

NE 40th STREET

EXECUTIVE SUMMARY

BACKGROUND

The City of Redmond is interested in making improvements to NE 40th Street between 148th Avenue NE and West Lake Sammamish Parkway (see vicinity map, Figure 1). NE 40th Street is a significant east-west corridor in the Overlake Neighborhood and has the following characteristics:

- ❧ Designated as a Multi-Modal Corridor in the City's Transportation Master Plan – these corridors are identified for priority infrastructure, and the City encourages land use and development patterns that support multi-modal travel.
- ❧ Identified as a corridor for a multi-use pathway in the Overlake Master Plan.
- ❧ The NE 40th Street/156th Avenue NE intersection is identified as an activity node in the Overlake Master Plan. This node is a key point within the neighborhood because of important transit connections, both existing and proposed, which

include a light rail station at the Overlake Transit Center. The Overlake Master Plan calls for distinctive street treatments and signage to identify this node. It is also a good location for strengthened pedestrian and bicycle facilities because of the heavy ped/bike use.

- Key Microsoft nodes along NE 40th Street at intersections with 150th (primary or secondary), 152nd (secondary), 159th (primary), and 163rd (tertiary) Avenues NE were identified in the Microsoft 2005 Master Plan. Concepts for key nodes address plaza types, wayfinding, crosswalk treatments, and landscaping.

node treatments. A design theme for the corridor, including lighting and landscaping concepts, is desired to better tie the corridor together.

- Evaluate the intersection of NE 40th Street and 172nd Avenue NE and identify preliminary recommendations to improve the function and safety of this intersection for all modes.
- Identify preliminary solutions to improve the crossing of NE 40th Street by the SR 520 Bicycle Trail.

This study was conducted with participation and financial support from the Microsoft Corporation. Other major stakeholders involved in the study included the Washington State Department of Transportation (WSDOT), King County Metro Transit, and Sound Transit.

Figure 1 – Vicinity Map



EXISTING CONDITIONS

Existing NE 40th Street varies in curb to curb width along the corridor, with its widest section on the SR 520 bridge with a curb to curb width of 96 feet. There are no existing bicycle lanes, and pedestrian facilities vary from 5.5-foot wide sidewalks to a section between 156th Avenue NE and 163rd Avenue NE that includes a 12-foot wide trail.

Table 1 in the Existing Conditions section provides detailed information on project features.

Annual Average Daily Traffic (AADT) varies from near 148th (20,200) to west of 156th (32,800) to east of Bel-Red Road (4,800). Vehicle congestion is most notable around the SR 520 interchange, with vehicle queues extending through and west of the interchange from 156th Avenue NE in the morning peak, and 600 to 700 feet east of 156th Avenue NE for westbound vehicles.

Pedestrian volumes are heavy, with daily volumes of about 1230 pedestrians per day crossing the SR 520 ramps, and about 840 crossing NE 40th at 156th Avenue NE. Bike volumes are also high, with about 440 crossing through the SR 520 westbound ramps on NE 40th and about 225 daily riders passing through the intersection of 156th Avenue NE and NE 40th Street. NE 40th has a Bicycle Level of Service (BLOS) for most of its length, with a small segment of BLOS E at the SR 520 interchange. For BLOS, A is better and E is worse.

PURPOSE

Overall, the purpose of this corridor study is to:

- Improve the corridor for non-motorized modes (pedestrian and bicycle) by identifying non-motorized enhancements, including the appropriate location and characteristics of a multi-use pathway.
- Identify preliminary solutions to improve the function and safety for all modes of travel at the SR 520/ NE 40th Street interchange.
- Identify activity node treatments to enhance corridor aesthetics and coordinate with identified key

Heavy vehicle volumes, combined with heavy pedestrian and bicycle volumes create many opportunities for conflicts between pedestrian/bicycle usage and vehicular traffic.

Transit in the corridor consists of King County Metro Transit and Sound Transit service. The Overlake Transit Center is located near the southeast quadrant of the interchange, and Freeway Flyer stops are located on both the SR 520 westbound on-ramp and the eastbound off-ramp. King County Metro Rapid Ride service will pass through the corridor (but not enter the Overlake Transit Center, making a stop on 156th Avenue NE south of the NE 40th Street intersection) with a stop at the intersection of 148th Avenue NE and NE 40th.

