MITIGATION SEQUENCING COMPLIANCE NARRATIVE

The City of Sammamish establishes a mitigation sequencing hierarchy for both critical areas and shorelines with a preference for first avoiding and then minimizing impacts before providing compensatory mitigation (SMC 21A.50.135 and SMC 25.06.020). This narrative is intended to describe the manner in which King County is in compliance with both requirements as they relate to the East Lake Sammamish Trail corridor. It is important to note that critical areas along the corridor occur both within and outside the shoreline area, as described in detail in the Revised Critical Areas Study (Parametrix 2017). In the narrative below, critical areas are discussed regardless of location relative to the shoreline and then the shoreline discussion addresses distinct categories of critical areas and resources within the shoreline.

Overview of Existing Conditions

East Lake Sammamish Trail corridor extends on the east side of Lake Sammamish from Issaquah to Redmond in a former railroad corridor. South Segment B encompasses 3.5 miles of the overall corridor from SE 33rd Street to Inglewood Hill Road. Approximately 1,900 linear feet of the corridor is 150 to 200 feet wide; 10,025 feet is 100; and the remainder of the corridor is less than 100 feet wide. The corridor is not a uniform distance from the lake shore. Portions of this railbanked corridor occur within the 50-foot shoreline setback area and the 200-foot shoreline area of Lake Sammamish.

Streams in the East Lake Sammamish Basin generally originate in wetlands located on the Sammamish Plateau, and drain west through steep ravines to Lake Sammamish. Seventeen drainages meeting the City of Sammamish definition of streams intersect the East Lake Sammamish Trail corridor, and 37 wetlands partially or fully occur within the corridor. Some of the wetlands are outside the 200-foot shoreline area or 50-foot shoreline setback area. Section 3 of the Revised CAS provides more information on these critical areas.

The shoreline of Lake Sammamish in this segment is characterized by residential development. Important functions of the shoreline area include drainage connections from uphill areas to the lake and vegetation along streams and wetlands.

Design Considerations and Accommodations to Avoid and Minimize Impacts

Applicable techniques for avoiding and minimizing impacts from trail development include design considerations pertaining to trail width, trail alignment, and use of retaining walls. Each of these is generally discussed below and then the specific application of the techniques is detailed in the sections that follow.

Trail Location

As discussed above, 65 percent the ELST corridor is at least 100 feet wide. This development proposal avoids and minimizes impacts to shoreline resources including critical areas by locating the trail on the existing railroad prism/interim use trail. By using the area of existing disturbance, the amount of earthwork and vegetation clearing is minimized.

Trail Width

This development proposal avoids and minimizes impacts to shoreline resources including critical areas by designing the trail to the minimum possible width. As stated above, the ELST corridor is far wider than

the 18 foot width proposed for the ELST trail. A wider trail was evaluated and considered during the environmental review process. Specifically, the environmental impact statement (EIS) prepared for this project considered trail width options ranging from 18 feet wide to 27 feet wide. As noted in the EIS, the trail offers both a non-motorized transportation option and a multi-use recreational opportunity. It is intended to safely accommodate a variety of user groups such as bicyclists, pedestrians and runners. The 18-foot-side option was considered the minimum acceptable width, based on AASHTO recommendations at that time and the anticipated volume of trail use. The sections wider than 18 feet provided for better separation of higher speed and lower speed trail uses, responding to ongoing comments and suggestions from trail users.

During the subsequent preliminary design process, King County elected to avoid and minimize impacts to shoreline resources including critical areas by choosing the alternatives with the narrowest trail footprint, namely an 18 foot wide trail for the entire corridor. This decision resulted in reduced costs and environmental impacts.

Since that time, AASHTO recommendations have been updated and King County's user counts along existing regional trails have become more sophisticated. However, none of this subsequent information supports reducing the trail width below the 18-foot section, which includes 12 feet of pavement. (Please refer to technical memoranda provided from Bill Schulteiss, Toole Design Group, to Parametrix, dated June 2016).

