APPENDIX C

Draft Concept Alternatives

1. VARIETY OF BICYCLE AND PEDESTRIAN TREATMENTS

Arterials within the urban area are required to accommodate all travel modes. How the different travel modes are best accommodated is determined by considering many factors including the needs of specific users, existing physical constraints, and cost effectiveness. The following are typical facilities to be considered for Scholls Ferry Road.

1.1 STRIPED TRAVEL LANES

The striped travel lanes can vary from 10- to 14-feet. Studies have shown that as travel speeds decrease, the width of a travel lane has less impact on lane capacity. For safety, a travel lane striped at 11 or 12 feet is effective, while wider lanes may be needed to accommodate freight traffic or road curvature to reduce tracking into adjacent lanes.

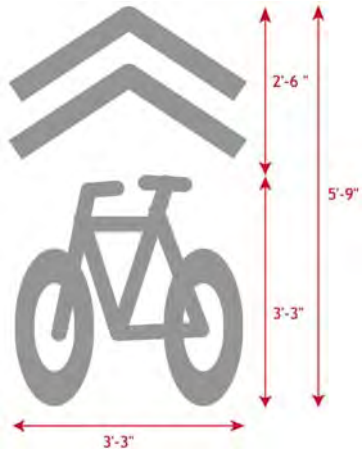
1.2 WIDE OUTSIDE LANE

A wide outside lane is typically larger than a standard lane and includes a paved travel lane with or without sideline striping. These lanes can be as wide as 14- to 15-feet. The striping is not used specifically to identify a bicycle lane, rather it serves to alert motorists to the edge of the travel lane (e.g., “fog line”). Often these roadways may be adequate and safe for bicycle travel with minimal signing and striping.

1.3 SHARED LANE MARKINGS (“SHARROWS”)

Some communities use high-visibility pavement markings to delineate specifically where bicyclists should operate within the travel lane. These markings, known as shared lane markings or “sharrows,” are often used on streets where dedicated bicycle lanes are desirable, but are not possible due to physical or other constraints. Sharrows are placed strategically in the travel lane to alert motorists to the presence of bicycle traffic, while also encouraging cyclists to ride at an appropriate distance from the edge of the roadway or the “door zone” of adjacent parked cars. As with bicycle lanes, sharrows clearly marks space for bicyclists and have been shown to draw riders off of adjacent sidewalks and onto the roadway, a desirable outcome given the inherent dangers of sidewalk riding. The arrow reinforces the correct direction of travel, an issue of great importance for bicycling safety. Placed in a linear pattern along a corridor (typically every 100-200 feet), sharrows also encourage cyclists to ride in a straight line so their movements are predictable to motorists. Sharrows made of thermoplastic tend to last longer than paint. The sharrow has been an experimental marking but has been approved for inclusion in the next edition of the Manual of Uniform Traffic Control Devices (MUTCD).

The shared-use arrow was developed with the intention of addressing the deficiencies of wide outside lanes mentioned above. Furthermore, for situations in which sufficient pavement width exists to choose between striping a bicycle lane or leaving a wide outside lane, the shared-use arrow may offer a third option, “bridging the gap” between the two existing treatments.



1.4 PAVED SHOULDER

A paved shoulder is a wider, paved outside travel lane with striping 3- to 6-feet from the edge of pavement. Parking

along the shoulder may or may not be allowed along. Shoulders are an acceptable facility for conveying bicyclists, especially on low traffic roadways.

1.5 BICYCLE LANE

A bike lane is a 5- to 6-foot wide portion of the paved roadway that is designated for the preferential or exclusive use of bicyclists by striping, signing and pavement marking. Bike lanes convey bicyclists in the same direction as the vehicles in the adjacent travel lane.

1.6 SHARED PATH

A multi-use path is a route, separated from other roads by a barrier or open space that is designed to accommodate a mix of non-automotive users (e.g. walkers, runners, strollers, wheelchair users, roller skaters, and bicyclists). These paths are usually 10 to 12-feet wide for two way traffic, and 8 to 10 feet for one-way travel, and are appropriate in corridors where driveways are less frequent to reduce potential conflicts with traffic. A physical barrier can enhance the sense of security for users, especially children and the hearing and sight impaired, and adds comfort along higher speed roadways. A shared path with a barrier can be at the same grade as the roadway reducing the costs that curb and gutters generally add to road improvement projects. Because of the space is shared between multiple users, potential conflicts can occur between users if there is insufficient space or great difference in desired travel speeds.

