

analyzed in the biological assessment prepared to support consultation with NMFS and USFWS during the Final EIS phase of this project. The assessment would also include a review of potential effects on essential fish habitat.

Underwater noise and in-water construction activities may also affect marine mammals. Seals and sea lions forage in the Puyallup River near the existing highway bridges. Noise from pile driving and other in-water construction work could injure or cause harassment of seals and sea lions in the river. As required under the MMPA, Sound Transit would work with NMFS to prepare an incidental harassment authorization for work that has the potential to affect marine mammals. The terms and conditions of the authorization would include measures to minimize adverse effects on seals and sea lions.

## 4.2 Vegetation, Wildlife, and Wildlife Habitat

Construction and operation of TDLE could adversely affect vegetation and terrestrial wildlife. Analyses in this subsection address the potential long-term and construction-related impacts of each alternative on vegetation, wildlife, and wildlife habitat. All the project alternatives are near existing highways and commercial or industrial areas and have relatively disturbed habitats compared to less-developed sites in rural areas. Despite the overall matrix of sparse ecosystem resources in the study area, remnant patches of natural vegetation may provide travel corridors or islands of habitat, allowing some wildlife populations to persist in the urban landscape. Actual impacts would depend on final alternative selection and design, construction footprint and methods, BMPs implemented during construction (see Section 4.8.2, Construction Best Management Practices), and performance of post-construction restoration, including revegetation of disturbed areas and mitigation measures for areas protected under local critical areas ordinances.

As discussed in Section 3.4.1, no ESA-listed or state-listed plant or wildlife species are known or expected to be present in the study area. Similarly, WDFW (2023a) does not identify any documented occurrences of state priority species in the study area. Priority species with potential to occur are identified in Section 3.4.3.1. Forested areas may provide suitable habitat for some priority species (see Section 3.4.3). Reductions in the amount of the forested cover type could have adverse effects on those species.

The only priority habitats known or expected to be present in the study area are mature forests, riparian areas, and wetlands. Potential impacts on mature forests are discussed in the following subsections. Potential impacts on riparian areas are analyzed in Section 4.1. Potential impacts on wetlands are analyzed in Section 4.3.

### 4.2.1 Long-Term Impacts

Potential direct long-term impacts would occur where project construction converts vegetation or other wildlife habitat features to project facilities. Noise, light, and human activity associated with operation of TDLE may also have long-term impacts on wildlife, and the presence of light rail structures may impede the movement of wildlife through the study area. Impacts associated with each alternative are discussed in the subsections that follow.

#### Vegetation Removal and Habitat Alteration

Any of the project alternatives would affect vegetation and wildlife through the loss or degradation of habitat. Existing vegetation within the limits of the permanent impact footprint would be removed and replaced with guideways, stations, and other project features.

Vegetation near the permanent impact footprint would also be permanently affected by the project. After being cleared for construction, areas within 15 feet of light rail facilities would be restored with native shrubs and other site-appropriate plant species, but trees and other tall vegetation would not be allowed to grow within this 15-foot buffer for safety. In areas that are currently dominated by non-native and invasive species (e.g., Himalayan blackberry, reed canarygrass), post-construction planting would improve habitat conditions by increasing structural and species diversity. In areas that currently support forested habitats, tree removal and replacement with lower-growing species would reduce habitat diversity. The permanent impact footprint developed for this analysis overlaps the 15-foot clearing zone in some areas but not everywhere. For this reason, potential impacts associated with maintaining the 15-foot-wide zone are addressed qualitatively but are not quantified.

Table J4.4-3 presents a comparison of the project alternatives' potential impacts on vegetation in the study area, based on the amount of each land cover type in the project footprint. The geographic distribution and configuration of impact areas are depicted in Figures J4.4-12 through J4.4-22. The values and areas in the table and figure do not represent actual anticipated impacts. As discussed in the introduction to Section 4, Environmental Impacts, impact areas represent conservative estimates, and not all areas within the project footprint would be converted to structures or hard surfaces. Some areas, for example, would be restored to pre-project conditions or converted to other cover types, such as stormwater facilities or landscaping. Instead, the values and areas indicate the relative degree of potential impacts on each cover type.

Long-term impacts on vegetation and wildlife habitat would vary, depending on the affected land cover type. In much of the study area (e.g., in areas classified as the Commercial or Residential land cover types), the replacement of existing impervious surfaces and structures would constitute a minimal change in ecological functions such as the capacity to support wildlife. In such areas, grass and low-growing vegetation along the alignment would provide some habitat for ground-dwelling small mammals, such as mice and voles.

The severity of impacts on plants and animals would be greater where cover types dominated by native or structurally complex vegetation (i.e., the mature native forest, other native forest, or wetland/stream cover types, including forested wetlands) are affected. Removing trees, snags, and understory vegetation would eliminate nesting and foraging sites for birds, roosting sites for bats, and hiding cover for small mammals. Alternatives that affect a greater area of such habitat types would have a higher likelihood of adverse effects on vegetation and wildlife. Given the scarcity of mature native forest habitat in and near the study area, combined with that habitat type's high value for wildlife, potential impacts on mature native forest receive particular attention in the impact analyses in this section.

The severity of impacts would also depend on the type of structure. Construction and operation of at-grade segments of guideway would entail the permanent removal of nearly all vegetation within the permanent impact footprint. In contrast, some vegetation would be able to grow underneath elevated structures. As described in the discussion of impacts on riparian vegetation (see Section 4.1.1), vegetation under elevated structures would be limited by the reduced availability of sunlight and water.



**Table J4.4-3 Potential Long-term Impacts on Vegetation Cover Types, by Alternative (acres)**

Alternative	Commercial	Residential	Grassland	Invasive Brush	Native Brush	Non Native Forest	Mature Native Forest	Other Native Forest	Wetland/Stream <sup>1</sup>	River Channel <sup>2</sup>	Stormwater Pond	Total
<b>Federal Way Segment</b>												
Preferred FW Enchanted Parkway	2	6	2	<0.5	0	0	2	3	1	0	<0.5	16
Preferred FW Enchanted Parkway with Design Option	2	7	3	<0.5	0	0	2	3	1	0	<0.5	18
<b>South Federal Way Segment</b>												
SF Enchanted Parkway	24	7	<0.5	3	0	0	1	10	3	0	<0.5	48
SF I-5	21	4	1	5	<0.5	0	1	16	4	0	<0.5	51
SF 99-West	31	1	<0.5	1	0	0	0	9	6	0	<0.5	49
SF 99-West with Porter Way Design Option	26	1	<0.5	1	0	0	1	9	7	0	<0.5	46
SF 99-East	34	<0.5	2	2	<0.5	0	0	8	7	0	1	54
SF 99-East with Porter Way Design Option	29	<0.5	2	2	<0.5	0	1	8	8	0	1	51
<b>Fife Segment</b>												
Fife Pacific Highway/ Fife Median <sup>3</sup>	27	1	5	<0.5	<0.5	<0.5	0	1	2	0	2	39
Fife Pacific Highway/ Fife Median with 54th Avenue Design Option	31	<0.5	4	<0.5	<0.5	<0.5	0	2	2	0	<0.5	41
Fife Pacific Highway/ Fife Median with 54th Span Design Option	33	<0.5	4	<0.5	<0.5	<0.5	0	2	2	0	<0.5	43
Fife I-5	19	<0.5	8	<0.5	<0.5	<0.5	0	1	3	0	2	34
Fife I-5 with 54th Avenue Design Option	21	<0.5	7	<0.5	<0.5	<0.5	0	1	3	0	<0.5	33
Fife I-5 with 54th Span Design Option	23	<0.5	7	<0.5	<0.5	<0.5	0	1	3	0	<0.5	35

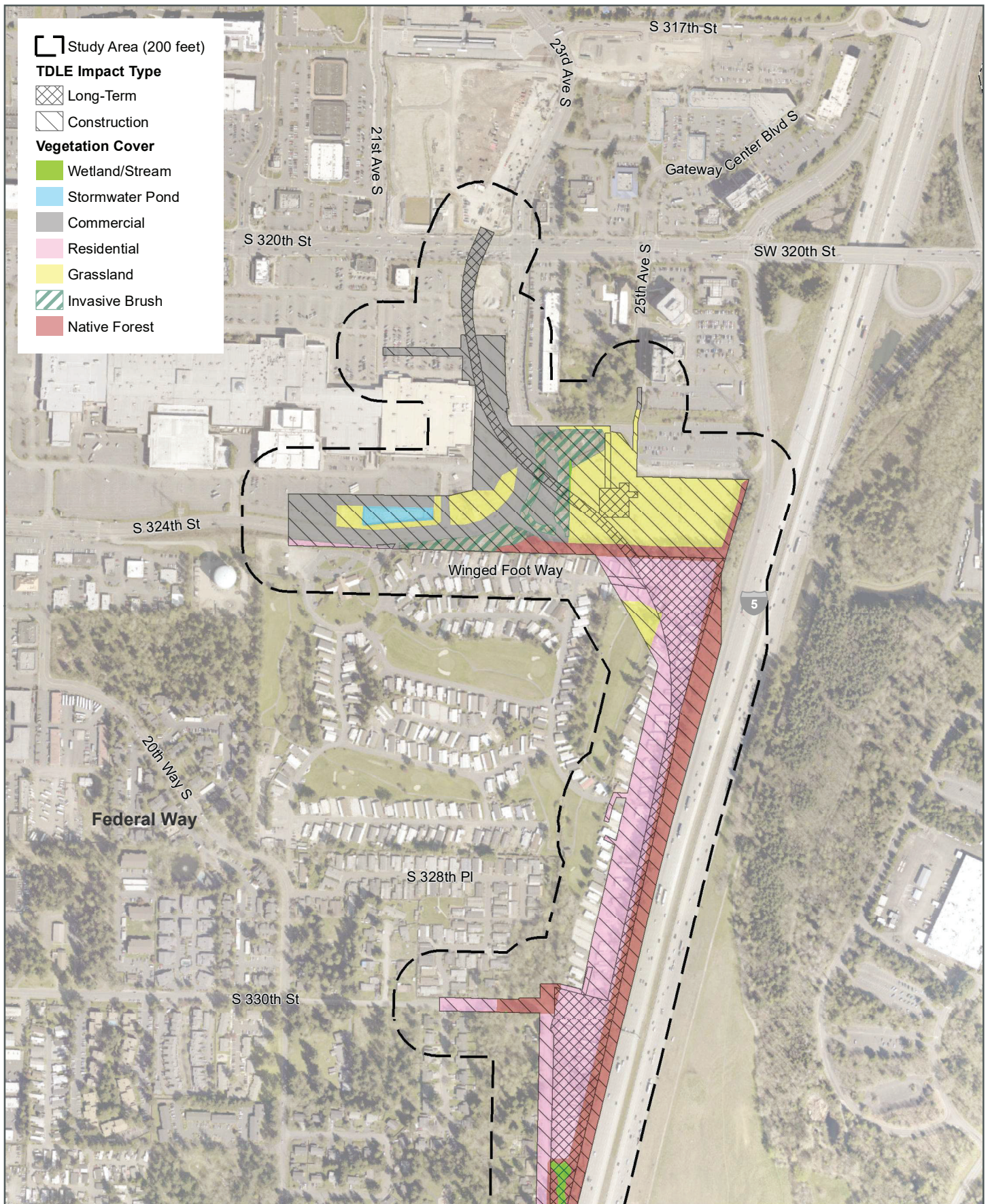
**Table J4.4-3 Potential Long-term Impacts on Vegetation Cover Types, by Alternative (acres) (continued)**

Alternative	Commer- cial	Residen- tial	Grass land	Invasive Brush	Native Brush	Non Native Forest	Mature Native Forest	Other Native Forest	Wetland/ Stream <sup>1</sup>	River Channel <sup>2</sup>	Stormwater Pond	Total
<b>Tacoma Segment</b>												
Preferred Tacoma 25th Street-West	19	<0.5	1	1	<0.5	0	0	0	<0.5	<0.5	0	21
Tacoma 25th Street-East	18	<0.5	1	1	<0.5	0	0	0	<0.5	<0.5	0	20
Tacoma Close to Sounder	16	1	1	1	<0.5	0	0	0	<0.5	<0.5	0	19
Tacoma 26th Street	18	2	1	1	<0.5	0	0	0	<0.5	<0.5	0	21

Notes:

- (1) Impacts on the Wetland/Stream cover type include areas within the OHWM of streams associated with wetlands. As such, the impact area values for the cover type in this table do not match those in the tabular summaries of impacts on wetlands.
- (2) The River Channel land cover type captures the Puyallup River. Impacts on smaller streams are discussed in Section 4.1.
- (3) The impacts of the Fife Pacific Highway and Fife Median alternatives on all cover types would be identical.



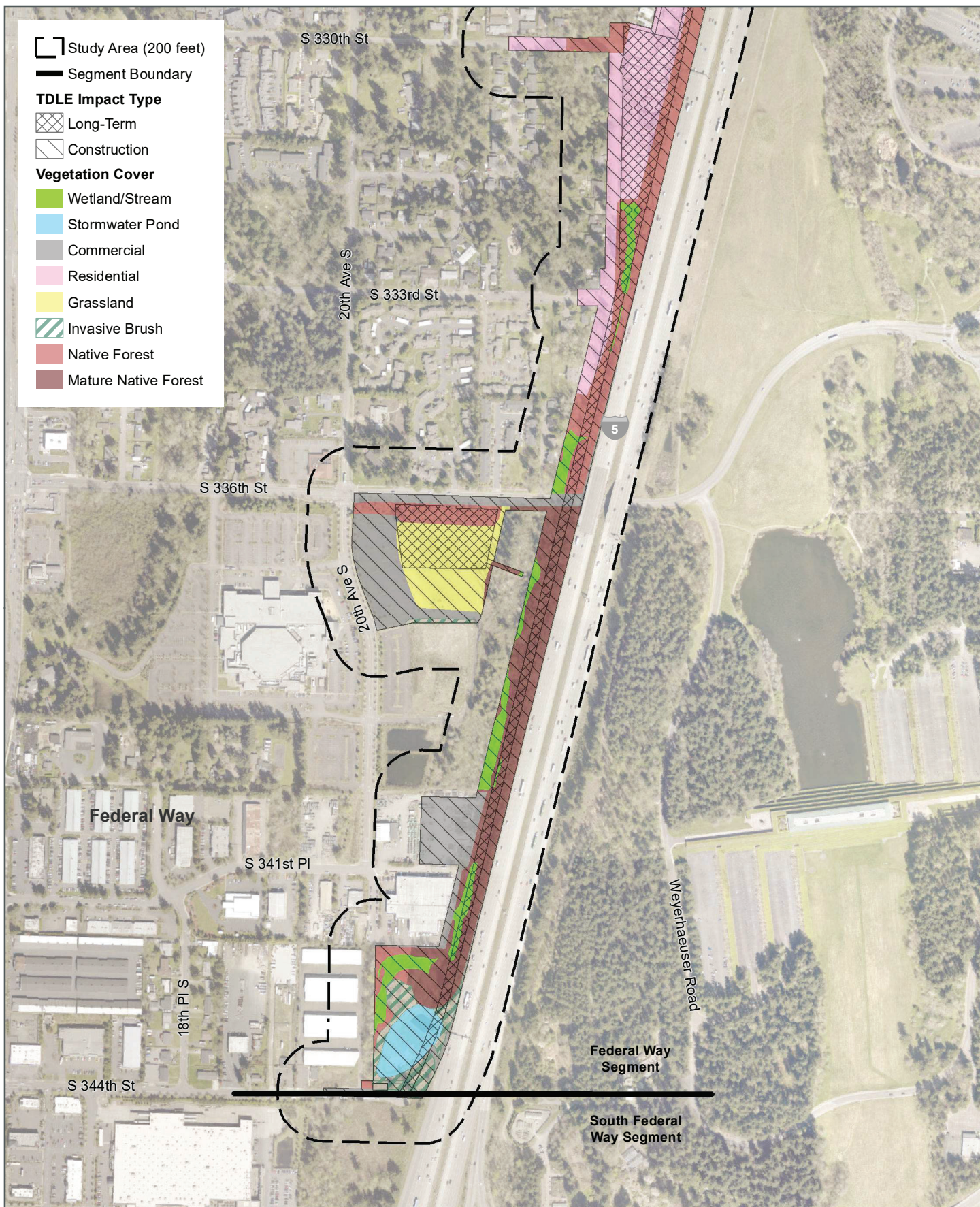


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

**FIGURE J4.4-12A**  
Vegetation Cover Impacts  
Preferred FW Enchanted Parkway Alternative  
Tacoma Dome Link Extension





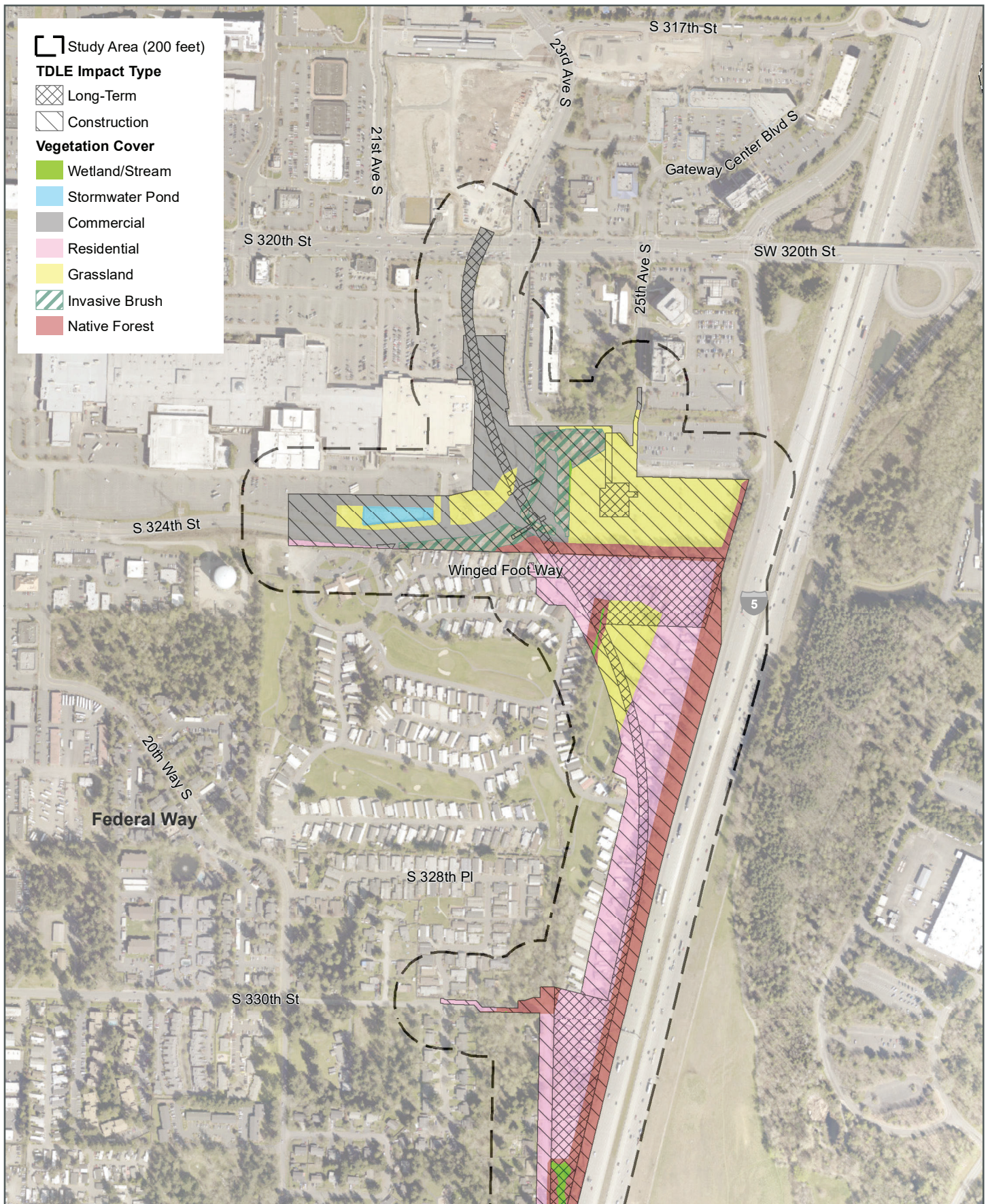


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-12B**  
Vegetation Cover Impacts  
Preferred FW Enchanted Parkway Alternative  
*Tacoma Dome Link Extension*



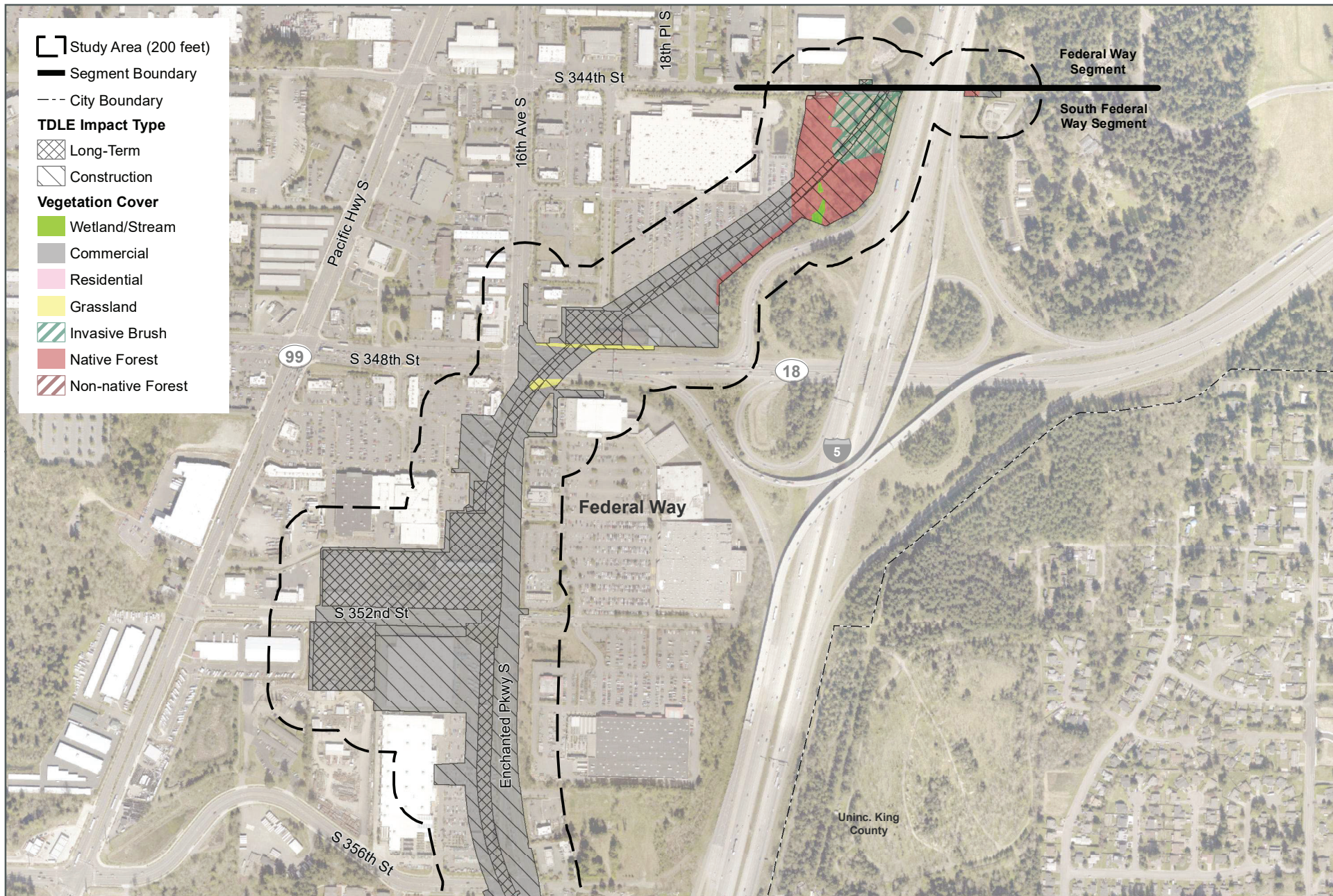


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

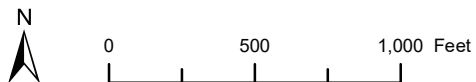


**FIGURE J4.4-12C**  
Vegetation Cover Impacts  
FW Design Option  
Tacoma Dome Link Extension



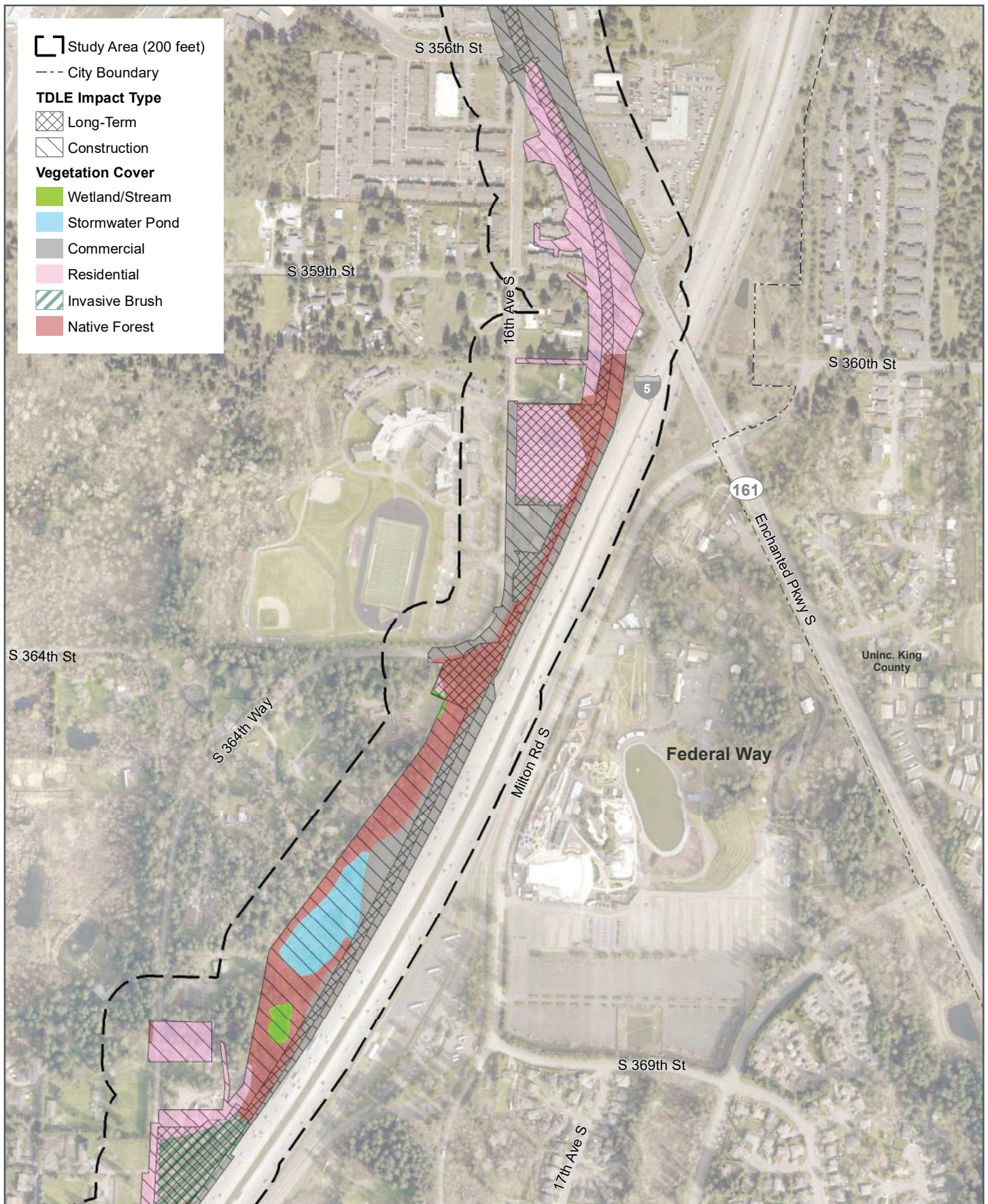


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-13A**  
Vegetation Cover Impacts  
SF Enchanted Parkway Alternative  
*Tacoma Dome Link Extension*



