CITY OF KIRKLAND
Department of Public Works
123 Fifth Avenue, Kirkland, WA 98033 425.587.3800
www.kirklandwa.gov

MEMORANDUM

To: Kurt Triplett, City Manager

From: Laura Drake, P.E, Senior Project Engineer
Rod Steitzer, P.E., Capital Projects Manager
Julie Underwood, Director of Public Works

Date: July 22, 2021

Subject: JUANITA DRIVE MULTI-MODAL IMPROVEMENTS—NE 132ND STREET CONNECTION CONCEPTS

RECOMMENDATION:

It is recommended that the City Council:

- Receive an update about proposed Juanita Drive multi-modal improvements; and
- Provide direction about concepts fora connection along NE 132nd Street between 72nd Avenue NE and Juanita Drive NE.

BACKGROUND DISCUSSION:

The Juanita Drive corridor is an important north/south regional connection, and it is used by thousands of people driving, walking, or biking daily. In 2014, using an extensive stakeholder engagement process, the City completed the "Juanita Drive Corridor Study" (Study), which identified 33 connectivity and safety improvements for people who use the corridor. In 2018, the City completed the first 11 sidewalk, crosswalk, bike lane, and lighting safety improvements under the Juanita Drive Quick Wins Project construction contract.

In 2019, the Council approved a scope modification for the Juanita Drive Nonmotorized Improvements project to create a continuous pedestrian and bike pathway along Juanita Drive NE from NE 132nd Street to NE 120th Street. The scope modification also will improve safety and access at the intersection of NE 112th Street/80th Avenue NE/Juanita Drive NE by realigning the streets to improve safety and accessibility. In October 2020, the Council received an update about the project's progress.

NE 132nd Street: 72nd Avenue NE to Juanita Drive

The Juanita Drive Corridor Study ranked the NE 132nd Street nonmotorized connection between Juanita Drive NE and 72nd Avenue NE, identified as "NM5" on the Citywide Connections Map, as a medium priority. On November 19, 2019, staff presented this connection with the inclusion of emergency vehicle access as part of the proposed Citywide Transportation Connections Map. The Council decided not to include an emergency vehicle access concept on the Citywide

Connections Map, but did include the nonmotorized connection as a potential future public works project. The Council asked for concepts with detailed cost estimates to be advanced with this project.

Currently, a 30-foot-wide stretch of public right-of-way extends from 76th Avenue NE to Juanita Drive, as shown below in figure 1. This includes an informal trail connection from 72nd to 74th Avenue NE, an unpaved road from 74th to 76th Avenue NE, and a 750-foot long rugged hiking trail from 76th to Juanita Drive that crosses Denny Creek. The eastern informal trail traverses a steep ravine with overgrown vegetation and loose surface materials, as shown in Figure 2, below (see also Attachment A, Vicinity and Area Maps). These trail connections are not identified officially as hiking trails, and therefore they not maintained regularly.