1.7 SIDEWALKS

Sidewalks are usually between 5- and 8-feet in width. They are typically located along roadways and are separated from vehicle traffic by a curb. Sidewalks are more comfortable for users if there is a buffer from traffic with a planting strip, parking or a bike lane. The use of sidewalks as bicycle facilities is generally discouraged because cycling on sidewalks can present safety conflicts to both cyclists and pedestrians.

1.8 ELEVATED WALKWAY “BOARDWALK”

In some situations an elevated walkway or boardwalk may be an appropriate treatment option as an alternative to a concrete sidewalk. An elevated sidewalk supported by a variety of footings options with wooden, plastic, or concrete decking material provides flexible design to best suit the prevailing conditions. Boardwalks are often used in areas with sensitive environments, such as wetlands or slopes. Boardwalks are suitable for pedestrians, but are less comfortable for bicyclists and rollerbladers because of the noise and vibration from surfacing materials. Installation is more complicated and typically has a higher cost. Maintenance requirements depend greatly on the materials used. A boardwalk also presents an option for a pervious surface to reduce stormwater runoff impacts.

1.9 RAISED BIKE LANE

Raised bike lanes incorporate the convenience of riding on the street with some physical separation, achieved with a mountable curb. The mountable curb lets motorists know that they are straying into the bike lane when they feel the slight bump created by the curb; it allows cyclists to enter or leave the bike lane to turn left, or overtake another cyclist; and it allows drivers to cross the bike lane to turn right.

The mountable curb should have a 4:1 or flatter slope, with no lip, so a bicycle tire is not caught during crossing maneuvers. The raised bike lane drains to the roadway and not to the curb or sidewalk; requiring that drainage grates be installed in the travel lanes. The raised bike lane is dropped prior to intersections, where the roadway elevation is uniform.

Raised bike lanes cost more to construct, as the travel lanes and bike lanes must be paved separately, and a narrow paving machine is required for paving the bike lane. The additional construction costs are mitigated by reduced long-term maintenance costs, as the bike lane portion receives less wear and tear than the travel lanes. Additionally; the bike lane accumulates less debris requiring less frequent sweeping; and the bike lane stripe doesn't need frequent repainting, especially if a concrete curb is placed between asphalt travel lanes and asphalt bike lanes (this also increases the visibility of the separation). Raised bike lanes are otherwise designed, marked and operated as conventional at-grade bike lanes. Adjacent to a curb and sidewalk, a barrier curb separates the raised bike lane from the sidewalk; the curb can be lower than conventional height, to avoid elevating the sidewalk more than necessary. Bicyclists proceed at signalized intersections as they would in an at-grade, striped bike lane, and make left turns by leaving the bike lane and positioning themselves correctly in the roadway.

