6TH ST ACTIVE TRANSPORTATION IMPROVEMENTS

PUBLIC OPEN HOUSE - RECHANNELIZATION ALTERNATIVES ROLL PLOT

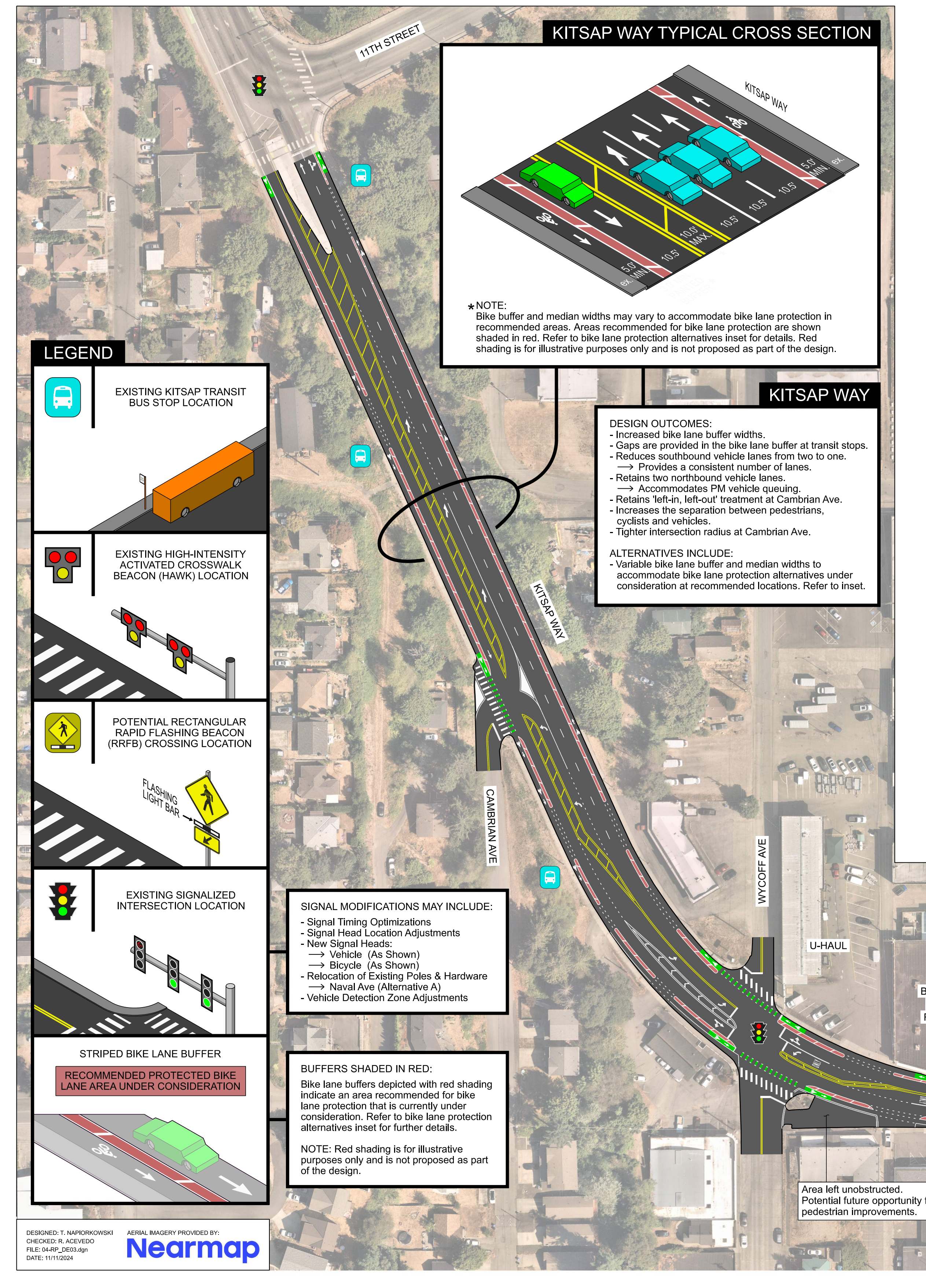
HDR

CITY OF BREMERTON

0' 40' 80' 160'

SCALE: 1" = 40'

215" x 36" ROLL PLOT



KITSAP WAY TYPICAL CROSS SECTION

*NOTE:
Bike buffer and median widths may vary to accommodate bike lane protection in recommended areas. Areas recommended for bike lane protection are shown shaded in red. Refer to bike lane protection alternatives inset for details. Red shading is for illustrative purposes only and is not proposed as part of the design.

KITSAP WAY

DESIGN OUTCOMES:
- Increased bike lane buffer widths.
- Gaps are provided in the bike lane buffer at transit stops.
- Reduces southbound vehicle lanes from two to one.
  - ⟶ Provides a consistent number of lanes.
- Retains two northbound vehicle lanes.
  - ⟶ Accommodates PM vehicle queuing.
- Retains 'left-in, left-out' treatment at Cambrian Ave.
- Increases the separation between pedestrians, cyclists and vehicles.
- Tighter intersection radius at Cambrian Ave.

ALTERNATIVES INCLUDE:
- Variable bike lane buffer and median widths to accommodate bike lane protection alternatives under consideration at recommended locations. Refer to inset.

LEGEND

- EXISTING KITSAP TRANSIT BUS STOP LOCATION
- EXISTING HIGH-INTENSITY ACTIVATED CROSSWALK BEACON (HAWK) LOCATION
- POTENTIAL RECTANGULAR RAPID FLASHING BEACON (RRFB) CROSSING LOCATION
- EXISTING SIGNALIZED INTERSECTION LOCATION
- STRIPED BIKE LANE BUFFER
- RECOMMENDED PROTECTED BIKE LANE AREA UNDER CONSIDERATION

SIGNAL MODIFICATIONS MAY INCLUDE:
- Signal Timing Optimizations
- Signal Head Location Adjustments
- New Signal Heads:
  - ⟶ Vehicle (As Shown)
  - ⟶ Bicycle (As Shown)
- Relocation of Existing Poles & Hardware
  - ⟶ Naval Ave (Alternative A)
- Vehicle Detection Zone Adjustments

BUFFERS SHADED IN RED:
Bike lane buffers depicted with red shading indicate an area recommended for bike lane protection that is currently under consideration. Refer to bike lane protection alternatives inset for further details.

