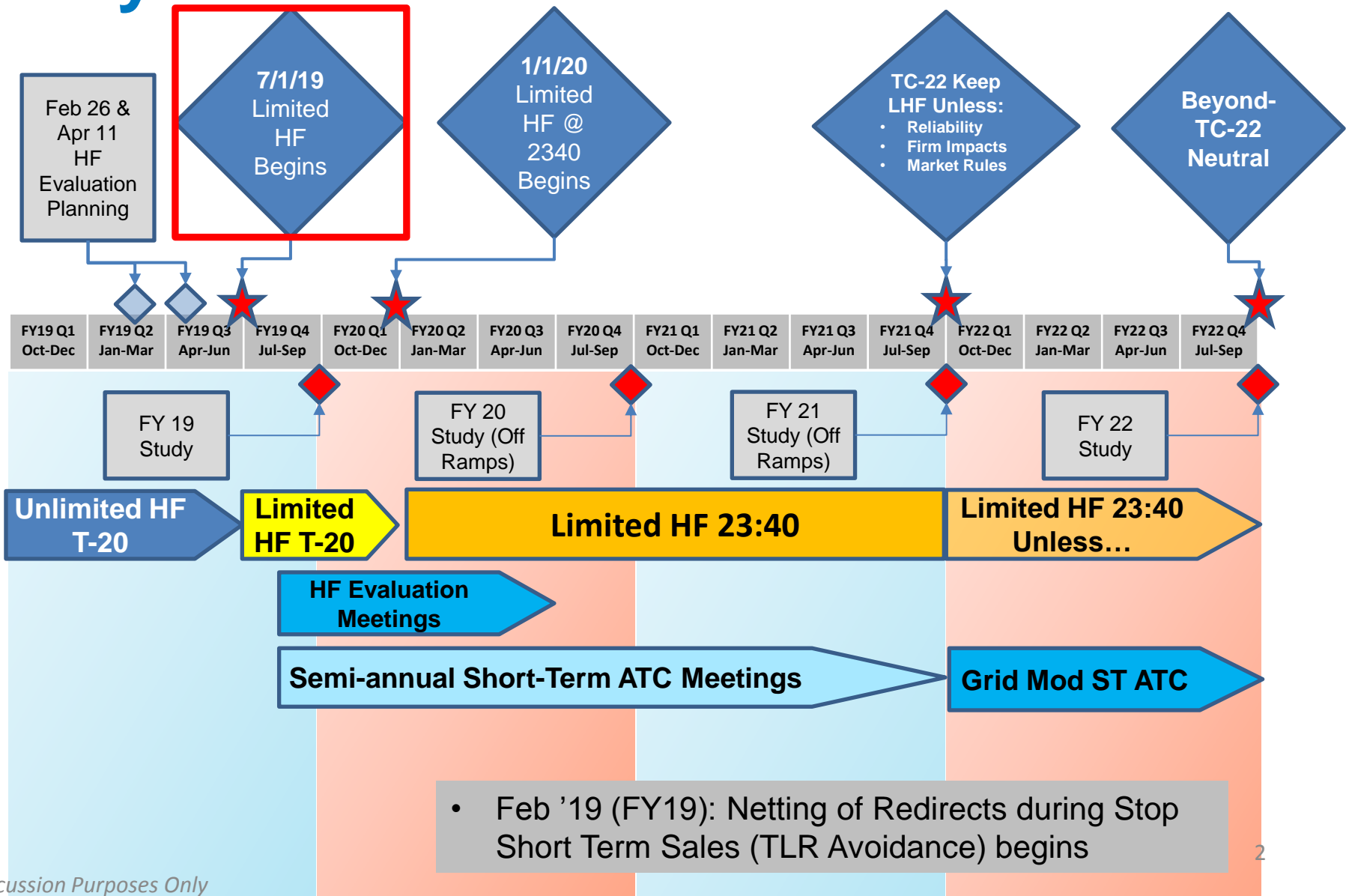


Preparing for the Transition to Limited Hourly Firm

Customer Training Session

May 21, 2019

Hourly Firm & Short-Term ATC Timeline



Limited Hourly Firm – Next Steps

- BPA will be selling to the currently calculated ATC value on the network paths for the hourly product starting 7/1/19
 - BPA is not considering implementing any improvements to short-term ATC calculation prior to 7/1/19
 - BPA does not limit hourly non-firm sales.
 - On 1/1/20, hourly firm will no longer be available after 23:40 prior to the day of service
- BPA currently sells to the calculated ATC value for external and intertie paths and will continue this practice
 - Intertie paths are already operating under limited ATC

