

**Appendix F –
Level 2 Screening Impacts
Technical Memorandum**

Washington State Department of Transportation
SR 302/Elgin Clifton Rd to SR 16
Corridor Study

Level II Screening Impacts

Technical Memorandum

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Level II Screening Impacts

Project Description

State Route (SR) 302 is an east-west state highway located in eastern Mason County and Northwestern Pierce County. SR 302 provides a link for Key Peninsula communities between Gig Harbor / SR 16 / I-5 to the east, and Mason County / SR 3 to the west. Safety and congestion issues have been identified on SR 302 over the past several years. In 2005, the Washington State Legislature directed the Washington State Department of Transportation (WSDOT) to study the issues and identify needed improvements to SR 302 to address congestion and safety.

The purpose of the project is to provide an efficient and functional transportation route in the general area of the existing SR 302 corridor between SR 302 at Key Peninsula Highway and SR 16 in Pierce County. The preferred alternative selected for the improvement of this corridor will be designed to increase the level of safety for all travelers who use the route. These improvements will be developed to:

- Meet or exceed the standards for intersection and highway level of service during the average weekday peak hour.
- Improve the average weekday peak hour travel time for those who use the route.
- Consider accommodating non-motorized modes of travel based on WSDOT policies.

Alternative Screening

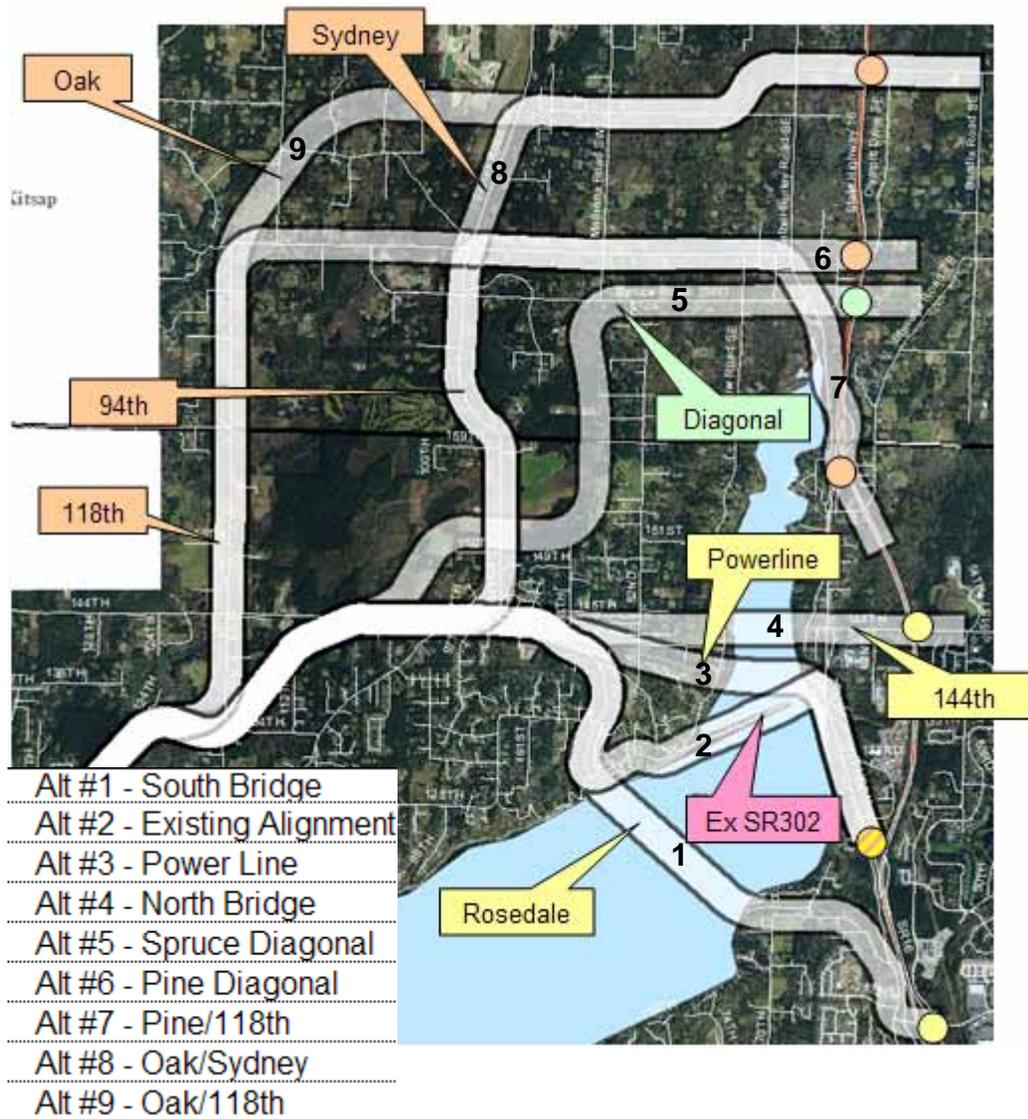
During the second half of 2007, the WSDOT project team worked with the public and community stakeholders to identify a broad range of alternatives that had potential value in addressing corridor deficiencies. A purpose and need statement was also drafted at that time to clarify how the alternatives would be evaluated. In September 2008, a WSDOT team of subject matter experts conducted a Level I screening analysis on ten alternatives compiled using the broad range of alternatives (see Page 4). The Level I analysis supported the identification of six (6) alternative alignments by the study team that merited further study at a more detailed level. Of the five, it was determined that two alternatives (Alternatives 5 and 6) would be combined for purposes of Level 2 investigation, because they're too close to differentiate at that scale.

In addition to the alternatives identified for further study based on Level 1 screening, the study team elected to add two other alternatives based on community input at meetings and through other communications. Alternative 10 was added based on the recognition that it would eventually be necessary to understand the benefits and impacts of the shortest bridge across Burley Lagoon. Alternative 11—providing for improvements to the existing route supported by the community—was added in order to understand in better detail the benefits and impacts associated with those improvements.

The WSDOT study team concluded their investigations of the six remaining alternatives (see Page 5) in support of the Level II screening analysis in mid December 2008. The results of these investigations are summarized below.



Location Map



Alternatives under Consideration (prior to Level 1 Screening)



Archaeological/Cultural/Section 4(f)/Agriculture/Land Use

Archaeological/Cultural Impacts

This section summarizes the research conducted of the Washington State Department of Archaeology and Historic Preservation (DAHP's) database files for documenting cultural resources found in the areas of the five selected alternatives for being evaluated in the Level II screening process.

Previous investigations from the Level I screening are also incorporated in this section. The historic structures database identified three potential historic buildings within the general SR 302 corridor area. They are:

- House located on the east side of 94th Ave NW; N of 150th St NW. This house was also noted in the February 2008 report by Jones & Stokes (located within Alternative 6).
- Two-story house located at 14910 118th Ave NW. This house was also noted in the February 2008 report by Jones & Stokes (possibly located within Alternative 7).
- Collins Store located on the SE corner of Hwy 302, 118th Ave NW (possibly located within all build alternatives).

The database also noted a Katherine Stein House in Burley known as the Cooperative Brotherhood Colony House. No known address was provided for this building and it may not be located within the areas of the five alignment alternatives.

Two historic barns are listed on Washington's Historic Barns and are located within the five alignment alternatives. These barns are also noted in the 2008 Jones & Stokes report:

- Glenwood Farm: 13710 Glenwood Farm Rd (possibly located within Alternative 7).
- Alvestad Farm: 15311 94th Ave NW (located within Alternative 6).

The Purdy Bridge is a historic bridge listed on the National Register of Historic Places (NRHP) and is located within Alternative 11. Any work done in and around the bridge has the potential to result in an adverse effect determination under Section 106 and may require consultation with DAHP and the Advisory Council on Historic Preservation (ACHP) to resolve effects.

Predictive modeling maps were reviewed and show there is high potential for locating archaeological sites around Burley Lagoon and Henderson Bay. There is very little information known in areas located away from the lagoon and bay since there has been little investigation made in those areas.

No previous cultural reports have been completed in any of the alignment alternative areas. No known archaeological sites have been located, however there are five known archaeological sites around the Burley Lagoon. These sites were originally located in 1948 and relocated in a 1985 cultural resource survey of known archaeological sites (from *Pierce County Cultural Resource Survey Site Inventory Forms* by Michael Avey, 1985). One of the sites has been investigated due to burials. This site is located within the Alternative 3 corridor. Three of the sites are located within Alternative 10 and one of the sites is located outside of any of the build alternatives.

Section 4(f) Impacts

Several resources were reviewed to determine where potential park resources are located within the study area. This section also attempts to identify park properties that may also be considered properties as defined under Section 4(f) of the Department of Transportation Act (codified as 23 CFR 771). As defined in 23 CFR 771.17, a Section 4(f) Property “means publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance”.

Resources reviewed include:

- Pierce County Parks, Recreation & Open Space Plan (2008)
- Key Peninsula Community Plan (2008)
- Kitsap County Parks, Recreation & Open Space Plan (2006)
- Kitsap County 10-year Comprehensive Plan Update (2006)
- Washington State Recreation and Conservation Office website (2008)

Three recreation resources and two potential resources were identified in the reference material, (see Exhibit 1). The three recreation resources are also considered potential Section 4(f) resources. They include Horseshoe Lake Park, the Purdy Sand spit, and the Joint Peninsula Recreation Park adjacent to Peninsula High School. The other potential recreational resource sites include the proposed Lake Cushman Transmission Line trail and the Horseshoe 360 acquisition property.