NOTE: Red shading is for illustrative purposes only and is not proposed as part of the design.

Area left unobstructed. Potential future opportunity for pedestrian improvements.

DESIGNED: T. NAPIORKOWSKI
CHECKED: R. ACEVEDO
FILE: 04-RP_DE03.dgn
DATE: 11/11/2024

AERIAL IMAGERY PROVIDED BY:
Nearmap

BIKE LANE PROTECTION ALTERNATIVES

Bike lane buffers depicted in red indicate an area of recommended bike lane protection currently under consideration. Alternatives may include:

ALTERNATIVE A [1]
Precast Curb

ALTERNATIVE B [2]
Delineator Posts

ALTERNATIVE C [3]
Specialty Delineators

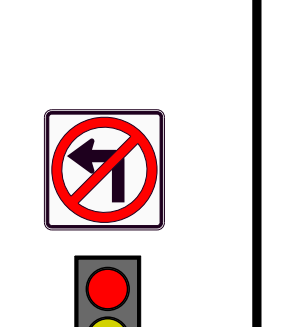
NOTE:
- A minimum 8.0' clear width is required between curb and delineation device to accommodate a standard city sweeper.
- WSDOT refers to protected bike lanes as 'separated bike lanes' within their engineering literature and requires a minimum 2.0' buffer width.

1. Image source: Sanderson Concrete. High profile precast curb shown. Types of available precast curbs vary.
2. Image source: FHWA Separated Bike Lane Planning and Design Guide. Dianne Yee.
3. Image source: ZICLA. Zicla 'Zebra' Cycle Lane Separator Shown. Types of available delineators vary.

WYCOFF AVE TO MONTGOMERY AVE

DESIGN OUTCOMES:
- Reduces the number of through lanes from two to one.
- Provides bike lanes in both directions.
- Provides striped bike buffers in both directions.
- Breaks are provided in the buffer at transit stop locations.
- Improves cyclist safety by removing right turn lanes.
  - ⟶ Isolates conflict points at intersections.
  - ⟶ Meets future traffic capacity requirements.
- Eastbound left turn lane removed at Montgomery Ave.
  - ⟶ Increases Callow Ave westbound turn lane capacity.
  - ⟶ Left turn lanes provided at all other intersections.
- Sight distance and turning space is improved on the southwest corner of the Montgomery Ave intersection, which is currently obstructed by the Furniture World building.

ALTERNATIVES INCLUDE:
- Striped bike lane buffers depicted with red shading indicate an area recommended for bike lane protection that is currently under consideration. Refer to inset.



Alternative for new signal head at Montgomery Ave

ALTERNATIVES DESCRIPTION

These alternatives are targeted at removing the safety issue with having opposing left turns at the Olympic Ave offset intersection, and creates an opportunity for a potential enhanced pedestrian crossing.

ALTERNATIVE A:
This alternative retains a westbound left turn into Olympic Ave and consists of precast curb and paint.

PROS:
- Low cost alternative.
- Allows for full median use by emergency vehicles.

CONS:
- Pedestrian crossing is 100' from intersection.
- No curbed refuge area for pedestrians.

ALTERNATIVE B:
This alternative retains a westbound left turn into Olympic Ave and consists of precast curb and a small permanent curbed median.

PROS:
- Allows for partial median use by emergency vehicles to make left turns (no through movements).
- Curbed refuge area provided for pedestrians.

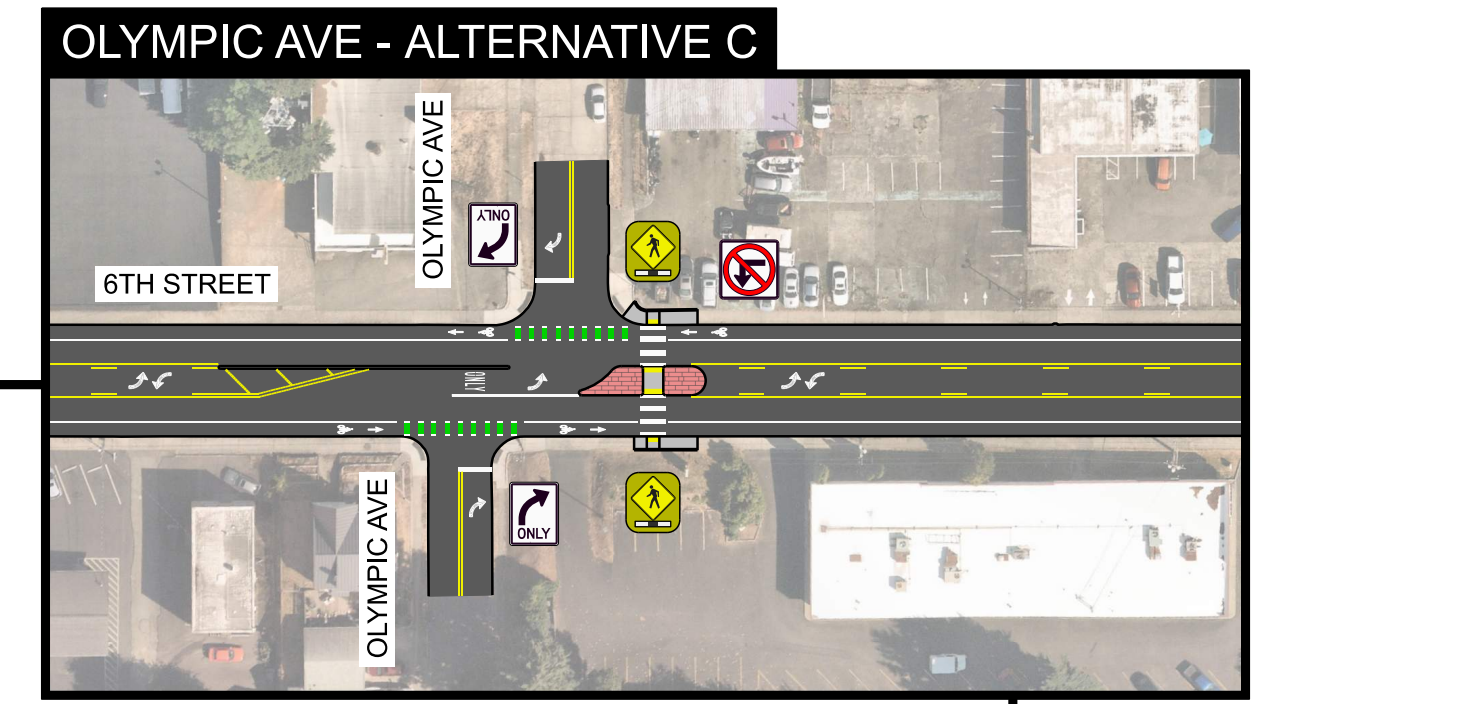
CONS:
- Moderate cost alternative.
- Pedestrian crossing is 100' from intersection.