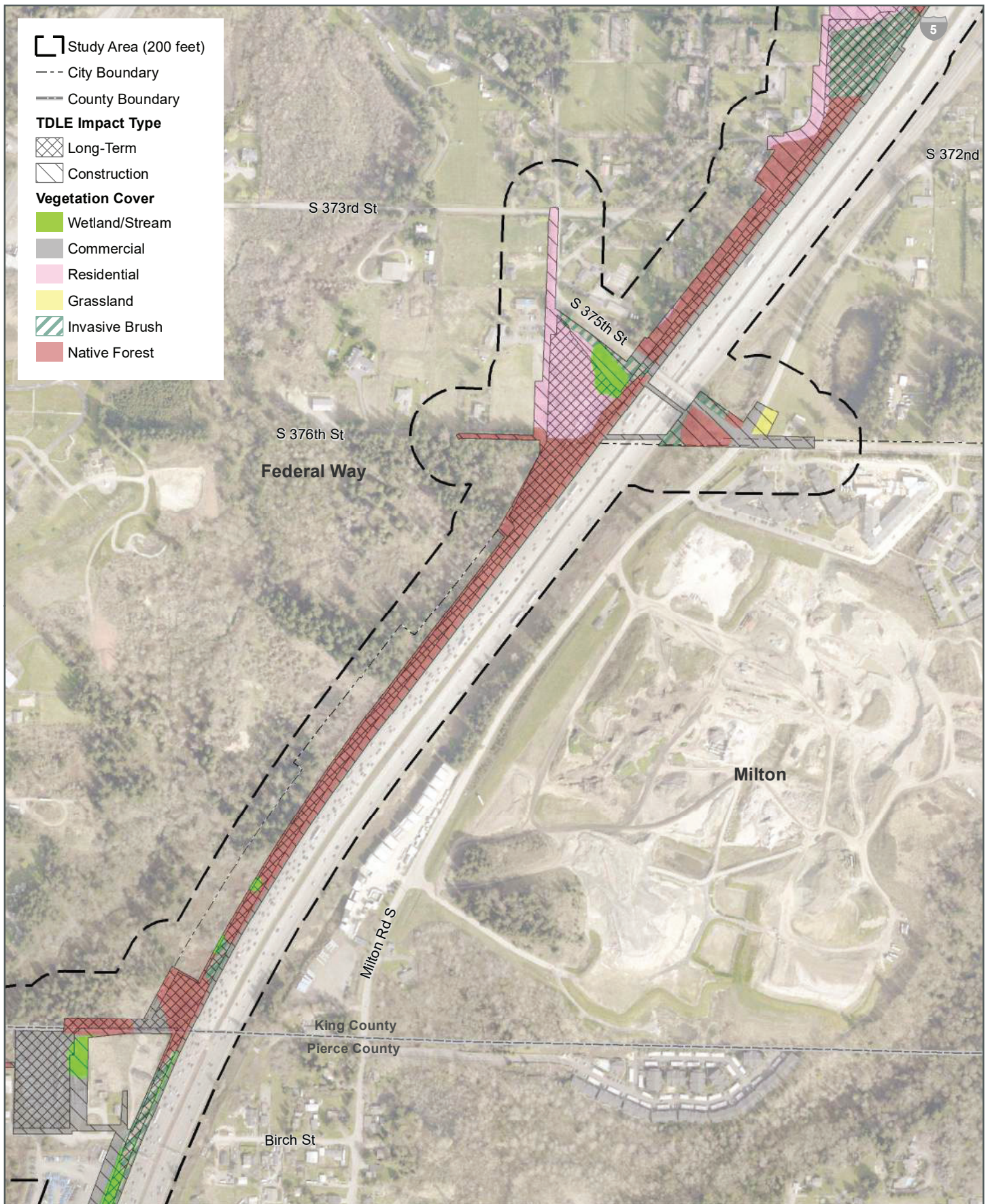


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-13B**  
Vegetation Cover Impacts  
SF Enchanted Parkway Alternative  
*Tacoma Dome Link Extension*



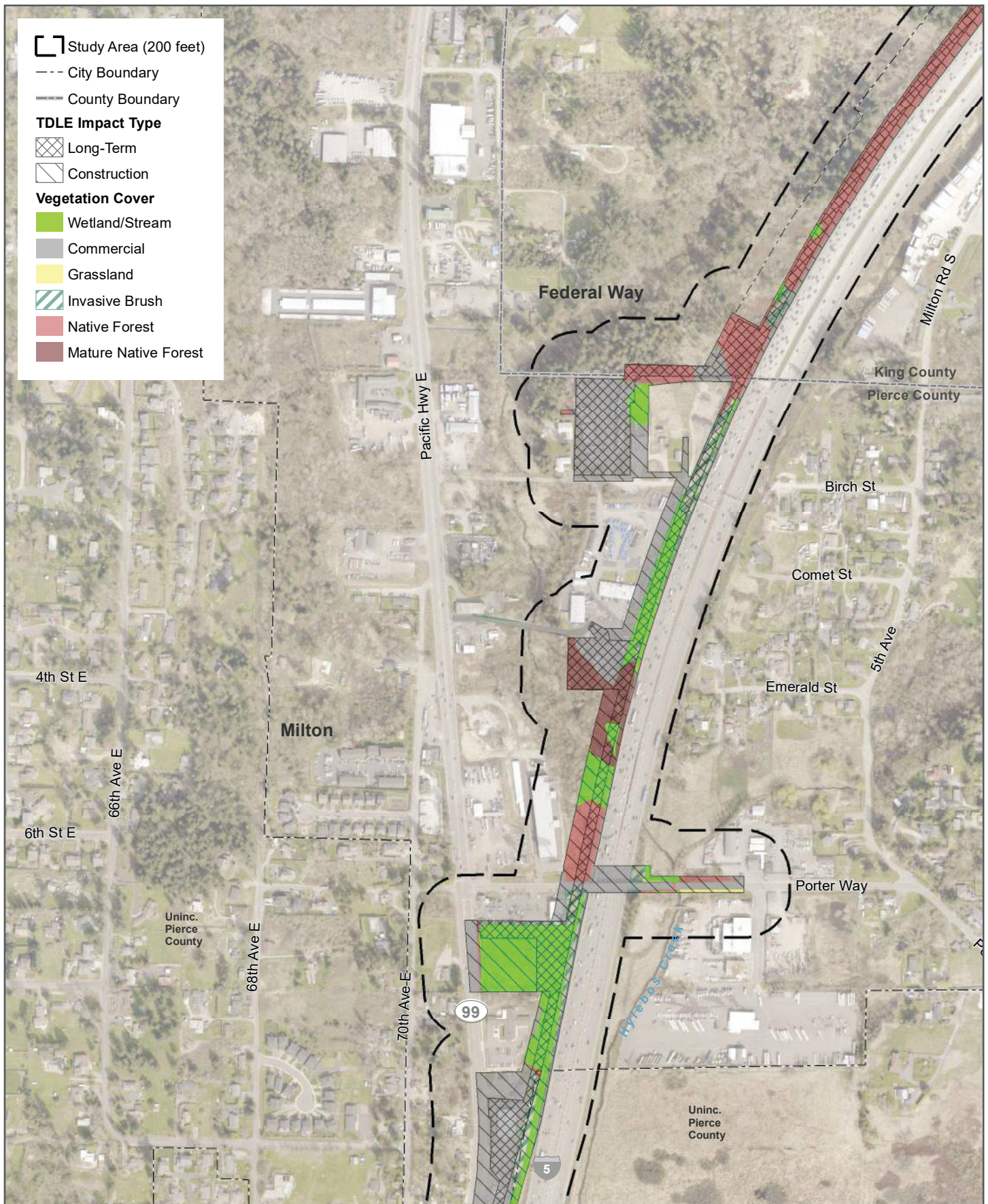


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-13C**  
Vegetation Cover Impacts  
SF Enchanted Parkway Alternative  
Tacoma Dome Link Extension



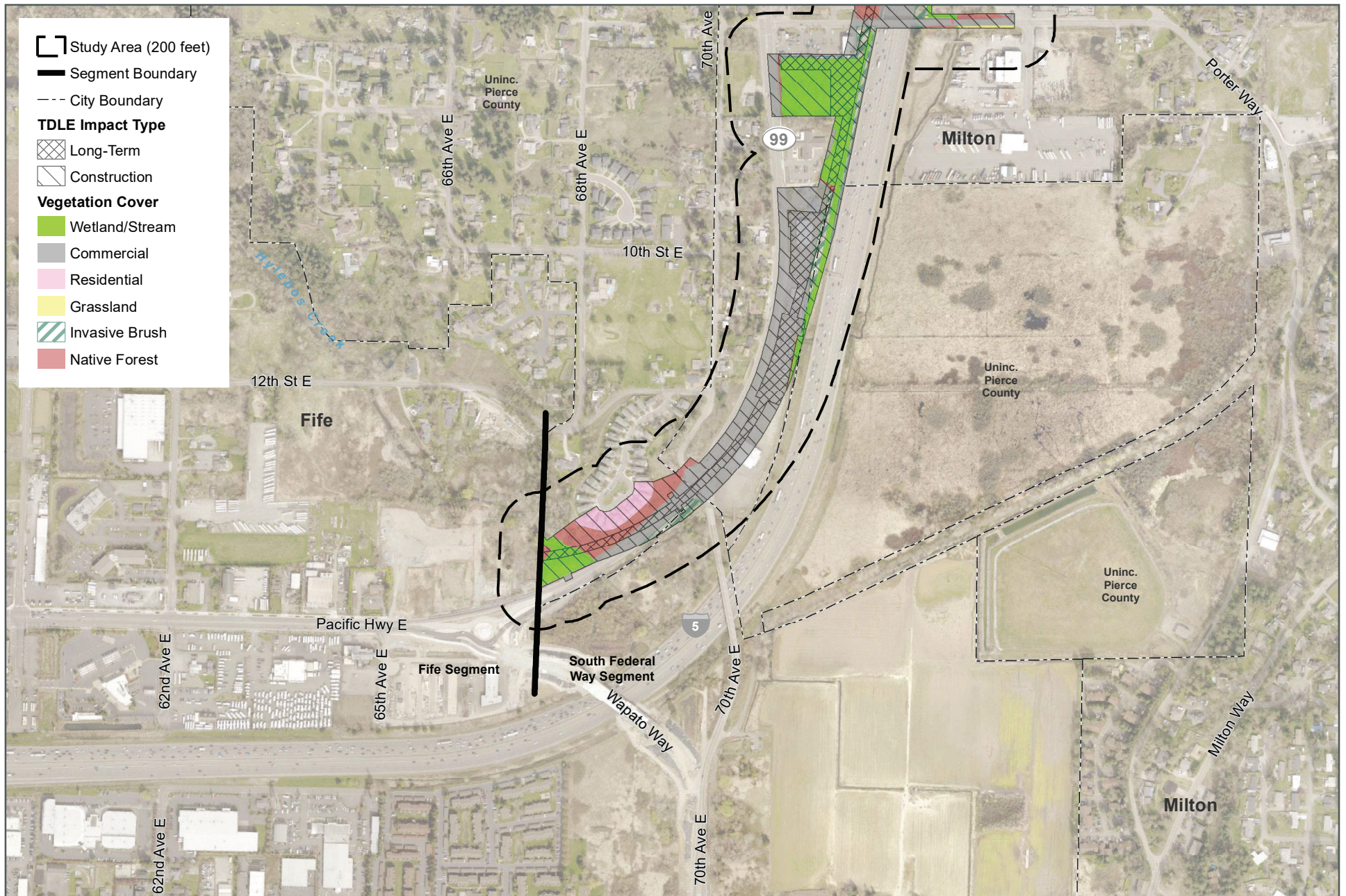


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-13D**  
Vegetation Cover Impacts  
SF Enchanted Parkway Alternative  
Tacoma Dome Link Extension



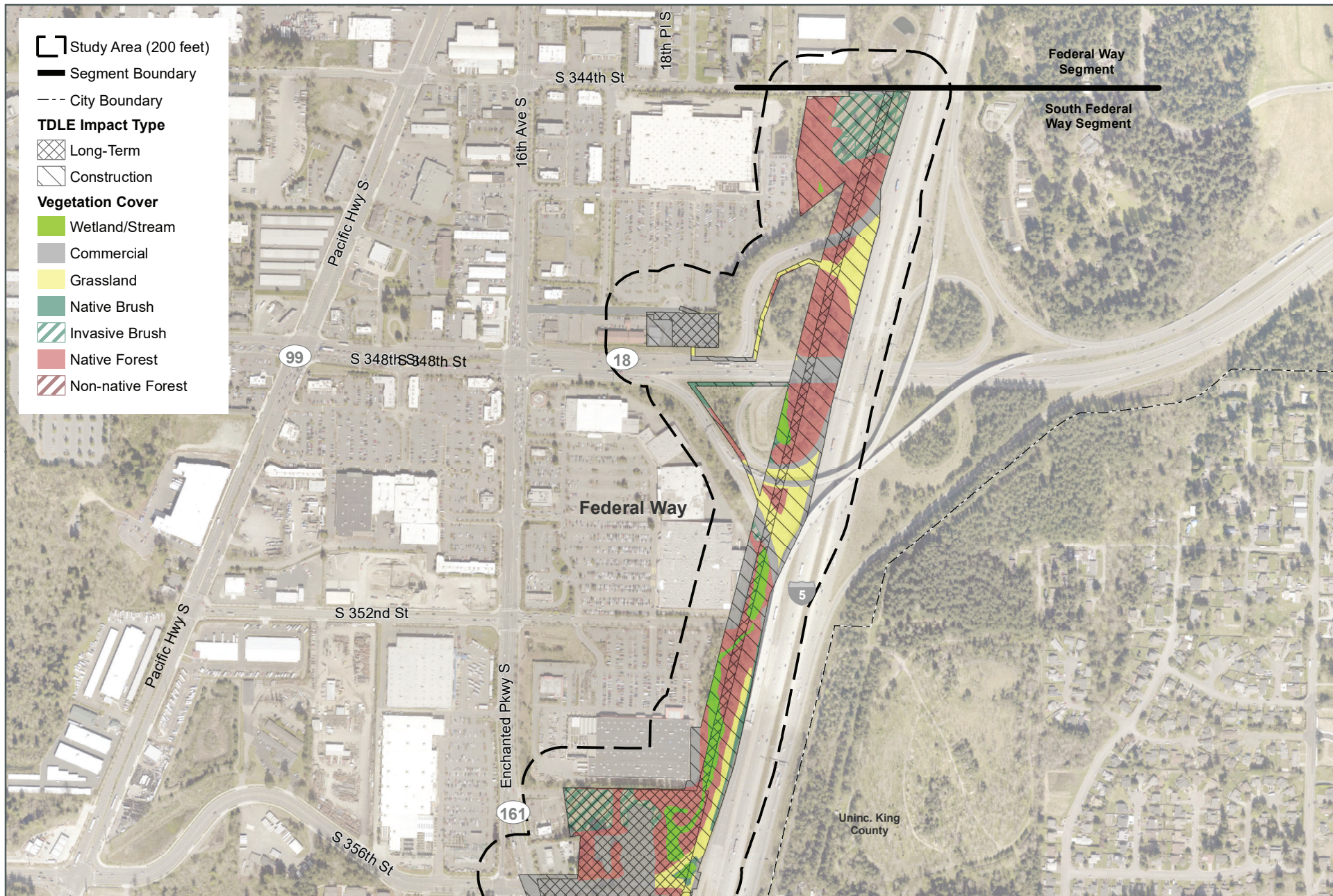


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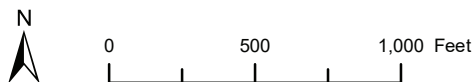


**FIGURE J4.4-13E**  
Vegetation Cover Impacts  
SF Enchanted Parkway Alternative  
*Tacoma Dome Link Extension*



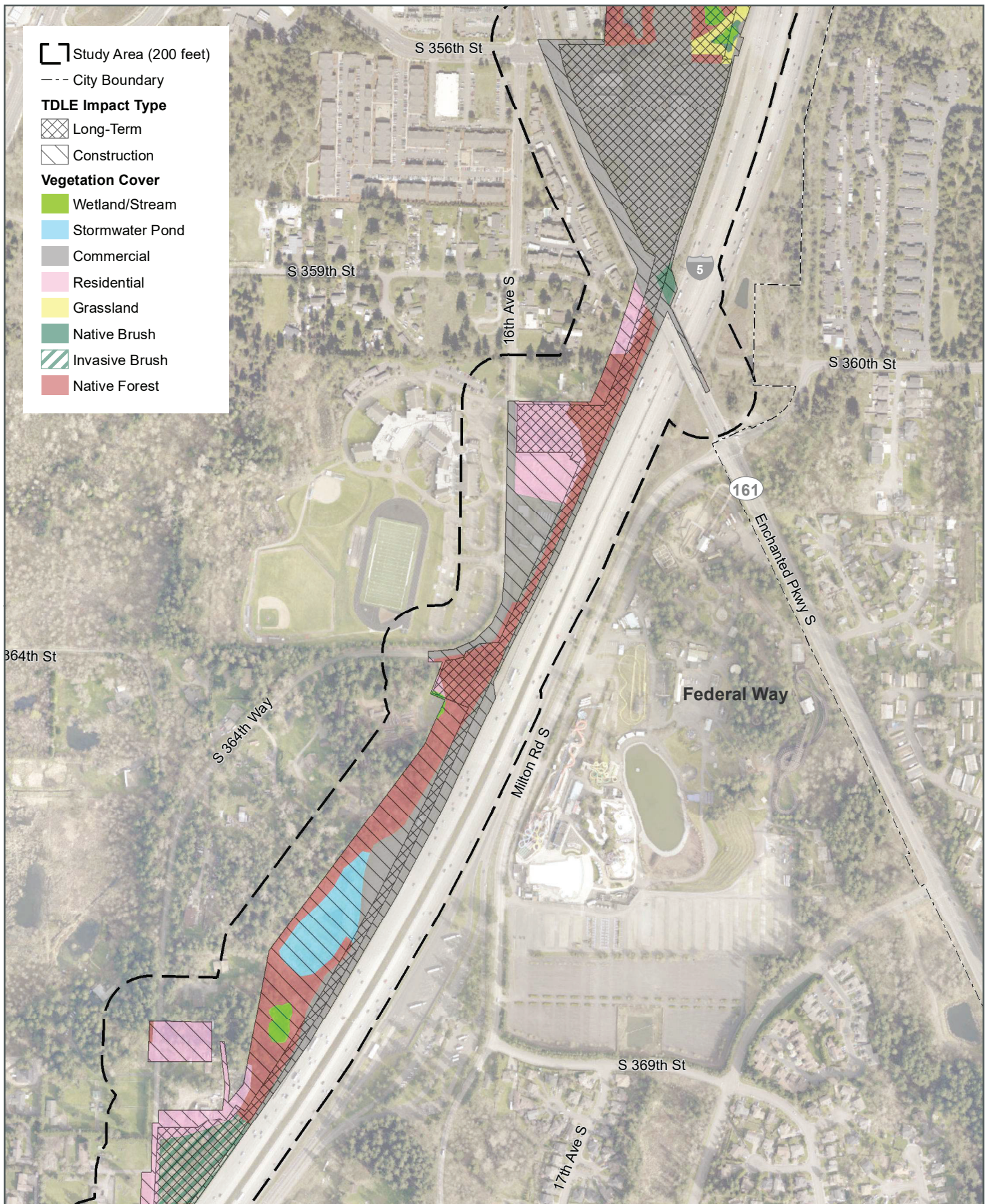


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-14A**  
 Vegetation Cover Impacts  
 SF I-5 Alternative  
 Tacoma Dome Link Extension



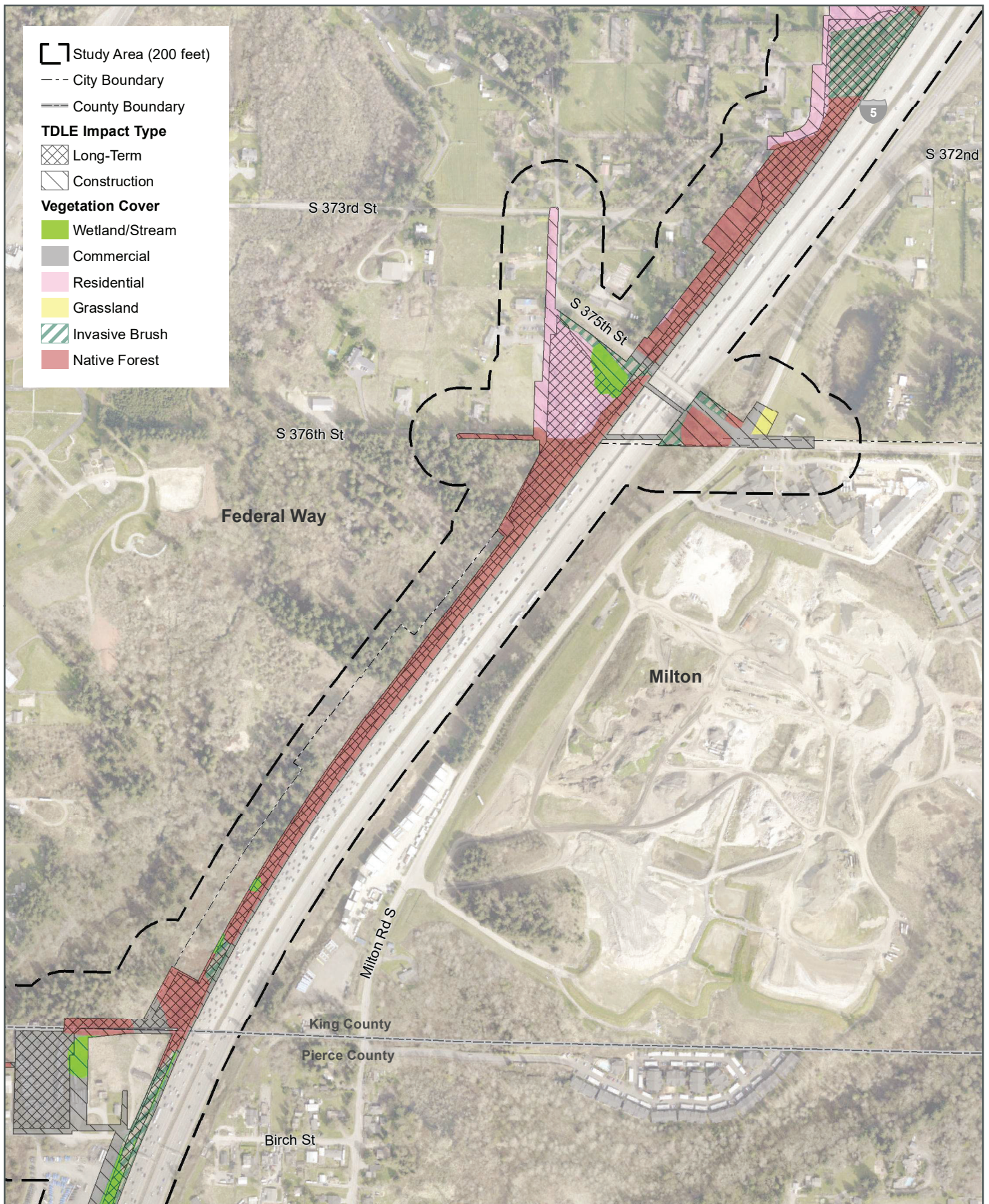


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-14B**  
 Vegetation Cover Impacts  
 SF I-5 Alternative  
 Tacoma Dome Link Extension



