

May 2014 Public Communications Summary

6/23/14

The following is a summary of feedback received by Puget Sound Energy (PSE) between May 1 and May 31, 2014 regarding the Energize Eastside project. During this period the project received 74 communications from the public. The communications were submitted via the project email address, the project website, or at community meetings. Communications address a range of topics and often discuss more than one topic and/or segment; therefore, many communications are categorized and discussed under multiple topics.

Feedback Frequency by Topic

The following table indicates the frequency with which various topics were discussed (total) and where a specific segment(s) was mentioned when discussing this topic*. Approximately half (35) of the 75 communications received during this period mentioned specific segments.

LESS MORE

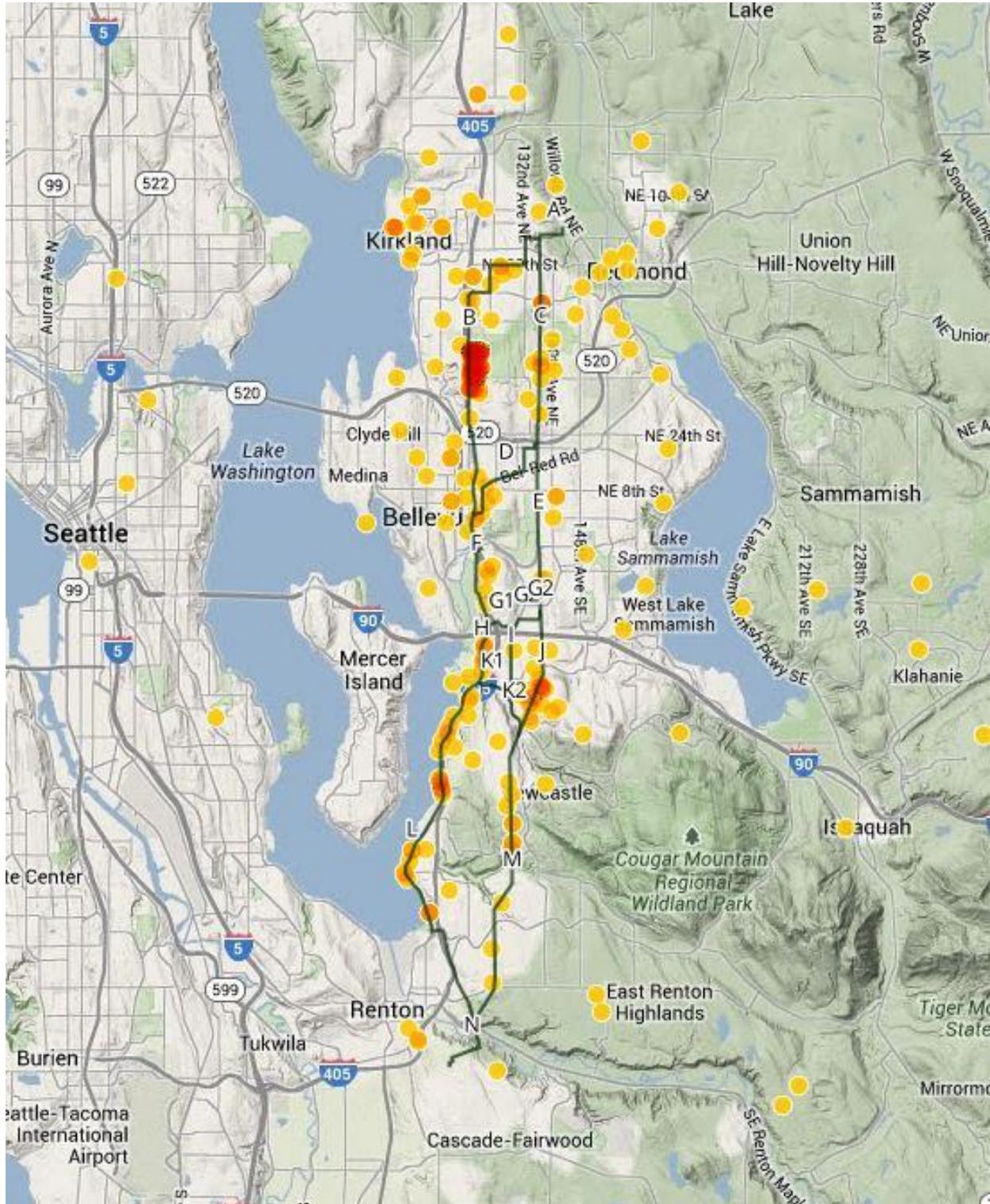
Table and map colors increase in intensity from yellow to red based on the frequency of occurrence.

Topic	Total	A	B	C	D	E	F	G1	G2	H	I	J	K1	K2	L	M	N
Total by segment	75		17	10	1	1	3			2	2	3		2	7	3	
Route segments	35		15	9	1	1	3			1	1	3		2	6	2	
Property values	18		4	6		1	1					1			3	1	
Visuals	11		1	2		1	3			1		1			1	1	
Health	11		5	1			1										
Underground	9		2	1											4		
Community character	7		2	3	1	1						1			1	1	
Schools	8		4												1	1	
Cost	6		3	4	1												
Design structure location	6		3	2													
Environmental	6		4	3											1		
Vegetation	6		3	2											1		
Real Estate	6		3	1													
Design structure type/appearance	5		1	1													
Noise	5		2	1													
Project need	5																
Alternative technology	4		1				1								1		
EMF	4																
Recreation	2														1	1	
Safety	2			1													

*Please note communications often reference more than one topic and/or segment. As a result, totaling columns or rows will produce results that exceed the total number of communications received.

