

# 2 | Developing the Alternatives



Chapter 2 provides information on the alternatives that were considered for the project and greater detail about the two alternatives studied in detail in this environmental impact statement.

## What alternatives were considered for the project?

Washington State Department of Transportation developed a range of initial alternatives for improving safety and mobility on SR 502 between I-5 and Battle Ground, Washington. These included alternatives that would widen the existing SR 502 corridor and other alternatives that would build a completely new roadway north or south of the current alignment. The alternatives were developed through a process that included the public's input at open house meetings from February 2007 through May 2008. Below is a detailed description of the alternatives evaluated. Appendix D, *Public Involvement*, includes more information on the public involvement process.

Five on-corridor alternatives were studied. Each on-corridor alternative involved widening and reconfiguring the existing SR 502 alignment (NE 219<sup>th</sup> Street) between NE 15<sup>th</sup> Avenue and NE 102<sup>nd</sup> Avenue. These alternatives would provide two travel lanes in each direction, turn pockets at intersections, and median treatment (see sidebar).

The five on-corridor alternatives originally developed differed in how roadway widening would be accomplished. These alternatives are illustrated in Exhibits 2-1 through 2-5.

### ? DEFINITION

#### WHAT ARE ON-CORRIDOR AND OFF-CORRIDOR ALTERNATIVES?

On-corridor alternatives focus on improvements to the existing SR 502 roadway. Off-corridor alternatives consider improvements that would create a new roadway north or south of the existing SR 502 corridor.

### ? DEFINITION

#### WHAT IS A MEDIAN TREATMENT?

A median treatment is a structure in the center of a roadway that physically separates the two directions of travel. The primary purpose of a median treatment is to prevent vehicles from straying into opposing lanes. In addition, median treatments can prevent turns where they are undesirable from a traffic flow or safety standpoint. The concrete Jersey barrier shown below is the most common for this type of median treatment. Median treatments along the SR 502 Corridor could include barrier or curb.



- **Red/Brown Alternative:** The Red/Brown Alternative would hold the existing SR 502 centerline and would widen the existing right of way symmetrically along SR 502 except at Dollars Corner, where it would follow a route to the north of the commercial area (Exhibit 2-1).
- **Yellow Alternative:** The Yellow Alternative would hold the existing SR 502 southern right of way boundary and would widen the existing right of way to the north (Exhibit 2-2).
- **Purple Alternative:** The Purple Alternative would hold the existing SR 502 centerline and widen the existing right of way symmetrically to the north and south (Exhibit 2-3).
- **White Alternative:** The White Alternative would hold the existing SR 502 northern right of way boundary and would widen the existing right of way to the south (Exhibit 2-4).
- **Orange Alternative:** The Orange Alternative would hold the existing SR 502 centerline and would widen the existing right of way symmetrically along SR 502 except at Dollars Corner, where it would follow a route to the south of the commercial area (Exhibit 2-5).

Two off-corridor alternatives were also considered. These would relocate SR 502 to a new roadway either north or south of the existing alignment (Exhibits 2-6 and 2-7).

- **Blue Alternative:** The Blue Alternative would be a new off-corridor road running parallel to NE 219<sup>th</sup> Street to the north. The existing NE 219<sup>th</sup> Street would be retained as a local road (Exhibit 2-6).
- **Aqua Alternative:** The Aqua Alternative would be a new off-corridor road running parallel to NE 219<sup>th</sup> Street to the south. The existing NE 219<sup>th</sup> Street would be retained as a local road (Exhibit 2-7).



Exhibit 2-1: Red/Brown Alternative: North Dollars Corner



Exhibit 2-2: Yellow Alternative: widen SR 502, hold south right of way line



Exhibit 2-3: Purple Alternative: widen SR 502 symmetrically



Exhibit 2-4: White Alternative: widen SR 502 hold north right of way line



Exhibit 2-5: Orange Alternative: South Dollars Corner



Exhibit 2-6: Blue Alternative: North off-corridor



Exhibit 2-7: Aqua Alternative: South off-corridor

**DEFINITION****WHAT IS TRANSPORTATION SYSTEM MANAGEMENT?**

Transportation System Management strategies identify options that may add capacity to the existing roadway without adding travel lanes to the corridor. These strategies include signal improvements, intersection lane configuration improvements, and increased transit service.

**DEFINITION****WHAT IS TRANSPORTATION DEMAND MANAGEMENT?**

Transportation Demand Management strategies identify options that may reduce the demand for additional capacity on the existing roadway without adding travel lanes to the corridor. These strategies include enhanced transit, carpooling, and other travel demand reduction strategies.

In addition to these on-corridor and off-corridor alternatives, the project considered two options for a Transportation System Management/Transportation Demand Management Alternative. These options would use combinations of new or improved traffic signals, turn lanes, access management, and transit improvements in lieu of roadway widening.

