



6TH STREET



Active Transportation Improvement Project

PROJECT UPDATE
JANUARY 8, 2025

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REVIEW OF PROJECT PURPOSE

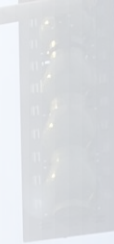
Improve Vehicle, Cyclist, and Pedestrian Safety & Comfort through Roadway Re-Channelization

- Vehicle:** Improve Safety Through Reduced Conflicts & Vehicle Speeds
- Cyclist:** Improve Safety & Comfort Through Dedicated Facilities / Re-Channelization
- Pedestrian:** Improve Safety & Comfort Through Re-Channelization & Spot Improvements



Previous Studies Recommending Roadway Re-Channelization

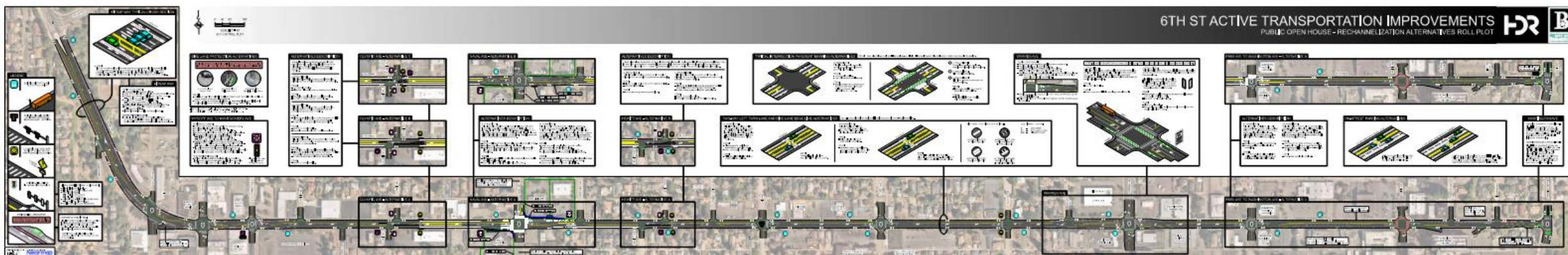
- Non-Motorized Transportation Plan (2007)
- Strategic Road Safety Plan (2020)
- 6th St and 11th St Corridor Feasibility Study (2020)
- Joint Compatibility Transportation Plan (2023)





ALTERNATIVES DEVELOPMENT

Presented November 2024



Standards & Best Practices



AMERICAN ASSOCIATION
OF STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

AASHTO



National Association of
City Transportation Officials



ALTERNATIVES DEVELOPED CONSIDERED...

Lane Configuration

Bike Lane Type

Supplemental Bike Markings

Vehicle Turn Movements

Transit / Bus Operations

Right-of-Way

On-Street Parking

Intersection Operations

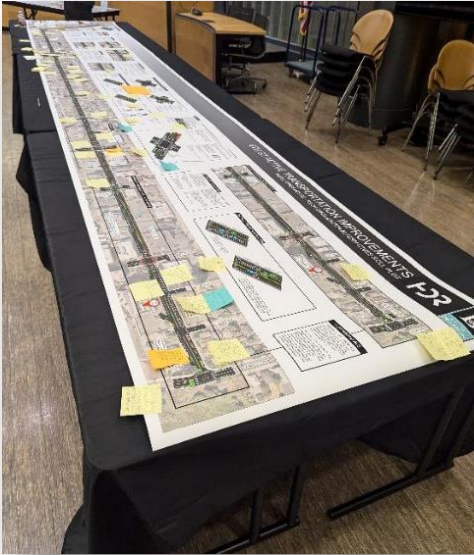
New RRFB Ped Crossings

Traffic Signals



PUBLIC INPUT SUMMARY

Emphasis on Bike Safety



Online Survey

- 49 Responses – Many of the alternative preferences were split or inconclusive
- RRFB Crossings, providing separate right-turn lanes, and bike lane physical protection noted as highest alternative priorities
- Precast curb bike lane protection preferred over flexible delineator posts
- Written survey response themes include concerns of traffic congestion and a desire for increased cyclist safety

Written Comments

- 28 Emailed Comments – Almost all focused on a desire for increased cyclist safety & separation
- Focus on providing corridor-wide bike lane protection
- Focus on eliminating separate right-turn lanes (especially at Naval Ave)
- Some comments provided alternate intersection or re-channelization design not presented