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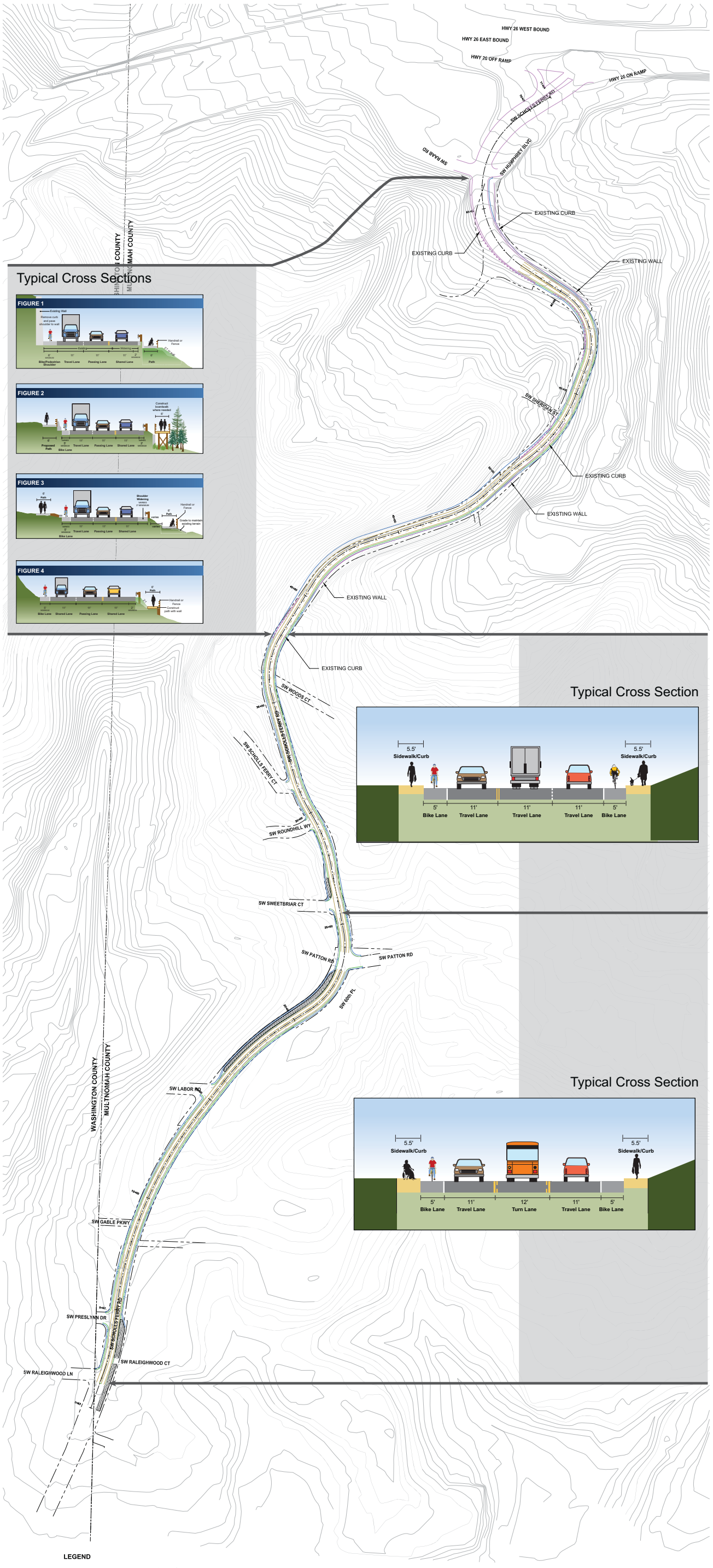
Design with Street Design Options



Typical Cross Sections

Typical Cross Section

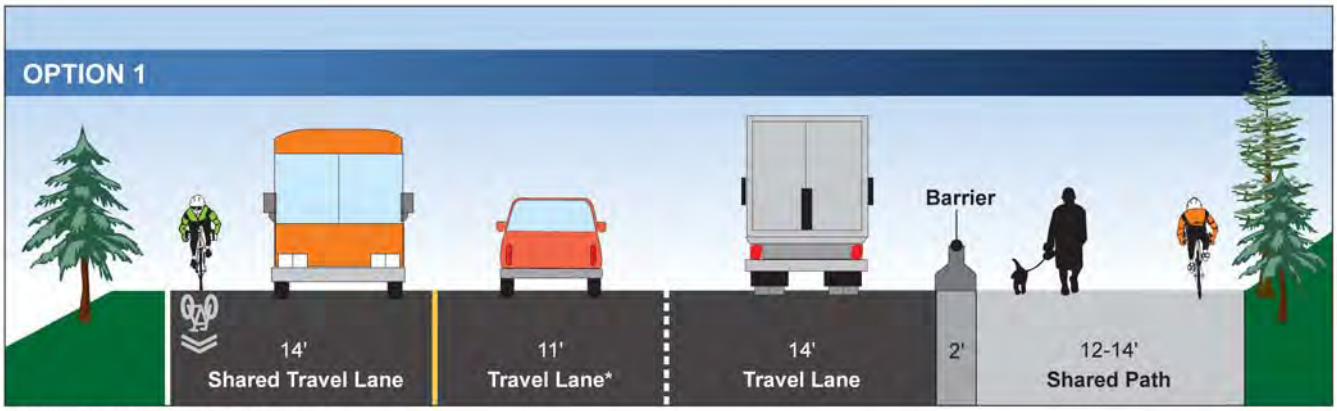
Typical Cross Section

LEGEND

- STRIPING
- CURB
- BACK OF SIDEWALK
- HORIZONTAL ALIGNMENT
- EXISTING ROW
- EXISTING CURB OR WALL
- EXISTING GUARDRAIL
- WATER TREATMENT AREA