Feedback Frequency by Address

The following map indicates the intensity of communications based on the addresses of individuals and organizations providing communications during this period.



Summary of Most Frequent Topics

Below is a summary of the topics (in order from most to least common) with key examples of the comments or questions received and a response from PSE. The communication excerpts are verbatim (including typographical errors) and reflect input from individuals who have contacted PSE about the Energize Eastside project. Please note that many communications received are statements and not questions. PSE makes every effort to respond to questions individually and has included general responses below by topic; general statements of fact or opinion do not typically receive detailed responses.

Multiple communication topics may be referenced in communications. Where appropriate, those topics have been combined in the summaries below.

The inclusion of the excerpts is to maintain a record of the information and input received by PSE and is not a reflection of PSE's concurrence or disagreement with any statements in whole or in part. The communication summary reflects PSE's public outreach process to assist the Community Advisory Group in gathering input that will be used to inform a recommendation about route selection.

Route segments/options

Feedback has been received regarding which specific segments should be chosen for the new transmission lines, as well as questions about using Seattle City Light's transmission corridor instead of identifying a new route.

Excerpts:

- *Please consider the L route over the M route through Newcastle and South Bellevue...infrastructure should be spread out for all users and not limited to areas where lower and middle class residents live.*
- *I strongly request and encourage PSE to explore alternative options to the current proposed Segment F.*
- *I cannot begin to fathom why any route other than route option C -- the existing power corridor -- is under consideration for installing the new lines.*
- *I oppose the I, J, and K2 segments running above ground through the densely-populated residential neighborhood.*
- *Has PSE approached SCL regarding connecting PSE substation to existing SCL line?*

Puget Sound Energy Response:

We thought it was important to complete a thorough analysis of all feasible route options in the project area so when the time comes to select a preferred route, we are confident that the route is the best option for both the community and PSE. To simply build in the existing corridor without looking at other options, we felt, would be shortsighted.

During the solution identification process, PSE's engineers and third-party experts looked for the best solutions to deliver electricity to the Eastside. Solutions included conservation, local electricity generation and new infrastructure. Through our analysis, it was determined that the best way to ensure the area's electric transmission system will meet growing customer demand was with a combination of conservation and new infrastructure (specifically, higher capacity transmission lines and a new transformer).

Next, engineers used the computer-based modeling tool, called the Linear Routing Tool (LRT), to analyze, weight and score key criteria such as geographic barriers, land uses and impacts to the environment. Based on this analysis, the LRT generated hundreds of possible routes before identifying the best possible route options, including two general north/south route paths – one along PSE's existing

corridor and one along a combination of roadway and rail corridor – with multiple crossover points. The two remaining route paths were broken into 16 constructible route segments that could be configured in a number of ways. PSE is now gathering public feedback on the potential route segments.

PSE generally prefers to site projects along public rights of way or existing utility corridors wherever possible. This was reflected in the route selection process, as existing corridors were deemed “opportunity areas” and weighted more highly in the LRT. However, upgrading an existing transmission system in a dense urban and suburban area poses unique challenges, and there is no route option that completely avoids community impacts. As a result, PSE is committed to engaging the community to better understand and address those challenges.

PSE is currently in the middle of a year-long public outreach and route selection process, which includes working with a Community Advisory Group to consider community values when evaluating the route options. We anticipate selecting a preferred route by the end of 2014 that balances the needs of customers, the local community and PSE.

As it is still early in the process, PSE doesn't yet have a preferred route or detailed design. Since we haven't yet determined whether Segment F will be part of the selected route, where poles will be placed, or what exact pole structures will be used, it is too early at this point to know about view effects and mitigation. However, once PSE has selected our preferred route, we will notify property owners, residents and businesses along the route about the project's next steps. We are committed to working with property owners, businesses and residents on pole locations and design, access and other issues, and to provide mitigation when appropriate and/or necessary.

Additionally, we have approached Seattle City Light requesting to share their existing utility corridor for the Energize Eastside project. Seattle City Light has been clear that the corridor is a key component of the company's transmission system used to meet current and future operating needs, and is not available for our use.

While PSE has eminent domain authority from the state, it does not extend to condemning property from a public agency that serves a public use.

Property values

Concerns have been raised about the potential for significant impacts to private property values and whether those impacts would be compensated for.