SEPARATED/PROTECTED BIKE LANES

RECOMMENDED

Specific Locations Only

DESIRED

Project-Wide / “Hard”
Protection

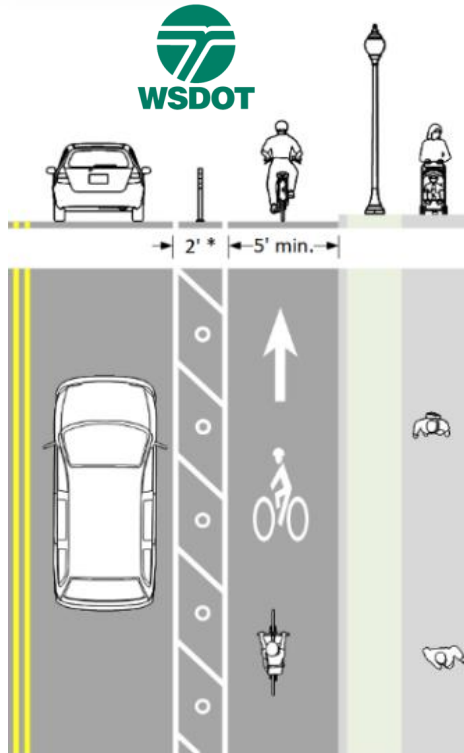
CONSIDERATIONS

Bicycle Level of Traffic Stress (BLTS) 2 Target, Available Buffer Space from Vehicle Lanes, Low-Cost Implementation

- Undefined Policy / Methodology / Standards
- Lack of available roadway width to meet standard(s) in some areas
- Significant number of driveways and transit stops (25% - 55% would remain “unprotected”); High vehicle traffic volumes
- Initial cost could exceed current budget
- Long-term operations & maintenance considerations

SEPARATED/PROTECTED BIKE LANES

LEVEL OF TRAFFIC STRESS – WSDOT METHODOLOGY



Separated Bike Lane

- Requires a minimum 2-foot buffer
- Requires “vertical features” within the buffer



Exhibit 1520-8 Bicycle Level of Traffic Stress for Separated Bike Lane

Separated Bicycle Lane								
Lane Configuration	AADT (total)	Target Speed						
		≤20	25	30	35	40	45	50+
1 thru lane per direction (or 1 lane one-way street)	0-750	1	1	1	2	2	2	2
	751-1500	1	1	1	2	2	2	2
	1501-3000	1	1	1	2	2	2	2
	3000+	2	2	2	2	2	2	2
2 thru lanes per direction	0-6000	2	2	2	2	2	2	2
	>6000	2	2	2	2	2	2	2
3+ thru lanes per direction	Any ADT	2	2	2	2	2	2	2

AADT = Annual Average Daily Traffic

Target Speed = Desired Highest Vehicle Travel Speed Sought

6th Street AADT
±13,400 West of Warren

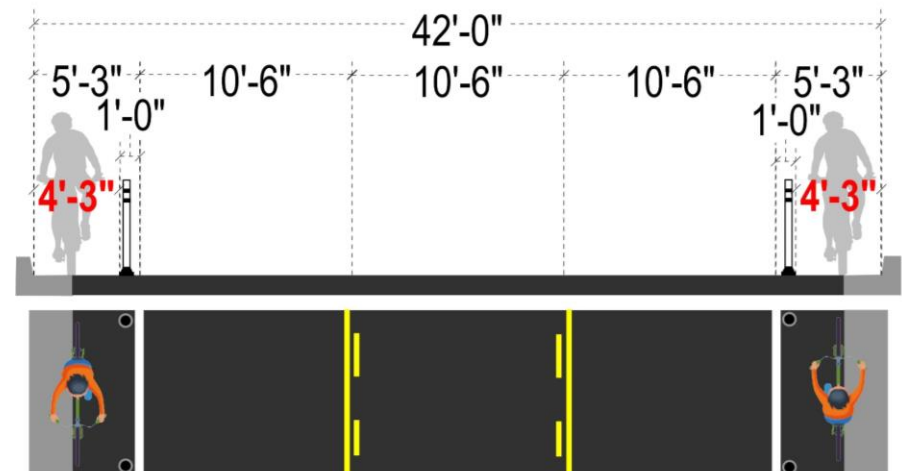
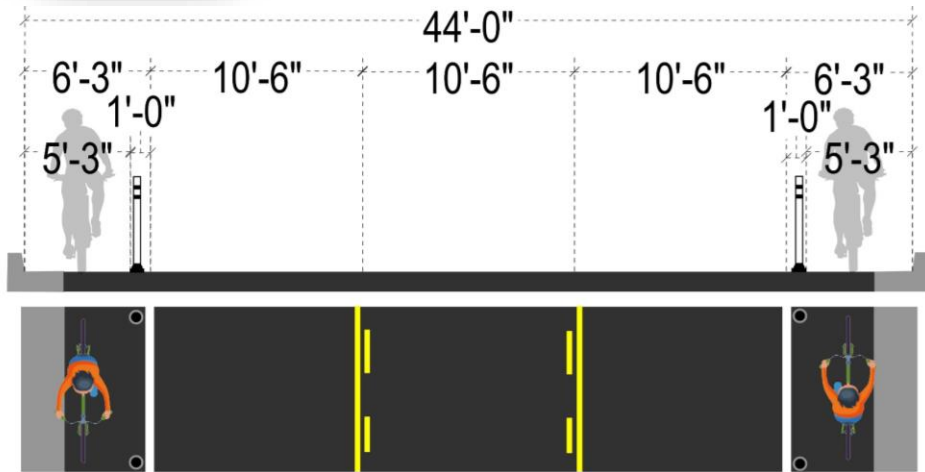
Only 2-Lane Roadways with Under 3,000 AADT and Under a 35 mph Target Speed are Considered BLTS 1 when Separated Bike Lanes are Provided

