



Technical Memorandum

Date: Tuesday, September 10, 2024

Project: NE Spring Boulevard: 124th Avenue NE – 130th Avenue NE (Zone 3)

To: Marina Arakelyan, PE (City of Bellevue)

From: Scott Johnson, PE (HDR)

Subject: Alternatives Analysis Memorandum

Executive Summary

The design team evaluated alternatives for corridor improvements along a new segment of NE Spring Boulevard between 124th Avenue NE and 130th Avenue NE. This segment will complete the Spring Boulevard corridor and is referred to as Zone 3. The area west of 124th Avenue NE is Spring Boulevard Zone 2 and the area east of 130th Avenue NE is Spring Boulevard Zone 4. The Zone 3 design alternatives were developed through charrette workshops with City staff and the design team and were heavily influenced by the existing Spring Boulevard Corridor cross sections in the adjacent zones. To better assess the intricacies and needs of users in the corridor, Spring Boulevard was broken into four distinct areas within Zone 3 (from west to east, areas A, B, C, and D), based on accommodating existing uses and planning for proposed land uses. Each area was evaluated based on the needs and expected uses in that segment. After mutual coordination, discussion, and analysis between the City of Bellevue and the design team, and a public online open house gathering feedback from the community; a series of criteria were developed and evaluated with an alternatives analysis matrix to select the preferred cross sections, horizontal alignment, and intersection configurations. The matrix included criteria that is relevant to user experience, safety, operational mobility, and right-of-way and environmental impacts. The following is the schedule of activities completed during the alternatives analysis process:

- Project Kickoff – March 2023
- Alternatives Development and Code Review – April/May 2023
- Design Charrette Meeting – June 2023
- Alternatives Refinement and Criteria Development – July 2023
- Alternatives Review Meeting – August 2023
- Online Open House – October 2023
- Design Criteria and Public Input Review Meeting – November 2023

The recommended preferred alternative cross section is the same concept for all four areas in Zone 3. The cross section includes bicycle lanes separated from the street via a planter, sidewalks for pedestrian space, and vertical separation between the pedestrian area and bicycle lane with a wedge curb. The configuration is the same on both sides of the street.



The recommended preferred alternative for horizontal alignment is Location 2, which follows existing property boundaries.

The recommended preferred intersection configuration is traffic signals for the two major intersections of Spring Boulevard at the future 128th Avenue NE. It is also preferred to use traffic signals at the future 129th Avenue NE intersections if the operational analysis or pedestrian crossing analysis recommends a traffic signal is necessary. If a signal is not used at a “T” intersection, the preferred control would be to stop control the minor leg of the intersection.

1.0 Project Overview

The NE Spring Boulevard Zone 3 project is a brand-new roadway and the last segment of NE Spring Boulevard through the Bel-Red subarea of Bellevue, WA. The project is referred to as Zone 3. It is the segment bounded to the west by 124th Avenue NE and bounded to the east by 130th Avenue NE. The project is a continuation of the NE Spring Boulevard corridor improvements which extend from 116th Avenue NE to Northup Way within the Bel-Red subarea of Bellevue. The project goal is to provide better motorized and non-motorized connectivity between the Bellevue and Redmond neighborhoods and augment mobility around new transit-oriented development next to the new Sound Transit Light Rail stations. The project site is in northeastern Bellevue within the Bel-Red neighborhood to the south of State Route 520 and east of Interstate 405 (see figure 1).

Project Purpose and Need:

- Provide improved east-west connectivity for pedestrian, non-motorized, and motorized transportation users.
- Emphasize safety of non-motorized facilities in the corridor.
- Improve connectivity and access between businesses, parks, and the light rail stations.

This memorandum documents the alternatives considered for the project, the alternatives analysis process, public engagement feedback, and criteria evaluated to decide a preferred alternative. To rigorously evaluate the corridor and account for the varied present uses and planned future development, the Zone 3 segment was broken into four distinct areas (see figure 1).



Figure 1 – Project Site (NE Spring Boulevard - Zone 3)

Area A is the western most area and is bounded on the south by Coca Cola beverage plant facility and to the north by the Safeway bottling plant facility. This Area will remain a truck centered access to connect to the freight corridor 124th Avenue NE.

Area B is within the City of Bellevue Park parcel. Bellevue also has a pump station facility and the detention pond facility maintenance access in this area. The eastern edge of Area B is the West Tributary to Kelsey Creek which is a fish bearing stream and was previously converted from a piped stream to an open channel by the Sound Transit Light Rail Project.