An assessment of the alternatives analyzed show there are no impacts to potential Section 4(f) Resources. See the following table for a summarization of potential impacts.

Alternative 3 may affect the potential alignment of a proposed regional trail along the Tacoma City Light transmission line corridor, however this resource is currently not considered Section 4(f) and the design would likely not preclude the development of a future trail.

Alternative 4 has most likelihood of Section 4(f) impacts. The proposed alignment would pass adjacent to the Peninsula Joint Recreation Park, which is adjacent to Peninsula High School. Depending upon the amount of roadway widening needed, there may be encroachment into the park. Alternative 4 may also affect the proposed trail alignment along the Tacoma City Light transmission corridor.

Alternatives 6 and 10 all have the potential to affect the Horseshoe Lake 360 proposed acquisition property. These alignments follow near the southwest corner of the property. The property is currently not considered Section 4(f) because it does not appear to be significant for recreation. However, if the Land Trust Transfer occurs as planned, then this property may become significant under Section 4(f).

Alternative 7 does not appear to affect any currently known Section 4(f) resource.

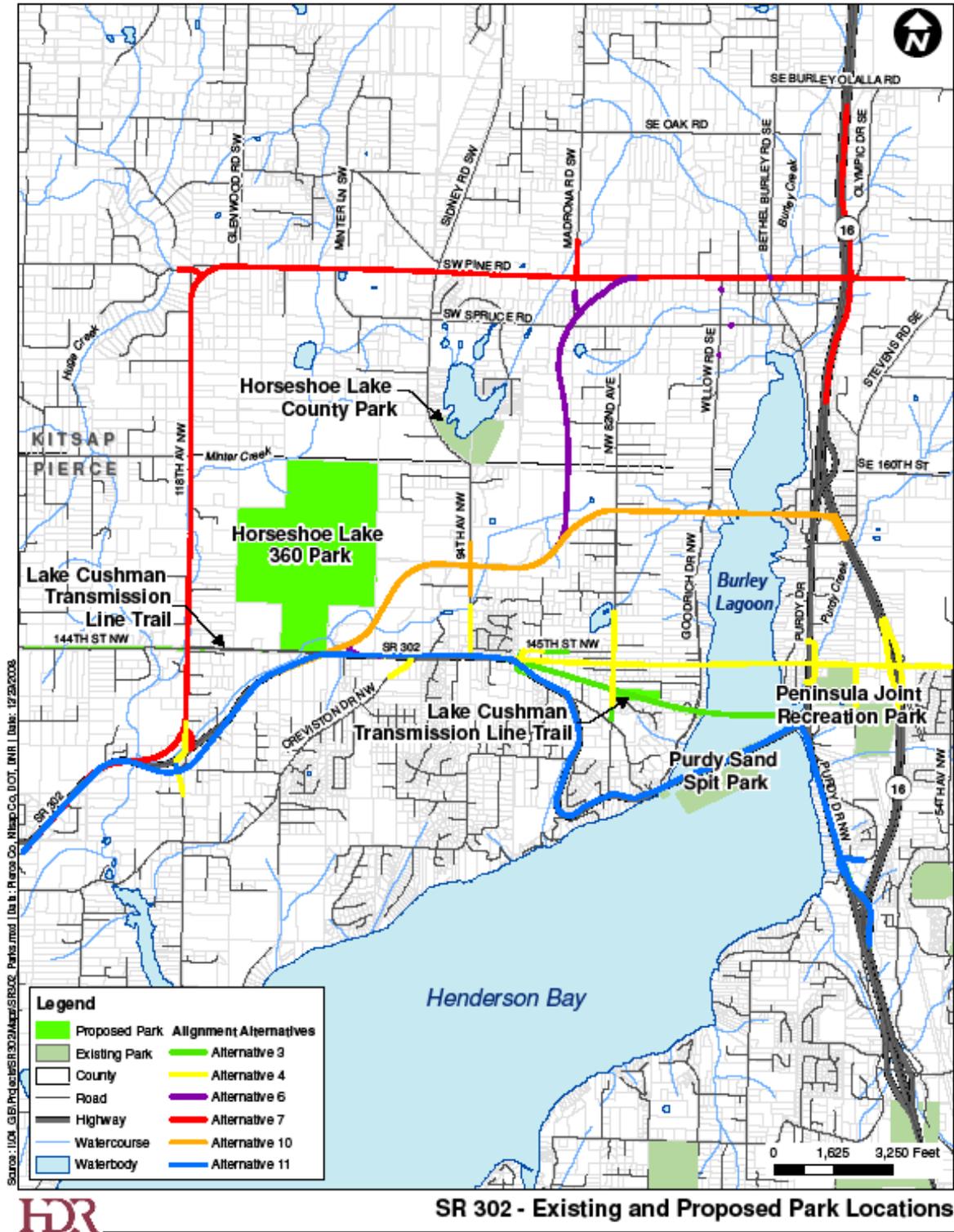
Alternative 11 is likely to affect the Purdy Sand Spit if it is chosen. The Purdy Sand Spit property includes parcels both immediately north and immediately south of the existing SR 302

right-of-way. Alternative 11 also has the potential to affect the Purdy Bridge, which is listed on the National Register of Historic Places.

For the purposes of Section 4(f), a historic site is significant only if it is on or eligible for the National Register, unless FHWA determines that the application of Section 4(f) is otherwise appropriate. Section 4(f) applies to all archaeological sites that are on or eligible for inclusion on the National Register and that warrant preservation in place.

Summary of Potential Impacts to Recreational Resources

4(F) RESOURCE	ALT. 3	ALT. 4	ALT. 6	ALT. 7	ALT. 10	ALT. 11
Horse shoe Lake	No	No	No	No	No	No
Purdy Sand Spit	N	No	No	No	No	Yes
Peninsula Joint Recreation Park	No	Yes (right of way)	No	No	No	No
Lake Cushman Transmission Line	Yes (trail alignment)	Yes (trail alignment)	No	No	No	No
Horse shoe Lake 360	No	No	Yes (right of way)	No	Yes (right of way)	No



Agriculture/Land Use Impacts

GIS data from Pierce and Kitsap Counties and the City of Gig Harbor was used to graphically display the types of land use that may be impacted by each of the alternatives. The land use types were simplified into eight general categories:

- Agriculture Resource Land
- Rural Sensitive Resource
- Rural Farm
- Commercial
- Residential
- Public Institutional
- Industrial
- Agriculture

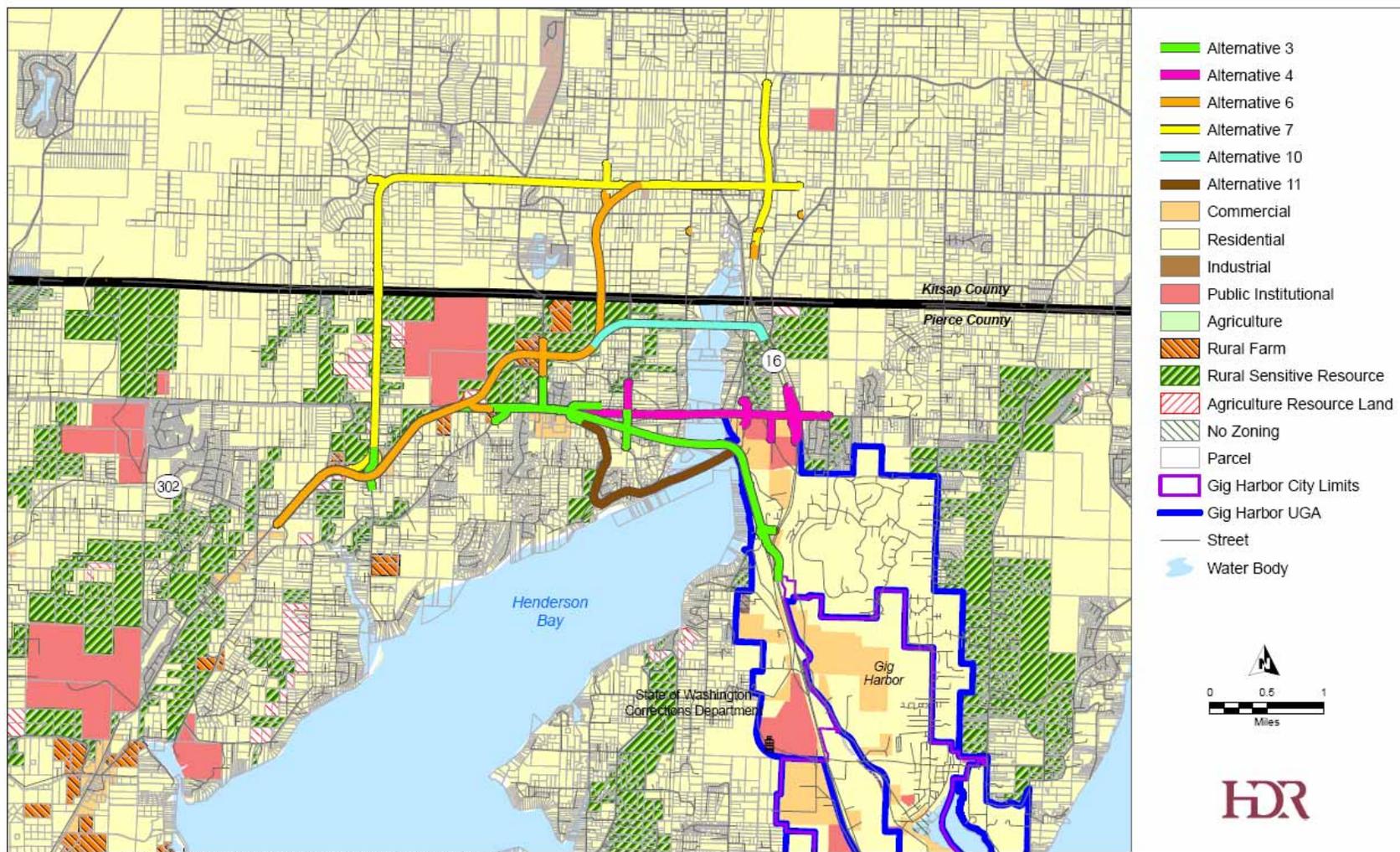
None of the farmland designated properties affected by the alternatives appear to be considered Prime and Unique by the county codes and zoning or farmland of statewide significance; however with the history of active farming and commercial production of agricultural products, further study to confirm project compliance with the Farmland Protection Policy Act is recommended once a preferred alignment is selected.

