

APPENDIX R: VISUAL QUALITY TECHNICAL MEMORANDUM

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I-405, Bellevue to Lynnwood Improvement Project

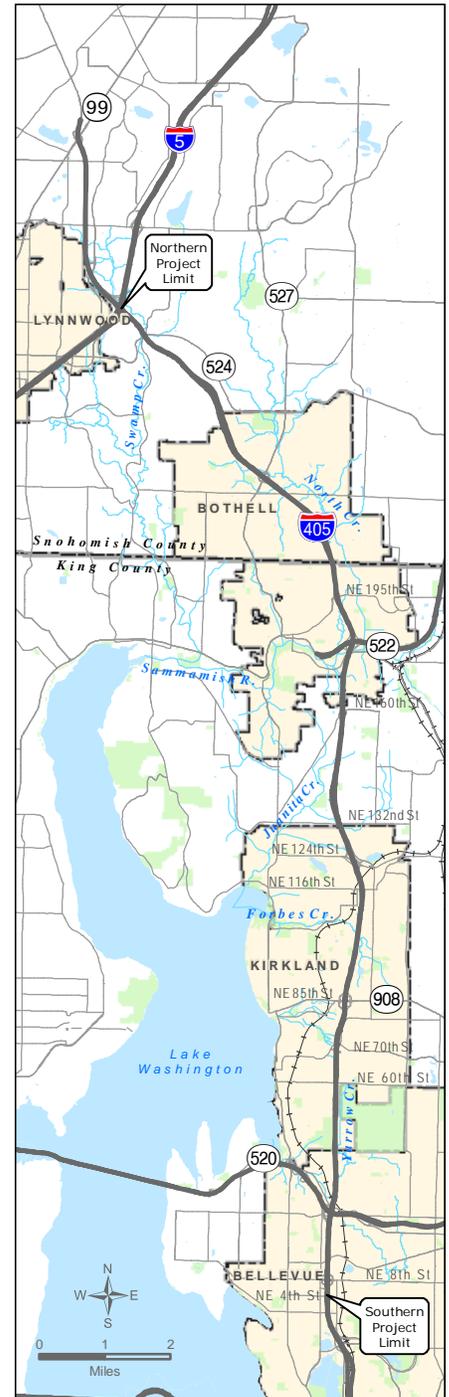


Corridor Program

Congestion Relief & Bus Rapid Transit Projects

VISUAL QUALITY TECHNICAL MEMORANDUM

April 2011





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SUMMARY

What is the objective of this study?

Visual perception is an important component of environmental quality that can be adversely affected by transportation projects. Community acceptance of a project is often strongly influenced by the perceived visual effects of that project. Because of the public nature of transportation projects and their potential to have visual effects, changes to the visual environment must be addressed during project development. For these reasons, the Washington State Department of Transportation (WSDOT) addresses changes to the visual environment during project development.

A visual effects assessment evaluates both negative and positive visual effects of proposed transportation facilities. Visual effects, including aesthetics, light, and glare, are assessed by evaluating the view that is seen from the freeway, as well as the view looking toward the freeway. We can determine visual effects by identifying changes in the visual resources and then evaluating viewer response to those changes.

By considering visual effects in conjunction with a broad range of environmental and socio-economic effects, we can develop concepts, determine avoidance and mitigation measures, and determine the most appropriate methods to use as we proceed with a proposed project.

How was the study done?

Visual effects are measured by the degree of change to visual resources combined with the viewer response to that change. For the Bellevue to Lynnwood Improvement Project, visual quality effects were assessed using baseline conditions, not existing conditions. Baseline conditions for this project assume that the improvements for the I-405, SR 520 to SR 522 - Kirkland Nickel Project, the NE 195th Street to SR 527 Auxiliary Lane Project, and the NE 8th Street to SR 520 Braided Ramps Project are complete.

Will there be any construction effects?

The proposed project will create temporary visual effects for highway users and neighbors during construction. Construction activities will reduce the visual quality in the project area due to the presence of construction equipment, materials, signs, and construction staging areas. Temporary lighting may be used for nighttime construction of some project elements. Construction effects to visual resources will be temporary, and will cease when construction is complete.

What are the potential visual effects of the project?

I-405 users will be exposed to increased human-made encroachment and complexity within the corridor, particularly where access ramps and overpasses dominate the view. Encroachment and complexity refer to the degree to which an area is not in its natural

condition. Increased encroachment and complexity usually mean increased human-made development, segmentation, and clutter. However, for this project, these changes are generally slight when compared to existing conditions. Portions of the project area, where 20 feet or more of new pavement will be added, are already the most highly developed, encroached-upon areas.

Additional elements proposed for the project, such as signage, retaining walls, stripe buffers, and other structural elements, will be located within the existing right-of-way, and, in many cases, within the existing screening of noise walls and vegetation.

The overall visual quality effects of the Bellevue to Lynnwood Improvement Project will be minor. I-405 is an existing major freeway, and since improvements in most of this area include additional pavement on either side of the shoulder or other improvements within existing right-of-way, most viewpoints will remain relatively unchanged. Two viewpoints described in this analysis will decrease slightly in their overall visual quality rating because a new retaining wall will be constructed. One viewpoint score decreases from 2.7 to 2.2, and the other viewpoint score decreases from 2.7 to 2 on a 7-point scale. In this visual quality analysis, we categorize a score of 2 as low visual quality, and a score of 3 as moderately low. Therefore, the viewpoints remain in a low to moderately low score bracket (see Appendix B), and the overall visual quality effects for the project are considered to be minor.

What measures are proposed to avoid or minimize project effects?

The I-405, Bellevue to Lynnwood Improvement Project is being planned, developed, and designed in accordance with Context Sensitive Solutions guidelines. These guidelines provide an approach that incorporates community values while meeting local, regional, and national requirements for the safe, efficient, and effective movement of people and goods.

PROJECT DESCRIPTION

What is the intent of the Bellevue to Lynnwood project and what are the improvements?

The Bellevue to Lynnwood Improvement Project is intended to improve safety and reduce congestion along I-405 between NE 6th Street in Bellevue and I-5 in Lynnwood. To accomplish this, WSDOT proposes the following roadway improvements:

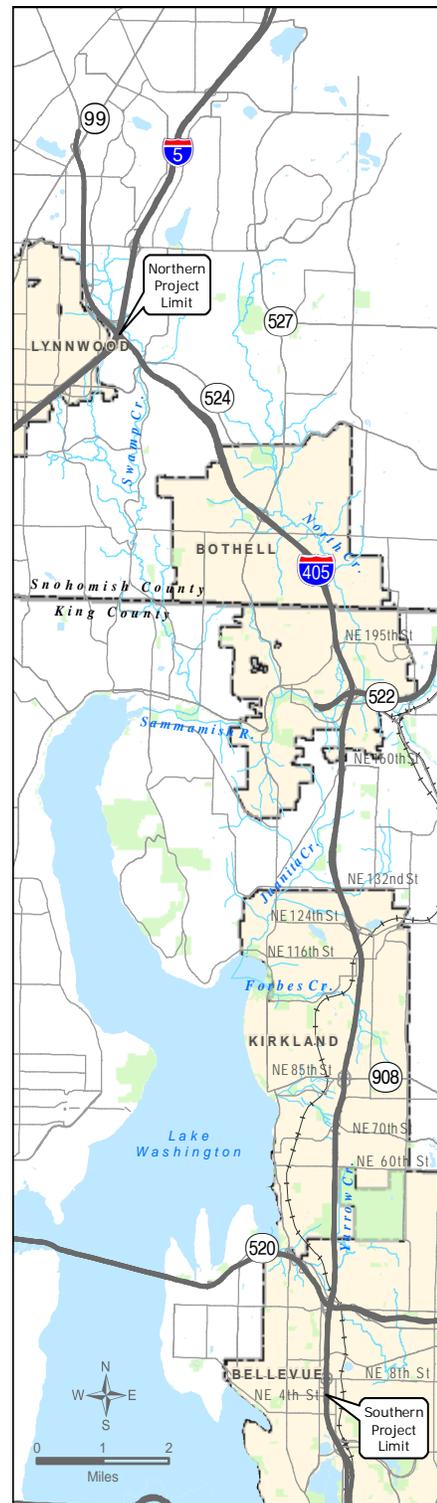
- Northbound lane from NE 124th Street to SR 522;
- Braided ramps between the I-405 northbound on-ramp from NE 160th Street and the northbound I-405 off-ramp to SR 522;
- Southbound transit shoulders between SR 522 and NE 160th Street and between SR 527 and NE 195th Street;
- New northbound and southbound structures over NE 132nd Street and a new northbound structure over the railroad for the I-405 northbound off-ramp to NE 124th Street;
- Small amounts of additional widening, between four and eight feet, at several locations for buffers, wider shoulders, tolling equipment, enforcement areas and maintenance pull-outs; and
- Minor upgrades to pedestrian facilities in some areas.

Exhibit 1 shows the Bellevue to Lynnwood project vicinity. Exhibit 2, sheets 1 through 17, shows more detail of the project improvements in the 17-mile long corridor.

Are there related projects?

The Bellevue to Lynnwood Improvement Project is designed to compliment other projects along I-405 including:

Exhibit 1: Project vicinity



- Kirkland Nickel Stage 1 Project, which added one lane in each direction between NE 85th Street and NE 124th Street and opened to traffic in November 2007;
- NE 195th Street to SR 527 Auxiliary Lane Project, which added one northbound lane between NE 195th Street and SR 527 and opened to traffic in June 2010; and
- NE 8th Street to SR 520 Braided Ramps Project, which creates new multi-level “braided” ramps to separate vehicles entering and exiting northbound I-405 between NE 8th Street and SR 520 and is anticipated to be open to traffic during the summer of 2012.

The Kirkland Nickel Stage 2 Project will reconfigure the NE 116th Street interchange, and northbound and southbound lanes between NE 70th Street and NE 85th Street, and a southbound lane between SR 522 and NE 124th Street, and between NE 70th Street and SR 520. The Kirkland Nickel Stage 2 project has been environmentally cleared and permitted, and, along with the other projects mentioned in this section, is considered part of the baseline conditions for this analysis. The Bellevue to Lynnwood Improvement Project will be constructed at the same time.

What will the completed project provide?

The Bellevue to Lynnwood Improvement Project fills in the remaining gaps and allows WSDOT to provide an improved system on I-405 between NE 6th Street and I-5. WSDOT has designed this project to maximize the use of existing pavement and minimize the need for new pavement. In some areas, small amounts of widening of less than a lane width, together with narrower shoulders and lanes, will allow an additional lane. In other areas, narrowing the shoulders and lanes will allow an additional lane without any pavement widening.

Exhibit 3 shows the configuration in each of the project segments when this project and the related projects described above are complete.

How will this portion of I-405 be operated after the project is completed?

In this environmental document, WSDOT and FHWA are considering two operational alternatives: 1) Express Toll and General Purpose Lanes (ETL); and 2) High Occupancy Vehicle and General Purpose Lanes (HOV). Under both scenarios, the project footprint is the same. The occupancy requirement for HOVs in this portion of the I-405 corridor is the same. It is assumed the occupancy requirement, to maintain HOV performance standards under WSDOT’s HOV policy, will be three or more people (HOV 3+). The difference is in how the roadway lanes would be managed.

Alternative 1: Express Toll and General Purpose Lanes (ETL)

This operational alternative will provide two express toll lanes in each direction between NE 6th Street in Bellevue and SR 522 in Bothell, and one express toll lane in each

direction between SR 522 and I-5 in Lynnwood. The express toll lane system will be open toll free to all HOV traffic with three or more occupants and all transit operations. The express toll lane system will also be open to single occupant vehicles (SOVs) and HOVs with two occupants through tolling.

The southern end of the express toll lane system will be at the existing direct access ramps at NE 6th Street in Bellevue where one of the two northbound express toll lanes will begin and one of the two southbound express toll lanes will end. South of the NE 6th Street, the other express toll lanes will connect with the existing single northbound and southbound HOV lanes. The northern end of the system would be much like it is today with I-405 becoming SR 525. Access points will be at various locations along the mainline as shown in Exhibit 4. The express toll lanes will be separated from the general purpose (GP) lanes by a two- to four-foot wide buffer. At an access point, the buffer will open and a section of transition lane may be provided between the express toll and general purpose lanes to ease ingress and egress to the system.