ALTERNATIVE C:
This alternative retains an eastbound left turn into Olympic Ave and consists of precast curb and a small permanent curbed median.

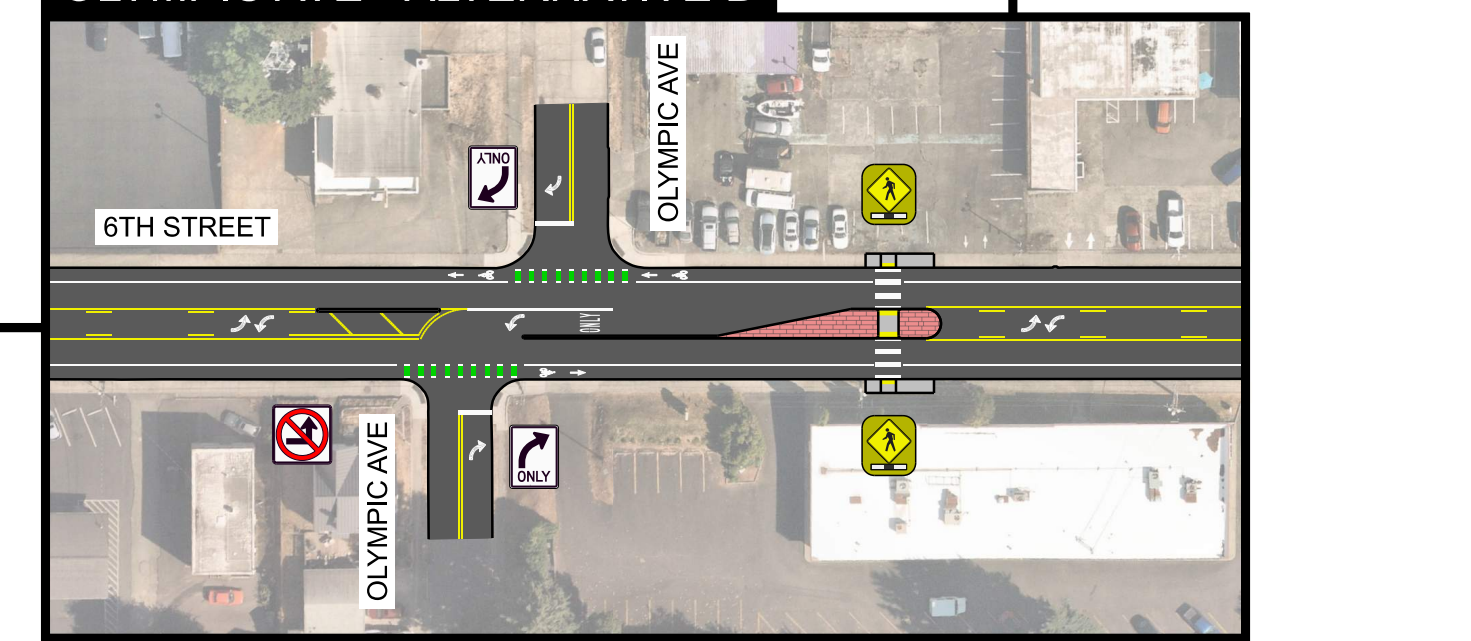
PROS:
- Pedestrian crossing provided at the intersection.
- Allows for partial median use by emergency vehicles to make left turns (no through movements).
- Curbed refuge area provided for pedestrians.

CONS:
- Moderate cost alternative.

