



In the Community to Serve®

Washington Integrated Resource Plan Targeted Technical Advisory Group Meeting #6

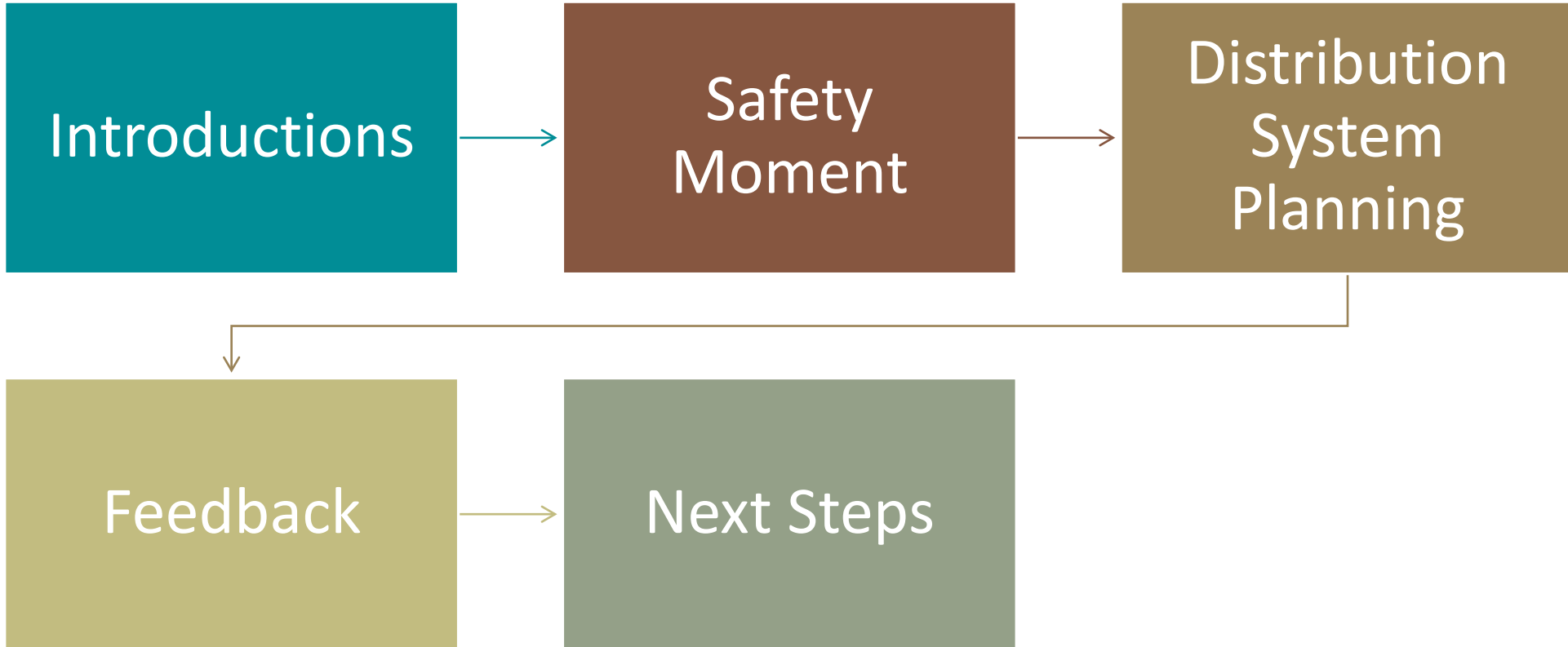
SEPTEMBER 2, 2026

MICROSOFT TEAMS/TELECONFERENCE



In the Community to Serve®

Agenda



Safety Moment

PEDESTRIAN SAFETY

TIPS FOR DRIVERS:

- Always be on the look out for pedestrians
- Be aware of children in neighborhoods and near school zones
- Reduce speed during inclement weather
- Be prepared to stop for pedestrians when approaching crosswalks or intersections
- Check for pedestrians before turning
- Do not block paths, crosswalks or intersections
- Check for pedestrians when leaving a parking space or driveway
- Avoid Distracted Driving

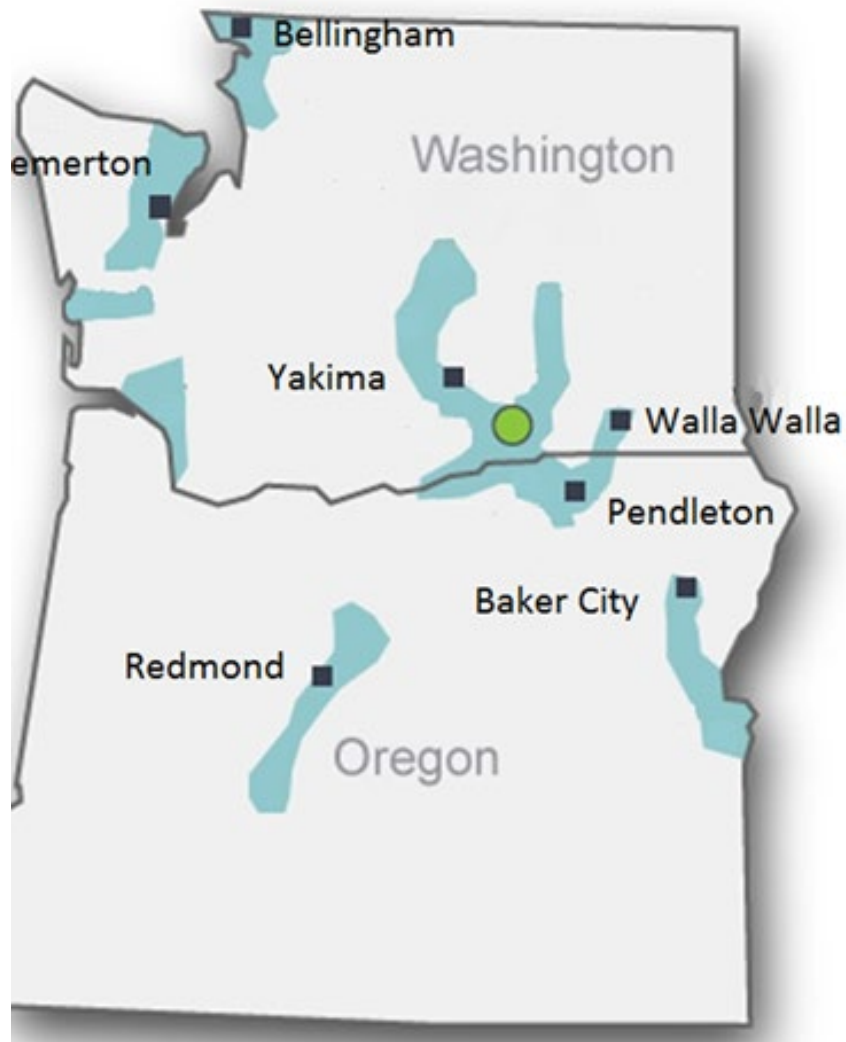
TIPS FOR PEDESTRIANS:

- Use sidewalks when available
- Always look both ways before crossing the road
- Only cross at marked crosswalks or intersections
- Obey all traffic signals, including Walk/Don't Walk signs
- Watch out for turning vehicles
- Keep an eye out for vehicles coming out of parking spaces and driveways
- Avoid Distracted Walking



Distribution System Planning

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ENGINEERING SERVICES



Presentation will cover:

1. Distribution system modeling process
2. Identification of system deficits/constraints
3. Distribution enhancements/reinforcements options to address deficits
4. Enhancement review and selection process to capital budget
5. Utility Discussion on meeting energy needs

System Dynamics:

Piping:

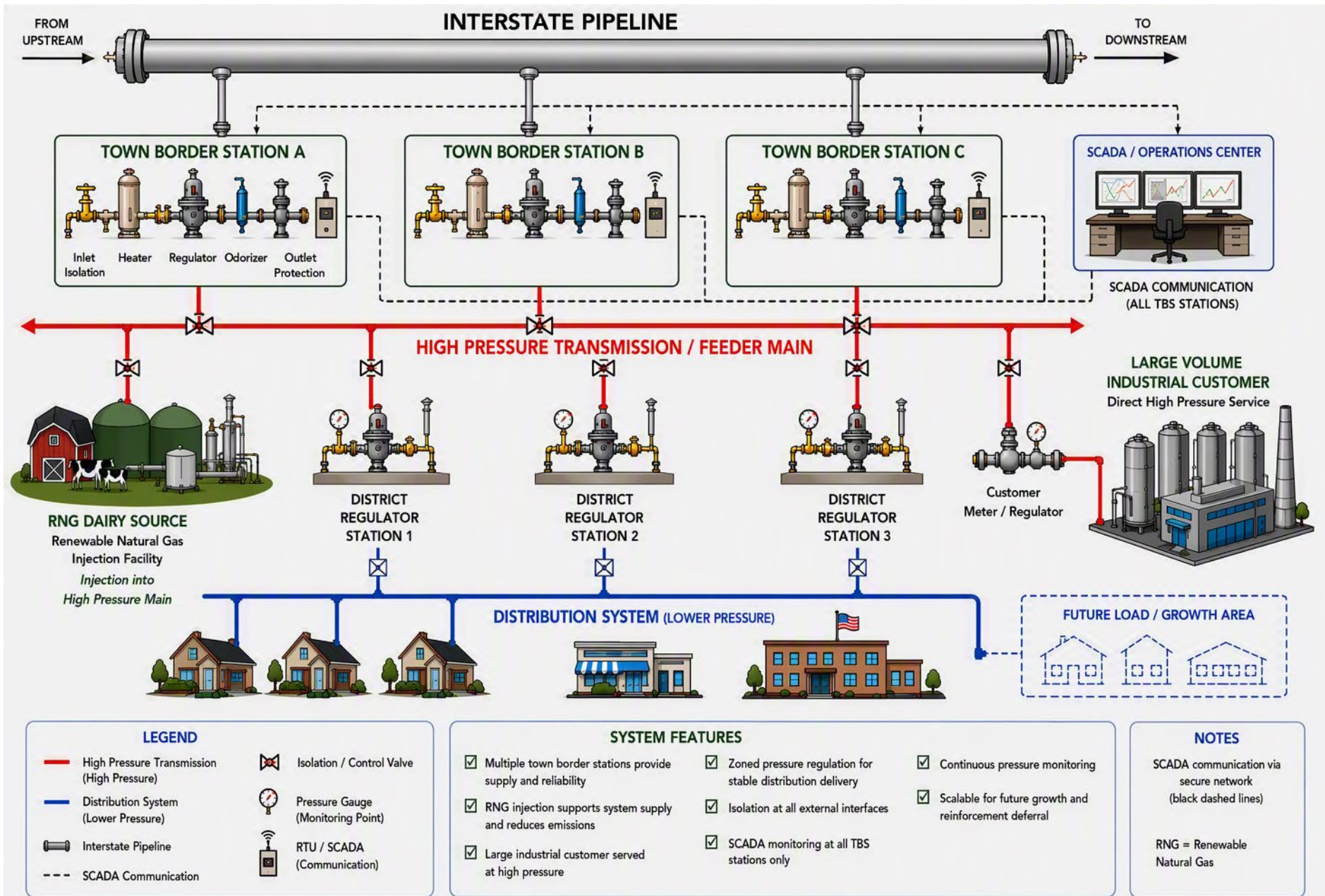
- Diameter – ½” to 20”
- Material – Polyethylene and Steel
- Operating Pressure – 20 psi to 900 psi
- Distribution
 - Washington – approx. 5,143 miles
 - Oregon – approx. 1,800 miles
- Transmission – 138 miles

System Dynamic's Cont.

Facilities:

- Regulator stations – ~ 700
- Valves – Over 1,600
- Other equipment such as RMVs, heaters, odorizer and compressors