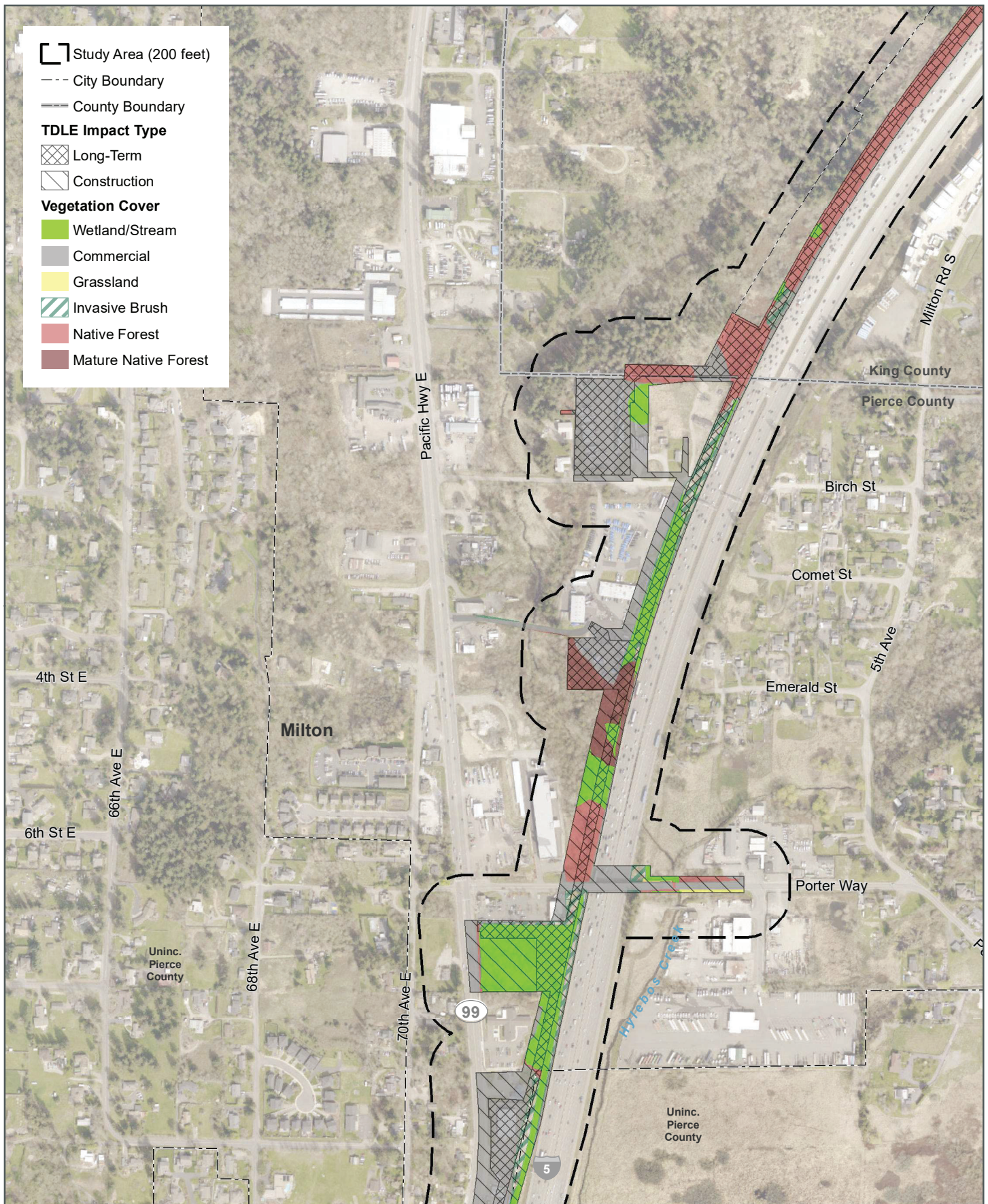


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-14C**  
Vegetation Cover Impacts  
SF I-5 Alternative  
*Tacoma Dome Link Extension*



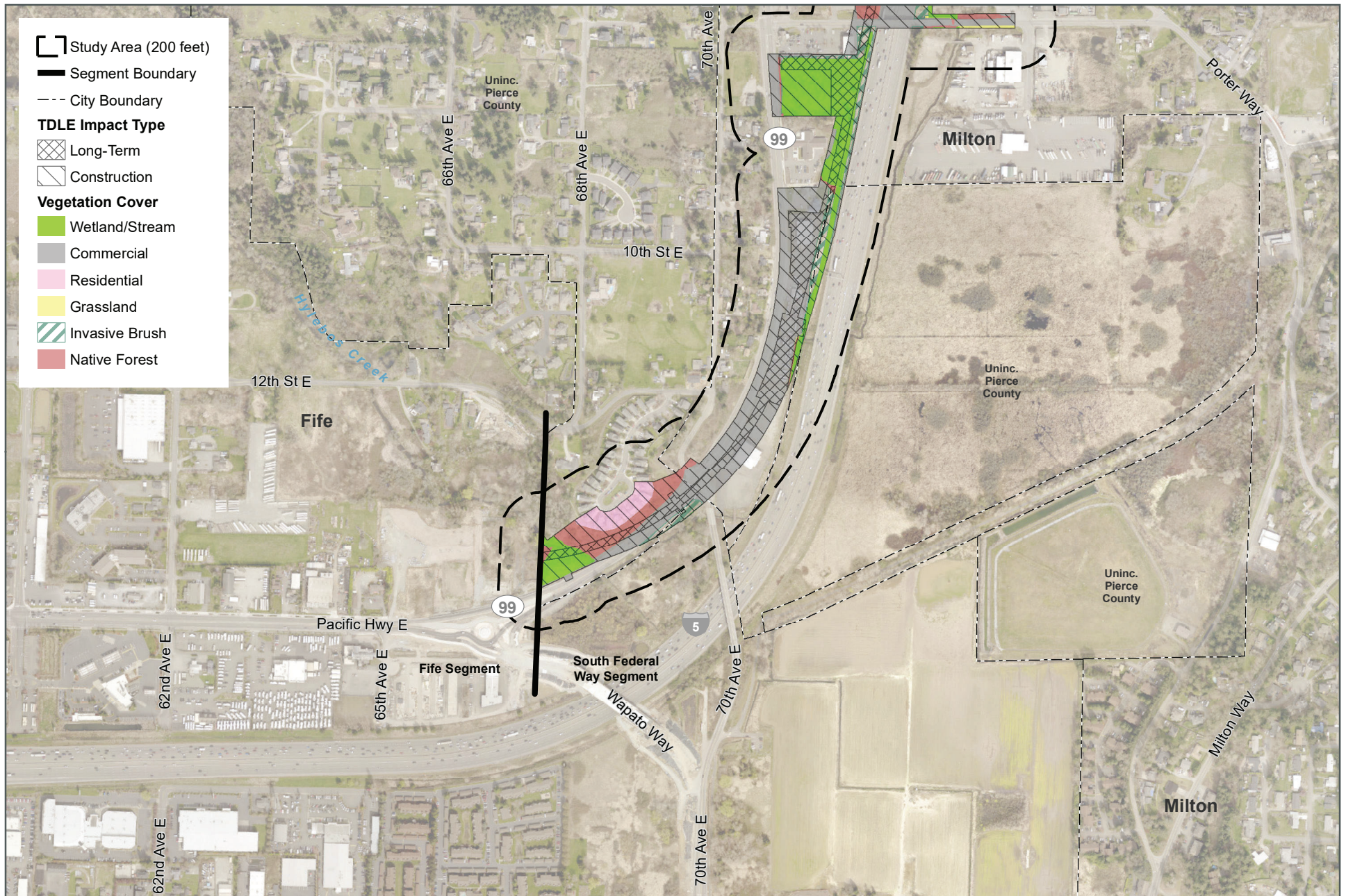


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-14D**  
Vegetation Cover Impacts  
SF I-5 Alternative  
Tacoma Dome Link Extension



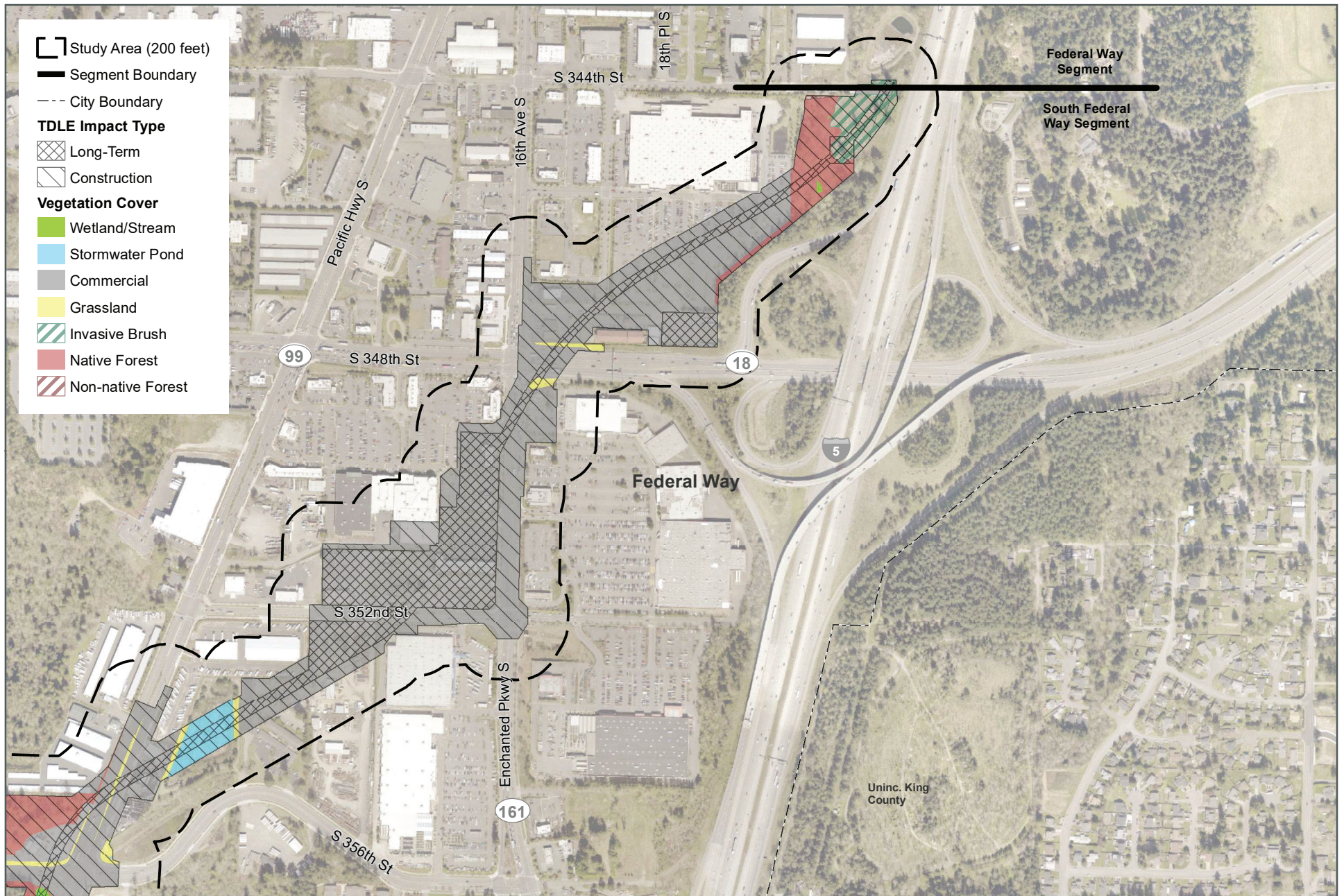


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

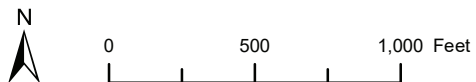


**FIGURE J4.4-14E**  
Vegetation Cover Impacts  
SF I-5 Alternative  
Tacoma Dome Link Extension



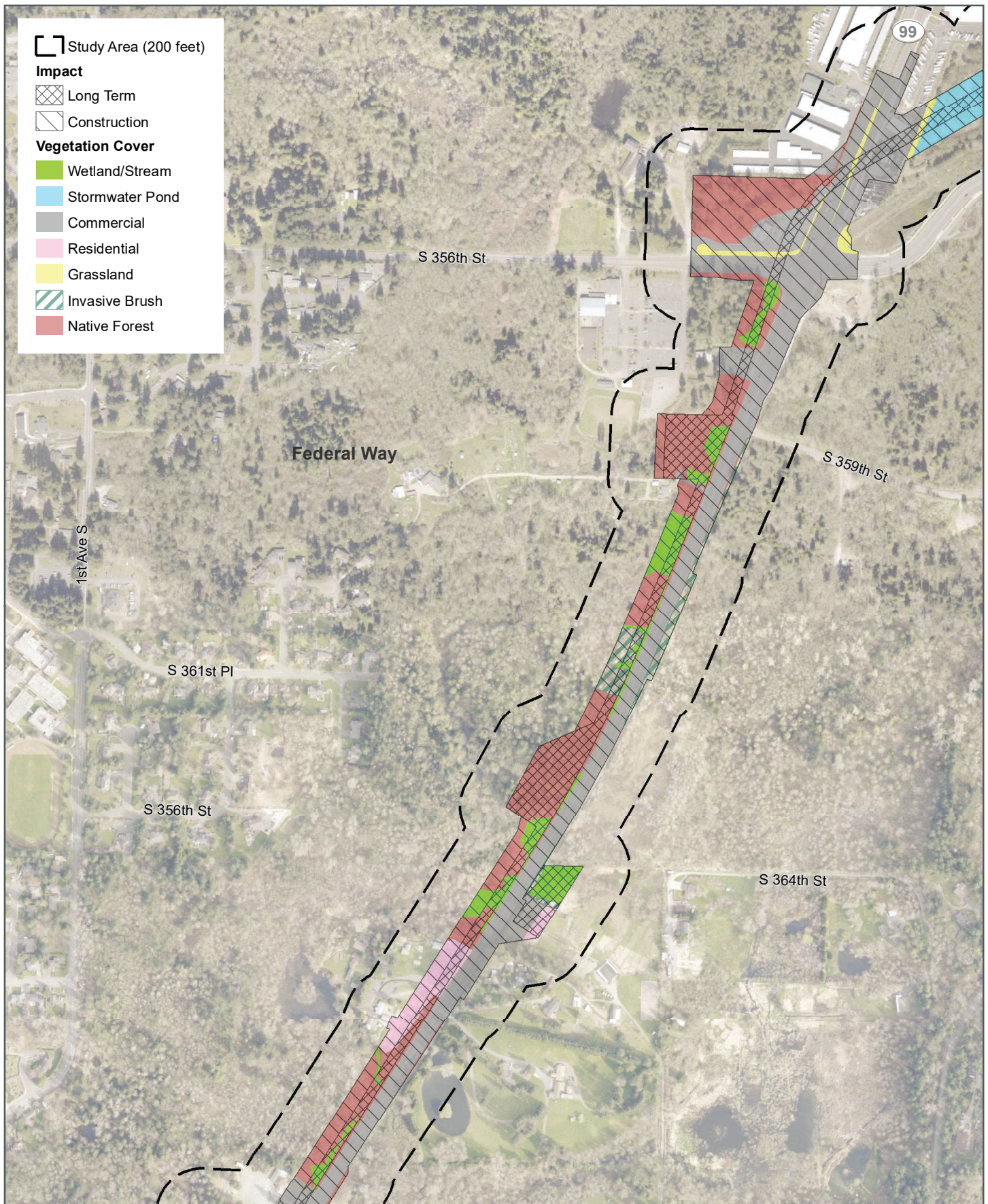


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-15A**  
 Vegetation Cover Impacts  
 SF 99-West Alternative  
 Tacoma Dome Link Extension



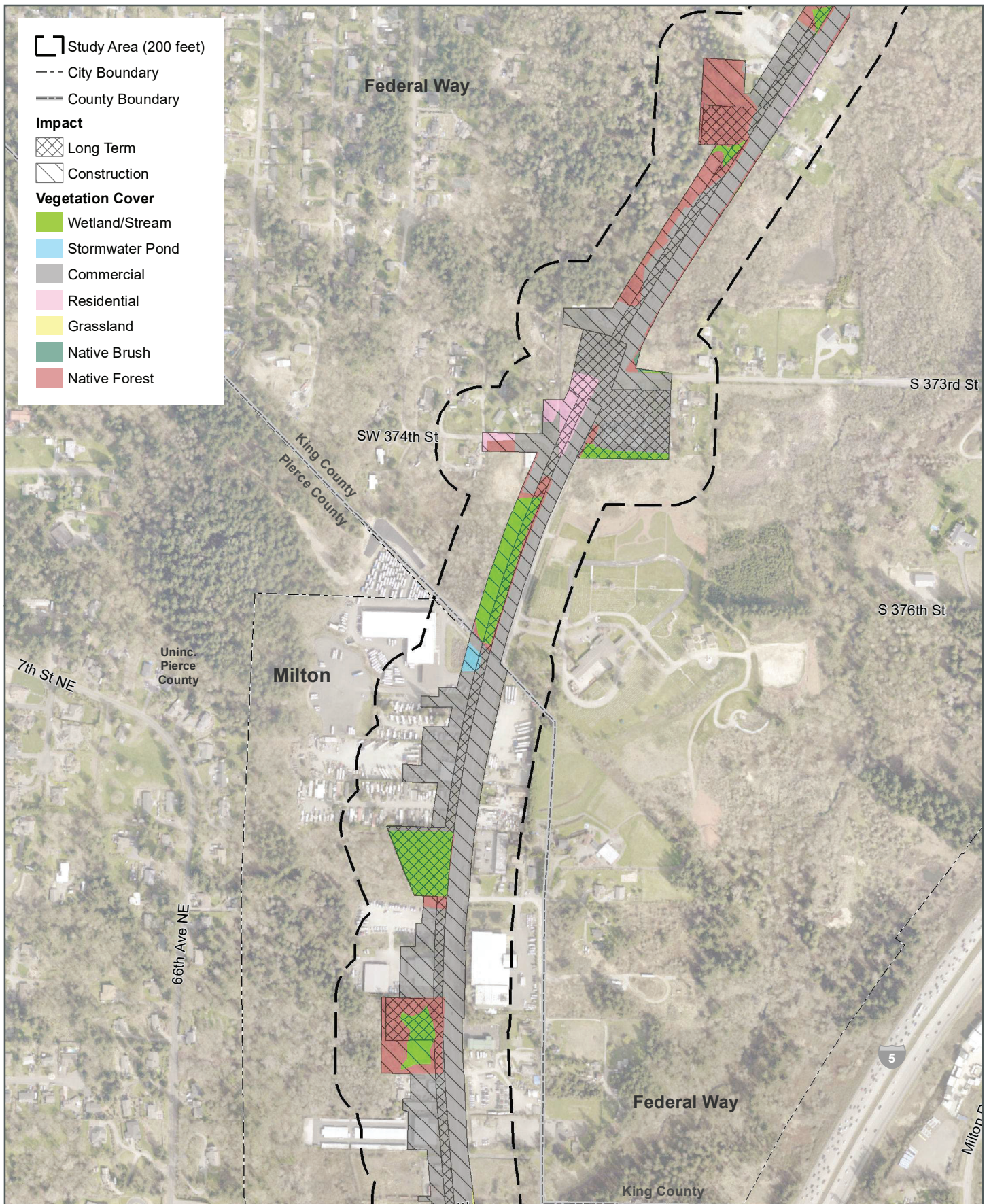


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-15B**  
Vegetation Cover Impacts  
SF 99-West Alternative  
Tacoma Dome Link Extension



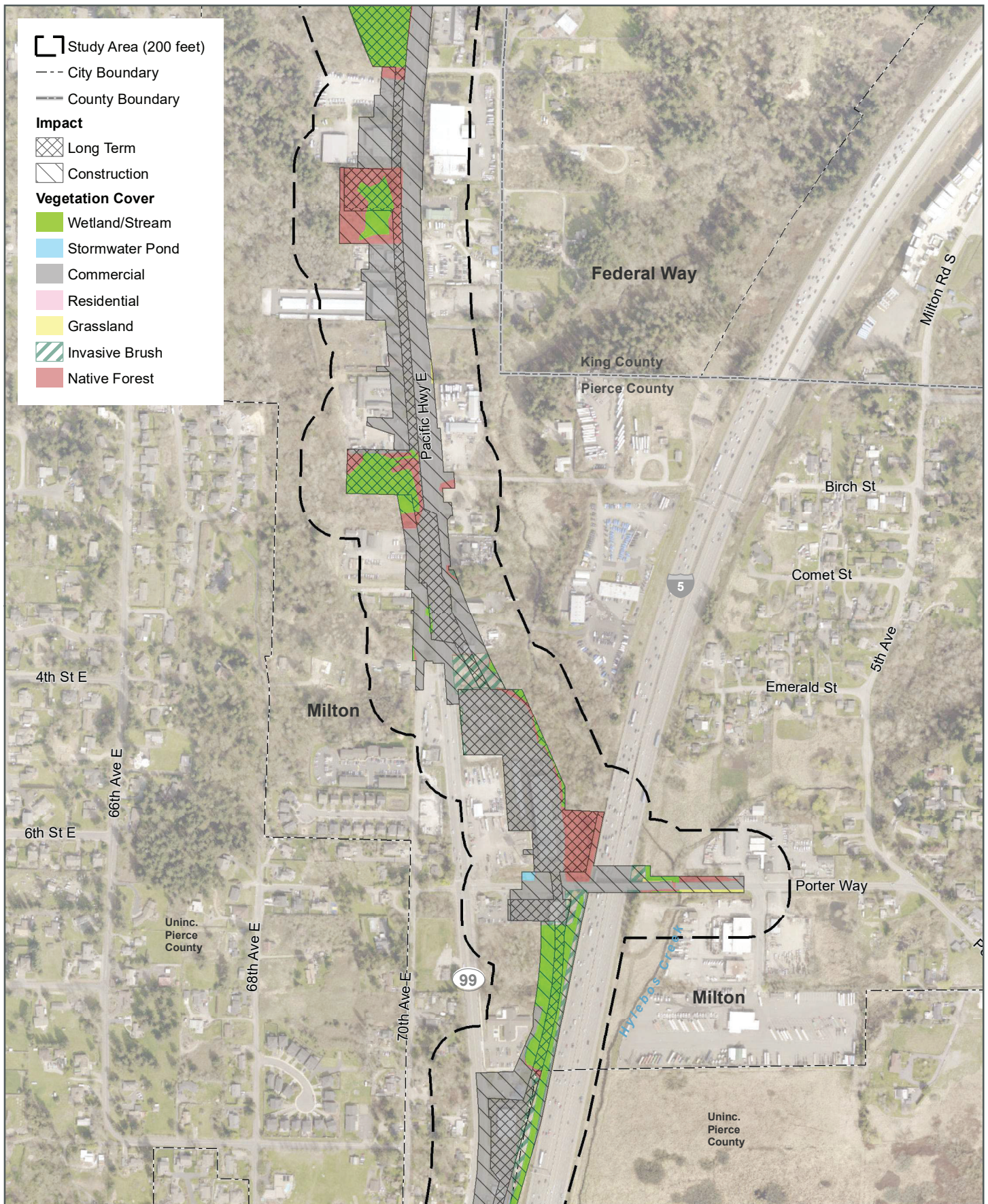


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-15C**  
Vegetation Cover Impacts  
SF 99-West Alternative  
Tacoma Dome Link Extension



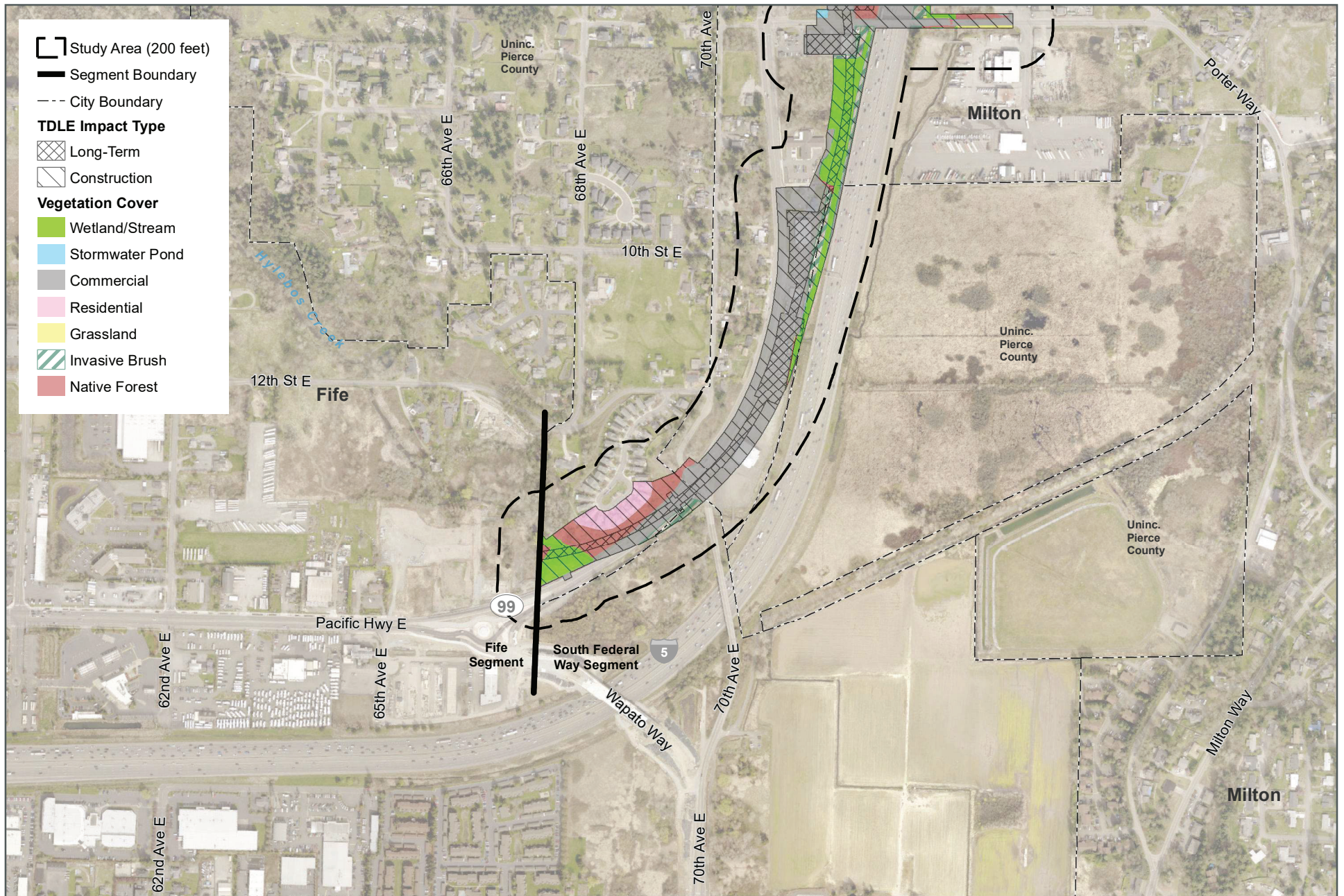


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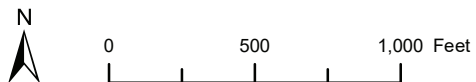


