

TransWest Express and Gateway South

Co-developed by four leading entities:

Arizona Public Service

PacifiCorp

National Grid

Wyoming Infrastructure Authority

Regional Stakeholder Meeting

December 5, 2007

Phoenix, Arizona



nationalgrid



Standards of Conduct Non-Disclosure Statement

The following procedures have been implemented to provide Standards of Conduct Safeguards:

- ◆ Ten day advance notice of public meeting
- ◆ All eligible customers invited
- ◆ Telephone participation provided
- ◆ Handouts posted on OASIS prior to meeting
- ◆ Meeting notes will be taken and posted
- ◆ One eligible customer must be in attendance
- ◆ Meetings no more than twice per month

Our agenda for today...

1. **Welcome** – David Smith
2. **Co-Development Partnership** – David Smith
 - a. Overview of Partners
 - b. Business Arrangements
 - c. Benefits of Collaborating
3. **Overview of Projects**
 - a. TransWest Express – Peter Krzykos
 - b. Gateway South – Craig Quist
 - c. Potential Co-Development Solutions – David Smith
 - d. Complementary Projects
 - e. Transmission Study Loads and Resources
 - f. Co-Development Status Update
- Lunch Break**
4. **Stakeholder Forum**

Welcome and Introductions

APS, PacifiCorp, National Grid, and the WIA in accordance with the WECC Regional Planning Review Process, the NTTG and SWAT planning processes, and FERC Order 890, request stakeholder feedback on the TransWest Express and Gateway South projects

Projects
Gateway South
TransWest Express

Routes shown are for illustration only and will be selected only following a comprehensive environmental review process.



About Arizona Public Service



Regions Served

- 11 of 15 counties within Arizona
- Fastest growing state at 3.5%
- 3 times the U.S. average

APS

- Largest electric utility in Arizona
- Growth 4 times the U.S. average
- More than 1 million customers
- 6,600+ employees
- \$1B 10-year Transmission Plan



About PacifiCorp



Regions Served

- Oregon, Washington and California (Pacific Power)
- Utah, Wyoming and Idaho (Rocky Mountain Power)

PacifiCorp

- 15,000 miles transmission
- 1.7 million customers
- 6,600+ employees
- 9,062 MW of generation



About National Grid

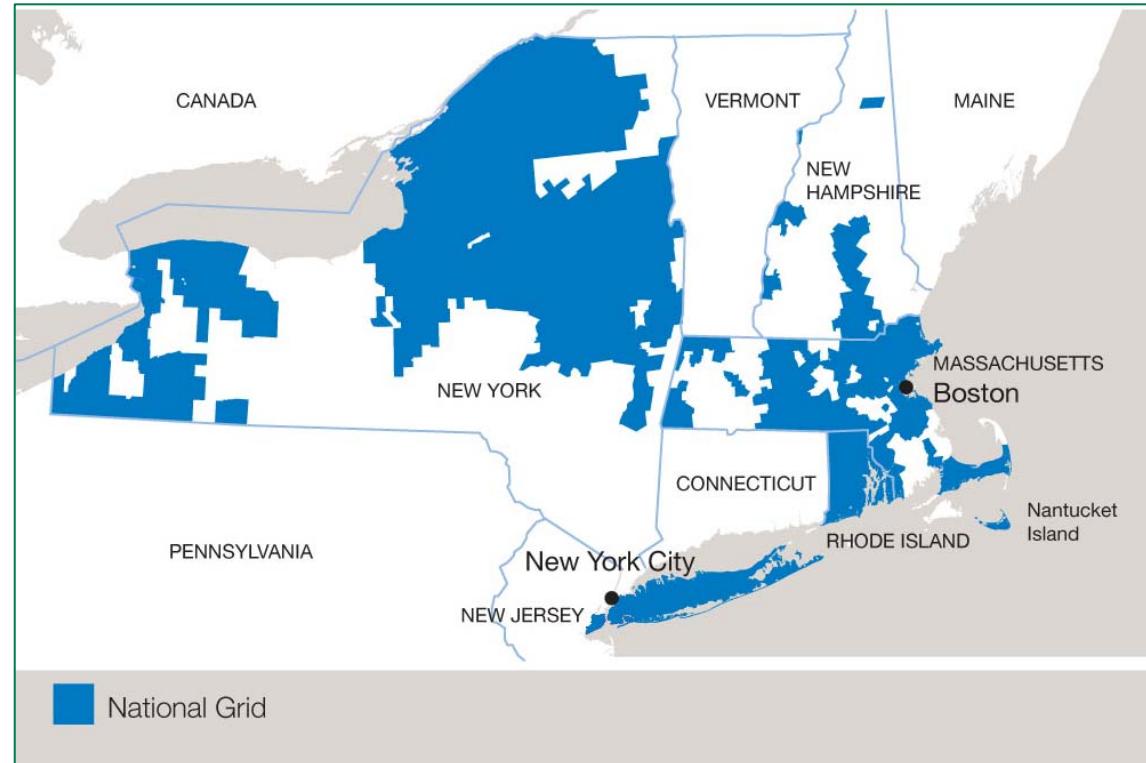
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Regions Served

- Northeast US
- All of UK

National Grid

- Transmission Operator and System Operator in U.K.
- > 4 million electric customers in US
- > 20,000 employees
- > 2,000 electric transmission staff
- Capital investment of ~\$4.5B per year

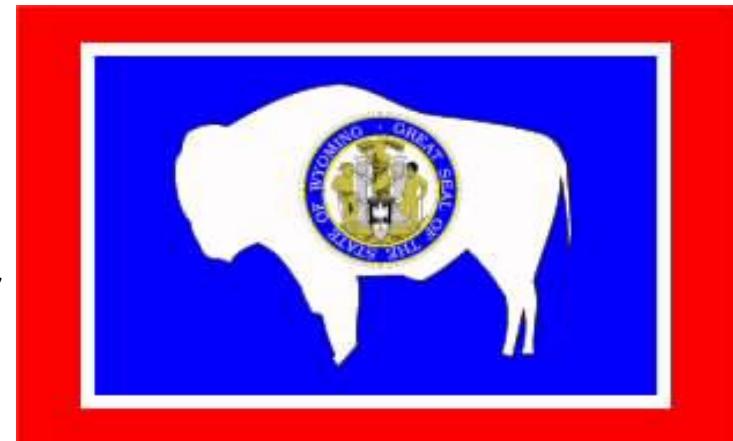




About Wyoming

Wyoming

- ◆ Largest energy exporting state in US
 - ◆ Largest producer of coal
 - ◆ Largest producer of uranium
 - ◆ Second largest producer of natural gas
- ◆ Estimated 3.4GW of > Class 6 wind and over 14GW of developable wind
- ◆ Governor Freudenthal chair of the Western Governors Association



Wyoming Infrastructure Authority

- ◆ Formed in 2004
- ◆ Mission to diversify and expand the state's economy through improvements in electric transmission infrastructure
- ◆ Authority to issue bonds to finance transmission facilities

Co-Development Agreement Overview

Interim Agreement

- Executed August 2007 – valid until March 2008.
- Longer term business agreement targeted for 2008 if parties agree this makes sense.

Purpose

- Established governance arrangements, with a common steering committee.
- National Grid as lead developer of TWE and Gateway South, responsible for deploying the project team.
- Allows initial development steps to be taken while more complex technical and regulatory issues considered.

Activities undertaken jointly

- Common project team implementation strategy and deployment
- Coordinated review of requests from 3rd party users
- More efficient regional planning and rating review processes
- Coordinate permitting
- Stakeholder and public outreach

Activities undertaken separately

- ROW filings - purpose and need case, approvals
- WECC Rating Process

Meeting Regional Needs

- ◆ **Consistent with WGA, RMATS, and CDEAC recommendations for transmission expansion**
- ◆ **Improve overall electric reliability for the West**
 - ◆ Reinforces east side of Western Interconnection
 - ◆ Adds import capability into the Desert Southwest
 - ◆ Wasatch Front reinforced from North and South
 - ◆ AC and DC combination
- ◆ **Provides increased access for 3rd party transmission users**
- ◆ **Improves regional resource diversity, reliability and economics**
 - ◆ Access to renewables (primarily wind)
 - ◆ Enhance wholesale market vitality

Benefits of Co-Development

- ◆ **Meet regional needs**
- ◆ **Better use of transmission corridors**
- ◆ **Opportunities to coordinate permitting**
- ◆ **Economies of scale and cost savings in the development and construction activities**

