

## 4.2 SUMMARY OF EFFECTS

As part of the Environmental Assessment (EA), the project team analyzed the topic areas included in Table 4.2-1. To provide a baseline for comparison, the No Build Alternative is included in this EA's discussion of the Build Alternative's affected environment and impacts. The No Build Alternative includes the existing transportation

system, plus currently-funded improvements as described in Chapter 3. Table 4.2-1 summarizes the anticipated effects of Build Alternative construction to each of these topic areas addressing both short-term (construction) impacts and long-term or operational impacts.

**Table 4.2-1 Summary of Effects for No Build and Build Alternatives**

| Resource       | No Build Alternative Effects  | Build Alternative Effects   |
|----------------|---|---|
| Transportation | <p><b>Construction:</b> No impact except for funded projects like the Berkeley Street interchange/Madigan Gate Access Improvements project.</p> <p><b>Long-Term:</b> Would carry fewer person trips and accommodate less demand than the Build Alternative (Build). Would experience about 13 minutes more PM peak northbound travel time than Build between Center Drive and Gravelly Lake Drive, and 24 minutes longer southbound travel time from Gravelly Lake Drive to Main Gate. Southbound travel time for Gravelly Lake to Center Drive is comparable to Build (36 minutes for No Build and 32 minutes for Build). Poorer intersections/interchange operations are expected compared to the Build Alternative, along with a higher collision rate.</p> <p><b>Beneficial:</b> No substantive benefits.</p> | <p><b>Construction:</b> New interchanges would be offset from existing locations to reduce traffic disruption during construction. 3-6 month closures of southbound ramps at Berkeley Street and Thorne Lane are possible. Night and possibly weekend closures would occur on northbound ramps to reconnect to the freeway and on local streets. I-5 through lanes would be narrowed and shifted around work zones. Temporary I-5 lane closures would occur during nighttime and off-peak periods. Public transit and school bus routing, as well as access to bicycle and pedestrian facilities for users of all ability levels, may be temporarily affected by closures during construction, and pedestrian access routes to transit may be slightly modified.</p> <p><b>Long-Term:</b> Long-term effects resulting from this project would benefit the transportation network, and are therefore included below in the "Beneficial" section.</p> <p><b>Beneficial:</b> Would reduce short-term congestion and improve travel times, while accommodating an increase in travel demand. Would improve interchange operations to reduce potential backups onto I-5. Would improve safety relative to increased demand, and reduce cut-through traffic impacts on the Tillicum neighborhood. Would benefit safety and traffic operations by grade-separating Thorne Lane and Berkeley Street from the Sound Transit railroad. Would add local connectivity with the southbound Gravelly-Thorne connector, along with bicycle/pedestrian connectivity with the proposed new shared use path adjacent to I-5.</p> <p><b>Mitigation:</b> During construction, on- and off-ramps at Thorne Lane and Berkeley Street would be scheduled for closures one interchange at a time such that the other interchange continues to provide local access. Temporary northbound on- and off-ramps would be provided around construction sites to maintain access to neighborhoods and military installations, including transit. Construction plans would be developed to keep three lanes of I-5 open in both the northbound and southbound direction on I-5 during daytime and peak travel times. Traffic management plans would address any necessary bus rerouting and bus stop relocation, as well as pedestrian accessibility.</p> |