Separated Bike Lanes Can Provide BLTS 2 on Most Urban Roadways



SEPARATED/PROTECTED BIKE LANES

6TH STREET TYPICAL SECTION



TYPICAL (CALLOW – WARREN)

- Placement of flexible posts just inside bike lane edge line would generally provide a minimum 5-foot effective bike lane width.
- Higher vehicle traffic segment

TYPICAL (WARREN – WASHINGTON)

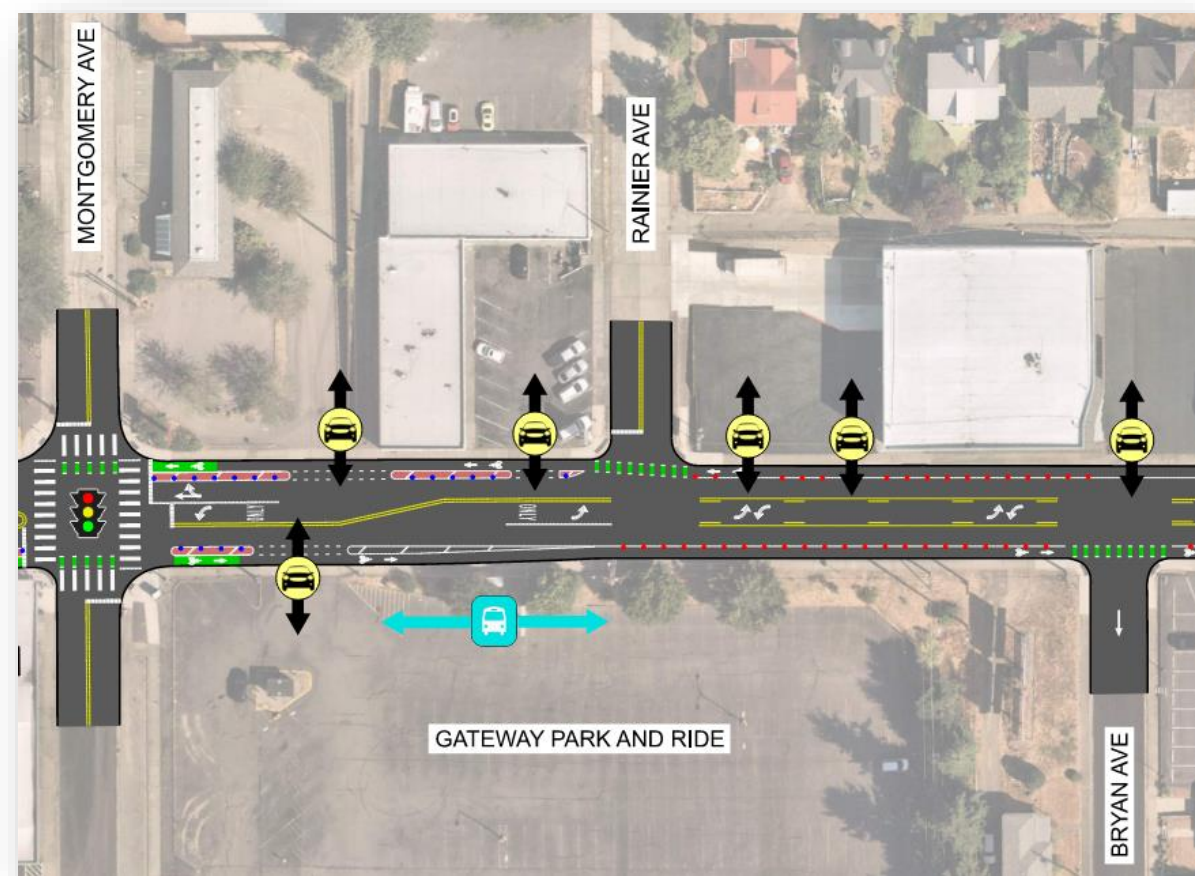
- Placement of flexible posts just inside bike lane edge line would **not** provide a minimum 5-foot effective bike lane width.
- Lower vehicle traffic segment
- Additional width would require elimination of all existing on-street parking and turn lanes (not recommended)