- **Transportation System Management/Transportation Demand Management Alternative, Option 1:** This option would make improvements to the existing roadway but would retain the existing two travel lanes. Paved roadway shoulders would be provided, and signals and designated eastbound and westbound left-turn lanes would be added at NE 29<sup>th</sup> Avenue, NE 50<sup>th</sup> Avenue, and NE 92<sup>nd</sup> Avenue. Additional turn lanes and signal improvements at NE 72<sup>nd</sup> Avenue, and a median treatment would be installed throughout the length of the corridor with breaks at the signalized intersections. Improvements in the option would be constructed within the existing right of way (approximately 75 feet).
- **Transportation System Management/Transportation Demand Management Alternative, Option 2:** This option would include the improvements proposed under Option 1 with the addition of substantially increased transit service along the corridor including local service (the only service now is non-stop, express commuter service), with the addition of bus stops/pullouts within the project area.

During the alternatives development process, the numerous similarities among the on-corridor alternatives became apparent, so a hybrid approach combining the best elements of the on-corridor alternatives and the Transportation System Management/Transportation Demand Management Alternative was developed as a sixth on-corridor alternative, known as the “Pink Alternative”, as illustrated in Exhibit 2-8.

- **Pink Alternative:** The Pink Alternative would generally balance widening along the existing SR 502 centerline, but would slightly shift the roadway alignment to both the north and south to minimize effects to properties and environmentally sensitive areas. For example, a minor shift of the roadway to the south makes it possible to avoid the Class I forested wetland located on the north side of SR 502 west of NE 84<sup>th</sup> Avenue, and a shift of the roadway to the north near Dollars Corner avoids adverse effects to the riparian area of Mill Creek, a fish-bearing stream.

Finally, the **No Build Alternative** was considered as required by the National Environmental Policy Act as the baseline for comparison.



Exhibit 2-8: Pink Alternative: combination of other on-corridor alternatives

## What criteria were used to evaluate the alternatives?

The alternatives were evaluated against screening criteria to assess which should be carried forward for further development and detailed consideration in the draft environmental impact statement. The screening process evaluated how well each of the alternatives met the following criteria:

- **Purpose and need:** Meets project purpose and need.
- **Design standards:** Meets Washington State Department of Transportation's design standards.
- **Public input:** Public support for the alternative.
- **Mobility:** Estimated travel times along the corridor.
- **Safety:** The number of locations – either at driveways or intersections – where traffic patterns cross and create potential conflict points.
- **Community effects:** The number of businesses or residences that would be displaced.
- **Environmental effects:** The number of acres of wetlands filled, the number of stream or water-body crossings required, and the potential to encounter sites contaminated with hazardous materials.

The results of the screening process, where alternatives were either forwarded for further study or withdrawn, are shown in Exhibit 2-9.



### KEY POINT

#### SECTION 4(f) EFFECTS

Alternatives were evaluated for their effects on Section 4(f) property in the Section 4(f) evaluation; see Appendix B. This evaluation considers effects of the alternatives on historic resources as well as other resources to identify which feasible and prudent alternatives cause the least overall harm.

Criteria	NO BUILD	On-Corridor Alternatives March 2007					Hybrid On-Corridor June 2007	Off-Corridor Alternatives March 2007	
		RED/BROWN North Dollars Corner	YELLOW Widen SR 502 Hold south right of way	PURPLE Widen SR 502 Symmetrical	WHITE Widen SR 502 Hold north right of way	ORANGE South Dollars Corner	PINK Combination of on-corridor alternatives	BLUE North Off-Corridor	AQUA South Off-Corridor
<b>Purpose and Need</b>									
Meets project purpose and need	X	✓	✓	✓	✓	✓	✓	✓	
<b>Design Standards</b>									
Meets design standards	X	✓	✓	✓	✓	✓	✓	✓	
<b>Safety</b>									
Conflict points – driveways	▼	●	●	●	●	●	▲	▲	
Conflict points – intersections	▼	●	●	●	●	●	●	●	
<b>Mobility</b>									
Travel time	▼	●	●	●	●	●	●	●	
<b>Community and Environment</b>									
Business displacements	n/a	▲	▼	▼	▼	▼*	▲*	▲*	
Residential displacements	n/a	▼	●	●	▼	●	▼	●	
Wetlands effects	n/a	▼	●	●	●	●	▼	▼	
Stream, pond, lake crossings	n/a	●	●	▼	▼	●	●	●	
Potential contaminated sites effects	n/a	●	▼	▼	▼	▼	●	●	
<b>Public Input</b>									
Public support for alternative	X	✓	✓	✓	✓	✓	X	X	
<b>Actions Taken</b>									
Which alternatives should be forwarded for detailed environmental study?	Forward (required)	No further study					Forward	No further study	

\* In spite of the greater number of businesses being displaced in the Pink Alternative, the business owners around Dollars Corner have stated they would rather be displaced than have the highway bypass their business.