The 18-foot section as considered in the EIS also includes a 2-foot shoulder and 1-foot clear zone on each side of the trail. These features serve important functions:

- Throughout public comment and engagement, walkers and runners have consistently asked for space that enables them to move along the corridor or step off the paved trail, away from higher-speed bicyclists. The 3-foot area addresses this need and also serves as a recovery area for bicyclists who run off the paved path.
- Throughout public comment and engagement, adjacent property owners who have to cross the trail have expressed concerns about the potential for conflict with trail users. The 3-foot area provides a landing space off the paved trail where people crossing the trail can stop and look for cross traffic and open gates, if applicable.

Trail Alignment

The centerline of the trail can shift away from the existing interim use trail centerline in response to resources occurring adjacent to the trail. In shifting the trail alignment, the following factors are considered:

- Encompassing the existing railbed prism
- Horizontal geometry
- Sight distances at intersections
- Grading at intersections
- Critical areas
- Terrain
- Significant trees
- Drainage conveyance

Specific places where impacts to critical areas and shoreline resources were avoided and minimized by shifting the trail are described in Sections III and IV below.

Retaining Walls

In most of Segment B, the existing rail prism/interim use trail is a bench on terrain that is generally sloping toward the lake. When the prism is widened to accommodate the width necessary to build a trail that meets the guidelines and standards of King County, WSDOT, and AASHTO, the construction cuts and fills can extend well beyond the operational footprint of the trail. In many areas, King County uses a retaining wall in lieu of cuts and fills to minimize the construction footprint. Specific places where impacts to critical areas and shoreline resources were avoided and minimized by the use of retaining walls are described in Sections III and IV below.

Avoidance of Critical Area and Shoreline Resources

Critical Areas Avoided

Wetlands

King County avoided permanent impacts to 24 of 37 wetlands, ultimately impacting only 0.22 acre of an estimated 5 acres of wetlands that occur within the trail corridor. Sixteen wetland were avoided by shifting the trail alignment away from the resource, where possible (Wetlands 15BC, 15D, 21B, 21D, 22AB, 22CD, 23A, 23C, 24A, 24C, 25B, 25C, 25F, 28B, 28E, 30B). Six were avoided by using retaining walls (Wetland 15A, 19B, 21AC, 25A, 26D, 29C). Two wetlands (Wetlands 18C and 26B) were avoidable because they aren't immediately adjacent to the trail.

Streams

The trail corridor intersects with 17 streams that meet the definition of "streams" as identified in SMC 21A.15.1240. For eight of these streams, impacts to the stream channel are avoided by using the existing railbed prism/interim trail. In these places, the existing culverts are long enough that no open channel is impacted. Where streams parallel the trail (Unnamed Stream #10, Stream 0143L (SF), and Stream 0143L (NF)), the trail alignment is adjusted to avoid permanently impacting the parallel stream channel.

For six of the streams, fish passage improvements are proposed in conjunction with culvert replacement—not only avoiding permanent impacts but resulting in a net gain of stream channel. Replacing existing culverts with shorter, wider structures that comply with current fish passage standards will result in net gain of 69 linear feet (681 square feet) of open channel in Type F streams in the project area. In addition, the installation of fish-passable structures in these streams will improve connectivity to approximately 660 feet of upstream habitat between the Interim Use Trail and East Lake Sammamish Parkway, with the potential for access to an additional 46,450 feet of habitat upstream of East Lake Sammamish Parkway. Finally, by installing structures that more closely resemble natural conditions, the project will contribute to improvements of ecological function, such as the timing, volume, and distribution of woody debris recruitment; the timing, volume, rate, and character of sediment input, storage, and transport; and the timing, magnitude, duration, and spatial distribution of peak, high, and low flows.

Shoreline Resources Avoided

Critical Areas in the Shoreline

See Section A above. By avoiding permanent impacts to 24 wetlands, existing plant communities in these wetlands will be maintained. By replacing eight existing culverts with wider, shorter culverts and avoiding impacts to parallel stream channels, the important shoreline function of connectivity of stream networks will be maintained or improved.

Trees and Vegetation

The County's commitment to vegetation preservation and the maintenance of existing plant communities in the shoreline jurisdiction is even greater than it is for the project overall. The County is avoiding and minimizing impacts to trees and vegetation within the ELST corridor. Of 847 significant trees inventoried and assessed within 40 feet of the clearing and grubbing limits, slightly more than one-half are in the shoreline jurisdiction. Of these, approximately 100 will be removed, amounting to 25 percent of the total number of significant trees in the shoreline jurisdiction. The retention rate for significant trees in the shoreline jurisdiction is thus 75 percent, which is slightly higher than the retention rate for the project area overall (70 percent).