Alternative 2: High Occupancy Vehicle and General Purpose Lanes (HOV)

This operational alternative will allow HOV users with three or more occupants and transit vehicles to use the single HOV lane, similar to today's operation. Access between the HOV lane and GP lanes will be allowed throughout the project, except northbound between NE 6th Street and SR 520 where access is not allowed under today's operation. The new northbound lane between NE 124th Street and SR 522 will be operated as a GP lane.

What will conditions be like if the project is not built?

No Build Alternative

A No Build Alternative has been evaluated as the basis for comparing effects associated with the Build Alternatives. No new improvements would be made beyond those constructed as a part of the Kirkland Nickel Project Stage 2 and the NE 8th Street to SR 520 Braided Ramps Project.

The No Build Alternative does not include additional stormwater treatment or any roadway improvements that would increase roadway capacity, reduce congestion, or improve safety on I-405. Only routine activities such as road maintenance, repair, and minor safety improvements would occur. As with the two build alternatives, we assume that the occupancy requirement for HOVs in this portion of the I-405 corridor will be three or more people (HOV 3+).

Exhibit 2: Project improvements – sheet 1 of 17

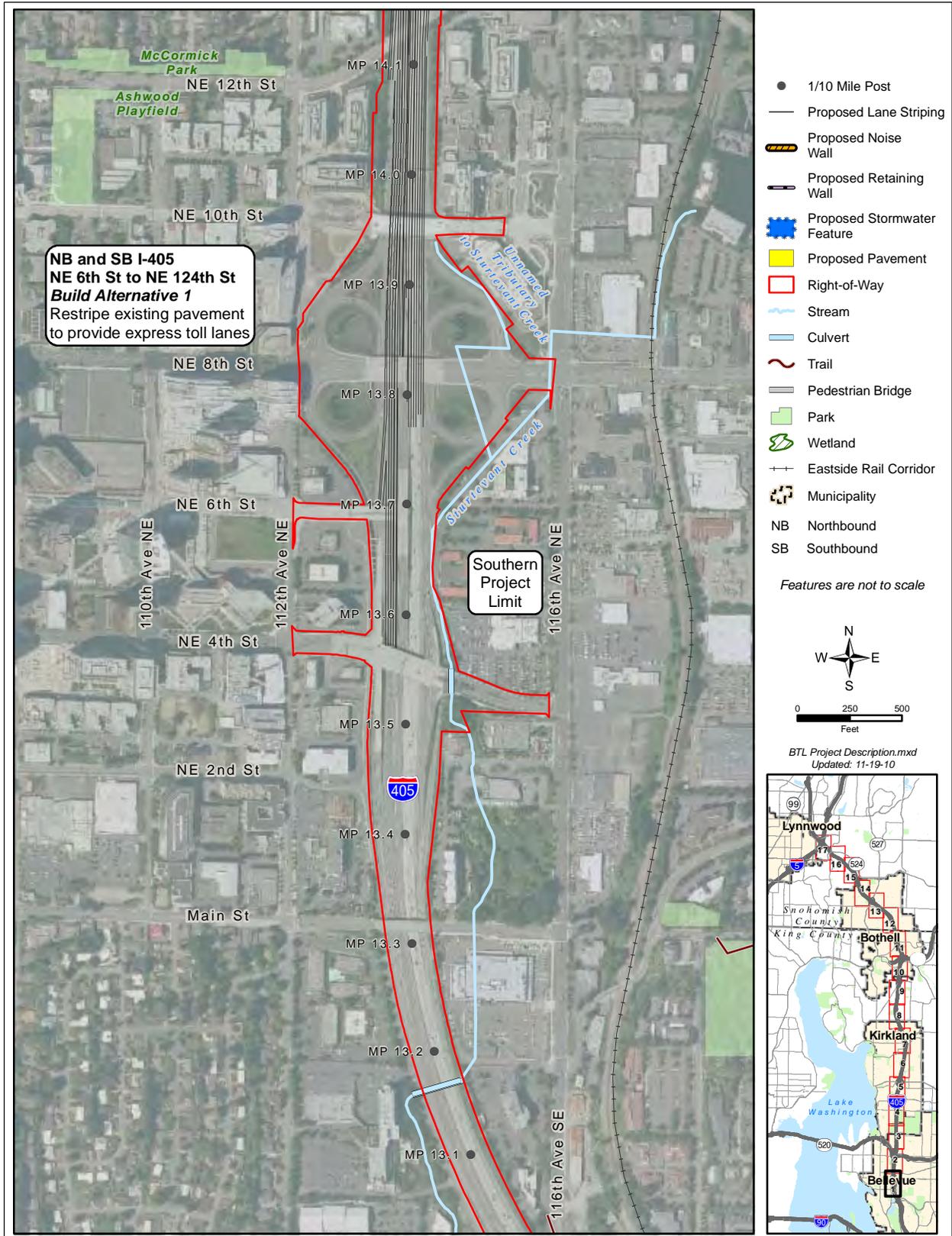


Exhibit 2: Project improvements – sheet 2 of 17

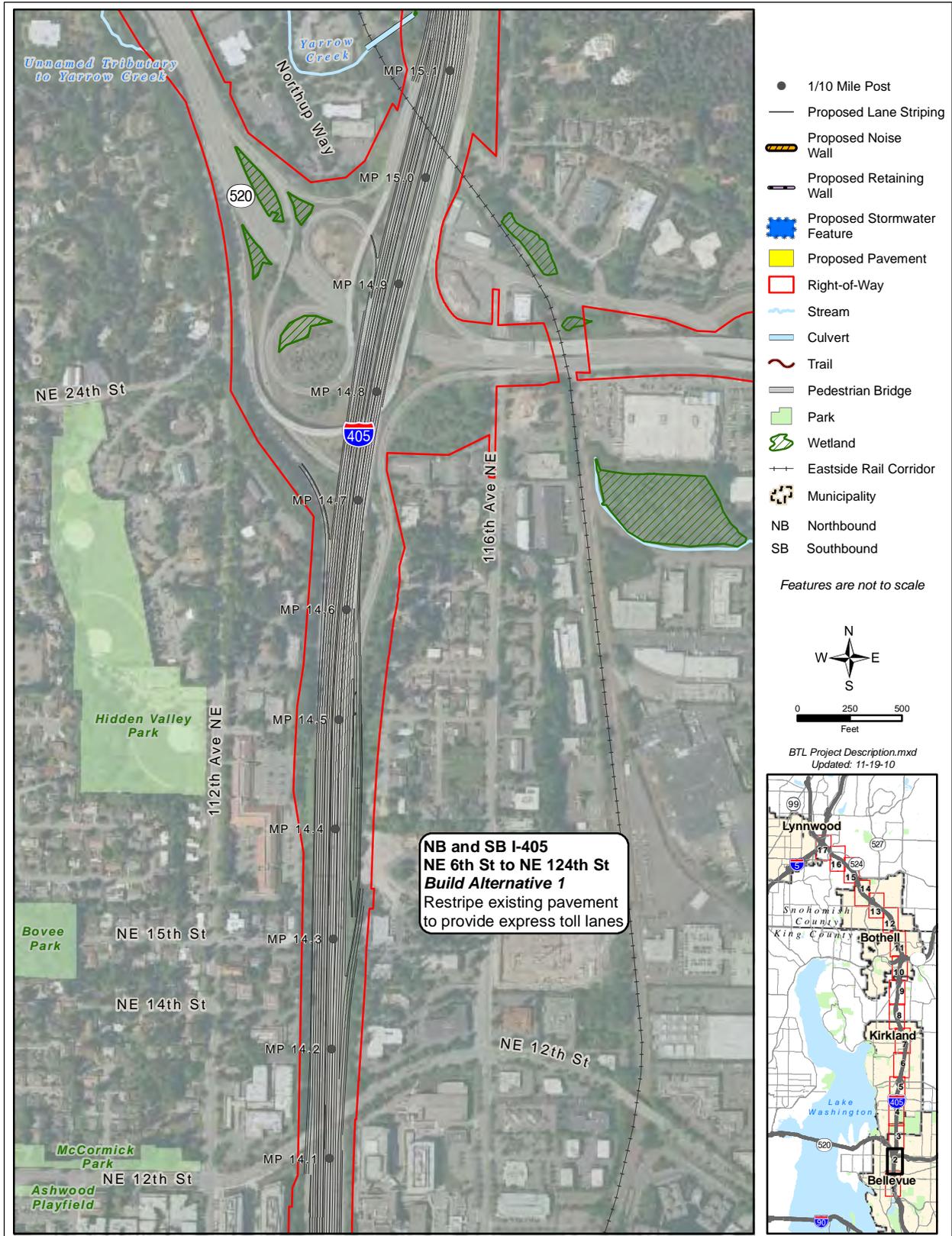