Excerpts:

- *We believe strongly that your proposed routing will be destructive to our quality of life and property values, and more study and public comment are definitely needed.*
- *The loss of vegetation, land, depreciation of home value, and health impact to this area would be devastating.*
- *It is critical that the choice be made based on objective and fair standards that can apply openly - cost, mitigation, and effect on property value.*
- *Keep the line where it is. Those property values already reflect the lines; the 116th property owners stand to lose a lot of value in their homes.*
- *I am concerned about my property value and the health risks to my family!*

Puget Sound Energy Response:

When evaluating possible locations to site utility infrastructure, property values of the adjacent community are not taken into consideration because it is socially inequitable to make infrastructure siting decisions based on income-related considerations such as high-end, moderate or low-value housing. Similarly, a project's potential effects on surrounding property values are excluded from consideration of impacts to the environment under Washington's State Environmental Policy Act (SEPA), Ch. 43.21C RCW. Property values are comprised of many factors, including economic outlook and location, as well as proximity to jobs, schools, transportation, parks and other amenities. Out of fairness to and in consideration for customers of all income levels, PSE does not use property values as a factor when selecting routes.

Attempting to determine the impact of a transmission line on property values outside of the context of a purchase and sale transaction requires a certain degree of speculation. Due to the unique qualities of each property, there's no 'one size fits all' formula. PSE does not compensate nearby property owners for perceived loss of property value due to the installation of energy infrastructure. In this respect, PSE is no different than any other public or private developer. This approach is consistent with Washington law.

If new easements are required to site our facilities on private property, PSE will compensate the affected property owners based on fair market value.

Visuals and Recreation

Concerns have been raised about the potential for visual impacts to public and private property and the surrounding landscape, including parks.

Excerpts:

- *I have huge concerns about this proposal and definitively not happy about it because it has impact on our view of Lake Washington.*
- *Today I walked Route "L" and cried at the thought of clear cutting all of those lovely trees from the beginning of Coulon Park, to the Sea Hawk and on to the bike path along 405. Heart Breaking!*
- *I don't understand why there is even a discussion. M-J-E-C route already exists. If you stick with that route the only impact is the get fewer towers that are higher and better looking.*
- *We own two buildings in Belle-View along the "F" route and this line will significantly affect the views from our buildings.*
- *Additional pole height and scope would further degrade any views of residents. 116th Ave NE is one of the lovely north south routes for foliage in the area. Why ruin a current situation and condemn property when a clear cut route already exists?*

Puget Sound Energy Response:

Delivering a project like Energize Eastside in a dense urban and suburban area is challenging but PSE is committed to working with the communities involved to minimize impacts to the maximum extent practicable.

Aesthetics and views could not be included in the initial route screening effort because there is no publically available data for these factors. However, visual impacts will be considered during the environmental review process that will be conducted to comply with the State Environmental Policy Act (SEPA). Additionally, photo simulations are currently being developed as a part of our ongoing public outreach process. As these simulations are complete, they are being shared publicly by being posted on our project website.

The placement or "spotting" of pole structures will be dependent upon factors such as available right-of-way width, location of access routes and obstacle avoidance. PSE typically has some flexibility when it

comes to where poles are placed on a property. Whenever we can, we will work with property owners to identify the least impactful option for pole placement. In some cases, strategic planting of vegetation, such as trees with larger spreading crowns, can be used to diffuse and mitigate view impacts. In turn, the height, loading and overall size of each structure will be greatly affected by location. Additionally, recognized areas of environmental significance will be identified and avoided where practicable.

Health, Electromagnetic fields, and Schools

Concerns have been presented about the potential for negative health and safety affects caused by high voltage transmission lines, particularly on students at school. While these are generally separate categories, communications typically relate these topics very closely.

Excerpts:

- *We have 155 children whose brains and bodies are still actively in the development mode- their growth and learning is based in large part on a safe and healthy school learning environment inside and out...The potential health hazards associated with high voltage power lines in close proximity to our students makes this route choice unacceptable.*
- *I am concerned about the potential health effects from running high voltage electric transmission lines so close to my home.*
- *Also I would like to know the strength of the electromagnetic field given off by both [230kV and 115kV transmission lines].*
- *I am not terribly concerned about the EMF a higher voltage line will emit but I am probably in the minority on the EMF issue.*
- *As a parent of school-age children, a trained biomedical researcher, and a homeowner in the [undisclosed to protect confidentiality] neighborhood, I would like to express my grave concerns for the public health implications of the proposed PSE high voltage 230kV power line Segment B through the [undisclosed to protect confidentiality] and [undisclosed to protect confidentiality] neighborhoods in Kirkland. There is clear evidence both in the US and other countries that links an increased risk for childhood leukemia and lymphoma to proximity to high-voltage power lines.*

Puget Sound Energy Response:

Over the past 45 years, there have been many scientific studies conducted to determine if EMF from transmission lines (called “power frequency EMF”) has any effect on human health. To date, this large body of research does not show that exposure to power frequency EMF causes adverse health effects.

At PSE, safety is always our top priority. Many customers have questions about EMF and our team works to provide access to information on EMF in a few different ways. Specifically, we:

- Follow all applicable federal, state, county and city rules, regulations and standards when constructing power facilities for the safe and reliable delivery of electric service;
- Remain informed about important developments in EMF research from reputable, international and national scientific and public health organizations and agencies that have reviewed the research on EMF; and
- Share accurate and objective information about EMF with our customers.