**Table 4.2-1 Continued. Summary of Effects for No Build and Build Alternatives**

| Resource          | No Build Alternative Effects   | Build Alternative Effects  |
|-------------------|--|--|
| Air Quality       | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> No violations of the NAAQS for carbon monoxide (CO) or Particulate Matter (PM<sub>2.5</sub>) are expected. Mobile Source Air Toxic Emissions (MSAT) are expected to improve over existing conditions.</p> <p><b>Beneficial:</b> No substantial benefits.</p>                                       | <p><b>Construction:</b> Potential impacts to localized air quality would be related to dust and construction vehicle emissions.</p> <p><b>Long-Term:</b> No violations of the NAAQS for carbon monoxide (CO) or Particulate Matter (PM<sub>2.5</sub>) are expected. Mobile Source Air Toxic Emissions (MSAT) are expected to improve over existing conditions.</p> <p><b>Beneficial:</b> No substantial benefits.</p> <p><b>Mitigation:</b> <u>Disturbed areas would be kept to a minimum. Dirt, gravel and debris piles would be covered as needed to reduce dust and debris. Water or other allowed dust suppressants would be used as needed. Disturbed areas would be replanted as soon as possible. Material hauling would wet down loads, cover, or allow adequate freeboard. Material spills would be cleaned up right away. Quarry spalls or wheel washers would be used at equipment access locations. Equipment and staging areas would be as far from sensitive receptors as practicable. Equipment idling would be minimized near sensitive receptors. TMP would minimize peak traffic delays during construction.</u></p> |
| Noise             | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> 132 locations are expected to exceed FHWA Noise Abatement Criteria.</p> <p><b>Beneficial:</b> No substantive benefits.</p>   | <p><b>Construction:</b> Temporary impacts from construction equipment. Level of impact is related to type of equipment being used and duration of use.</p> <p><b>Long-Term:</b> 140 locations are expected to exceed FHWA Noise Abatement Criteria. 42 can be mitigated leaving 98 that are unavoidably impacted. No receivers would experience a severe noise impact.</p> <p><b>Beneficial:</b> Proposed noise wall mitigation would reduce noise exposure for many sensitive receptors along the corridor that are currently at or above WSDOT's Noise Abatement criteria or would be following construction of the Build Alternative.</p> <p><b>Mitigation:</b> Construction of four noise walls would mitigate noise levels at 42 out of 140 locations where noise would exceed 66 dBA. 98 would remain at noise levels above 66 dBA. Construction noise would be managed using BMPs such as limiting equipment idling time, mufflers and engine enclosures on heavy equipment.</p>  |
| Geology and Soils | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> No direct impact. Existing Thorne Lane and Berkeley Street bridges (built in 1954) are aging and not designed to current seismic standards. There is a potentially greater risk of loss due to earthquakes than with the Build Alternative.</p> <p><b>Beneficial:</b> No substantial benefits.</p> | <p><b>Construction:</b> Impacts could result from earth movement and placement including: structure foundations, slope cuts, fill for embankments and retaining walls, and soil import/export.</p> <p><b>Long-Term:</b> There could be Geology and soil impacts, the extent depending on final design and mitigation options. Key issues may include seismic stability and long-term settlement of fill.</p> <p><b>Beneficial:</b> None.</p> <p><b>Mitigation:</b> BMPs to minimize erosion, stabilize slopes, and compact fill would be implemented. Revegetation of exposed soil following construction. New overpasses would be designed to meet seismic standards.</p>   |