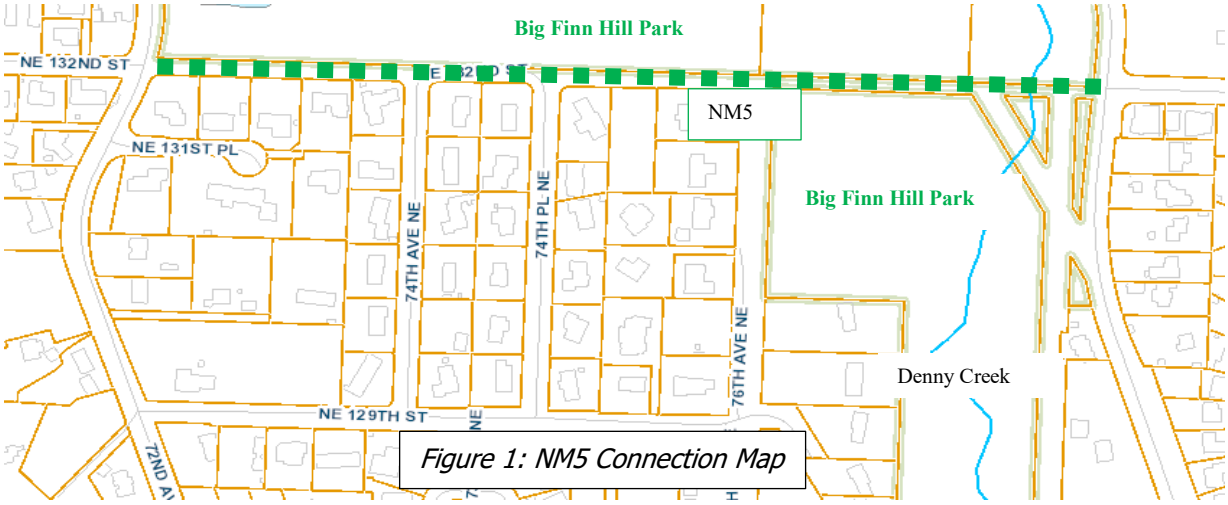

Figure 1: NM5 Connection Map

Staff focused on the connection between 76th Avenue NE and Juanita Drive NE, because that segment is the most difficult to traverse today and would require the bulk of the necessary improvements. If the Council selects one of these proposed concepts for full design and construction, staff could design and construct improvements the full length of 72nd Avenue NE and Juanita Drive.

The project's design consultant has completed four preliminary concepts for improving this connection and their preliminary cost estimates, based on field survey and current design standards and current environmental permitting requirements. The four concepts are:

- Recreational Hiking Trail;
- ADA-Compliant Pedestrian Path;
- Human-Powered Gondola Ravine Crossing; and
- Pedestrian and Emergency Vehicle-Accessible Path.

Figure 2: Denny Creek and Ravine (facing west)

All four concepts include an enhanced pedestrian crossing at the NE 132nd Street and Juanita Drive NE intersection. Crossing enhancements could be a rapid rectangular flashing beacon (RRFB) with overhead sign, or a High-Intensity Activated crosswalk (HAWK) signal. The enhancements would add an estimated $84,000 to each cost estimate, including construction and soft costs. Preliminary cost estimates are shown in Table 1 on page 4 of this staff report.

Option #1: Recreational Hiking Trail

This option would be the easiest to implement, benefiting from the lowest construction costs, simplest design, least amount of environmental permitting, and would have the least ongoing maintenance costs compared to the other options. However this option would not be ADA compliant. This option could be constructed as early as 2022, and would increase safety and usability by providing:

- Overlapping timber steps on steep slopes, including landing areas and optional bike runnels;
- A log-stringer bridge with handrails to safely cross Denny Creek (see Figure 3, below);
- Minimum 18" trail tread width (see Figure 4, below);
- Horizontal and vertical clearing of vegetation, including invasive blackberries;
- Grading and new gravel as needed to improve trail cross-slopes and existing uneven ground;
- Enhanced pedestrian crossing at Juanita Drive NE; and
- Informational and wayfinding signage.