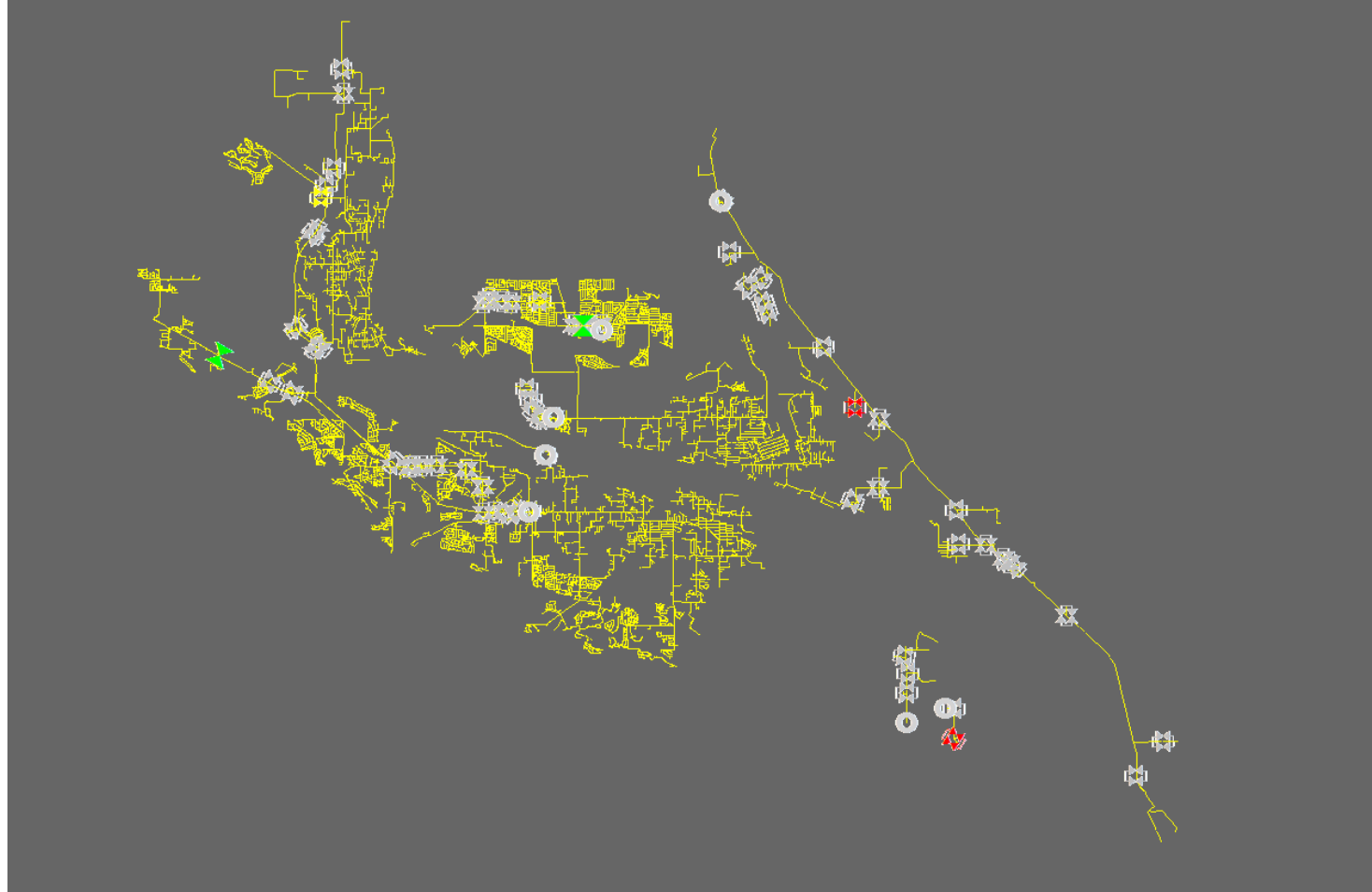




Synergi Gas Modeling

- Synergi gas is distributed and supported by DNV
- Synergi Gas models incorporates:
 - Total customer loads
 - Existing pipe and system configurations
 - Supply sources including RNG injection
- Synergi gas is an industry used hydraulic modeling software that allows us to predict flows and pressures on our system based on gas demands predicted during a peak weather event.
- Synergi models are rebuilt and validated every three years and maintained between rebuilds

Synergi Model Example



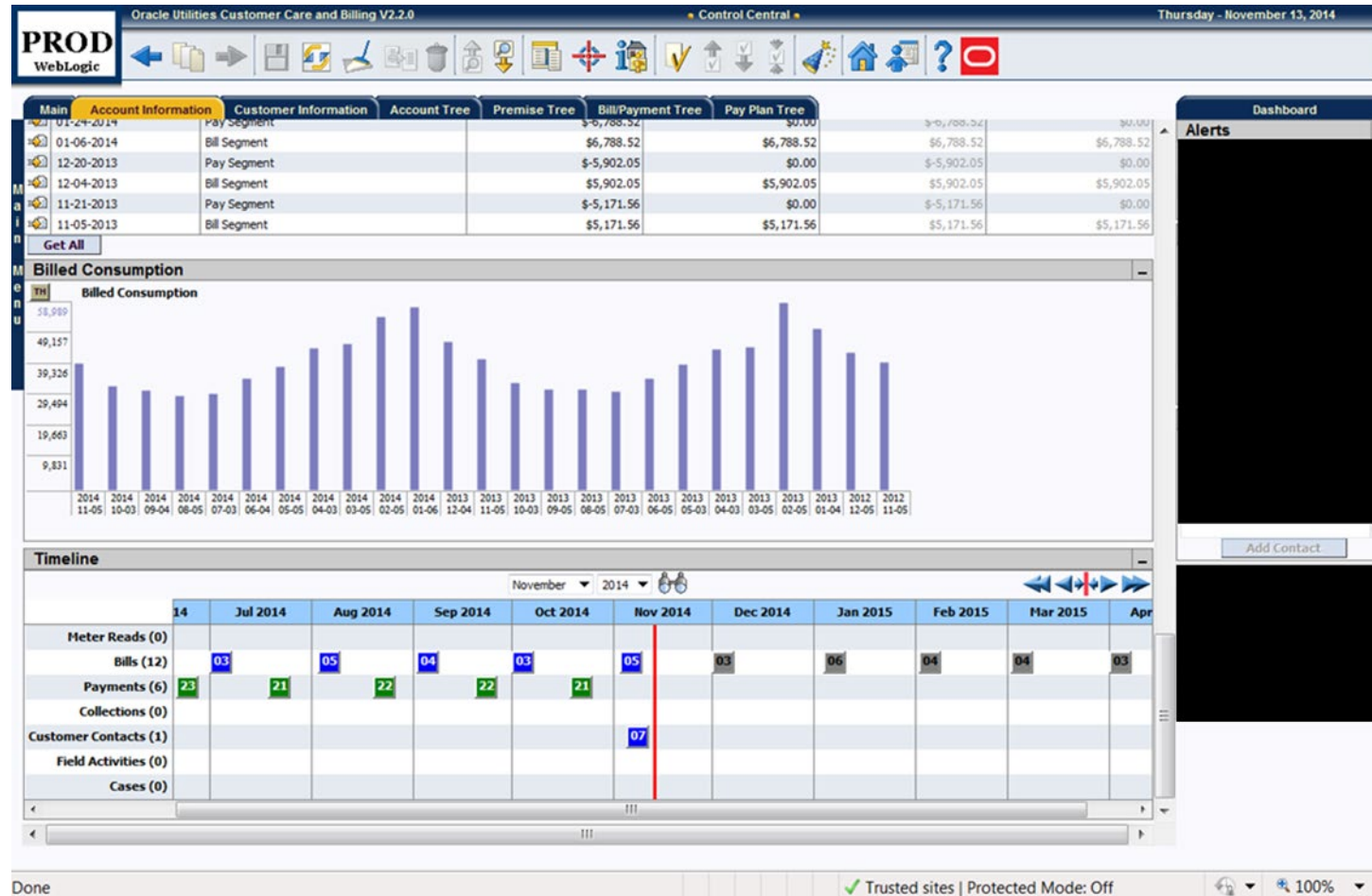
Model Building Process

When models are rebuilt

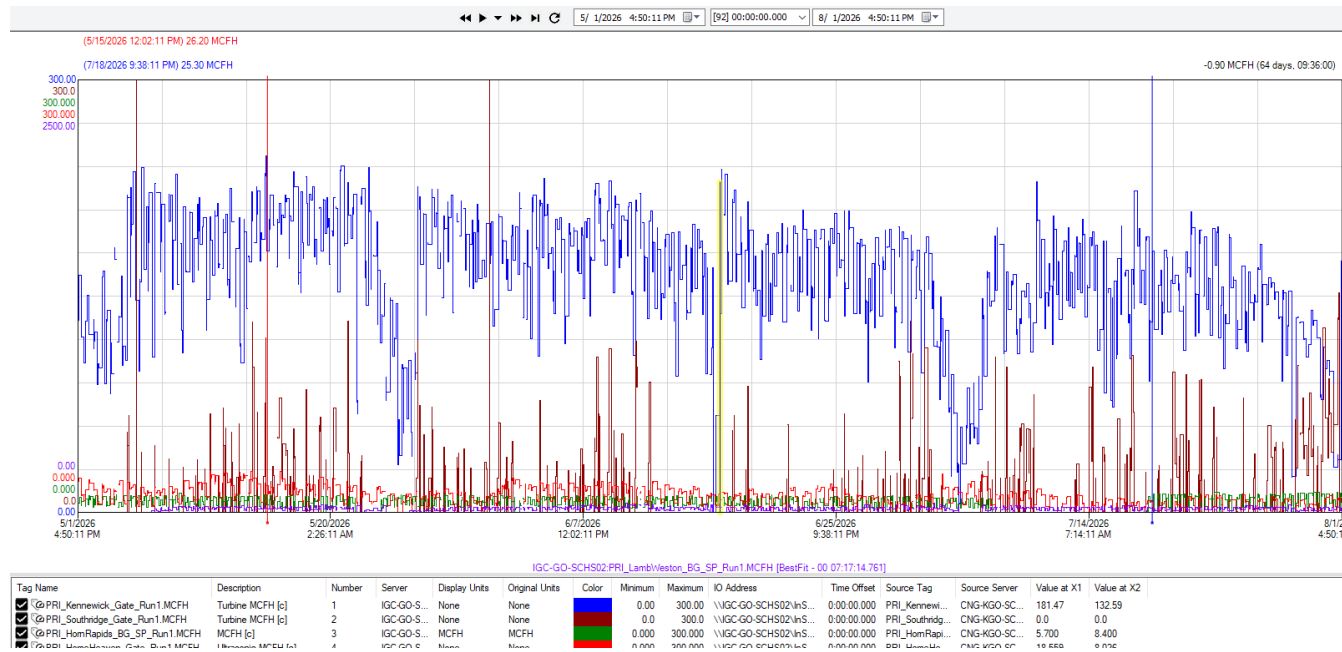
- We export current GIS data to build spatial model
- We export current CC&B billing data to CMM to create an updated demands file
- We validate and calibrate each district model to a recent low-temperature event using existing data (ERXs/pressure charts/SCADA/metertek/LV usage)
- We create a design day model based on the updated heating degree day determined by gas supply (determined by trending historical weather events)