Area C is to the east of the stream and is existing light industrial on the Evans industrial parcel and a vacant lot owned by Sound Transit which is a remnant parcel from light rail construction.

Area D is the most eastern area and abuts 130th Avenue NE. It includes the CADMAN property to the north of the light rail, the vacant Sound Transit remnant parcel south of the light rail, and the Evans industrial parcel to the south.

The existing conditions looking from each end of the project are shown in figures 2 and 3.



Figure 2 – Existing Condition Street View, NE Spring Boulevard Area A, Looking East



Figure 3 – Existing Condition Street View, 130th Ave NE Area D, Looking West

2.0 Alternatives Development

The design team developed initial alternatives per code requirements, the City of Bellevue transportation design standards, and in collaboration with City staff. These alternatives were presented at a Charrette Meeting in June 2023. The meeting included the design team and representatives from the different teams within the City's Transportation Department and Development Services group. The purpose of the charrette meeting was to gather feedback from City staff on the alternatives and use that feedback to revise alternatives to improve them, addressing concerns. Due to the complex nature of the project and many competing priorities in the corridor, a preferred alternative was not something that could be decided at the June 2023 charrette meeting. Materials from the charrette are included in Appendix A.

The alternatives were modified to address comments from the charrette and confirmed at a follow-up meeting in August 2023.

2.1 Cross Section Alternatives

ALTERNATIVE 1 – BIKE LANE ADJACENT TO SIDEWALK, SEPARATED VERTICALLY FROM SIDEWALK

This alternative closely follows the Spring Boulevard Zone 2 configuration. It includes a bike lane adjacent to the sidewalk that is separated vertically from pedestrians via a wedge curb. The vehicle lanes are narrowed and separated from bike lanes with landscaping.

BIKE LANE ADJACENT TO SIDEWALK SEPARATED VERTICALLY FROM SIDEWALK

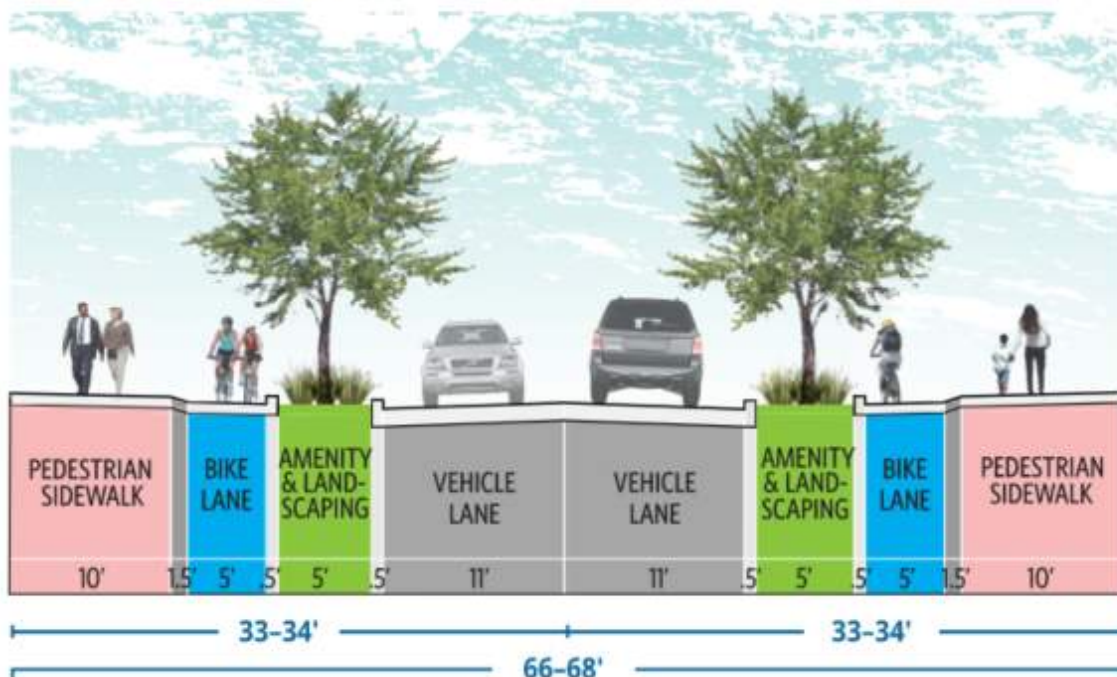


Figure 4 – Bike Lane Adjacent to Sidewalk, Separated Vertically from Sidewalk

ALTERNATIVE 2 – BIKE LANE ADJACENT TO ROAD, SEPARATED VERTICALLY FROM ROADWAY

This alternative closely follows the Spring Boulevard Zone 4 configuration. It provides an in-street bicycle lane adjacent to the narrowed road that is separated vertically from motor traffic via a wedge curb. Pedestrian sidewalks are separated from bike lanes with landscaping.