Additionally, PSE understands that you, and other local residents, may have more questions about electromagnetic fields. PSE has hired Drew Thatcher – an independent, board-certified health physicist – to address more specific EMF questions. If you or your neighbors would like to ask questions of Drew, we would be happy to connect you with him for more information.

Also, in the next few months we will have information on EMF measurements in the existing utility corridors (what magnetic field measurements exists today) and modeling numbers with the new transmission line. Once the EMF modeling study is complete, it will be posted on our project website.

Regarding schools, the locations of schools were one of many factors considered when developing potential route segments. It is not uncommon for power lines to be sited near schools, or for schools to be built near power lines. However, PSE heard that this is a community concern as part of the Sub-Area outreach process and this feedback will be shared with the Community Advisory Group for further consideration during the route selection process.

Underground

Suggestions have been received that PSE construct the new line underground, along with questions about undergrounding costs and feasibility.

Excerpts:

- *Please put at least a 1-year moratorium on the proposed "L" lines passing near our [undisclosed to protect confidentiality] neighborhood until other options can be explored, including a less intrusive site to the East, and possibly underwater.*
- *Any new routes should be underground, any replacement of current routes should be underground, and any of the commercial developers that need these upgrades should be the ones that are paying for them.*
- *PSE's comparison of overhead and underground projects is very lacking - a "life cycle cost" analysis is needed to pick up all the pros and cons of overhead vs. underground 230 kV transmission.*
- *We have also been in touch with other groups who are encouraging exploration of alternatives, including undergrounding and finding a way to make use of the Seattle City Light corridor.*

Puget Sound Energy Response:

Overhead transmission lines are PSE's first option for standard service due to their reliability and affordability, both of which are important to our customers. Unless a community or local jurisdiction requests the lines be put underground and are willing to pay the cost difference, regulations require PSE to construct overhead transmission lines.

The biggest challenge to underground transmission lines is cost. The construction costs for an overhead transmission line will be about \$3 million to \$4 million per mile, versus \$20 million to \$28 million per mile to construct the line underground. These figures only take engineering and construction costs into consideration, and do not include additional costs such as land acquisition, traffic control, relocation of existing underground facilities that may conflict with an underground transmission line, future increased operation and maintenance costs, or taxes and overheads. These additional costs can be very significant – sometimes two to three times the construction costs.

When a transmission line is constructed overhead, project costs are distributed evenly between PSE's 1.1 million customers. If a transmission line were to be constructed underground, we can't justify asking customers across PSE's entire service territory to pay the significant cost increases for a local aesthetic benefit. That's why, when an overhead line is a viable option like in the case of the Energize Eastside project, our tariff regulated by the Washington Utilities and Transportation Commission requires the local jurisdiction or customer group requesting that the transmission line go underground to pay the difference between the overhead and underground costs.

The tariff is in place to protect all of our customers from substantial bill increases that would result from frequent requests to underground or relocate transmission lines (view the full tariff: [Schedule 80, Section 34](#)). We recognize some of our customers are in the financial position to pay the substantial increase in rates to underground this project and others, but we have many low- and fixed-income customers who depend on affordable rates. It is PSE's responsibility to balance the needs of all customers and provide service that is both reliable and affordable. These regulations are founded in fundamental public policy, which hinges on fairness and reasonableness for all customers, regardless of income. Having the local community pay to underground power lines for the aesthetic benefit is not new – it is the same concept our communities follow today when a new development undergrounds the lower voltage distribution power lines.

In addition to cost, there are other factors to consider. For example:

- Putting power lines underground can have bigger environmental and neighborhood impacts. Undergrounding transmission lines requires extensive vegetation removal, trenching and installation of large (20 feet x 30 feet) access vaults every quarter mile and can be very disruptive to neighborhoods and the environment.
- Underground lines typically take longer to repair, and repairs are more difficult. When an overhead line fails, our crews can often repair it within hours. Repair of underground transmission lines can take days and even weeks, depending on the repairs that need to be made.

All of these factors are why PSE is proposing to construct the Energize Eastside project overhead.

Read more in our [undergrounding](#) fact sheet.

Community character

Concerns have been presented about impacts to unique community characteristics.

Excerpts:

- *Ultimately the shortest distance between two points is a straight line, section D just adds cost and negative community impact with no benefit.*
- *Segment C has existed for over 50 years and most homes and buildings were built after it were built after. Whereas the homes, schools and buildings along segment B were not built knowing that a power corridor may pass through their property.*
- *Absolutely opposed to new power line along B route. This is bad for our neighborhood at multiple levels and there is no significant advantage over updating line along C route that already exists.*

Puget Sound Energy Response:

We know that we'll be bringing changes to any of the neighborhoods where we install lines. We're actively engaging the public to discuss routing, impacts and potential design considerations to reduce these impacts while we move forward with this project, which is vital to maintaining reliable power for all of the customers in the area.

We encourage all potentially impacted community members to participate in ongoing community events to provide feedback on the various route segment options. In March and April, PSE hosted a series of sub-area workshops for neighborhoods to provide input on the proposed transmission line segments and to discuss the evaluation factors most important to their communities. In an urban area like the Eastside, there are unfortunately no corridors running north/south that completely avoid effects to residential neighborhoods. We know there is no easy way to get from Segment A to Segment N; there are

challenges with each option and that is why we are first learning what is important to our customers and the communities we may be affecting before selecting a route.