Exhibit 2: Project improvements – sheet 3 of 17

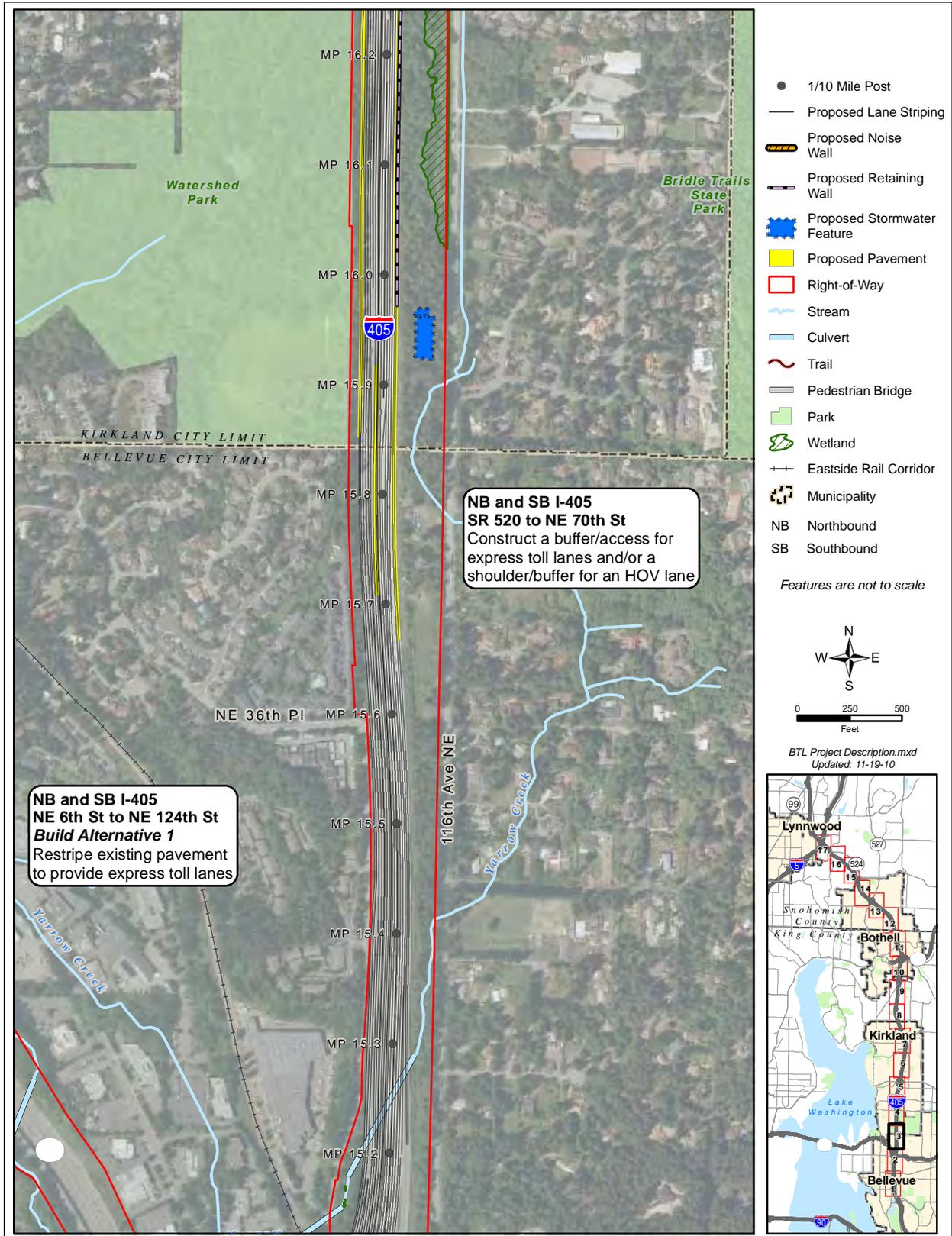


Exhibit 2: Project improvements – sheet 4 of 17

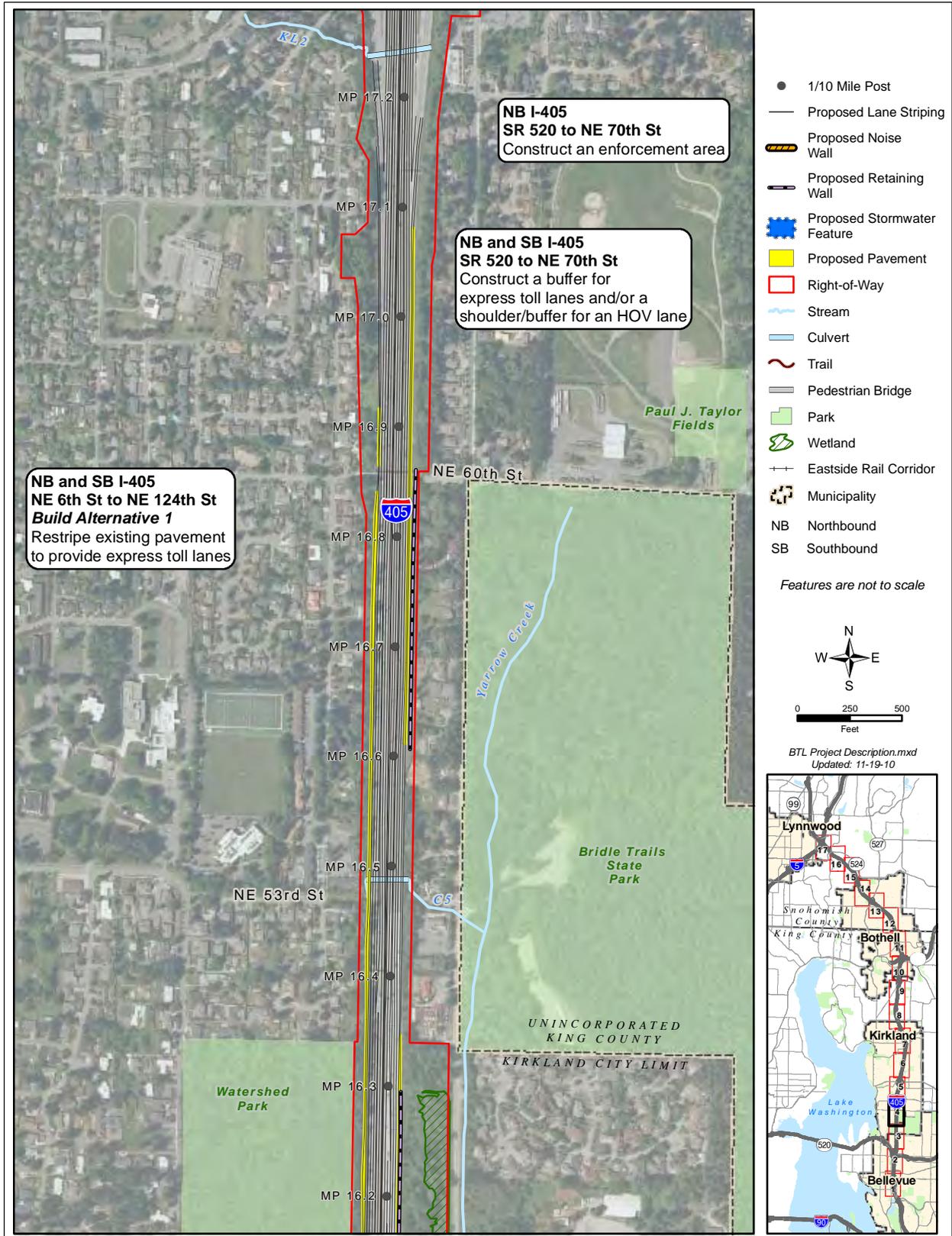


Exhibit 2: Project improvements – sheet 5 of 17

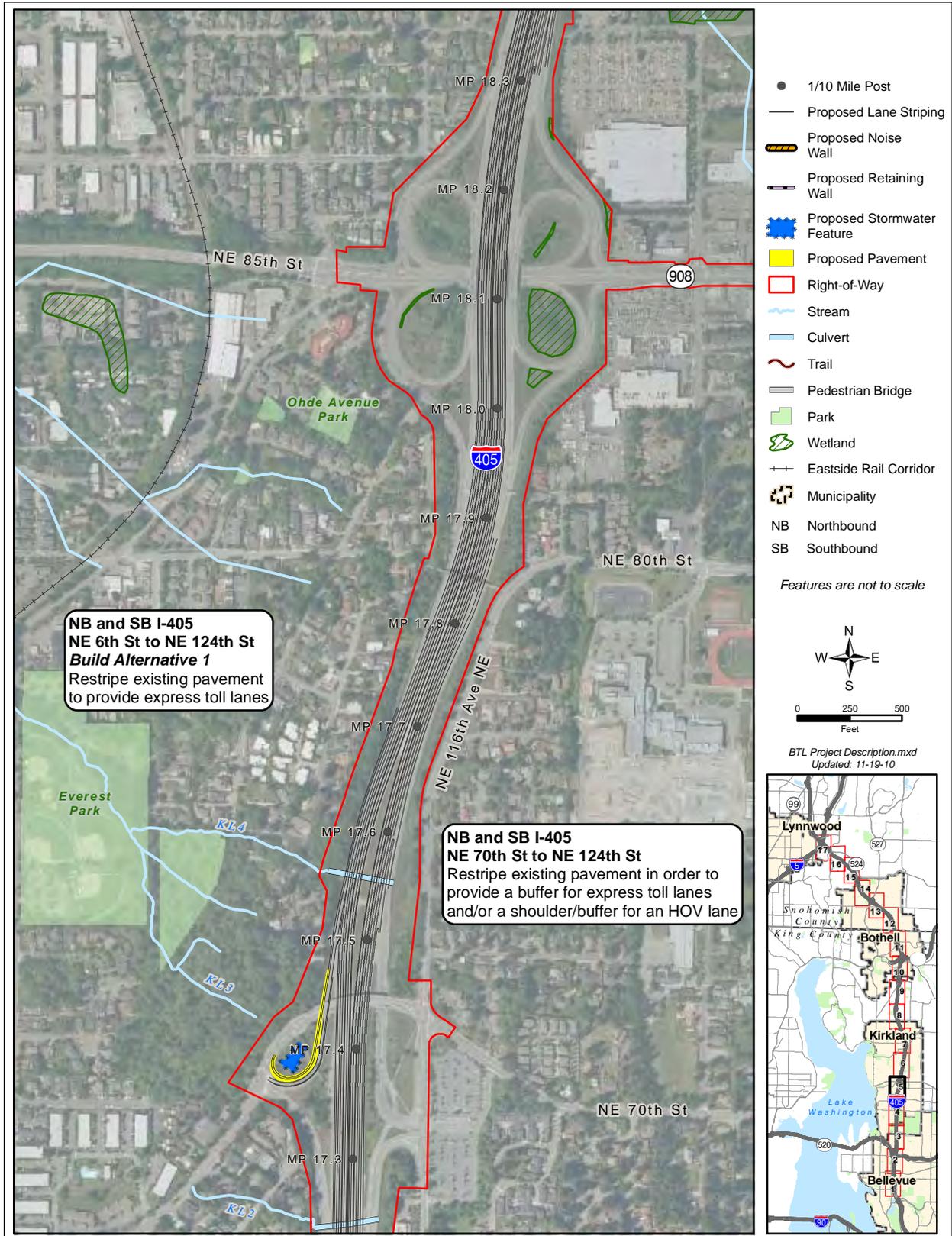


Exhibit 2: Project improvements – sheet 6 of 17

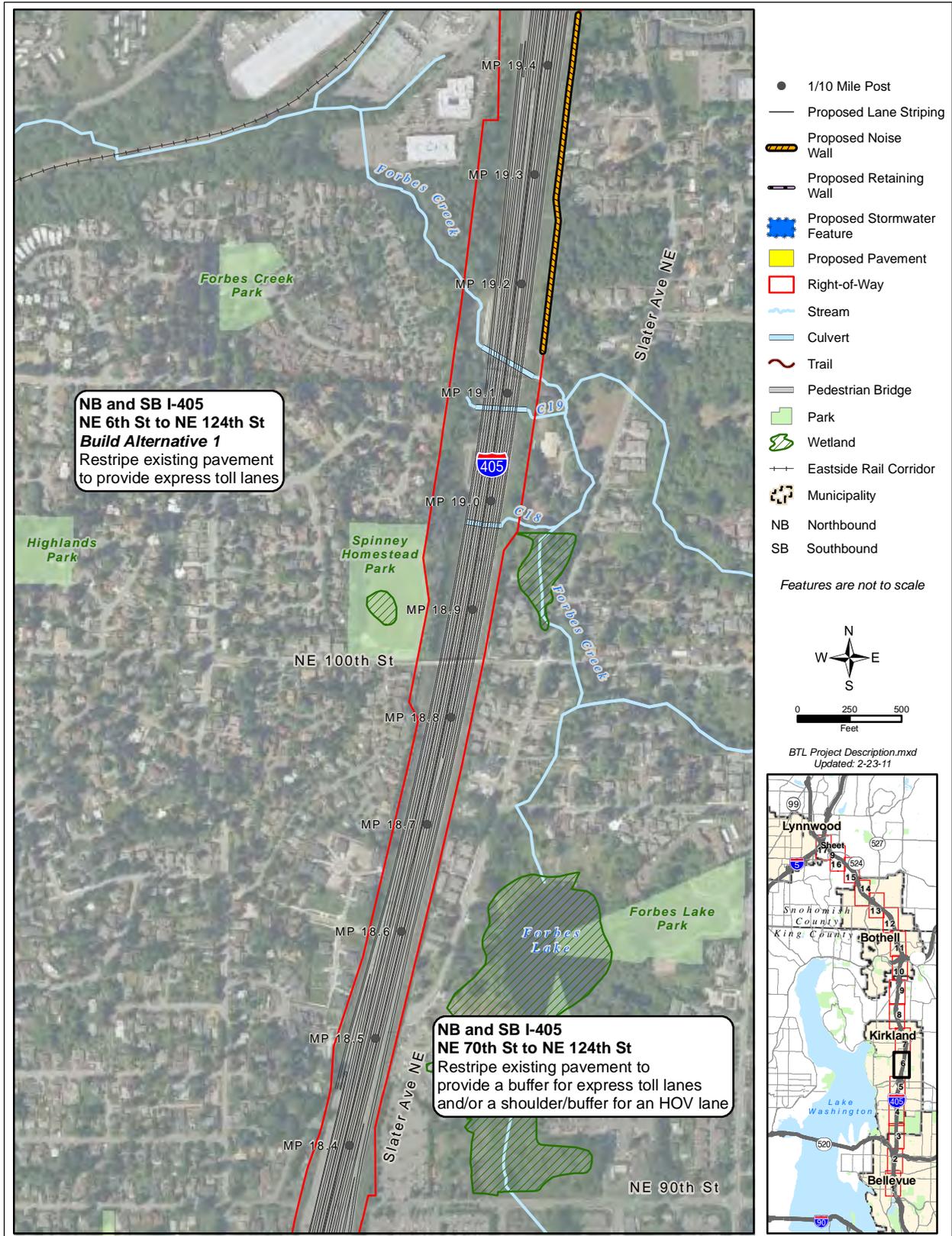


Exhibit 2: Project improvements – sheet 7 of 17

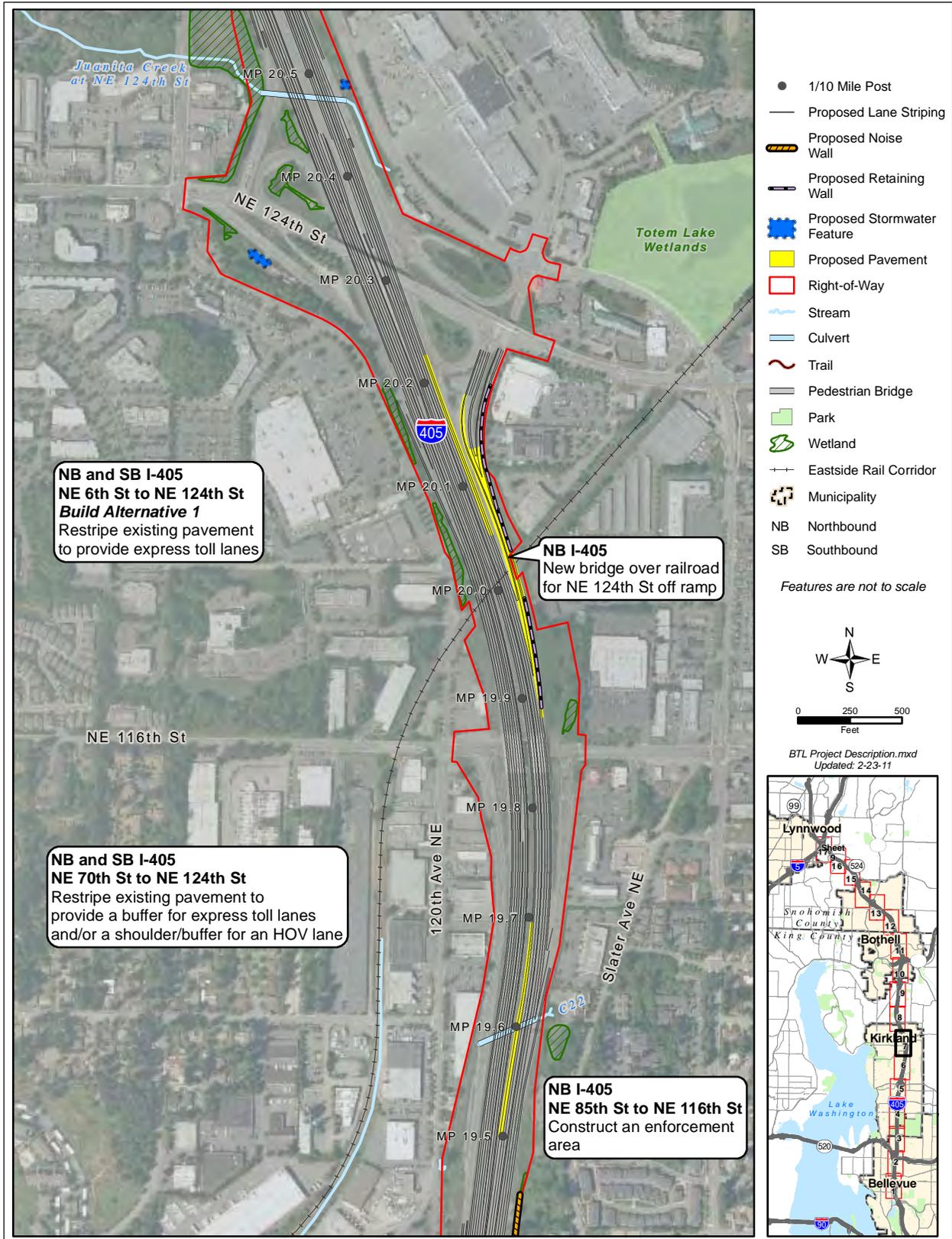


Exhibit 2: Project improvements – sheet 8 of 17