BIKE LANE ADJACENT TO ROAD SEPARATED VERTICALLY FROM ROADWAY

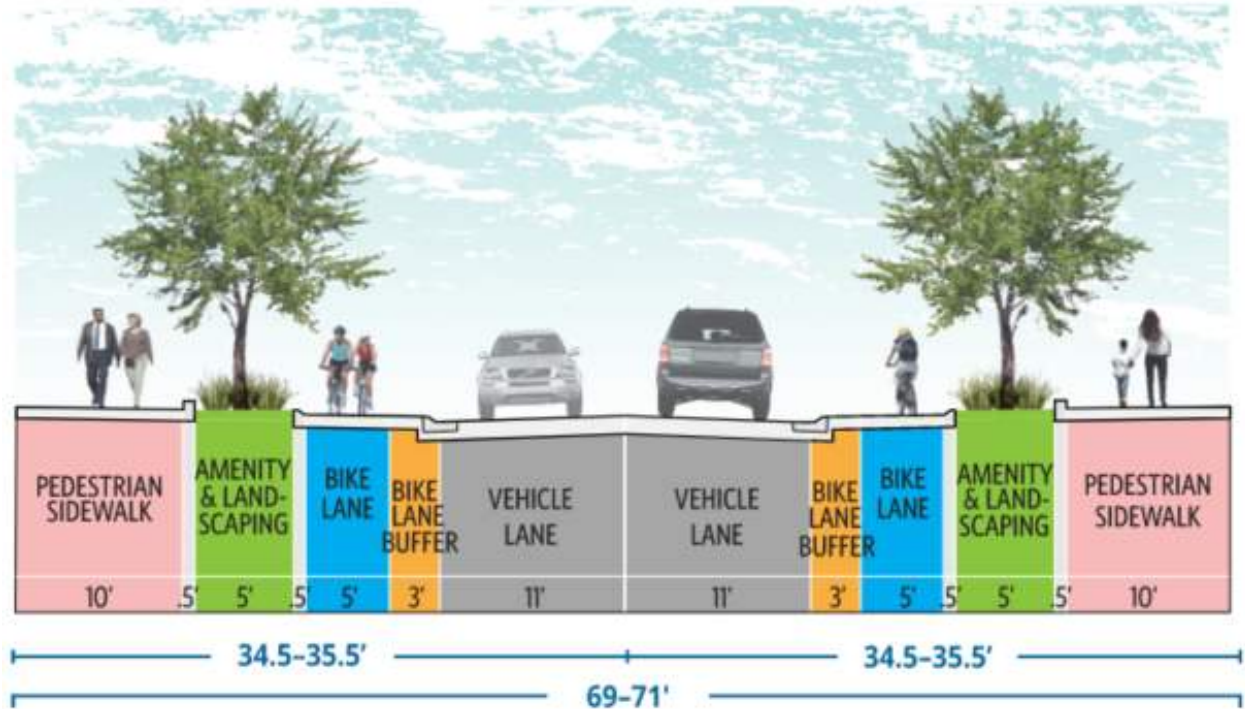


Figure 5 – Bike Lane Adjacent to Road, Separated Vertically from Sidewalk

ALTERNATIVE 3 – MULTI-PURPOSE PATH – SOUTH SIDE

This alternative provides access to cyclists with a multipurpose pedestrian and bicycle path on the road's south side. A sidewalk is provided on the north side. Vehicle lanes are separated from the non-motorized uses with landscaping.