**FIGURE J4.4-15D**  
Vegetation Cover Impacts  
SF 99-West Alternative  
Tacoma Dome Link Extension



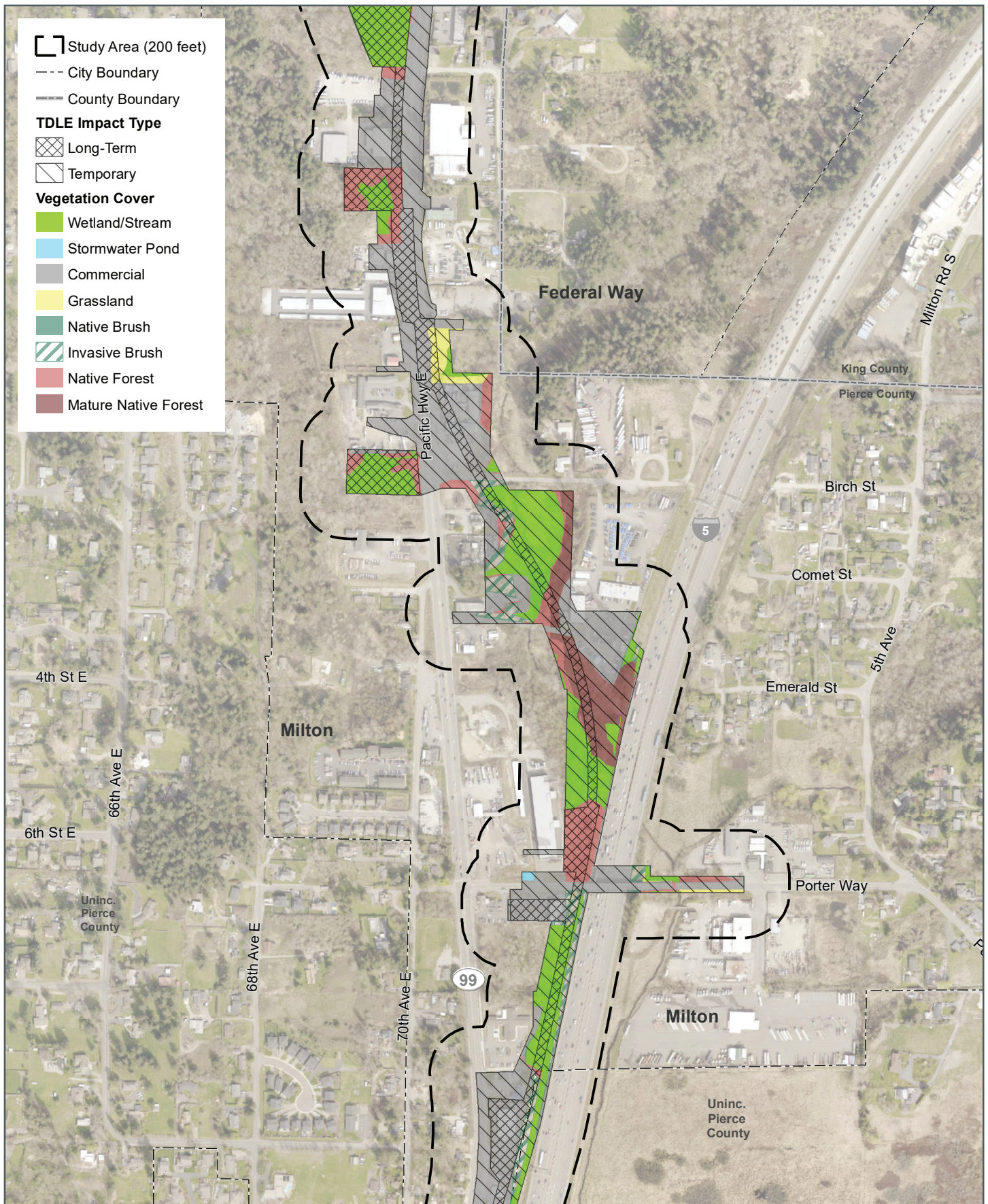


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-15E**  
Vegetation Cover Impacts  
SF 99-West Alternative  
Tacoma Dome Link Extension



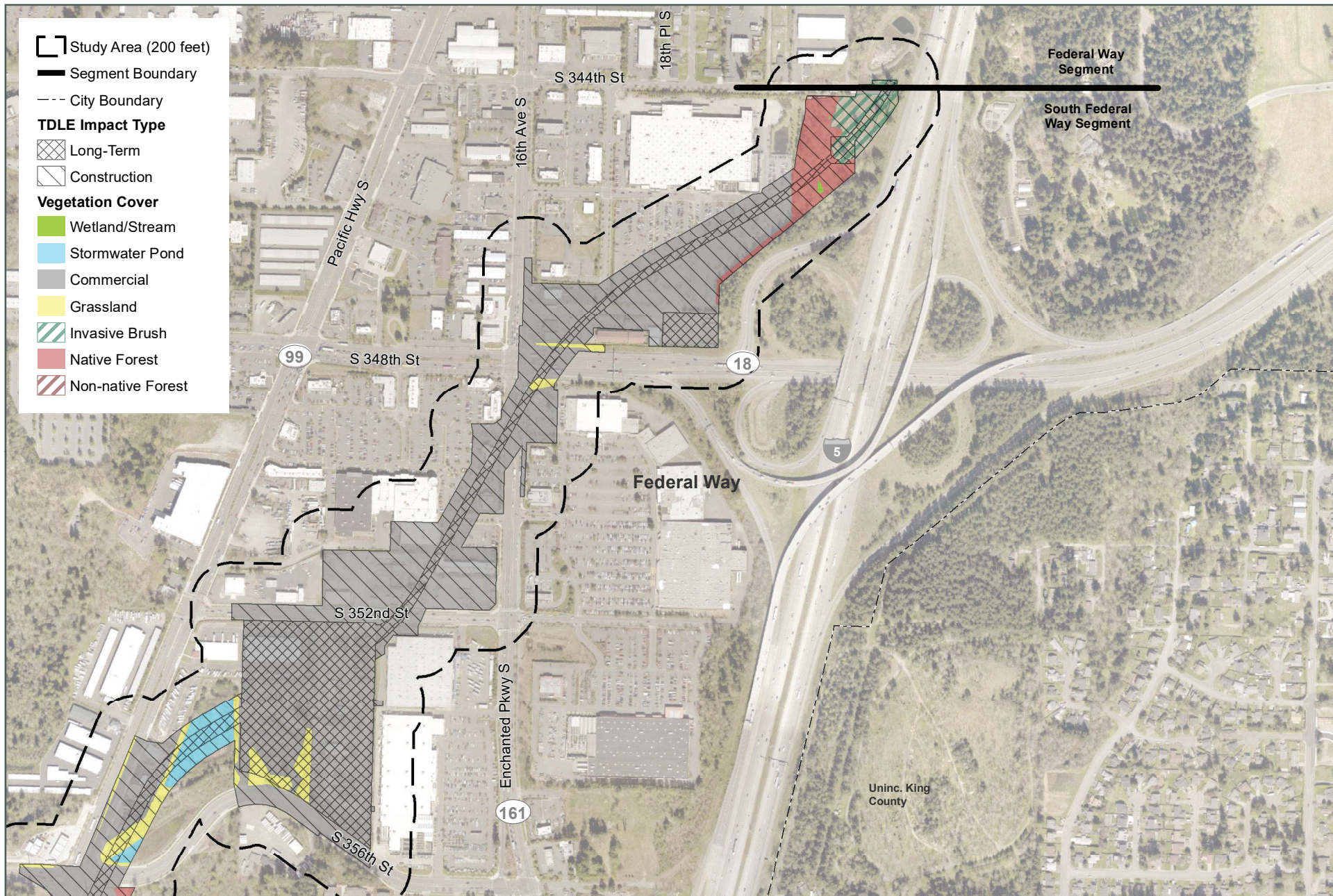


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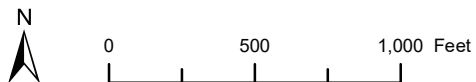


**FIGURE J4.4-15F**  
Vegetation Cover Impacts  
SF 99-West Alternative with Porter Way Design Option  
*Tacoma Dome Link Extension*



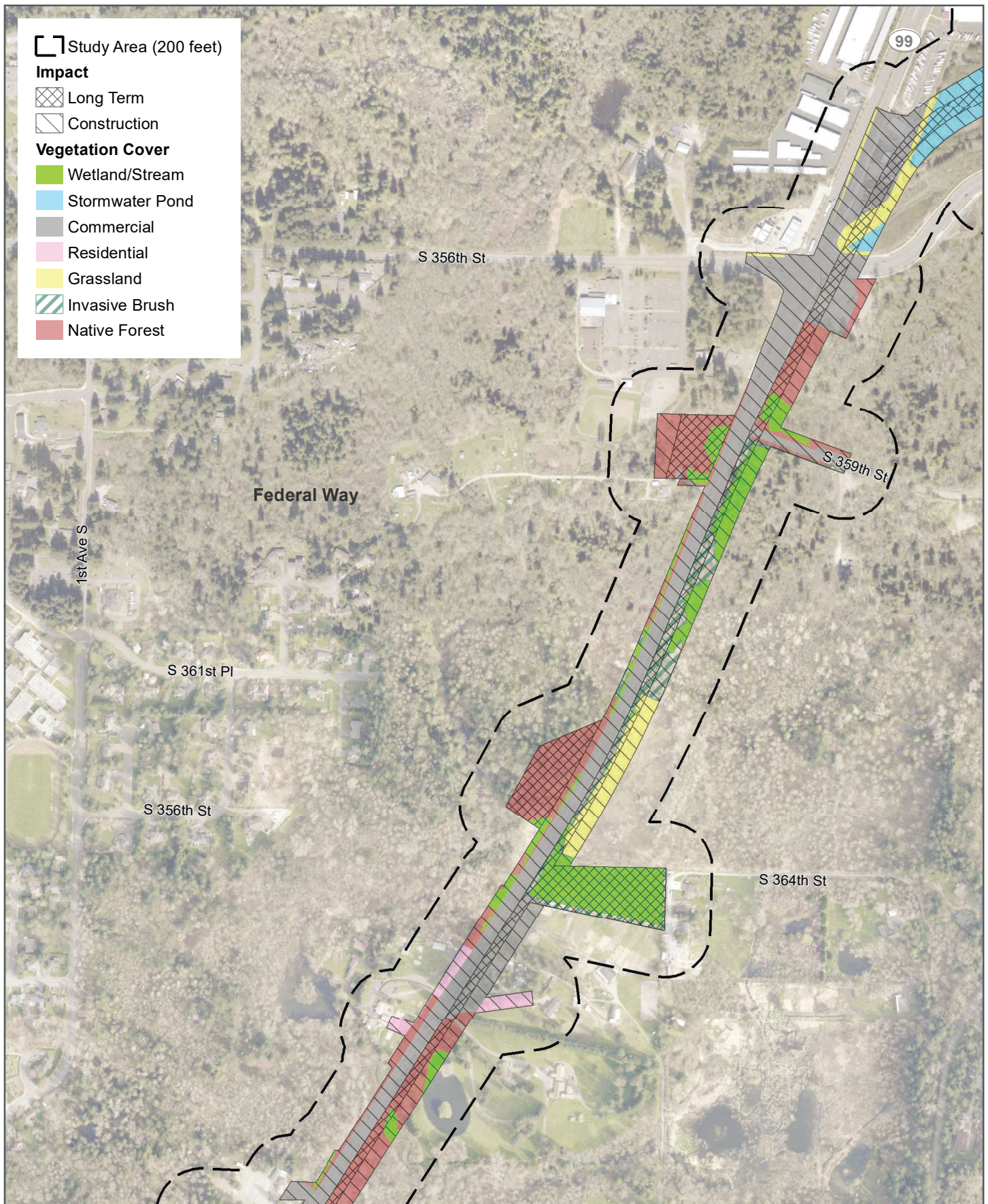


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-16A**  
Vegetation Cover Impacts  
SF 99-East Alternative  
Tacoma Dome Link Extension



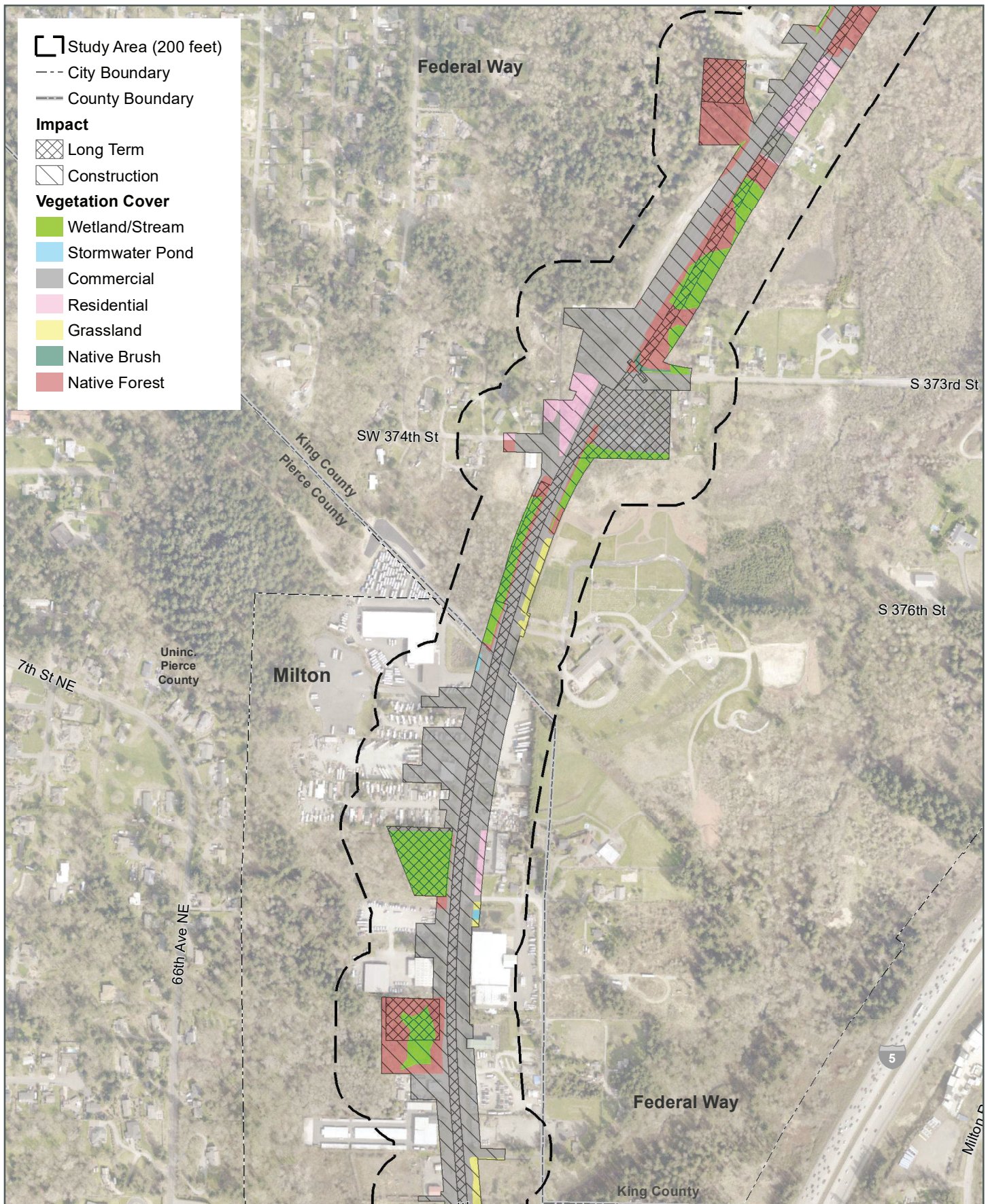


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-16B**  
 Vegetation Cover Impacts  
 SF 99-East Alternative  
 Tacoma Dome Link Extension



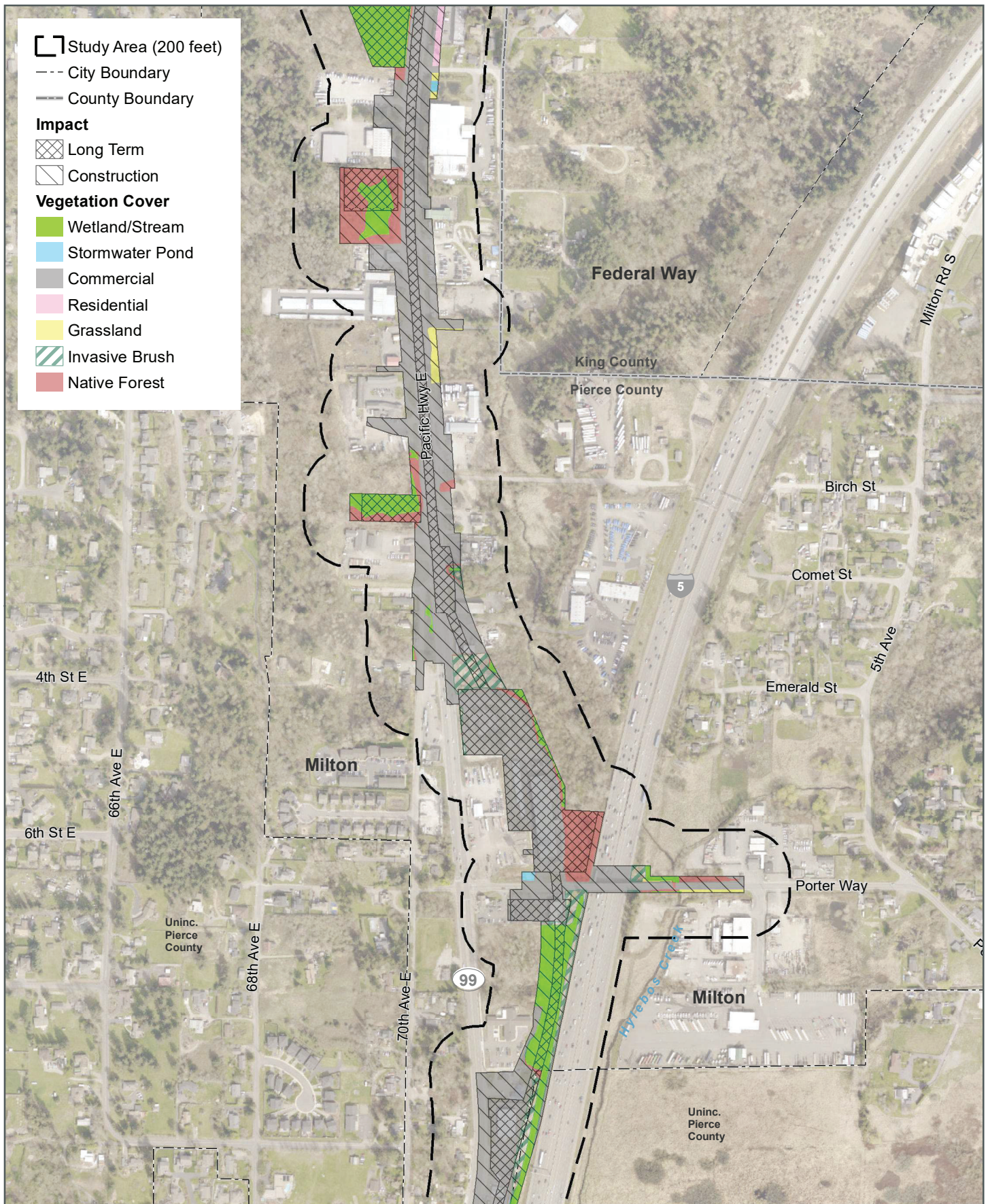


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-16C**  
 Vegetation Cover Impacts  
 SF 99-East Alternative  
 Tacoma Dome Link Extension



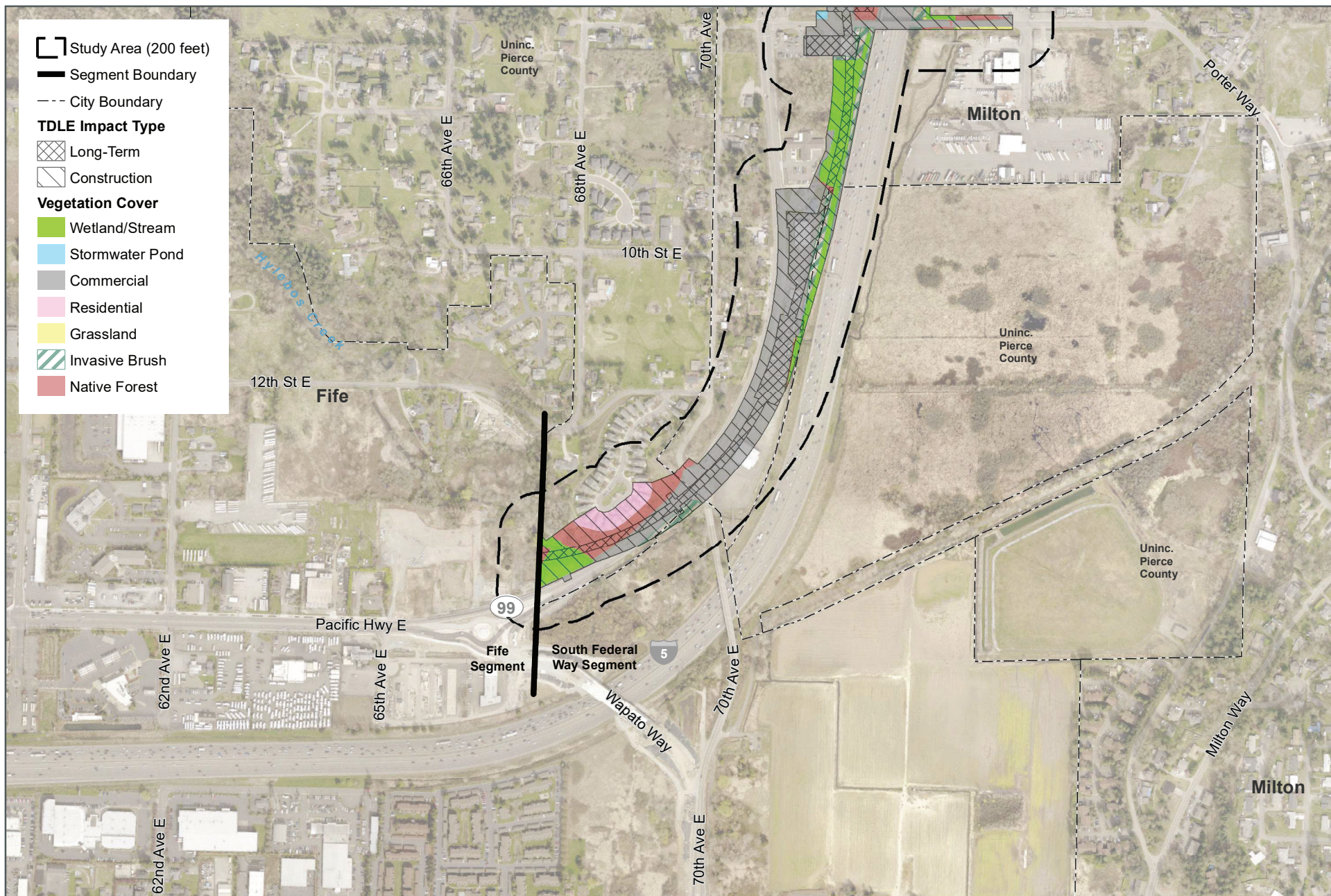


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-16D**  
Vegetation Cover Impacts  
SF 99-East Alternative  
Tacoma Dome Link Extension



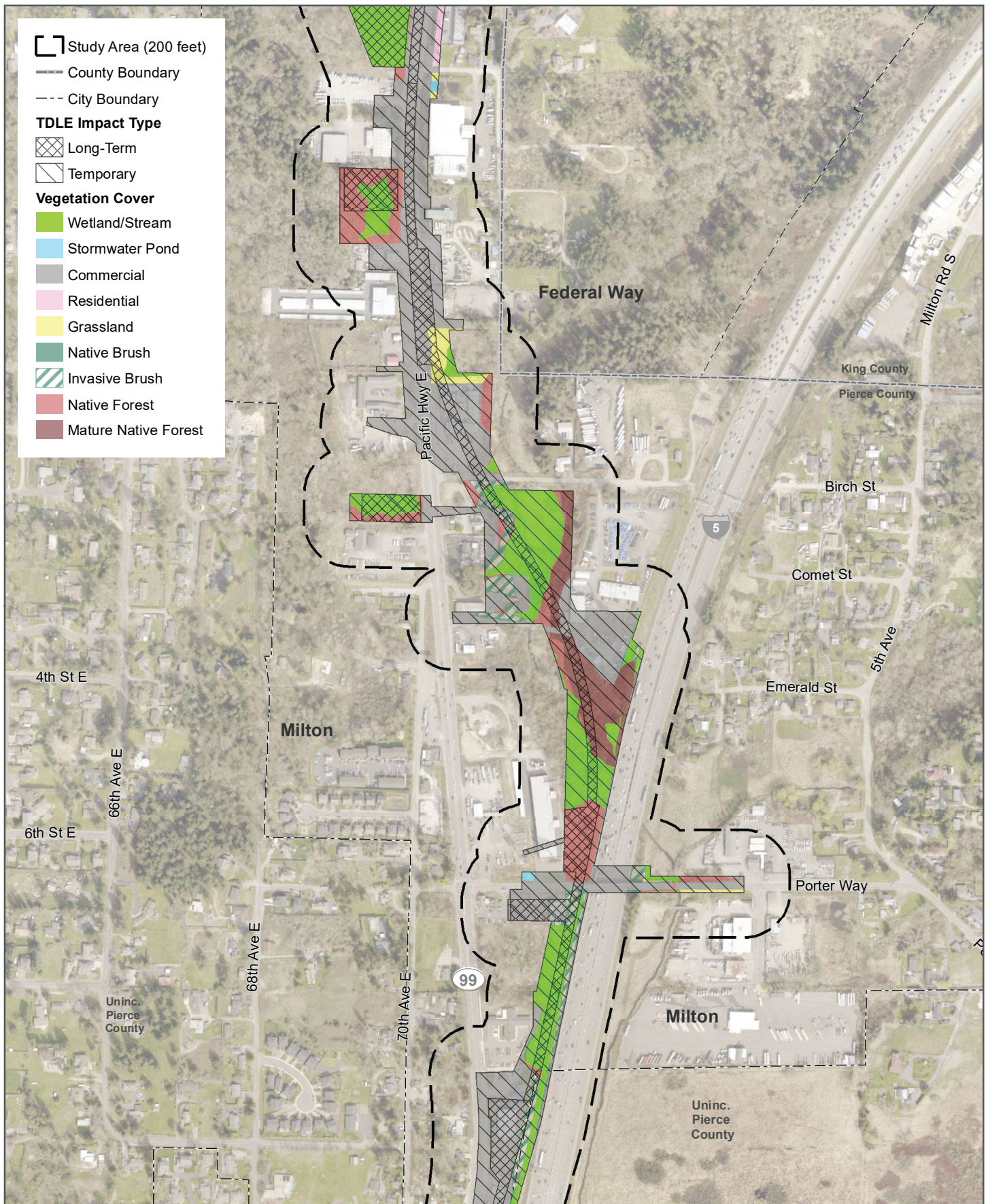


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-16E**  
Vegetation Cover Impacts  
SF 99-East Alternative  
*Tacoma Dome Link Extension*