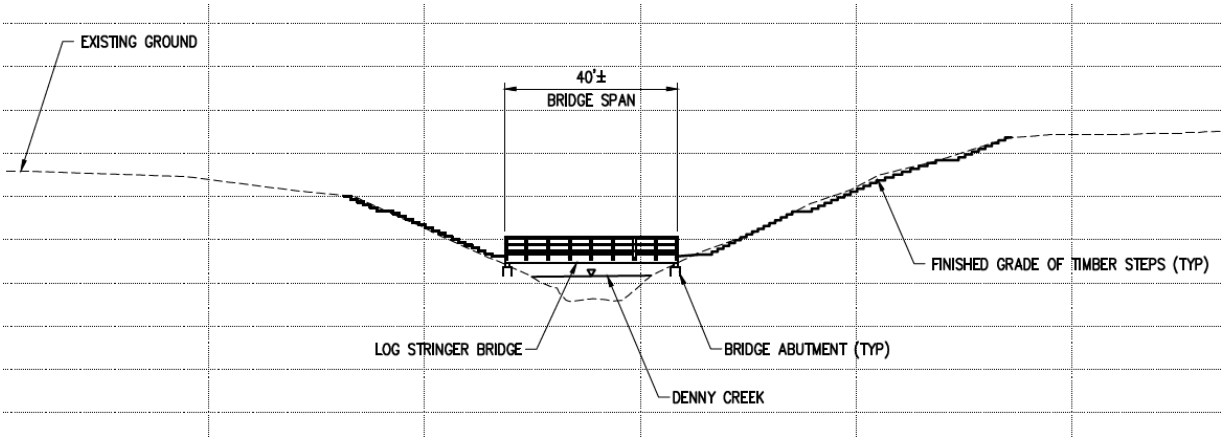

Figure 3: Conceptual Log-Stringer Bridge over Denny Creek

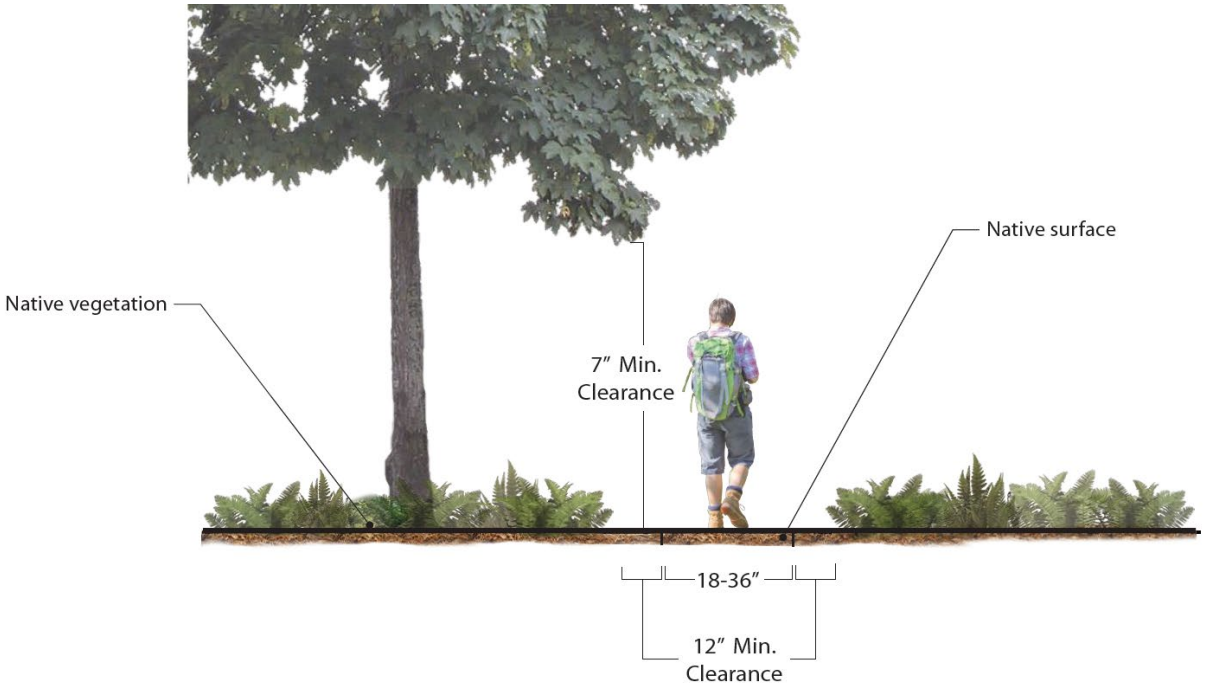

Figure 4: Recreational Trail Conceptual Cross-Section

Further geotechnical and structural design is needed for the log-stringer bridge, but it is a relatively simple structure when compared with the other options.

While no tree removals are anticipated at this time, minimal tree removal could be required if impacts to tree roots are significant or existing tree health is poor. Routine maintenance would be needed to maintain a safe recreational facility for the public, such as replacing the timber every 10-20 years or longer.

Option #2: ADA-Compliant Pedestrian Path

To fully comply with 2010 American with Disabilities Act Standards for Accessible Design, this option includes:

- A series of concrete ramps, landings, handrails, and walls to create switchbacks on steeper slopes (see example switchbacks in Figure 5, right);
- Asphalt path with intermittent landings on flatter slopes;
- 8-foot wide concrete-deck pedestrian bridge over the existing ravine, spanning 145 feet;
- Minimum 5-foot width pathway (see Figure 6, below);
- Horizontal and vertical clearing of trees and vegetation, including invasive blackberries;
- Enhanced pedestrian crossing at Juanita Drive NE;
- Informational and wayfinding signage; and
- Relocation of franchise utilities, including poles, hydrants and vaults.