MULTI-PURPOSE PATH – SOUTH SIDE

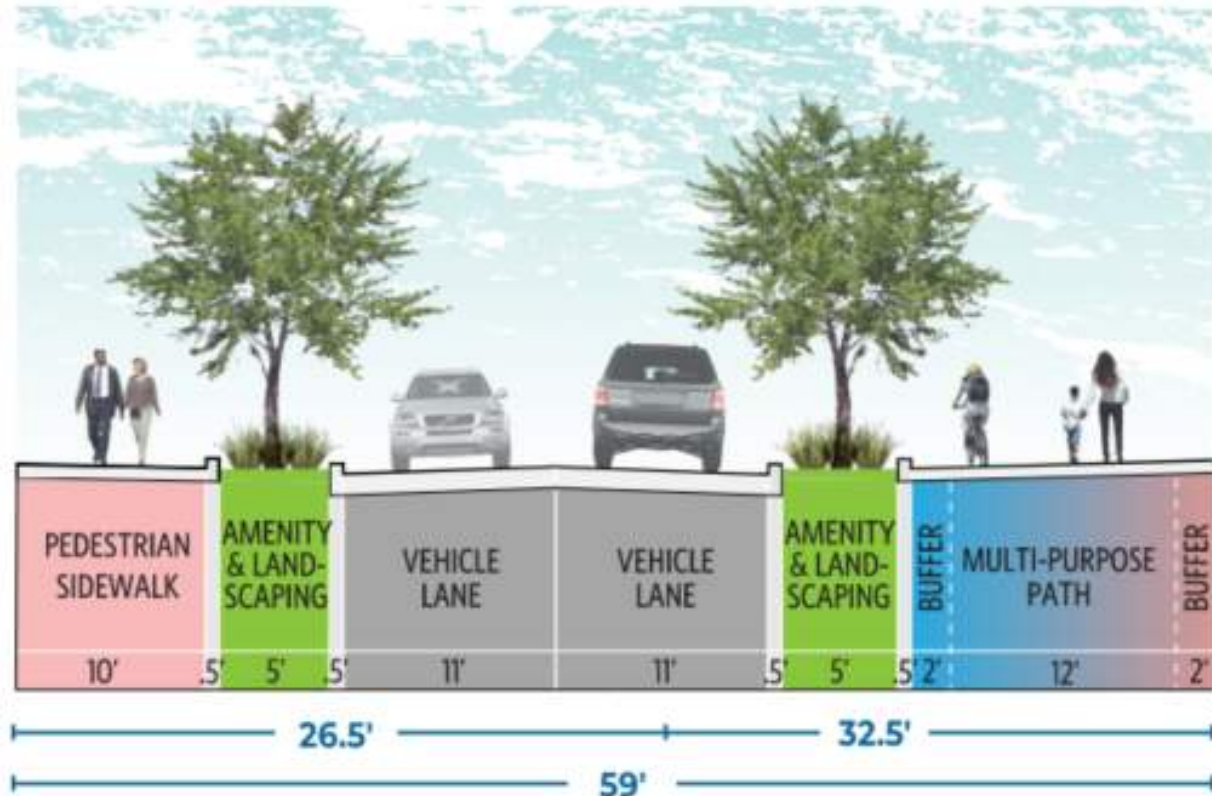


Figure 6 – multi-purpose path – south side

ALTERNATIVE 4 – BIKE LANES ADJACENT TO ROAD, SEPARATED VERTICALLY FROM ROADWAY & MULTI-PURPOSE PATH – SOUTH SIDE

This alternative provides access to all non-motorized users with a wider multi-purpose pathway on the south side of the proposed road and in-street bicycle lanes. The vehicle lanes are narrowed, and in-street bicycle lanes are separated vertically from traffic by a wedge curb. Landscaping separates the in-street bicycle lanes from the sidewalk and multi-purpose pathway.