Data Gathering

CC&B (Customer Billing Data)

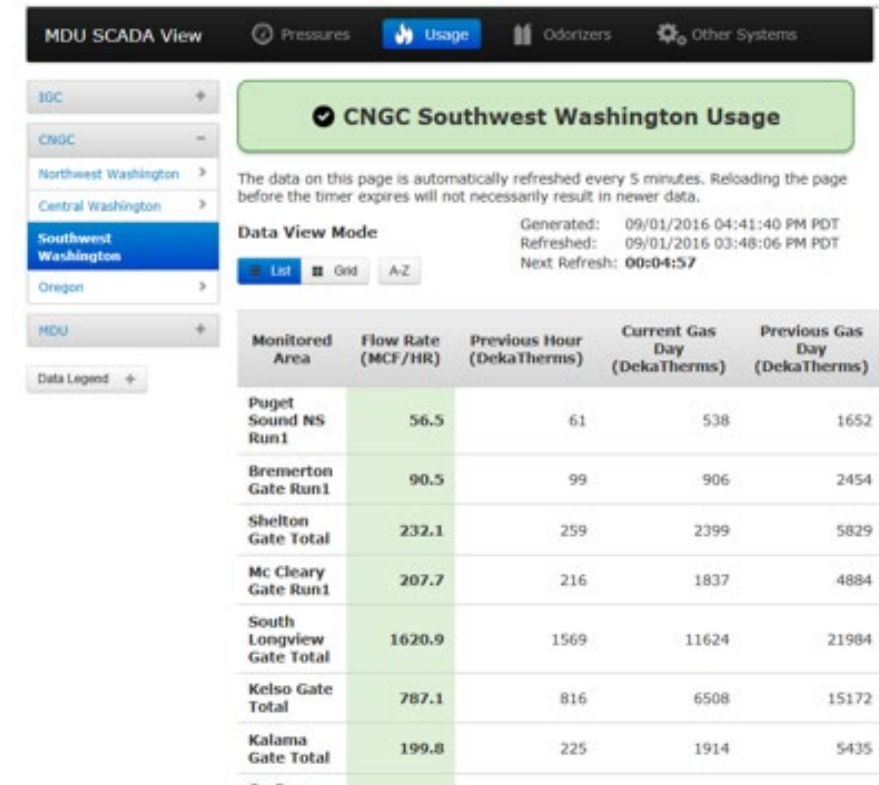


Data Gathering



SCADA Data

Real time and historical flow characteristics at specific locations in the system

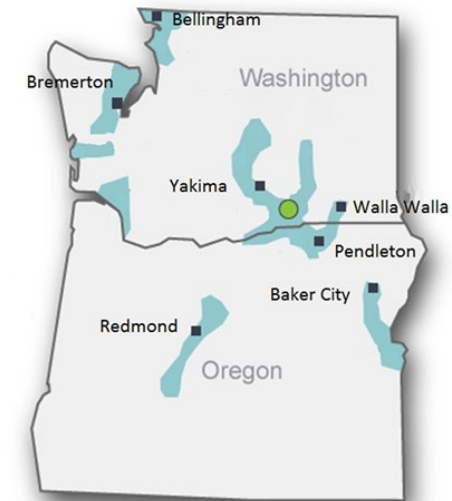


Data Gathering

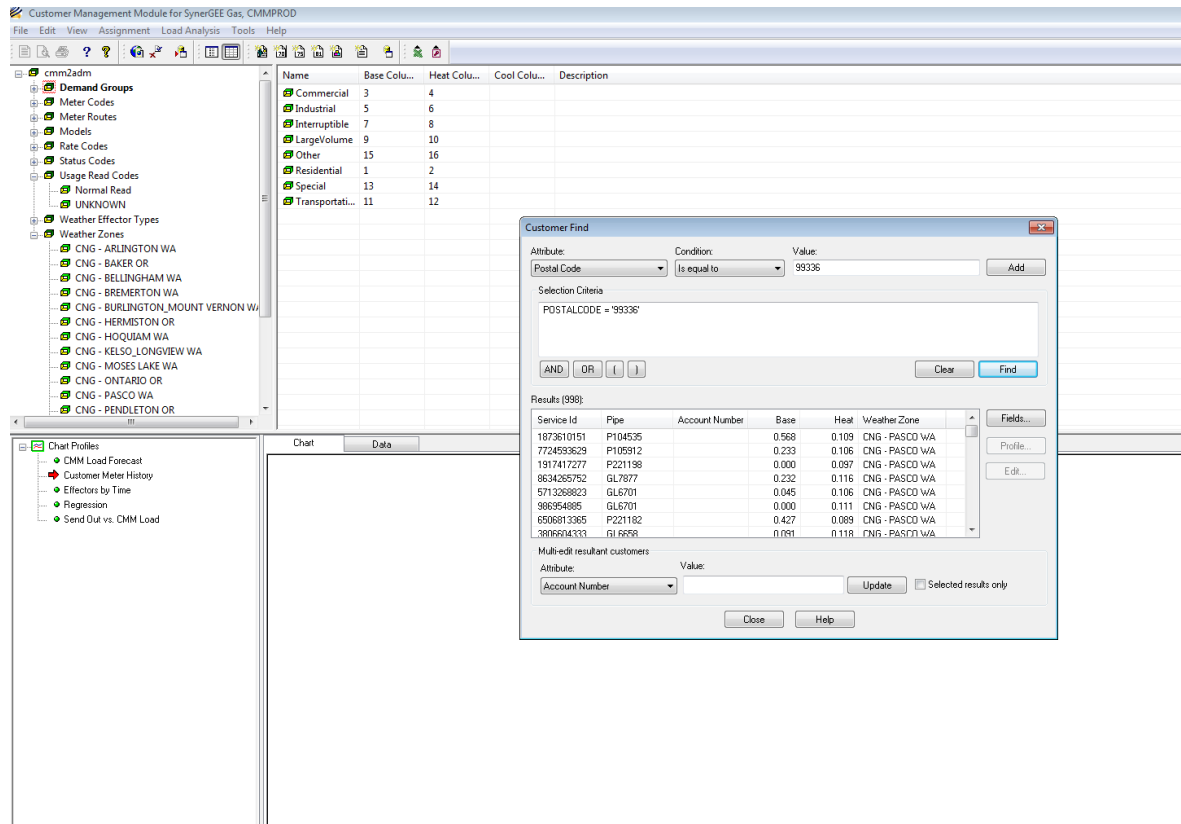
District	HDD	Avg Daily Temperature (°F)
Aberdeen	46	14
Bellingham	47	13
Bend	71	-11
Bremerton	46	14
Eastern Oregon	73	-13
Kennewick	65	-5
Longview	46	14
Mt Vernon	47	13
Pendleton	67	-7
Walla Walla	66	-6
Wenatchee	65	-5
Yakima	65	-5