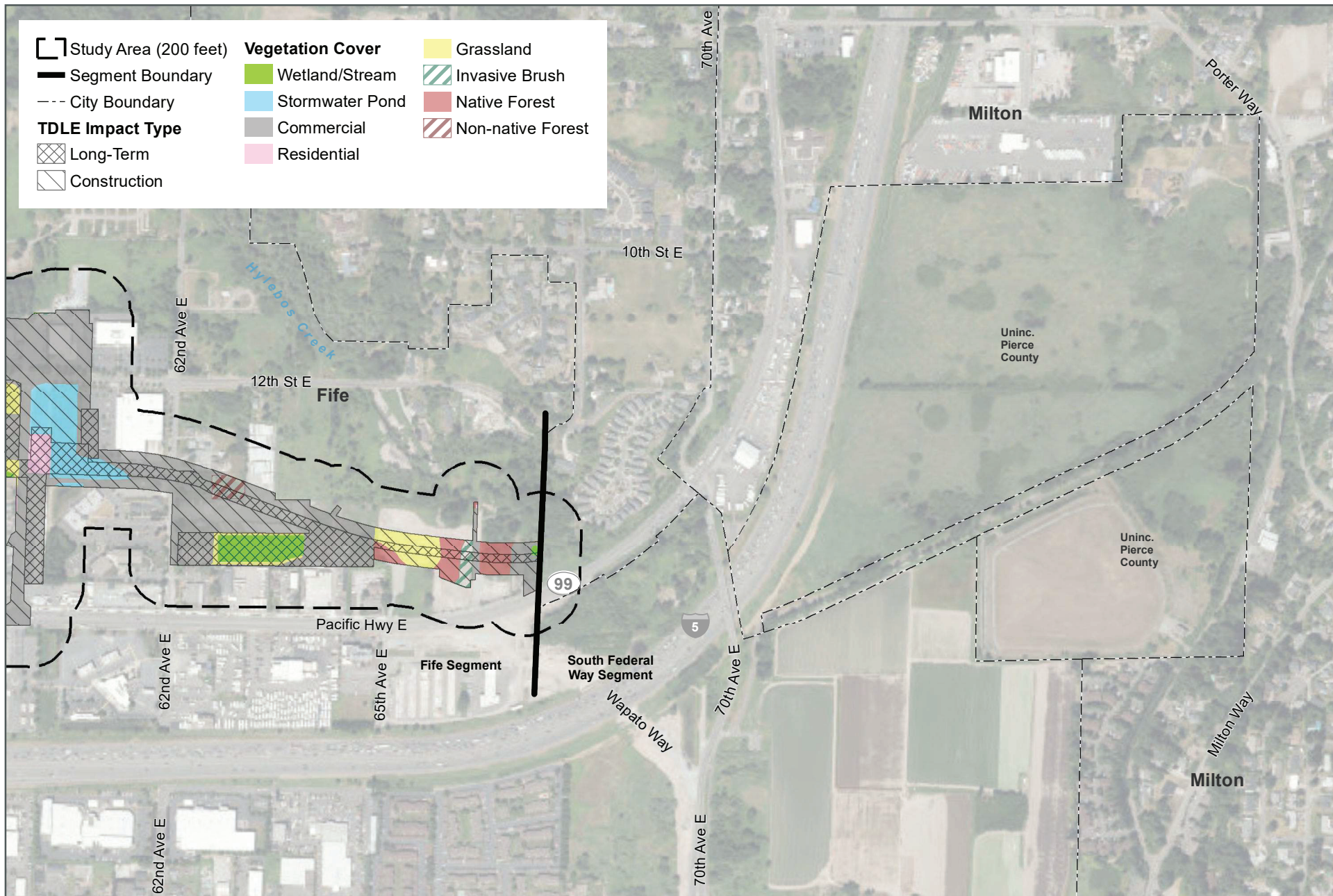


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-16F**  
Vegetation Cover Impacts  
SF 99-East with Porter Way Design Option  
*Tacoma Dome Link Extension*



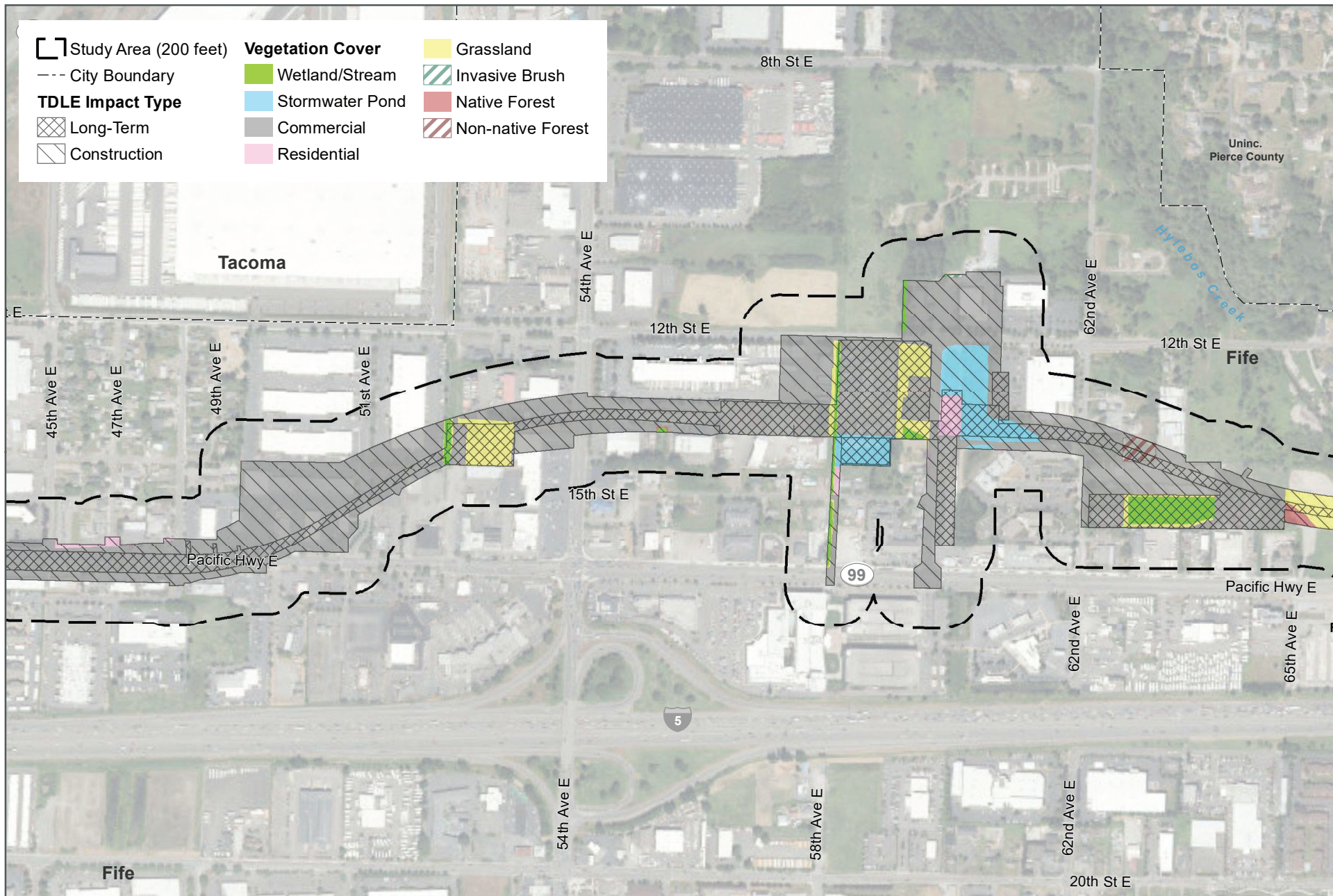


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-17A**  
Vegetation Cover Impacts  
Fife Pacific Highway Alternative  
*Tacoma Dome Link Extension*



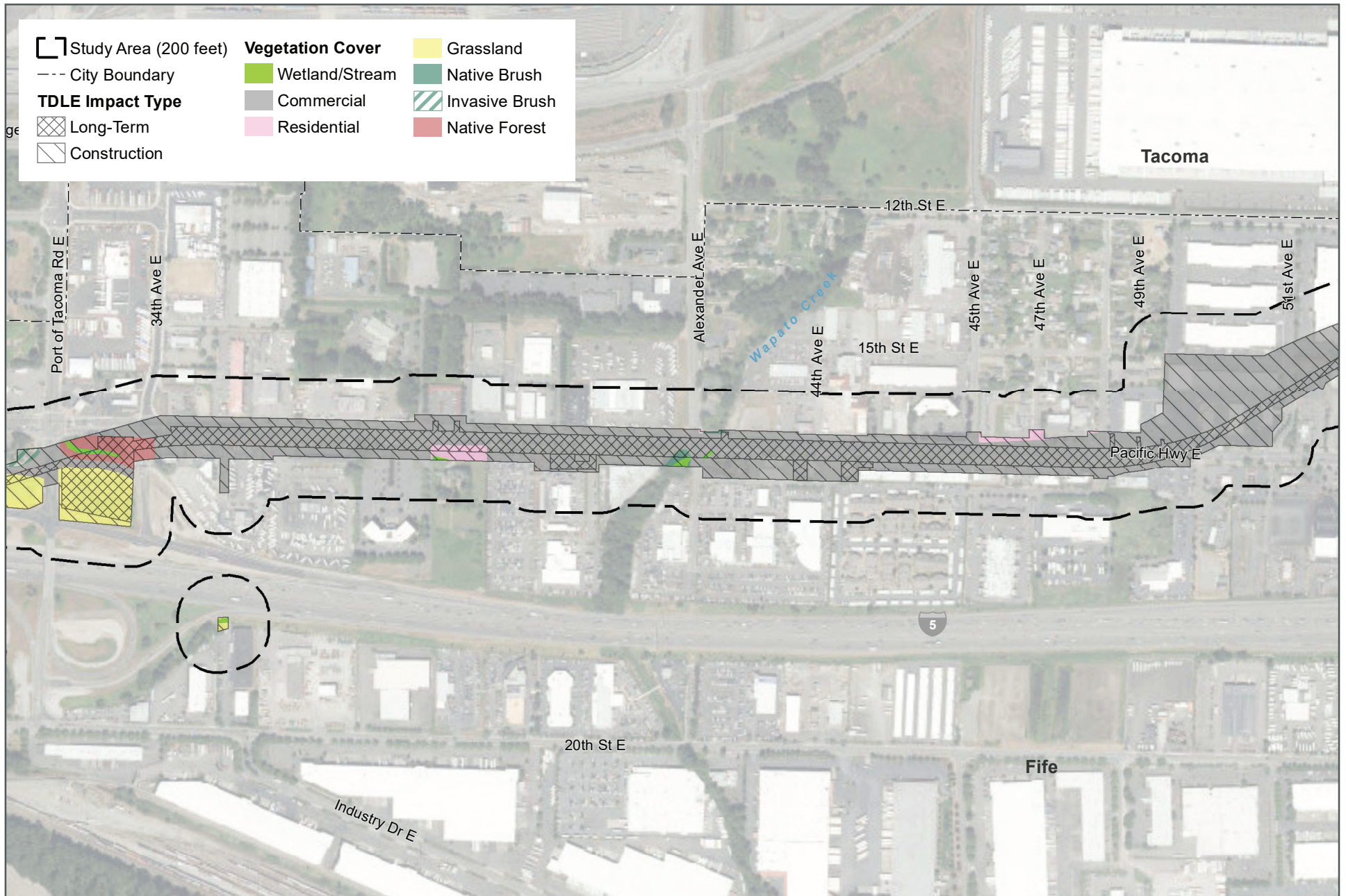


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

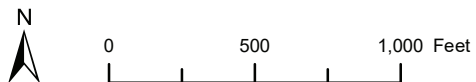


**FIGURE J4.4-17B**  
 Vegetation Cover Impacts  
 Fife Pacific Highway Alternative  
 Tacoma Dome Link Extension



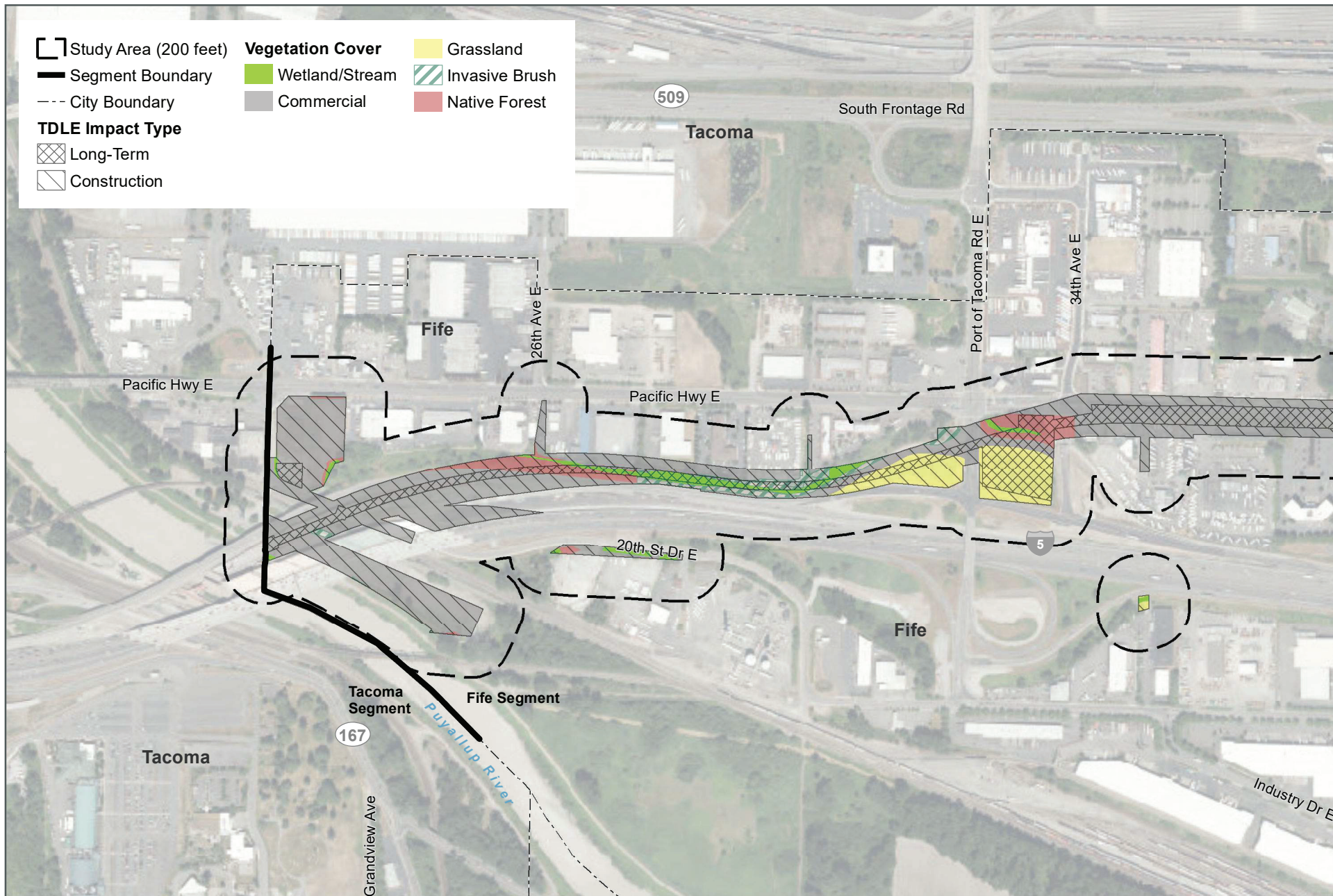


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-17C**  
Vegetation Cover Impacts  
Fife Pacific Highway Alternative  
*Tacoma Dome Link Extension*



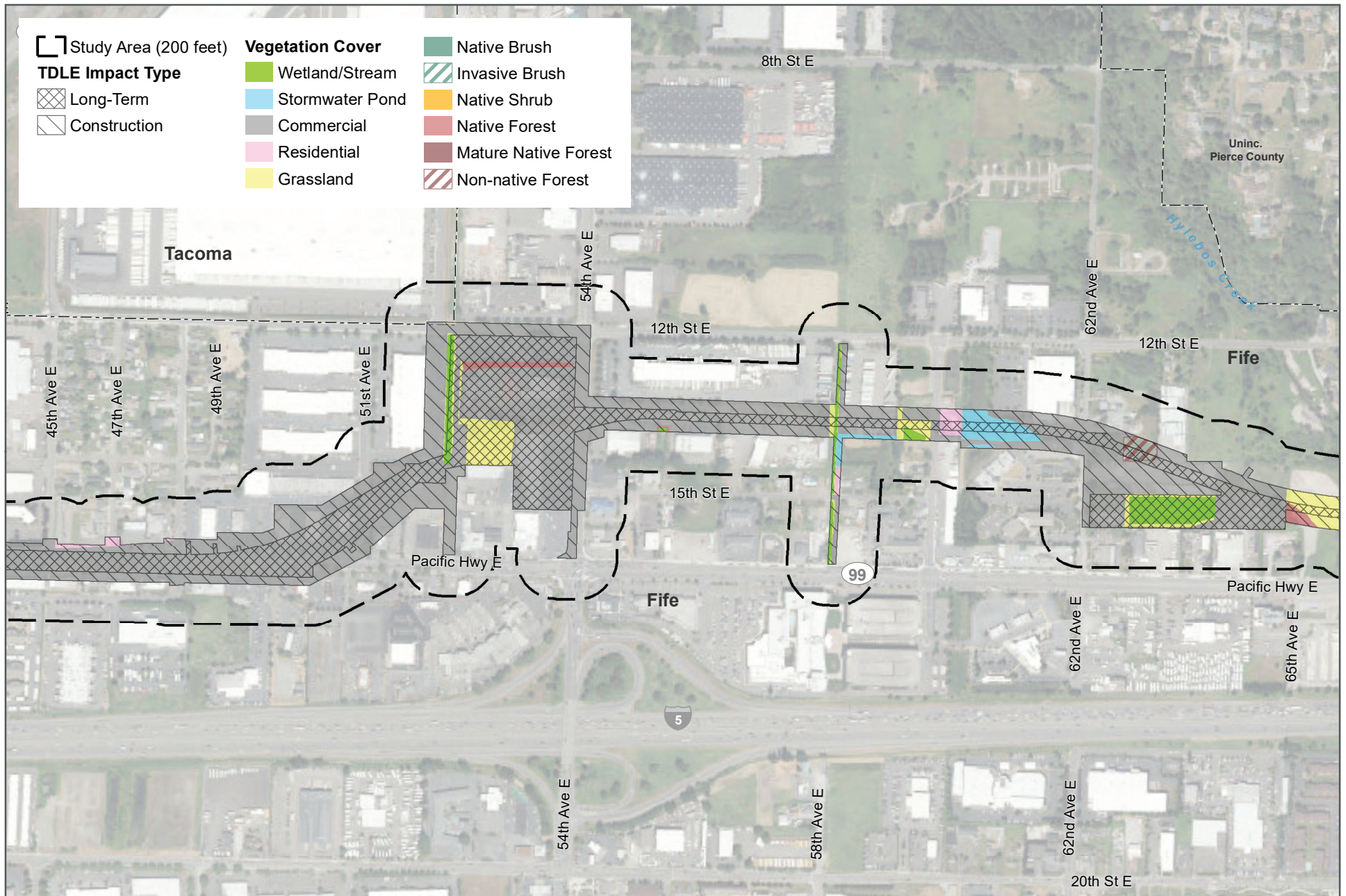


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

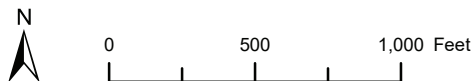


**FIGURE J4.4-17D**  
Vegetation Cover Impacts  
Fife Pacific Highway Alternative  
*Tacoma Dome Link Extension*



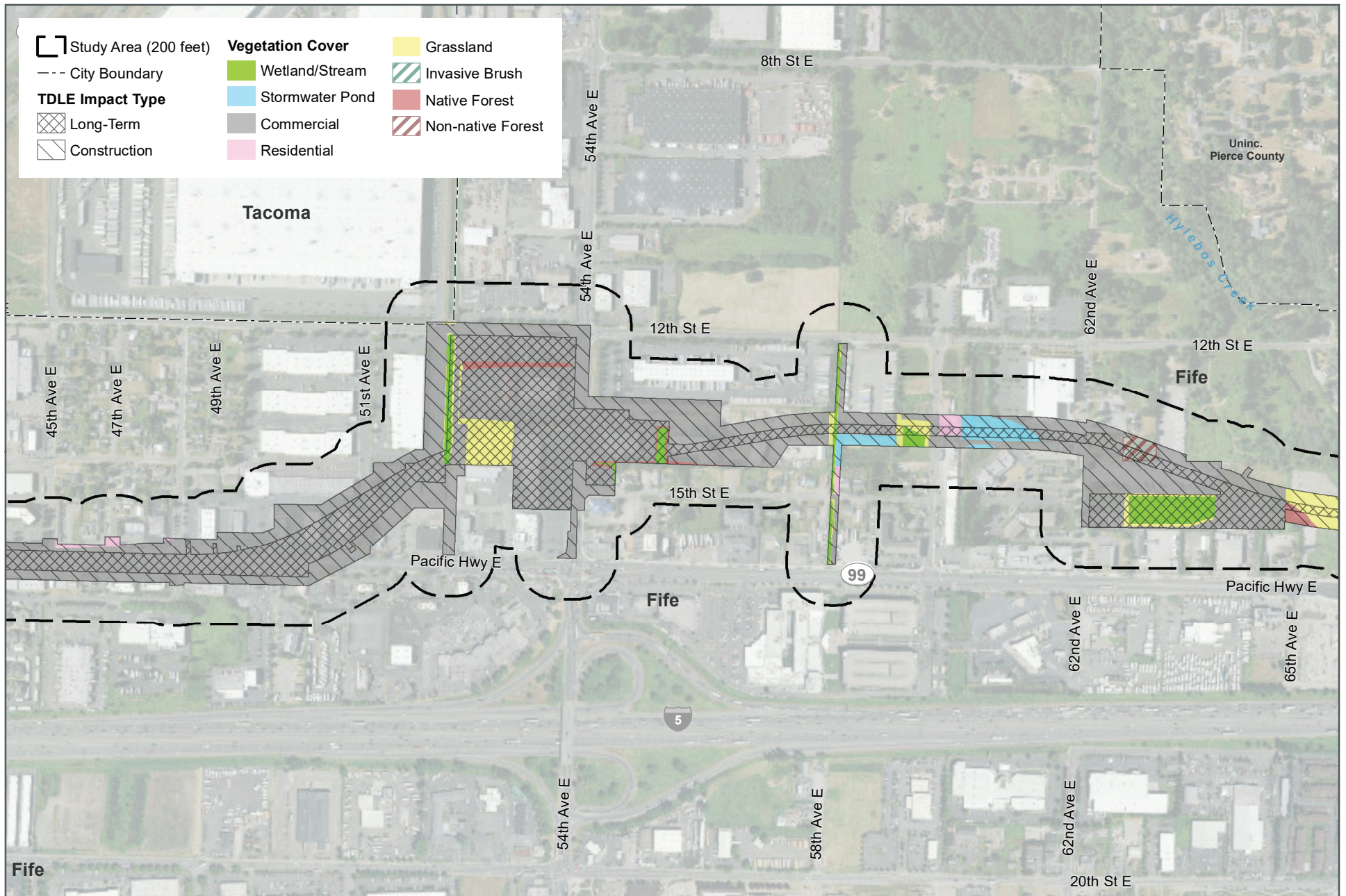


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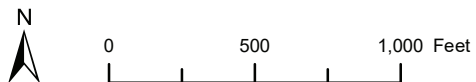


**FIGURE J4.4-17E**  
Vegetation Cover Impacts  
Fife Pacific Highway Alternative 54th Avenue Design Option  
Tacoma Dome Link Extension