BIKE LANES ADJACENT TO ROAD SEPARATED VERTICALLY FROM ROADWAY & MULTI-PURPOSE PATH – SOUTH SIDE

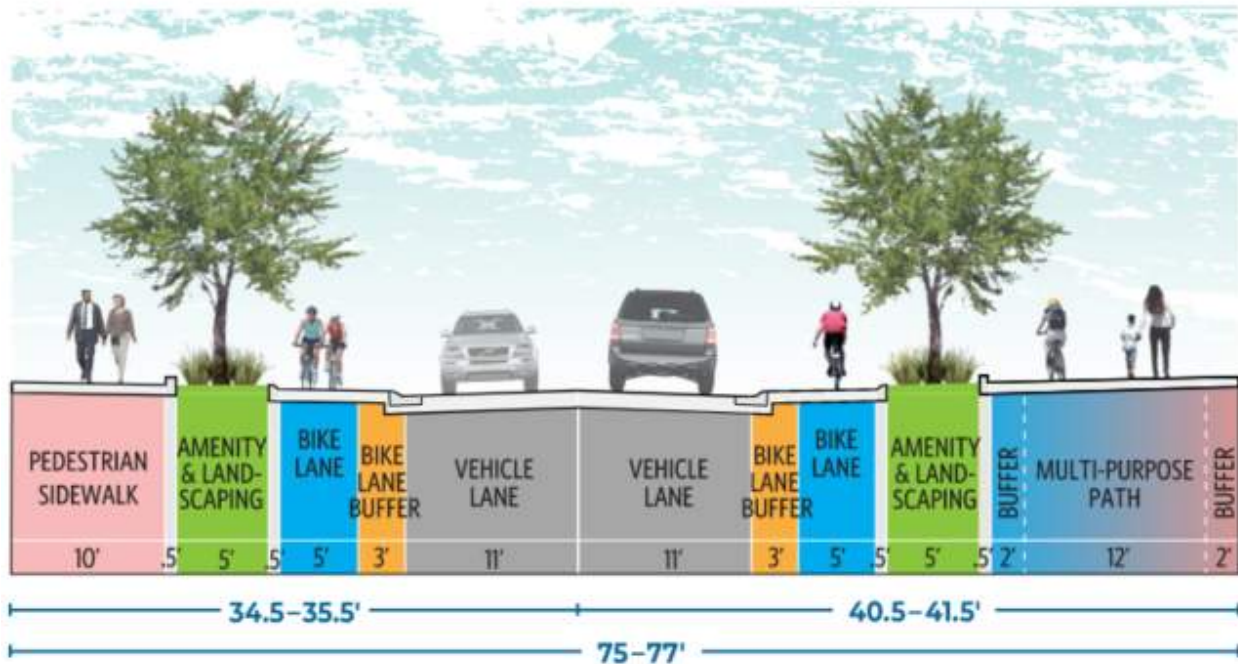


Figure 7 – Bike Lanes Adjacent to Road, Separated Vertically from Roadway & Multi-Purpose Path – South Side

2.2 Horizontal Alignment Alternatives

The project team developed three horizontal alignments for the location of the roadway as it traverses the four areas in Zone 3 (see Figure 8). Roadway location 1 parallels the existing light rail train alignment. Roadway location 2 closely follows existing parcel lines. And roadway location 3 partially follows existing property lines but focused on minimizing impacts to wetlands and buffers surrounding the West Tributary to Kelsey Creek. All roadway locations require a bridge over the creek and use the existing Spring Boulevard right-of-way within Area 1.