Scholls Ferry Road Conceptual Design Plan Project

Option 1



*Center Lane is in uphill direction.

Cross Section Summary

Pavement Width: 39 ft Total Width: 53-55 ft

- Separated shared path on uphill side
- Concrete barrier or guardrail between path and travel lane
- Wide outside lanes
- Southbound travel lane with shared lane marking for bicycles

Considerations

- Barrier between roadway provides a better sense of security and safety for bicycles and pedestrians
- Potential maintenance challenges for separated areas
- Additional width improves vehicle sight distance along the inside of curves
- Lower traffic driveway crossings on east side of roadway
- Barrier discourages-prevents off tracking into bikeway/walkway
- Breaks in barrier for driveways and crossing locations creates safety hazard
- Bicycles and pedestrians in shared space could result in conflicts, although bike speeds will be slower uphill
- Guardrail and/or barrier likely required on downhill shared lane
- Cost – median compared to other options due to wider pavement, barrier, and more grading required
- Stormwater – Wider impermeable area and sheet flow off west edge. Requires storm system due to barrier and path on east side of roadway

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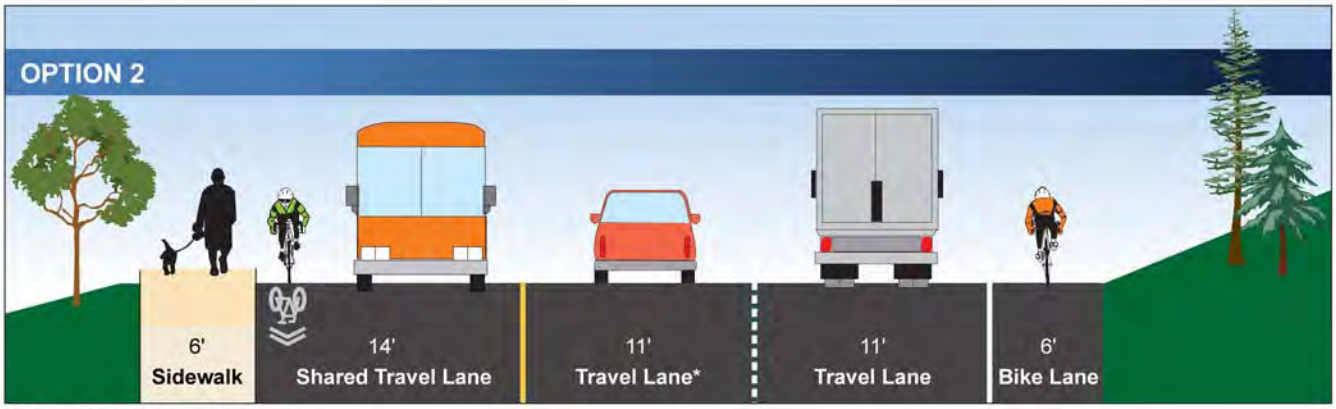
Option 2



*Center Lane is in uphill direction.

Cross Section Summary

Pavement Width: 42 ft Total width: 48 ft

- Separated sidewalk on west side
- Wider southbound travel lane with shared lane marking for bicycles
- Bike lane northbound

Considerations

- Bike lane northbound separates slower moving bicycles climbing uphill
- Additional width improves vehicle sight distance along the inside of curves
- No buffer between sidewalk and travel lane
- Sidewalk would better serve driveways/residences on west side of roadway
- Eliminates barrier hazards to provide breaks for driveways
- Sidewalk could be a boardwalk in narrower segments
- Bicyclists and pedestrians in separate facilities, reduces conflicts
- Cost – Lower due to narrow pavement and less grading required. Added cost due to curb and storm system on west edge and east edge to drain ditch
- Stormwater – Less impermeable area but requires piping stormwater on west edge due to sidewalk and east edge to drain ditch