Moreover, the County's approach to tree retention plan emphasizes native species and large trees, both of which provide valuable ecological function. The retention rate of significant trees in the shoreline zone is 77 percent for native species, compared to 68 percent for non-native species. The retention rate is even greater for trees in the largest size classes: 81 percent of trees 24 inches or greater in diameter, as measured 4 ½ feet above the ground, will be retained in the shoreline zone.

Ditches

Open conveyance ditches often parallel the interim use trail on the upgradient side in many areas of the corridor. These ditches convey water along the corridor to culverts under the trail. This open conveyance provides for some reduction in flow velocity and allows infiltration of water moving through. These ditches were reviewed on a case-by-case basis and impacts were avoided, where practical.

Minimization of Critical Area and Shoreline Impacts

Critical Areas:

Wetlands

Some impacts to wetland buffers could not be avoided because wetlands occur close to the existing railbed with buffer areas often extending on both sides of the trail. Likewise, temporary impacts during construction could not be avoided to many wetlands and wetland buffers due to proximity. Table 1 below identifies the 13 wetlands with permanent impacts and explains why avoidance was not possible. As shown in the table, in most instances, the impacts were unavoidable because wetlands occur on both sides of the trail. As noted in the trail width discussion above, an 18 foot trail is the minimum width necessary to meet the standards and guidelines of King County, WSDOT, or AASHTO, given the types and volume of use anticipated.

Where impacts could not be completely avoided, King County looked for opportunities to minimize the impacts. Minimization efforts are described for the impacted wetlands in Table 1, where applicable. Boardwalks were not proposed to further minimize these impacts because, as shown in the table, the area of impact for each wetland is relatively low and the impacted wetlands are either Category III or IV wetlands. Boardwalks substantially increase project cost and do not completely avoid impacts; thus, they are more typically proposed when traversing larger or higher quality wetlands.

Table 1

Wetland	Rating	Perm. Impacts acres (SF)	Avoidance and Minimization
15E	IV	0.05 (2,022)	This long narrow wetland could not be avoided because wetlands occur on both sides of the existing railroad prism/interim use trail. Permanent impacts to the wetland on the opposing side (Wetland 15D) were avoided. Impacts to Wetland 15E couldn't be minimized through the use of a retaining wall because it is too close and too narrow.
19A	IV	0.01 (278)	The trail alignment shifts away from this small wetland, but impacts could not be avoided while avoiding the larger wetland (Wetland 19B) on the opposite side of the existing railroad prism/interim use trail. Impacts to Wetland 19A couldn't be minimized through the use of a retaining wall because it is too close and too small.
20A	III	0.05 (2,087)	This wetland could not be avoided in order to maintain access road to residences on the opposite side of the existing railroad prism/interim use trail. The use of a retaining wall minimizes the impacts.
22E	IV	<0.01 (191)	This small wetland could not be avoided because wetlands occur on both sides of the existing railroad prism/interim use trail. Permanent impacts to the larger wetland on the opposing side (Wetland 22AB) were avoided. Even the use of a retaining wall does not minimize the impacts due to the proximity and size of the wetland.
23B	III	<0.01 (65)	This wetland could not be avoided because wetlands occur on both sides of the existing railroad prism/interim use trail. Permanent impacts to Wetland 23A were avoided. The use of a retaining wall greatly minimized the impacts to Wetland 23B.
24B	III	0.05 (2,301)	This wetland could not be avoided because wetlands occur on both sides of the existing railroad prism/interim use trail. Permanent impacts to Wetland 24A were avoided. The use of a retaining wall greatly minimized the impacts to Wetland 24B.
26A	III	<0.01 (9)	The trail alignment shifts away from this wetland, but impacts could not be completed avoided while minimizing impacts to the wetland on the opposing side (Wetland 26C). A wall would not likely reduce the impact here due to proximity.
26C	IV	0.01 (455)	A small extension of this wetland could not be avoided while minimizing impacts to Wetland 26A. Use of a retaining wall here to minimize impacts would be inconsistent with the proposed design for dispersing stormwater.
28A	IV	0.01 (175)	Although the trail alignment shifts away from this wetland, impacts could not be avoided while providing access for adjacent property owners to park and cross the trail to their homes. A wall would not reduce the impacts.
28C	IV	0.02 (837)	Although the trail alignment shifts away from this wetland, impacts could not be avoided while providing access for adjacent property owners to park and cross the trail to their homes.
28D	IV	<0.01 (201)	This small wetland could not be avoided while retaining parking for property owners who park and cross the trail to access their homes.