Peak Heating Degree Day (HDD) modeled by CNG based on historical weather data

Peak HDD = 60 – Average Daily Temp



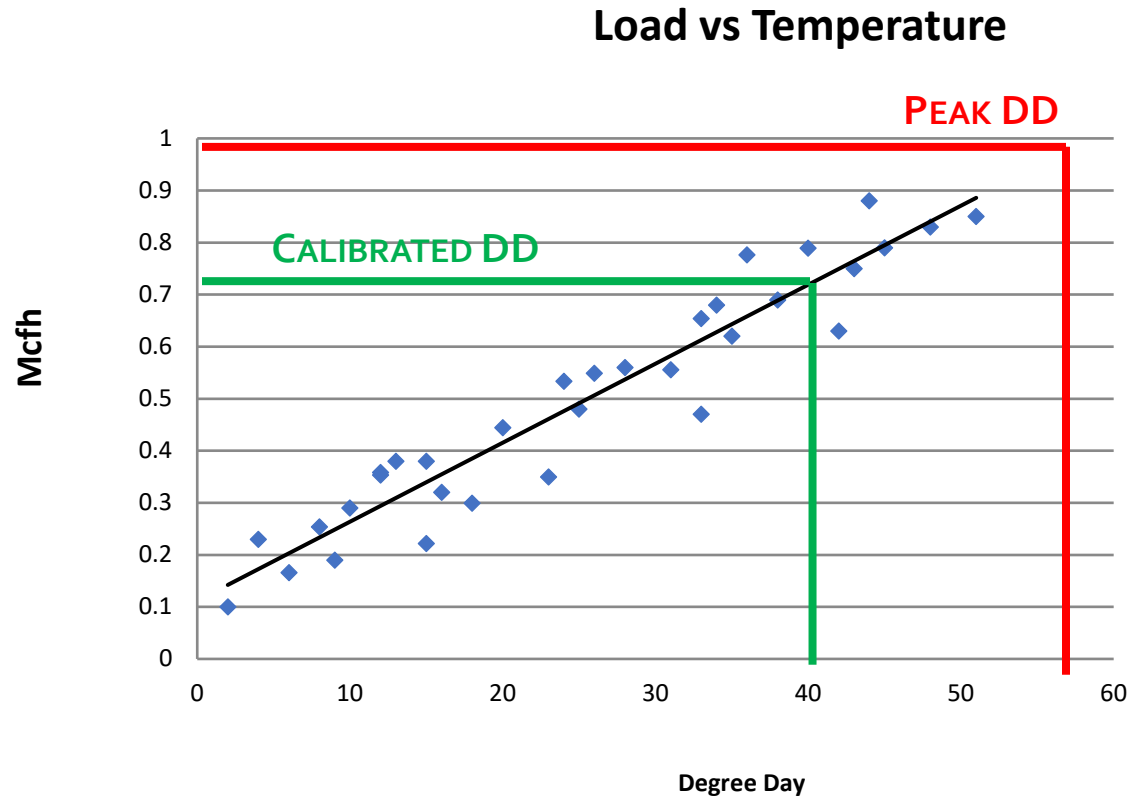
Customer Management Module (CMM)



Brings CC&B customer data into Synergi as demands file

Demand file applies load spatially in the model.

Calibrated vs Peak Degree Day



$$y = 0.0152x + 0.1118$$

HEAT

BASE

40 DD = 0.72 MCFH

58 DD = 0.99 MCFH

Synergi Modeling Capabilities:

- Review Large Volume Customer requests
- Model RNG
- Supports design/sizing of pipe and pipeline components (regulator stations, compressors, RMVs)
- Future planning
- Model IRP predicted growth
- Identify deficiencies
- Determine system reliability
- Optimize distribution enhancement options

Demand Side Management

- Built into our 5-year growth predictions
- Past demand side management efforts have been incorporated into updated CMM/CC&B data used in the latest model rebuild.
- Could be considered as an alternative to address a deficit
- Working with ETO on a TLM program to use DSM efforts to see if we can offset or delay a reinforcement that is in the 5-year planning horizon. Town will be identified in 3Q of 2026 and will be implemented by ETO in 2027.

Identification of System Deficits/Constraints

What is a Capacity Deficit?

A deficit is defined as a critical system that has reached a limiting capacity.

Critical system examples include:

- Pipeline bottlenecks
- Minimum inlet pressure to a regulator station or HP system
- Not meeting a required customer delivery pressure
- Component limiting capacity
- Velocity

Growth Modeling

- Model out 5-year growth predicted in the IRP to determine if or when a capacity deficit exists.
- Iterative process to determine deficit timing.
- We want to make sure that our systems can support growth and maintain reliable service during peak demand.

System reviews to avoid deficits

- Complete a comprehensive review of each distribution system model every two years to ensure that we can maintain reliable service to our customers during peak low temperature events.
- With our capital budget cycle, we also complete system reviews on an annual basis.
- If a deficit is predicted the system is evaluated and a reinforcement/enhancement is proposed and selected based on alternative analysis considerations and placed into the capital budget based on timing needs of the predicted deficit.

Distribution Enhancement/Reinforcement Options to Address Deficits

Enhancement Options

Pipeline:

- Replacements
- Reinforcements
- Loops & Back feeds
- Pressure Increases
- Uprates