✓ Yes X No ▲ Better ● Moderate ▼ Worse n/a = not applicable

Exhibit 2-9: Initial screening matrix

### Why were the Blue and Aqua off-corridor alternatives withdrawn from further study?

The reasons for withdrawal of the Blue and Aqua alternatives are described in the following bullet points.

- Public support:** According to business owners at Dollars Corner, and contrary to ones' first impression, the off-corridor alternatives would result in more severe indirect effects on businesses than any of the on-corridor alternatives. Although the Blue and Aqua alternatives would displace fewer business than the on-corridor alternatives that go through Dollars Corner, these off-corridor alignments would reduce the visibility and convenience of these businesses to people that commute on SR 502 by routing potential customers around Dollars Corner. During the public outreach process, property and business owners stated a strong preference for the direct effects associated with an on-corridor alternative (meaning they would



approximately three times more than the Pink Alternative. Like the off-corridor alternatives, these two alternatives would reduce the connectivity of existing wetlands by bisecting large wetland complexes where they would deviate from the existing corridor around Dollars Corner, leaving pockets of isolated wetlands and fragmenting the associated plant, animal, and fish habitat. The high level of wetland fill and reduced connectivity would result in far more substantial adverse environmental effect than the on-corridor alternatives that minimize fill and stay on-corridor for the entire alignment.

- **Residential Displacements:** The Red/Brown Alternative would have a high level of residential displacements, approximately 50 percent more than the Pink Alternative.
- **Design Standards:** The Orange Alternative would not be feasible to construct because it would not meet Washington State Department of Transportation's design standards, which would result in potential safety issues. The distance between the NE 219<sup>th</sup> Street/NE 72<sup>nd</sup> Avenue intersection and the new SR 502 roadway/NE 72<sup>nd</sup> Avenue intersection to the south would be insufficient to accommodate the left-turn lanes that would be necessary for left-turns from northbound NE 72<sup>nd</sup> Avenue west onto NE 219<sup>th</sup> Street and from southbound NE 72<sup>nd</sup> Avenue east onto the new SR 502 roadway. Without sufficient turn lane length, traffic trying to turn left at these locations would back up into the travel lanes on NE 72<sup>nd</sup> Avenue, potentially causing unsafe travel conditions. The alignment of the Orange Alternative could not be shifted further south to provide the needed intersection spacing because it would result in significantly greater adverse effects on Mill Creek and the critical fish habitat that it provides.

The Red/Brown and Orange alternatives were withdrawn from further study because of their significant effects on wetlands and residences. Additionally, the Orange Alternative did not meet design standards.

### Yellow, Purple, and White on-corridor alternatives

The Yellow, Purple, and White alternatives would all stay on-corridor for the entire alignment as desired by the public. However, each of these three alternatives would also result in adverse environmental and community effects:

- **Wetland effects:** All of these on-corridor alternatives would require filling substantial areas of wetlands. The Yellow Alternative would require filling 32 to 34 acres of wetlands. The Purple Alternative would require 26 to 28 acres of wetland fill, and the White Alternative would require 21 to 23 acres of wetland fill. Wetland effects of this magnitude represent a severe change within the watershed due to the

loss of important environmental functions. Each of these alternatives would require two to three times more wetland effects than the Pink Alternative, but none would bisect wetland complexes like the Blue, Aqua, Red/Brown, and Orange Alternatives.

- **Effects to streams:** The Purple and White alternatives would both require aligning a segment of stream channel, 310 linear feet and 400 feet respectively, for a parallel stream crossing. This realignment could substantially degrade critical fish habitat. By comparison, the Pink Alternative would not require any stream channel realignment.
- **Residential displacements:** The White Alternative would require nearly twice as many residential displacements as the Pink Alternative.

Because of the significant stream, wetland, and residential displacements that the Yellow, Purple, and White alternatives would require, Washington State Department of Transportation developed a hybrid on-corridor alternative to minimize effects to community and environmental resources. This hybrid alternative, named the Pink Alternative, combined of the best portions of each of the Yellow, Purple, and White alignments as well as elements of the Transportation System Management/Transportation Demand Management Alternative. The Yellow, Purple, and White alternatives were withdrawn because their effects would be so much higher than those of the Pink Alternative. Therefore, the Pink Alternative was the only on-corridor alternative carried forward for further environmental study as a Build Alternative.