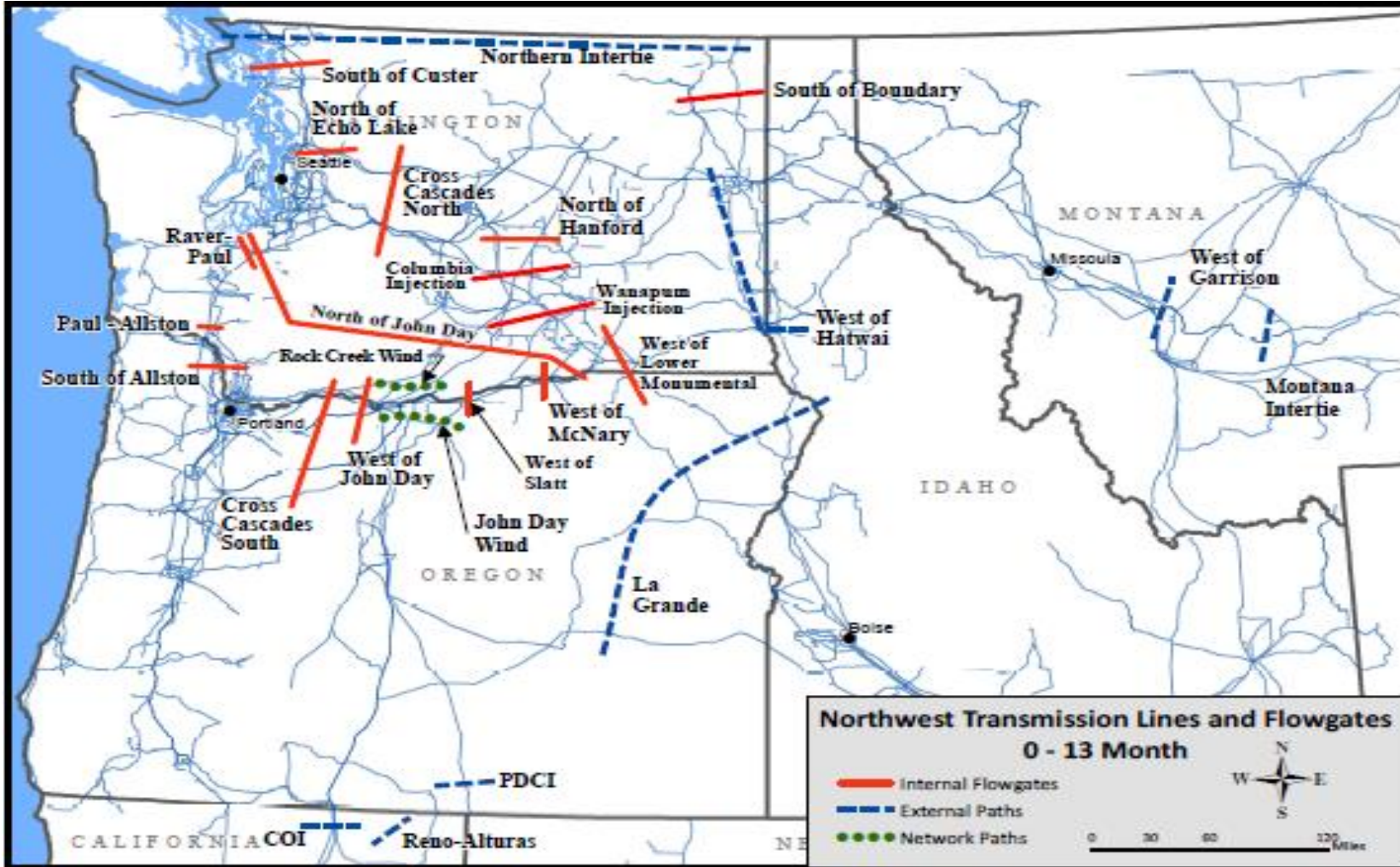
Transmission Product:ATC Matrix

TRANSMISSION SERVICE PRODUCT	Priority	Network Paths	1 to 1 Paths
STF-MONTHLY NT AND PTP	7	LIMITED	LIMITED
STF-WEEKLY NT AND PTP	7	LIMITED	LIMITED
STF-DAILY NT AND PTP	7	LIMITED	LIMITED
F-HOURLY NT AND PTP	7	LIMITED AS OF 7/1/19	LIMITED
ST Non-Firm Monthly NT	6	LIMITED	LIMITED
ST Non-Firm Weekly NT	6	LIMITED	LIMITED
ST Non-Firm Daily NT	6	LIMITED	LIMITED
ST Non-Firm Hourly NT	6	UNLIMITED	LIMITED
ST Non-Firm Monthly PTP	5	LIMITED	LIMITED
ST Non-Firm Weekly PTP	4	LIMITED	LIMITED
ST Non-Firm Daily PTP	3	LIMITED	LIMITED
NF-Hourly PTP	2	UNLIMITED	LIMITED
NF-Secondary Hourly PTP	1	UNLIMITED	LIMITED