Facility Upgrades

Additional Regulator Stations feeding the distribution system

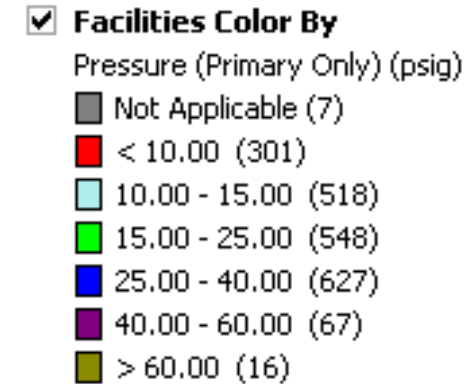
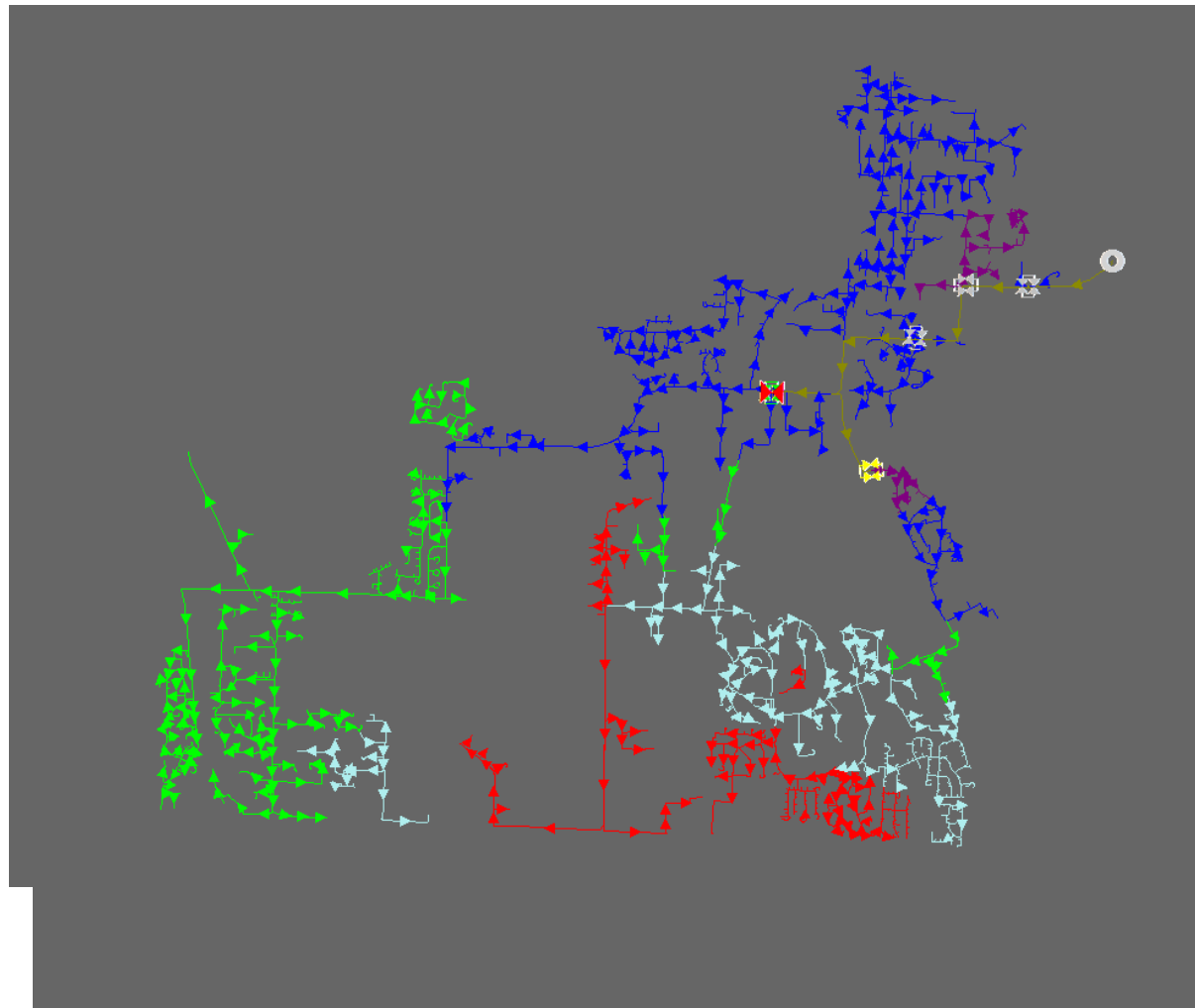
New Strategically placed Town Border Stations