Minimum 10' – 6" Travel Lanes Shown to Accommodate Transit Vehicles & Corridor Designation as "T-3" Freight Corridor



SEPARATED/PROTECTED BIKE LANES

Flexible Delineator Post Scenarios



Flexible Post Delineators Exhibit (Montgomery Ave to Bryan Ave)

WB Bike Lane ±63% Delineator Coverage

EB Bike Lane ±56% Delineator Coverage

PROS

- Lowest Initial Construction Cost
- Can be Installed in Narrow Spaces
- High Driver Visibility
- Allows Emergency Access

CONS

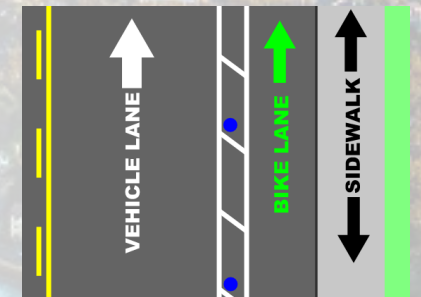
- High Maintenance Need
- Not “Hard” Protection
- Not “Continuous” Protection



Flexible Post Delineators with Buffer



Flexible Post Delineators without Buffer





SEPARATED/PROTECTED BIKE LANES

Estimated Cost

DEVELOPED RECOMMENDATION

11th St to Montgomery Ave
Highland Ave to Washington Ave (WB)

Bicycle Level of Traffic Stress (BLTS) *



240 Estimated Delineators

\$80,000 Estimated Construction Cost

CORRIDOR-WIDE PROTECTION

Project-Wide

Bicycle Level of Traffic Stress (BLTS) * **



950 Estimated Delineators

\$315,000 Estimated Construction Cost

* Based on use of WSDOT BLTS Methodology

** Majority of project would not provide minimum 2-foot buffer requirement to be considered a "Separated" Bike Lane per WSDOT

Alternate "Hard" Treatment



Precast Curb with Delineator Posts
**2x Cost Estimated Versus Only
Providing Flexible Delineator Posts**

No BLTS Impact *

Requires additional width for installation



SEPARATED/PROTECTED BIKE LANES

General Discussion and Next Steps

Current Staff Recommendation

Provide physical bike lane protection only at specific locations which would allow for minimum 2-foot buffer between vehicle lane and effective bike lane edge; Distribute project budget for other improvements

Option

- Corridor-wide bike lane protection strategy with additional guidance/direction
- Document required design variances related to minimum bike lane width
- Report to the Public Works Committee and Council on refined cost estimates/needs, considerations, and opportunities during detailed design development phase

Additional Considerations

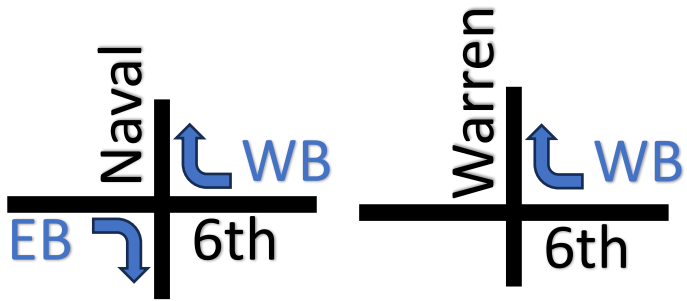
- Bike lane protection type (flexible post vs. curb)
- Project budget implications
- Assessment and strategy on long-term operations and maintenance will be needed by PW&U