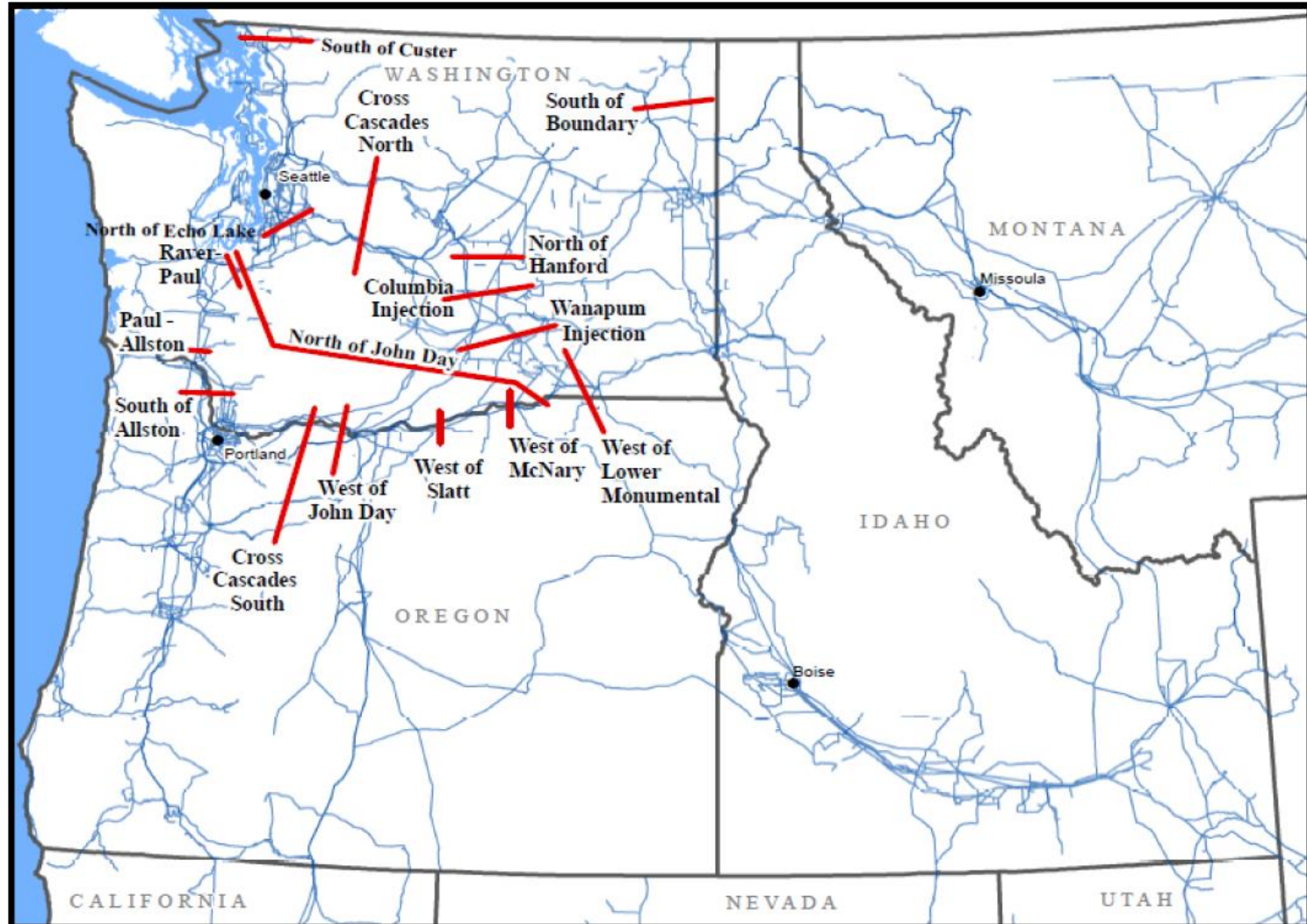
Overview

- Presentation is intended to walk customers through resources available to help business strategies once ATC is limited on the Network
 - Intro to Network Paths
 - Intro to 1 to 1 Paths
 - Tools for Calculation of Impacts
 - Finding ATC Values
 - Portfolio Strategy
 - Other Resources