### Pink Alternative

The Pink Alternative would result in:

- Substantially less wetland fill than all of the other alternatives considered. This alternative would require filling 8 to 12 acres of wetlands, which is two to five times less than the other on-corridor alternatives and approximately seven times less than the off-corridor alternatives. The Pink Alternative would not bisect any wetland complexes, and therefore would maintain connectivity of existing wetlands and the associated plant, animal, and fish habitat. This alternative best retains the important environmental functions of existing wetlands, and it requires the least amount of wetland mitigation.
- No realignment of any stream channels, reducing the adverse effects of this alternative on critical stream habitat.
- The displacement of 20 to 30 residences, as discussed in detail in Chapter 4. The level of residential displacements is comparable or less than the other on-corridor alternatives.

- The displacement of 16 to 22 businesses, as discussed in detail in Chapter 4. Although the Pink Alternative requires more business displacements than the off-corridor alternatives, the overall impacts to businesses is less severe because this alternative does not route potential customers away from Dollars Corner. Residents and businesses expressed a strong preference for an on-corridor alternative.

### What alternatives are studied in detail in this draft environmental impact statement?

This draft environmental impact statement evaluates a No Build Alternative, as required by the National Environmental Policy Act, and one Build Alternative. The Build Alternative is the hybrid on-corridor approach, previously known as the “Pink Alternative.”

#### No Build Alternative

The No Build Alternative reflects expected conditions if the project were not built. The current configuration of SR 502 would be maintained without improvements other than routine maintenance. SR 502 would remain a two-lane roadway with numerous driveway access points. The intersections at SR 502/NE 10<sup>th</sup> Avenue and SR 502/NE 72<sup>nd</sup> Avenue would have traffic signals as they do today, while other intersections would only have stop signs controlling the side-street movements. The No Build Alternative provides a basis against which the Build Alternative is compared throughout this draft environmental impact statement.

#### Build Alternative (Preliminary Preferred Alternative)

The Build Alternative would widen the existing SR 502 corridor between NE 15<sup>th</sup> Avenue and NE 102<sup>nd</sup> Avenue (Exhibit 2-10). This segment connects the City of Battle Ground with I-5 and provides access to adjacent properties along the highway.

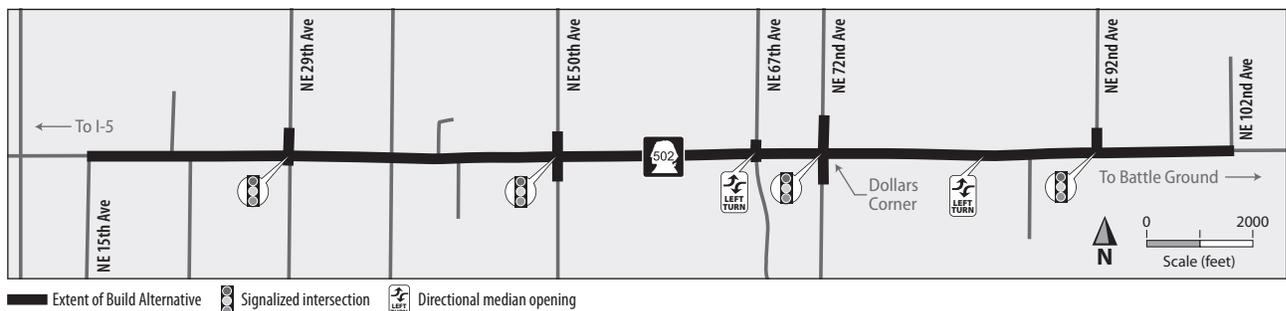


Exhibit 2-10: Extent of Build Alternative

Widening would create two additional travel lanes to improve traffic flow, resulting in a total of two through travel lanes in each direction (Exhibit 2-11). The right of way width would be approximately 150 feet and would require acquiring strips of additional right of way from parcels located along the existing SR 502.