Cost

Feedback varies from requests to choose specific segments that are believed to cost less to build, to suggestions about whether cost should be a factor in route selection.

Excerpts:

- *[Segment D] would also probably be the most expensive section of the entire route with the least benefits.*
- *Route option C appears to be the lowest cost route option over route B.*
- *Construction costs alone don't adequately answer the questions of overhead project opponents.*

Puget Sound Energy Response:

We don't yet know the total cost of the project, but estimates range from \$150 million to \$300 million. Once we select the route and determine the final design and alignment, we will have a better idea of the total cost. In the meantime, PSE is putting together cost estimates for various route options under consideration by the Community Advisory Group to assist in their deliberation on what route(s) to recommend.

Upgrades or additions to the electric infrastructure are shared by all of PSE's 1.1 million electric customers and paid for over time (unless a more expensive upgrade or addition is made to benefit only a certain area or community, such as undergrounding a line for the purpose of preserving aesthetics). While there are many factors that go into determining the individual customers' monthly bill increase, we roughly estimate that it will range from \$1 to \$2 per month for typical residential customers.

Environmental, Permitting and Vegetation

Questions about the environmental review process and impacts to wildlife and vegetation have also been presented.

Excerpts:

- *Because of the tightness of much of the [neighborhood], having to clear 95' of trees would pretty much clear-cut the entire area, in some cases down to the lake itself. That is a lot more impactful than just removing a few trees!*
- *Shouldn't you be assessing the impact of tree removal (and everything else the route would impact, for that matter) BEFORE making a decision?*
- *Least environmental impact. PSE already has the right of way through route option C. This corridor is already cleared, and as I understand it, no additional homeowner land would be taken, and relatively little vegetation would require removal.*
- *Does PSE intend to apply for such certification by EFSEC? If so, when?*

Puget Sound Energy Response:

As with all of our projects, PSE is committed to minimizing, where practicable, environmental impacts that can result from our construction, operation and maintenance of electric transmission lines. When impacts cannot be avoided, PSE provides appropriate restoration or mitigation. For illustration, regardless of the route selected, federal, state, and local regulations do not allow construction stormwater that exceeds specific water quality parameters to run off into waters of the State. Erosion Control Planning will be incorporated into the project design. This is standard practice, as all large scale projects are required to assess potential drainage impacts. Once the route is selected, a detailed engineering analysis will be

performed to address possible stormwater issues. Transmission lines typically have a small impervious footprint and therefore are not a major contributor to stormwater runoff. Additionally, runoff from PSE's infrastructure facilities will comply with the appropriate storm water manuals.

As we continue design of the Energize Eastside project, PSE will collaborate with local, state and federal agencies to ensure compliance with all applicable regulations. This includes meeting all local permit requirements and conducting an environmental review pursuant to the State Environmental Policy Act (SEPA). The SEPA process is used to help decision-makers understand a project's potential to cause impacts to the natural and built environments. For example, potential effects on wildlife such as bald eagles would be identified during that process, along with appropriate restoration or mitigation. Additionally, PSE has an extensive avian protection program and often includes protective measures to power line design. More information on this program can be found on our [Protecting Birds web page](#).

As for the Energy Facility Site Evaluation Council (EFSEC), PSE is not planning to apply for EFSEC certification for the Energize Eastside project. Additionally, electrical transmission lines are not subject to EFSEC jurisdiction. For more information on the applicability of EFSEC review and the Energize Eastside project, we encourage you to refer to RCW 80.050.020(10), (11) and (21) and RCW 80.50.060(3). Additionally, review of WAC 463-61 is also informative on this topic.

As stated in the above-mentioned RCWs, under certain conditions, a utility can choose to have a transmission line project undergo siting through EFSEC. If PSE decided to get EFSEC approval for the Energize Eastside project, EFSEC would not select the route; rather, PSE would apply for a specific route that would then be approved, approved with conditions, or denied. This is the same process we go through on the individual jurisdictional level, and we prefer to work with those jurisdictions that are more directly affected by the project.

Please visit our [Environmental Review](#) web page for more details.

Design structure location and real estate

Additional concerns have been raised about a range of related subtopics, including easements and where the design structures will be located within segments.

Excerpts:

- *The proposed easement would place poles and wires within existing home footprints and backyards and would cause the homes to be condemned or have poles and wires going over the houses.*
- *My question is that I am going to be buying a property in the Bellevue area and we are in that process on [address], and that has an easement and there is a power line that runs over it, so I'm not sure if my area will be impacted.*
- *There is a salmon stream on the east side of [street] along Bridle Trail Park and [undisclosed to protect confidentiality] neighborhood. It would be a challenge to respect that stream if the lines new along the east of [street] from Bellevue/Kirkland line north. If you put a 30' easement in from the stream you would have to condemn all the homes on [street] in [neighborhood].*
- *The residents in the [neighborhood] Neighborhood are opposed to having the new power lines put in our backyards.*

Puget Sound Energy Response:

At this time, we're in the early stages of the public route discussion, so we don't have the route configuration identified yet. Nonetheless, when selecting a route for a new power line, PSE considers it

an opportunity to locate the line where other lines already exist whenever practical. That said, existing right-of-way is just one of many factors we look into when siting new power lines. In a dense urban area like the Eastside, there is no easy solution to selecting a route. For that reason, we felt an obligation to identify all reasonable route options within the project study area. This was done by using a computer-based modeling tool to analyze key criteria like geographic barriers, land uses and impacts to the environment. Based on this analysis, route segments were identified that included an existing corridor and road rights-of-way.