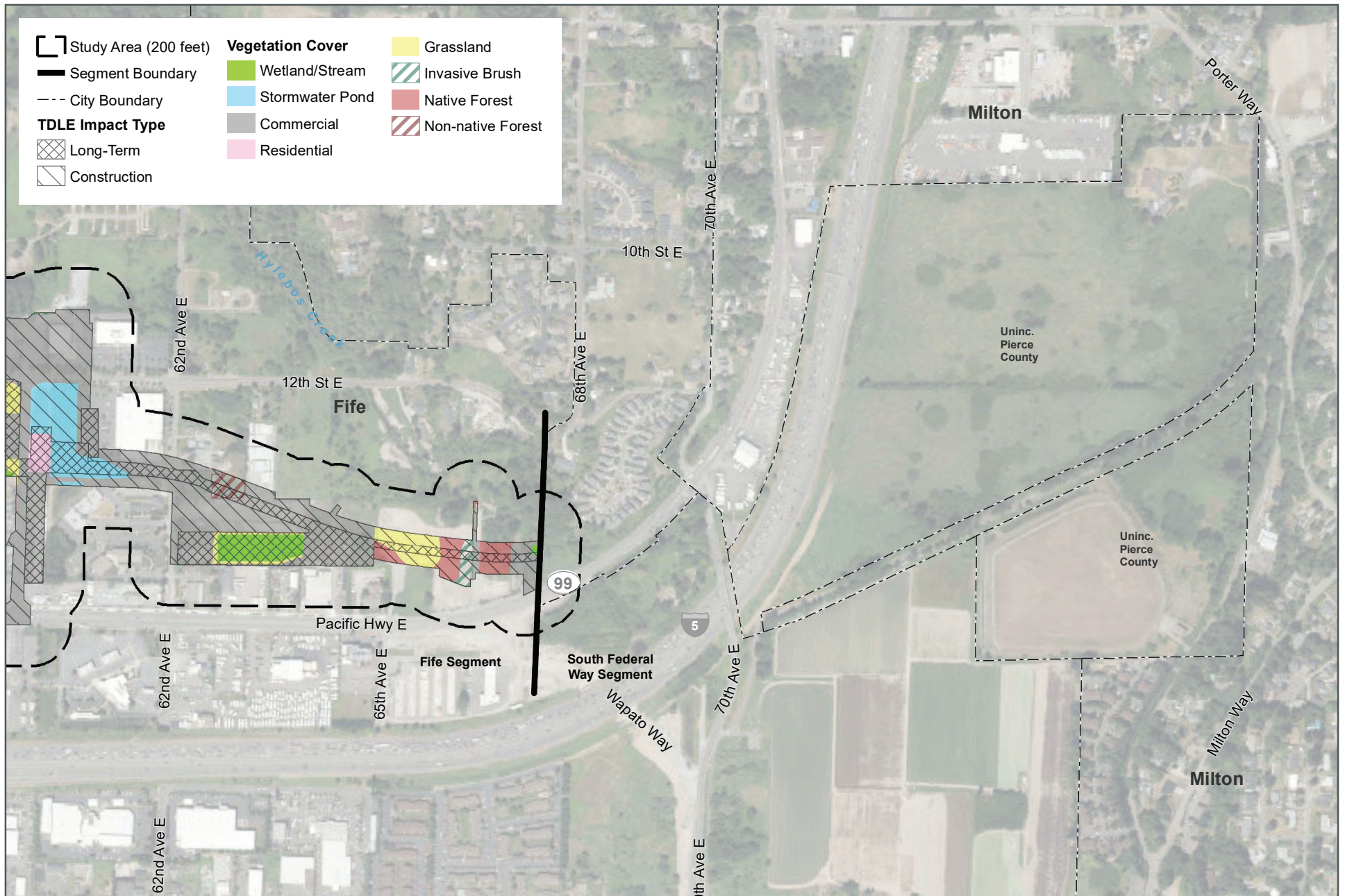


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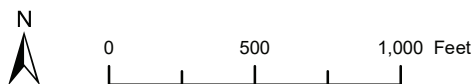


**FIGURE J4.4-17F**  
Vegetation Cover Impacts  
Fife Pacific Highway Alternative 54th Span Design Option  
*Tacoma Dome Link Extension*



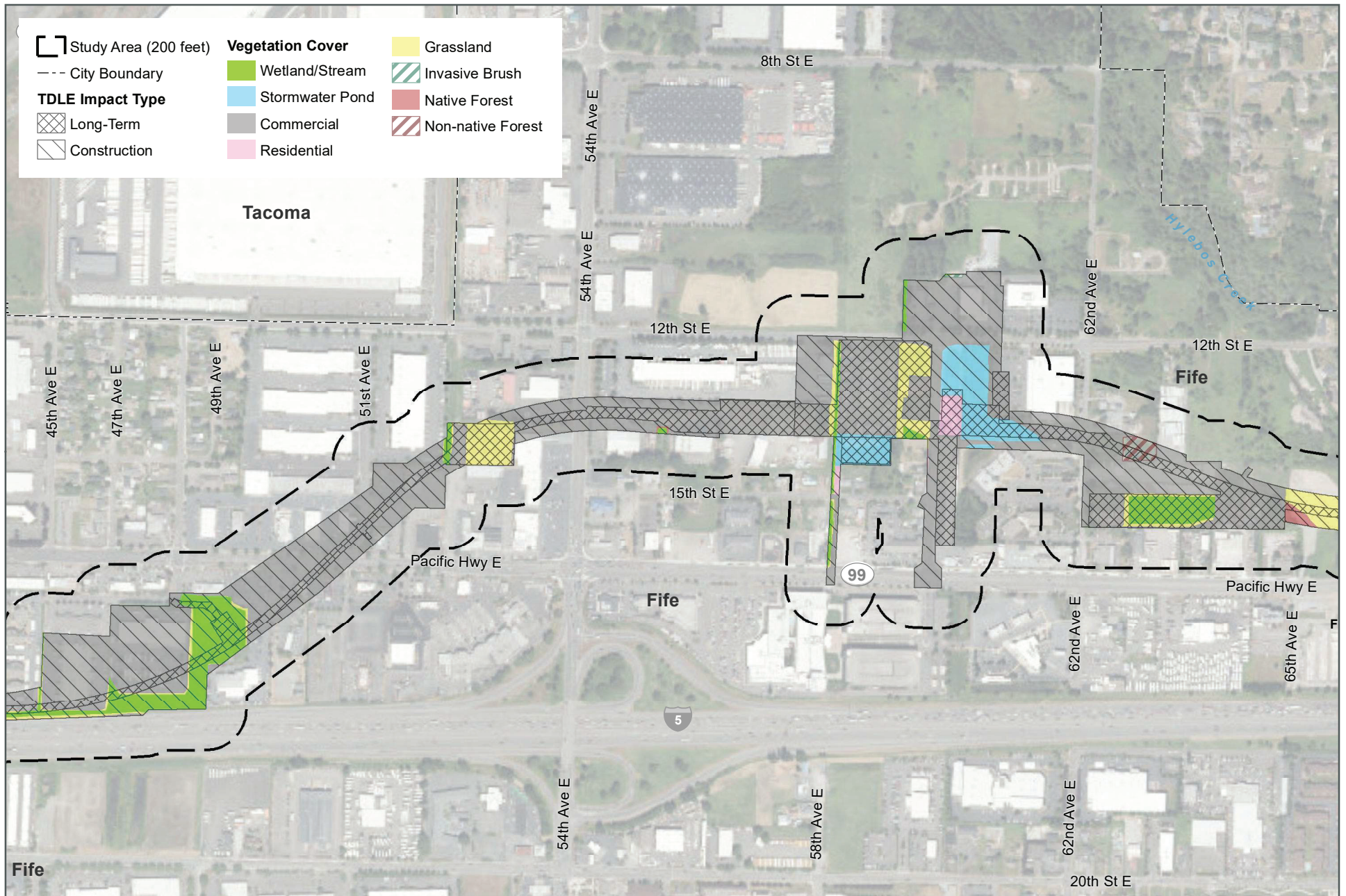


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

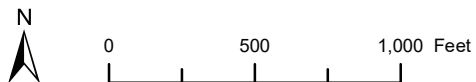


**FIGURE J4.4-18A**  
Vegetation Cover Impacts  
Fife I-5 Alternative  
*Tacoma Dome Link Extension*



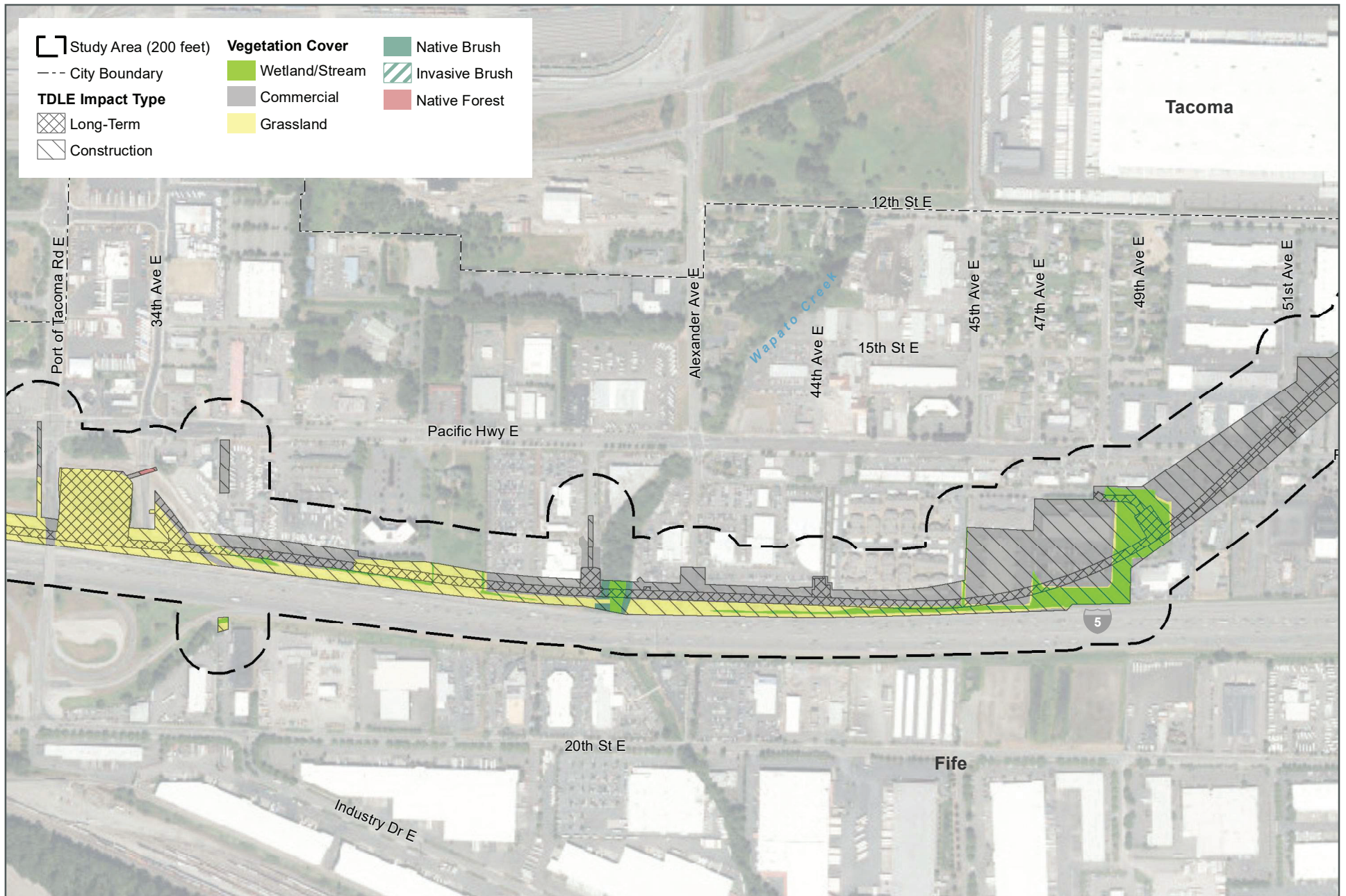


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

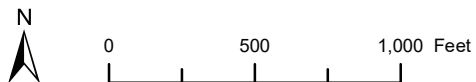


**FIGURE J4.4-18B**  
Vegetation Cover Impacts  
Fife I-5 Alternative  
*Tacoma Dome Link Extension*



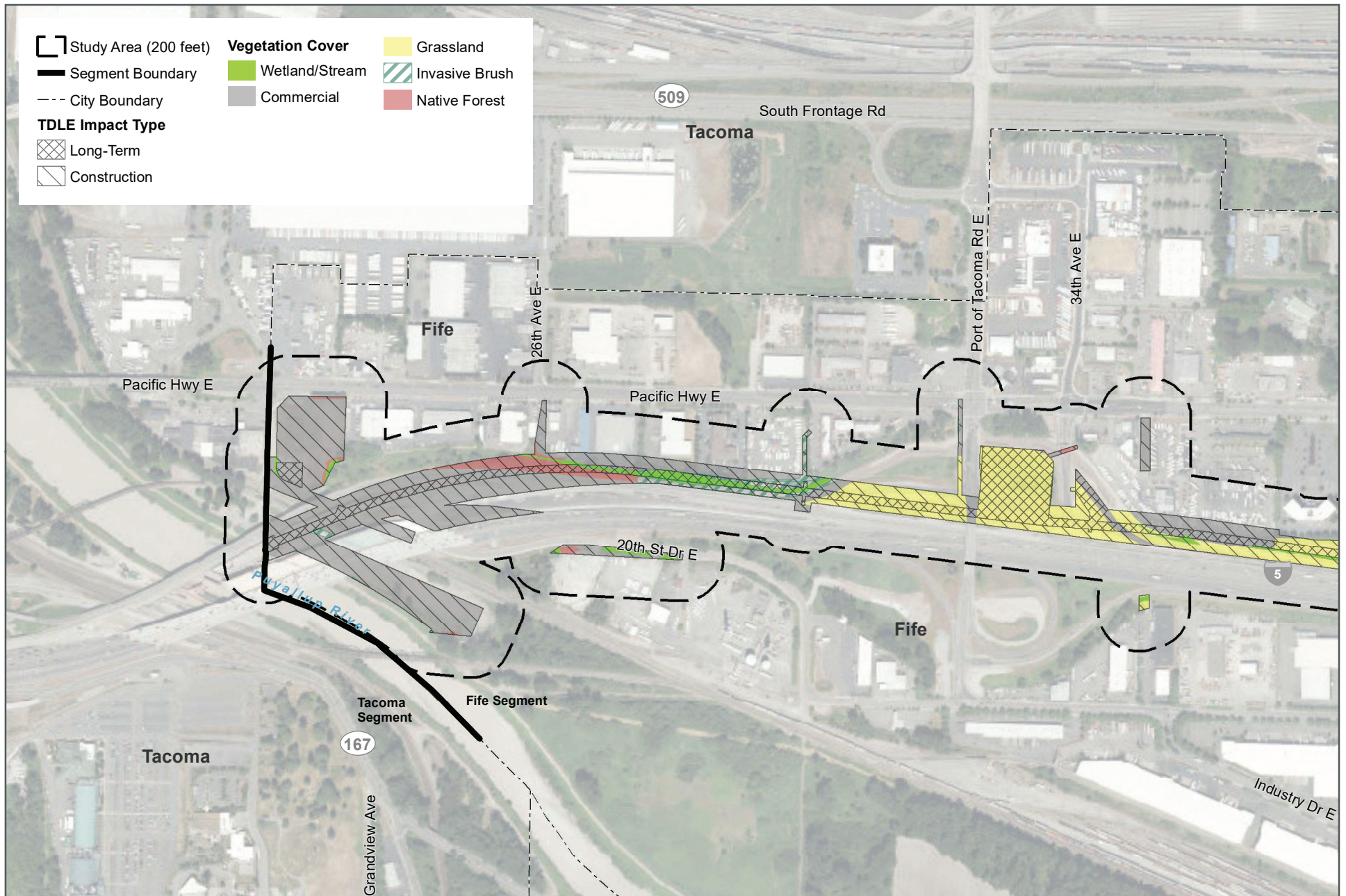


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

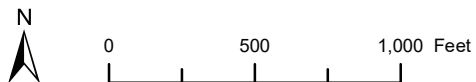


**FIGURE J4.4-18C**  
 Vegetation Cover Impacts  
 Fife I-5 Alternative  
 Tacoma Dome Link Extension



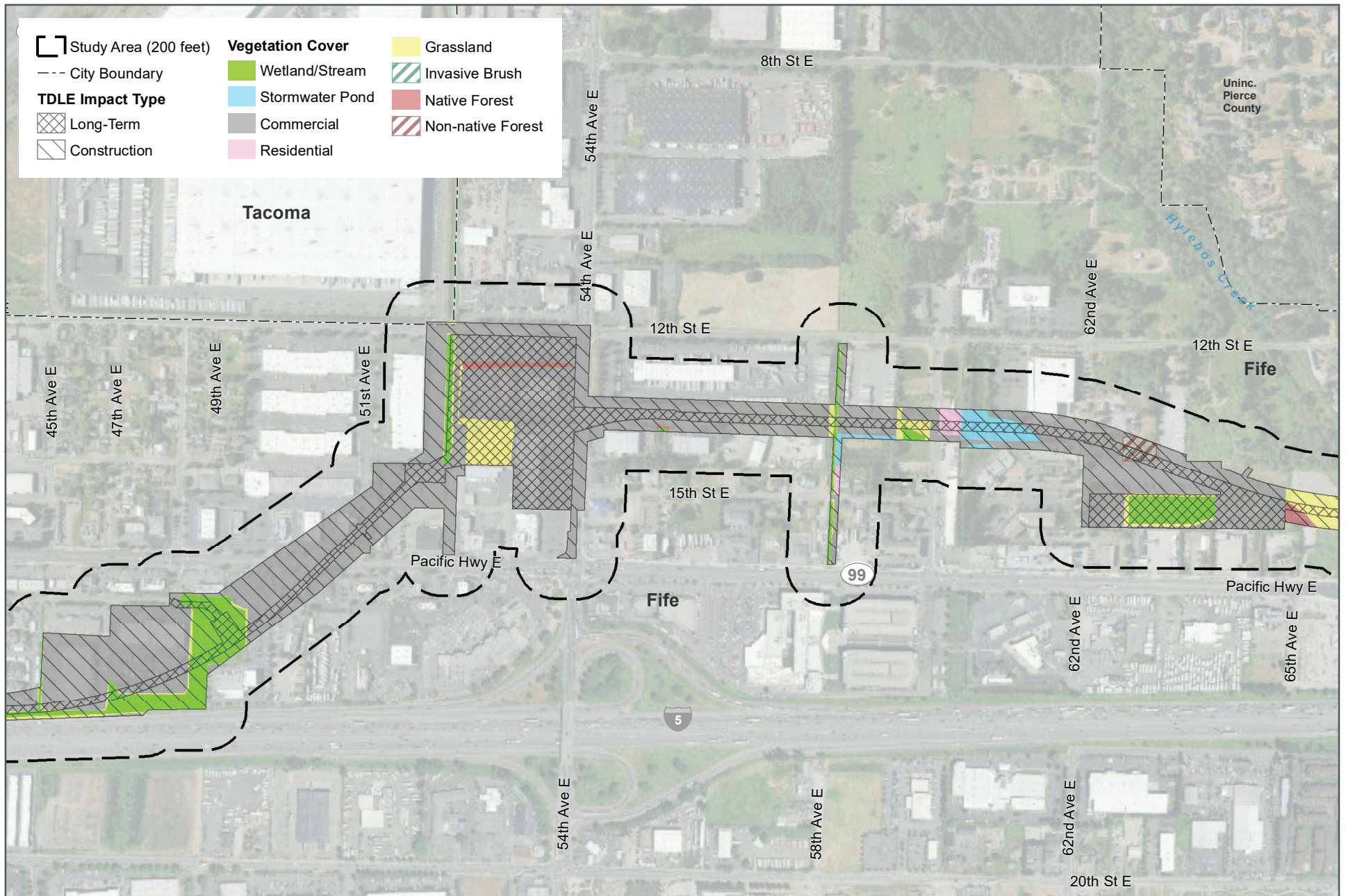


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

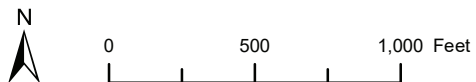


**FIGURE J4.4-18D**  
Vegetation Cover Impacts  
Fife I-5 Alternative  
*Tacoma Dome Link Extension*



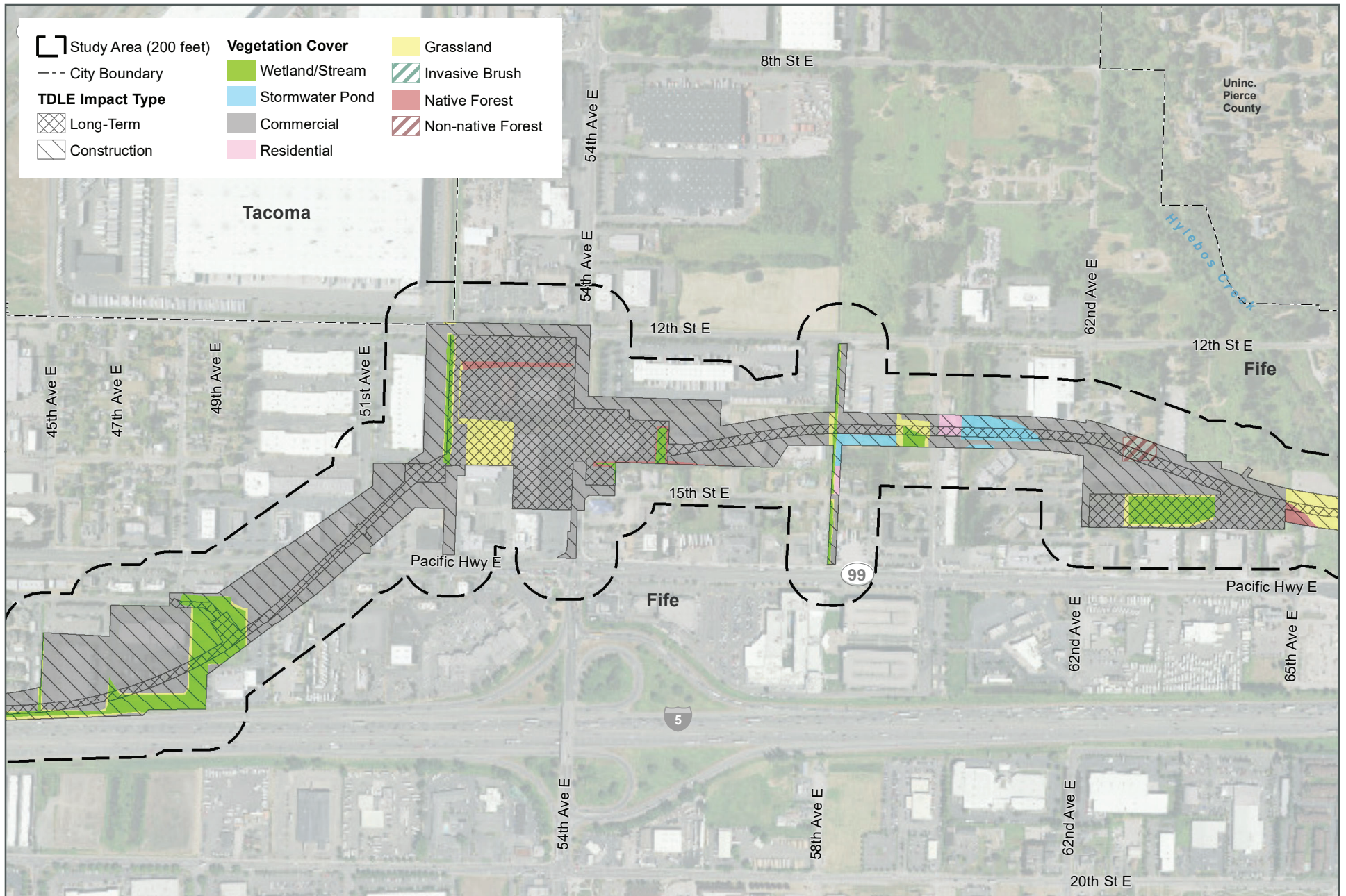


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

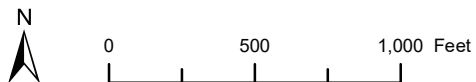


**FIGURE J4.4-18E**  
 Vegetation Cover Impacts  
 Fife I-5 Alternative 54th Avenue Design Option  
 Tacoma Dome Link Extension



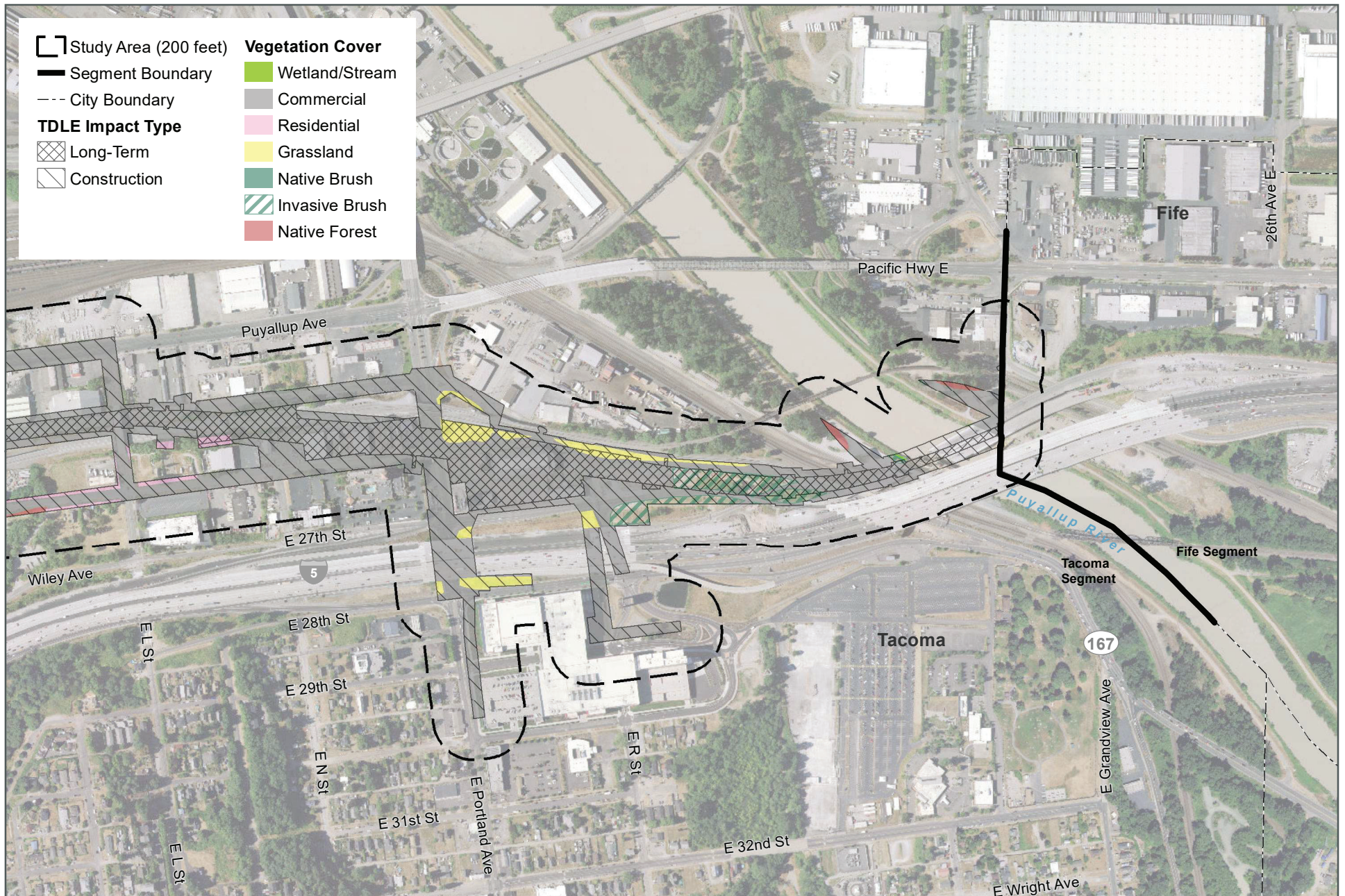


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-18F**  
Vegetation Cover Impacts  
Fife I-5 Alternative 54th Span Design Option  
*Tacoma Dome Link Extension*