Compressor Stations

Non pipe alternatives

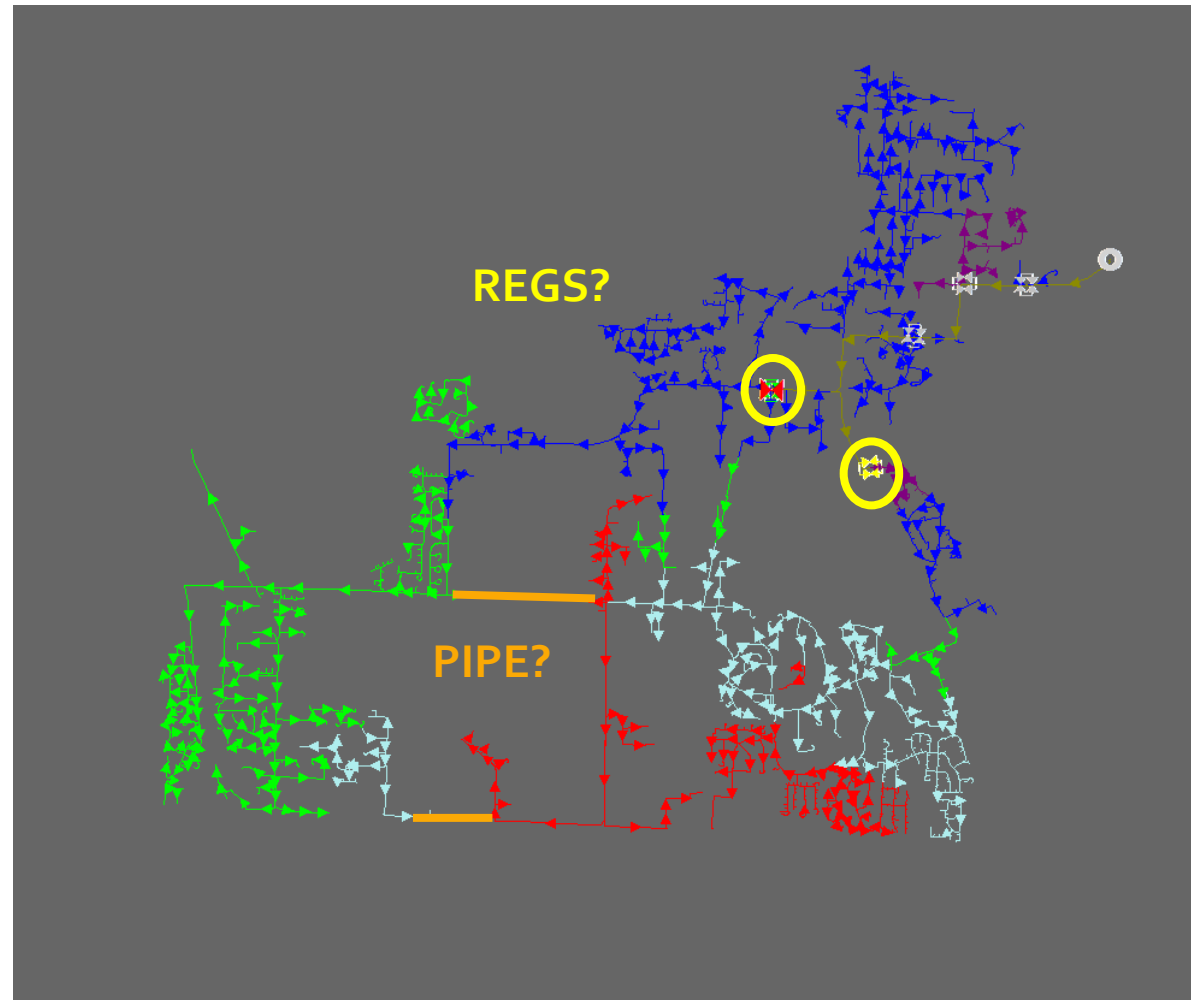
Distribution Enhancement Example

Theoretical low-pressure scenario



Distribution Enhancement Options

Low pressure scenario



☒ **Facilities Color By**

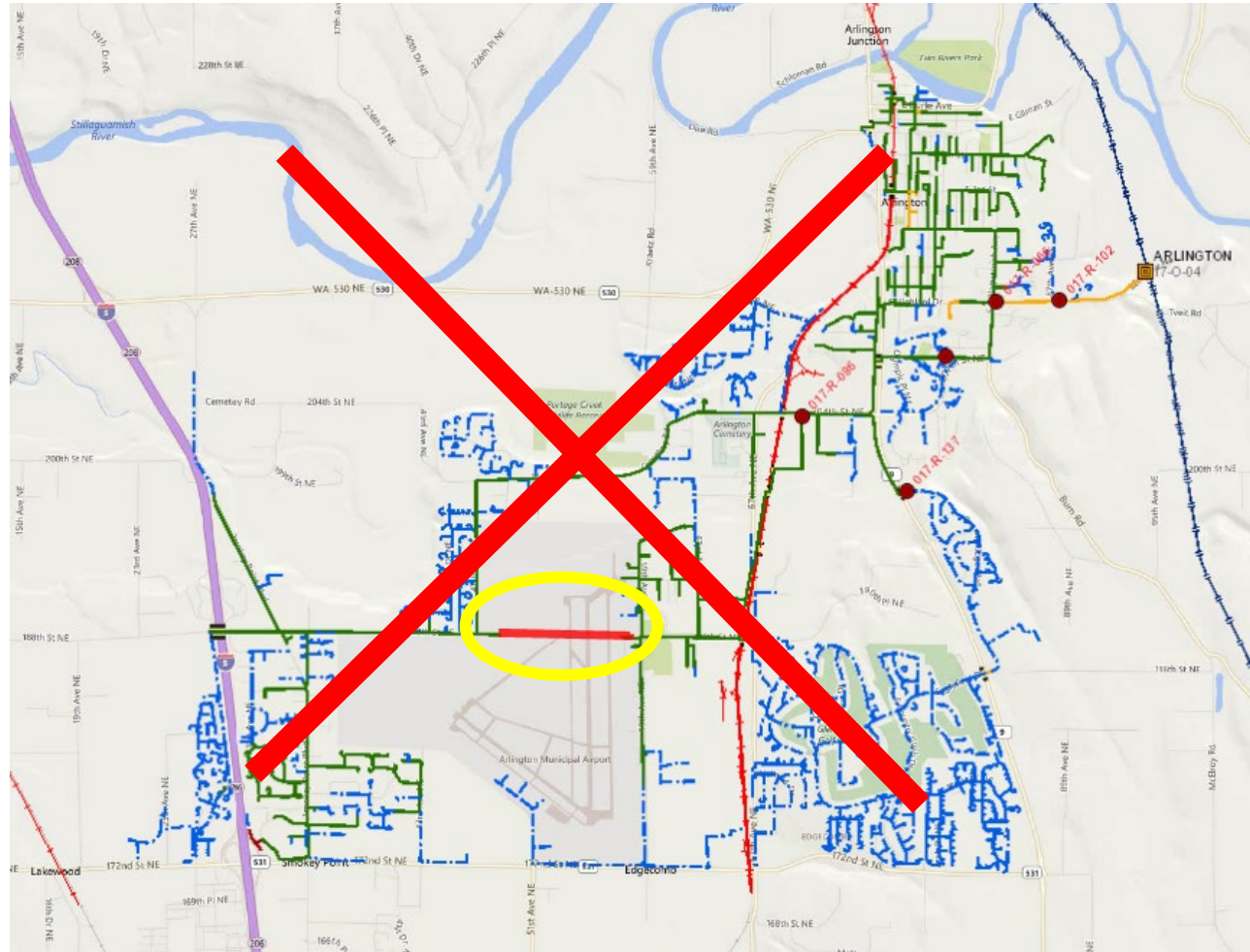
Pressure (Primary Only) (psig)

Not Applicable (7)
< 10.00 (301)
10.00 - 15.00 (518)
15.00 - 25.00 (548)
25.00 - 40.00 (627)
40.00 - 60.00 (67)
> 60.00 (16)

- Compressor station infeasible
- Other Solutions?

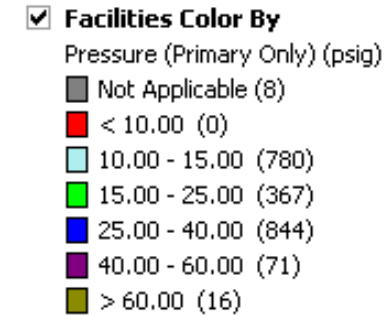
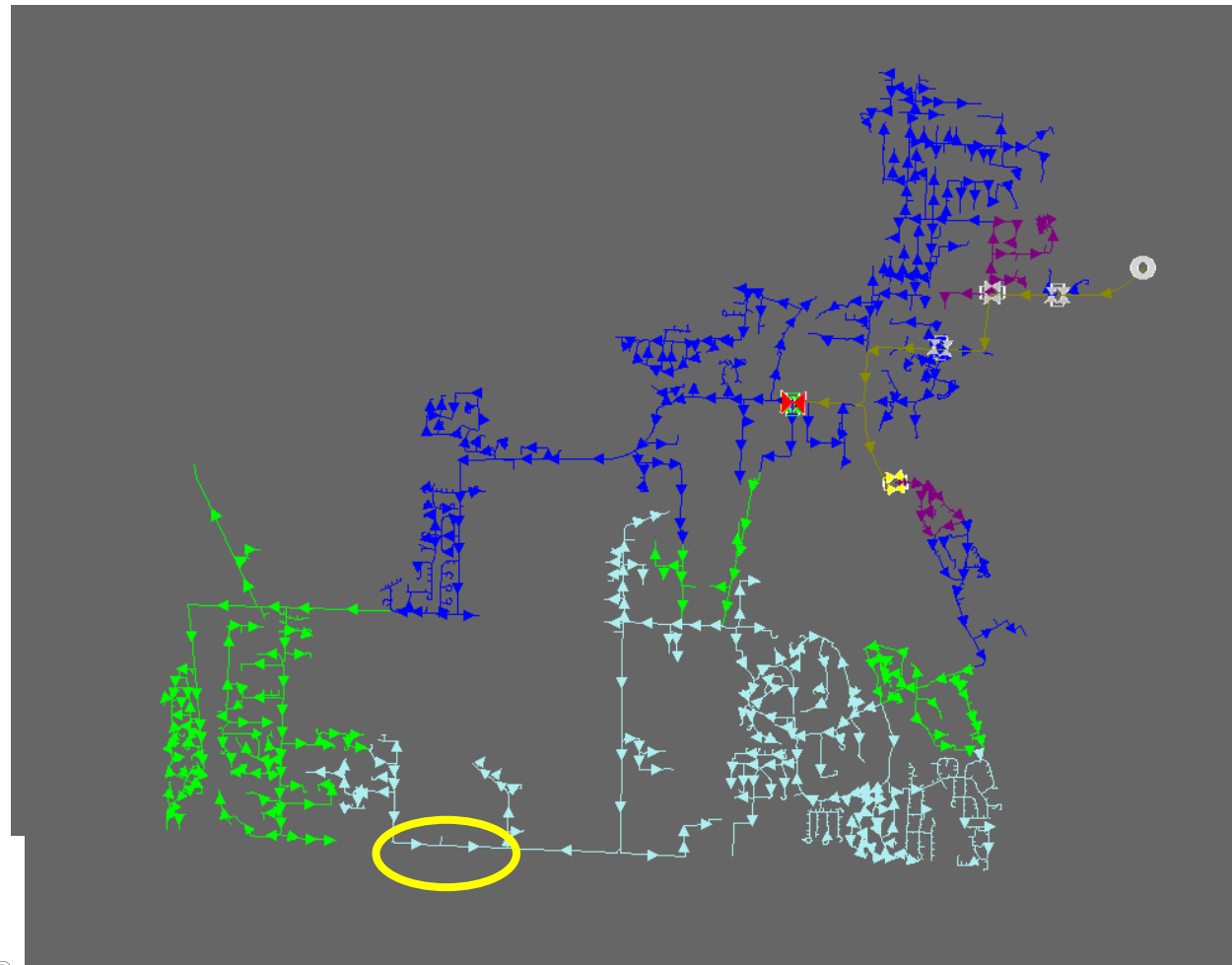
Distribution Enhancement Options