Figure 5: ADA-Compliant Switchbacks in Tacoma, WA

To meet ADA standards, the switchbacks will take up most of the existing 30-foot right-of-way width, leaving a very limited area for utility relocation and access. To construct the switchbacks, temporary construction easements will be needed from the adjacent King County Parks property. Further geotechnical and structural analysis is needed for the concrete-deck pedestrian bridge and will be completed if this option is selected by Council.

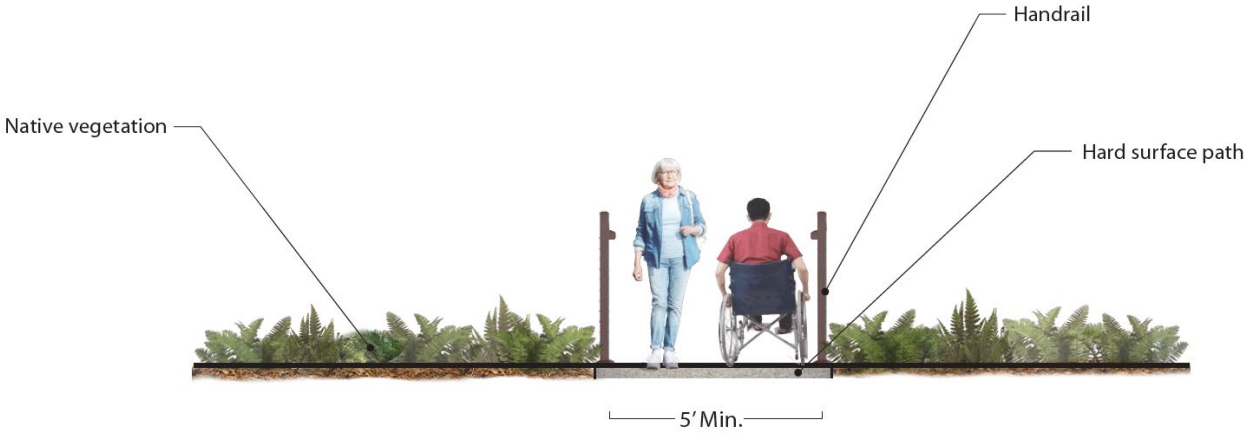

Figure 6: ADA-Compliant Pedestrian Path

At this time, up to 14 tree removals would be expected because of direct conflicts and significant anticipated impacts to tree roots. Tree replacement would be pursued as part of this option, with the goal of providing a 1:1 tree removal-to-replacement ratio.

Because of the amount of new impervious surfaces required for this option, the need for at least one stormwater detention vault is anticipated. Further stormwater analysis is needed, and it is expected these stormwater facilities would be challenging to build because of the limited right-of-way, additional vegetation clearing, and slope stability impacts. In addition to routine maintenance to the bridge and pedestrian pathway, regular maintenance of the stormwater structures would be needed.

Option #3: Human-Powered Gondola Ravine Crossing
This option would give the City a distinct feature that is uncommon in urban areas. Trail connections would be similar to the recreational trail in Option 1, but with a human-powered gondola over the Denny Creek ravine in place of the steps and log-stringer bridge:

- Human-powered gondola or cable car over the Denny Creek ravine (see example in Figure 7, adjacent);
- Minimum 18" trail tread width (see Figure 3 on page 3 of this staff report);
- Horizontal and vertical clearing of vegetation, including invasive blackberries;
- Grading and new gravel as needed to improve trail cross-slopes and existing uneven ground;
- Enhanced pedestrian crossing at Juanita Drive NE; and
- Informational and wayfinding signage.

Figure 7: Chilliwack River Cable Car, Copper Ridge Loop, North Cascades, WA

Further analysis is needed to determine the exact impacts to vegetation and slope-stability, as well as ongoing maintenance needs. Upon direction from the Council, staff would begin the full design of this option with intensive safety and liability analysis. Additionally, further geotechnical and structural analysis is needed to determine the exact gondola system that would best meet the City's needs for this location.