Overhead and underground public and private utilities exist within the corridor, and will need to be considered as part of future improvement design.

Stormwater facilities are located along the corridor, with no existing runoff treatment facilities for the street. West of SR 520, runoff drains west of the freeway, and discharges into the Sammamish River. East of SR 520, runoff flows to the east and discharges into Lake Sammamish. Because of the discharge into Lake Sammamish for the east section, phosphorous treatment will be required for new impervious surface.

STREET TREES AND LANDSCAPING

New street trees and native landscaping are proposed for the planting strips between the street and the sidewalk and along outside edges of the right-of-way, where space is available. Trees and landscaping at curb side bring the added benefit of visually narrowing the corridor, which helps to calm traffic and improve safety. Planting strips also provide a buffer between pedestrians and travel lanes, increasing pedestrian safety and comfort.

New red oaks (*Quercus rubra*) are proposed to replace the existing trees that have caused sidewalk heaving throughout the corridor, except where noted. The use of Silva Cells (or equivalent) to encourage healthy growth of large canopy street trees is recommended. East of Bel-Red Road new cherry trees are proposed on the south side to work with the existing cherry trees on the to frame views to the Lake Sammamish.

Landscaped and hardscaped medians are proposed to induce traffic calming by reducing the perceived width

of a street and to provide pedestrian refuge space. See Section 4 Streetscape Elements for additional details.

PAVING TREATMENTS

In general, sidewalks are proposed to be constructed of concrete along the corridor, in accordance with City of Redmond standards. The City is experimenting with the use of pervious concrete paving for sidewalks, and if experiments are successful, pervious concrete may be appropriate for use along NE 40th Street.

Key intersections described below under wayfinding could be enhanced and highlighted with special accent paving in the crosswalks and sidewalk areas near the intersections. The use of special paving in these areas would serve as a traffic calming measure and draw motorists' attention to the crosswalks and pedestrians.

STREET FURNISHINGS

Street furnishings would enhance the pedestrian environment by contributing to pedestrian comfort and use. Furnishings also would add character, human scale, and aesthetic enhancement to the look of NE 40th Street and would help to establish and reinforce a signature identity for the corridor. For design guidelines related to furnishings and additional information about recommended options, refer to Section 4 Streetscape Elements.



WAYFINDING AND GATEWAY ELEMENTS

Proposed wayfinding and gateway improvements incorporate recommendations of previous studies and documents, including the Overlake Wayfinding Study, Redmond Gateways Report, and the Microsoft Signage/Wayfinding Plan. Implementing these previous recommendations as part of streetscape improvements

will improve the corridor's function for a diversity of users and increase safety for pedestrians, bicyclists, transit riders, and motorists.

Wayfinding elements include features that reinforce the character and identity of the corridor, first as being part of the City of Redmond, and second as being representative of the Microsoft campus and other business uses along the western segments of the corridor and the residential neighborhoods along the eastern segments. Several key intersections have been identified, including 150th Ave NE, 156th Ave NE, Bel-Red Road, and West Lake Sammamish Parkway. These intersections should receive wayfinding and gateway treatments. For additional recommendations related to gateway treatments, kiosks, directional and orientation signs, refer to Section 4 Streetscape Elements.



PUBLIC ART ELEMENTS

Public art elements, such as sculptural features, vertical elements, or other treatments can further enhance wayfinding and gateway functions along the corridor, while bringing color, life, and a sense of community to the streetscape aesthetics. Local artists, as well as artists from international origins can be commissioned to design special elements for the corridor. In addition to serving as wayfinding/gateway elements. Art features also could be integrated into transit stops, the proposed bridge across SR 520, and at key intersections.

PUBLIC AND STAKEHOLDER PARTICIPATION PROCESS

Public and stakeholder involvement was integral to the NE 40th Street corridor study process, guiding decision making and recommendations developed for the corridor. Participation activities included the following, and the results of these activities are summarized below.