**Table 4.2.1 Continued. Summary of Effects for No Build and Build Alternatives**

| Resource                      | No Build Alternative Effects   | Build Alternative Effects  |
|-------------------------------|--|--|
| Water Resources               | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> Runoff from roadway surfaces would continue to be untreated.</p> <p><b>Beneficial:</b> No substantial benefits.</p>                          | <p><b>Construction:</b> Could have temporary effect on adjacent water bodies, floodplain resources and surface/groundwater quantity.</p> <p><b>Long-Term:</b> May increase roadway runoff due to expansion of impervious areas. May also result in loss of floodplain storage and/or conveyance, and changes in infiltration capacity. High infiltration rates along corridor will likely result in greatly reduced potential for roadway runoff to depart the Project site via a surface water discharge.</p> <p><b>Beneficial:</b> Increased treatment of runoff where currently there is none.</p> <p><b>Mitigation:</b> A temporary Erosion and Sediment Control Plan and a Spill Prevention Plan would be developed and implemented. Erosion control measures <u>would be located adjacent to construction areas and</u> near streams and stormwater facilities. Construction of stormwater treatment and disposal facilities for new paved surfaces. Floodplain compensation if improvements cause a flood rise or reduce storage or conveyance.</p> |
| Wetlands                      | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> No impact.</p> <p><b>Beneficial:</b> Preservation of existing wetlands and wetland buffers.</p>  | <p><b>Construction:</b> Temporary impacts to 0.15 acre of wetlands and 0.55 acre of wetland buffers are expected.</p> <p><b>Long-Term:</b> Permanent impacts are expected to two riverine wetlands near the Thorne Lane interchange resulting in the loss of 0.06 acre of wetlands and 1.1 acres of wetland buffers.</p> <p><b>Beneficial:</b> None.</p> <p><b>Mitigation:</b> Restoration of disturbed wetland and buffer areas and/or compensatory mitigation through Pierce County's Fee In-Lieu program.</p>   |
| Fish, Wildlife and Vegetation | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> No impact.</p> <p><b>Beneficial:</b> Preservation of existing trees and vegetation adjacent to I-5 and at locations of new interchanges.</p> | <p><b>Construction:</b> Some temporary impacts to land cover are expected such as tree removal and fill. There may also be noise impacts that affect wildlife.</p> <p><b>Long-Term:</b> Some conversion of land cover from potential habitat like grass or forest to pavement or other impervious surfaces is anticipated.</p> <p><b>Beneficial:</b> None.</p> <p><b>Mitigation:</b> Minimize clearing, especially in habitat areas. Replacement per the <i>WSDOT Roadside Policy Manual</i>. Clearing limits would be marked with construction fencing. Staging areas would be located 300 feet away from streams or buffers if possible. Shared use path would be designed to minimize impacts to trees. Schedule of construction would avoid osprey breeding season in vicinity of osprey nest if possible. Limit construction activity by osprey nest during nesting.</p>  |

**Table 4.2.1 Continued. Summary of Effects for No Build and Build Alternatives**

| Resource                    | No Build Alternative Effects  | Build Alternative Effects   |
|-----------------------------|---|---|
| Hazardous Materials         | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> No impact.</p> <p><b>Beneficial:</b> No substantive benefits.</p>   | <p><b>Construction:</b> May have impacts associated with excavation of contaminated materials through demolition of existing structures, or construction spills. <a href="#">Portions of the project within the Tacoma Smelter Plume may encounter contaminated soils.</a></p> <p><b>Long-Term:</b> There are known locations of groundwater contamination in the Build Alternative footprint. If contaminated soils or groundwater are not managed there may be impacts to clean soil or water in areas with deep excavations. Contamination due to spills could also occur.</p> <p><b>Beneficial:</b> Project could potentially clean up any contamination discovered.</p> <p><b>Mitigation:</b> BMPs to address/avoid potential spills during construction. Hazardous materials encountered during construction would be mitigated using WSDOT’s Standard Hazardous Materials Impacts and Mitigation Measures table. <a href="#">Disturbed soils within the Tacoma Smelter Plume will be screened for soil contamination.</a></p>  |
| Visual Quality              | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> Existing visual quality would not decrease.</p> <p><b>Beneficial:</b> Maintenance of existing view shed including trees between I-5 and golf course and nearby townhomes.</p> | <p><b>Construction:</b> Impacts to visual resources would typically be greatest during construction due to presence of construction equipment and materials.</p> <p><b>Long-Term:</b> There are three primary changes that would affect visual quality: added retaining walls, increased pavement width/modified geometry, and loss of existing trees and other vegetation. Impacts would occur largely around the modified interchanges at Berkeley Street and Thorne Lane, as well as the Gravelly-Thorne connector and the proposed noise walls. Impacts would be negative for some, while being neutral or benefiting others.</p> <p><b>Beneficial:</b> Some travelers may have improved views from increased height of overpasses. Some neighbors may benefit from walls that screen views of I-5.</p> <p><b>Mitigation:</b> Minimization of tree and shrub removal associated with construction of proposed noise walls. Aesthetic treatments to bridges and walls may be implemented, use of native vegetation in restoration of disturbed areas to maintain visual unity.</p> |
| Archaeological and Historic | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> No impact.</p> <p><b>Beneficial:</b> No substantial benefits.</p>   | <p><b>Construction:</b> Primary impacts would be related to noise, construction traffic, vibration, and possible limitations on building access.</p> <p><b>Long-Term:</b> No long-term impacts to archaeological or historic resources.</p> <p><b>Beneficial:</b> No substantial benefits.</p> <p><b>Mitigation:</b> None</p>   |