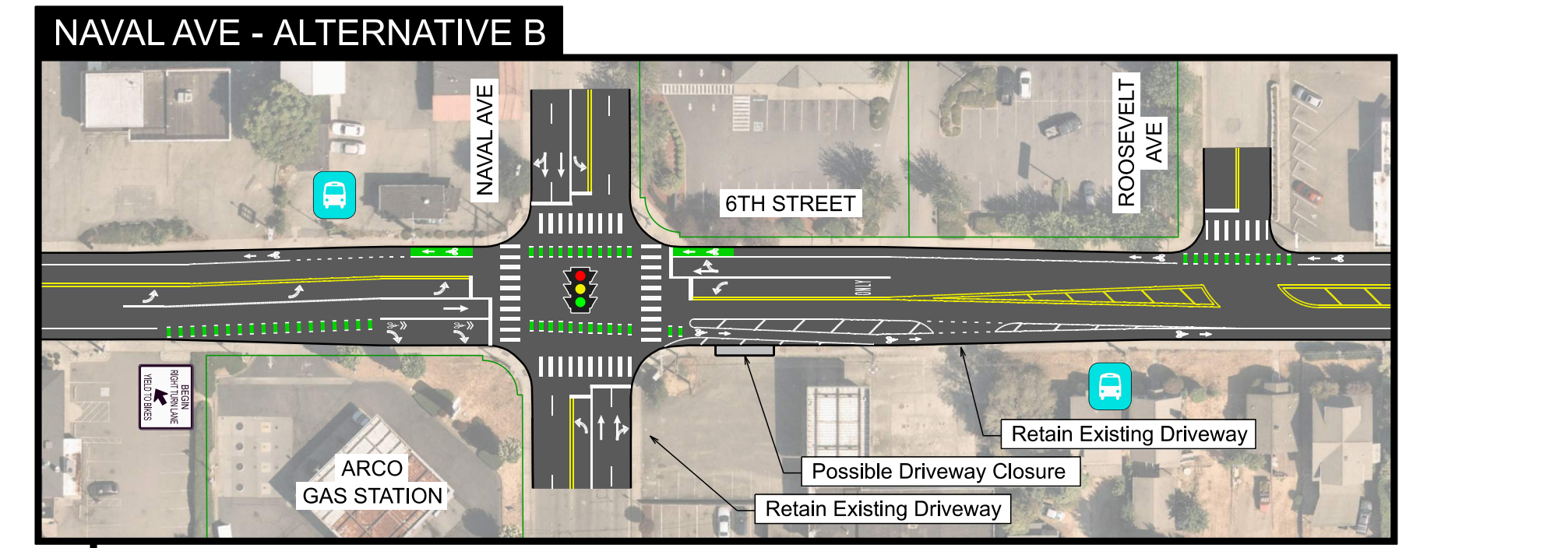
OLYMPIC AVE - ALTERNATIVE C



OLYMPIC AVE - ALTERNATIVE B



NAVAL AVE - ALTERNATIVE B



Retain Existing Driveway

Possible Driveway Closure

Retain Existing Driveway

ALTERNATIVES DESCRIPTION

ALTERNATIVE A:
This alternative provides continuous bike lanes, and meets intersection operation requirements by providing right turn lanes. This alternative requires right-of-way acquisition, curb, sidewalk and pavement reconstruction. Traffic signal pole and utility pole relocations will also be required. These impacts are on the northeast and southwest corners.

PROS:
- Meets anticipated future intersection operation requirements.
- Provides a continuous dedicated bike lane.
- Provides an increased opportunity to enhance intersection bike connectivity with planned bicycle improvements on Naval Ave.

CONS:
- Right-of-way acquisition could delay construction and would result in additional costs.
- Curb widening results in additional project costs.

ALTERNATIVE B:
This alternative repurposes the existing road space. A continuous westbound bike lane is provided with no dedicated right turn vehicle lane. A continuous bike lane cannot be provided in the eastbound direction due to space constraints, with a 'shared' right turn / bike lane treatment provided instead. The left turn into Roosevelt Ave has been removed to increase Naval Ave westbound turn capacity.

PROS:
- Lower cost which would allow for other project investments with available funding.
- Can be constructed by the target delivery date.
- No impact to right-of-way or traffic signal hardware.

CONS:
- Does not meet anticipated future operational requirements (westbound right turn lane needed prior to 2044).
- Does not provide a continuous bicycle lane.

ALTERNATIVES DESCRIPTION

These alternatives are targeted at removing the safety issue with having opposing left turns at the Hewitt Ave offset intersection, and creates an opportunity for a potential enhanced pedestrian crossing. Hewitt Ave southbound becomes a 'right only' turn movement. Westbound left turns onto Hewitt Ave are restricted in both alternatives.

ALTERNATIVE A:
This alternative retains a westbound left turn into Olympic Ave and consists of precast curb and paint.

PROS:
- Allows for full median use by emergency vehicles.
- Low cost alternative.

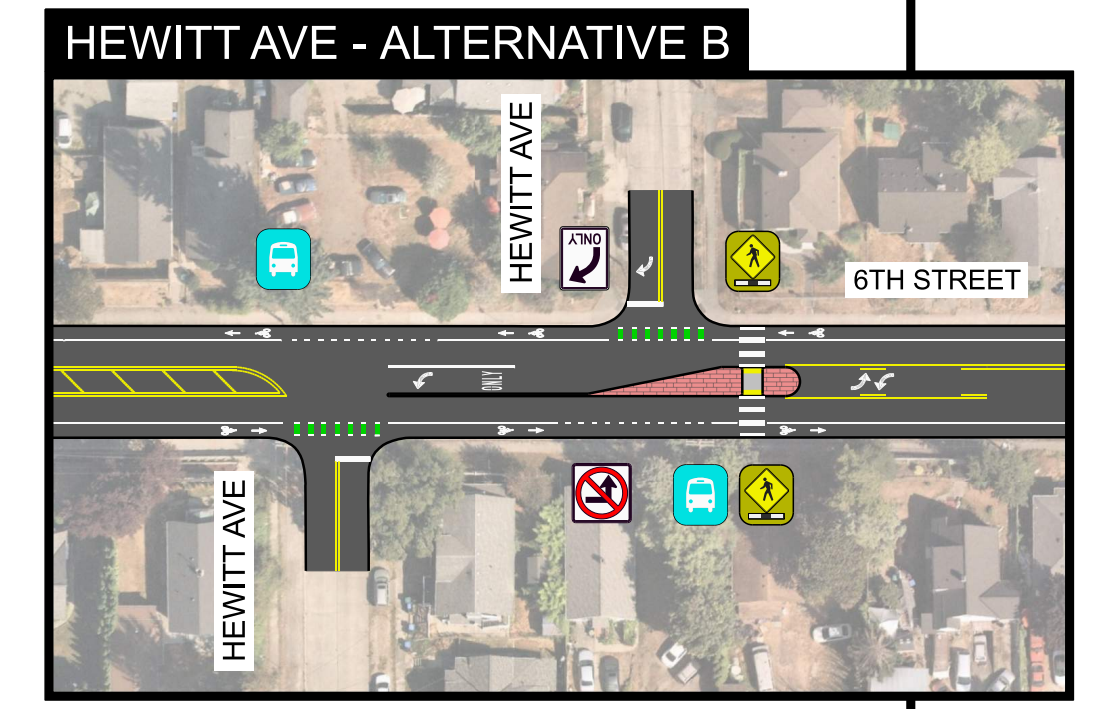
CONS:
- No curbed refuge area for pedestrians.

ALTERNATIVE B:
This alternative retains a westbound left turn into Olympic Ave and consists of precast curb and a small permanent curbed median.