- Two online surveys - one near the beginning of the study process and one after options were developed
- Public and stakeholder workshops
- Stakeholder meetings
- City website inviting public input throughout the study process and conveying important information about the project

Several key findings were identified as a result of the study participation and outreach activities, as summarized below.

Heavy Multimodal Use in the Corridor

- Users of NE 40th Street who responded to the survey travel predominantly multimodal. Of the 415 respondents to the first survey, 55 percent indicated that they are multimodal (including bicycle, walking, and transit). Of the 195 respondents to the second survey, 87 percent responded that they use more than one mode of travel. Of those who drive themselves, 15 percent also use public transit; 19 percent use Microsoft's shuttle or Connector; 24 percent walk; and 29 percent bike. Responses to both surveys show that a fairly high percentage of people use NE 40th Street by a variety of modes compared to other metropolitan areas in the Puget Sound Region. These responses lead to the need to provide good transit, pedestrian, and bicycles facilities for this corridor.

- ✦ In the second survey, respondents were asked to pick all modes that apply – the percentage of bikers rose from 26 percent to 45 percent, which could be an indication of the type of respondents (more bicyclists responding) or a growing interest in bicycling needs in the corridor.

Bike Lanes are Strongly Supported

- ✦ A clear outcome of the surveys and meetings was confirmation that there is a strong interest in adding bike lanes throughout the corridor.

Users Want a Safe Corridor for All Modes

- ✦ Comments received over the course of the study (online surveys and meetings) show a strong interest in improving safety for all modes and support for separated travel ways (i.e. delineated bike lanes, separated sidewalks, etc.). Over half (52 percent) stated that they are not at all comfortable with vehicles/bikes sharing a lane. Several concerns about the use of sharrows, shared road pavement markings, were raised, particularly in heavy traffic areas; participants felt that sharrows do not delineate the bicycle travel way as clearly as bike lanes.

Daytime Use of the Corridor

- ✦ Responses showed that people use the corridor regularly and not just during commute hours. About half of the respondents indicated they use the corridor during the day and many respondents indicated their place of employment as the Microsoft Campus, indicating a lot of walking, biking, transit use and driving between campus areas (including the two campus areas on either side of SR 520).

Use of Microsoft Shuttle System and 520 Bike Trail

- ✦ Respondents were heavy users of the Microsoft shuttle system and 13 percent stated they use the 520 bike trail on a daily basis.

Support for SR 520 Bike Trail Tunnel under 40th

- ✦ There was strong support for a tunnel under NE 40th for the SR 520 Bike Trail. Safety was cited as the #1 reason and time savings as the #2 reason.

Support for Pedestrian/Bike Crossing @ OTC and at 40th

- ✦ Respondents also strongly supported a crossing over 520 in the vicinity of the Overlake Transit Center.

This location was preferred over a grade separated crossing along NE 40th.

Immediate Issues to be Addressed

- ✦ Respondents indicated a preference to modify signal timing to timing that is more favorable for pedestrian use. They also indicated a strong interest in better marking of pedestrian facilities, better lighting and visibility; and again, there was a strong interest in adding bike lanes in the near term to NE 40th.

ALTERNATIVES AND PROPOSED IMPROVEMENTS

Because the characteristics of NE 40th vary so much from one end of the corridor to the other, alternatives were considered segment by segment rather than for the corridor as a whole. The preferred alternative, described in detail in Section X and illustrated in Appendix 2, is a combination of options in each segment. As alternatives were developed and different options were discussed by the Stakeholders Committee, it was determined that rather than have multiple options for the length of the project, options would be considered on a segment by segment basis. Further, it was determined that the best approach was to have a short term plan and long term plan. The short term plan was defined as improvements occurring in the next six years, and the long term plan would be implemented by 2022.