TransWest Express

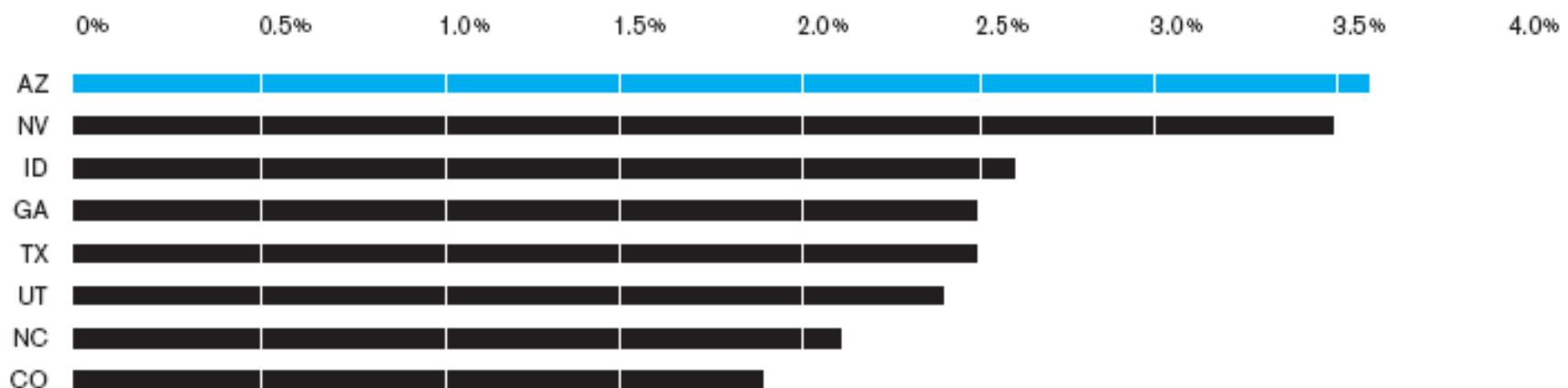
Need for the Project

APS Customers and Demand Continue to Grow

ARIZONA IS THE FASTEST GROWING STATE IN THE COUNTRY.

Source: Population Division, U.S. Census Bureau

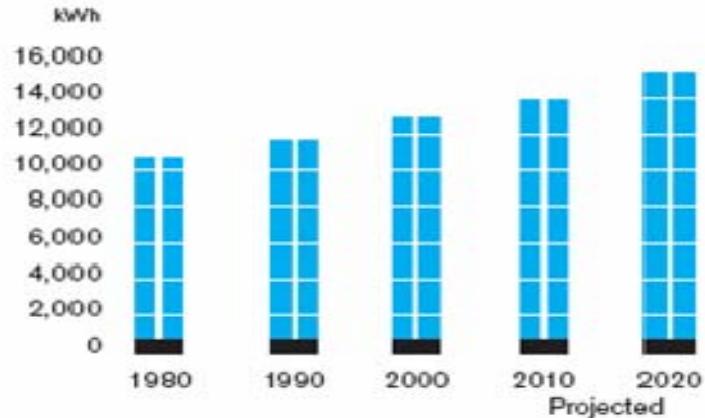
ANNUAL POPULATION GROWTH



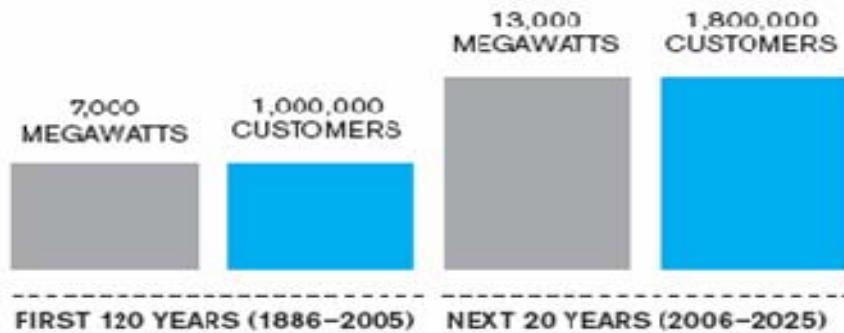
TransWest Express – Need for the Project

- ◆ APS' summer resource capacity requirement expected to increase 8000MW by 2025
- ◆ APS' annual energy sales expected to increase by 70% by 2025
- ◆ Other Arizona utilities are growing at comparable rates
- ◆ Arizona RPS requires 15% of retail energy sales from renewable resources by 2025
- ◆ TransWest Express is viewed as a viable alternative to local resource development

APS CUSTOMERS ARE USING MORE ELECTRICITY EACH YEAR.



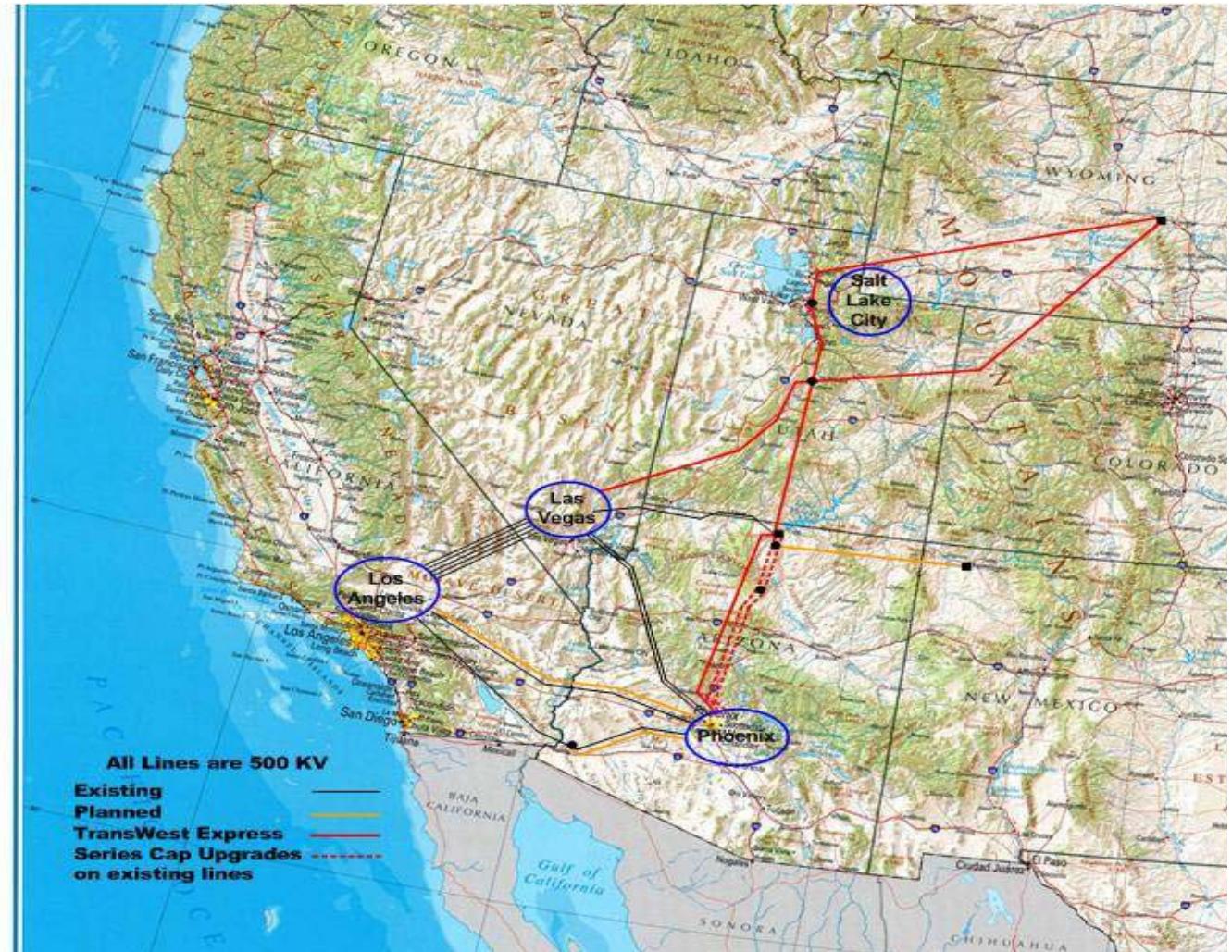
BY 2025, APS WILL BE NEARLY TWICE THE ELECTRIC COMPANY WE ARE TODAY.