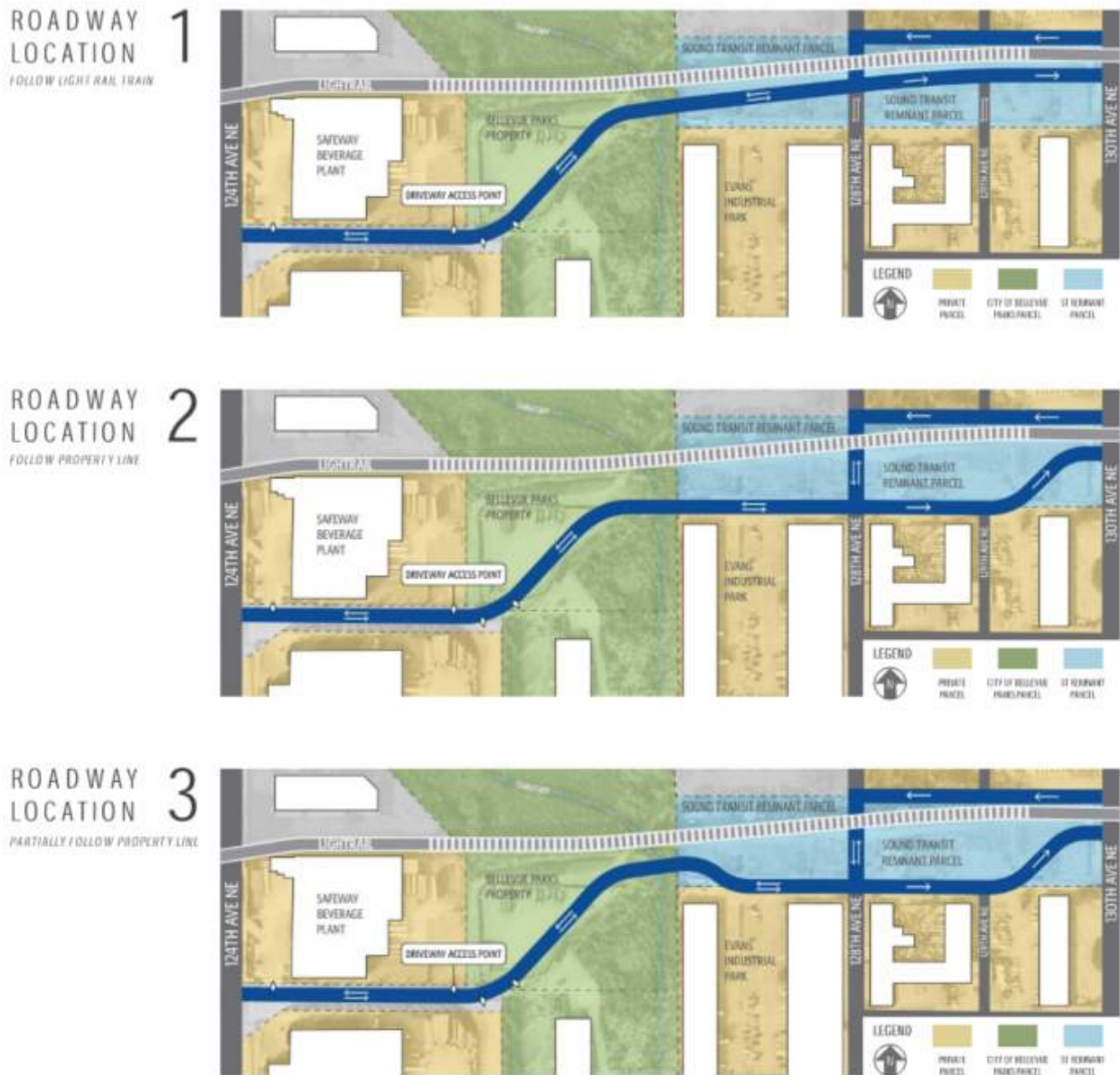


Figure 8 – Horizontal Alignment Alternatives

2.3 Intersection Control Alternatives

The project team developed two intersection control alternatives for the major roadway crossing present on the project at 128th Avenue NE and NE Spring Boulevard; signalized intersection and roundabout (see figure 9). Traffic operational analysis was completed for each control alternative.