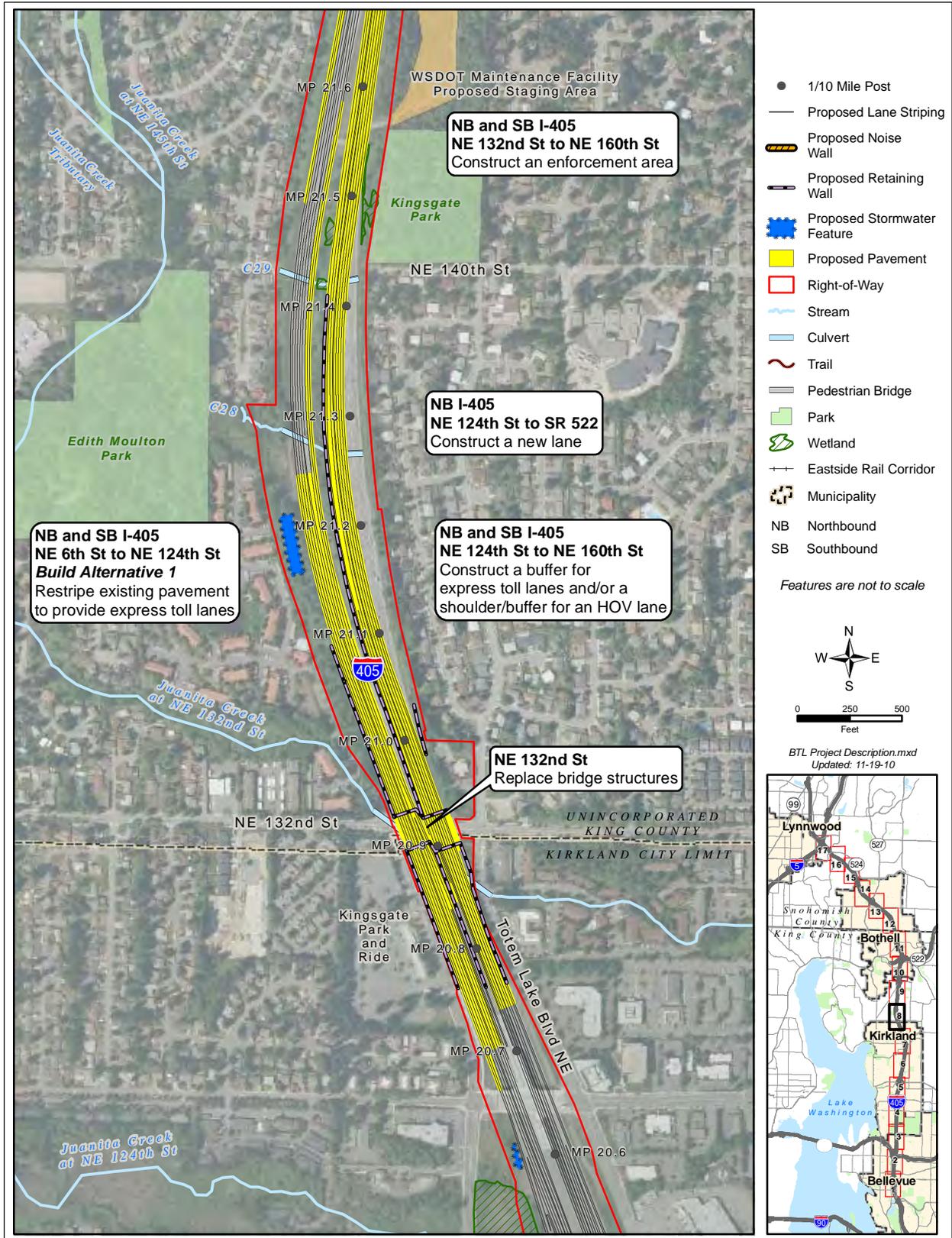


Exhibit 2: Project improvements – sheet 9 of 17

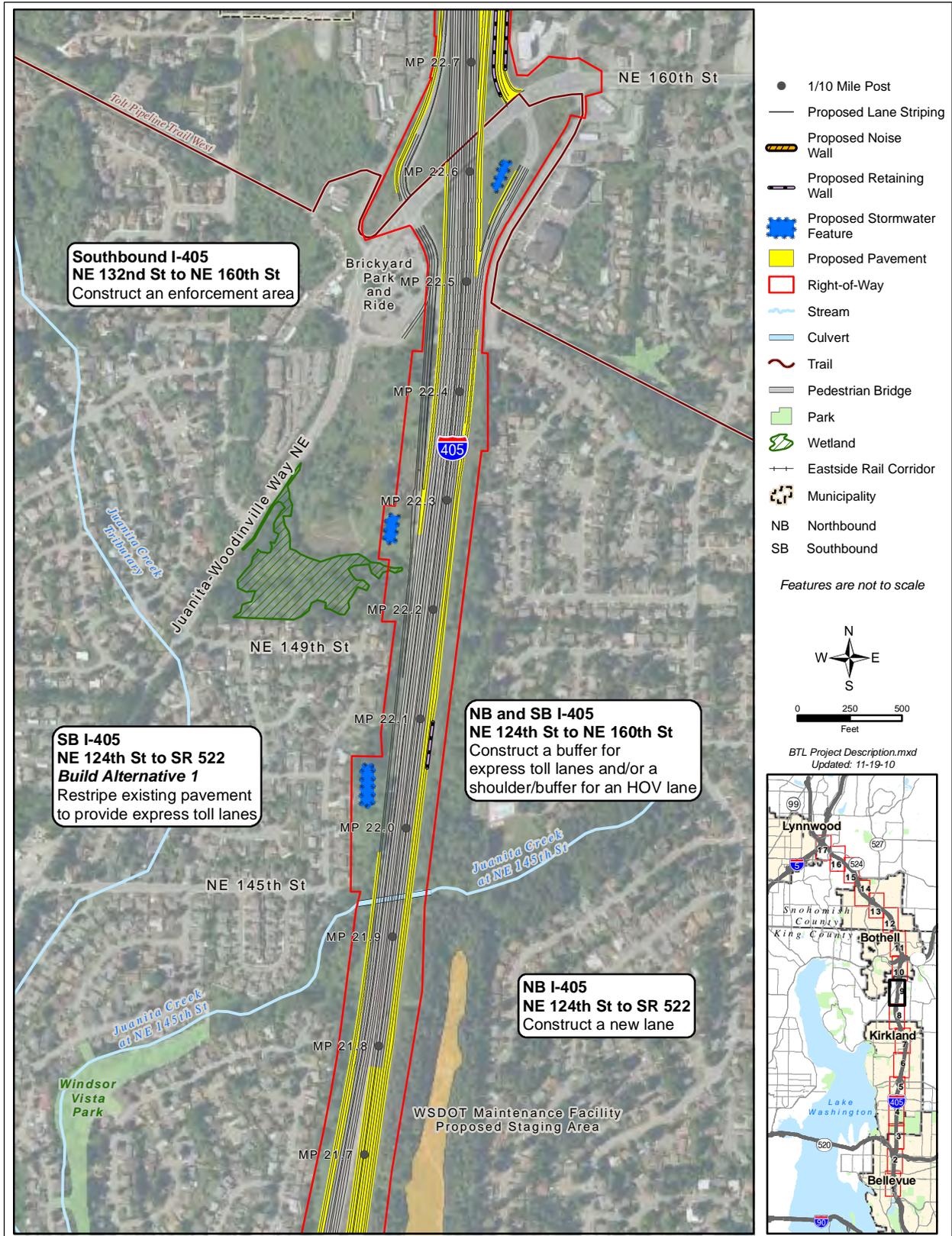


Exhibit 2: Project improvements – sheet 10 of 17

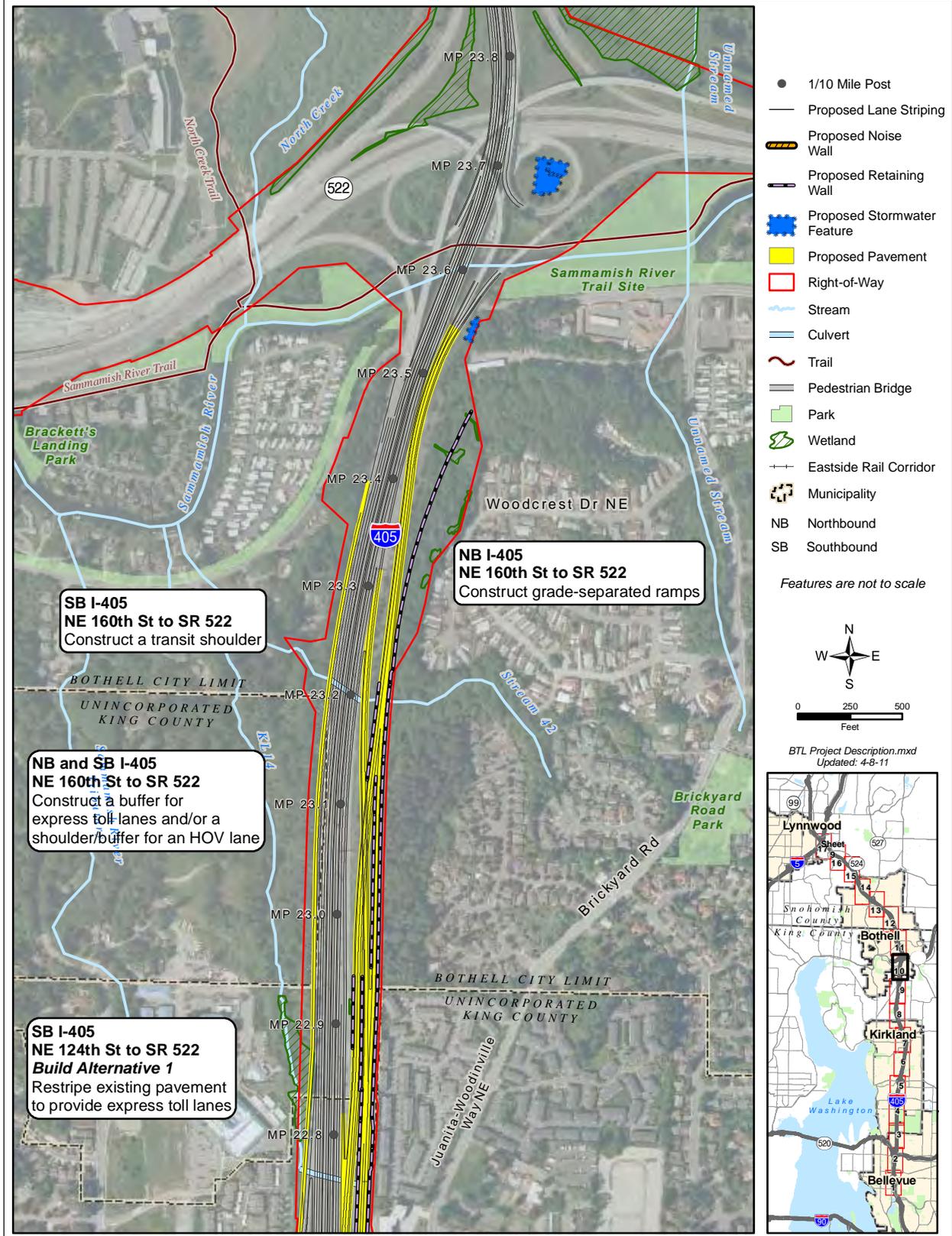


Exhibit 2: Project improvements – sheet 11 of 17

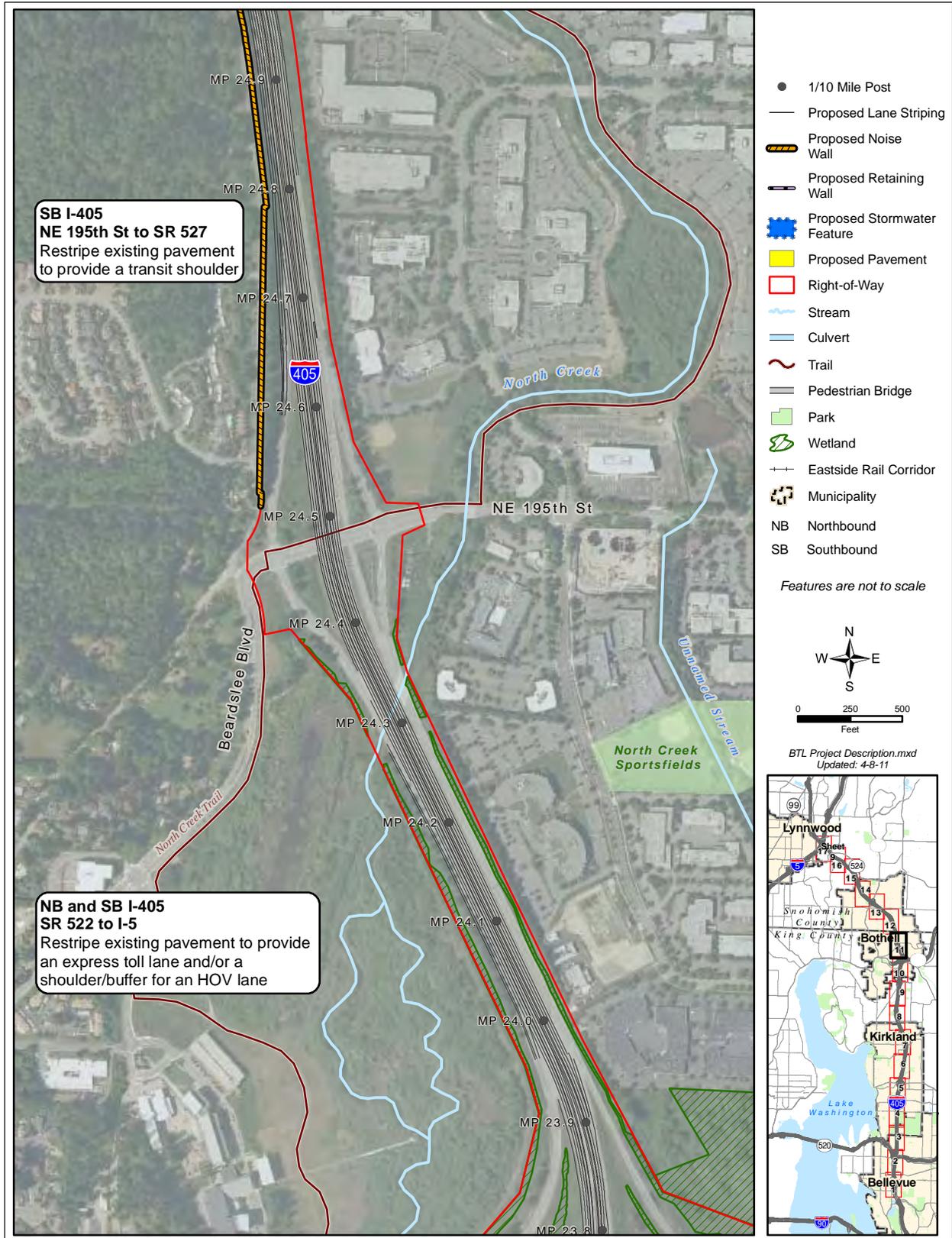


Exhibit 2: Project improvements – sheet 12 of 17

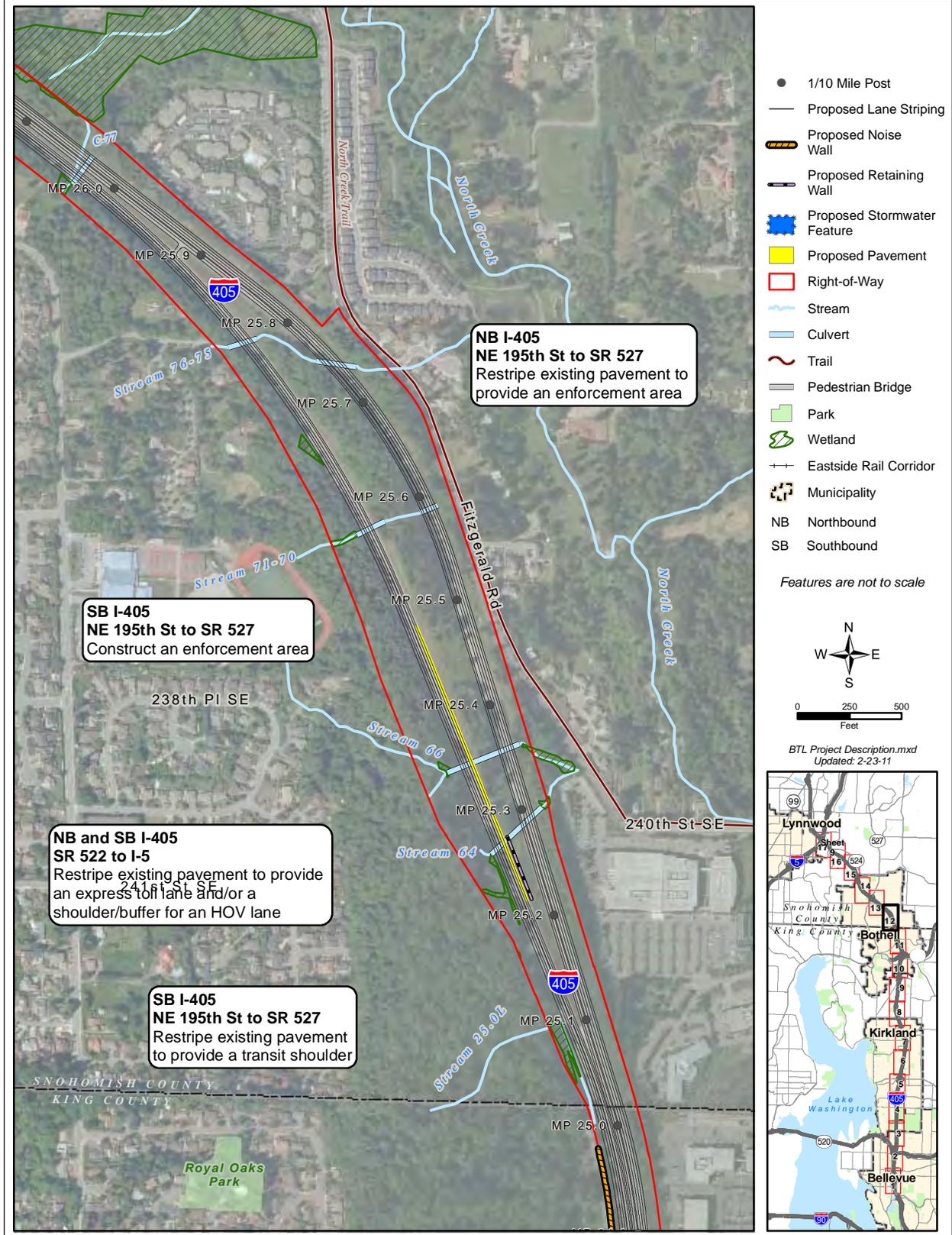


Exhibit 2: Project improvements – sheet 13 of 17

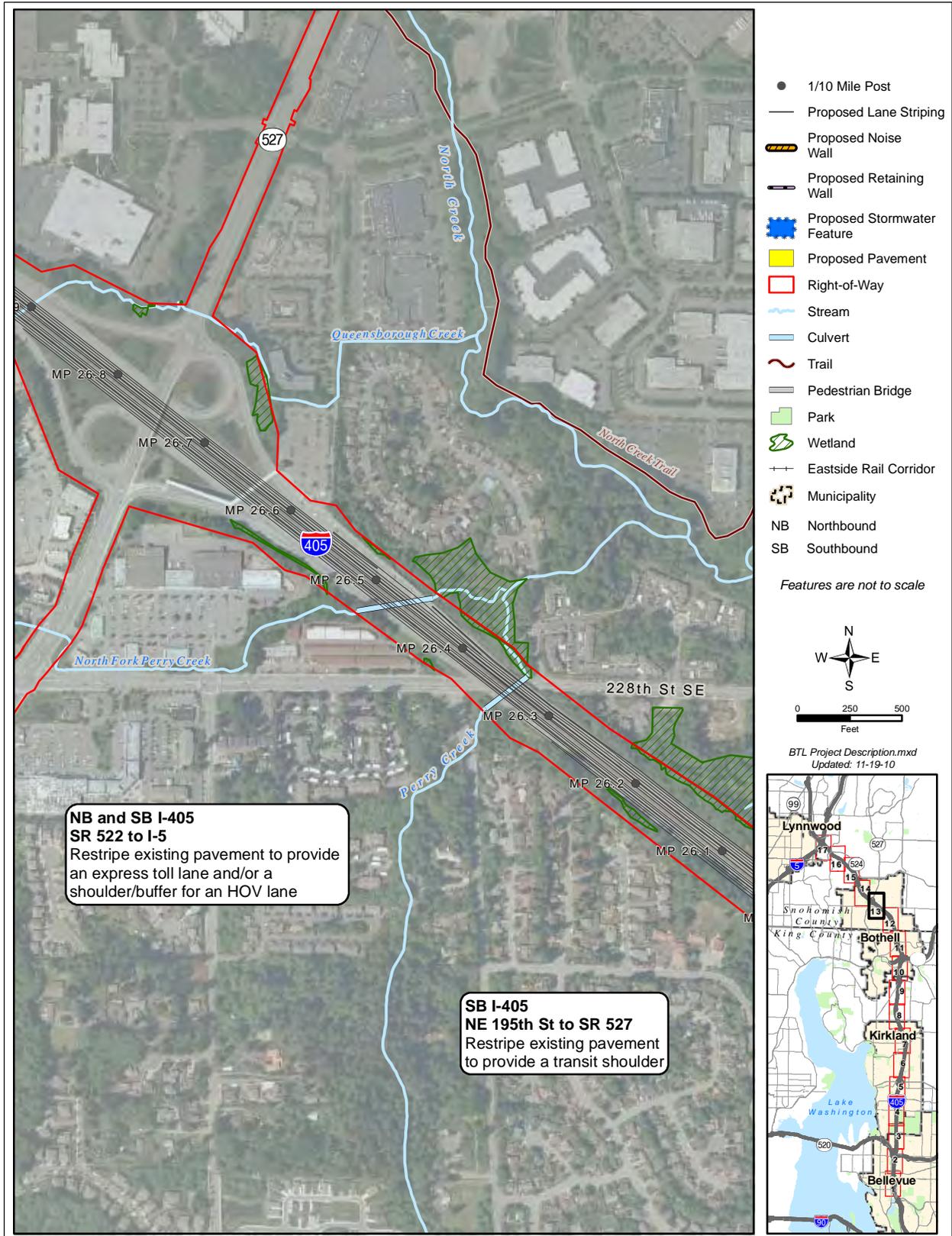