APS TransWest Express Feasibility Study

Completed Feasibility Study in 2006

- >Analyzed - 5 route options, 500 & 765 kV AC, 500 kV DC
- Economic analysis supports DC or AC/DC hybrid alternatives
- Cost \$2.3B – \$3.2B

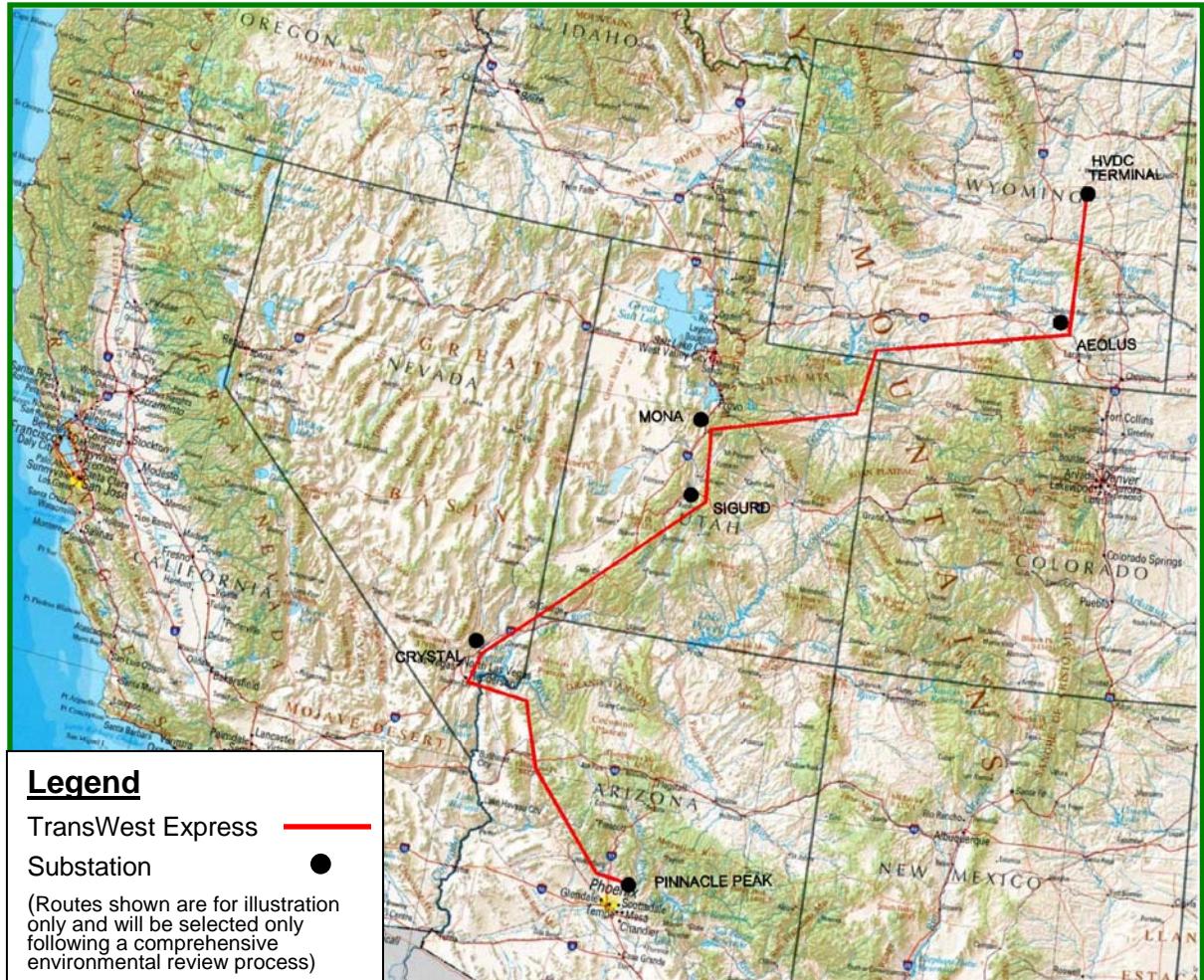


TransWest Express Stakeholder Input

- ◆ **Open stakeholder process**
 - ◆ November 2005 kick-off meeting - Phoenix
 - ◆ March 2006 project update meeting – Salt Lake City
 - ◆ June 2006 project update meeting - Jackson
- ◆ **Periodic project updates**
 - ◆ Sub-regional Planning Groups
 - ◆ SSG-WI
 - ◆ WECC

TransWest Express Reference Case

- ◆ 3,000 MW
- ◆ 500kV bi-pole HVDC
- ◆ 2015 in-service date
- ◆ Route to preserve option of Las Vegas area terminal



TransWest Express

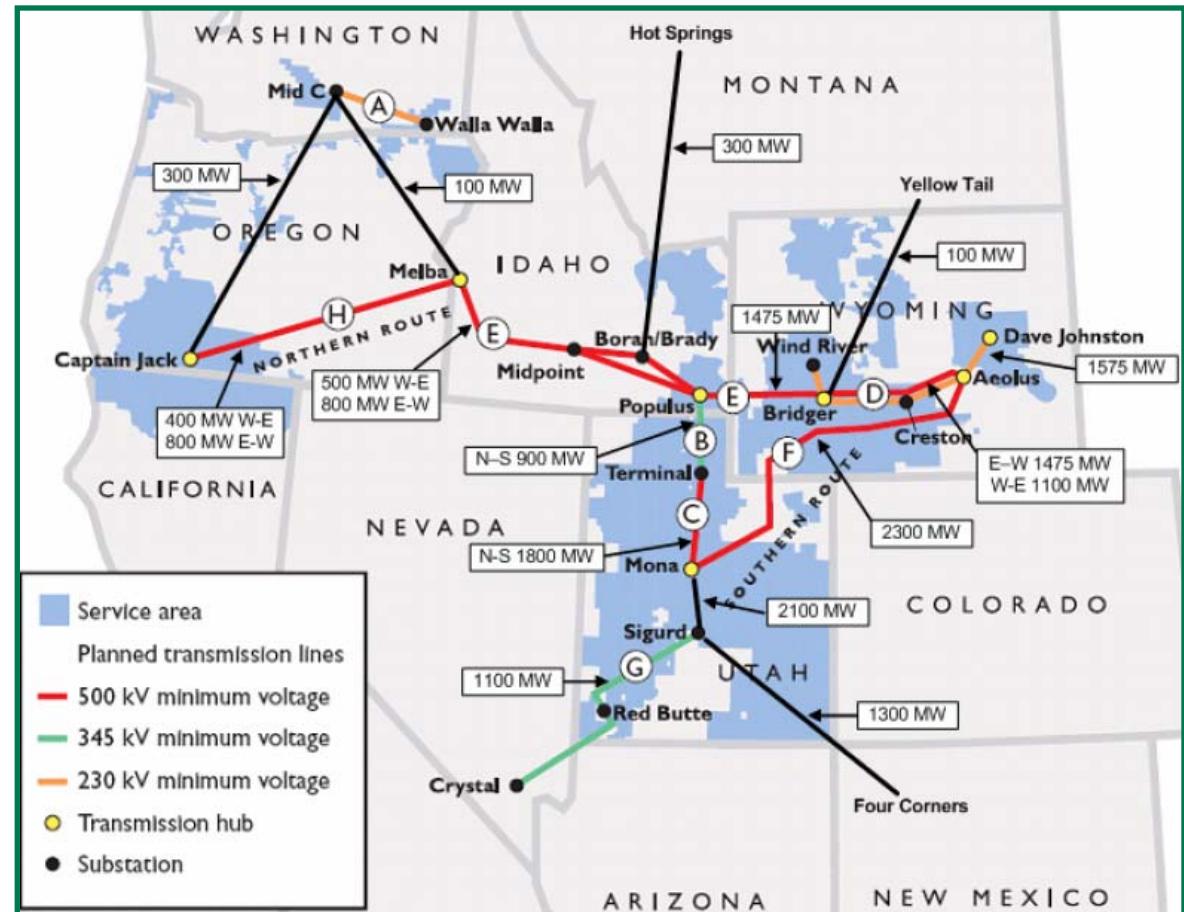
Parties Expressing Interest

- ◆ Salt River Project, Tucson Electric Power and Southern California Edison expressed interest in participation
- ◆ National Grid, as Development Manager, and WIA joined Project Team
- ◆ PacifiCorp expressed interest in exploring co-development of TWE and Gateway South
- ◆ All parties remain interested in participation and support the work being conducted under the Co-Development Agreement

Gateway South Need for the Project

- Wasatch Front annual peak load to increase 2500MW by 2022
- Southern Utah annual peak load to increase by 500MW by 2022*
- PacifiCorp IRP targets 8.5% renewables by 2016
- Over 5000MW in point to point Transmission Service Requests

Third Party Point to Point Requests on PacifiCorp System



*including Transmission Network Service customers

Gateway South Stakeholder Input

- ◆ **PacifiCorp Integrated Resource Plan**
 - ◆ Eight public meetings between December 2005 and April 2007 held in Salt Lake City, Cheyenne, and Portland
- ◆ **Northern Tier Transmission Group**
 - ◆ Three stakeholder meetings since May 2007 and ongoing to develop NTTG Sub-Regional Transmission Plan