**Table 4.2.1 Continued. Summary of Effects for No Build and Build Alternatives**

| Resource                              | No Build Alternative Effects   | Build Alternative Effects  |
|---------------------------------------|--|--|
| Section 4(f) and 6(f)                 | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> No impact.</p> <p><b>Beneficial:</b> No substantial benefits.</p>  | <p><b>Construction:</b> There would be no temporary use of or occupancy of any listed 4(f) or 6(f) resource during construction of the Build Alternative</p> <p><b>Long-Term:</b> There would be no temporary use of or occupancy of any listed 4(f) or 6(f) resource during construction of the Build Alternative.</p> <p><b>Beneficial:</b> No substantive benefits.</p> <p><b>Mitigation:</b> None.</p>   |
| Socioeconomic & Environmental Justice | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> Lacks both connections and transportation options provided by the Build Alternative, particularly impacting low-income populations in the corridor.</p> <p><b>Beneficial:</b> No property acquisition or construction-related impacts.</p> | <p><b>Construction:</b> Temporary impacts would include dust, noise, equipment emissions and traffic interruptions. The Tillicum and Woodbrook neighborhoods would experience the greatest intrusion and disruption associated with modifications to the Berkeley Street and Thorne Lane interchanges. Public transit and school bus routing, as well as access to bicycle and pedestrian facilities for users of all ability levels, may be temporarily affected by closures during construction.</p> <p><b>Long-Term:</b> Build Alternative would require full and/or partial right of way acquisition affecting several properties in the vicinity of proposed improvements. Build Alternative would have disproportionately high adverse impact on areas with low-income and minority populations.</p> <p><b>Beneficial:</b> Would generally reduce congestion and improve connectivity for residents and businesses throughout the corridor. Would improve access to Woodbrook to support planned industrial development. Would provide multimodal connectivity and enhance safety, particularly for low-income residents of Tillicum and Woodbrook.</p> <p><b>Mitigation:</b> Scheduling of road closures would be coordinated with police, fire, emergency services, transit agencies, and school districts. Ongoing communications would occur with local businesses and residents regarding potential access changes and alternate routes. Direct compensation to individuals whose property would be purchased for Build Alternative use, and relocation assistance for tenants displaced by the Build Alternative, in accordance with the Uniform Relocation Assistance Policies and Real Properties Act (1970), as amended. Ongoing focused community outreach through final design and construction of Build Alternative.</p> |