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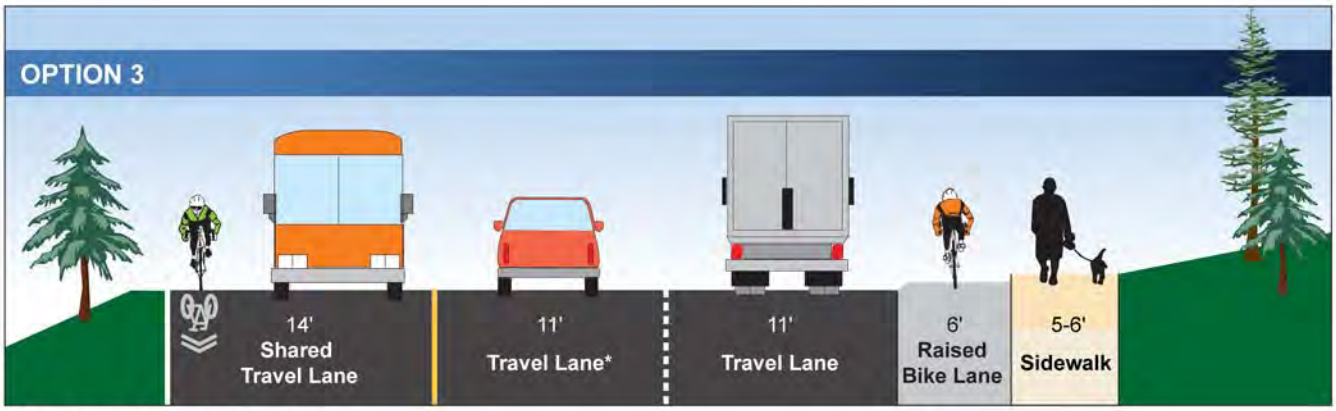
Option 3



*Center Lane is in uphill direction.

Cross Section Summary

Pavement Width: 36 ft Total width: 47-48 ft

- Sidewalk on east side of roadway
- Raised bike lane on east side of roadway
- Wider southbound travel lane with shared lane marking for bicycles