BPA Managed Paths: 0-13 Months

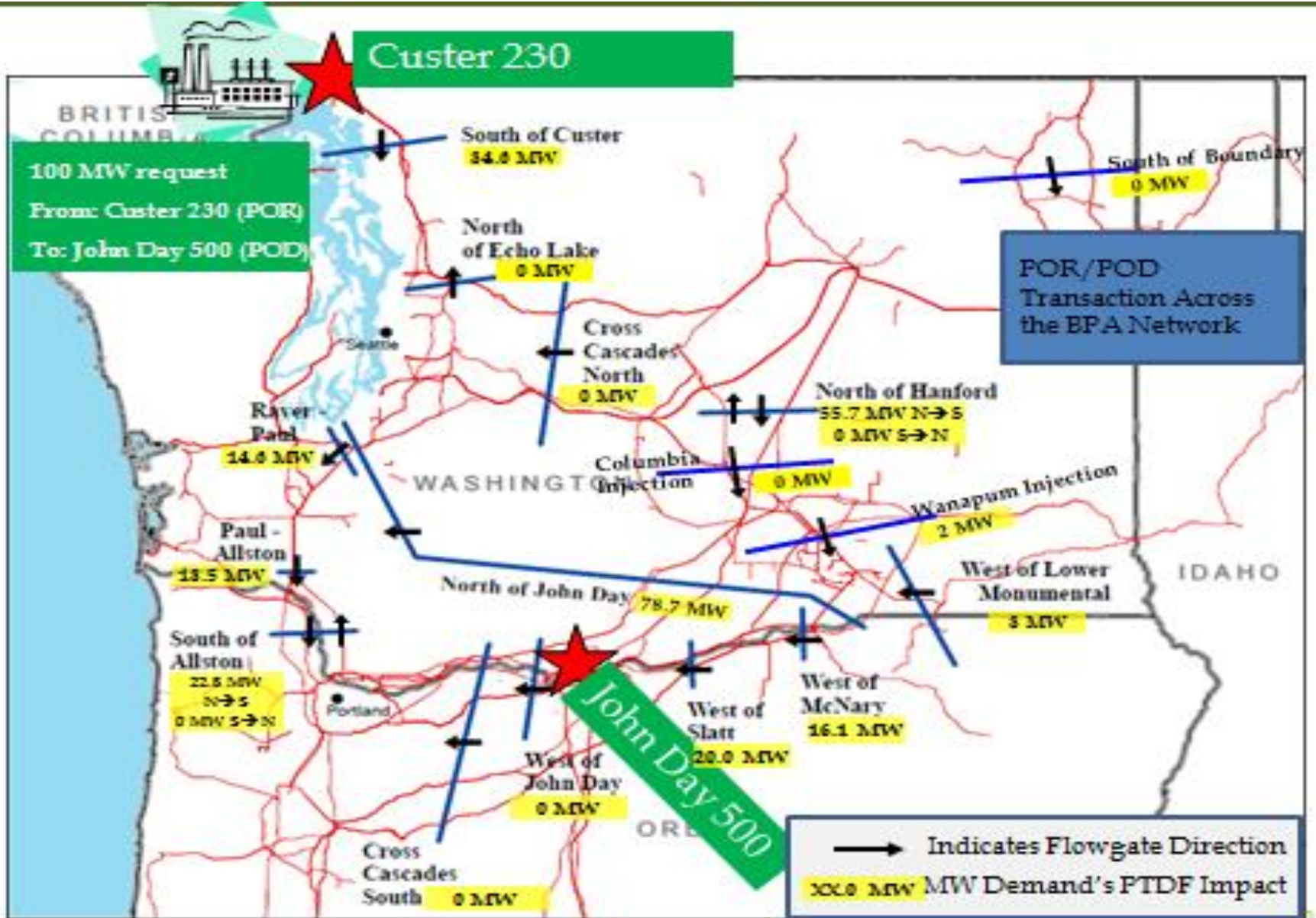


Network Paths

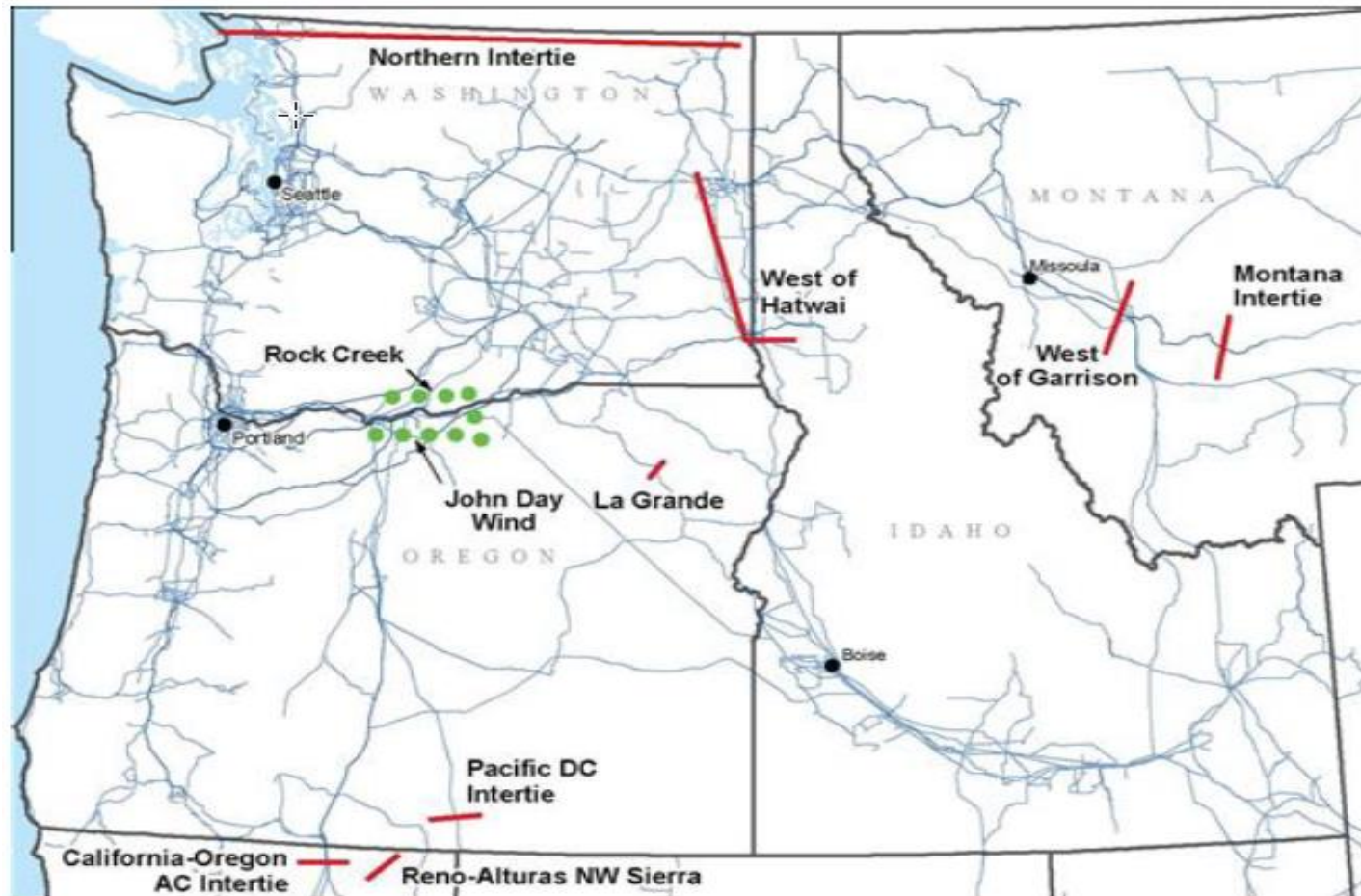


Network Paths

- BPA sells ATC on 18 Network Paths using a PTDF method
- PTDF method assesses impacts on the 18 paths simultaneously and is a representation of how power would flow
- The impact values will be less than the demand requested due to the nature of the calculation
- Impact Results:
 - Positive impact values require ATC
 - Negative or *de minimis* impact values do not require ATC



1 to 1 Paths: External Interconnections, ATC Paths, and Interties



1 to 1 Paths: External Interconnections, ATC Paths, and Interties