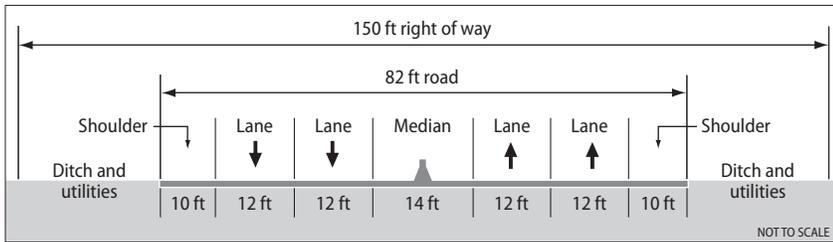


Exhibit 2-11: Typical cross section of SR 502 under the Build Alternative

Signalized intersections would be provided at NE 29<sup>th</sup> Avenue, NE 50<sup>th</sup> Avenue, NE 72<sup>nd</sup> Avenue, and NE 92<sup>nd</sup> Avenue. These intersections would allow full movements in all directions, including u-turns. Street lights also would be provided at these intersections to improve visibility. The alignment of the Build Alternative would include a minor shift of the roadway to the south to avoid a Class I forested wetland located on the north side of SR 502 west of NE 84<sup>th</sup> Avenue, and a shift of the roadway to the north near Dollars Corner avoids effects to the riparian area of Mill Creek. The right of way of the Build Alternative would be slightly narrowed for a short distance to avoid effects to the Bonneville Power Administration transmission line tower located west of NE 41<sup>st</sup> Court. Appendix A, *Preliminary Plan Sheets*, illustrates the alignment of the Build Alternative and the locations of the signalized intersections in greater detail.

To improve safety, a median would be provided in the center of the roadway. The median treatment would physically separate traffic moving in opposing directions and also consolidate movements crossing the roadway to the signalized intersection locations. Driveway access would be provided to adjacent properties, but drivers would be restricted to making right-turns into and out of these locations. Directional median openings would be provided in two locations to allow left-turns from SR 502 onto side streets, and other side street connections would be limited to right-turns only. To change direction of travel or access properties on the opposite side of the roadway, drivers could make a u-turn at one of the signalized intersections, which are located at approximately one-mile intervals.

Paved shoulders, generally 10 feet wide, would be provided along the length of the corridor, except at NE 72<sup>nd</sup> Avenue (Dollars Corner), where sidewalks and bicycle lanes would be provided instead. These facilities would extend from NE 67<sup>th</sup> Avenue to the 7600 block along SR 502, and roughly 340 feet in each direction along NE 72<sup>nd</sup> Avenue. They are provided to help bicyclists safely navigate through the more heavily developed Dollars Corner area and to allow pedestrian access to adjacent properties. Along other segments of SR 502, bicyclists could use the paved shoulders. Due to the light nature of development along the corridor, only occasional pedestrian traffic is expected outside of the

Dollars Corner area. These walkers could also use the paved shoulders outside of the Dollars Corner area. Crosswalks would be provided across all legs of the four signalized intersections.

Additional turn pockets would be provided at each of the signalized intersections. At NE 29<sup>th</sup> Avenue, a right-turn pocket and left-turn pocket would be provided for both directions of SR 502 (Exhibit 2-12). NE 29<sup>th</sup> Avenue would be widened for roughly 350 feet to either side of SR 502 to provide left-turn pockets as well as a northbound right-turn pocket. A similar design is proposed for the intersection at NE 50<sup>th</sup> Avenue (Exhibit 2-13).

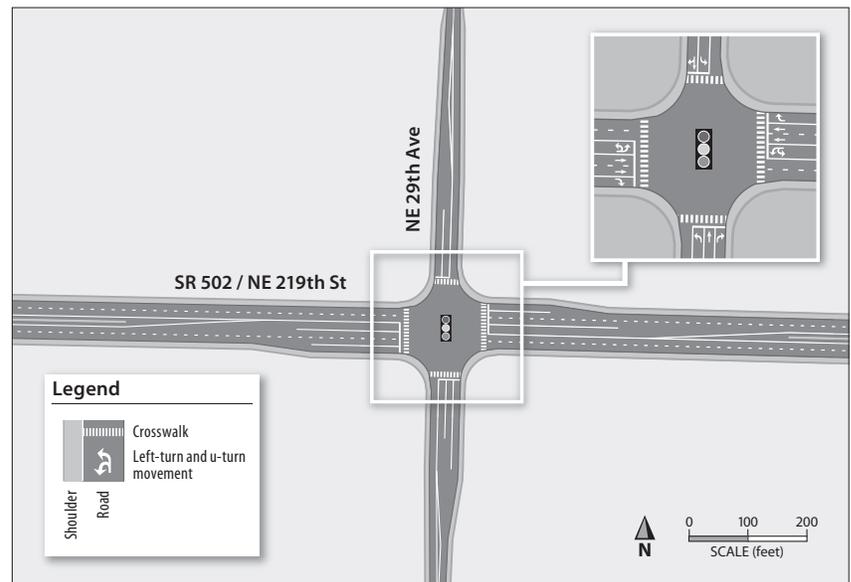


Exhibit 2-12: Proposed intersection of SR 502 and NE 29th Ave under the Build Alternative