The placement or “spotting” of pole structures will be dependent upon factors such as available right-of-way width, location of access routes and obstacle avoidance. In turn, the height, loading and overall size of each structure will be greatly affected by location. In addition, recognized areas of environmental significance will be identified and avoided where possible.

If the use of private property is required, PSE will negotiate fair market value purchase of easements with the affected property owners. Our preference is to arrive at mutually acceptable terms outside of court rather than using condemnation and we will work cooperatively with property owners to that end. If a legal path towards resolution is necessary we will treat all landowners fairly, with dignity and respect and we will continue to negotiate in good faith throughout the process.

At this time it is too early to say whether we’ll need additional easements; existing easements do not require additional compensation. Like any developer, PSE must comply with local zoning codes and development standards and obtain all necessary permits for the project. We are seeking input from the communities and our customers throughout the siting process to consider designs which could minimize impacts. In general, PSE prefers to site projects along public rights of way or existing utility corridors wherever possible.

Design structure type/appearance

Concerns have been raised about the appearance and technical details of structures.

Excerpts:

- *Please indicate the size of the base required to support the monopoles you are considering. How deep does the substructure go? How much is exposed?*
- *Some where I saw what looked like parallel high tension transmission lines about 6 inches to 1 foot apart. Does this double the capacity of the line? Could this be done to the existing transmission lines by maybe only having to strengthen the towers to carry the extra weight?*
- *I have noticed that the transmission lines which run down the west side of Bridle Trails (route B) are much taller than the current route A lines. Can the 230kV lines be run on those big metal towers?*

Puget Sound Energy Response:

While we do not have the preferred route or final design yet, we anticipate using steel monopoles made of galvanized or weathering steel. We won’t know the exact measurements of poles and foundations until a detailed design has been done, after a final route is selected. We estimate the poles will generally be between 85 and 130¹ feet, with diameters between 3 and 7 feet, but they could be taller or shorter depending on specific circumstances. Note that the pole diameter estimate refers to the diameter of the

¹ In late May 2014, updated design estimates changed this figure range from 90 feet to 125 feet to 85 feet to 130 feet above ground and responses given before the update quoted the earlier figure.

pole itself; if poles require a foundation, the overall footprint of the pole would increase. PSE will be asking for community feedback on these options. Pole height will depend on several factors, such as topography and obstacles, wire tension, whether a pole is located in a straight line or at a corner, and the distance between poles, which could range from 200 feet to 1,000 feet. In general, the taller the poles, the longer we can make the distance between them.

How deep the pole is installed underground is also dependent upon foundations. The two main factors to consider when determining the size and type of foundation system to be used is the amount of loading that the foundation will need to hold up and the strength of the surrounding soil. As mentioned above, both of these factors will be determined during the detailed design phase of the project. As such, we do not currently have the design and survey information needed to determine how deep the foundations will go, but concrete foundations generally range from 20 to 50 feet, depending on the specific conditions. Depending on subsurface conditions and line design, foundations may not be needed in some areas. If that's the case, the hole would typically be 12 to 18 feet deep, depending on the specific conditions.

We will not build lattice towers for this project. To view sample pole images and photo simulations from each Sub-Area, visit the [Design](#) page on our website.

Sometimes parallel high tension lines are spaced closely together in a “bundled” configuration, which consists of multiple wires per electrical phase on the same circuit to increase the overall capacity of the transmission line. Whether this option or a larger single conductor is used, the poles will still need to be re-built to handle the extra weight and loading. With the voltage of the line being upgraded from 115 kV to 230 kV, larger electrical clearances are required which will be one of the drivers in the type of line configuration that is used.

As far as increasing the capacity of the existing line rather than rebuilding, the poles for Energize Eastside will need to support three phases for a single circuit configuration or six phases for a double circuit configuration. Typically, we limit the amount of circuits on a single structure to two due to the increased loading that would need to be handled by the structure. For the existing structures, installing additional circuits would require a complete rebuild of those towers including new foundations and new steel structures. Furthermore, issues will arise with reliability as installing multiple circuits on a single structure hinders the redundancy of the system.

Noise

Concerns have been expressed about noise generated from power lines, including in damp conditions.