- 1 to 1 Paths: BPA sells to 16 paths
 - Sometimes referred to as contract path
- 1 to 1 means that if a request is for 50MW, there must be 50MW of ATC
- These paths will continue to be managed by limited ATC
 - There will be no changes after 7/1/19
- TSRs will also be assessed on Network Paths
 - Exception is AC, DC, Montana Intertie, and RATS
- These paths are defined by the POR/POD combination of a TSR

1 to 1 Paths: External Interconnections, ATC Paths, and Interties

- The POR/POD combination of a TSR is used to define whether a TSR impacts a 1 to 1 path
- These POR/POD definitions can be found at:
 - <https://www.bpa.gov/transmission/Reports/TransmissionAvailability/Pages/default.aspx>
 - Information>Interties and External Interconnections in OASIS

Tools for Calculation of Network Impacts on Short Term TSRs

- <https://www.bpa.gov/transmission/Reports/TransmissionAvailability/Pages/default.aspx>
- Short-Term Availability Transfer Capability
 - Short Term Original Transmission Service Request Calculator
 - Use for Original TSRs and *Non-Firm Redirect* analysis
 - Non-Firm redirects can be Relinquished back to the parent, so there is no netting
 - Short Term Redirect Transmission Service Request Calculator
 - Use for Firm Redirect analysis
- OASIS
 - Reports>AFC/Flowgate Reports
 - Scenario Analyzer (for Originals or Non-Firm Redirects)
 - Request Evaluations