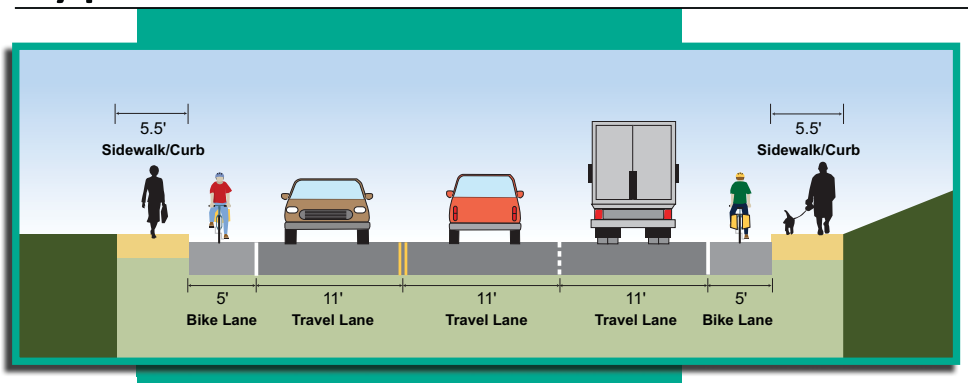
Considerations

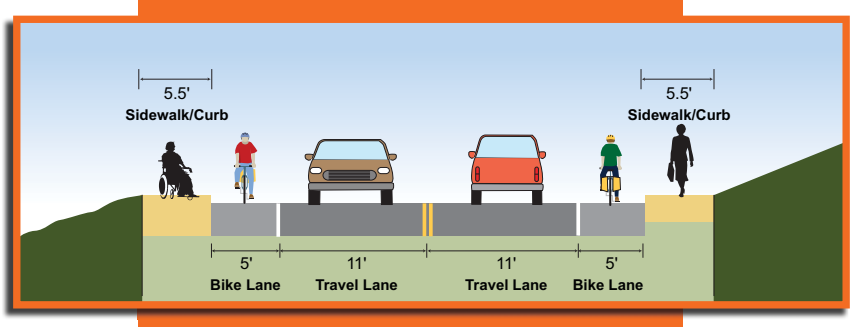
- Raised bike lane provides visual and vertical separation from travel way and sidewalk
- Raised bike lane discourages off tracking into bike lane
- Bike lane acts as a buffer between traffic for pedestrians
- Additional width improves sight distance along the inside of curves
- Lower traffic driveway crossings on east side of roadway
- Bicyclists and pedestrians in separate facilities, reduces conflicts
- Eliminates barrier hazards to provide breaks for driveways
- Cost – Lower compared to other options due to narrow width and less grading
- Stormwater – Less impermeable area and allows sheet flow off west edge. Storm system required on east edge

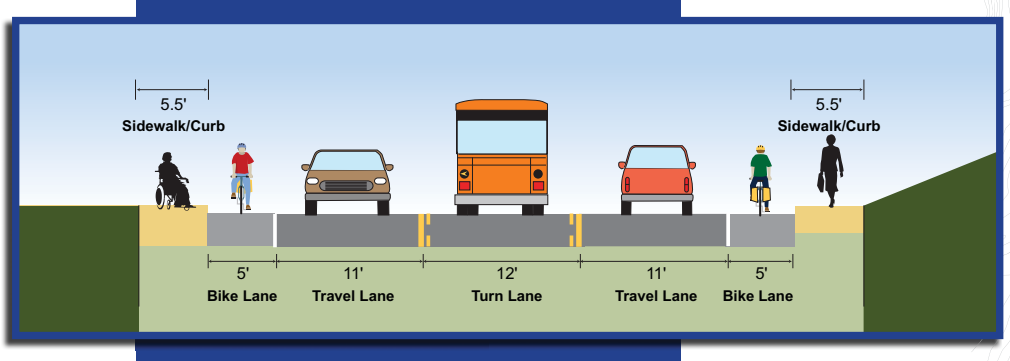
Scholls Ferry Road Conceptual Design Plan