Table 1

Wetland	Rating	Perm. Impacts acres (SF)	Avoidance and Minimization
29B	IV	0.01 (295)	Impacts could not be avoided because wetlands occur on both sides of the existing railroad prism/interim use trail. Impacts to Wetland 29B were minimized greatly by the use of a retaining wall.
29D	IV	0.01 (464)	Impacts could not be avoided because wetlands occur on both sides of the existing railroad prism/interim use trail. Impacts to Wetland 29B were minimized greatly by the trail alignment.

Streams

The trail design uses head walls to minimize the length of culvert extensions, thus reducing stream channel and stream buffer impacts. Head walls reduced the potential impacts at 8 stream crossing locations on Pine Lake Creek (trail and private driveway), Stream 0155, Ebright Creek, Zackuse Creek (trail and Shore Lane) and Stream 0143L North Fork. As previously noted, the project will result in a net gain of stream channel.

Shoreline Resources

After avoidance of shoreline resources, the potential impacts are minimized during construction by establishing clear construction limits with construction fencing that protects resources outside the construction zone, implementing a construction stomwater pollution prevention plan to minimize and control pollution from project generated stormwater, and implementing a temporary erosion and sedimentation control plan to minimize and control erosion from stormwater.

Compensatory Mitigation for Critical Area Impacts

After avoidance and minimization, remaining impacts must be mitigated in accordance with local, state, and federal regulations.

Chronology of Approach

This discussion focuses on mitigation site selection for wetland and wetland buffer impacts. At the time the Final Environmental Impact Statement (FEIS) was published, King County proposed to compensate for unavoidable wetland and buffer impacts by purchasing wetland banking credits from the mitigation bank at the headwaters of Laughing Jacobs Creek in the City of Sammamish. The County envisioned greater ecological benefits than could be realized with onsite mitigation for a linear corridor project. However, the FEIS also stated that "if it is determined that mitigation should not occur at the mitigation bank, on-site mitigation opportunities would be used."

After issuance of the FEIS, King County proceeded with the phased design, permitting and construction of the trail. As each phase advanced, mitigation for wetland and wetland buffer impacts was coordinated with the appropriate regulatory agencies:

- In the Redmond Segment, the City of Redmond required that compensatory mitigation occur within its municipal limits and would not allow use of the bank in the City of Sammamish. Thus, mitigation occurred near the northern terminus of the project along Bear Creek.

- In the Issaquah Segment, the City of Issaquah required that compensatory mitigation occur in the same basin as the impacts and would not allow use of the bank in the City of Sammamish. Thus onsite mitigation occurred at several locations along the corridor.
- In the North Sammamish Segment, Kathy Curry (formerly with the City of Sammamish) indicated during the pre-application process that the City preferred onsite mitigation (reference Sammamish Municipal Code (SMC) 21A.50.310 at that time). Thus, onsite mitigation occurred at several locations along the corridor.
- In the South Sammamish Segment A, as part of its shoreline substantial development permit application to the City of Sammamish, King County submitted a Critical Areas Study (CAS) that proposed use of the mitigation bank (Parametrix, July 2014) because of concern that mitigation areas in the trail corridor would potentially be small and fragmented. The City of Sammamish suggested that King County further investigate onsite potential. Based on the City's preference, King County was able to identify onsite mitigation areas with available acreage and the opportunity to increase the ecological benefit at four consolidated locations in the corridor. These sites also offered easy access for both construction and maintenance with minimal disturbance to other habitats and provided an opportunity for visual and aural screening of the Lake Sammamish Parkway for both wildlife and trail users. The onsite mitigation was approved by the City of Sammamish in its July 2014 permit decision.