Exhibit 2: Project improvements – sheet 14 of 17

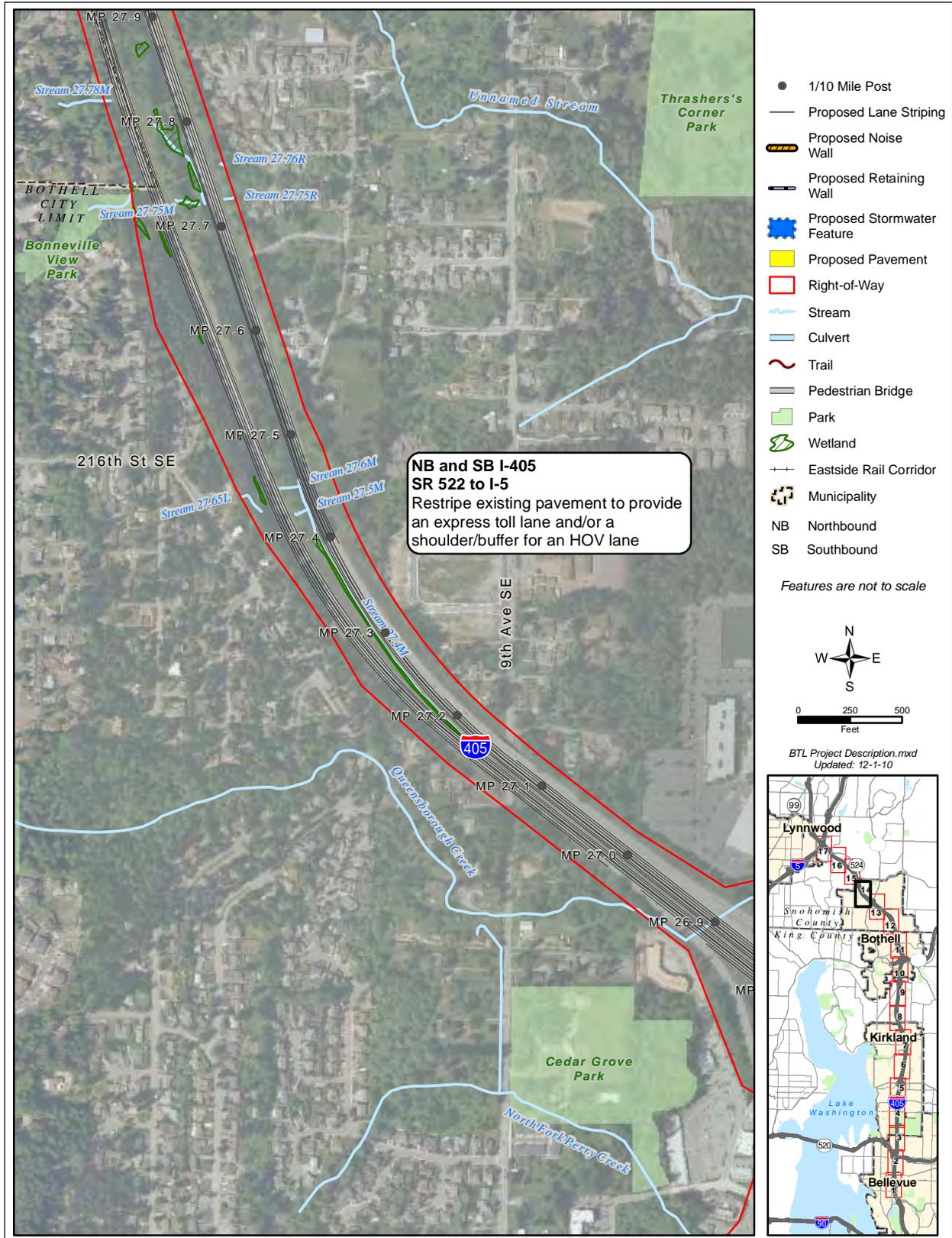


Exhibit 2: Project improvements – sheet 15 of 17

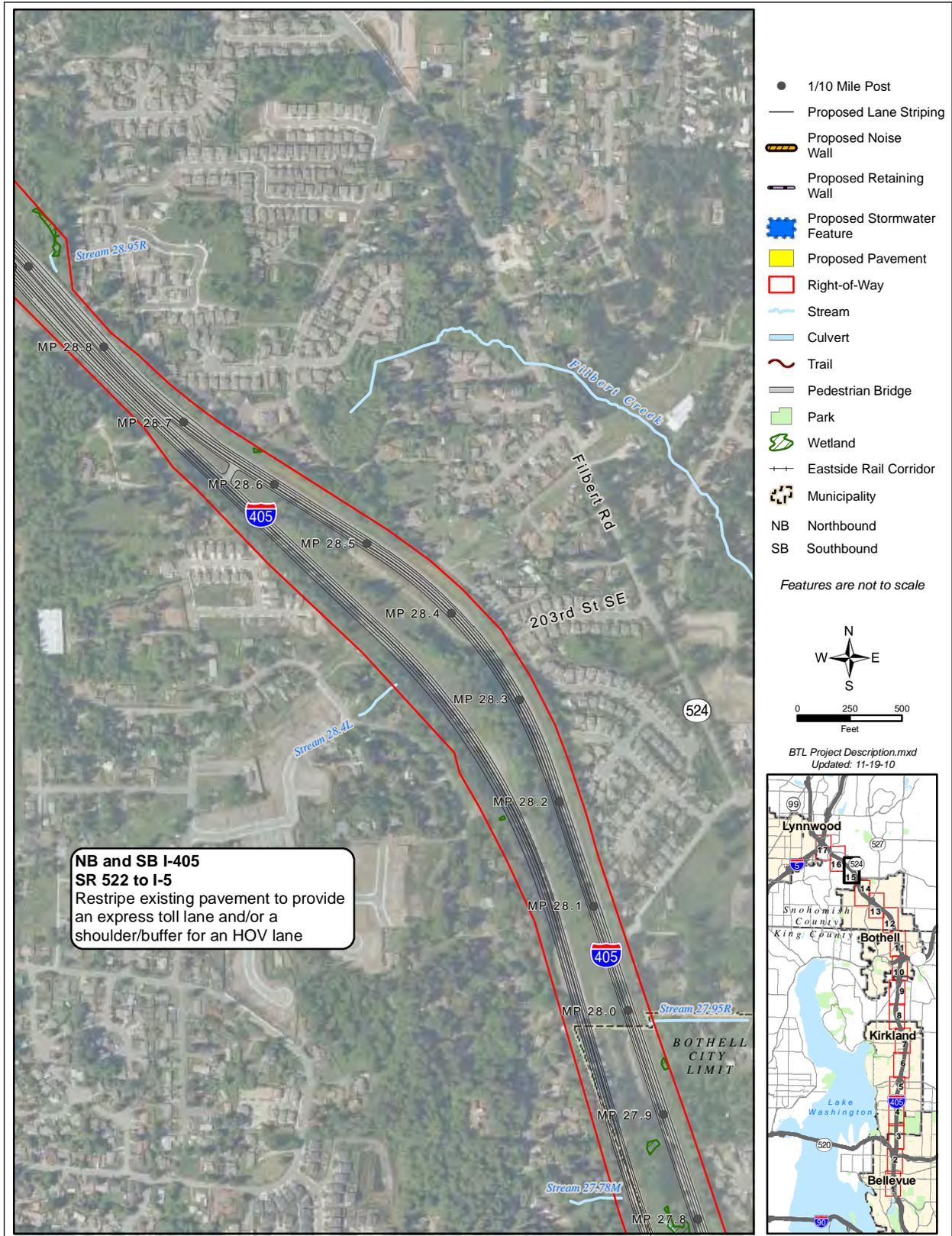


Exhibit 2: Project improvements – sheet 16 of 17

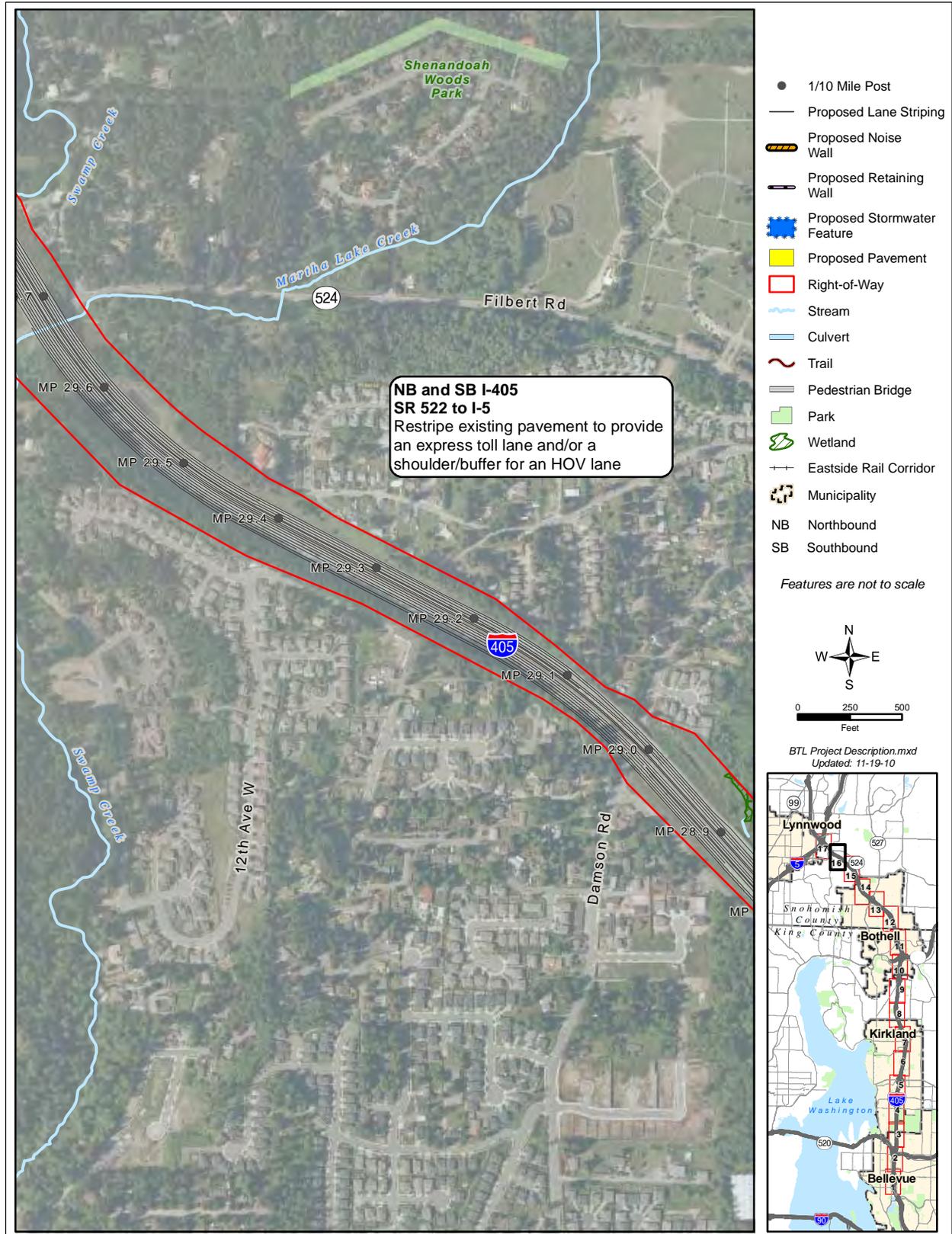
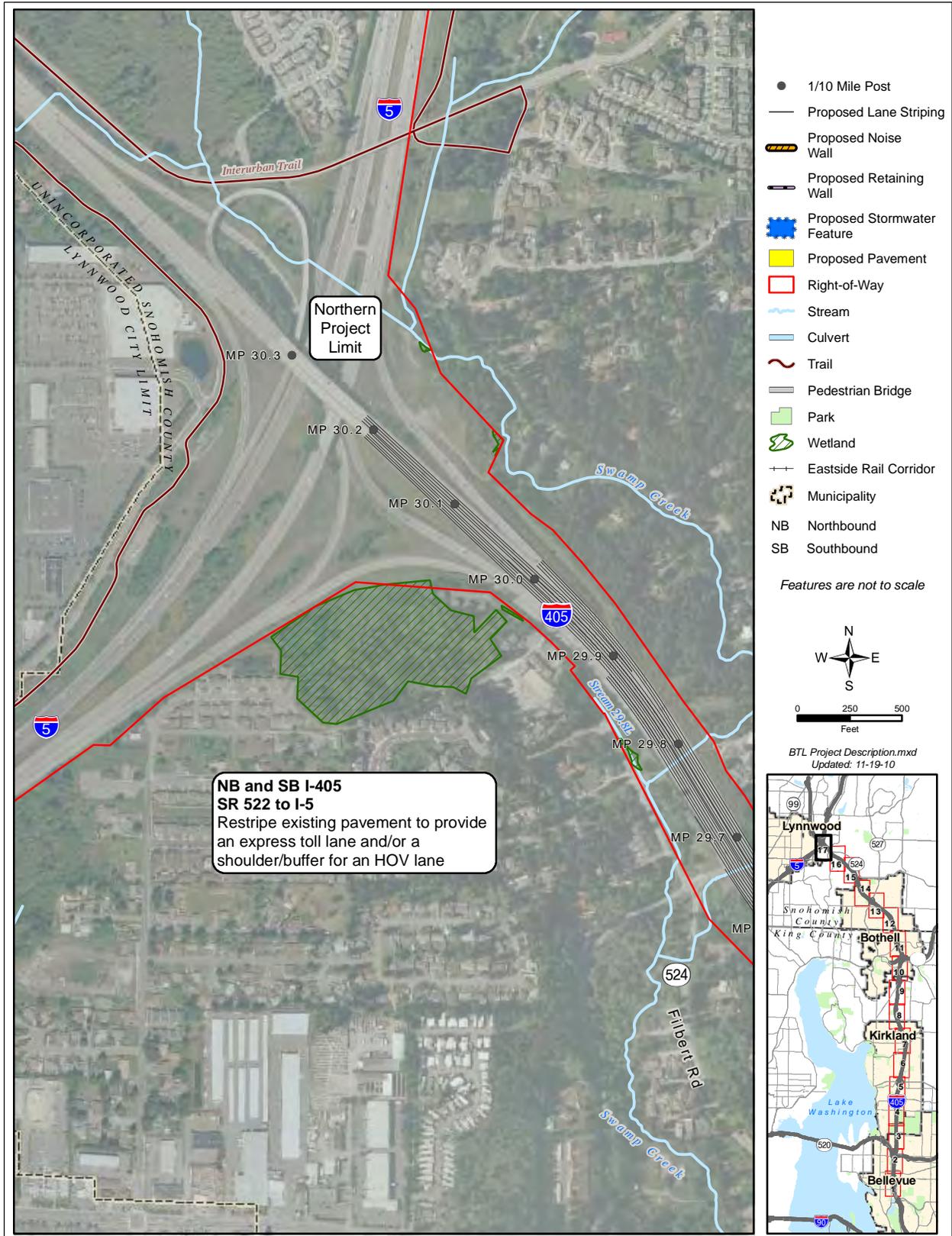
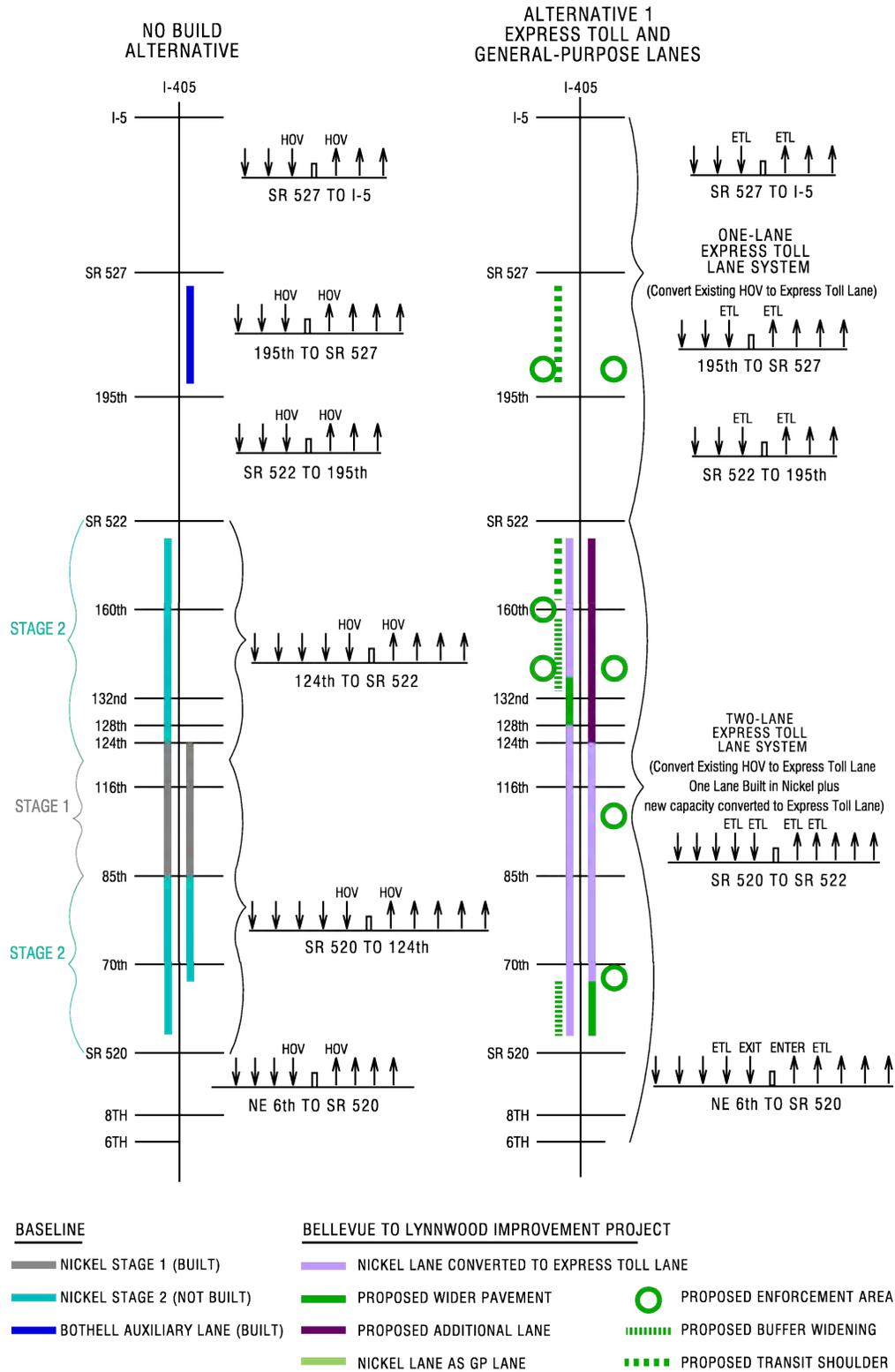


Exhibit 2: Project improvements – sheet 17 of 17





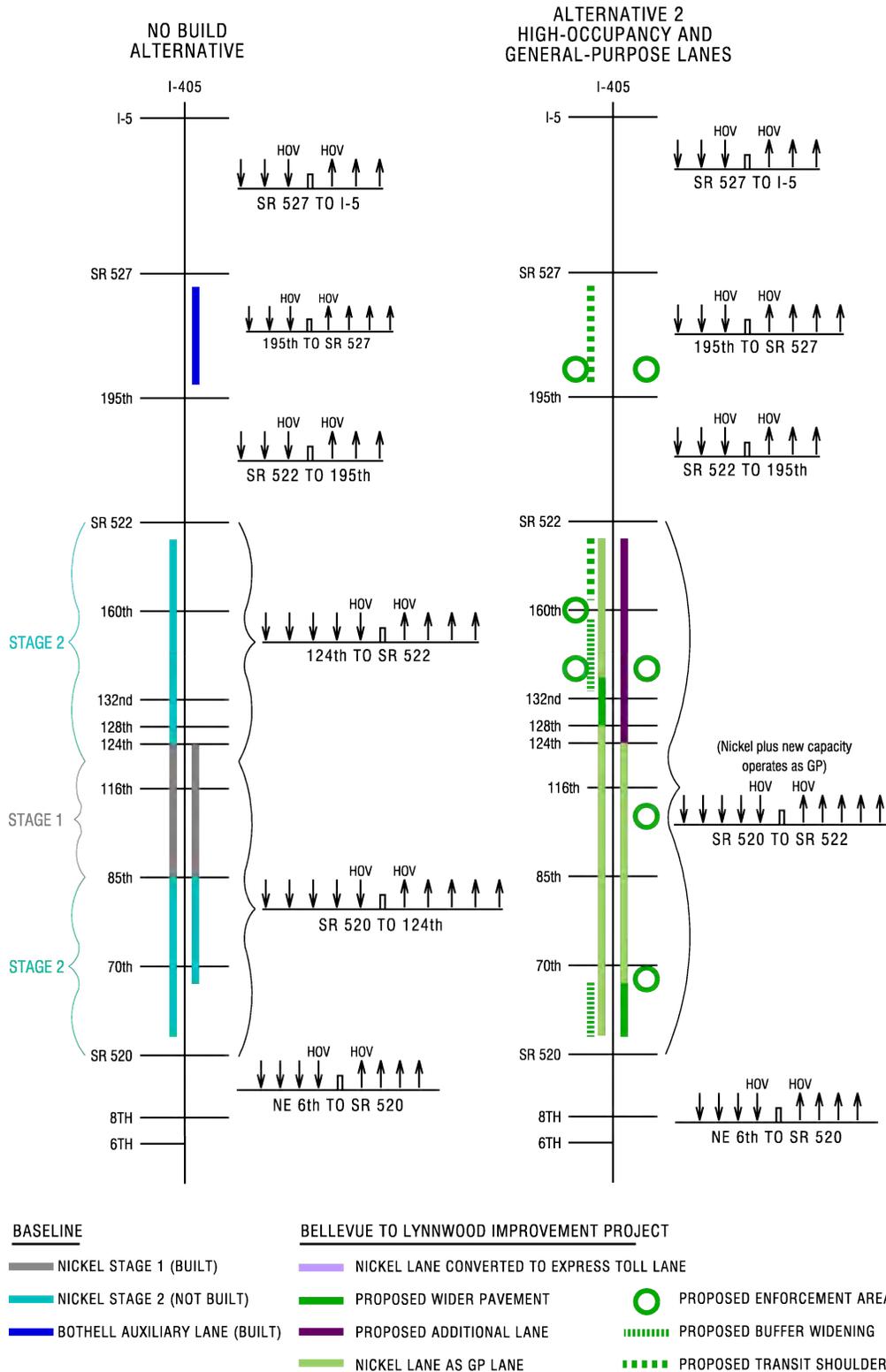
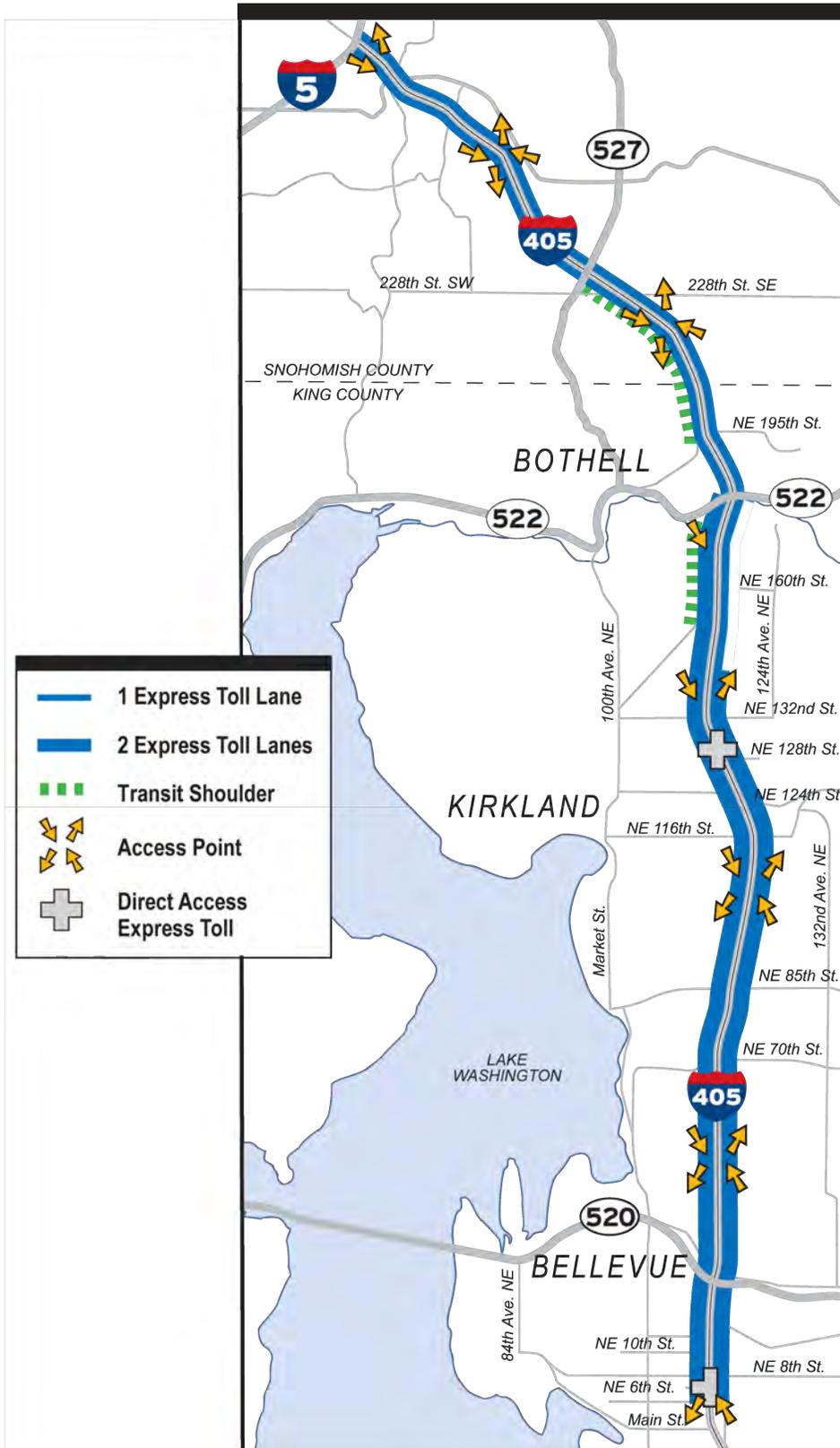