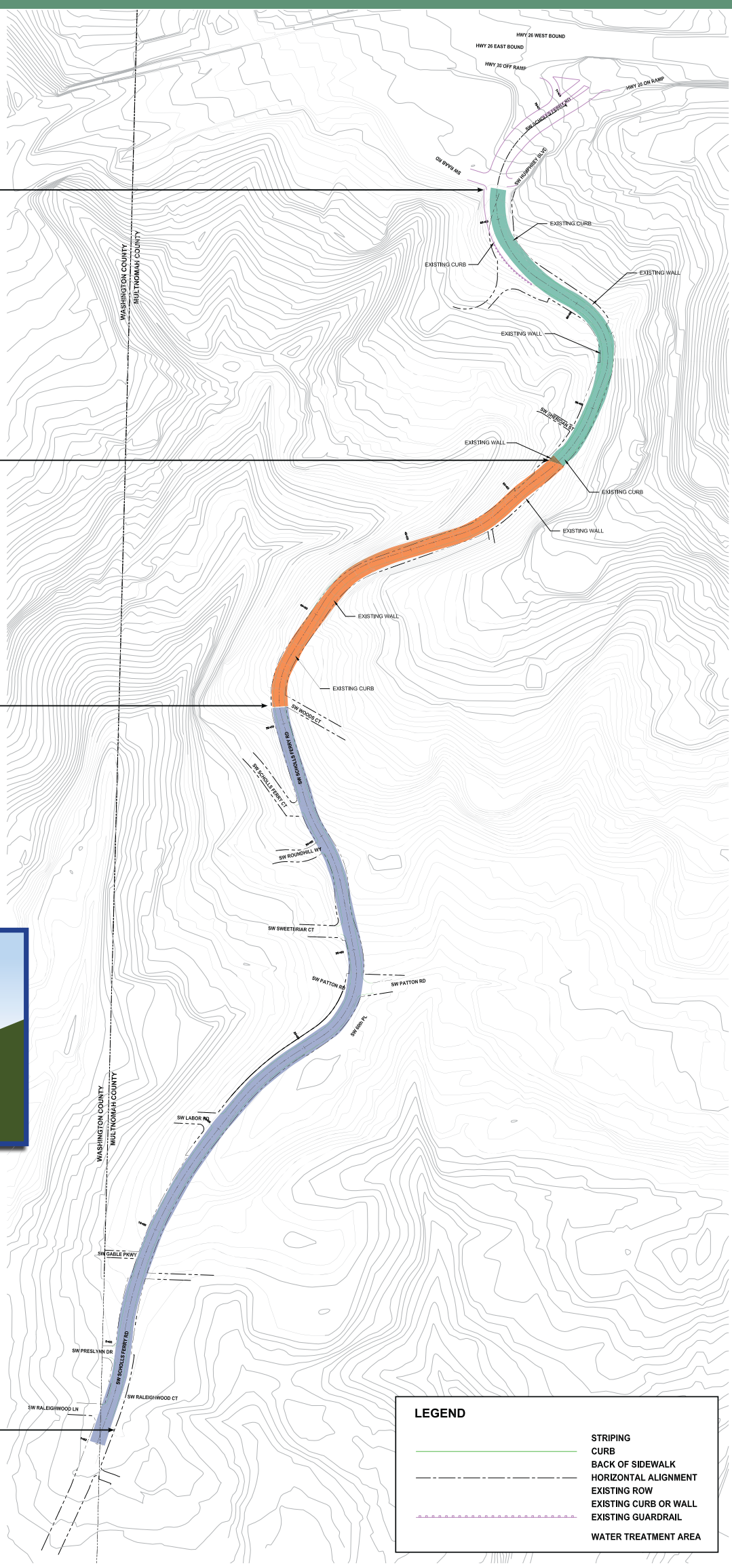
Street Design Options

Typical Cross Sections









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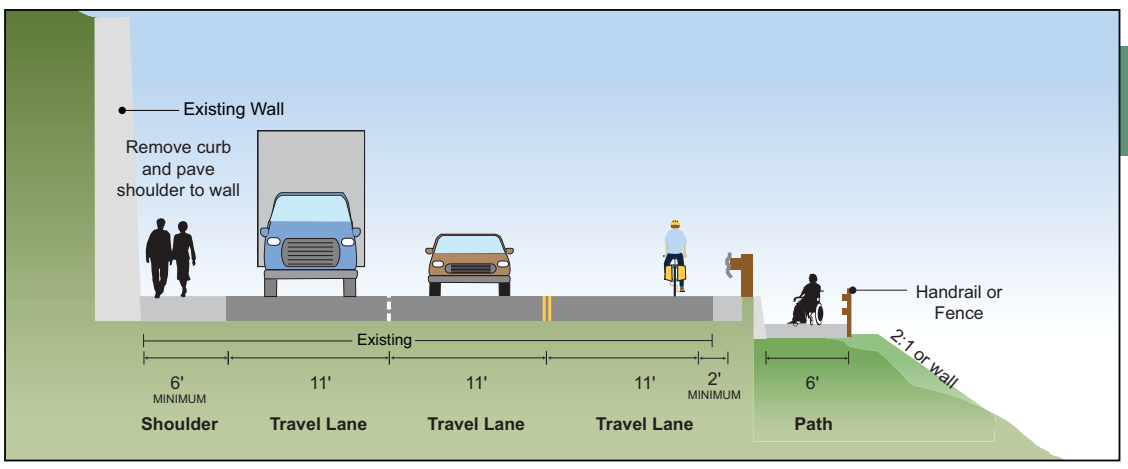
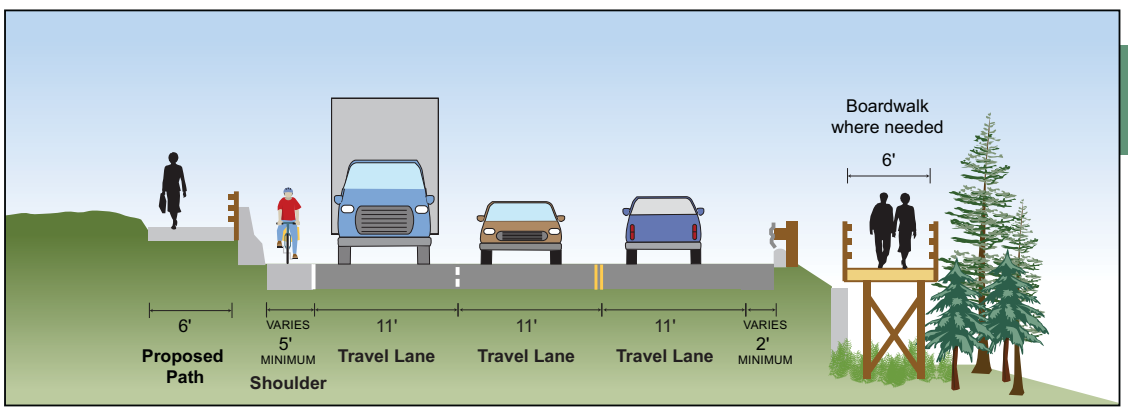
Toolbox Concepts