Tools for Finding Short Term ATC Values in OASIS

- Short Term ATC
 - ATC/AFC>System Data Summary
 - Reports>AFC/Flowgate Reports
 - AFC Initialization Impacts and ATC Initialization Impacts
 - Short Term ATC = Committed SAFC – Pending SETC (Long Term Pending Queue hold out)
 - SADJ (Short Term Adjustment) and Pending SETC values reduce or become 0 in the 0-4 month timeframe, which increases availability
 - Equivalent ATC/TTC
 - If the equivalent ATC is greater than or equal to the desired demand to request, then the transaction will likely pass

Tools to Find TSR Failure Reasons in OASIS

- TSR failure
 - Status of INVALID indicates a submittal error
 - Status of REFUSED indicates lack of ATC
 - TSR comment
 - Reports>AFC/Flowgate Reports
 - Request Evaluations
- TLR Avoidance
 - Changes the Firm ATC value to 0 for the avoidance time period for the specific path (ex: NOEL)
 - The Non-Firm ATC value may also be impacted in Preschedule or Real-Time, although has not historically occurred with frequency
 - Go to OASIS>Notices>Messages for postings on TLR Avoidance

Peak Season ETCs by Network Path

- Chart depicts the seasons with the highest ETC from the powerflow case
- Shows which seasons a path may have higher risk of low or no ATC

NETWORK PATH	ETC PEAK
NORTH OF JOHN DAY N>S	SUMMER
RAVER-PAUL N>S	SUMMER
SOUTH OF BOUNDARY N>S	SUMMER
SOUTH OF ALLSTON N>S	SUMMER
SOUTH OF ALLSTON S>N	WINTER
PAUL-ALLSTON N>S	SUMMER
WEST OF LOMO E>W	WINTER
WEST OF MCNARY E>W	SUMMER
CROSS CASCADES NORTH E>W	WINTER
CROSS CASCADES SOUTH E>W	WINTER
WEST OF SLATT E>W	SPRING
COLUMBIA INJECTION N>S	SUMMER
NORTH OF HANFORD N>S	SUMMER
NORTH OF HANFORD S>N	WINTER
WANAPUM INJECTION N>S	SUMMER
WEST OF JOHN DAY E>W	WINTER
NORTH OF ECHO LAKE S>N	WINTER
SOUTH OF CUSTER N>S	SUMMER

Evaluating Your Portfolio

- Recommend using the PTDF calculator to create a table of impacts for common transactions
- Become familiar with the parent paths that best enable desired child paths when redirecting
- Become familiar with path constraints
 - Ex: South of Allston is summer peaking and Cross Cascades North is winter peaking
- Pay attention to TS Web Updates email regarding the release of Short Term Base Cases

Other Resources

- Discuss setting up a meeting with your AE and the Reservation Desk
- Call the Reservation Desk directly at 360-418-8499 for help with:
 - How to find TSR impacts
 - TSR failure reasons
 - Navigating/understanding OASIS and resources on BPA Transmission site
 - Questions regarding timing
- Business Practices
 - <https://www.bpa.gov/transmission/Doing%20Business/bp/Pages/Business-Practices.aspx>

APPENDIX

BPA Transmission Site Resources

- <http://www.bpa.gov/transmission/>
 - Doing Business>ATC Methodology
 - Doing Business>Business Practices
 - Especially Requesting Transmission Service Business Practice
 - Reports & Tools>Transmission Availability
 - System Information>Interties and External Interconnections in OASIS
 - Short-Term Availability Transfer Capability>Short Term Original Transmission Service Request Calculator
 - Short-Term Availability Transfer Capability>Short Term Redirect Transmission Service Request Calculator