Option #4: Pedestrian and Emergency Vehicle-Accessible Path
This option would provide both a pedestrian connection and an emergency vehicle access from Juanita Drive to 76th Avenue NE that would improve emergency response times to the Holmes Point area. This option would accommodate an aide car. A full-sized firetruck might also be able to use this connection, although the running slope likely exceeds the City's emergency route standards. The consultants can do additional feasibility analyses. Option #4 includes:

- A 12-foot wide asphalt roadway with retractable bollards to control access (see Figure 8, below);
- A 12-foot wide, 185- long concrete-deck vehicle bridge;
- Horizontal and vertical clearing of trees and vegetation, including invasive blackberries;
- Enhanced pedestrian crossing at Juanita Drive NE;
- Informational and wayfinding signage; and
- Relocation of franchise utilities, including poles, hydrants, and vaults.

The new access roadway would be graded smooth and generally would follow the natural grades within the existing right-of-way. While the running slope could be traversed by emergency vehicles, it would exceed the ADA-standards. If directed to fully design this option, staff will pursue all options to meet ADA-standards to the greatest extent feasible.

This option would have less vegetation removal and slope-stability impacts than Option #2, but still more than the recreational trail option. Unfortunately, preliminary analysis indicates that up to 13 trees would require removal because of either direct impacts or significant impacts to tree roots.

Figure 8: Pedestrian and Emergency Vehicle-Accessible Path

Similar to the Option #2, the amount of new impervious surfaces likely would require at least one new stormwater detention vault, adding both construction and ongoing maintenance costs. Installing new stormwater structures may require additional vegetation clearing and slope stability impacts. Additionally, further geotechnical and structural analysis is needed for the proposed bridge, which would be undertaken were the Council to direct staff to design this option fully.

Comparative Costs

For each option, Staff's consultant has prepared preliminary cost estimates including necessary soft costs as summarized in Table 1, below. These options do not include right-of-way or temporary construction easement costs. As with any project, costs may increase due to unanticipated challenges or construction cost inflation exceeding current trends. For each option, the soft costs reflect the cost to progress the current concepts to bid-ready and manage construction.

Table 1: Comparative Anticipated Costs

	Option #1 Recreation Trail[1]	Option #2 ADA Path[2]	Option #3 Gondola[2]
Soft Costs	$ 219,800	$ 1,097,800	$ 283,750
Construction Costs	$ 431,600	$ 2,537,600	$ 552,500
Total Expected Expenses	$ 651,400	$ 3,635,400	$ 836,250

[1] *Option #1 has been progressed to 30% design level.*
[2] *Options #2 and #3 have been progressed to 15% conceptual design level.*

Option #4 requires significant geotechnical investigation, structural engineering analysis, and would require extensive permitting. Preliminary analysis indicates this option could cost between $4 and $12 million, depending on the geotechnical and structural needs of the bridge and the termini of the connection (i.e. Juanita Drive NE to 72nd Avenue NE or Juanita Drive NE to 76th Avenue NE). For an estimated $300,000, staff could analyze this option further and provide the Council with refined estimated expenses for design and construction.

While each option has unique merits, Option 1 is the most cost-effective solution and could be constructed as early as 2022, prior to construction of the Juanita Drive Multi-modal, Safety and Intersection Improvements. Implementing Option 1 would be a sunk cost, but it would not prevent any of the other options from being implemented in the future. Options 2, 3, and 4 all have unique challenges that would require significantly more time to fully design.

NEXT STEPS:

Based upon the Council's direction, staff will return with a formal proposed action to add the preferred connection concept to the Capital Improvement Plan.

Regarding the Juanita Drive Multi-modal, Safety, and Intersection Improvements (Improvements) currently in design, staff will return to the Council with an update on the right-of-way acquisition process later this year. Construction for that project is currently anticipated for early 2023.

Attachment A: Vicinity and Area Maps

Attachment A

Vicinity and Area Map
Juanita Drive Multi-Modal Improvements