Each alternative was ranked on a scale from 1 to 6 using available data. For ranking, a score of 1 represents the alternative that will likely result in the least amount of impact on a particular resource (i.e., lowest amount of residentially designated property acquisition), and to be the best option in consideration of the impact to that resource. A score of 6 represents the alternative that will likely result in the highest level of impact to a resource.

Right-of-way acquisition of residential property was given higher consideration over other types of land use. Each of the six alternatives appear to require significant acquisitions of residentially designated property for the new highway. Based purely on the total number of residentially designated property needed for the project, Alternative 10 would receive the highest rank and a score of 1. Alternative 7 would see the highest amount of residential property acquisition causing it rank the lowest and receive a score of 6.

AREA OF IMPACT BY ALTERNATIVE BY LAND USE TYPE (ACRES)								
	Agriculture Resource Land	Commercial	Industrial	Public	Rural Farm	Rural Sensitive Resource	Residential	Total
Alt 3	2.4	24.4	0	0.4	5.2	7.5	89.3	129.2
Alt 4	2.4	26.6	0	8.4	5.2	12.3	86.9	140.8
Alt 6	6.1	4.8	0.1	0.3	11.1	24.9	58.0	105.4
Alt 7	5.5	2.4	0.3	0.3	1.7	18.0	138.2	166.2
Alt 10	5.1	4.8	0	0.3	10.7	28	47.5	96.4
Alt 11	2.4	20.0	0	3.3	4.6	8.9	76.0	115.2

Comprehensive Plan Designations in the SR 302 Study Area



Relocations/Social/Environmental Justice

Relocation Impacts

Since each alternative is comprised of a new corridor there will be substantial impacts to adjacent properties resulting in property acquisition and residential and business relocations. It is estimated that Alternative 3 would result in eight relocations; Alternative 4 would result in 26 relocations; Alternative 6 would result in 26 relocations; Alternative 7 would result in 41 relocations; Alternative 10 would result in 20 relocations; and Alternative 11 would result in 29 relocations (see following table).

BUILD ALTERNATIVE	ESTIMATED NUMBER OF RELOCATIONS
Alternative 3	8
Alternative 4	26
Alternative 6	26
Alternative 7	41
Alternative 10	20
Alternative 11	29

Source: USDA and Google Maps, 2008

Social Impacts

All of the build alternatives will result in substantial impacts to neighborhoods resulting from right-of-way property acquisition and subsequent relocations: it is estimated that Alternative 3 would result in eight relocations; Alternative 4 would result in 26 relocations; Alternative 6 would result in 26 relocations; Alternative 7 would result in 41 relocations; Alternative 10 would result in 20 relocations; and Alternative 11 would result in 29 relocations.

In addition, each of the build alternatives will adversely impact community cohesion. These adverse impacts may include splitting neighborhoods, isolating a portion of a neighborhood or an ethnic group, generating new development, affecting property values, or separating residents from community facilities.

Changes in travel patterns and accessibility (e.g., vehicular, commuter, bicycle, or pedestrian) are expected, but these impacts will be mostly beneficial because the new corridor would improve access in the area.

The build alternatives will also have adverse and beneficial impacts on school districts, recreation areas, churches, businesses, and emergency services. Some adverse impacts will include changes to travel patterns, more traffic in the vicinity of the build alternatives, and increased travel times for emergency vehicles depending on the location of the emergency. The beneficial impacts will include improved access to schools, recreation areas, churches, and businesses; and reduced travel times for emergency vehicles depending on the location of the emergency.

Impacts regarding highway and traffic safety will be beneficial to all of the build alternatives since the new roadway will decrease traffic congestion and improve safety.

Environmental Justice Impacts

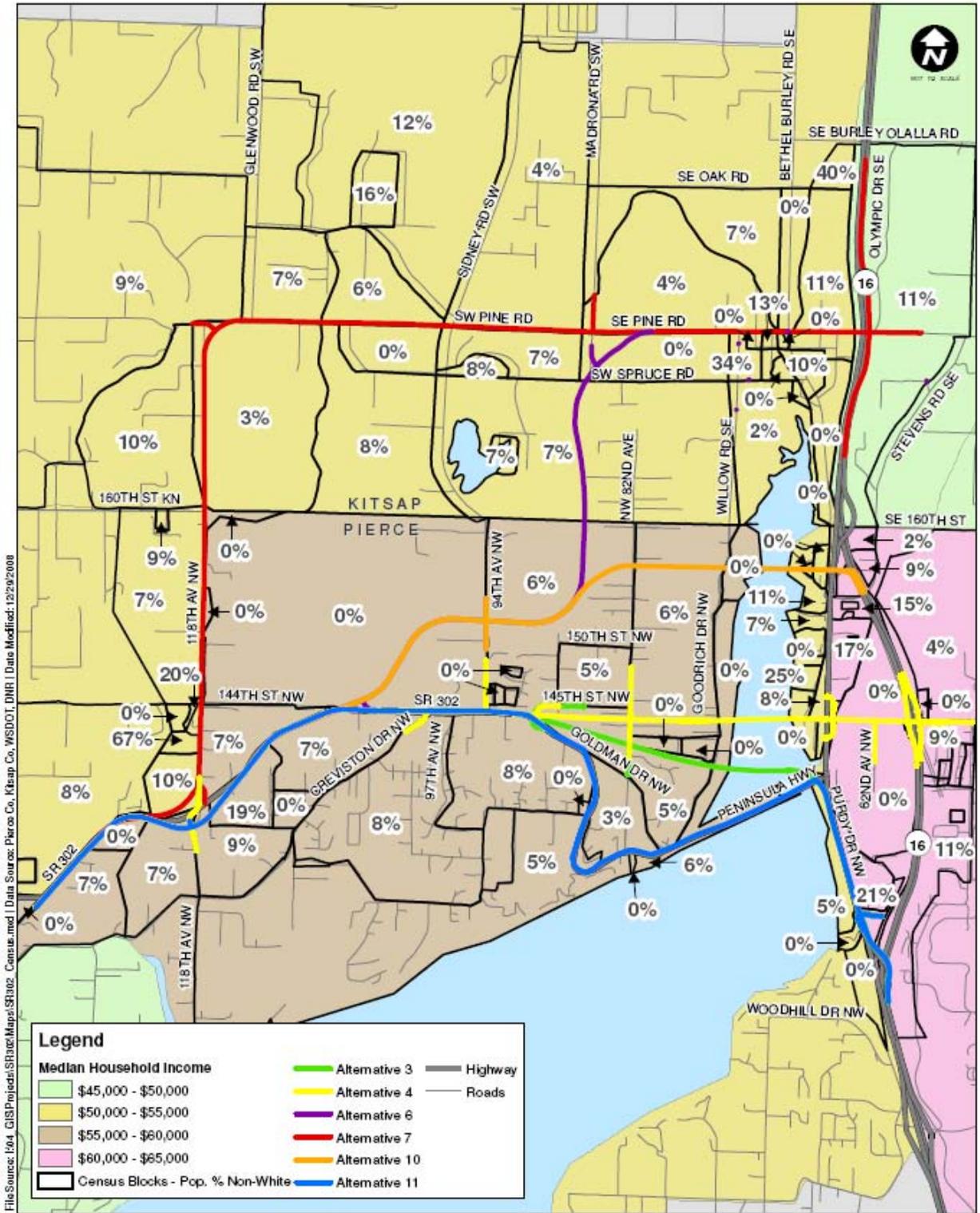
There are four fundamental environmental justice principles each alternative will need to address. Those principles will be to:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- Prevent the denial of, reduction in or significant delay in the receipt of benefits by minority and low-income populations.
- Address whether any social group is disproportionately impacted and identify mitigation measures to avoid or minimize adverse impacts.

All build alternatives will be carefully analyzed to identify low-income and minority populations, but based on 2000 Census data, Alternative 7 is the build alternative that may disproportionately affecting low income populations (see the SR 302-2000 Census map and the following table), but more detailed analysis is needed to make a determination.