Proposed Mitigation

The history of coordination and communication with the local jurisdictions played a role in developing the current mitigation proposal submitted with the application for shoreline substantial development permit for South Sammamish Segment B. Consistent with the previous direction by the City of Sammamish, King County looked first for onsite opportunities to mitigate for wetland and wetland buffer impacts. As noted in the October 2016 CAS for this segment: "The project team was able to identify on-site mitigation areas with available acreage and the opportunity to increase the ecological benefits at 21 locations in the corridor." The proposed mitigation will include a minimum of 0.22 acre of wetland creation/restoration, 0.64 acre of wetland enhancement, 1.48 acres of wetland buffer addition, 0.56 acre of wetland buffer enhancement, 0.20 acre of stream buffer enhancement, and 0.09 acre of shoreline setback enhancement. Additional details about the proposed mitigation are provided in the October 2016 CAS, Section 5.3.1.4.

Revised Mitigation

In the review of the permit application and the October 2016 CAS, City of Sammamish staff commented: "Review and revise or support the proposed mitigation design. Include rationale for why mitigation banking or use of the King County [Management Reserves Program] MRP are not appropriate. Provide a detailed assessment documenting how the proposed mitigation will maintain critical area functions and values."

It is important to note that, based on the hierarchy established in SMC 21A.50.140, the County's analysis starts with the analysis of how onsite mitigation will maintain critical area functions and values. If the onsite mitigation maintains the functions and values, then the code and past direction establishes a clear preference for onsite mitigation. It is only if the functions and values cannot be maintained (i.e., the mitigation is infeasible) that offsite alternatives are considered.

Upon review of the detailed comments from City of Sammamish staff and consultants, King County has agreed that a portion of the previously proposed mitigation should be moved to the offsite mitigation bank, and the balance remain onsite. The detailed analysis is provided in the narrative that follows.

City comments noted that adequate buffers are not proposed for wetland creation and enhancement areas in this constrained linear corridor. Per SMC 21A.50.310, among other requirements, mitigation shall be consistent with the Department of Ecology Guidance on Wetland Mitigation in Washington State. Consistent with this guidance, King County has modified its mitigation proposal so that wetland creation credits will be obtained from an approved mitigation bank to compensate for the 0.22 acre of permanent wetland impacts.

However, wetlands can only be enhanced in their current location. The wetlands along the trail corridor provide water quality and hydrology functions that are important to shoreline ecology. To help achieve the goal of providing no net loss of wetland function, wetlands will be enhanced in situ.

As described in the Revised CAS, Section 5.4.1, the mitigation goals are:

- Replace 8 fish barrier culverts on 6 Type F streams with fish passable culverts.
- Create/restore 0.22 acre of wetland (offsite at mitigation bank).
- Enhance 0.65 acre of wetland.
- Increase and enhance the buffer of 7 wetlands by 1. 53 acre.
- Enhance 0.75 acre of wetland buffer.
- Enhance 0.24 acre of stream buffer.
- Enhance 0.09 acre of shoreline setback.

Achievement of these goals is expected to provide the following improvements to wetland, stream, wetland buffer, stream buffer, and shoreline setback functions:

- Provide additional fish habitat by removing fish barriers, increasing open stream channel, and opening up available upstream habitat.
- Increase the production of organic matter by planting trees and shrubs in the created/restored wetland, enhanced wetland, increased wetland buffer, enhanced wetland buffer, enhanced stream buffer, and enhanced shoreline setback.
- Increase fish and wildlife habitat and improve biological diversity by planting with a variety of native wetland and buffer plant species and installing habitat features (habitat logs and brush piles).

Mitigation Performance

King County is confident that the proposed mitigation will be successful based on best available science and past experience.

Best Available Science

The City's current Environmental Critical Areas regulations are based on best available science (BAS). By complying with those regulations, the proposed mitigation plan for the ELST project is consistent with BAS.

Ordinance O2016-410 (ECA Amendments to SMP, Amendments to SMC Title 21A.50), approved by the Sammamish City Council on June 7, 2016, determined that the City's Environmental Critical Areas regulations, as amended, "provide protection for critical areas consistent with BAS" and "were developed through a review of the BAS literature," and that the City had followed requirements established in the Growth Management Act for "including and considering BAS in modification of the regulations for critical areas." The mitigation requirements incorporated into the City's Environmental Critical Areas regulations

are thus supported by best available science, as required under SMC 21A.50.145(4). By complying with those requirements, the Revised CAS is consistent with BAS.