Toolbox Concept 1



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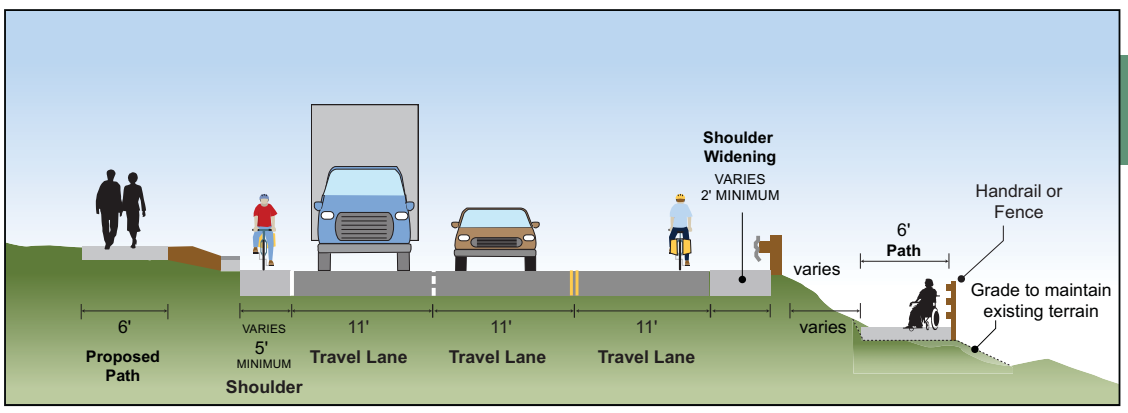

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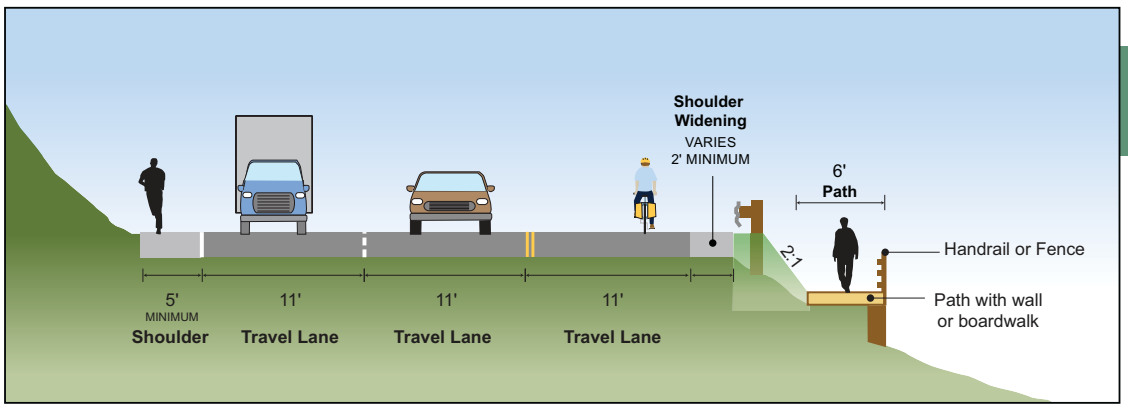

Toolbox Concept 4

Parametrix