PROS:
- Allows for partial median use by emergency vehicles to make left turns (no through movements).
- Curbed refuge area provided for pedestrians.

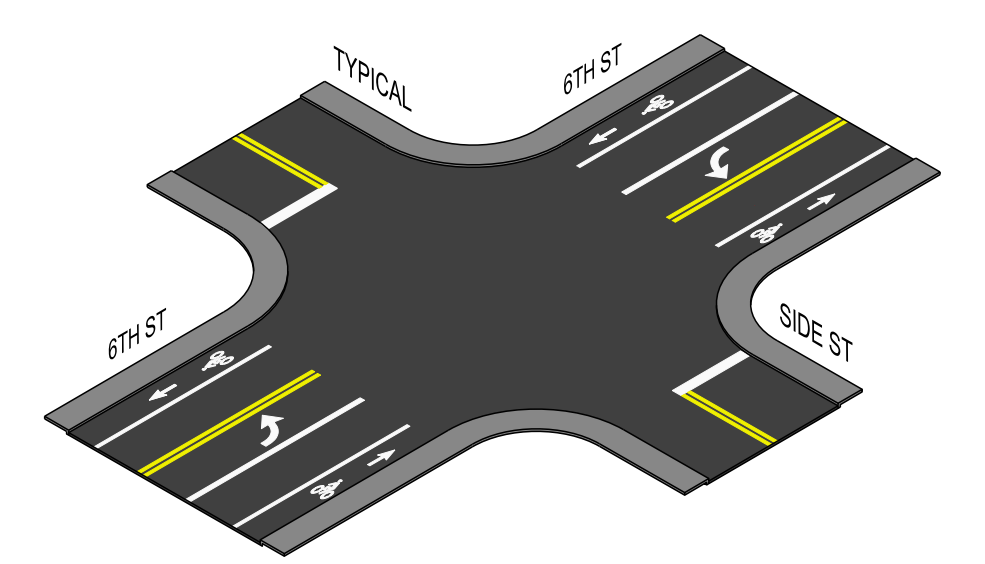
CONS:
- Moderate cost alternative.
- Pedestrian crossing is 100' from intersection.

HEWITT AVE - ALTERNATIVE B



TYPICAL INTERSECTION PAVEMENT MARKING ALTERNATIVES

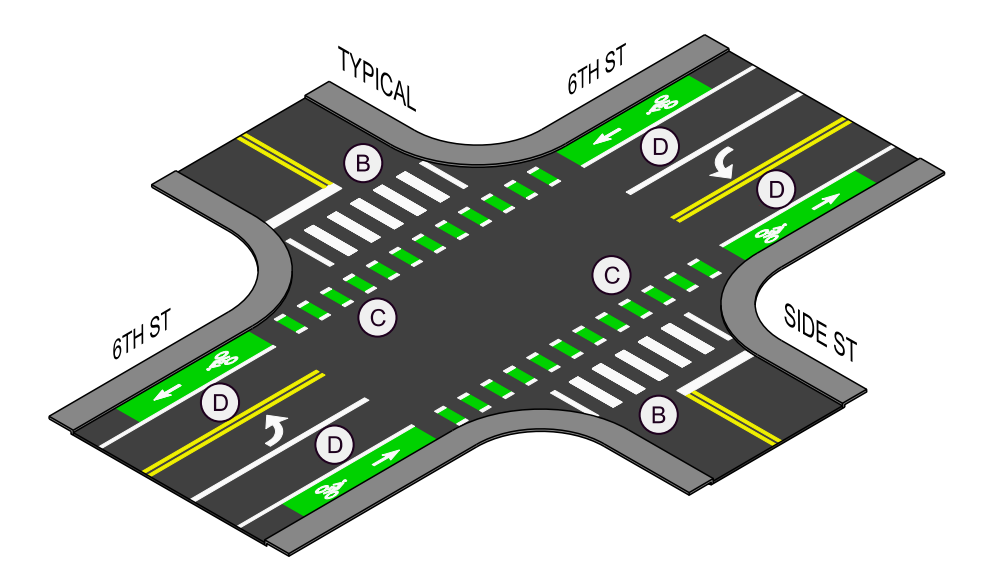
NOTE: These alternatives apply at all intersections. For clarity of lane assignment, Alternartives B, C and D are shown in the design.



ALTERNATIVE A:
This alternative omits pedestrian and bike crossing markings and green bike lane paint.

PROS:
- Low cost alternative.
- Low maintenance requirement.

CONS:
- Motorists may have a decreased awareness of pedestrians and cyclists compared with Alternatives B, C and D.



Ⓑ ALTERNATIVE B:
Pedestrian crossing markings.
Required at signalized intersections.

Ⓒ ALTERNATIVE C:
Bike crossing markings.

Ⓓ ALTERNATIVE D:
Bike lane approach and departure green markings.

PROS:
- Improved motorist awarness of pedestrians and cyclists.

CONS:
- High installation and ongoing maintenance costs.

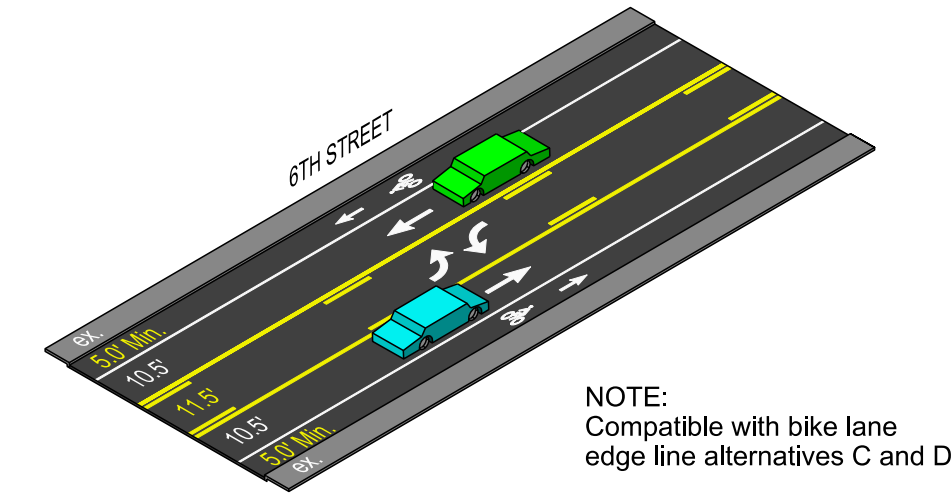
TWO-WAY LEFT TURN LANE AND BIKE LANE EDGE LINE ALTERNATIVES

NOTE: These alternatives apply at all locations shown with a two-way left turn lane.