Quick Action Projects

As part of the input received from the Stakeholders Committee and the survey results, a few projects were identified that could be completed within the next three years at relatively low cost. Many of the projects relate to improvements within the SR 520 interchange, and would probably have to be implemented by WSDOT, particularly where their traffic signal equipment is involved. These recommended “Quick Action” projects include:

- ✦ **Leading Pedestrian Intervals** – provides “walk” indication for pedestrians prior to the parallel and right turn movement for the same interval occur.
- ✦ **Pedestrian Warning Signs for Vehicles** – warning signs for right turning motorists to alert them of the presence of pedestrians in the crosswalk they are turning right through.
- ✦ **Ramp Curb Return/Barrier Modification** – at the entrance to the SR 520 westbound on-ramp, it is recommended that the radius of the curb return

on the southwest corner be reduced to shorten the pedestrian crossing distance and that a barrier be placed along the edge of shoulder south of the intersection to eliminate diagonal pedestrian crossing.

- ✿ **Countdown Pedestrian Signal Heads** – provide countdown signal heads at all signalized intersections within the corridor. Countdown heads currently exist within the SR 520 interchange.
- ✿ **No Right Turn on Red (NRTR)** – at the westbound SR 520 off-ramp, provide a new signal head with an all-arrow display that holds the right-turning (westbound) traffic until the pedestrian “walk” display clears.
- ✿ **Median Refuge** – reduce the pedestrian “walk” clearance time across NE 40th at the SR 520 westbound ramp intersection and provide a median refuge area for pedestrians that don’t have time to cross the full width of the street.

These projects respond to immediate needs expressed by Stakeholders and feedback received during the public involvement process. Additional analysis will be required for projects that affect the signal timing of intersections, and some may not move ahead if it is determined that traffic flow will be too severely impacted. Project sketches on aerial photos are shown in Appendix 4.

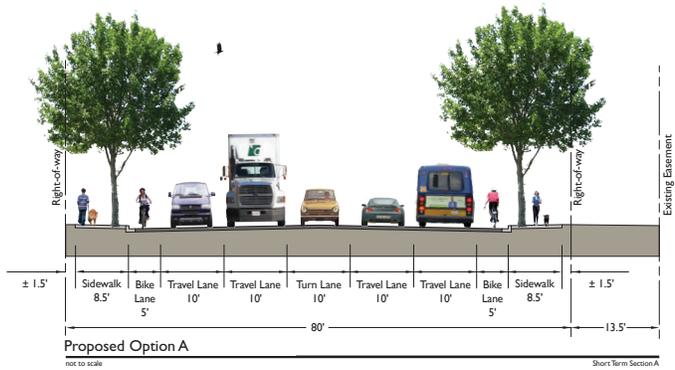
Short Term and Long Term Projects

Generally, short term projects are projects that reappropriate the roadway space between the curbs to reduce lane widths and provide bike lanes or wider curb lanes for bicycles and vehicles to share, without having to relocate curbs and sidewalks. Because of the congestion and high volume of vehicles between 150th Avenue NE and 156th Avenue NE, shared curb lanes are not recommended for this area.

I48th Avenue NE to SR 520 Interchange

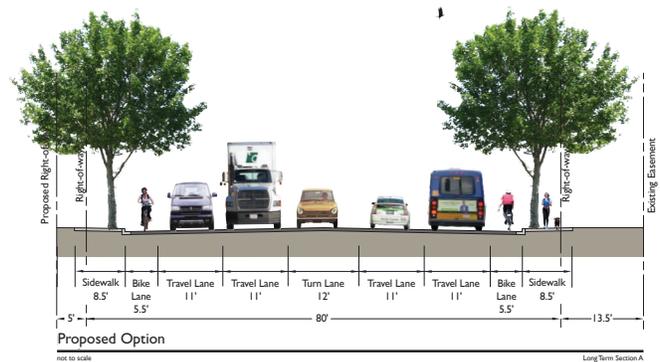
The recommended short term option for this section is Option A which reduces vehicle lanes to 10-foot width and provides for 5-foot bike lanes along the curb. While this option is recommended, City of Redmond Transportation staff are considering the desirability of 10-foot wide lanes, and implementation cannot occur until this decision is made. Option A is shown in Figure 2.

Figure 2 – Option A



For the long term, the recommended section includes widening of the street by moving the curbs and providing 11- and 12-foot lanes with 5.5-foot bike lanes. This is shown in Figure 3.