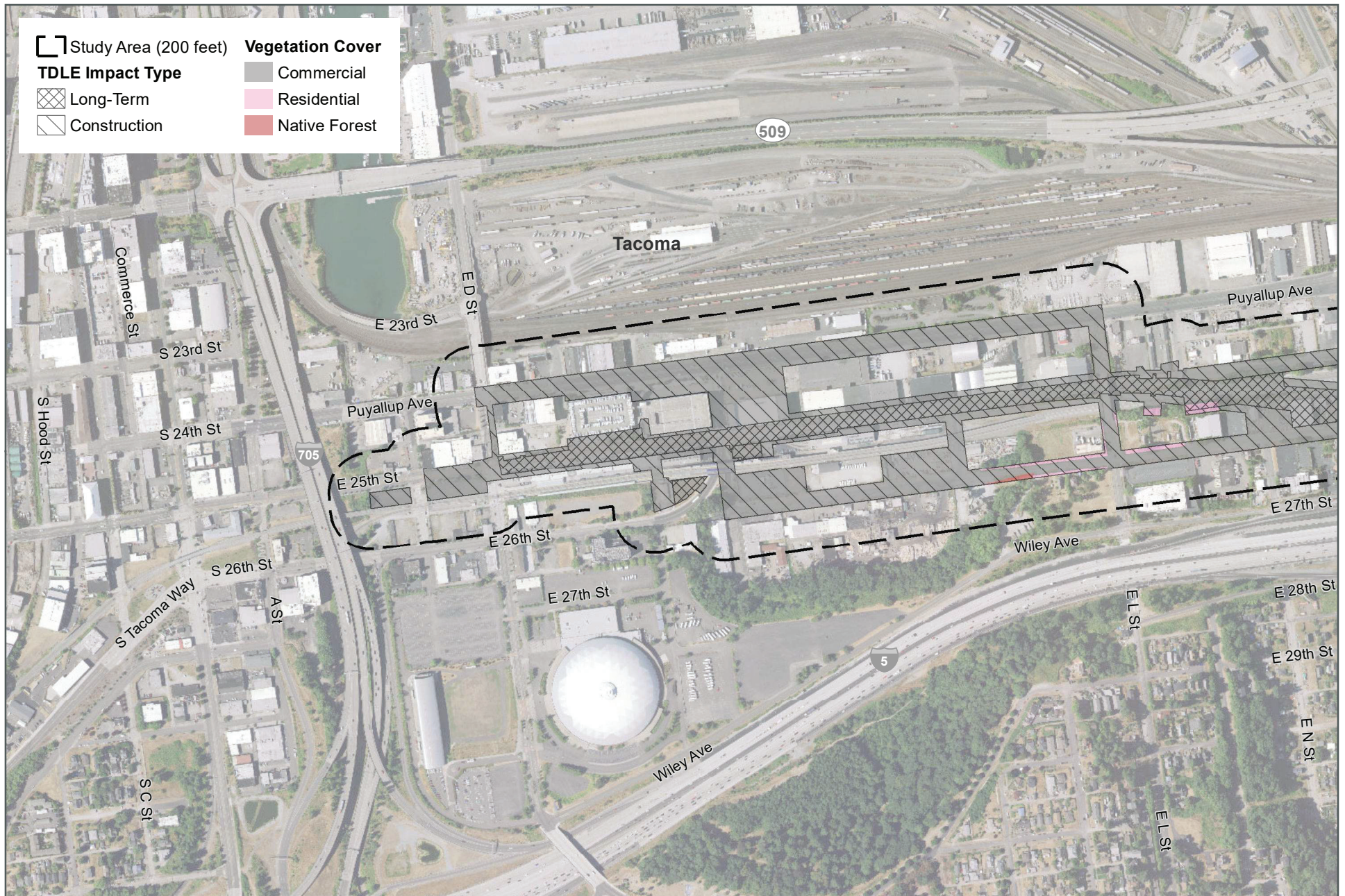


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-19A**  
 Vegetation Cover Impacts  
 Preferred Tacoma 25th Street-West Alternative  
 Tacoma Dome Link Extension



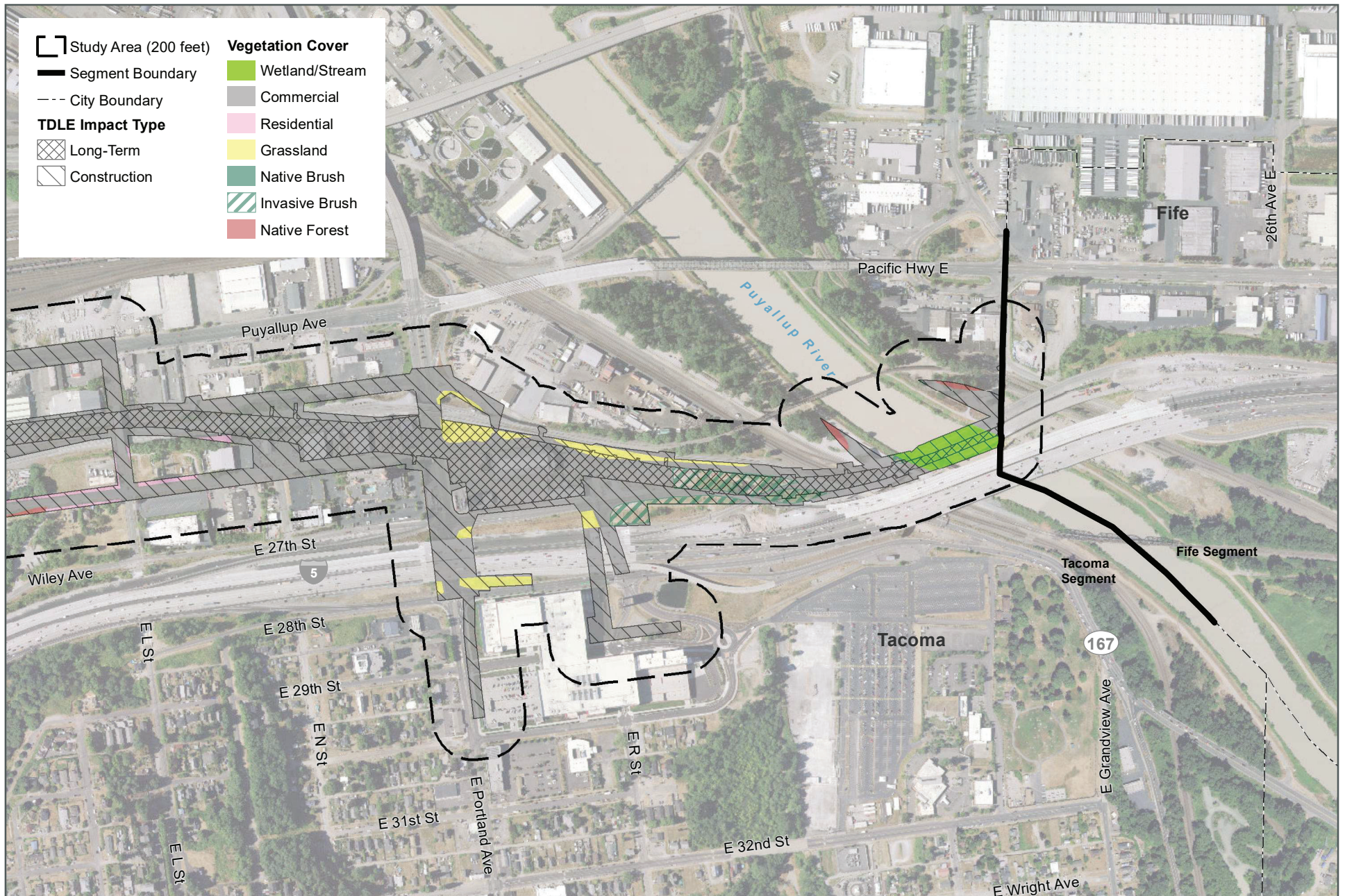


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-19B**  
Vegetation Cover Impacts  
Preferred Tacoma 25th Street-West Alternative  
*Tacoma Dome Link Extension*



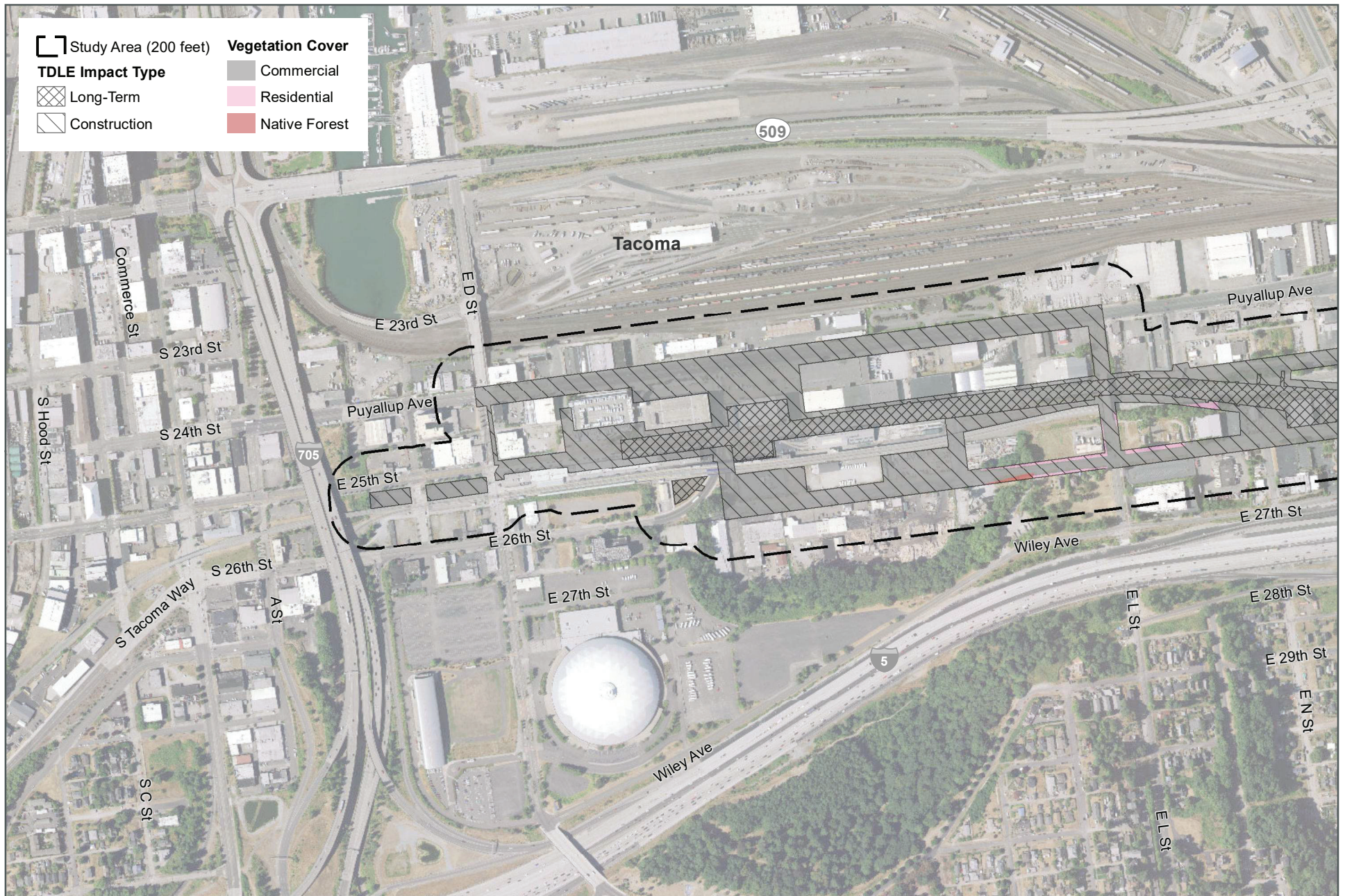


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-20A**  
Vegetation Cover Impacts  
Tacoma 25th Street-East Alternative  
*Tacoma Dome Link Extension*



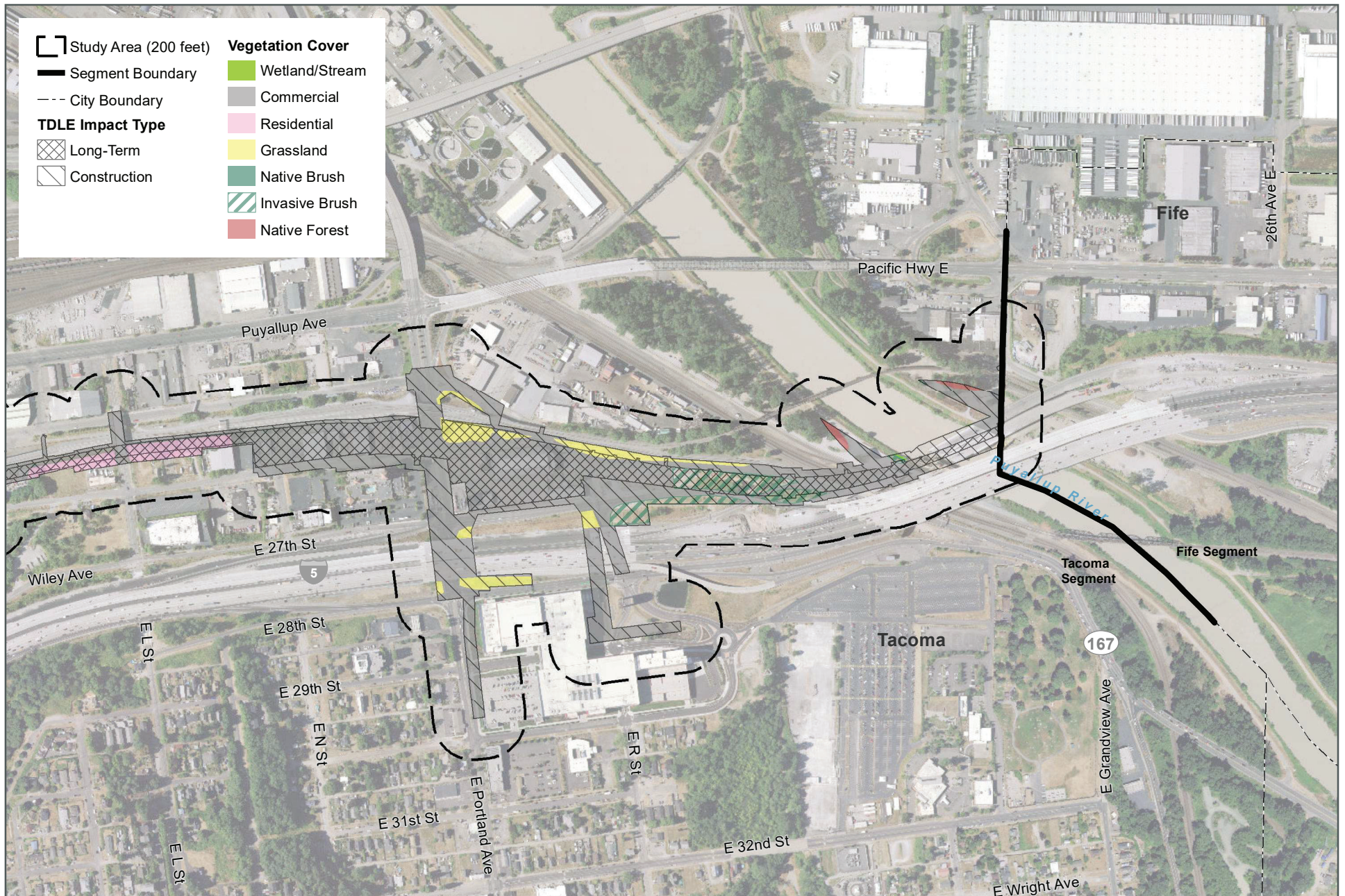


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).

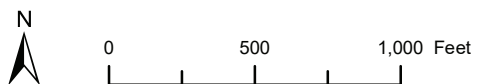


**FIGURE J4.4-20B**  
Vegetation Cover Impacts  
Tacoma 25th Street-East Alternative  
*Tacoma Dome Link Extension*



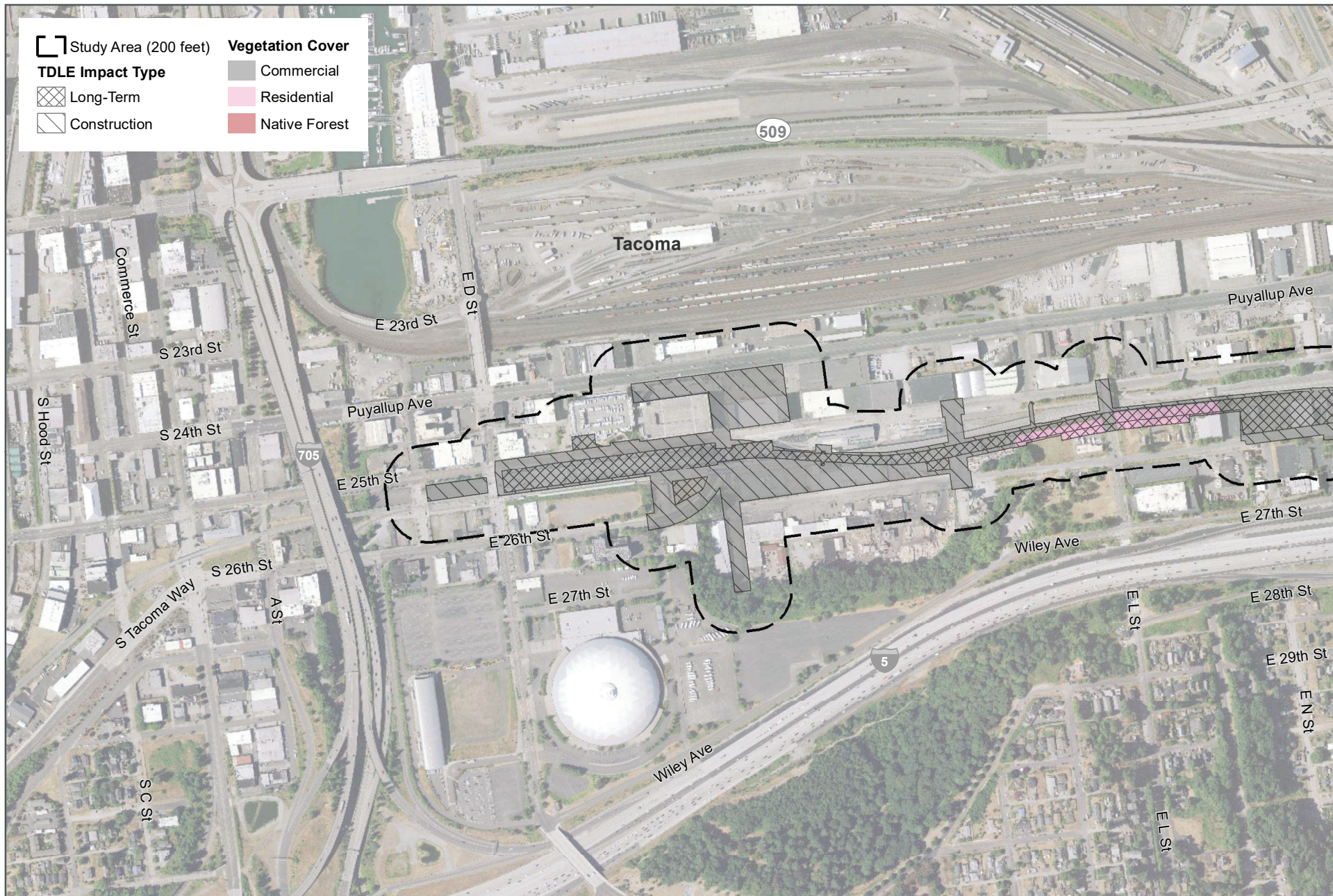


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-21A**  
Vegetation Cover Impacts  
Tacoma Close to Sounder Alternative  
*Tacoma Dome Link Extension*



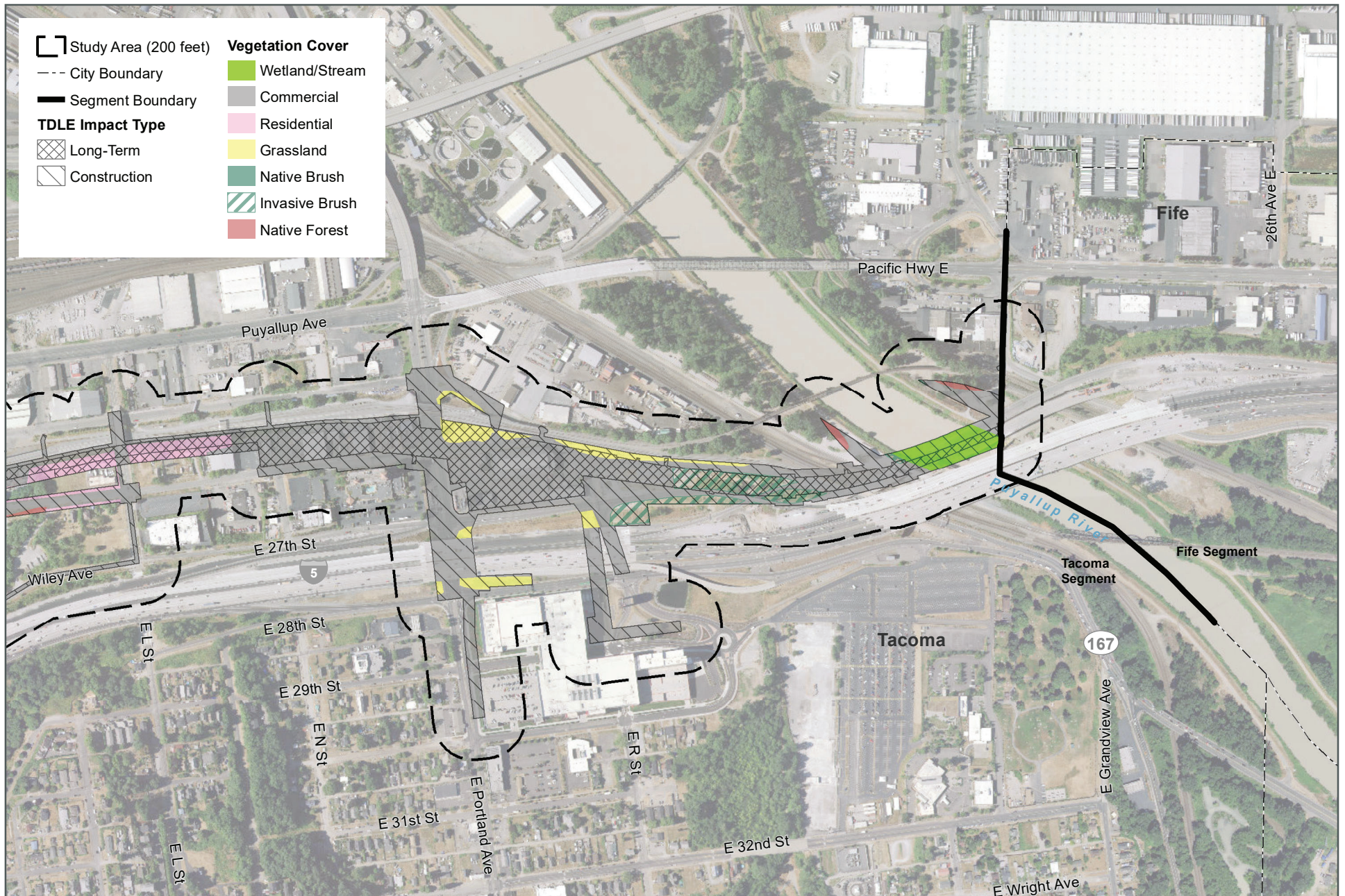


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-21B**  
Vegetation Cover Impacts  
Tacoma Close to Sounder Alternative  
*Tacoma Dome Link Extension*



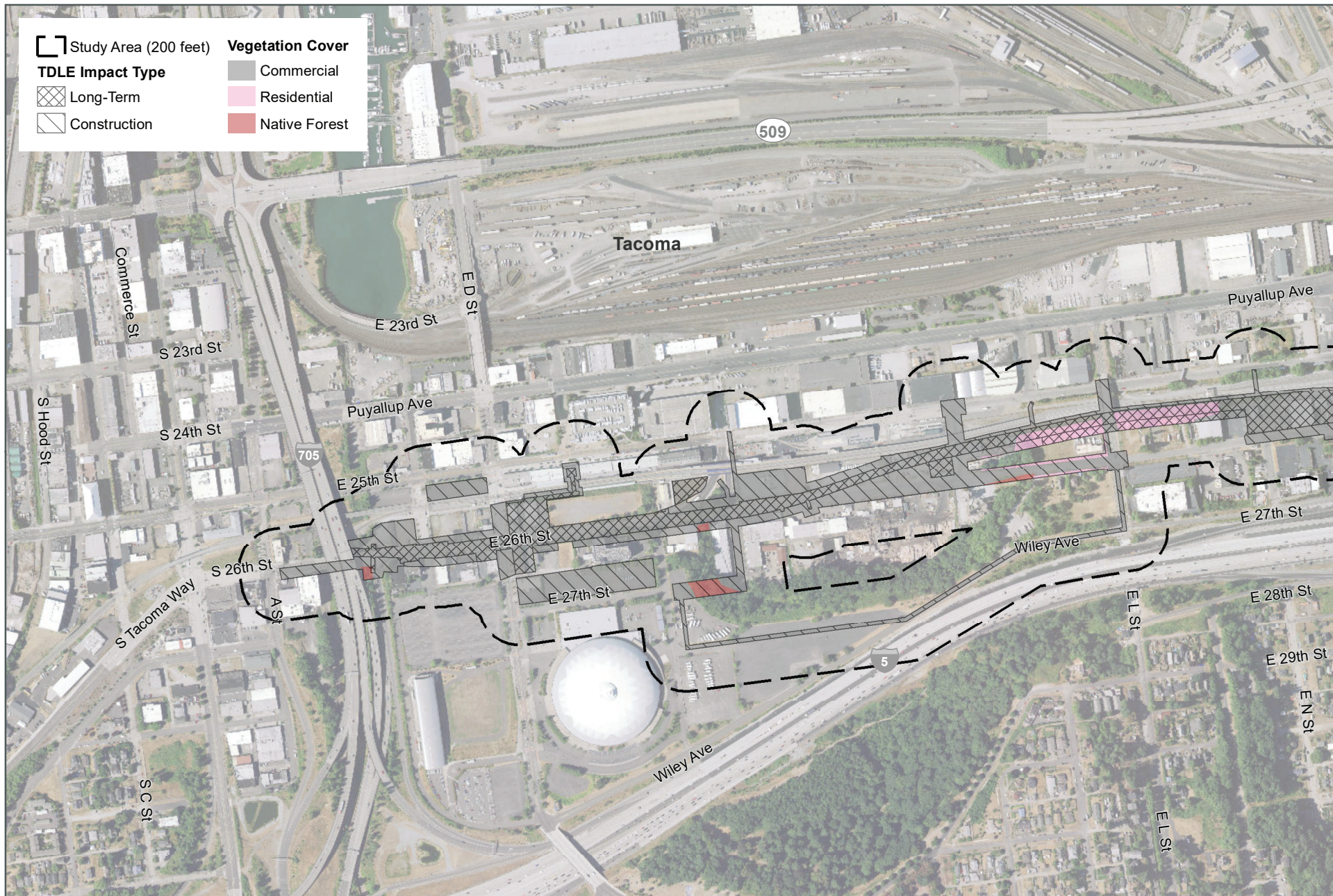


Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-22A**  
 Vegetation Cover Impacts  
 Tacoma 26th Street Alternative  
 Tacoma Dome Link Extension





Data Sources: WDFW; King and Pierce Counties; Cities of Federal Way, Fife, Milton, Tacoma (2023).