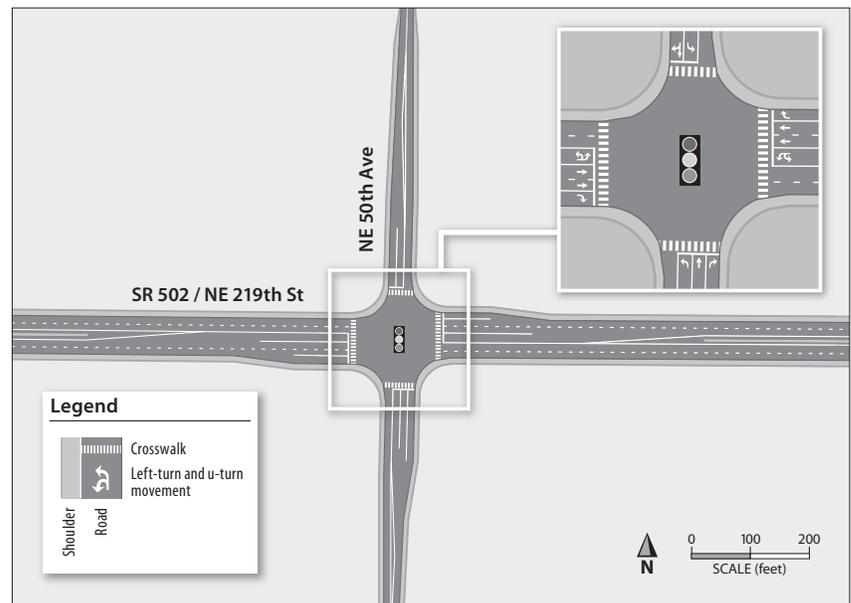


Exhibit 2-13: Proposed intersection of SR 502 and NE 50th Ave under the Build Alternative

The unsignalized intersection of SR 502 and NE 67<sup>th</sup> Avenue would be improved to include a short right-turn lane in both directions. Additionally, a directional median opening at NE 67<sup>th</sup> Avenue would allow traffic traveling in either direction on SR 502 to turn left onto NE 67<sup>th</sup> Avenue (Exhibit 2-14).

At NE 72<sup>nd</sup> Avenue, an additional right-turn pocket is proposed for all four approaches (Exhibit 2-15). These would vary in length from approximately 150 feet to 250 feet. Left-turn pockets also would be

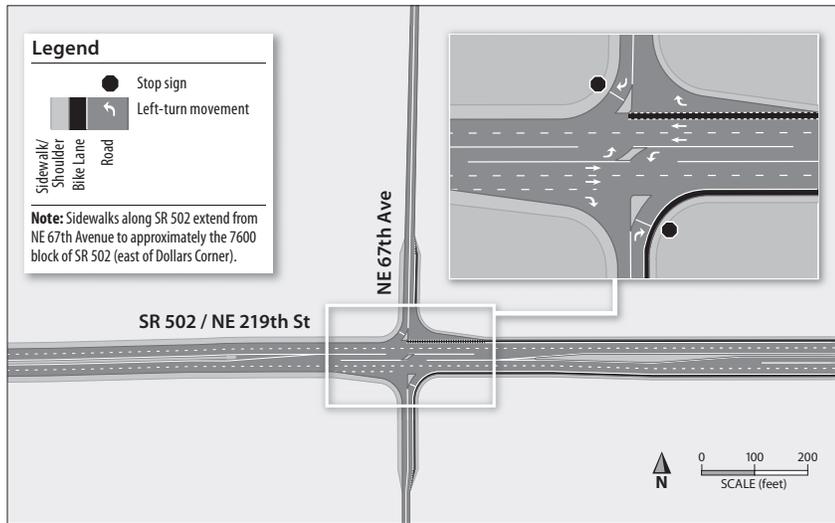


Exhibit 2-14: Proposed directional median opening at NE 67th Ave under the Build Alternative