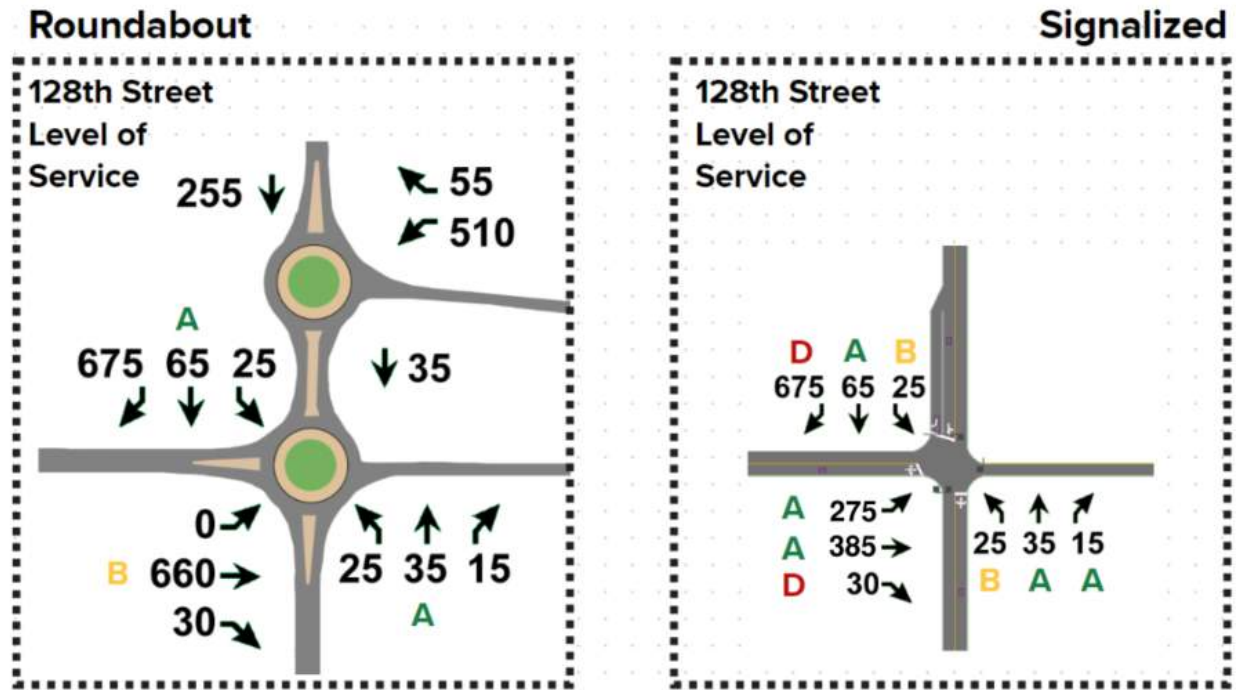


Figure 9 – Intersection Control Alternatives

3.0 Public Outreach and Input

Following the August meeting that finalized the alternatives, the alternatives were taken to the public in the form of an online Open House. The Open House was active from October 2, 2023 – October 22, 2023. The online Open House received 52 responses and represented 12 Bellevue neighborhoods. The open house included survey questions about which alternative most encouraged active use of the corridor, and which alternative was most comfortable. Cross section Alternative 1 received the most responses for each question. The Open House summary information is included in Appendix C.



4.0 Evaluation Criteria

The design team, in collaboration with Bellevue Transportation staff, developed a list of criteria to evaluate the alternatives against one another. The criteria selected have impact and meaning to the use, function, and safety of the future corridor. Once criteria were developed, each alternative was evaluated against the criteria and given a rating of High (3 pts), Medium (2 pts), Low (1 pt), or N/A (Not Applicable, 0 pts). A “High” score for a criterion means an alternative shows a strong benefit to that item and is superior to other options available. A “Medium” score means an alternative shows a moderate amount of benefit but doesn’t separate from the other alternatives as much. A “Low” rating means the alternative only shows minor or no benefits over other alternatives available.

4.1 Criteria

The Project team developed fifteen evaluation criteria to evaluate the merits of each considered alternative. The information contained in this memorandum guided the scoring of each criterion.

Criterion #1 to #15 are considered base criteria and can earn up to 3 points for how much benefit the alternative provides to achieving the desired outcome of the criterion. Criteria are a mix of considerations including environmental, right-of-way, land-use, user experience, and safety.

CRITERION #1 – MINIMIZE ENVIRONMENTAL IMPACTS (WETLAND AND STREAM)

Alternatives have less impacts to sensitive areas and require less mitigation than other alternatives.

CRITERION #2 – MINIMIZE ENVIRONMENTAL PERMITTING COMPLEXITY/RISK

All alternatives will require NEPA/SEPA/Cultural Resources. If the existing mitigation site is disturbed, that adds complexity.

CRITERION #3 – BEST COMPATIBILITY WITH FUTURE LAND USE

Continuity with existing planned street grid, building access points, and developable parcels is desired. Maximize remnant parcels and available floorplates. Sidewalk area is compatible with zoned retail/residential uses at back of sidewalk.

CRITERION #4 – MOST CLOSELY ALIGNS BEL-RED VISION

Maintain or closely adhere to the planned Bel-Red street grid and minimize pavement widths, adhering to the green street urban environment.

CRITERION #5 – MOST COMPATIBLE WITH EXISTING PRIVATE PROPERTY USE

Alternative allows freight access to maintain viability of businesses along existing Spring Boulevard. Alternative minimizes disruption to existing property and business uses on either side of the planned corridor.



CRITERION #6 - MINIMIZE PROPERTY ACQUISITIONS/IMPACTS

Limit the amount of acquisition required to be completed by the project and limit the complications expected in a future right-of-way acquisition process. No buildings or full parcel acquisitions.

CRITERION #7 - MAXIMIZE AFFORDABLE HOUSING POTENTIAL (SOUND TRANSIT PARCEL)

Provide more developable land and a clear parcel remnant that is large enough to allow affordable housing development.

CRITERION #8 – MINIMIZE STORMWATER TREATMENT AND DETENTION NEEDS (WATER QUALITY)

Minimize total square footage of roadway pavements and non-motorized pavements to decrease the cost and infrastructure to meet Ecology stormwater requirements.