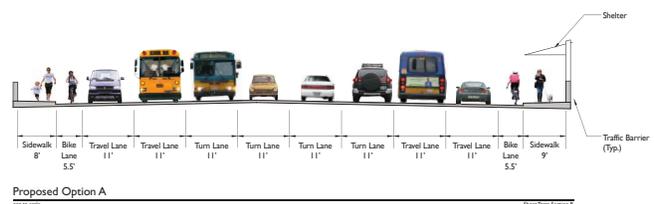
Figure 3 – Long Term Option



SR 520 Interchange Area

This is the area of heaviest pedestrian, bicycle, and vehicle volumes, congestion and conflict. Several options were studied here for short term and long term solutions. The existing bridge includes eight 12-foot lanes, an 8-foot sidewalk on the north side, and a 12-foot walkway on the south side separated from the roadway by a barrier. The recommended short term option for this bridge section, shown in Figure 4, reduces the lane widths to 11 feet, eliminates the traffic barrier, reduces the south sidewalk to nine feet, and provides for 5.5-foot bike lanes in each direction.

Figure 4 – Short Term Option



For the long term, effort was directed toward grade separating pedestrians and bicyclists from the vehicular traffic. Concepts 1A and 1B included pedestrian/ bicycle bridges over the ramp approaches and SR 520 and Concept 2 provided for a tunnel for the SR 520 trail to cross under NE 40th. Concept 1B (shown in Figure 6) was the preferred option for crossing SR 520, and Concept 2 (shown in Figure 7) accommodated the trail crossing of NE 40th. No further long term modifications for the existing NE 40th bridge were recommended beyond the short term modifications.