The Revised CAS complies with the impact avoidance, minimization, and mitigation requirements in the City's Environmental Critical Areas regulations by following the mitigation sequencing approach established in SMC 21A.50.135 and SMC 25.06.020. King County employed a rigorous approach to avoiding and minimizing impacts to critical areas in a manner consistent with the purpose, effectiveness, engineering feasibility, safety, and cost of the project, as described in this narrative.

Consistent with the requirements of SMC 21A.50.135 and SMC 21A.50.310, King County is compensating for unavoidable impacts by enhancing critical areas and their buffers and by creating replacement critical areas and buffers, thereby achieving no net loss of critical areas and their functions and values. By meeting or exceeding the impact mitigation ratios in SMC 21A.50.310, the project is consistent with the BAS approach for ensuring no net loss of ecological functions and values.

King County is proposing to complete compensatory mitigation for critical areas impacts at a total of 18 sites in the South Sammamish Segment B corridor (Revised CAS Table 5-1; Appendix E). The proposed mitigation will include a minimum of 0.22 acre of wetland creation/restoration credits at an off-site mitigation bank, 0.65 acre of wetland enhancement, 1.53 acres of wetland buffer addition, 0.77 acre of wetland buffer enhancement, and 0.22 acre of stream buffer enhancement. An additional 0.09 acre of shoreline setback enhancement will occur at four separate sites. The proposed mitigation equals or exceeds City critical areas mitigation requirements. A detailed description of the proposed mitigation is presented in Section 5.3 of Revised CAS, dated July 2017.

King County Mitigation Experience and Likelihood of Mitigation Success in Trail Corridors

In general small isolated mitigation sites are often less successful than larger sites. However, with regular maintenance including invasive weed control, irrigation, and supplemental plantings, if needed, these sites can achieve their mitigation goals and provide valuable habitat, especially in urban and developing communities.

The greatest risk to the success of wetland and buffer enhancements mitigation sites is encroachment by invasive species and displacement of native vegetation. Himalayan blackberry and reed canarygrass are often the two most invasive species which colonize sites. Blackberry can grow over native vegetation and retard their growth. Reed canarygrass competes vigorously with new plantings. Regular maintenance activities to reduce weed growth has proven to be effective in allowing native plants to become established and ultimately to grow and achieve mitigation standards.

King County Parks has a formal maintenance program for all its trail projects. The program is directed at maintaining the trail corridors for recreational and aesthetic uses but it also includes many mitigation projects. The County understands that regular maintenance is necessary to achieve its mitigation commitments in public trail corridors. In conjunction with the 90-percent trail design, the County will develop a segment-specific update to the ELST Vegetation Management Plan and submit the document with the design plans to the City as part of the grading permit application package.

King County has successfully managed a number of sites to achieve mitigation goals and standards. Examples are described below.

- The County has been monitoring the compensatory buffer mitigation site for the Redmond segment of the ELST for five years. It achieved all its performance standards for invasive weeds control and native plant cover in 2016.

- The Marymoor Connector Trail mitigation site was constructed by King County in November 2008. Almost an acre of riparian buffer was enhanced by invasive species removal and planting along the Sammamish River. King County has performed maintenance activities over an 8 year period in order to achieve the mitigation goals. Despite a regular battle with reed canarygrass and Himalayan blackberry, native woody plants have established and grown such that they have achieved there cover performance standards after 8 years.
- Another example of mitigation success occurs at the Snoqualmie Valley Trail (SVT)—Tolt River Bridge Project mitigation site located east and west of the SVT Tolt River Bridge on the south bank, near the city of Carnation. After five years with necessary maintenance, the SVT—Tolt River Bridge Project mitigation site surpassed performance standards for native plant survival rates and invasive species control.

Conclusion

As demonstrated by this narrative and the Revised CAS, King County's development of East Lake Sammamish Trail South Sammamish Segment B is in compliance with the City of Sammamish's mitigation sequencing hierarchy for both critical areas and shorelines. The project design considered avoidance and minimization before providing compensatory mitigation, consistent with the requirements of SMC 21A.50 and SMC 25.06.