**FIGURE J4.4-22B**  
Vegetation Cover Impacts  
Tacoma 26th Street Alternative  
*Tacoma Dome Link Extension*



## Noise, Light, and Human Disturbance

Over the long term, TDLE operation would entail moderate to high levels of human activity and associated noise and light. Notably, all alternatives and station locations are adjacent to I-5 or other high-volume roadways and are in developed areas with relatively high levels of human activity. In addition to noise, light, and vehicle traffic, regular human activity associated with residential, commercial, and industrial development is a common feature of the landscape throughout the study area. Under existing conditions, wildlife that use habitats in or near the project alternatives are regularly exposed to these sources of disturbance.

Project-related impacts would be a product of changes in activity levels. The intensity of each alternative's effects would depend on existing activity patterns and lighting regimes at the site under consideration; these differences are described in the discussions of individual alternatives, below. The potential for adverse effects would be greatest where facilities are constructed near areas dominated by native or structurally complex vegetation.

Noise and human activity have been demonstrated to displace wildlife from occupied habitats and to disrupt normal behaviors (e.g., territorial singing of songbirds, mating and alarm calls of amphibians and small mammals, and foraging activities of raptors). Artificial night lighting can adversely affect wildlife by disrupting foraging behavior, circadian rhythms, and dispersal movements (including migration). Potential adverse effects associated with artificial lighting would be minimized through compliance with applicable local lighting standards and BMPs, such as screening and directing lights away from the night sky and nearby residential and natural areas.

If activity or noise levels (near stations, for example) noticeably exceed current conditions, affected animals may be displaced from otherwise suitable habitat, potentially leading to competition with animals that occupy suitable habitat at other sites with less disturbance. Such competition may produce increased stress and decreased reproductive success for affected individuals. Adverse behavioral responses to increased night lighting may have similar consequences. Animals displaced from areas of suitable habitat may be exposed to an elevated risk of predation or vehicle collisions while they are seeking new areas of suitable habitat. Based on the limited amount of area that would be affected under any of the alternatives, such effects would not be expected to measurably reduce the regional populations of any wildlife species. None of the project alternatives is within 0.25 mile of a documented breeding area or other sensitive site for any special-status wildlife species.

## Animal Movement

Long-term impacts on the movement of wildlife through the study area would vary, depending on the type of structure. Animals would be able to pass beneath elevated guideway segments. The general lack of vegetation in at-grade segments would likely pose a barrier to movement. In addition, animals crossing the track would face the risk of being struck by trains. The portions of track built at grade through areas of wildlife habitat would be fenced to minimize the risk of collisions. These fenced portions would, however, impede the movement of animals. As noted in Section 3.2.2, patches of high-quality wildlife habitat in the study area are isolated from other areas of similar habitat and generally do not serve as connective corridors to other areas of habitat outside of the study area.



#### 4.2.1.1 No-Build Alternative

The No-Build Alternative (which includes full build-out of the Sound Transit 3 System) would not have any direct long-term impacts on vegetation, wildlife, or wildlife habitat in most of the study area. Conversely, implementing the No-Build Alternative would preclude potential beneficial environmental effects over the long term, such as tempering increases in motor vehicle traffic in the region and facilitating the concentration of residential and commercial growth in planned growth centers.

As discussed in the analysis of impacts on aquatic resources, the No-Build Alternative includes the planned OMF South project. Two of the alternative sites under consideration for OMF South would entail the construction of approximately 1.4 miles of guideway extending south from the Federal Way Downtown Station. If either of these alternatives is selected, patches of mature native forest and forested wetlands along I-5 near S 336th Street would be affected by construction and operation of OMF South.

WSDOT's SR 167 Completion Project intersects the TDLE study area between Porter Way and 62nd Avenue E. Because it is planned for completion with or without TDLE, the SR 167 Completion Project is considered part of the No-Build Alternative. The SR 167 Completion Project includes the restoration of approximately 110 acres of riparian buffer habitat associated with Hylebos Creek, Surprise Lake Creek, and Wapato Creek. Riparian restoration will include extensive planting of native trees and shrubs, increasing the availability of the native tree and native brush cover types. Some of the restoration areas fall within the TDLE study area and would, therefore, increase the availability of high-quality habitat in the TDLE study area.

#### 4.2.1.2 Federal Way Segment Alternatives

The potential long-term impacts of the Federal Way Segment alternatives on vegetation cover types are compared in Table J4.4-3. The permanent impact footprints of the Preferred FW Enchanted Parkway Alternative and the FW I-5 Alternative are essentially identical, and both alternatives would affect equivalent areas of the various vegetation types. For this reason, the potential impacts of these two alternatives are addressed together.

Approximately 2 acres of mature native forest habitat along I-5 south of S 336th Street would fall within the permanent impact area of the Federal Way Segment alternatives (Table J4.4-3). In addition to diminishing the amount of habitat that provides the functions described in Section 3.2.1, removal of forested habitat in this area would reduce forested riparian habitat (see Section 4.1.1) and forested wetland habitat (see Section 4.3.1).

Under either alternative, the guideway in this area would be elevated, generally 20 to 30 feet above ground level. The lowest clearance would be about 14 feet above ground level, at a location approximately 350 feet south of S 336th Street. The affected patch is the largest patch of mature native forest that has been identified in the study area. Although other patches are available in areas farther from I-5 and other sources of disturbance, the loss of mature forest would decrease the amount of this habitat type in the study area.

The permanent impact footprints of the Preferred FW Enchanted Parkway Alternative and the FW Design option would overlap essentially equal amounts of the mature native forest, other native forest, and wetland/stream cover types.

As discussed above, wildlife that use habitats in or near the project alternatives are regularly exposed to noise, light, and human activity associated with I-5 and other areas of commercial and



industrial activity. Over the long term, light rail operation in the Federal Way Segment would not be expected to represent a perceptible increase in disturbance levels.

The only at-grade segments of the guideway in this segment would be immediately adjacent to I-5, where the existing freeway presents a substantial barrier to wildlife movement. As such, the presence of the light rail guideway in the Federal Way Segment would not be likely to affect the movement of wildlife through the study area.

#### **4.2.1.3 South Federal Way Segment Alternatives**

Approximately 1 acre of mature native forest habitat along West Fork Hylebos Creek would fall within the permanent impact footprints of both the SF Enchanted Parkway Alternative and the SF I-5 Alternative (Table J4.4-3). The SF 99-West and SF 99-East alternatives would avoid this patch of mature forest, but the permanent impact footprint of the Porter Way Design Option for either of those alternatives would overlap a little more than 0.5 acre of the patch (that acreage value rounds up to 1 acre in Table J4.4-3). The long-term effects of the loss of mature forest habitat in this area would be as described for the Federal Way Segment alternatives.

The South Federal Way Segment alternatives would differ in the amount of other native forest habitat that falls within the permanent impact footprint. The greatest overlap would occur under the SF I-5 Alternative, which would affect several patches of other native forest south of the I-5/SR 18 interchange. The SF Enchanted Parkway Alternative would avoid these patches, as would the SF 99-West and SF 99-East alternatives, with or without the Porter Way Design Option (Table J4.4-3).

The alternatives would also differ in the amount of wetland/stream habitat affected (Table J4.4-3). The SF I-5 Alternative would affect several wetlands (including forested wetlands) associated with East Fork Hylebos Creek Tributary 0016A south of the I-5/SR 18 interchange. The SF Enchanted Parkway Alternative would avoid these, as would the SF 99-West and SF 99-East alternatives. The permanent impact footprints of the SF 99-West and SF 99-East alternatives would overlap more wetland/stream habitat than either the SF Enchanted Parkway Alternative or the SF I-5 Alternative (Table J4.4-3). The SF 99-East Alternative would affect more wetland/stream habitat than any of the other alternatives in this segment, largely due to impacts along the edge of the wetland complex associated with North Fork Hylebos Creek.

Compared to the SF 99-West and SF 99-East alternatives, the Porter Way Design Option would affect approximately 1 acre more of wetland/stream habitat (Table J4.4-3). This difference would result from impacts to wetlands near the patch of mature native forest described above.

As with the Federal Way Segment alternatives, operation of the South Federal Way Segment alternatives would not be expected to represent a perceptible increase in disturbance levels for wildlife that use habitats in the study area. Similarly, the only at-grade segments of the guideway in this segment would be immediately adjacent to I-5, and only the SF Enchanted Parkway Alternative or the SF I-5 Alternative would have at-grade segments. As such, none of the South Federal Way Segment alternatives would be likely to affect the movement of wildlife through the study area.

#### **4.2.1.4 Fife Segment Alternatives**

No mature native forest would fall within the permanent impact footprints of any of the Fife Segment alternatives or design options (Table J4.4-3). Also, the alternatives and design options



would not have substantially different effects on areas of the other native forest or wetland/stream cover types.

Similar to the South Federal Way Segment alternatives, the alternatives in the Fife Segment would not be expected to result in a perceptible increase in the level of disturbance to wildlife in the study area. In addition, because all alternatives would be on elevated guideways, none of the alternatives in the Fife Segment would be likely to affect the movement of wildlife through the study area.

#### **4.2.1.5 Tacoma Segment Alternatives**

The long-term impacts of the Tacoma Segment alternatives on the mature native forest, other native forest, and wetland/stream cover types would be essentially identical (Table J4.4-3). None of the alternatives would have any direct impacts on forested wetlands nor any measurable long-term impacts on native forest.

If new piers are installed in the Puyallup River to support a bridge for the guideway, the presence of those piers would permanently reduce the amount of river channel habitat. Due to the small size of the support piers relative to the breadth of the channel, this loss would not be expected to appreciably reduce the capacity of the river to support use by wildlife.

Similar to the South Federal Way Segment alternatives, the Tacoma Segment alternatives would not be expected to result in a perceptible increase in the level of disturbance to wildlife in the study area. In addition, because all alternatives would be on elevated guideways, none of the Tacoma Segment alternatives would be likely to affect the movement of wildlife through the study area.

#### **4.2.2 Construction Impacts**

Construction-related impacts include temporary loss or degradation of terrestrial habitats, as well as disturbance due to construction-related noise, light, and human activity. If bats are using existing structures in the study area (e.g., highway bridges over Hylebos Creek and the Puyallup River) for roosting sites or maternity colonies, these behaviors may be disrupted by construction activities. Nesting birds on such structures may similarly be disturbed or displaced. Clearing for project construction would also increase the risk of contributing to the spread of noxious or invasive weed species. As discussed in Section 2.5.4, the estimated extent of areas that would be temporarily affected by project construction is based on mapping provided by the project design team.

Noxious weeds and invasive plants rapidly colonize disturbed sites such as construction areas, preventing native species from becoming reestablished following ground disturbance. Noxious weeds and invasive plants also spread into undisturbed areas and provide poor habitat or forage for wildlife. Several of the BMPs that would be implemented during project construction are intended to avoid, reduce, and control new infestations of noxious weeds (see Section 4.8.2, Construction Best Management Practices). These BMPs would likely reduce but may not eliminate the potential for noxious weeds and invasive plants to colonize sites disturbed by construction. The risk of colonization would be proportional to the amount of area temporarily disturbed by construction. An alternative with a greater extent of ground disturbance would pose a higher risk of contributing to the establishment or spread of noxious weeds and invasive plants.



Given the widespread occurrence of Himalayan blackberry and other invasive plant species in the study area, any of the project alternatives would provide the opportunity to reduce, at least temporarily, invasive species through vegetation removal. In some areas, noxious weeds may be eradicated because cover types dominated by invasive species (e.g., commercial, invasive brush) would be converted to maintenance facilities, landscaping, and other areas where invasive species would be controlled. In areas where invasive species are replaced with native species, construction related impacts may result in improved habitat function.

The duration of temporary impacts would vary depending on the type of vegetation that is affected. Impacts on grasses and areas dominated by fast-growing invasive species would generally be short-lived, with functions typically returning to pre-impact levels within one growing season. In contrast, temporary impacts on woody vegetation generally last longer because trees and/or shrubs require several years or decades to achieve the size and stature necessary to provide pre-impact functions, such as canopy habitat.

Construction of TDLE parking facilities at the stations in South Federal Way and Fife could be delayed up to 3 years after initial service opens. If that occurs, the construction-related effects described above would occur at these two station locations at the time the parking facilities are built.

The following sections outline the range of potential temporary construction impacts that could occur under each alternative. These impact areas are summarized in Table J4.4-4. Actual impacts would depend on the final configuration and design, construction footprint and methods, BMPs implemented during construction (see Section 4.8.2, Construction Best Management Practices), and performance of post-construction restoration. Direct construction impacts would be identified and quantified during final design and permitting.

#### **4.2.2.1 No-Build Alternative**

The No-Build Alternative would not have any temporary, construction-related impacts on vegetation, wildlife, or wildlife habitat. Areas temporarily affected by construction of the planned OMF South and SR 167 Completion projects (which are considered to be part of the No-Build Alternative) would be restored separately from TDLE.

#### **4.2.2.2 Federal Way Segment Alternatives**

The potential construction-related impacts of the Federal Way Segment alternatives on vegetation cover types are compared in Table J4.4-4. The construction footprints of the Preferred FW Enchanted Parkway Alternative and the FW I-5 Alternative are essentially identical, and both alternatives would affect equivalent areas of the various vegetation types. For this reason, the potential impacts of these two alternatives are addressed together.

Approximately 4 acres of mature native forest habitat along I-5 south of S 336th Street would fall within the construction footprint of the Federal Way Segment alternatives (Table J4.4-4). Although the affected areas would be replanted with native trees following construction, the ecosystem functions of mature forest would not be restored for several decades. The construction footprint of the Federal Way Segment alternatives would also overlap areas of other native forest and wetland/stream habitats. The return of pre-construction ecosystem functions in those areas would likely require several years.

Similar to the permanent impact footprints, the construction footprints of the options for the curve at the northern end of the Federal Way Segment would overlap essentially equal amounts of the mature native forest, other native forest, and wetland/stream cover types.



Table J4.4-4 Potential Construction-Related Impacts on Vegetation, by Alternative (acres)

Alternative	Commercial	Residential	Grass land	Invasive Brush	Native Brush	Non Native Forest	Mature Native Forest	Other Native Forest	Wetland/ Stream <sup>1</sup>	River Channel <sup>2</sup>	Stormwater Pond	Total
<b>Federal Way Segment</b>												
Preferred FW Enchanted Parkway	18	7	3	3	0	0	4	8	2	0	2	47
Preferred FW Enchanted Parkway with FW Design Option	17	9	4	3	0	0	4	8	2	0	2	49
<b>South Federal Way Segment</b>												
SF Enchanted Parkway	42	8	1	4	0	<0.5	1	17	5	0	2	80
SF I-5	23	6	4	4	1	<0.5	1	21	6	0	2	68
SF 99-West	59	2	1	4	<0.5	<0.5	0	14	5	0	1	87
SF 99-West with Porter Way Design Option	60	2	1	4	<0.5	<0.5	2	15	8	0	1	94
SF 99-East	62	3	3	4	<0.5	<0.5	0	12	7	0	1	91
SF 99-East with Porter Way Design Option	63	3	3	4	<0.5	<0.5	2	12	10	0	1	99
<b>Fife Segment</b>												
Fife Pacific Highway/ Fife Median <sup>3</sup>	51	1	3	1	<0.5	<0.5	0	3	1	0	2	62
Fife Pacific Highway/Fife Median with either Design Option <sup>3,4</sup>	45	1	3	1	<0.5	<0.5	0	3	2	0	1	55
Fife I-5	46	<0.5	8	1	<0.5	<0.5	0	2	5	0	2	64
Fife I-5 with either Design Option <sup>3</sup>	45	<0.5	8	1	<0.5	<0.5	0	2	5	0	1	63



**Table J4.4-4 Potential Construction-Related Impacts on Vegetation, by Alternative (acres) (continued)**

Alternative	Commercial	Residential	Grass land	Invasive Brush	Native Brush	Non Native Forest	Mature Native Forest	Other Native Forest	Wetland/ Stream <sup>1</sup>	River Channel <sup>2</sup>	Stormwater Pond	Total
<b>Tacoma Segment</b>												
Preferred Tacoma 25th Street-West	41	1	1	1	<0.5	0	0	<0.5	<0.5	1	0	45
Tacoma 25th Street-East	41	1	1	1	<0.5	0	0	<0.5	<0.5	1	0	45
Tacoma Close to Sounder	27	<0.5	1	1	<0.5	0	0	<0.5	<0.5	1	0	31
Tacoma 26th Street	29	<0.5	1	1	<0.5	0	0	1	<0.5	1	0	33

## Notes:

- (1) Impacts on the Wetland/Stream cover type include areas within the OHWM of streams associated with wetlands. As such, the impact area values for the cover type in this table do not match those in the tabular summaries of impacts on wetlands.
- (2) The River Channel land cover type captures the Puyallup River. Impacts on smaller streams are discussed in Section 4.1.
- (3) The impacts of the Fife Pacific Highway and Fife Median alternatives on all cover types would be identical.
- (4) The impacts of the 54th Avenue and 54th Span design options for all Fife Segment alternatives would be identical.



The total size of the construction footprint for the FW Design Option would be slightly larger than that of the Preferred FW Enchanted Parkway Alternative, indicating a slightly greater potential for temporary loss or degradation of terrestrial habitats and disturbance of sensitive wildlife species during construction, as well as a higher risk of contributing to the establishment or spread of noxious weeds and invasive plants (Table J4.4-4).

#### **4.2.2.3 South Federal Way Segment Alternatives**

The comparative construction-related impacts of the South Federal Way Segment alternatives would be similar to those for permanent impacts: both the SF Enchanted Parkway Alternative and the SF I-5 Alternative would require clearing approximately 1 acre of mature native forest habitat along West Fork Hylebos Creek, and the SF 99-West and SF 99-East alternatives would avoid that patch of habitat (Table J4.4-4). The construction footprints of the Porter Way design option for the latter two alternatives would overlap 2 acres of mature native forest near West Fork Hylebos Creek south of Birch Street. The effects of temporary impacts to mature forest habitat in this area would be as described for the Federal Way Segment alternatives.

Among the alternatives in this segment, the SF I-5 Alternative would require clearing the most native forest habitat — 21 acres, compared to 12 to 17 areas under the other alternatives (Table J4.4-4). This difference is largely attributable to the impacts of the SF I-5 Alternative on forested areas associated with East Fork Hylebos Creek Tributary 0016A south of the I-5/SR 18 interchange. The construction footprint of the Porter Way Design Option for the SF 99-West Alternative would overlap the same amount of other native forest habitat, as would this alternative without the design option; the construction footprint of the Porter Way Design Option for the SF 99-East Alternative would overlap 1 more acre of other native forest habitat, compared to this alternative without the design option.

Approximately 5 to 6 acres of wetland/stream habitat would fall within the construction footprints of any of the South Federal Way Segment alternatives (Table J4.4-4). The Porter Way Design Option for the SF 99-West Alternative would affect 3 more acres of this habitat type than would the baseline option, while the corresponding difference for the SF 99-East Alternative would be 4 acres (Table J4.4-4).

As discussed above, the potential for temporary loss or degradation of terrestrial habitats and disturbance of sensitive wildlife species during construction would be proportional to the total size of the construction footprint, as would the risk of contributing to the establishment or spread of noxious weeds and invasive plants. Based on this consideration, the SF 99-East Alternative would have the highest potential for these impacts, and the SF I-5 Alternative would have the lowest (Table J4.4-4). Implementation of the Porter Way Design option under the SF 99-West Alternative would increase the construction footprint by approximately 7 acres; the corresponding increase for the SF 99-East Alternative would be approximately 8 acres (Table J4.4-4).

#### **4.2.2.4 Fife Segment Alternatives**

No mature native forest would fall within the construction footprints of any of the Fife Segment alternatives or design options (Table J4.4-4). The construction-related impacts of the alternatives in the Fife Segment on the other native forest and wetland/stream habitat types would be similar, although the Fife Pacific Highway and Fife Median alternatives would affect slightly more other native forest habitat than the Fife I-5 Alternative (Table J4.4-4). In contrast, the Fife I-5 Alternative would affect 3 to 4 more acres (depending on the design option) of wetland/stream habitat, compared to the Fife Pacific Highway and Fife Median alternatives.



The Fife I-5 Alternative would have a slightly larger overall construction footprint than either the Fife Pacific Highway or the Fife Median alternatives. The potential for disturbance of sensitive wildlife species during construction would not necessarily be higher, however, because construction of the Fife I-5 Alternative would take place in areas adjacent to I-5 that are dominated by high levels of existing noise and human disturbance. Based on the predominance of the commercial cover type within the construction footprint, the Fife I-5 Alternative's risk of contributing to the establishment or spread of noxious weeds and invasive plants would also not be substantially higher than that of the other two alternatives.

#### 4.2.2.5 Tacoma Segment Alternatives

The construction-related impacts of the Tacoma Segment alternatives on the mature native forest, other native forest, and wetland/stream cover types would be similar; none of the alternatives would affect more than 1 acre of any of these habitat types, individually or collectively (Table J4.4-4). None of the alternatives would have any construction-related impacts on any forested wetlands. Given the existing high levels of noise and human disturbance throughout the Tacoma Segment study area, the overall size of the alternatives' construction footprints would not appreciably affect their potential to disturb sensitive wildlife species or contribute to the establishment or spread of noxious weeds and invasive plants.

Noise from pile driving for the installation of support structures for the guideway bridge over the Puyallup River may be audible as much as 1 mile away from project activities. However, the sites where pile driving may be needed are adjacent to I-5 in a heavily developed urban area. Background noise levels would likely eclipse pile driving noise a relatively short distance away. For example, USFWS (2015) determined that pile driving noise for transportation projects in rural areas would likely have no effect on nesting ESA-listed birds more than 0.25 mile away. Animals that use habitats in portions of the TDLE study area where pile driving noise might be audible species are adapted to high levels of noise and human disturbance. For these reasons, pile driving noise is unlikely to disturb wildlife more than 0.25 mile from the work site.

Big brown bat colonies and nesting birds on nearby bridges could be affected by construction noise. Such effects would be temporary and would not be expected to result in any long-term impacts on species that use habitats in the urban areas surrounding the project site. The impacts of in-water pile driving are discussed in Section 4.1.2.

### 4.3 Wetlands

Analyses in this subsection address the potential long-term and construction-related impacts of each alternative on wetlands and wetland buffers. Actual impacts would depend on the location and design of the final preferred alternative, the construction footprint and methods, the BMPs implemented during construction (see Section 4.8.2), and the performance of post-construction restoration. Wetland delineations and detailed impact analyses would be completed during the process of final design and permitting.

To the extent that impacts cannot be avoided or minimized through BMPs, Sound Transit would implement additional measures to reduce adverse effects and provide compensatory mitigation measures where adverse effects are unavoidable. Sound Transit has committed to achieving no net loss of ecosystem function on a project-wide basis (Sound Transit 2007). As discussed in Section 5, compensatory mitigation would be implemented in accordance with applicable Tribal, federal, state, and local requirements and guidelines.