Figure 5 – Concept 1A

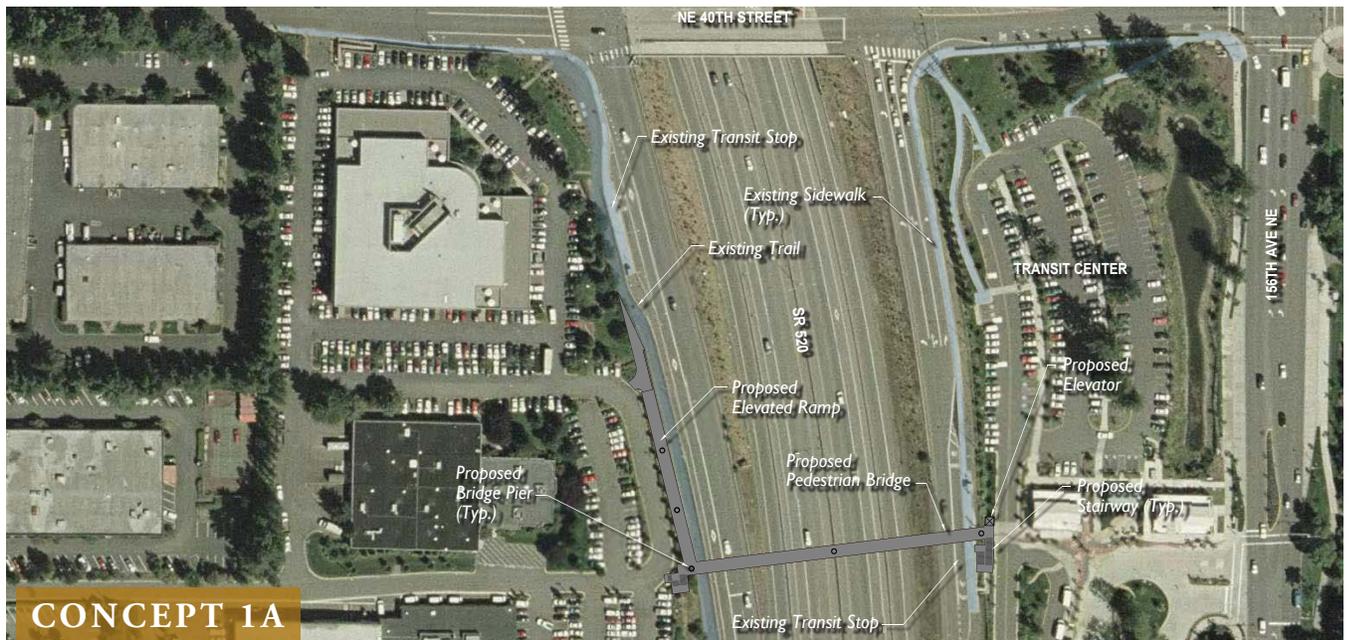


Figure 6 – Concept 1B

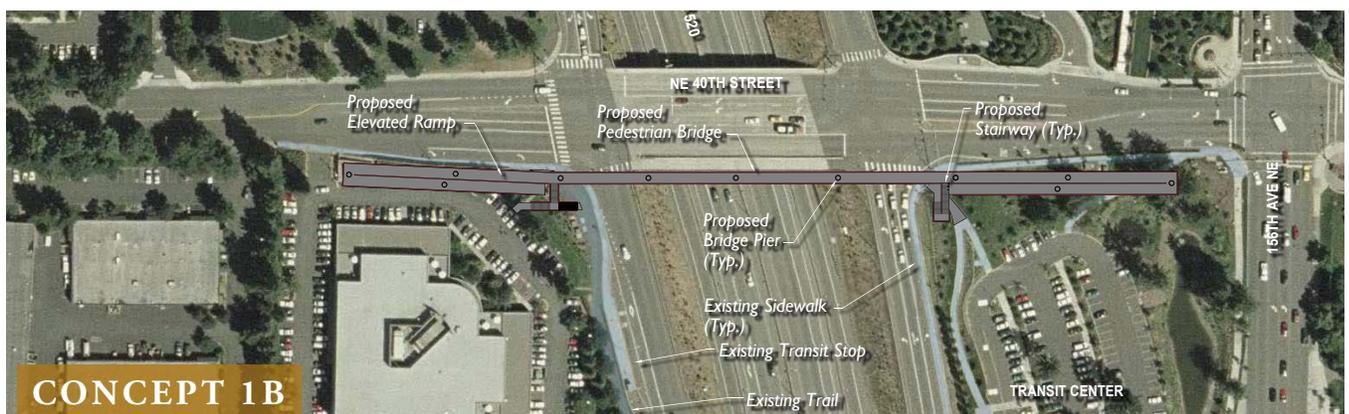
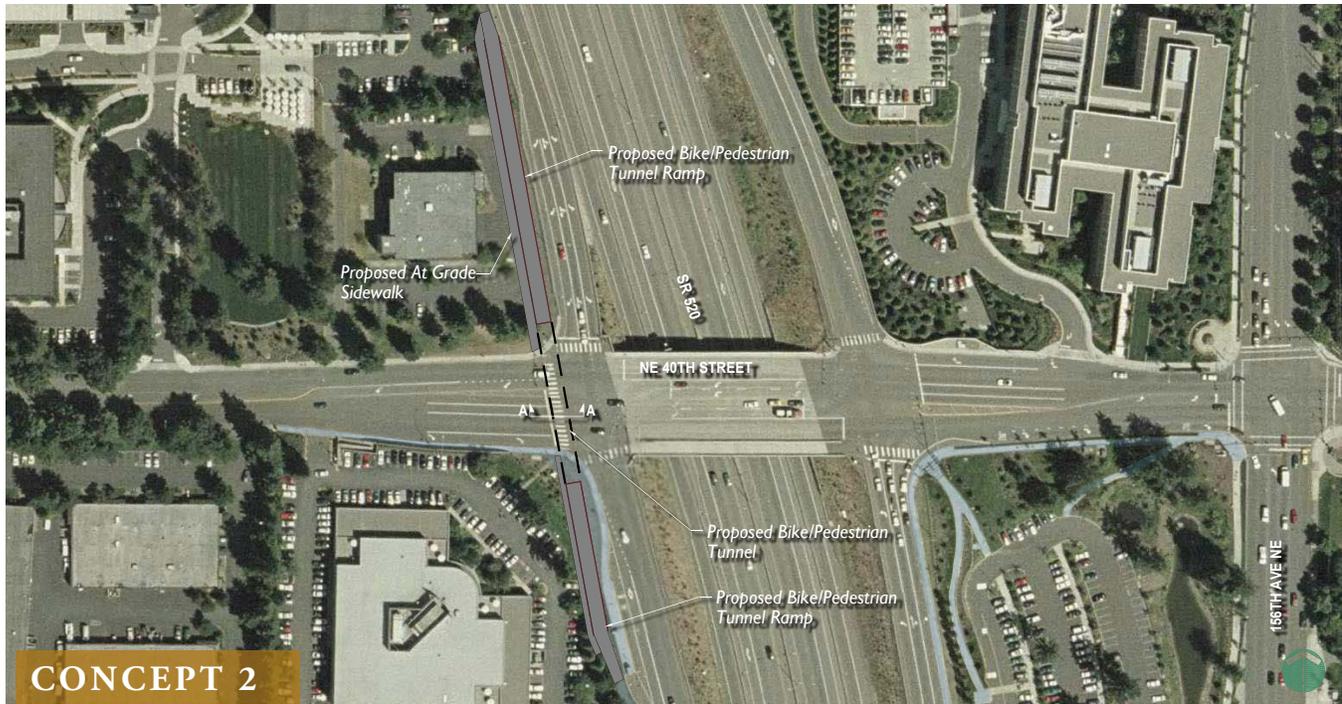