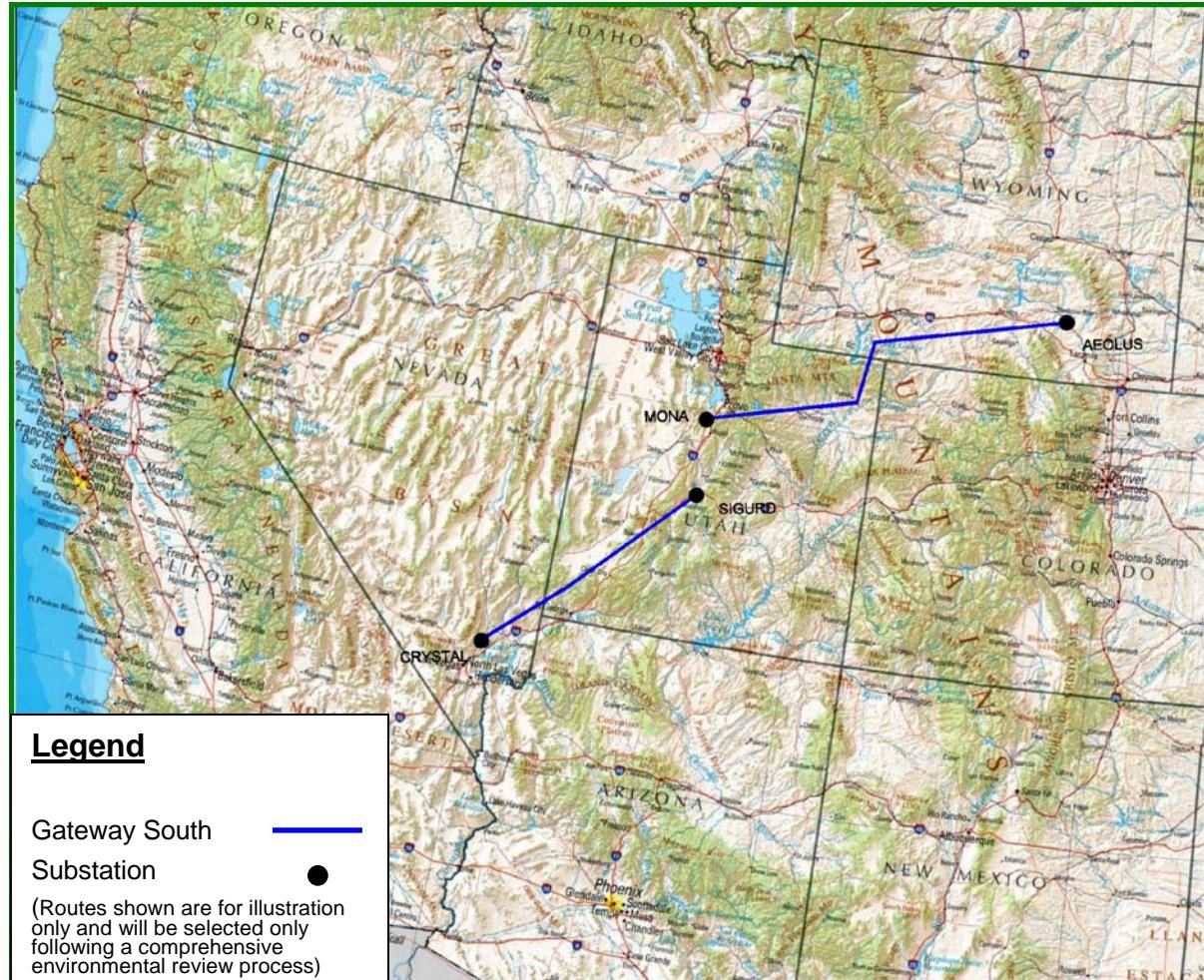
Gateway South Reference Case

Wyoming - Utah

- ◆ 3,000 MW
- ◆ 2 - 500kV AC
- ◆ 2013 in-service date

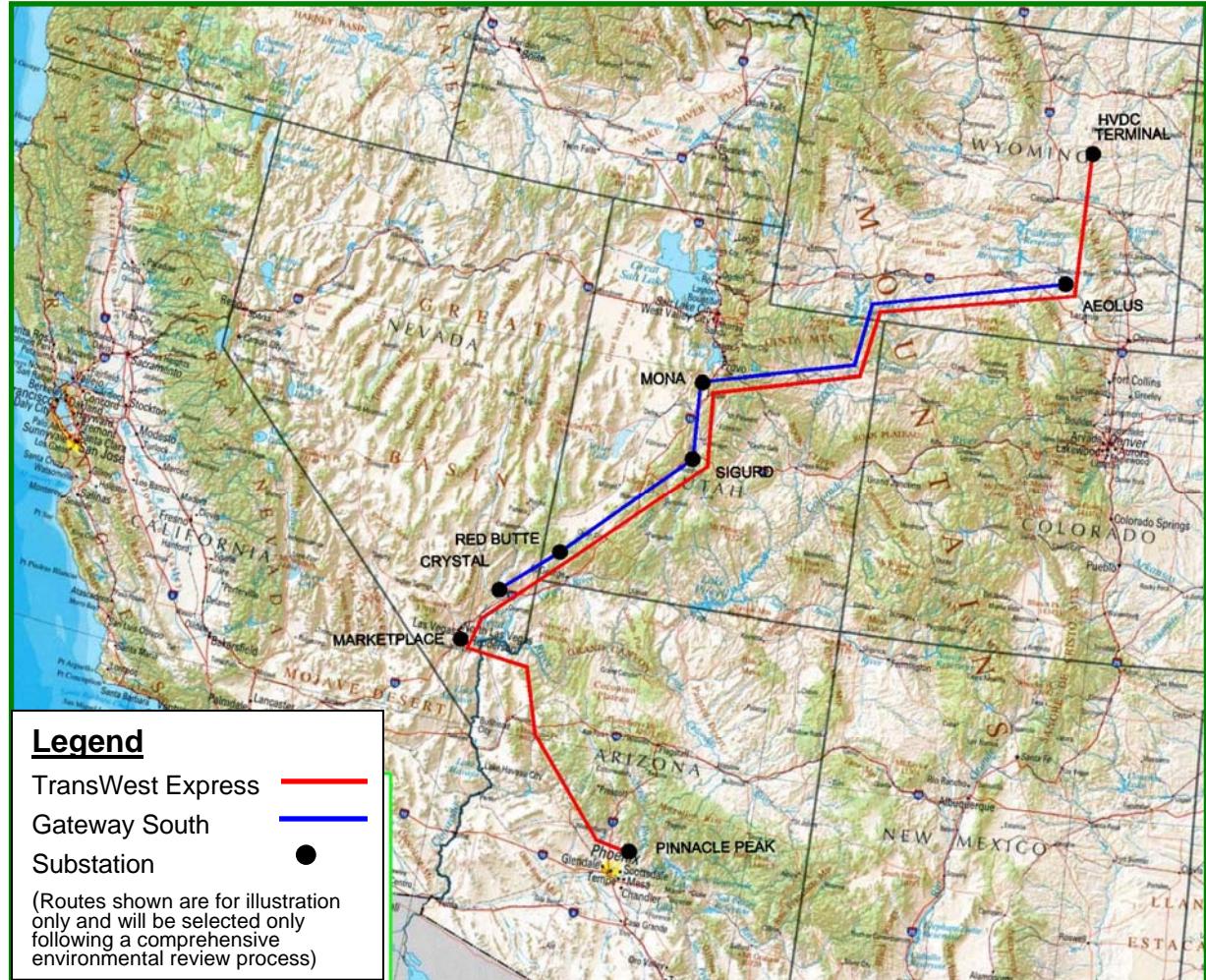
Utah - Nevada

- ◆ 800 - 1500 MW
- ◆ 345 kV or 500 kV AC
- ◆ 2012 in-service Date

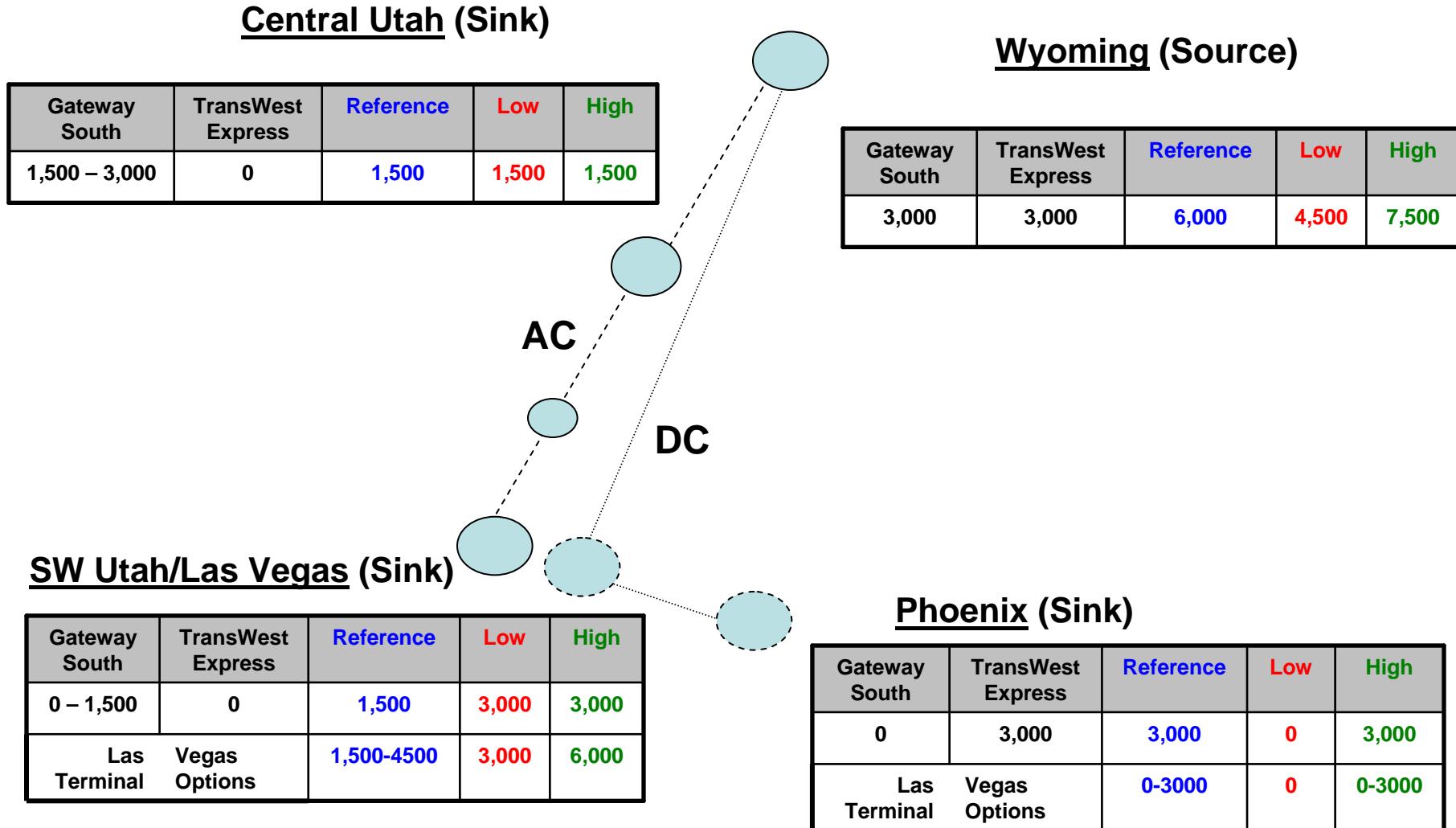


TransWest Express and Gateway South Potential Design Solutions