Exhibit 4: Express Toll Lanes access locations



- 1 Express Toll Lane
- 2 Express Toll Lanes
- - - Transit Shoulder
- Access Point
- Direct Access Express Toll

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METHODOLOGY

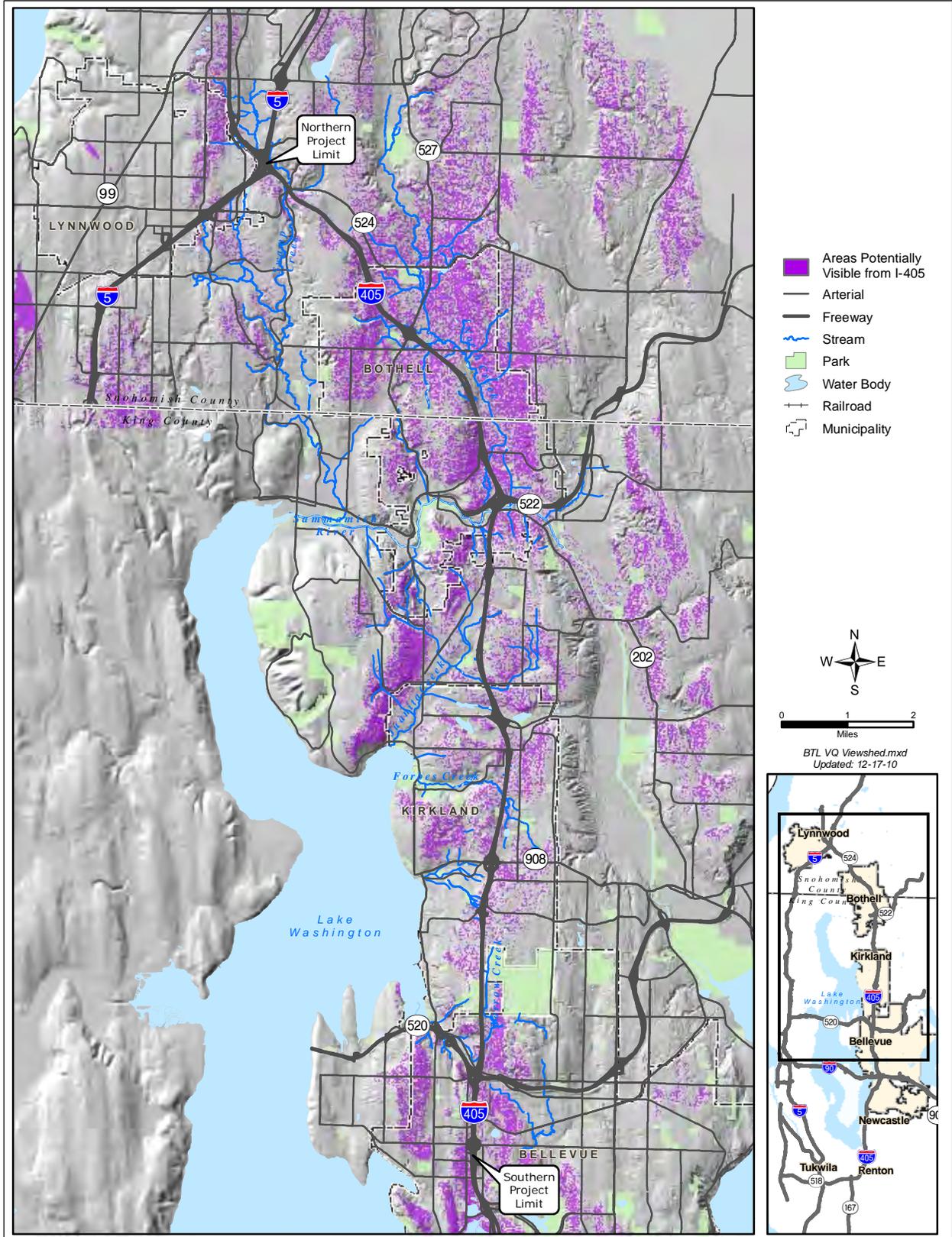
How did we collect the visual assessment information?

The I-405, Bellevue to Lynnwood Project Team evaluated the visual effects of the Bellevue to Lynnwood Improvement Project in the following manner: by identifying the visual resources of the affected environment; by determining the potential changes to resources that will result from the project; and by evaluating the viewer response to those changes. When observing and evaluating their visual environments, viewers use their own personal values and perspectives. This methodology provides an objective approach to assessing the visual environment and project changes.

The project team reviewed existing I-405 corridor environmental documents to help identify viewer groups. Reports on effects to visual quality in the programmatic EIS and the I-405, SR 520 to SR 522 – Kirkland Nickel Project (David Evans and Associates [DEA], 2001 and Washington State Department of Transportation [WSDOT], 2005b) identified two principal viewer groups: (1) those with views *from* I-405, which included commuters and local traffic; and (2) groups with views *toward* I-405, which included persons living in or using adjacent residential, commercial, industrial, and recreational areas, as well as travelers on the local roadway network.

For the Bellevue to Lynnwood Improvement Project, the project team used the geographic information system (GIS) to: (a) define the boundaries of the visual assessment area, and (b) evaluate what parts of the project area may be visible from the project and what parts of the project are visible from the surrounding areas. GIS can help define a “topographic viewshed” – or the part of the project area that is visible based solely on topography (see Exhibit 5). Starting with the GIS viewshed analysis, field reconnaissance was conducted to verify where existing vegetation and structures screened or blocked views looking toward and away from the project area. The project team then identified the key views to be evaluated for visual quality. Key views are described in detail later in this memorandum and are shown in Exhibit 6. Please refer to Appendix A to see a more detailed methodology.

Exhibit 5: Viewshed analysis, areas potentially visible toward or from I-405



How did we determine representative viewpoints?

The project team reviewed the existing documentation on the visual environment in the project area. The team also used GIS to determine the topographic viewshed within the study area. We conducted field reconnaissance to assess “seen” areas, looking both from and toward the project, and to select representative viewpoints to be analyzed. Exhibit 6 shows the locations selected as representative viewpoints.

What regulations and policies apply to this assessment?

Federal requirements

Federal requirements for visual quality evaluation in association with freeway systems and other transportation facilities are contained in several programs, including: the Transportation Equity Act for the 21st Century; the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003; the Highway Beautification Act of 1965; the National Historic Preservation Act of 1966; and the U.S. Department of Transportation Act of 1966.

In addition, the National Environmental Policy Act (NEPA) requires that due consideration be given to environmental issues, including aesthetics and visual quality, during project development.

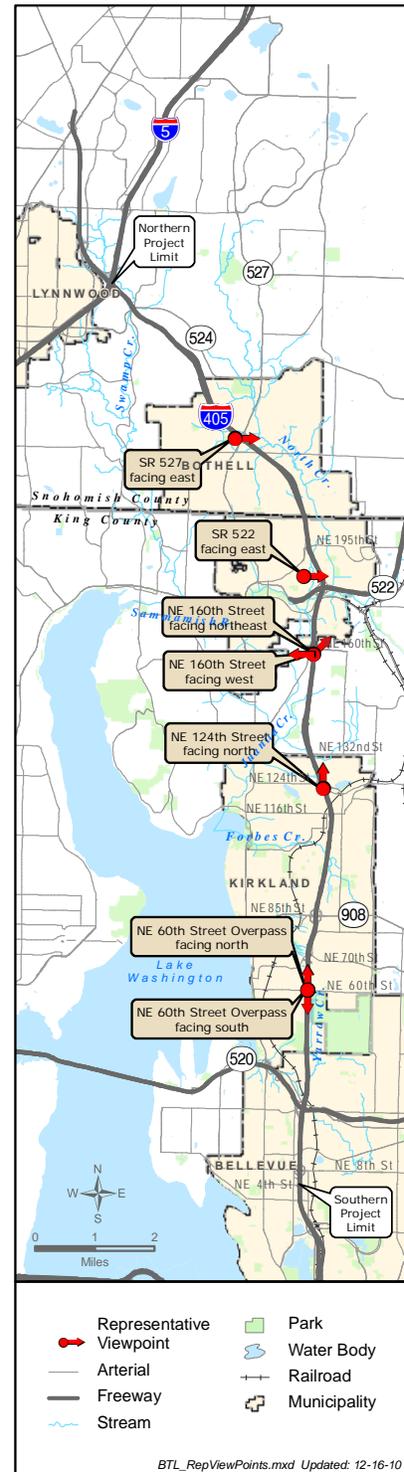
The method and criteria used in this visual quality assessment follow the guidance provided in the FHWA *Visual Impact Assessment for Highway Projects* manual (FHWA, 1981).

State regulations and policy guidance

WSDOT policies for visual quality assessment are contained in Section 459 of the WSDOT *Environmental Procedures Manual* (WSDOT, 2006).

Applicable state regulations include Washington’s Highway Beautification Act (RCW 47.040.101) and the

Exhibit 6: Representative viewpoint locations



Open Space Land Preservation Act (RCW 84.340).

Local regulations

Local comprehensive plans frequently contain urban design and aesthetic goals. The comprehensive plans of the local jurisdictions in the project area were examined to gain an understanding of these future land uses and related goals.