Figure 7 – Concept 2

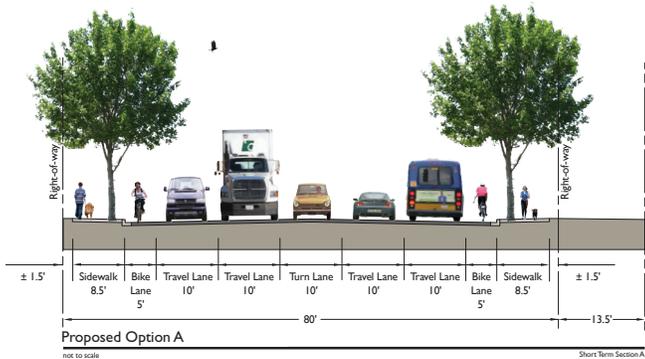


CONCEPT 2

156th Avenue NE to 163rd Avenue NE

Strong preference for providing bike lanes in this section was evident from the public involvement process. By reducing the lane widths in this section to ten feet, 5-foot bike lanes can be provided, as shown in Option A, Figure 8. Again, the City’s acceptance of 10-foot lanes is a requirement to implement this configuration.

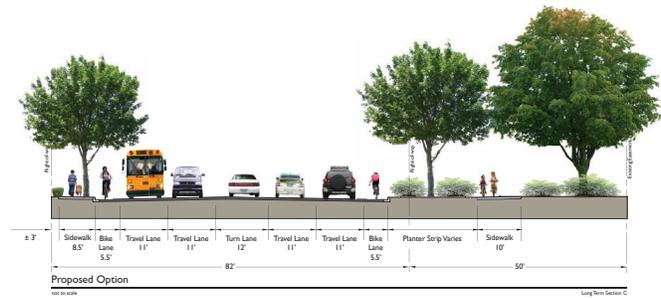
Figure 8 – Option A



For a long term solution in this area, four 11-foot travel lanes and a 12-foot turn lane are recommended with 5.5-foot bike lanes in each direction at the curb. This section would narrow to a three-lane section east of 163rd Avenue NE. This would require relocation of the curb and sidewalk on the north side of the street. A mid-block crossing is recommended about 470 feet west of

the 159th Avenue NE intersection. This crossing would include a median-refuge area, and high level pedestrian warning devices that would be activated by a crossing pedestrian. The long term option is shown in Figure 9.