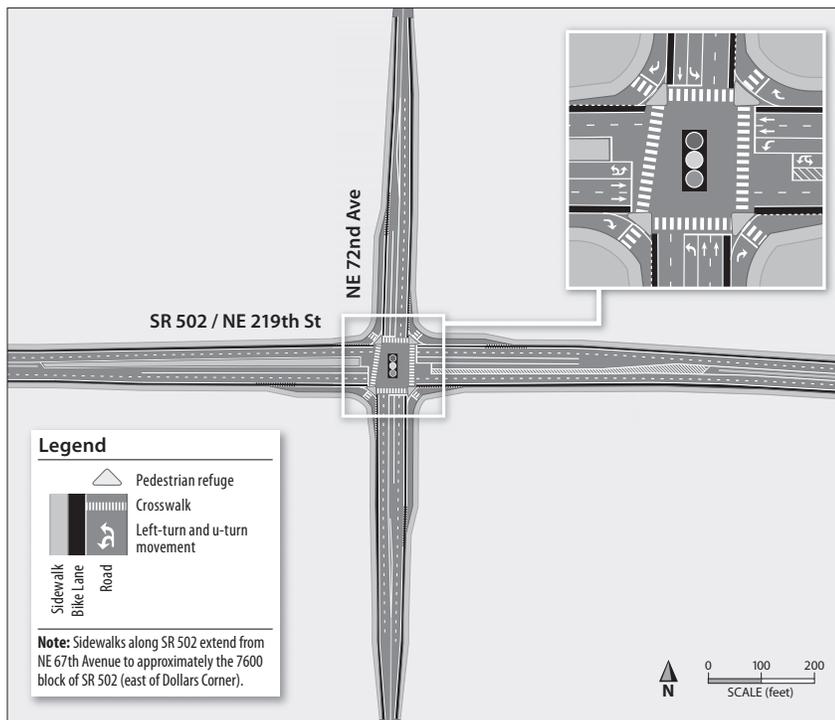


Exhibit 2-15: Proposed intersection of SR 502 and NE 72nd Ave under the Build Alternative

provided for each approach. Projected traffic volumes necessitate dual left-turn lanes for the westbound direction. In addition, the configuration of the intersection would provide sufficient space to accommodate u-turns.

A second directional median opening in the median treatment would be provided east of Dollars Corner between NE 79<sup>th</sup> Avenue and NE 82<sup>nd</sup> Avenue to allow left-turns from SR 502 (Exhibit 2-16). The two directional median openings were added to the Build Alternative in response to public comments received at the access hearing. The exact location of this directional median opening will be determined as final design of the Build Alternative progresses. This location will be coordinated with Clark County to ensure that its placement is consistent with the County’s future transportation system.

The NE 92<sup>nd</sup> Avenue intersection is a three-legged intersection with NE 92<sup>nd</sup> Avenue extending north from SR 502 (Exhibit 2-17). A left-

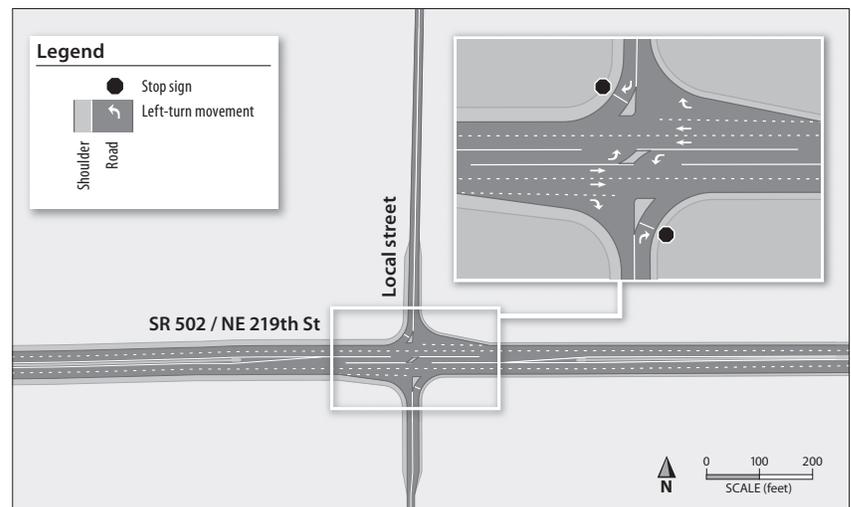


Exhibit 2-16: Proposed directional median opening east of Dollars Corner

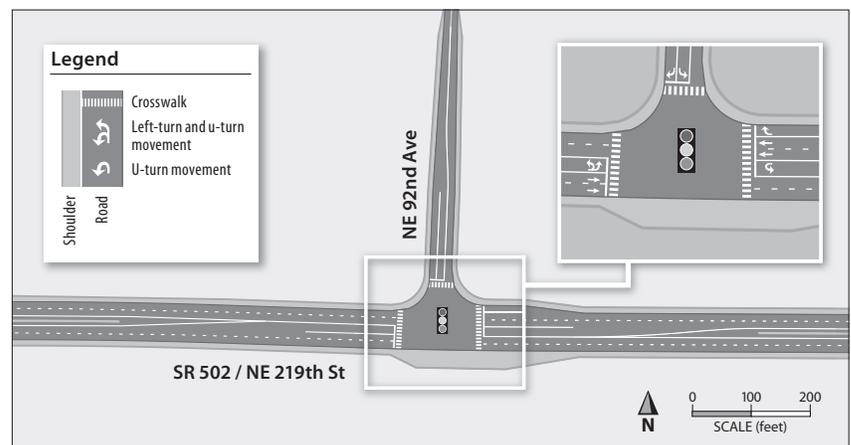


Exhibit 2-17: Proposed intersection of SR 502 and NE 92nd Ave under the Build Alternative

turn pocket would be provided for each direction of SR 502, with the westbound turn pocket only accommodating u-turns. A widened shoulder would be provided on the south side of the intersection to provide sufficient space for larger vehicles to make the u-turn movement. A right-turn pocket would be provided in the westbound direction. NE 92<sup>nd</sup> Avenue would terminate at SR 502 with both left-turn and right-turn only lanes.