Reinforcement option #1



Distribution Enhancement Options

Reinforcement option #2



Enhancements Considerations:

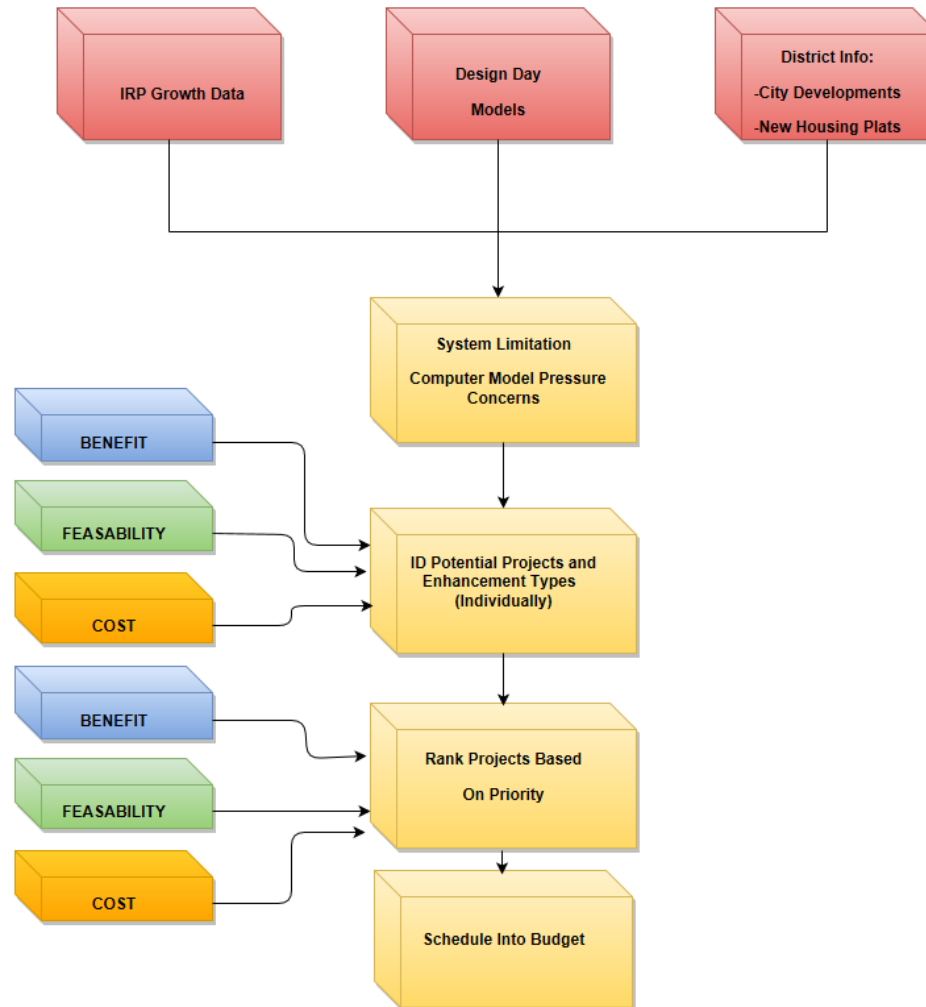
- Scope
- Cost
- Capacity Increase
- Timing
- System Benefits
- Alternative Analysis
- Environmental Impact

Enhancement Review and Selection Process to Capital Budget

Enhancement Selection Guidelines:

- Shortest segment of pipe that addresses deficiency
- Segment of pipe with the most favorable construction conditions
- Segment of pipe that minimizes environmental concerns and impacts to the community
- Segment of pipe that provides opportunity to add additional customers
- Total construction cost including restoration

Enhancement Selection Process:



Info & Data



Project & Schedules

Ongoing Steps/Process to review/identify IRP projects

- Assess our systems and identify deficits caused by 5-year growth modeling
- Propose and evaluate alternatives to address deficits
- Discuss deficits and alternatives with management
- Work through alternative analysis process
- Budget projects needed to meet 5-year core growth

Feedback for Cascade?

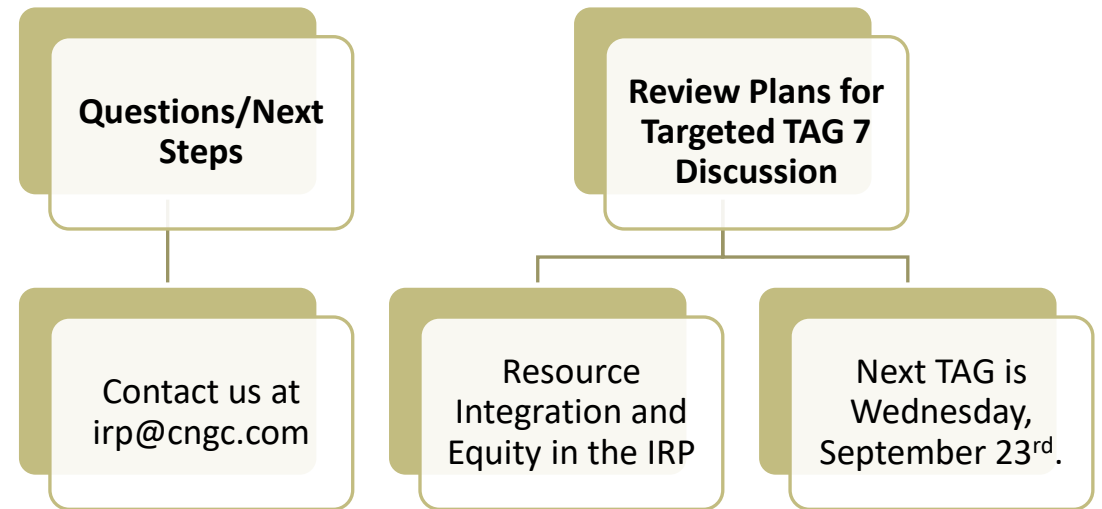
Do you have comments or ideas that Cascade should consider regarding Distribution System Planning?

Process Item	Date	Process Element
Targeted-TAG	Wednesday, September 23, 2026	Resource Integration and Equity in the IRP
TAG 1	Wednesday, October 14, 2026	Process, Key Points, IRP Team, Timeline, Regional Market Outlook, Planned Scenarios and Sensitivities, Stakeholder Engagement, Demand and Customer Forecast and Non-Core Outlook, Drilling down into segments of demand forecast. Upstream Pipeline presentation.
TAG 2	Wednesday, November 18, 2026	Respond to TAG 1 Feedback, Distribution System Planning, Alternative Resources, Price Forecast, Avoided Costs, Current Supply Resources, Transport Issues, Carbon Impacts, Energy Efficiency, Bio-Natural Gas, Preliminary Resource Integration Results.
First Draft	Wednesday, December 16, 2026	
Comments Due	Wednesday, January 20, 2027	
TAG 3	Wednesday, February 10, 2027	Respond to TAG 2 feedback, Final Integration Results, finalization of plan components, Proposed new 2- to 4-year Action Plan
Final Draft	Friday, March 12, 2027	
Comments Due	Friday, April 9, 2027	
TAG 4 (if needed)	Wednesday, April 28, 2027	
Final Complete By	Wednesday, May 19, 2027	
File	Friday, May 21, 2027	

2027 IRP Schedule



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