Excerpts:

- *One of my neighbors is concerned about noise on the lines. How will PSE address chronic line noise?*
- *Because our neighborhoods are part of the Emergency Operations Network in conjunction with the City of Bellevue, we have HAM operators ready to deal with emergencies affecting our area. However, if their antennas are affected by the 230kv lines, that would affect our ability to communicate with the city's EOC in an emergency.*
- *We live in a humid environment with lots of rain and this makes this a bigger problem for us. But in the end 115KV almost never causes Corona noise because it never exceeds the breakdown voltage of air on the surface of the conductor. 230KV and higher DOES cause issues and we WILL hear it.*

Puget Sound Energy Response:

In general, 230 kV transmission lines do not produce noise like that of higher voltages. This is because over the years, transmission line design improvements have contributed to minimizing audible noise levels. Audible noise from 230 kV transmission lines is generally less than 40 dBA but can be as high as about 50 dBA. To put these sound levels into perspective, 40 dBA is the sound of a whisper while a 50 dBA noise would be the background noise in an office. The higher noise level would occur during humid and or windy days but is still considered relatively quiet and not a nuisance unless in close proximity to the power lines. In the rare instance where noise above this standard level can be heard from a 230 kV line, a simple adjustment to a piece of equipment on the line can usually solve the problem. In addition to audible noise due directly to the transmission line and to other environmental factors, noise can be generated as a result of wind blowing across power lines and power poles. An evaluation of audible noise will be conducted as a part of the overall design of the transmission line.

Power-line radio frequency interference from 230 kV lines has the potential to interfere with radio communications such as those used by HAM radio operators. Such interference and its repair typically involve identifying and eliminating arcing across the line hardware. However, such interference would be due to a problem identified with the lines and not related with normal operations. For a newly installed line a typical problem might be inadequate hardware spacing. Corona discharge from lines is usually not a problem, as this is confined to audible frequencies and not the higher frequencies used by HAM operators. A HAM radio operator under normal operating conditions might notice some increased noise if in close proximity to the lines but such interference should not limit operations.

It is important to point out that PSE's proposed 230 kV transmission lines will be developed in compliance with all applicable laws and regulations. Additionally, we will conduct a communication facilities study for the proposed route of the Energize Eastside project which will identify potential impacts. The survey classifies all FCC protected and unprotected facilities and is important for permitting of the power lines. PSE can work with the emergency communications crews during initial energizing of the lines to ensure that any potential problems are identified and quickly resolved.

Project need

Questions about how growth was predicted were posed, as well as requests to document the need.

Excerpts:

- *If Bellevue needs the power to support all of it's fancy development projects, then the developers in Bellevue who stand to make a lot of money should be the ones that pay for it...GROWTH does not equal GOOD!*
- *Yes, please tell me if this proposed expansion is ONLY for the eastside. Will any of these improvements provide PSE better service to California and Canada? If so how?*
- *The relationship of the proposed transmission project and power flowing to Canada...I know it is a pretty technical issue involving how the interconnected grid works, power flowing according to the laws of physics, and outage conditions. But someone has planted this issue in the minds of a lot of people and it won't go away without a better explanation, and maybe not then.*

Puget Sound Energy Response:

Much has changed on the Eastside in the last 20 years. Not only have communities grown and prospered, but the way we use electricity has changed—we plug in more devices and build bigger homes. Demand for electricity has grown dramatically, and it's time for our infrastructure to catch up.

Economic development, job growth and associated population growth on the Eastside depend on a robust electrical transmission system. The Bellevue-Redmond area has become a major regional

economic and employment center with 140,000 jobs and 143 corporate headquarters, for which many people have moved to the surrounding area. Eastside population has grown seven-fold since 1960, and recent growth trends are expected to continue – in fact, the Puget Sound Regional Council recently predicted that population will grow by more than a third between 2012 and 2040, with population in the Bellevue central business district growing by more than 280 percent by 2040².

At the same time, this economic rejuvenation is straining our region's existing electric system. Growth studies project that demand for reliable power will exceed capacity as early as 2017. We have essentially outgrown the electric system that serves our communities. Without substantial electric infrastructure upgrades, tens of thousands of residents and businesses will be at risk of more frequent and longer outages.

The Energize Eastside project is driven by Eastside's growing customer base, and is needed to ensure reliable power for our customers on the Eastside specifically. PSE does not have transmission lines that interconnect to Canada. PSE's transmission lines run from Thurston County to Whatcom County, and are part of the integrated western electrical grid, similar to our neighboring utilities such as Seattle City Light and the regional utility Bonneville Power Administration.

Adding a transmission line to the system always changes regional power flows – in this case, providing an ancillary regional reliability benefit. Between 92 and 97 percent of the power flows on the Energize Eastside line will deliver electricity to local Eastside customers. Power flow studies show that the power used for regional purposes on the Energize Eastside project is 3 to 8 percent. This is the natural consequence of connecting a transmission line into an interconnected system.

If power is sold or another utility requests to use our lines, 100 percent of the revenue PSE receives is credited back to our customers in the form of a rate reduction. Because PSE customers paid for the infrastructure, the thought is they should receive the monetary benefit of any power transactions that bring in money to the utility.

For more information, please see the [Eastside Need](#) page of our project website as well as the [Needs Assessment Report](#).

Alternative technology

Questions and suggestions have been posed regarding ways to address the project need without a new transmission line.

Excerpts:

- *With today's technology, there should be ways to establish and strengthen the grid without impacting overall aesthetics.*
- *I have several concerns. In the flyer that came in the mail it showed a windmill in front of the lovely house with a lovely windmill and it seems to me that that is an option that could be used in the north end of the Sound and you could sell the extra power which would compensate for the power that you might lose otherwise.*

² In April 2014, the Puget Sound Regional Council updated their growth forecasts from 275 percent to 280 percent by 2040.