BUILD ALTERNATIVE	TOTAL POPULATION	% WHITE ALONE	% NON-WHITE	AVERAGE MEDIAN INCOME (\$)
Alternative 3	3,767	92.7	7.3	54,952
Alternative 4	4,187	93.4	6.6	54,952
Alternative 6	2,476	92.7	7.3	53,149
Alternative 7	3,965	92.7	7.3	52,735
Alternative 10	4,930	92.2	7.8	57,133
Alternative 11	3,956	92.4	7.6	56,152

Source: Census 2000



File Source: I:\04_GIS\Projects\SR302\Map\SR302_Census.mxd | Data Source: Pierce Co, Kitsap Co, WSDOT, DNR | Date Modified: 12/29/2008

SR 302 - 2000 Census



Wetlands/Wildlife and Terrestrial Habitat

Wetlands

HDR Staff visited each alternative alignment on November 26th, 2008 to confirm the presence of and approximate location of wetlands. The project Alternatives were ranked from 1 to 6 (least impact to most impact) based on the total affected linear feet of wetlands for each Alternative. These impacts were calculated based on inventory level data. The wetland impacts and Alternative rankings are shown in the figure and table below.

BUILD ALTERNATIVE	NUMBER OF WETLANDS AFFECTED (LINEAR FEET)				RANKING ^b
	Forested ^a	Scrub/Shrub ^a	Emergent ^a	Total	
Alternative 3	7 (4,960)	-	1 (40)	8 (5,000)	3
Alternative 4	7 (5,320)	1 (400)	1 (160)	9 (5,880)	4
Alternative 6	3 (4,360)	-	-	3 (4,360)	1
Alternative 7	4 (5,350)	1 (330)	1 (510)	6 (6,190)	5
Alternative 10	5 (4,700)	-	1 (160)	6 (4,860)	2
Alternative 11	6 (1,780)	-	1 (40)	7 (1,820)	2

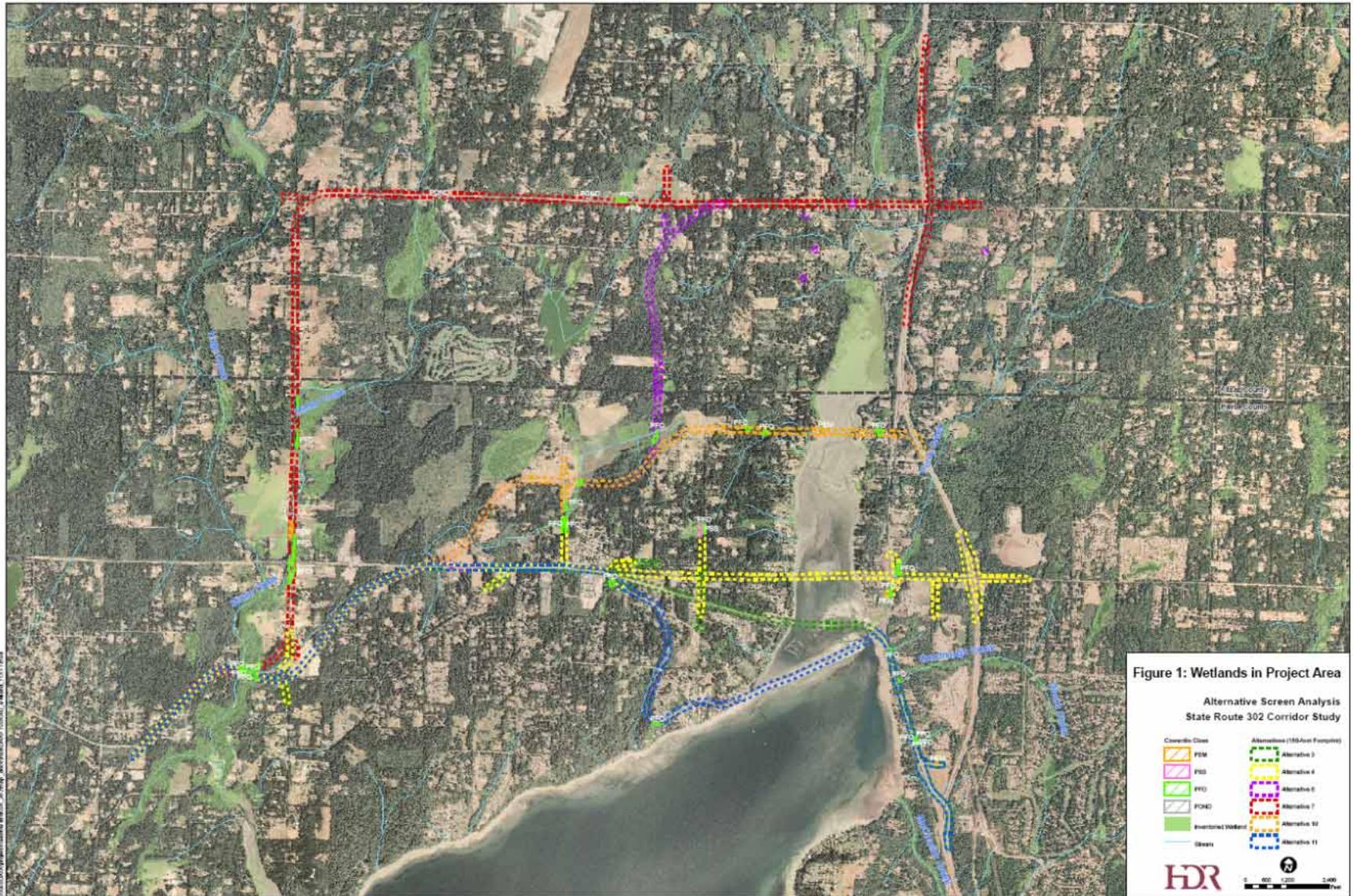
a. Wetland classification based on Cowardin et al., (1979). All information is preliminary.

b. A score of 1 represents the least impact to resources. A score of 6 represents the greatest level of impact. Wetland impacts were calculated based on inventory level data.

Jones and Stokes identified an additional fourteen wetlands in the project area during a site reconnaissance (Parametrix, 2008). These wetlands are identified in the discussion of the SE Pine Road wetland summary, and shown on Figure 1 in that memorandum, and would be present along the routes of both Alternative 6 and 7. Since this more detailed level of data was not available for the entire corridor, the wetlands from this section were not included in our analysis.

Based on existing digital data, Alternative 6 has the least impact to wetland resources. However, all six of the alternatives would affect wetlands, and the overall level of impact is quite similar considering the scale of the project.

More detailed studies (including wetland delineations and ratings) will need to be completed to accurately assess the extent of wetland impacts related to the final alternative, and the effects of these impacts. Furthermore, it is expected that the final alignment will be designed to minimize these effects to wetlands to the extent possible.



Wildlife and Terrestrial Habitat

HDR Staff conducted a site assessment of wildlife and terrestrial habitat impacts associated with each of the six alternative alignments on November 26th, 2008. The project Alternatives were ranked from 1 to 6 (least impact to most impact) based on the total affected linear feet of habitat for each Alternative. The habitat impacts and Alternative rankings are shown in Figure H1 and presented in Table 1 below.

Large portions of the study area consist of urbanized habitats such as residential yards, which provide habitat for the most disturbance tolerant species. These species are well acclimated to the presence of human activity, and are not likely to be further displaced by roadway improvements.

Of these eight priority terrestrial habitats found in the Puget Sound region of western Washington, only riparian areas were found in the project study area. However, wetlands are considered aquatic priority habitats and some of the riparian areas may also fit the requirements for Biodiversity Areas and Corridors. Riparian corridors are located along Minter Creek, Burley Creek, Purdy Creek, Goodnough Creek, their tributaries, and several unnamed tributaries to Horseshoe Lake and Henderson Bay. The following table summarizes the effects of the project on wildlife habitats.

BUILD ALTERNATIVE	AFFECTED HABITAT (LINEAR FEET)			RANKING ^a
	Forest	Herbaceous	Total	
Alternative 3	28,600	2,160	30,760	1
Alternative 4	36,520	950	37,470	3
Alternative 6	45,880	8,310	54,190	5
Alternative 7	47,920	6,770	54,690	6
Alternative 10	38,420	7,060	45,480	4
Alternative 11	29,700	280	29,980	2

All information is preliminary.

a. A score of 1 represents the least impact to resources. A score of 6 represents the greatest level of impact.

The following table lists species found within the project area that are protected under federal or state laws as endangered, threatened, candidate species, species of concern, or state priority species. These species would be more sensitive to construction practices and ongoing operations of a roadway.

Federal Species of Concern
Bald Eagle (<i>Haliaeetus leucocephalus</i>)
Washington State Priority Species
Great Blue Heron (<i>Ardea herodias</i>)
Mountain Quail (<i>Oreortyx pictus</i>)

This table is based on information from the Washington State Department of Fish and Wildlife Priority Habits and Species database (WSDOT 2008) and the US Fish and Wildlife Service (<http://www.fws.gov/westwafwo/speciesmap.html>).

The following table summarizes the rankings of alternatives by impact on listed species and common wildlife species. The ranking represents the aggregate of impacts to both common wildlife species and listed or priority species.