ALTERNATIVE A:
This alternative provides a wider 11.5' two-way left turn lane, and a 5.0' (minimum) bike lane in each direction. Both alternatives provide 10.5' vehicle lanes - the minimum width to accommodate a Kitsap Transit bus.

PROS:
- Wider space for vehicles to maneuver to make left turns.
- More comfortable for motorists.

CONS:
- Minimum width bike lane is less comfortable for cyclists.

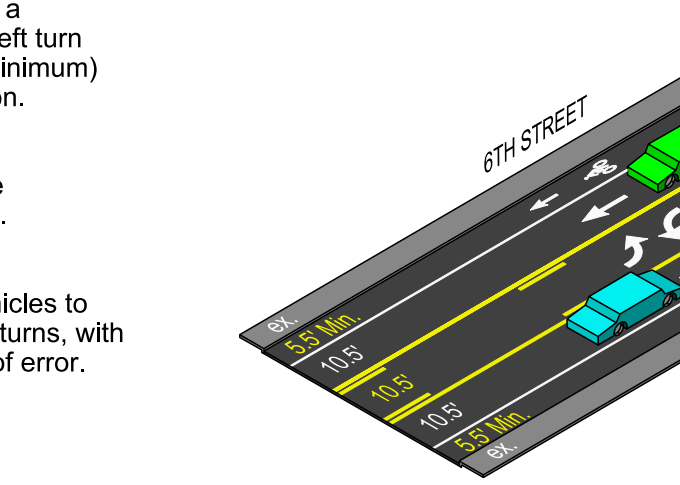


NOTE:
Compatible with bike lane edge line alternatives C and D.

ALTERNATIVE B:
This alternative provides a narrower 10.5' two-way left turn lane, and a wider 5.5' (minimum) bike lane in each direction.

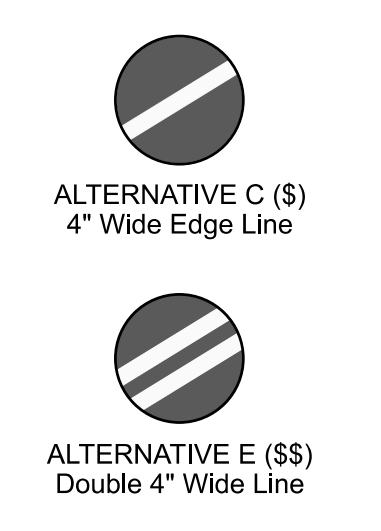
PROS:
- Wider bike lane is more comfortable for cyclists.

CONS:
- Narrower space for vehicles to maneuver to make left turns, with less allowable margin of error.



NOTE:
Compatible with bike lane edge line alternatives C, D, E and F. Alternatives E and F will reduce bike lane to 5.0' wide.

BIKE LANE EDGE LINE ALTERNATIVES:



ALTERNATIVE C ($)
4" Wide Edge Line

ALTERNATIVE D ($$)
4" Wide Profiled Edge Line Rumble Strip

ALTERNATIVE E ($$)
Double 4" Wide Line

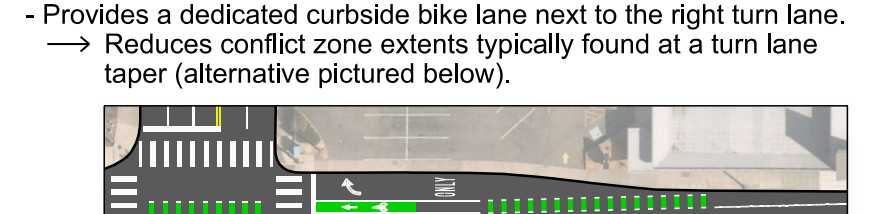
ALTERNATIVE F ($$$)
Double 4" Wide Line with Single Profiled Line

COST IMPACT LEGEND:

$	-	LOW COST
$$	-	MODERATE COST
$$$	-	HIGHEST COST

WARREN AVE

DESIGN OUTCOMES:
- Reduces the number of through lanes from two to one.
- Provides bike lanes in both directions.
- Provides a dedicated westbound right turn lane.
  - ⟶ Meets intersection operation requirements.
- Provides a dedicated curbside bike lane next to the right turn lane.
  - ⟶ Reduces conflict zone extents typically found at a turn lane taper (alternative pictured below).



- Provides a 'bus only' departure lane for access to the bus stop and commercial driveway.
- Striped bike lane buffer provided on approach to the Broadway Ave intersection.

NOTE: Alternatives A and B have the same physical layout. The alternatives differ in the signal operation described below.

ALTERNATIVE A:
This alternative allows buses to drive forward from the right turn lane, allowing them to pull up directly to the westbound bus stop. This alternative is achieved with pavement markings and signing only (as pictured below) and does not modify signal operation.

PROS:
- Low cost alternative.