Roundabouts were considered as part of the Build Alternative at the intersections of SR 502 and NE 29<sup>th</sup> Avenue, NE 50<sup>th</sup> Avenue, NE 72<sup>nd</sup> Avenue, and NE 92<sup>nd</sup> Avenue. The analysis concluded that roundabouts at NE 29<sup>th</sup> Avenue, NE 50<sup>th</sup> Avenue, and NE 72<sup>nd</sup> Avenue would experience substantial delays and would not meet level of service objectives. The roundabout at NE 92<sup>nd</sup> Avenue would experience minimal delays; however, based on the volume to capacity ratios this roundabout also would not meet the level of service objectives. Therefore, roundabouts were not recommended.

While transportation system management/travel demand management options were eliminated from further consideration as stand-alone improvements because they did not fully meet the project's purpose and need, particularly with regard to mobility, many of these features could be incorporated into the Build Alternative.

- Sidewalks and marked bike lanes along SR 502 in Dollars Corner.
- Wide shoulders to allow for bicycle and pedestrian mobility and safety outside of Dollars Corner.
- Access management provisions including a raised, center median along much of the corridor.
- Allowance for future, local fixed-route bus service that would use the SR 502 corridor (provisions for future bus stops and bus pullouts based on coordination with C-TRAN, the transit provider).
- Improved pedestrian crossings at highway intersections.

The Build Alternative would create approximately 28 acres of new impervious surface, for a total of approximately 51 acres including the existing roadway facility. Stormwater detention and treatment facilities designed to treat runoff from approximately 34 acres of impervious surface would be provided. Approximately 10 detention ponds are anticipated as part of this project, though the number, location and size of these would be determined during final design.

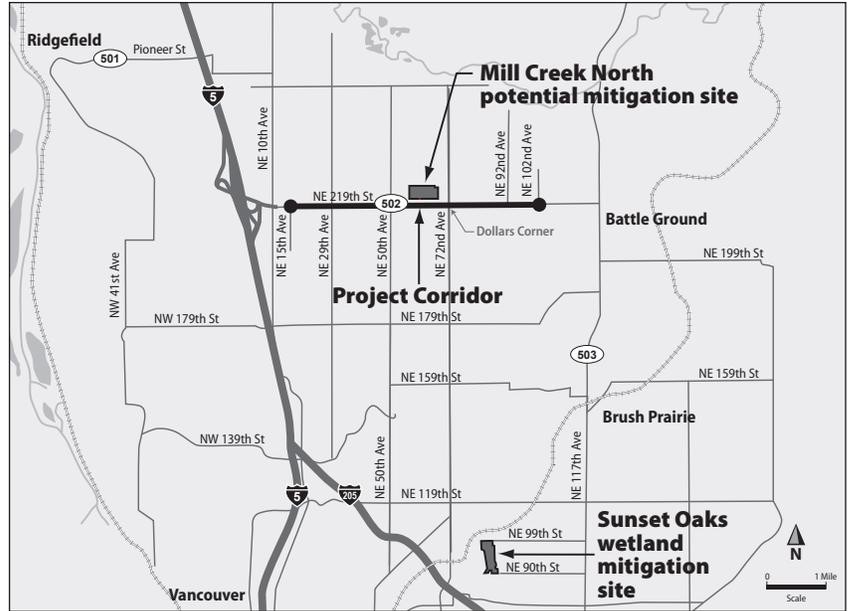


Exhibit 2-18: Potential mitigation sites

Two potential mitigation sites have been identified for the Build Alternative (Exhibit 2-18). The Sunset Oaks wetland mitigation site is a 32-acre site located east of NE 72<sup>nd</sup> Avenue between NE 90<sup>th</sup> Street and NE 99<sup>th</sup> Street, which is roughly six miles south of the SR 502 corridor. This location is proposed specifically to mitigate wetland effects associated with the Build Alternative. Although Sunset Oaks is physically separated from the SR 502 corridor, this site was included as part of the study area.

In addition, Washington State Department of Transportation is considering acquisition of approximately 68 acres adjacent to the SR 502 corridor just west of Dollars Corner (NE 72<sup>nd</sup> Avenue). This site, known as the Mill Creek North potential mitigation site, could potentially be used for wetland creation or enhancement, fish habitat improvement, stream rehabilitation, and increasing flood storage capacity. Other mitigation sites may be identified as the project progresses. Further details regarding proposed environmental mitigation are presented in Chapter 7, *Environmental Commitments*.