- *The other thing is that if the street lights would go to LED you would have an enormous saving of power there yourself. Our first forefront should be making the difference in our own communities which is Renton, Washington.*

Puget Sound Energy Response:

Before launching this project, we studied many several different solutions besides building the new overhead transmission lines. Those alternatives included reducing demand through conservation, increasing the capacity of our existing electric transmission lines, generating energy locally, and building new infrastructure. However, these other solutions are not enough to solve the problem of transporting the energy we have to the fastest-growing places and the people who need it.

PSE reviewed both the planned conservation as well as additional potential demand reduction to meet the growing need. This included such things such as increased incentives for insulation and efficiency improvements in existing residences and businesses, gas conversions, etc. In addition, solar panels and other types of local renewable generation were considered. All of these potential measures combined were unable to meet the need for the growth expected in the Eastside region. After a detailed analysis and weighing the relative tradeoffs, we found that the best solution is a combination of aggressive conservation and new infrastructure.

Many have asked us what options are available to avoid building the new line by upgrading our existing infrastructure. We have already made upgrades to our existing infrastructure to postpone the need for the new 230 kV line as much as possible. By increasing the voltage from 115 kV to 230 kV, we have to put the wires on new poles due to different clearance requirements and the fact that the new wires are heavier and require sturdier poles to support them.

Over the past few decades, PSE has taken significant steps to get the most out of the electric system. In fact, through upgraded lighting, appliances and equipment, increased weatherization, and energy-efficient building technologies, PSE customers helped us save enough electricity to power 30,000 homes in 2012.

However, conservation alone won't create the capacity to keep up with our region's growth. The Eastside economy and population are growing far faster than our conservation efforts can keep up with. Without substantial electric infrastructure upgrades, tens of thousands of residents and businesses will be at risk of more frequent and longer outages. The problem we face is not that we don't have enough energy to power Eastside communities. Instead, the problem we need to solve is transporting the energy we have to the fastest-growing places and the people who need it. The Eastside is growing faster than any other region in Washington, which is straining our region's electric system. Growth studies project that demand for reliable power will exceed capacity as early as 2017, increasing the possibility of outages for as many as 60,000 customers in the Eastside.

You can read more about the alternatives studied in our [needs assessment report](#), [solutions report](#), [non-wires solution analysis](#), and much more on the [Energize Eastside project website](#).

Safety

Safety concerns related to a variety of factors, including earthquake loads, the Olympic Pipeline and its proximity to the proposed transmission line, and the potential for construction accidents have been raised.

Excerpts:

- *The co-location of pipelines carrying high-pressure jet fuel with high-voltage transmission lines is a concern for our neighborhood.*

- *We realize the possibility of an accident is very small. But any accident that caused a rupture of those pipelines and ignition of the jet fuel would be catastrophic.*
- *Have there been any accidents involved in the placement of the monopoles? Has a monopole ever toppled?*

Puget Sound Energy Response:

Safety is always our top priority at PSE. Across North America, significant high-voltage electric transmission lines (even at voltages much higher than 230 kV) exist parallel and adjacent to petroleum product pipelines like the Olympic Pipeline and have been operated safely in close proximity for many decades.

PSE is also a natural gas company. PSE and its contractors are very familiar with concerns regarding pipeline safety and employ safe construction practices when performing work in the vicinity of pipelines. Our experiences and those of other utilities and pipeline companies have demonstrated that power lines can and do safely occupy the same corridor as pipelines.

PSE has a long history of working closely with Olympic. We've shared this corridor with Olympic Pipeline for decades and have a shared interest in the protection and safe operation of the facilities in the corridor. As an example, PSE and Olympic wrapped up a project in 2010 that is similar to Energize Eastside. We replaced existing H-frame poles with new poles and 230 kV lines in an existing easement shared with the pipeline. The Energize Eastside project manager, Leann Kostek, safely managed construction of the Sedro Woolley-Horse Ranch 230 kV project that ran from Skagit County to Snohomish County.

PSE also has a history of moving pipelines when required and understands the construction and safety issues facing such moves. For example, PSE is moving its natural gas pipeline for the Alaskan Way Viaduct construction. Additionally, PSE and Olympic are working with Sound Transit to move poles and the pipeline for the East Link project.

Regarding earthquakes, we take geologic conditions, including potential for earthquakes, into the design of electric transmission lines. When designing any transmission structure, engineers consider a wide range of loading scenarios (e.g. load cases) that the structure may experience over its service life. While engineers consider these load cases, we are concerned with identifying and applying the most stringent load cases, or combinations thereof, that govern the strength requirements of the structure to withstand these loads. In the experience of transmission engineers, high wind events, wind combined with ice, or extreme ice loads govern the design of structures. It is standard utilities practice to design transmission structures to withstand wind/ice combination loads which are considered more stringent than the loads induced due to ground motion. For these reasons, poles are designed with extreme elements in mind (high winds, ice, earthquakes, etc.), making a toppling event extremely rare and unlikely.