Figure 9 – Long Term Option

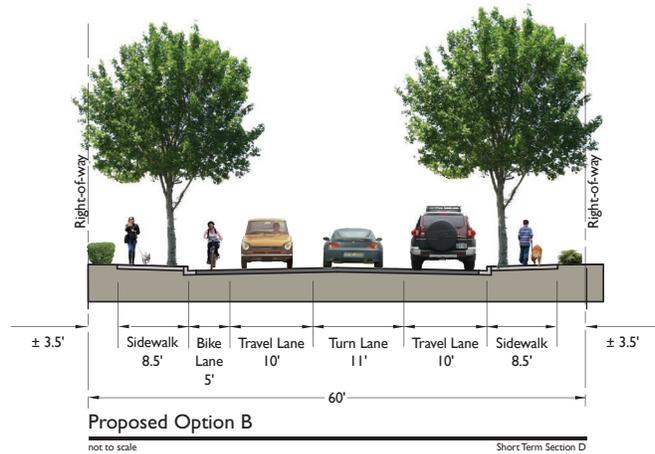


163rd Avenue NE to Bel-Red Road

At 163rd Avenue NE, the right of way reduces from the wider rights of way to the west to a more typical 60-foot right of way. This section is also the steepest grade in the corridor. As a result, options were studied that provided a location for bicyclists that would keep uphill cyclists from delaying vehicular traffic. The preferred option, shown in Figure 10, provides for 10-foot through traffic lanes, and an 11-foot turn lane, with a 5-foot bike lane in the uphill (westbound) direction.

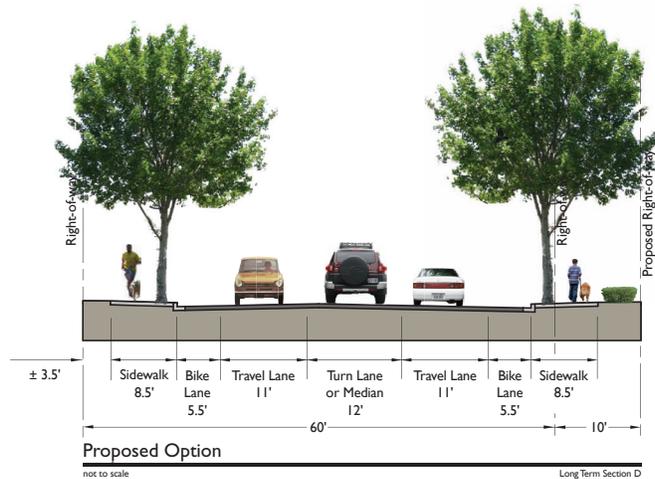


Figure 10 – Option B



The long term option returns the roadway to two 11-foot through traffic lanes, a 12-foot turn lane and 5.5-foot bike lanes in each direction, requiring relocation of the south curb and sidewalk to the south. The north curb and sidewalk need replacement because of deterioration. The long term option is shown in Figure 11.

Figure 11 – Long Term Option



Bel-Red Road to West Lake Sammamish Parkway

This section of NE 40th Street has light traffic volumes. The recommended short term option (Option A) consists of 14-foot traffic lanes and 5.5-foot bike lanes in each direction. The long term option is the same as short term Option B, using 11-foot traffic lanes and 5.5- and 6-foot bike lanes and landscape buffer between the south sidewalk and the street. The short term Option A is recommended because it fits with the sidewalk construction that occurred at this location in 2009, and retains existing curbs. If it is determined that it is satisfactory to not provide the south side planter buffer, the short and long term options could be the same. They are shown in Figures 12 and 13, respectively.

Figure 12 – Option B

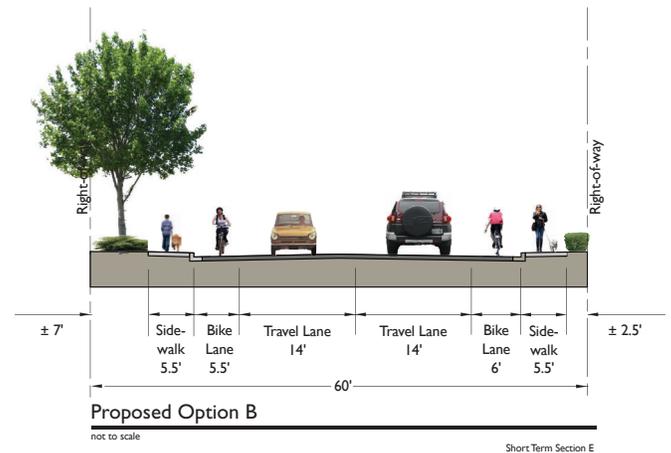


Figure 13 – Long Term Option