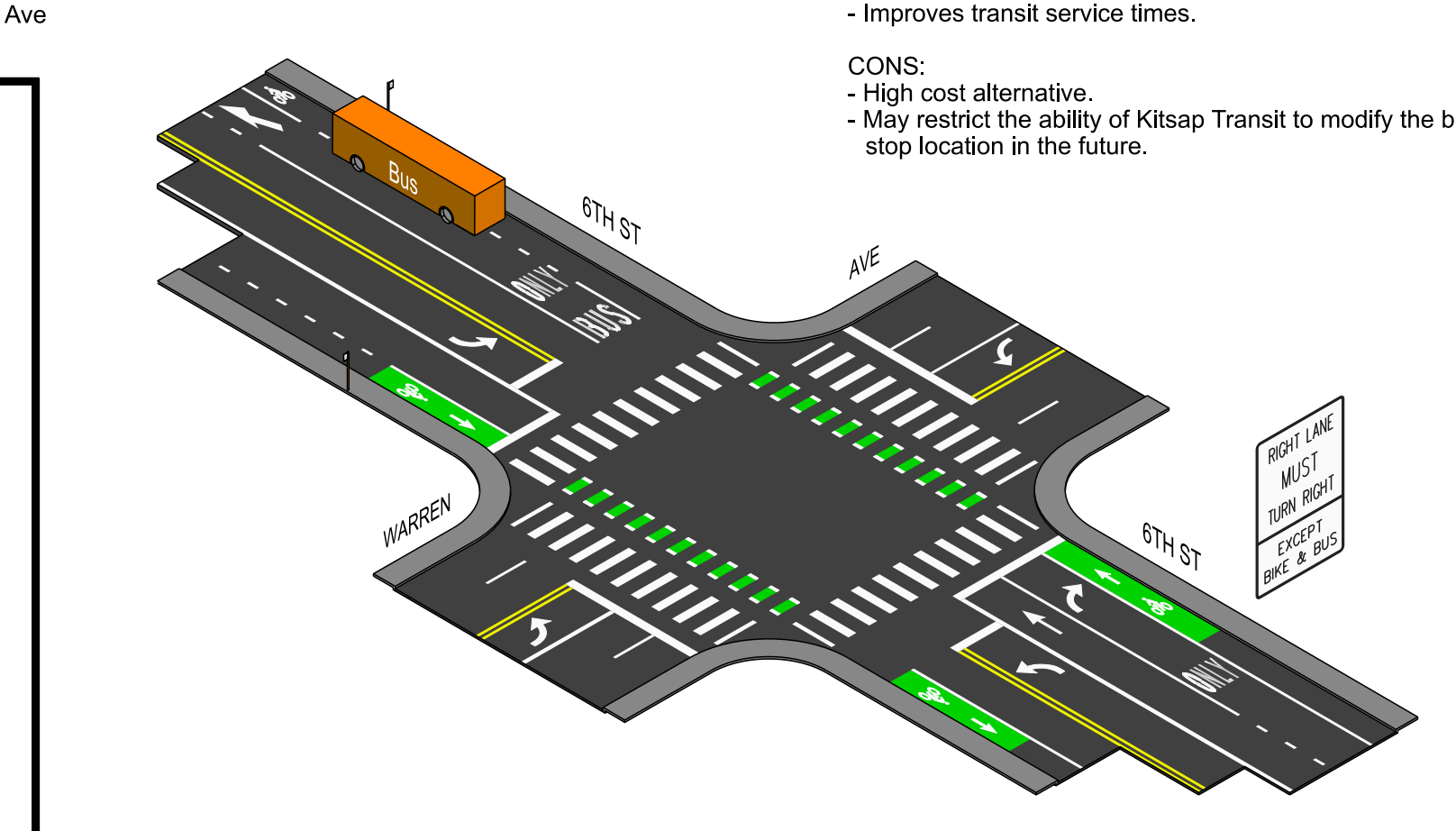
CONS:
- Buses may have difficulty merging back with traffic.

ALTERNATIVE B:
This alternative has the same physical layout as Alternative A, but uses a 'reverse queue jump' signal phase to improve bus operations.

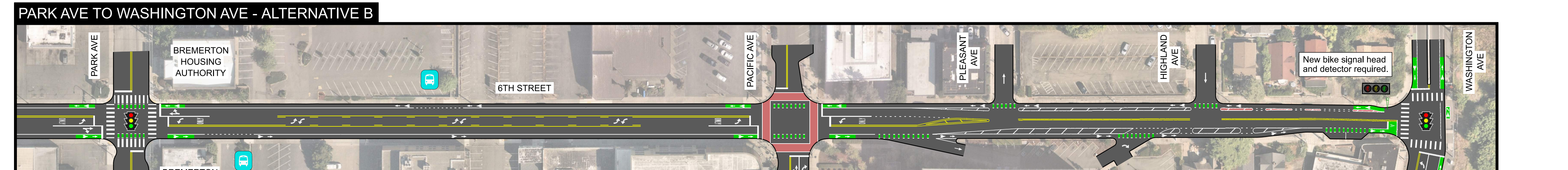
Signal timing and phasing is modified in real time to stop traffic at the Warren Ave intersection. This allows a bus to easily merge back into the westbound through lane after making a stop.

PROS:
- Reduces the conflict frequency between merging buses and regular vehicular traffic.
- Improves transit service times.

CONS:
- High cost alternative.
- May restrict the ability of Kitsap Transit to modify the bus stop location in the future.



PARK AVE TO WASHINGTON AVE - ALTERNATIVE B



New bike signal head and detector required.

ALTERNATIVES DESCRIPTION

ALTERNATIVE A:
This alternative partially retains on-street parking. A door buffer is provided adjacent the parking spaces as shown on the parking alternatives inset. Striped bike lane buffers are provided either side of the on-street parking.

PROS:
- Retains some parking on 6th Street.
- Parked vehicles provide bike lane protection.