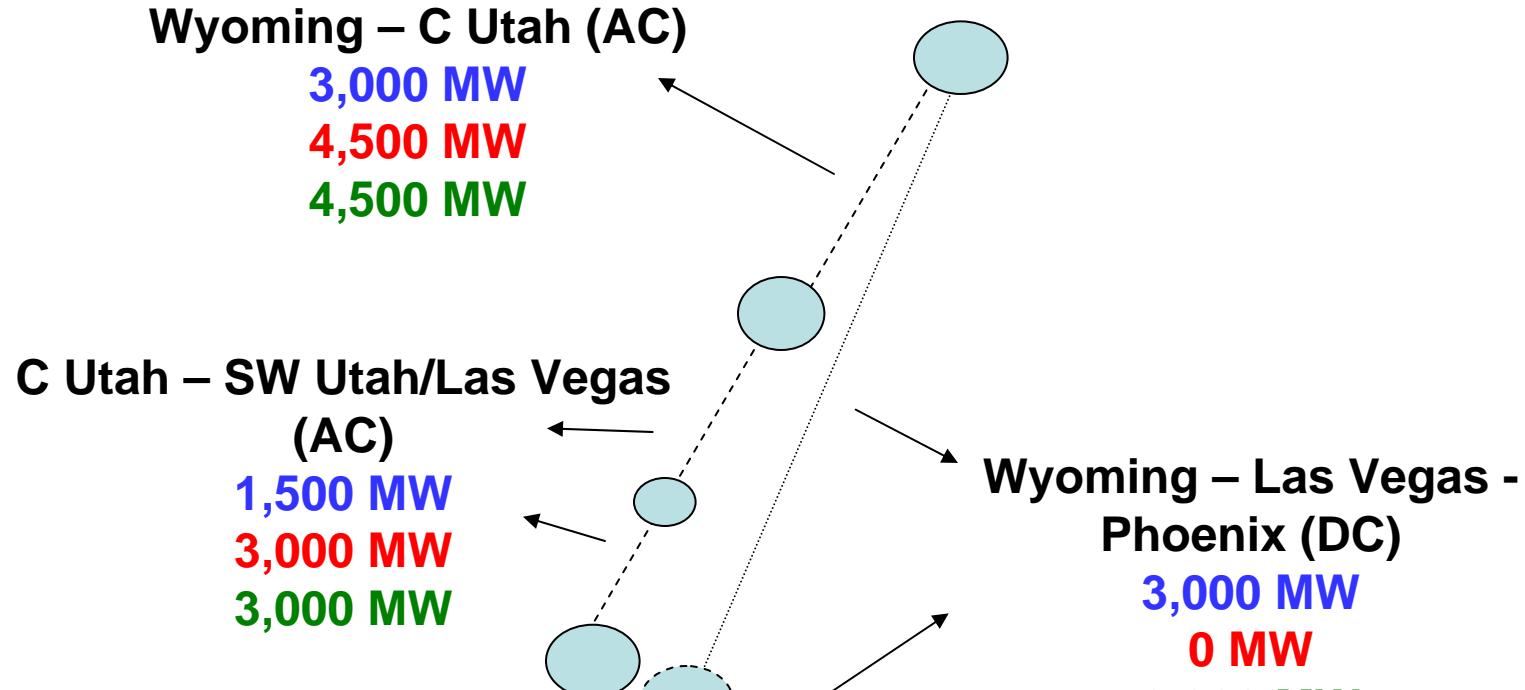
- Size of combined projects dependent on regional and customer needs
- Capacity options are under review from 4,500 to 7,500 MW export from WY
- DC circuit options include 3rd terminal or termination in southern Nevada



Gateway South and TransWest Express Projects - Needs Assumptions (MW)