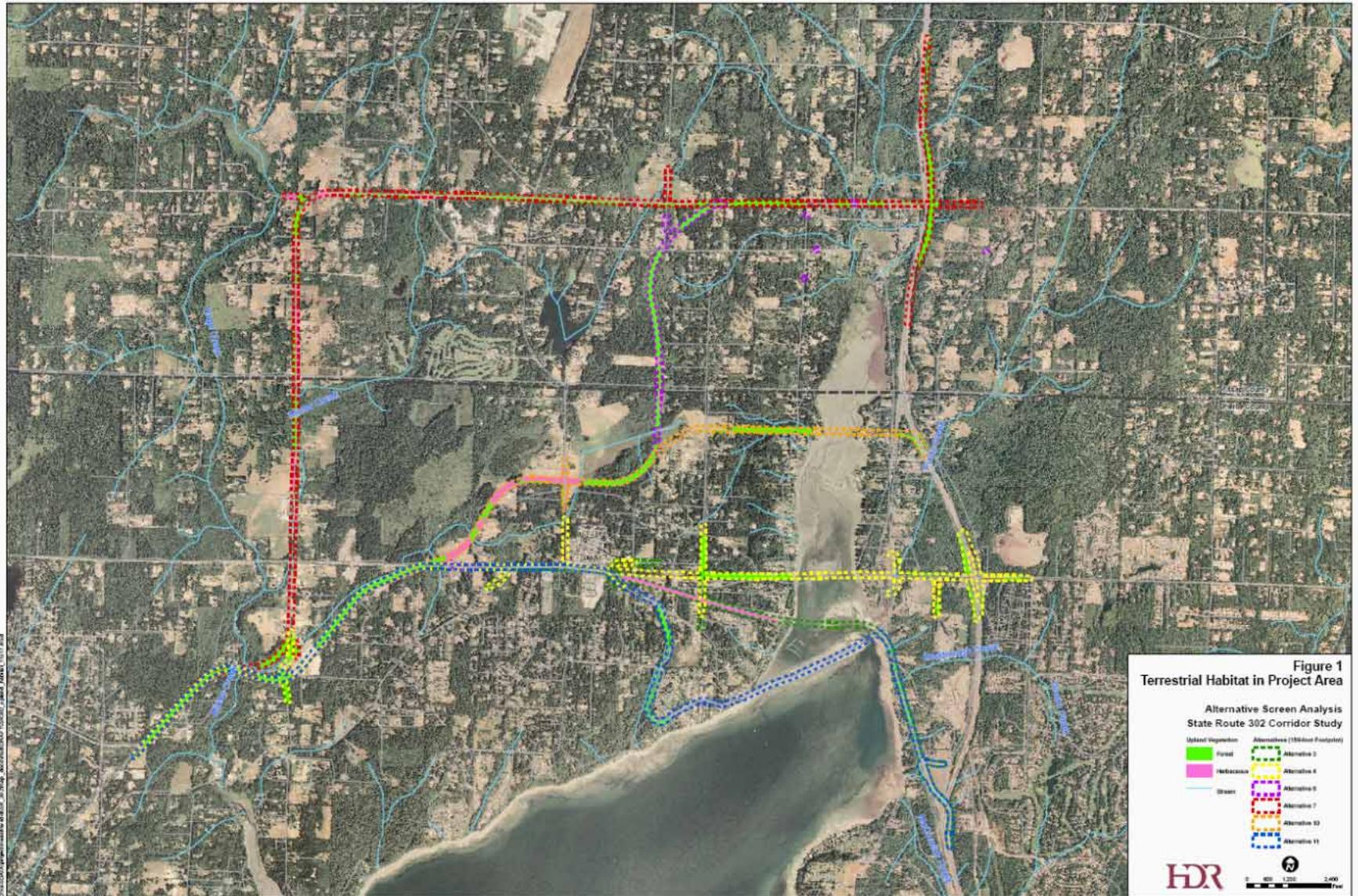
BUILD ALTERNATIVE	RANKING ^A
Alternative 3	1
Alternative 4	3
Alternative 6	4
Alternative 7	5
Alternative 10	6
Alternative 11	2

All information is preliminary.

a. A score of 1 represents the least impact to resources. A score of 6 represents the greatest level of impact.

Construction of the project is not expected to have a limiting effect on forestry activities in the area. Alternative 6 provides access to the larger forest areas that are not currently near large roads, which may be beneficial to logging practices.

Based on existing sources of information and the field verification, Alternative 3 has the least impact to both wildlife and habitat resources. It should be noted that these results are based on preliminary information, and more detailed studies will need to be completed to accurately assess the extent of impacts to wildlife and terrestrial habitat related to the final alternative.



Fish/Surface Water/Aquatic Habitat

Surface Water

The table below estimates the approximate acreage of new impervious surface for each of the six build alternatives, which is important in determining the impacts to surface water.

Build Alternative	New Impervious Surface (acres)
Alternative 3	42.3
Alternative 4	48.3
Alternative 6	56.0
Alternative 7	65.6
Alternative 10	45.1
Alternative 11	56.5

Fish/Aquatic Habitat

This section describes the results of an aquatic resources mapping exercise and field verification conducted for five alternative roadway corridors, as defined through previous Level One Screening analyses for the Washington Department of Transportation (WSDOT) SR 302 Corridor Study. One new alternative (Alternative 11) was added during Level Two Screening discussions following completion of the original analysis. Database searches, GIS analysis, and windshield surveys were conducted for the six alternatives to assess the conditions relative to freshwater aquatic resources, defined as all freshwater streams to be crossed by SR 302 alternative alignments considered in this phase of the project; marine aquatic resources, defined as Burley Lagoon and portions of Henderson Bay just south of the existing SR 302 Bridge; and aquaculture resources in Burley Lagoon, defined as priority shrimp and shellfish concentrations (concentrations of hardshell intertidal and geoduck clams and non-native oysters) currently mapped (by WDFW) within proposed SR 302 alternative corridors.

Baseline information was gathered and used to define existing resources, and to assess potential effects to marine, freshwater and aquaculture resources. Stream crossings along each alternative route were field verified, where access was possible, during vehicular surveys. Because Alternative 11 was developed after the field verification, stream crossings for that route were not verified; however, a portion of the route overlaps with that of Alternatives 3 and 4, which were field verified. The potential suitability of streams with regard to salmonid habitat, particularly listed salmonids, was not assessed during the field verification.

Windshield surveys were conducted along the routes for Alternatives 3, 4, 6, 7, and 10 on November 26, 2008. Any area of water flow in a naturally formed channel with a distinct bed and bank was considered a stream. Stream locations were estimated and drawn on field maps. It should be noted that the exact locations of streams are estimates, and that project designs and plans should not be finalized until the ordinary high water marks (OHWMs) are flagged.

Windshield surveys were conducted by driving along the roadway, and documenting stream crossings that could be observed from the car while traveling at speeds consistent with existing traffic. Investigators stopped along the shoulder of roadways to verify the presence of running water in streams, ditches, or creeks. Since public roadways were not always present along the entirety of some routes, only portions of particular routes were subject to survey; however, GIS data indicates that stream crossings were not present along most of the inaccessible stretches.

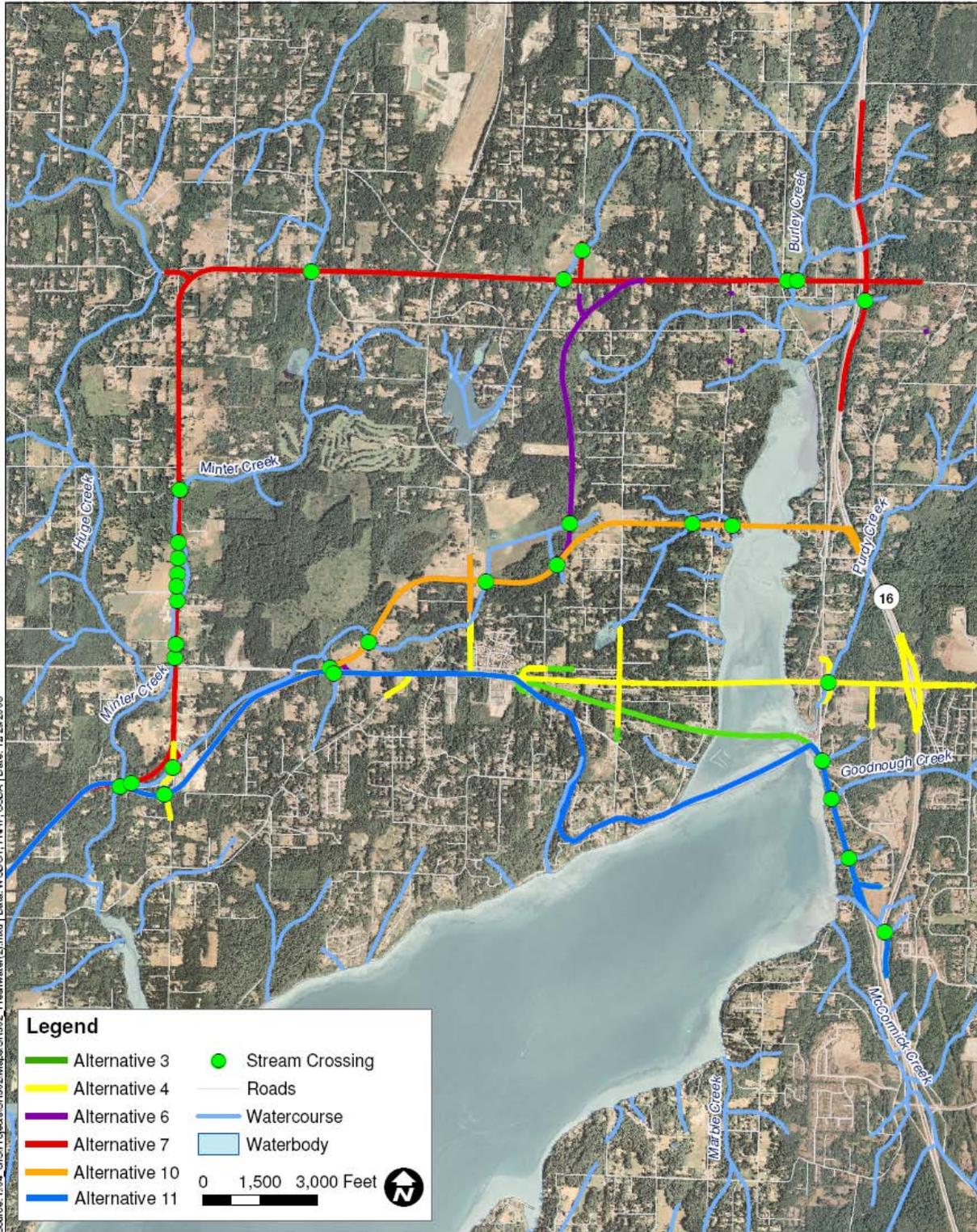
Based on the information gathered during the baseline and field verification phases of this task, each alternative was ranked from 1 to 6 using the following criteria:

1. **Freshwater Aquatic Resources:** The alternative with the fewest stream crossings was assigned the highest ranking of 1, while the alternative with the highest number of stream crossings was assigned the lowest ranking of 6. The character of the streams to be crossed and their suitability for providing habitat was not considered in the ranking.
2. **Marine Aquatic Resources:** The alternative with the least linear feet of marine overwater structures (due to proposed crossings of Burley Lagoon) was assigned the highest ranking of 1, while the alternative with the most linear feet of overwater structures was assigned the lowest ranking of 6.
3. **Aquaculture Resources:** The alternative with the least square footage of overwater shading (due to proposed crossings of Burley Lagoon in areas identified by WDFW to be suitable for aquaculture) was assigned the highest ranking of 1, while the alternative with the most square footage of overwater shading was assigned the lowest ranking of 6.

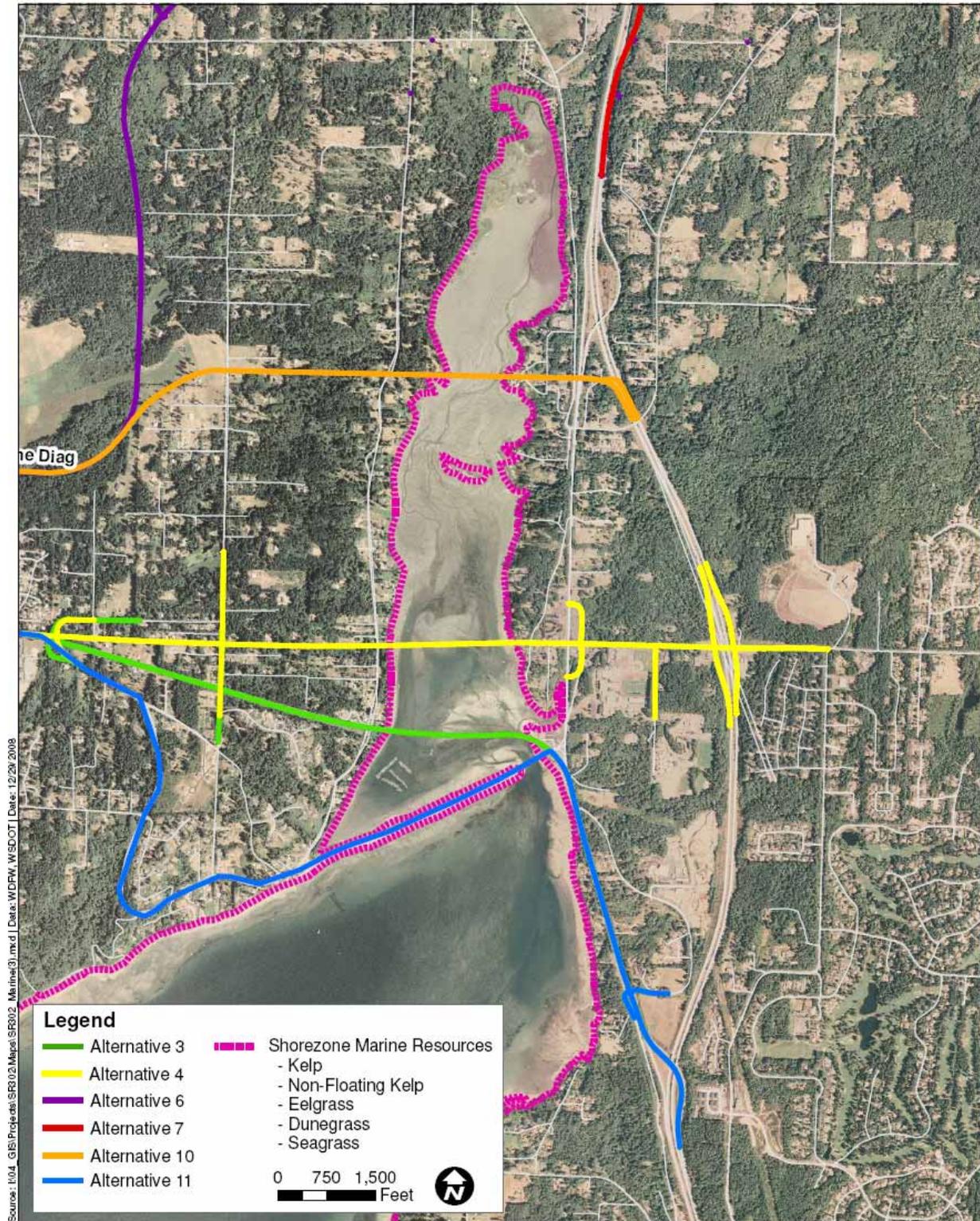
For rankings, a score of 1 represents the alternative among the five that will likely result in the least amount of impact on a particular resource (i.e., fewest stream crossings), and therefore, is likely the best option in consideration of impact to that resource. A score of 6 represents the alternative among the five that will likely result in the highest level of impacts.

Alternatives 6 and 7 would result in the most freshwater stream crossings, including crossing of Burley and Minter creeks, which contain habitat for federal-status salmonid species. However, both of these alternatives require no crossings of Burley Lagoon and therefore would not result in filling or shading of marine or aquaculture resources. For this reason, these alternatives would likely be less difficult to permit compared to Alternatives 3, 4, and 10, which would require crossing of Burley Lagoon. Lagoon crossings would result in the creation of overwater shading and direct temporary effects to the marine environment during construction. However, these alternatives result in the least effect to freshwater resources. If a bridge option is desired, consideration of overwater structures should be given priority in decision-making.

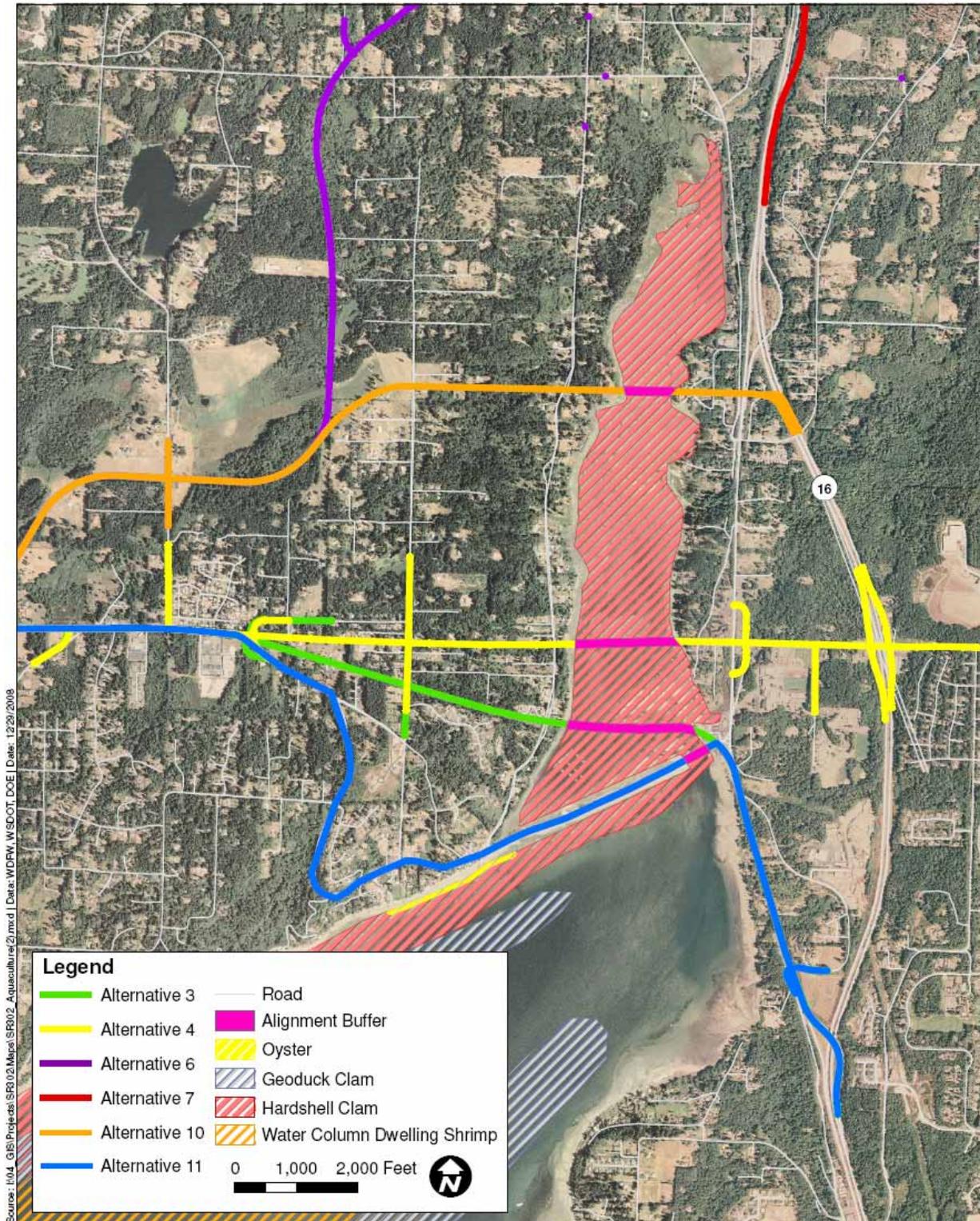
BUILD ALTERNATIVE	FRESHWATER		MARINE		AQUACULTURE	
	Number of stream crossings	Rank	Linear feet of Burley Lagoon crossings	Rank	Square feet of marine overwater structures ³	Rank
Alternative 3	7	2 (tie)	2,185	6	314,819	6
Alternative 4	4	1	1,922	4	245,271	5
Alternative 6	9	4	0	1 (tie)	0	1 (tie)
Alternative 7	17	5	0	1 (tie)	0	1 (tie)
Alternative 10	8	3	857	4	120,323	4
Alternative 11	7	2 (tie)	417	3	59,981	3