CRITERION #9 – CYCLIST FACILITY WITH LEAST STRESS

Quality of experience and stress of bicycle facility and how safe it feels to users.

CRITERION #10 – BEST PEDESTRIAN EXPERIENCE AND SAFETY

Quality of experience for pedestrians and how they feel protected vs cyclists and cars.

CRITERION #11 - BEST VEHICULAR EXPERIENCE AND SAFETY

Processing vehicles at the intersections along 128th for decreased delays and ease of visibility for bike and ped crossings creating fewer conflicts.

CRITERION #12 – MOST FORWARD COMPATIBLE WITH PHASED CONSTRUCTION (NON-MOTORIZED CONNECTION)

Alternative can be built after a potential intermediate non-motorized only project with minimal re-work or lost costs.

CRITERION #13 – BEST RECREATIONAL SPACE CONNECTIVITY

Alternative provides deliberate and intuitive connection for users from vehicles, bicycles, and pedestrians to the open space park and regional trails.

CRITERION #14 – HIGHEST CONTINUITY WITH EXISTING CORRIDOR NON-MOTORIZED FACILITY

Matches up with adjacent facilities and creates a predictable environment for users.

CRITERION #15 – BEST FACILITY TO PROMOTE ALL AGES AND ABILITIES USERS

Facility is attractive and non-challenging for both experienced riders and newer or younger riders. Facility also provides access and non-threatening facility for strollers, scooters, and other wheeled users to coexist.



4.2 Criteria Matrix

Each of the criteria for the four cross sections, the three alignment locations, and the two intersection control alternatives were combined into a single table, also referred to as a matrix, which shows the rankings of the alternatives and total scoring of each. The matrix was used to view the alternatives in a single sheet and compare them against each other for each criterion. Once filled out, the table identifies the alternative that most closely achieves the goals of the project.

5.0 Evaluation of Alternatives

The design criteria were evaluated by the design team and scores were input to the matrix. On November 29th, the design team presented the criteria matrix and the open house results to the broader City Transportation Department team. The design team collected input and feedback on the design criteria, the scoring of alternatives, and thoughts on the results of the open house from City staff. The City’s Mobility Implementation Plan (April 2022) was a guiding document during the meeting discussion and how bicycle and pedestrian facilities were evaluated related to safety and comfortability (Figure 10).

Roadway Characteristics		Bicycle Facility Components: Guideline to Achieve Intended Level of Service/Level of Traffic Stress					
Speed Limit	Arterial Traffic Volume	No Marking	Sharrow Lane Marking	Striped Bike Lane	Buffered Bike Lane (Horizontal)	Protected Bike Lane (Vertical)	Physically Separated Bikeway
<=25	<3k	1	1	1	1	1	1
	3-7k	3	3	2	1	1	1
	>=7k	3	3	2	2	1	1
30	<10k	3	3	2	2	1	1
	10-25k	4	4	3	3	2	1
	>=25k	4	4	3	3	3	1
35	<25k	4	4	3	3	3	1
	>=25k	4	4	4	3	3	1
>35	Any	4	4	4	4	3	1

Figure 10 – Bicycle Level of Service / Level of Stress (Source: Bellevue Mobility and Implementation Plan, City of Bellevue, April 18, 2022; Resolution No. 10085)

Modifications were made to the way a few criteria were evaluated and revised scoring discussions took place to apply the revised direction. The resulting matrix is included in Appendix D.

4.0 Recommended Alternative to Advance to Preliminary Design

The project team collaboratively deliberated and scored the alternatives per the criteria included in this memorandum. The chosen alternatives based on the matrix results are as follows and included in Appendix E:

- Cross Section Area A: Bike Lane Adjacent to Sidewalk
- Cross Section Area B: Bike Lane Adjacent to Sidewalk
- Cross Section Area C: Bike Lane Adjacent to Sidewalk
- Cross Section Area D: Bike Lane Adjacent to Sidewalk

- Horizontal Alignment: Roadway Location 2, Follow Property Line

- Intersection Control: Signalized intersections on 128th Avenue NE

APPENDIX LIST:

Appendix A – June 2023 Design Charette Meeting Materials
Appendix B – August 2023 Follow-up Meeting Materials
Appendix C – October 2023 - Results of Online Open House
Appendix D – November 2023 - Criteria Matrix Results
Appendix E – November 2023 - Recommended Alternative Exhibit