Potential Design Solutions



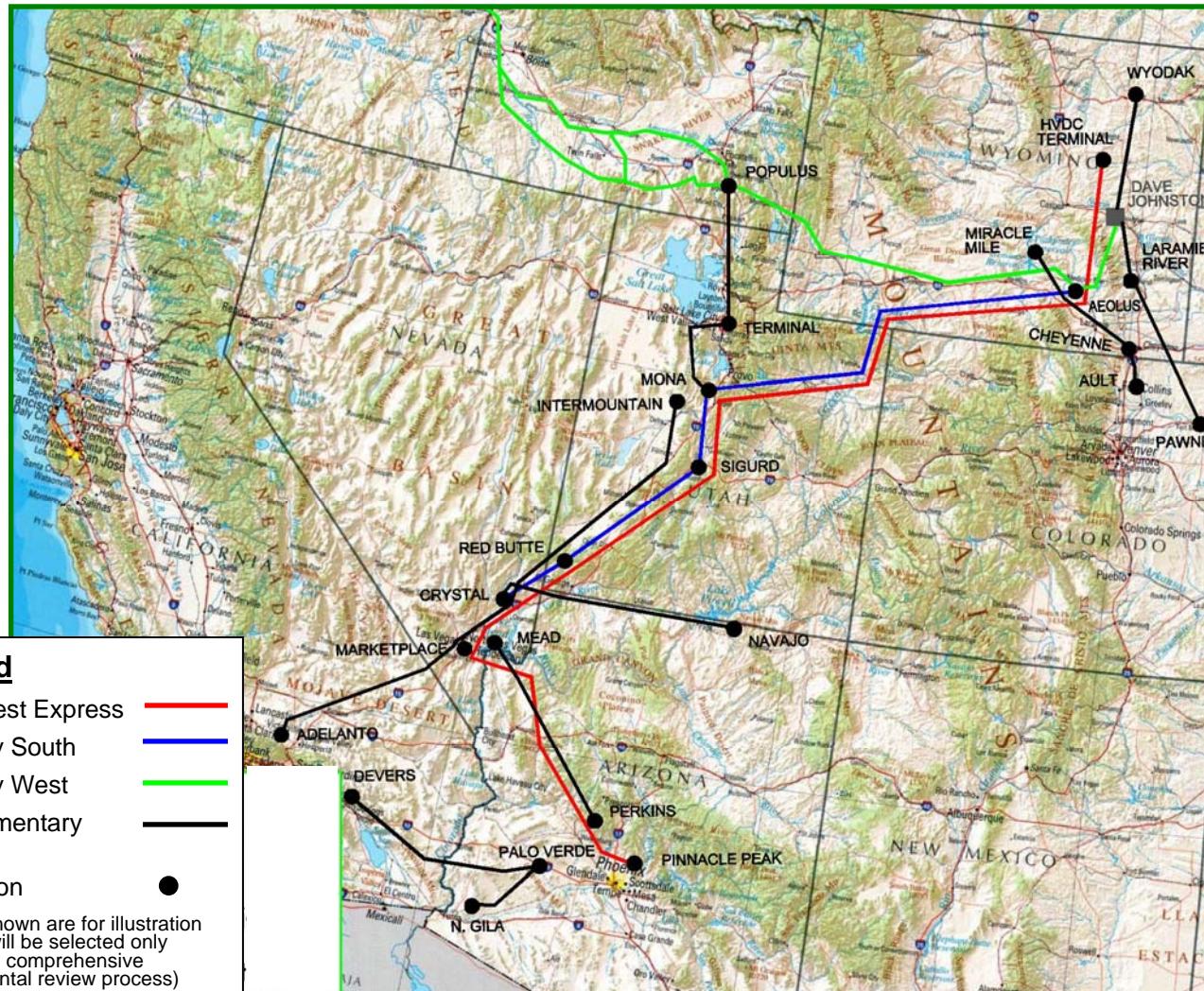
Key

Reference Case

Lower Case

Upper Case

TransWest Express and Gateway South Complementary Projects



APS • National Grid • PacifiCorp • Wyoming Infrastructure Authority

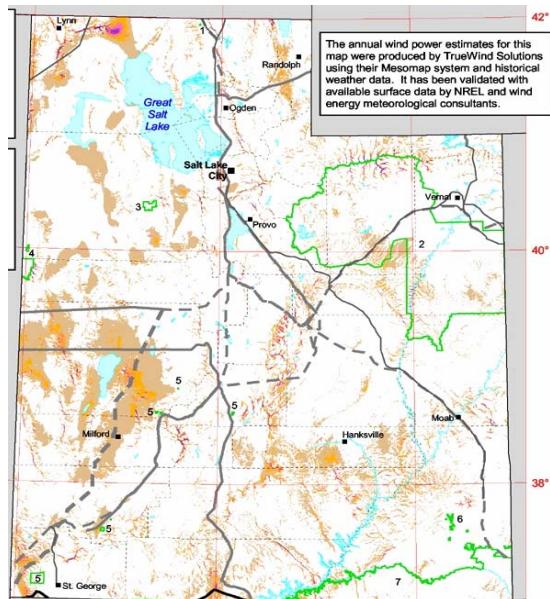
Wyoming Resource Overview

Clean Coal-fired Generation Potential in Wyoming:

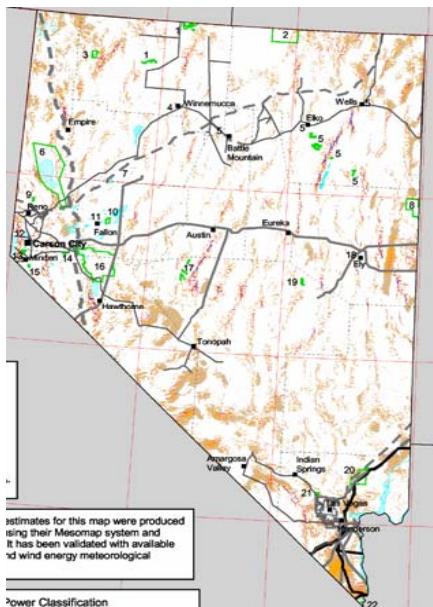
- ◆ 6 -10GW possible with latest technologies within current regulatory and environmental framework
- ◆ Air shed constraints imply the need for geographically distributed projects in the range of 500MW-1000MW

Wind Generation Potential in Wyoming:

- ◆ Wyoming ranks 7th in U.S. wind potential but 1st from a geographic location relative to Nevada
- ◆ 57 GW of developable Class 6 & 7 wind (NREL)
- ◆ 59 GW of developable Class 5 wind (NREL)
- ◆ Over 140 GW of commercially viable wind resources (NREL—Class 4, 5, 6 & 7)

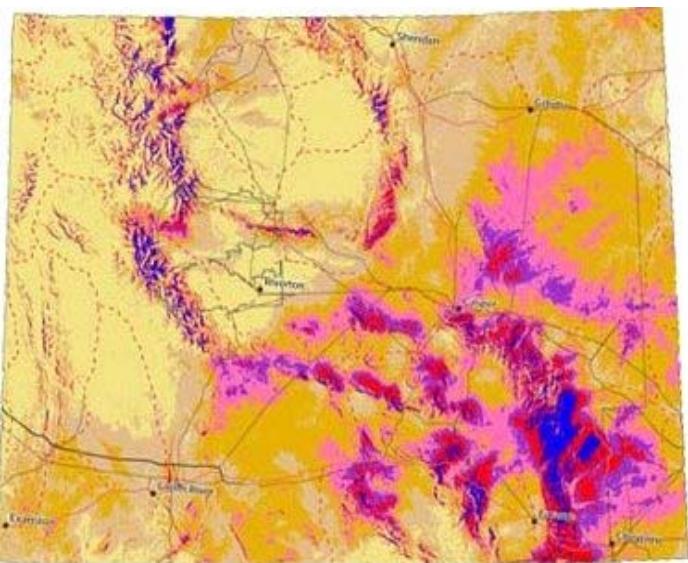


Utah - 26th

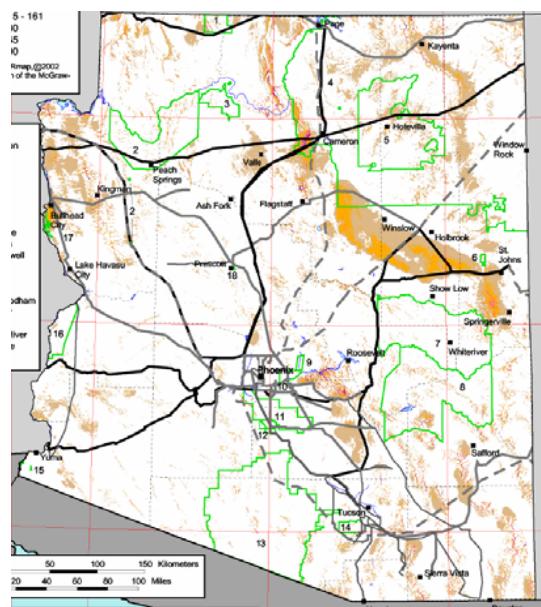


Nevada - 26th

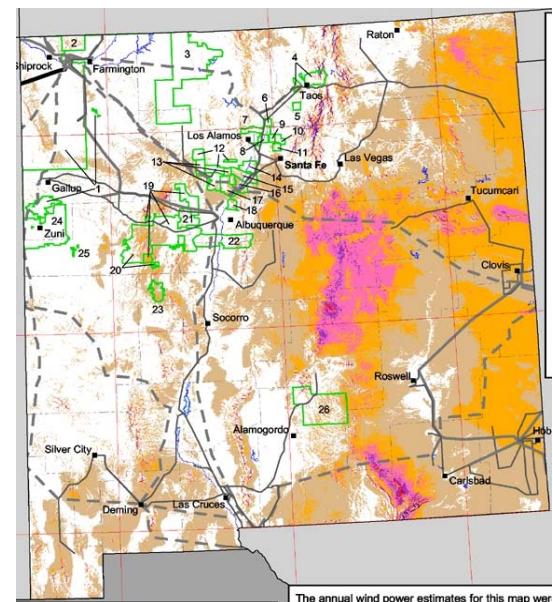
Why Wyoming? – Comparison of States



Wyoming - 7th



Arizona - 30th



New Mexico - 12th

Generation Development in Wyoming

- **Undedicated Wind Development identified in 2006 & 2007 currently totals 16,950MW**
 - 8,000 MW in S/E part of the state
 - 8,190 MW in south-central and S/W part of the state
 - 700 MW in the Powder River Basin Area
- **Undedicated Coal-Fired Development identified in 2007 currently totals 1,360 MW**
 - 610 MW in the south-central and S/W part of the state
 - 750 MW in the Powder River Basin Area
- **Undedicated Natural Gas-Fired Development identified in 2007 currently totals 1,185 MW**
 - 910 MW in the south-central and S/W part of the state
 - 275 MW in the Powder River Basin Area

Gateway and TransWest Express Transmission Study Loads & Resources

- ◆ **Transmission Study Loads**

- ◆ WECC 2015 High Summer Case
- ◆ Reduce Las Vegas and western Arizona generation to stress paths

- ◆ **Transmission Study Resources**

- ◆ These are not the proposed resources for the projects
- ◆ Developed (partially) from Integrated Resource Plans
- ◆ Includes renewable resources above existing RPS levels
- ◆ Wind resource level sufficient to test impacts of non-synchronous generation