SR 302 - Freshwater Areas



SR 302 - Marine Resources



SR 302 - Aquaculture

Traffic Impacts

This section describes the seven 2035 SR 302 corridor alternatives (six alternatives plus the baseline) evaluated by HDR using travel demand modeling and traffic operational analyses. The findings and results are used to rank the seven alternatives from a technical perspective considering the travel demand modeling and traffic operational analyses.

SR 302 Corridors Alternatives

Seven of the 2035 SR 302 corridor alternatives (including the baseline) were advanced from the SR 302 Level I Screening Process, and thus required further detailed travel demand modeling and traffic operational analysis. The purpose of the modeling analysis is to evaluate the effectiveness of each alternative on its potential congestion relief on the SR 302 corridor between Key Peninsular Hwy and SR 16. In addition to the seven SR 302 corridor alternatives, the 2007 existing PM peak hour condition is also analyzed to make a relative comparison to the future scenarios being considered. The seven SR 302 corridor alternatives listed below are all assumed to be a four-lane section arterial between SR 16 to Key Peninsular Highway:

- 2035 Baseline Scenario: Adds future local and regional Transportation Improvement Programs
- 2035 SR 302 Corridor Alternative 3: Removes the current SR 302 Bridge + 2035 Baseline + new four-lane connection from Purdy Dr to SR 302 + intersection improvements
- 2035 SR 302 Corridor Alternative 4: Removes the current SR 302 Bridge + 2035 Baseline + new full diamond interchange at 144th St NW and SR 16 + new four-lane connection from the new interchange to SR 302 + intersection improvements
- 2035 SR 302 Corridor Alternative 6: Removes the current SR 302 Bridge + 2035 Baseline + new full diamond interchange at Pine St NW/SR 16 + new four-lane connection from the new interchange to SR 302 along Pine St, Madrona Rd, and new road from Mcleod-Alexandra Rd to SR 302 + intersection improvements
- 2035 SR 302 Corridor Alternative 7: Removes the current SR 302 Bridge + 2035 Baseline + new four-lane connection from the Bothell-Burley Rd/Purdy Dr to SR 302 along Pine St and 118th Ave NW + intersection improvements
- 2035 SR 302 Corridor Alternative 10: Removes the current SR 302 Bridge + 2035 Baseline + new half interchange at 156th St NW/SR 16 + new four-lane connection from the new interchange to SR 302 along new roadway + intersection improvements
- 2035 SR 302 Corridor Alternative 11: 2035 Baseline + new four-lane connection from SR 302 Purdy ramp to Key Peninsula Hwy + intersection improvements

SR 302 Corridors Alternative Travel Demand Modeling Analysis

Four kinds of travel demand modeling analyses were conducted in the study area: SR 302 corridor travel time, measures of effectiveness (VMT, VHT, Delay and Speed), congestion analysis (volume/capacity ratios), and select link analyses for corridor traffic distributions. Travel time is the key concern for SR 302 Corridor Transportation Study due to increasing traffic congestion and delays. The table below summarizes the travel times of each of the corridor alternatives modeled, listed by rank.

SR 302 PM Peak Hour Travel Time Comparison: Between Borgen Rd/SR 16 IC and SR-302/Key Peninsula Highway Intersection				
Scenarios	WB (min)	EB (min)	Round Trip (min)	Travel Time Ranking
2007 Existing	18.8	13.9	32.7	N/A
2035 Alternative 3	15.8	12.9	28.6	1
2035 Alternative 11	15.8	13.1	28.8	2
2035 Alternative 10	16.6	13.7	30.3	3
2035 Alternative 4	17.1	13.2	30.3	4
2035 Baseline Scenario	21.2	15.3	36.5	5
2035 Alternative 6	21.3	17.8	39.1	6
2035 Alternative 7	21.0	18.6	39.5	7
<i>Note: Rankings are based on the fastest WB travel time or total time where WB times are equal.</i>				

All alternatives were ranked by peak direction travel time, area-wide vehicle miles traveled, total vehicle hour delay reduction, number of congested segments with v/c ratios greater than 0.90 and the majority of traffic served. Alt. 3 stands out as the best alternative due to the shortest corridor travel time, the fewest vehicle miles traveled, the second highest reduction in vehicle hours delay, the fewest segments with a v/c ratio greater than 0.90, and it serves the project purpose of relieving the majority traffic congestion between the south and the west. Although their average speed is faster than 2035 Baseline Scenario, Alt. 6 and Alt. 7 are ranked lower than the baseline (no action) alternative because they will result in VMT increases by 12.5% and 12.8% respectively, with the smallest amount of total delay reductions, 23%, and 28% respectively.

SR 302 Corridors Alternative Arterial Analyses

Arterials were split into sections with similar characteristics, such as signal density and traffic volume, for analysis in HCS+. Sections shorter than 1 mile in length were analyzed under intersection analyses, as recommended in the Highway Capacity Manual.

All arterials were analyzed in the westbound direction during the PM peak hour. The highest ADT for each analyzed section was used for the future volume. Arterials were either classified as Class 1 with a free flow speed of 55 mph or Class 2 with a free flow speed of 45 mph, depending on signal and access point density.

Under the existing 2007 conditions, the entire five-mile SR 302 arterial is currently operating at LOS E from Key Peninsula Highway to the SR 302 spur. Under the 2035 Baseline Scenario, the maximum ADT on SR 302 will increase from 19,000 to 30,000 vehicles per day, so the corridor will continue to operate at a LOS E or degrade to a LOS F.

All of the corridor alternatives considered will improve the SR 302 arterial operation to LOS C or better in 2035. The improvement in Levels of Service for all the corridor alternatives is due to the roadway widening to four lanes and some signal installations to maintain intersection operations at LOS D or better. Therefore, four lanes are recommended for all the 2035 alternatives. Alternative 3 stands out as the best alternative since it is projected to serve up to

35,000 vehicles per day and operate at LOS A for the sections analyzed. Alternative 11 is the second best alternative, since it serves between 32,500-35,000 vehicles per day and operates at LOS B or LOS C.

SR 302 Corridors Alternative Intersection Analyses

The intersection operational LOS analyses were performed to evaluate and compare the traffic scenarios between the 2007 existing conditions, the 2035 Baseline conditions, and the 2035 Alternatives. By comparative analyses, it can be determined which intersections will perform better or worse for each scenario.

Mitigation measures were identified for each of the seven Corridor Alternatives to maintain LOS D or better. These specific intersection improvements are necessary to meet the objectives of congestion relief in the SR 302 Corridor Transportation Study. The table below provides a summary result of each intersection LOS.