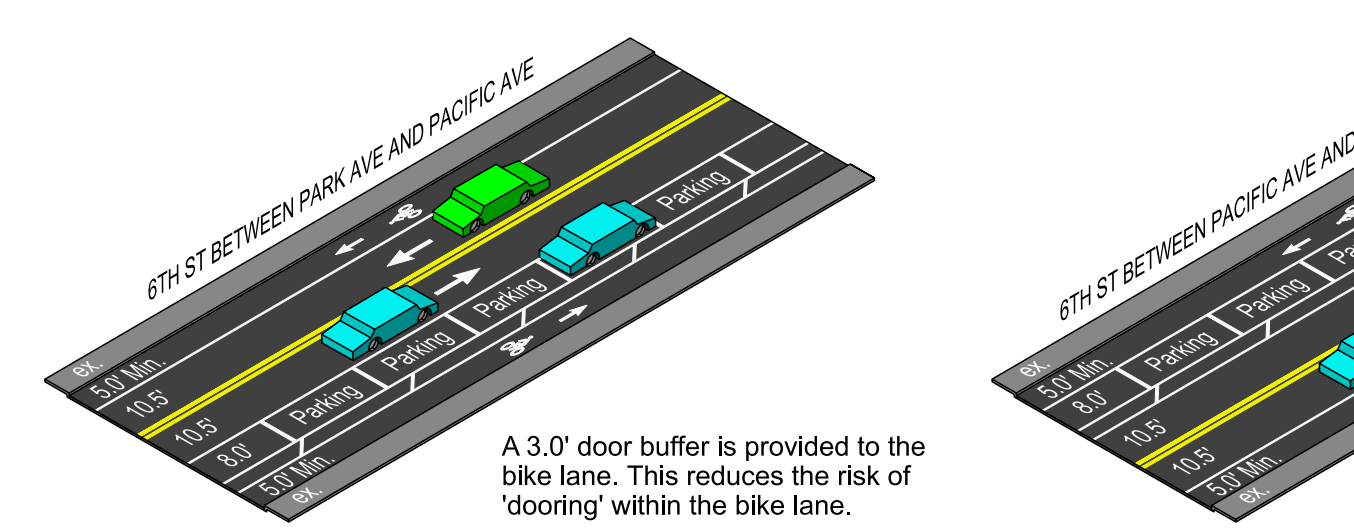
CONS:
- No center turn lane will result in left turning vehicles obstructing through vehicles. Additional conflict point.

ALTERNATIVE B:
This alternative removes all on street parking. A two-way left turn lane is provided to facilitate left turns into off-street parking facilities. Striped buffers are provided to bike lanes in leiu of a two-way left turn lane between Pacific Ave and Washington Ave.

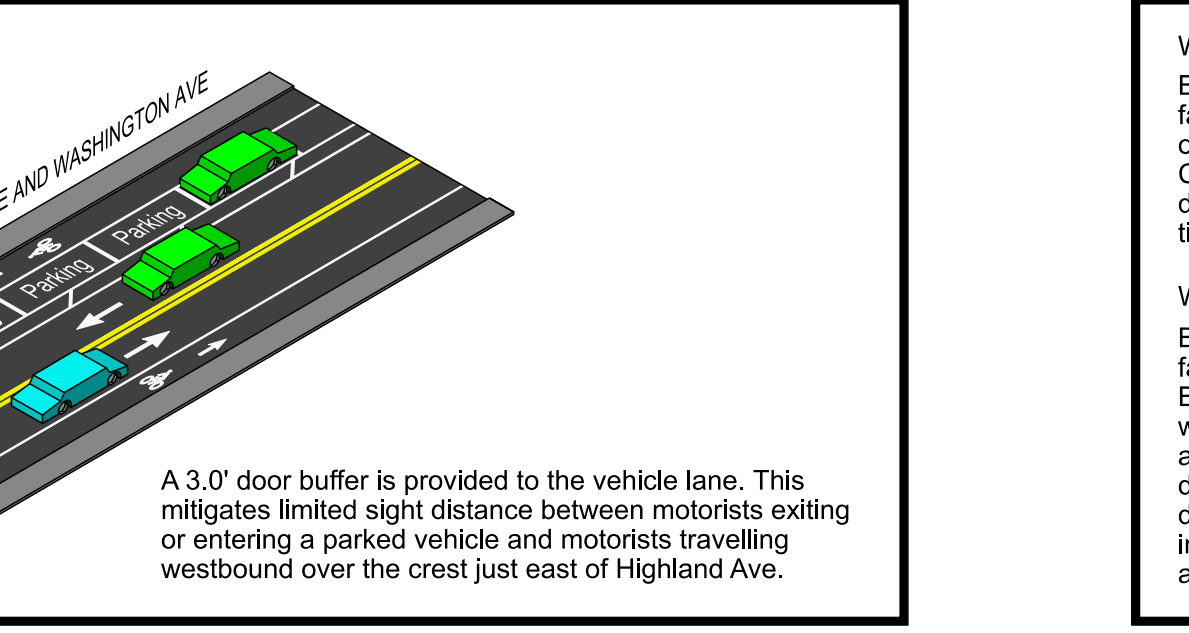
PROS:
- Left turns do not obstruct through vehicles, two-way left turn lane removes the conflict.
- Emergency vehicles can utilize two-way left turn lane to bypass traffic.

CONS:
- No on-street parking is retained.

ON-STREET PARKING ALTERNATIVES



A 3.0' door buffer is provided to the bike lane. This reduces the risk of 'dooring' within the bike lane.



A 3.0' door buffer is provided to the vehicle lane. This mitigates limited sight distance between motorists exiting or entering a parked vehicle and motorists travelling westbound over the crest just east of Highland Ave.

WASHINGTON AVE

WASHINGTON AVE ALTERNATIVE A:
Bicycle left turns onto 6th Street are facilitated by a bicycle box extending over the two northbound vehicle lanes. Changes will be required to the vehicle detection zones and traffic signal timing and programming.

WASHINGTON AVE ALTERNATIVE B:
Bicycle left turns onto 6th Street are facilitated by a two stage left turn box. Bicycles will wait in this box and cross with east-west pedestrians. This alternative is dependant on the driveway configuration of a planned development on the east side of the intersection. A new bike signal head and detector will be required.

Naval Avenue - 1st to 15th Bicycle and Pedestrian Enhancements Project (Separate City Project Underway)

Existing Right-of-Way

Widened Right-of-Way

Widened Right-of-Way

Existing Right-of-Way

Naval Avenue - 1st to 15th Bicycle and Pedestrian Enhancements Project (Separate City Project Underway)

Remove curb ramp and accessible parking space.

PARK AVE TO PACIFIC AVE:
Net reduction of 6 on-street parking spaces
Net reduction of 2 on-street accessible spaces

PACIFIC AVE TO WASHINGTON AVE:
Net reduction of 7 on-street parking spaces

Retain two existing parking spaces. Existing street width does not allow for a buffer to the bike lane.