- ◆ **Actual Resource Development for Projects**

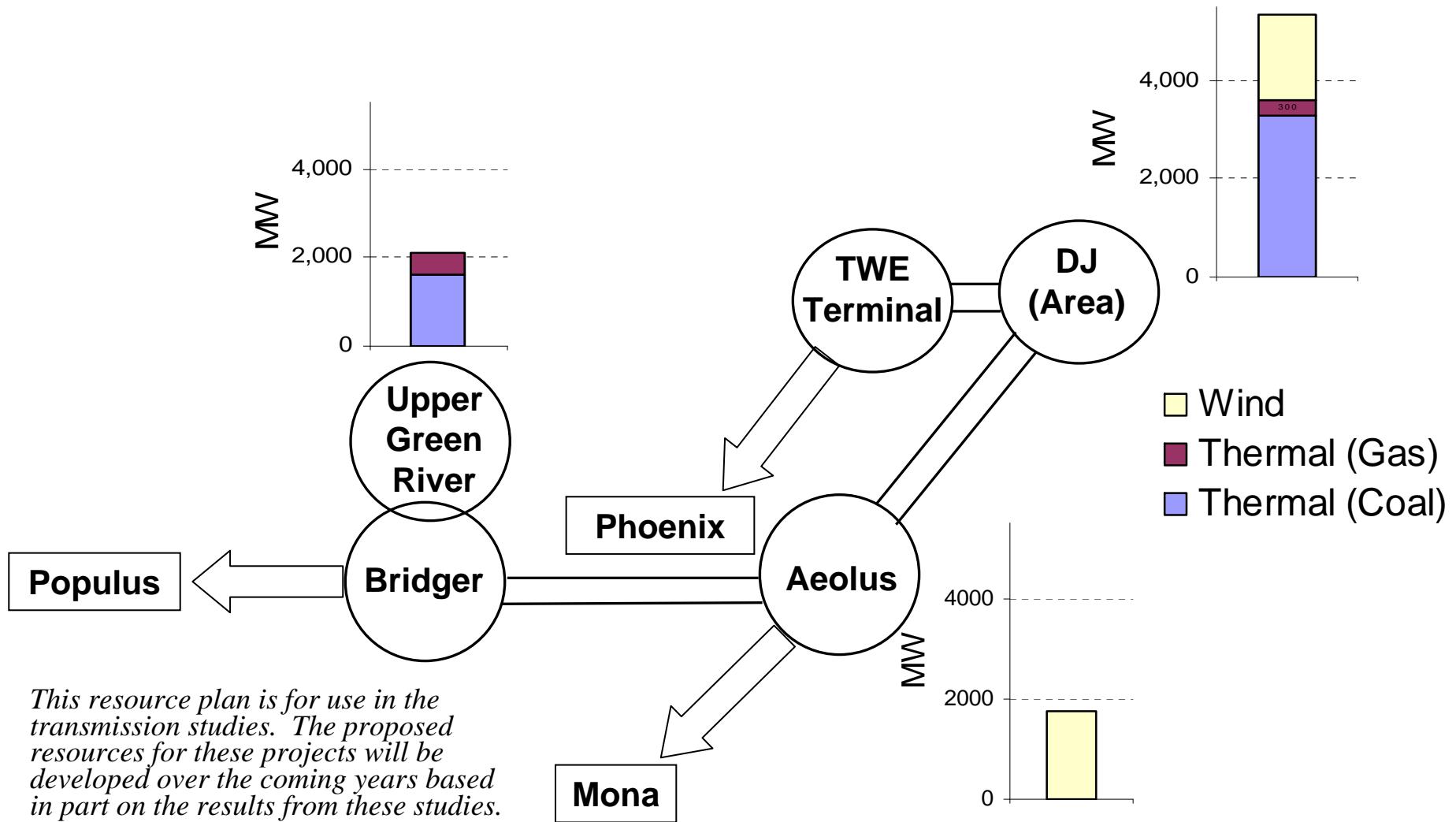
- ◆ Will be responsive to energy policies currently under review by utilities, regulators and other stakeholders
- ◆ Specific economic and technology evaluations and siting/permitting processes also need to run their course

Gateway and TransWest Express Transmission Study Wyoming Resource Plan

Project	Resource Type	Jim Bridger	Upper Green River	Aeolus	Dave Johnston	Total
Gateway	Coal	1,600			1,800	3,400
	Wind				1,100	2,200
	Natural Gas		500			500
	Total	1,600	500	1,100	2,900	6,100
TransWest Express	Coal				1,500	1,500
	Wind				650	650
	Natural Gas				300	300
	Total			650	2,450	3,100
Wyoming Total	Coal	1,600			3,300	4,900
	Wind				1,750	3,500
	Natural Gas		500		300	800
	Total	1,600	500	1,750	5,050	9,200

This resource plan is for use in the transmission studies. The proposed resources for these projects will be developed over the coming years based in part on the results from these studies.

Gateway and TransWest Express Transmission Study Resource Bubble Diagram



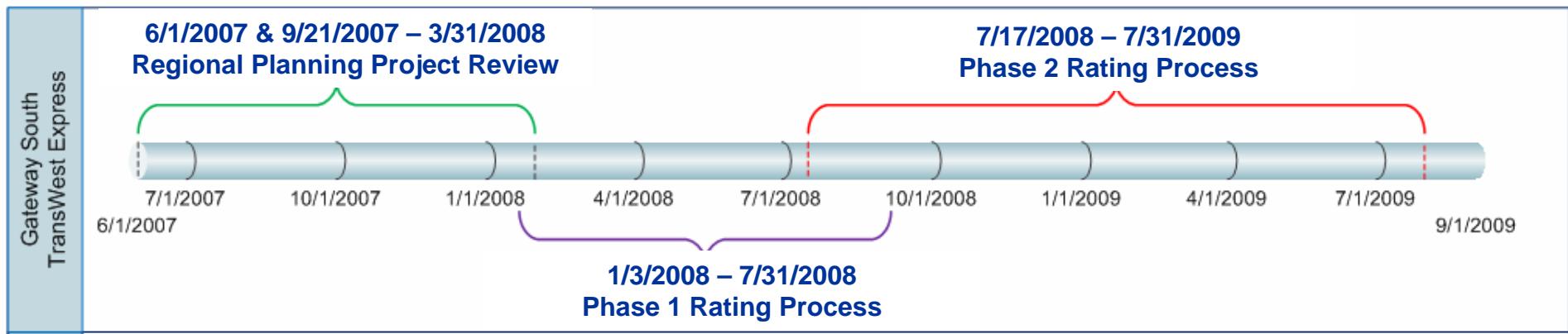
Status of Co-Development Deliverables

- ◆ **Conceptual Technical Analysis**
- ◆ **Resource Plan Development**
- ◆ **Delivered Energy Economic Analysis**
- ◆ **Performance & Line Separation Criteria**
- ◆ **Corridor Analysis**
- ◆ **Regulatory Plan**
- ◆ **Stakeholder Outreach & Communications**

Critical Path Steps

WECC Review Timeline

- ◆ **Regional Planning Project Review Stake Holder Meetings**
 - ◆ Salt Lake City – October 17, 2007
 - ◆ Cheyenne - November 7, 2007
 - ◆ Phoenix - December 5, 2007
 - ◆ *Las Vegas – January 23, 2008*

