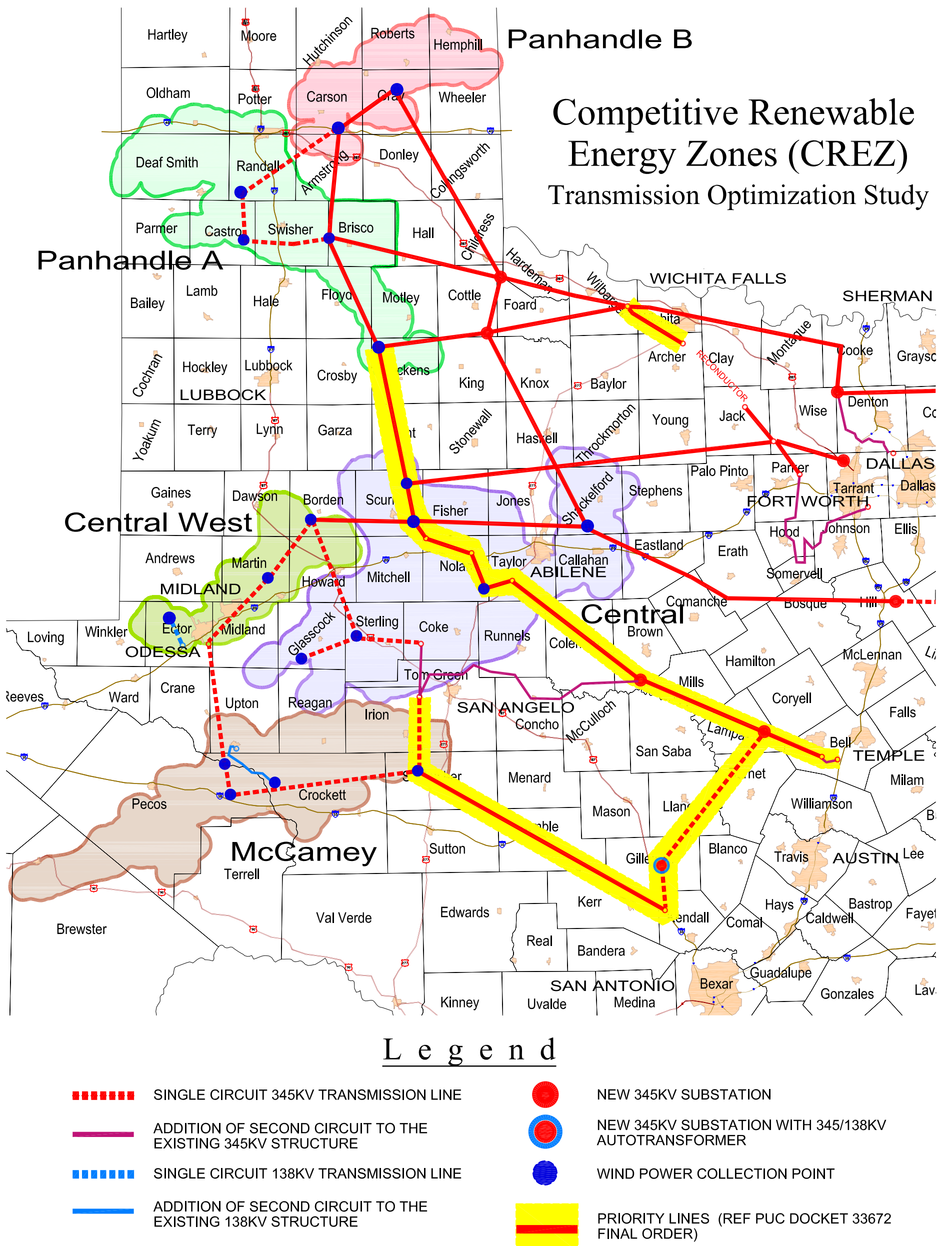
To fulfill the requirements of Senate Bill 20, the PUC requested that ERCOT complete a study of wind generation potential throughout the State, and develop options for transmission improvements to connect the wind generation to load. Working with AWS Truewind, ERCOT identified 25 areas in Texas with significant potential for wind generation and developed transmission solutions that would provide sufficient transmission capacity to carry generation from these areas to the Dallas/Fort Worth and central Texas load centers.

Following completion of the ERCOT study, the PUC initiated a contested-case proceeding (Docket 33672) with the goal of establishing Competitive Renewable Energy Zones. Based on the evidence, the PUC issued an Interim Order in October, 2007 that established five CREZ, show in the picture below.



The order also instructed ERCOT to conduct an optimization study of transmission improvements to provide transfer capacity sufficient for four scenarios of wind generation capacity in these zones.

ERCOT System Planning worked with stakeholders to develop optimized transmission plans for the four wind scenarios specified by the PUC. The Commission reviewed these plans, along with additional evidence in the docket, and, in August, 2008, designated the transmission improvements associated with scenario 2 as needed for allowing integration of wind resources from the CREZ in the most cost-effective manner. The transmission plan for scenario 2 is depicted below. The large red lines represent new 345-kV circuits; the solid lines are double-circuit lines, while the dotted lines are single-circuit lines built on double-circuit capable towers.



10.0 Long Term System Assessment Summary

Background

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 order to meet this requirement, ERCOT completes a Long-Term System Assessment (LTSA) every other year. 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.

Summary

The ERCOT 2008 LTSA is based on the most recently completed ERCOT Five-Year Plan. It incorporates all generation currently in operation and all generation for which there is a signed interconnection agreement. The base transmission topology also includes 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. Other input parameters, such as natural gas price and emissions allowance costs, were modified by scenario in order to determine their impact on the model results.

The study consisted of three parts. The first was an analysis of steady-state peak-load system conditions, using A/C contingency analysis, to evaluate import needs into four regions of Texas:

- Dallas/Fort Worth
- San Antonio/Austin
- Houston/Galveston
- The Valley

The second was an analysis of local system needs using a security constrained economic dispatch model. The third was an evaluation of the cost-effectiveness of potential economic projects using scenario analysis.

These analyses led to the following major conclusions:

- Additional import capacity into Houston is needed. Although an import pathway into Houston from the west, such as from Fayette to Zenith substations, was generally cost-effective across a range of scenarios included in this study, the specific pathway should be reviewed and selected as part of the ERCOT five-year planning process.

- Load growth in two areas (north of Dallas in Cooke and Grayson County and in western Williamson County) may result in the need for long-lead time transmission projects in the next ten years. Any transmission project evaluated for these areas in the five-year planning process should be compared to projects evaluated in this LTSA for long-term cost-effectiveness.

- Economic benefits from most transmission projects were dependent on the location of new sources of generation, fuel costs, and emissions allowance costs. Few projects were cost effective across a range of different potential future scenarios. Given the uncertainty associated with the future development of base-load generation, it is not reasonable to plan large inter-zonal projects at this time.

The full report on the LTSA is available in the Operations and System Planning section of the following web site: http://www.ercot.com/news/presentations.

11.0 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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12.0 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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