Table 2: Intersection LOS Comparison Between 2007 Existing, 2035 Baseline Scenario, and SR302 Corridor Alternatives

Intersection	2007	2035	2035 Alt 3	2035 Alt 4	2035 Alt 6	2035 Alt 7	2035 Alt 10	2035 Alt 11
SR 302 at Key Peninsula Hwy	B	B	B	C	C	B	C	C
SR 302 at 118 th Ave NW	E	B	A	A	A	B	A	A
SR 302 at Creviston Dr	C	C	C	C	A	C	B	B
SR 302 at 97 th Ave NW	C	D	D	C	A	C	A	C
SR 302 at 94 th Ave NW	D	C	B	B	A	C	A	B
SR 302 at 92 nd Ave NW	F	E	A	A	B	B	B	A
SR 302 at Goldman Dr (west)	E	D	B	B	B	B	B	A
SR 302 at Emerald/ Danforth	D	F	B	B	B	B	B	A
SR 302 at Goldman Dr (east)	F	F	B	B	B	B	B	A
SR 302 at Goodrich Dr	F	C	A	A	A	A	A	A
SR 302 at SR 302 Spur	D	C	D	A	A	A	A	D
SR 302 at Goodnough Dr (north)	D	F	C	C	B	B	B	C
SR 302 at Goodnough Dr (south)	E	F	A	C	C	B	B	A
SR 302 Spur at Purdy Ln	A	A	A	A	A	A	A	A
SR 302 Spur at 144 th St NW	D	C	C	C	C	C	C	C
SR 302 Spur at 154 th St NW	F	E	F	F	F	E	F	F
Pine Rd at Glenwood Rd	*	B	B	B	B	B	B	B
Pine Rd at Sidney Rd	*	C	B	B	C	B	B	B
Pine Rd at Madrona Rd	*	C	B	B	C	C	B	B
Pine Rd at Bethel-Burley	*	C	B	B	A	C	C	B
Spruce Rd at Sidney Rd	*	B	B	B	B	F	B	B
Spruce Rd at Madrona Rd	*	A	A	A	C	B	A	A
Spruce Rd at Bethel-Burley	*	A	A	A	A	A	A	A
Bethel-Burley at Oak Rd	*	E	C	B	B	B	B	C
Bethel-Burley at Burley Olalla Rd	*	F	C	C	B	C	B	D

**volume data unavailable*

Community Comments

Introduction

The study team conducted two public open houses in October 2008 that coordinated with the alternative screening process. The purpose of these events was to review the results of the Level 1 screening process, and gain an understanding of the community's attitudes towards the results. The team also convened an advisory committee on three occasions, with meetings in October and December intended to establish community attitudes towards Level 1 and Level 2 criteria weightings. An exercise conducted with the committee on October 20 confirmed the criteria weightings developed by the WSDOT Level 1 screening team. A similar exercise conducted with the committee on December 9 about prospective Level 2 criteria was inconclusive. However, these December 9 are summarized later in this section based on notes during the discussion.

In December 2008, the study team conducted another open house in response to requests from the community to provide input in response to the addition of Alternative 10. This third meeting was advertised only in the local paper, and by sending out email notification to advisory committee members. Comments from the meeting have been combined with those from the October meetings for purposes of this summary.

A summary of community comments follows which includes comments from public open houses and in emails received by WSDOT staff directly, or by an interface available on the project website. The summary is organized by central themes that can be taken from their contents.

In Favor of a New Bridge

47 comments

Comments in this category typically refer to the importance of a direct route, and problems associated with increased travel distances resulting from routing the highway north of the lagoon. Some comments refer to significant impacts resulting from these non-bridge alternatives to residents in Burley. It's been noted that residents of Kitsap County commonly refer to the traffic congestion in Purdy as being a "Pierce County problem," and that WSDOT should not be addressing the situation by creating new problems in Kitsap County. Because they are more direct and shorter, many suggested that Alternatives 3 and 4 would result in fewer impacts to the community and would be safer.

Nearly 2/3 of comments in this category referred to Alternative 4 (144th St) as their preference, with both Alternative 4 (powerline) and "either Alternative 3 or 4" coming in second at about 15% each. Alternative 10, which was not described until after the October open houses, has received only three comments in favor of it so far.

In Opposition to a New Bridge

45 comments

Comments in this category commonly refer to the high environmental value of Burley Lagoon, and recent efforts to recover it to a pristine state. Many think that the assumed high cost of a bridge compared to the establishment or improvement of a terrestrial route makes these

alternatives uncompetitive, and would possibly result in a toll. References to specific impacts of these bridges include high visual impact, quality of life, fish, and bird habitat.

Twelve comments in this category (about 25%) specifically opposed Alternative 10. These Alternative 10 comments commonly referred to “rural” lifestyle, including impacts to property values, peace and quiet, and quality of life. Environmental impacts mentioned include wildlife, terrestrial wetlands, and aquatic life.

Seventeen comments in this category (40%) recommended another alternative instead of a bridge, with over 50% mentioning Alternative 7 as a favorite, while those mentioning “any non-bridge build alternative” somewhat less often at 35%. No action was mentioned once.

In Favor of a New Route through Burley

35 comments

Comments in this category commonly refer to the advantages of using existing right-of-way from an environmental impact perspective. Some reference a lesser impact on residences, since a road already exists there. A few refer to the advantage of Alternatives 5 and 6 (diagonal routes) since they provide a more direct route and impact fewer residences.

Twenty-five comments in this category (about 70%) described a preference in how to proceed. Of this number, over half (about 58%) expressed a preference for Alternative 7, while a preference for either 5 or 6 was mentioned nearly 30% of the time.

Suggests New Alternatives

13 comments

Several comments in this category spoke in favor of replacing the causeway on Purdy Spit with a viaduct, which contributed to consideration by the study team of adding Alternative 11 to the Level II screening process. Specific alternatives include the following:

- Pine Road in Burley (E), to Bethel-Burley Road (N), to Burley-Olalla interchange (E)
- Pine Road in Burley (E), to Bethel-Burley Road (S), to SR 16 near Spruce.
- Add more ramps to serve different areas at 144th and SR 302 Spur to relieve Purdy
- Grade separation needed at Purdy intersection
- Provide a bundle of lesser improvements - accelerate Purdy bridge replacement, add signals along existing route, add ramps at SR 16/144th, and improve Pine Road.

In Favor of No Action/Improve Existing Route

12 comments

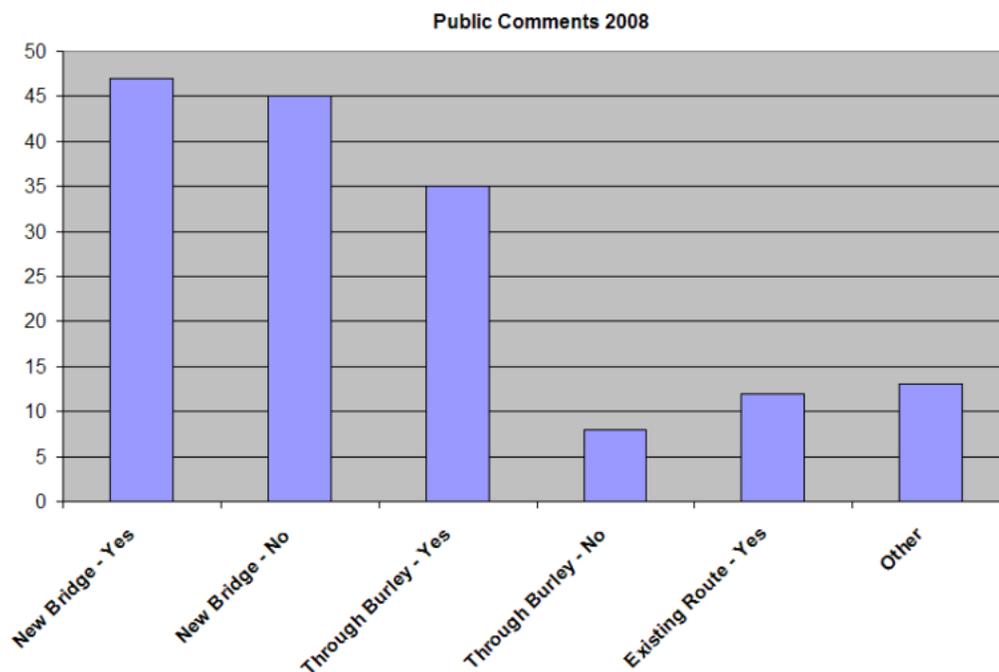
These two alternatives are combined in peoples understanding, with gradations described from do absolutely nothing and things will take care of themselves (2), to providing specific improvements like signals, roundabouts, and guardrails, as well as a new bridge at Purdy.

In Opposition to a New Route through Burley

8 comments

Several comments in this category referred to specific impacts to properties owned or operated by the commenter. Reference was also made in these comments to the difficulty of the terrain

and the aquatic resources near the road. Alternatives 5 and 6 would likely impact the Burley Bible Church, and two comments were opposed to that.



Committee Criteria Ranking – December 9, 2008

The study advisory committee represents a mix of agency staff and community representatives that is not intended to be numerically representative of highway users or community members. Therefore, for purposes of developing the comparative rankings of the seven criteria proposed for Level 2 screening a consensus model, rather than majority model, was suggested for the weighting exercise. Unfortunately, this approach resulted in virtually no clear decisions by the committee in the matrix. Subjective findings from the discussions are listed below by criteria.

Operations criteria vs. other criteria

Some consensus was attained in finding mainline operations were more important than arch/cultural/4(f)/ag/LU and improve travel time criteria. Comparisons of operations to the natural environment criteria split the committee.

Relocations/Social/EJ/Noise/Visual vs. other criteria

As the discussion proceeded, it became clear that several (about six) committee members were blocking a broader consensus on the importance of this criterion by consistently arguing in favor of other criteria, including travel time, project schedule, and the environment.

Project Schedule vs. Improve Travel Times

A near consensus was reached in favor of project schedule.