OASIS System Resources

- Reports>AFC/Flowgate Reports
 - Scenario Analyzer (for Originals only)
 - Request Evaluations
 - AFC Initialization Impacts
 - ATC Initialization Impacts
 - Equivalent ATC/TTC
- ATC/AFC>System Data Summary
- Notices>Messages
- Home page contains outage information

Path Name/OASIS Path Name Crosswalk

Network Path Name	OASIS Path Descriptor	External Interconnection and Intertie Path Names	OASIS Path Descriptor
•South of Allston N>S	SOALSN	•AC Intertie N>S	AC_N>S
•Cross Cascades North E>W	C-CASC_N	•AC Intertie S>N	AC_S>N
•Cross Cascades South E>W	C-CASC_S	•DC Intertie N>S	DC_N>S
•North of Hanford N>S	NOHANF	•DC Intertie S>N	DC_S>N
•North of Johnday N>S	NOJDAY	•Northern Intertie N>S	NI_TOTL_N>S
•Paul-Allston N>S	PAUL_ALSN	•Northern Intertie S>N	NI_TOTL_S>N
•Raver-Paul N>S	RAVR_PAUL	•Lagrande W>E	LAGR_W>E
•West of McNary E>W	WOMCNY	•Lagrande E>W	LAGR_E>W
•West of Slatt E>W	WOSLATT	•West of Garrison W>E	WOGARR_W>E
•West of Johnday E>W	WOJD_E>W	•West of Garrison E>W	WOGARR_E>W
•South of Custer N>S	SCSTER_N>S	•West of Hatwai E>W	WOH_E>W
•North of Echo Lake S>N	N_ECOL_S>N	•John Day Wind Gen	JDWIND_GEN
•West of Lomo E>W	W_LOMO_E>W	•Rock Creek Wind Gen	ROCKCK_GEN
•South of Allston S>N	SOALSN_S>N	•RATS N>S	RATS_N>S
•South of Boundary N>S	SBNDRY_N>S	•RATS S>N	RATS_S>N
•Wanapum Injection N>S	WANAPM_N>S	•Montana Intertie E>W	MI_E>W
•Columbia Injection N>S	CLMBIA_N>S		
•North of Hanford S>N	NOHANF_S>N		

OASIS AFC/ATC Initialization Impact Horizons

OASIS AFC/ATC Initialization Impact	Horizon Covered	Calculation Granularity
Monthly Pre-Schedule	3 months to 13 months	Monthly
Daily Pre-Schedule	8 days to 90 days	Daily
Hourly Pre-Schedule	Next day to 168 hours (7 days)	Hourly
Hourly Real-Time	Next hour to end of day	Hourly
Minute Real-Time	Start of current hour to end of next hour	1 minute

Hourly Transmission Service Products

There is a simultaneous submission window the first five minutes a product reservation window opens (9:00-9:05 for Hourly Firm and 10:00-10:05 for Hourly Non-Firm). TSRs submitted during that time will receive a number in a lottery order for which to be evaluated.

Hourly Transmission Service Products	Transmission Service Classification	NERC Priority	Reservation Window	Duration
F-Hourly PTP, Hourly NT	Firm	7	Beginning at 9:00 of the WECC Preschedule Day, up to 20 minutes prior to the start of flow.	Begins XX:00 for no less than 1 hour and no more than 24 hours.
NF-Hourly NT	Non-Firm	6	Beginning at 10:00 of the WECC Preschedule day, up to the end of the operating hour.	Begins XX:00 for no less than 1 hour and no more than 24 hours.
NF-Hourly PTP	Non-Firm	2	Beginning at 10:00 of the WECC Preschedule day, up to the end of the operating hour.	Begins XX:00 for no less than 1 hour and no more than 24 hours.
NF-Secondary Hourly PTP (Redirect)	Non-Firm	1	Beginning at 10:00 of the WECC Preschedule day, up to the end of the operating hour.	Begins XX:00 for no less than 1 hour and no more than 24 hours.