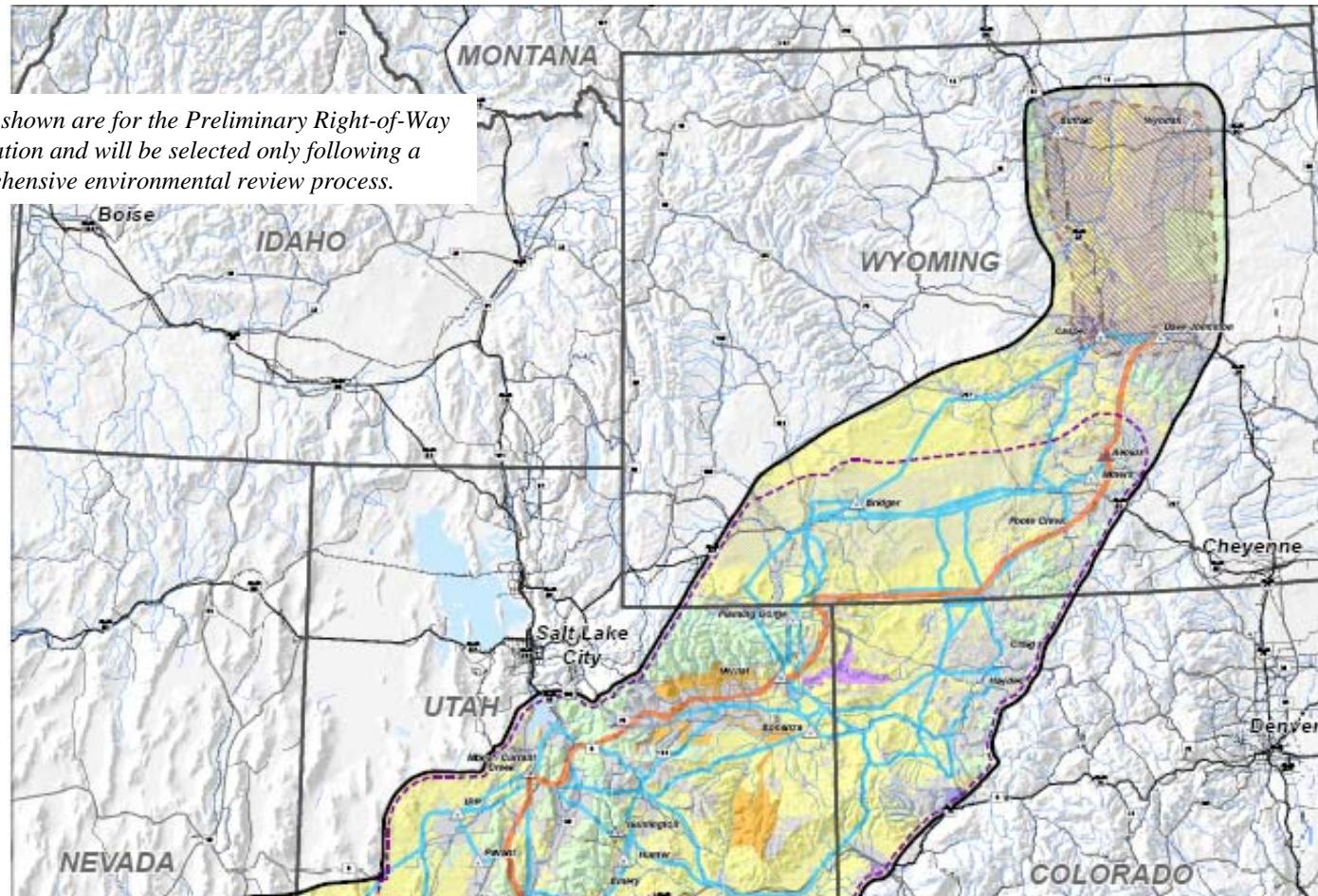


Critical Path Steps

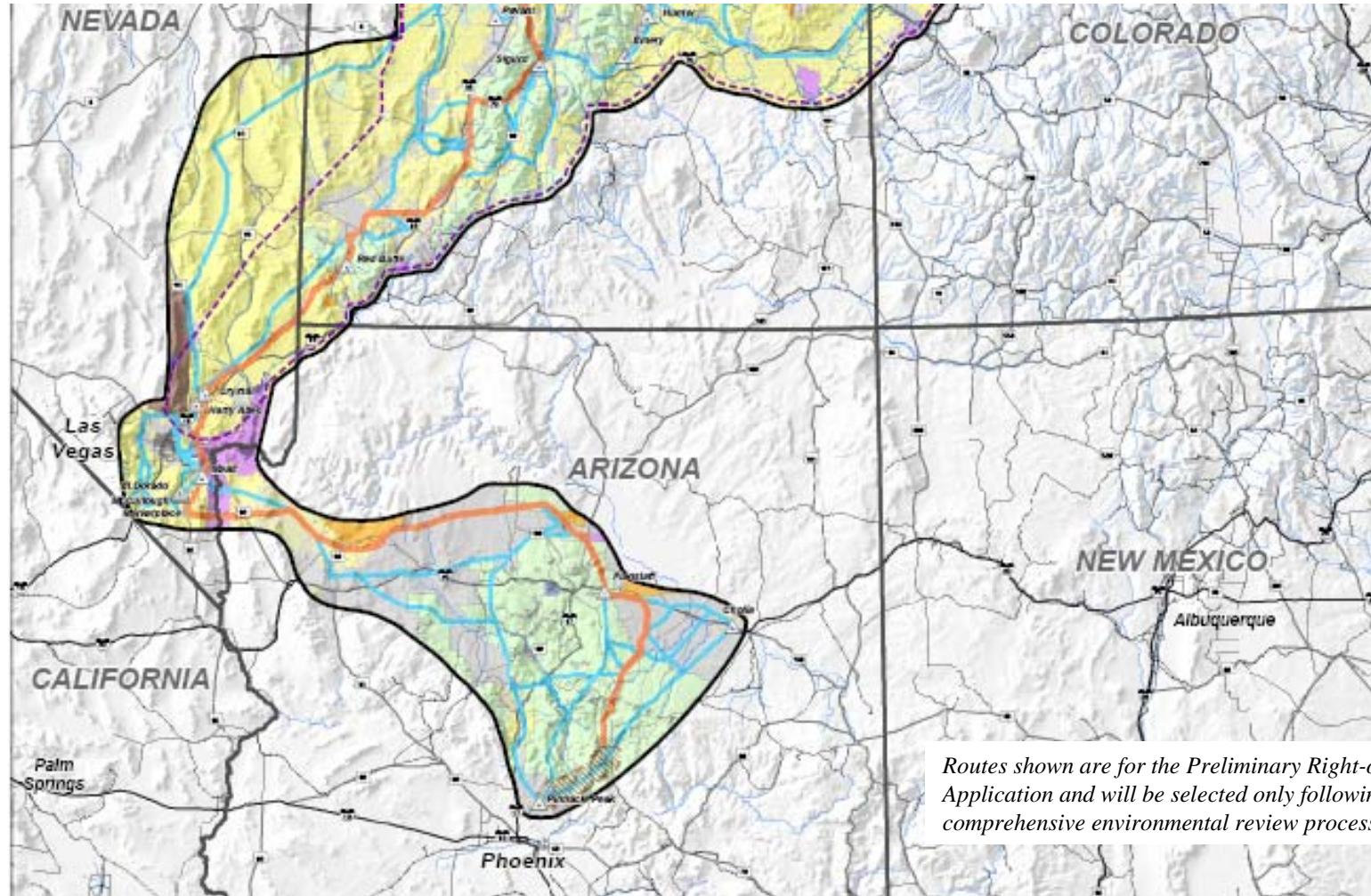
Permitting & Siting

- ◆ **ROW Application Submittals – November 2007**
- ◆ **BLM to be Lead Agency**
- ◆ **Common Environmental Impact Statement agreed in principle amongst parties and BLM**
- ◆ **Next steps**
 - ◆ Tendering a 3rd Party EIS Environmental Consultant
 - ◆ Executing agreements (MOUs, CRAs) with agencies
 - ◆ Consider adoption of federal & state coordination protocols

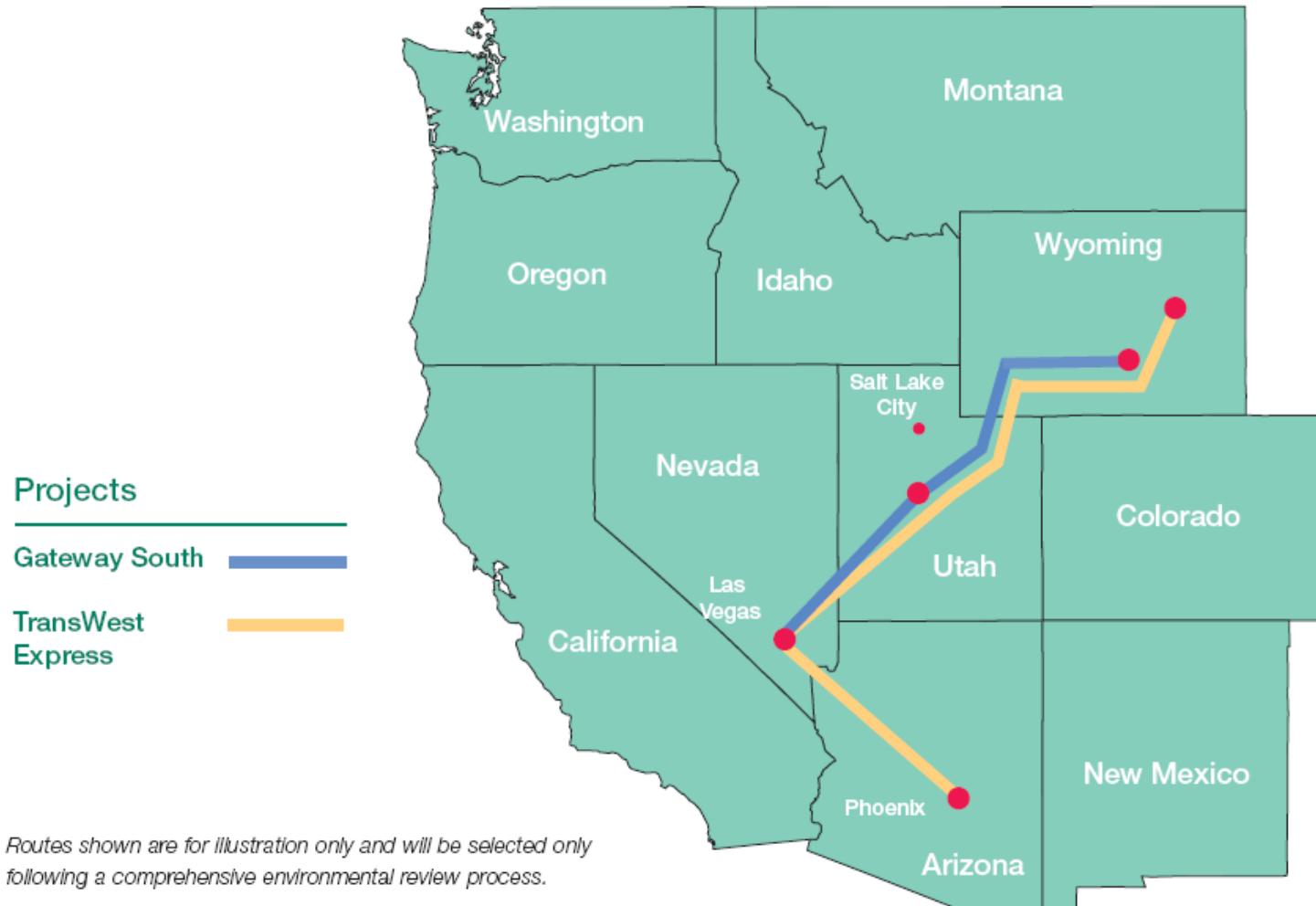
TransWest Express and Gateway South Proposed Northern Study Area and Route



TransWest Express and Gateway South Proposed Southern Study Area and Route



Stakeholder Forum



Represented today by...

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