**Table 4.2.1 Continued.** Summary of Effects for No Build and Build Alternatives

| Resource  | No Build Alternative Effects  | Build Alternative Effects   |
|-----------|---|---|
| Land Use  | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> Not consistent with adopted state, regional, local and JBLM plans. Existing land uses would likely persist and planned residential and employment development may not materialize. Tillicum neighborhood would remain geographically isolated.</p> <p><b>Beneficial:</b> No property acquisition or construction-related impacts.</p> | <p><b>Construction:</b> Some short- and longer-term road or freeway interchange ramp closures are anticipated that would affect land accessibility. The potential disruptions would likely be greatest in the Tillicum neighborhood.</p> <p><b>Long-Term:</b> Would be consistent with local, regional, state and JBLM plans. Would reduce the geographical isolation of the Tillicum neighborhood, add new non-motorized connections, and improve traffic operations in support of land use consistent with adopted plans.</p> <p><b>Beneficial:</b> Enhanced mobility to/from local communities, supportive of and consistent with local comprehensive plans.</p> <p><b>Mitigation:</b> None.</p>   |
| Utilities | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> No change to existing utilities.</p> <p><b>Beneficial:</b> No disruptions to existing utility services.</p>   | <p><b>Construction:</b> Some potential utility disruptions during transitions between old and new connections. Disruptions would typically last only a few minutes. Solid waste providers would need to establish new service routes during construction.</p> <p><b>Long-Term:</b> Reduced crash potential through relocation of existing utilities outside of the roadway clear zone.</p> <p><b>Beneficial:</b> Potential to enhance existing traveler safety.</p> <p><b>Mitigation:</b> Early communication with utility providers during design process. Relocation and/or mitigation plans for existing utilities impacted by the Build Alternative will be prepared collaboratively between the project team and the utility provider.</p> |

**Table 4.2.1 Continued. Summary of Effects for No Build and Build Alternatives**

| Resource                | No Build Alternative Effects  | Build Alternative Effects  |
|-------------------------|---|--|
| Economic                | <p><b>Construction:</b> No impact.</p> <p><b>Long-Term:</b> Anticipated increased future congestion on I-5, along with Amtrak planned high speed rail service on the line that parallels I-5 in the corridor, could lead to increased travel delays to and from Tillicum. This could result in fewer I-5 drivers stopping in Tillicum to patronize local businesses, and an associated decrease in revenue and employment.</p> <p><b>Beneficial:</b> No substantial benefits.</p> | <p><b>Construction:</b> Temporary impacts during ramp construction at Thorne Lane and Berkeley Street interchanges, due to increased congestion and changes in travel patterns during temporary long-term ramp closures.</p> <p><b>Long-Term:</b> Increased capacity on I-5 would improve conditions for freight movement. Configuration of new Thorne Lane and Berkeley Street interchanges would result in slightly longer travel times to Tillicum from I-5. Drivers from JBLM to Tillicum would see slight decrease in travel times. Roundabouts at interchanges would enhance safety, and elevated design of interchanges could reduce vehicle queues associated with at-grade rail line crossing. Connectivity between Tillicum and the surrounding communities would be enhanced.</p> <p><b>Beneficial:</b> Grade separation and improved mobility associated with new interchanges would enhance access into and out of Tillicum. Most business owners anticipate that improved capacity, safety and connectivity would have positive impacts to Tillicum businesses.</p> <p><b>Mitigation:</b> Staged construction would involve closure of only one southbound interchange ramp location at a time, ensuring continual access to Tillicum from I-5. I-5 drivers would be notified of access changes using variable message signs during construction. A Traffic Management Plan would be prepared to document all mitigation measures and traffic-related requirements that the build contractor must implement during construction.</p> |
| Indirect and Cumulative | <p><b>Construction:</b> None.</p> <p><b>Long-Term:</b> None.</p> <p><b>Beneficial:</b> None.</p>  | <p><b>Construction:</b> None.</p> <p><b>Long-Term:</b> Indirect effects would result from the widening of Constitution Drive and construction of the shared use path, which would cause a minor erosion of setting to the Fort Lewis Garrison Historic District and Salvation Army Red Shield Inn.</p> <p><b>Beneficial:</b> Improved traffic circulation and grade separation is expected to make the Tillicum area more attractive to developers, customers and residents. Grade separation of the rail line will enhance access. Temporary effects from the hiring of vendors, purchasing of materials, and employment opportunities associated with construction of the Build Alternative. Cumulative beneficial effects on regional and local transportation. Noise barriers would reduce noise adjacent to the roadway at up to six locations.</p> <p><b>Mitigation:</b> None.</p>   |