VEHICLE RIGHT-TURN LANES

RECOMMENDED

Per Project Traffic Study
(3 Locations)



DESIRED

No Right Turn Lanes
(Especially at Naval)

CONSIDERATIONS

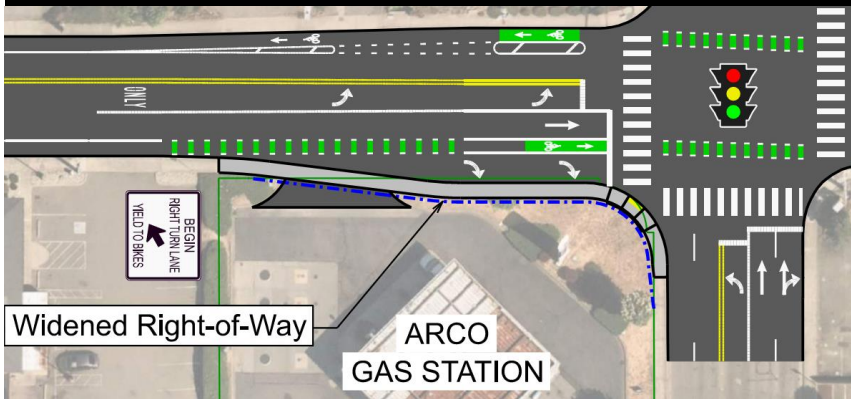
AM & PM Peak Hour Vehicle Volumes (2023 & Estimated 2044), NBK-BR Gate Operations, Vehicle Level of Service Minimums per Current Policy (City “E” or Better, SR-310 “D” or Better), Right-of Way

- EB at Naval – Recommended for NBK-BR Gate Queueing (AM)
- WB at Naval – Recommended to Mitigate 2044 Approach LOS “F” (PM)
- **WB at Warren – Required to Mitigate Intersection LOS “F” (PM)**
- Substandard Peak Hour Vehicle Operations / Growth Management Act (GMA)
- Likely Negative Impact on Driver Behavior(s) During High Congestion
- Would Avoid Right-of-Way Acquisition at Naval Ave
- Eliminates Vehicle / Bike “Mixing Zone” Conflict

VEHICLE RIGHT-TURN LANES

Bike Lane Offset from Curb

“Through Bike Lane” or “Bike Pocket” Design (NACTO) – Naval & Warren Alternatives



- Leads to more predictable bicyclist and motorist travel movements
- Alerts motorists to expect and yield to merging bicycle traffic

“Combined Bike/Turn Lane” (NACTO) – Naval EB Alternative (No Right-of-Way Option)



- Used where there is a right turn lane but not enough space to maintain a standard-width bicycle lane at the intersection
- Reduces the risk of ‘right hook’ collisions at intersections
- Currently used at several locations on Kitsap Way



VEHICLE RIGHT-TURN LANES

General Discussion and Next Steps

Current Staff Recommendation

- Defer WB right-turn lane at Naval Ave (Meets intersection operation levels)
- Provide EB combination right-turn lane at Naval Ave (Mitigate AM Naval Gate operations)
- Provide WB right-turn lane at Warren Ave (Mitigate substandard intersection operation levels)

Option

- Do not provide EB combination right-turn lane at Naval Ave understanding that Naval Gate queueing may create other area traffic-related issues
- Used gained roadway space to provide additional bike lane buffering and/or protection

Additional Considerations

Traffic impacts of Naval Gate operations have not been studied in detail and are problematic to model as queueing, spillover, and delays are variable and dependent on internal Navy operations



ESTIMATED IMPROVEMENT COSTS

Developed Project Design Options Estimated within Current Budget (±\$3 Million)

1. No Curb Widening / ROW at Naval Ave with Any Combination of Alternatives Presented at Open House
2. Curb Widening / ROW at Naval Ave with Only Minimal Re-Channelization Improvements (Basic Markings + RRFBs)
 - Excludes RRFB paved medians, bike signal alternatives, and enhanced bike lane channelization

Estimated Cost Impacts of Other Project Scenarios

- Provide Additional Project-Wide Bike Lane Protection (Add \$235,000+) **
 - Would require elimination of other alternatives and/or identifying additional project funding
- Remove Shared EB Right-Turn Lane at Naval (Negligible Cost Impact)

*** Based on use of lower-cost flexible delineator posts for bike lane protection; Cost to double for precast curb protection*



QUESTIONS & DISCUSSION



www.bremertonwa.gov/404/Projects

6th Street Active Transportation Improvement Project



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