**I-5 Southbound Off-Ramp at North Broadway Project**
**Frequently Asked Questions (FAQs)**
November 2014

## Frequently Asked Questions (FAQs)

**Q: What are the problems at the Interstate 5 southbound exit ramp at North Broadway in Portland?**

A: The Interstate 5 southbound off-ramp at the Rose Quarter/City Center exit (Exit 302-A) connects to North Broadway, a one-way westbound street heavily used by various transportation modes: cars, trucks, bicycles, pedestrians and streetcar. North Broadway curves and changes elevation west of I-5 and several side streets intersect North Broadway within a short distance from the I-5 off-ramp. These conditions result in limited sight distance, frequent turning and merging movements and create multiple conflict points where the paths of various transportation modes cross which can increase the potential for crashes within the corridor.

The I-5 off-ramp right turn "slip lane" that connects motorists from southbound I-5 to westbound North Broadway and the Broadway Bridge is not currently signalized and has a wide radius, allowing vehicles traveling at faster speeds to enter moving traffic on Broadway. This movement limits visibility of pedestrians and bicyclists, resulting in vehicles entering from the I-5 exit ramp onto Broadway in close proximity to the intersection of North Broadway and North Flint.

North Broadway is also traveled by a high number of bicyclists and pedestrians on a daily basis. The combination of high volume bicycle and pedestrian activity, merging and turning traffic on North Broadway and poor sight distance due to horizontal and vertical alignment on North Broadway, create potential conflicts for bicyclists and pedestrians.

Multiple intersections along the corridor, specifically the intersections of North Broadway and North Flint and North Wheeler Avenues have a history of vehicle and bicycle collisions. To address this issue, in December 2007 the City of Portland Water Bureau prohibited their employees from making right turns from Broadway to North Wheeler Avenue to access their facility. The area continued to be an issue and in August 2012 the City of Portland closed vehicle access on North Wheeler Avenue northbound from North Broadway Ave with an installation of a concrete island to prevent collisions with cyclists.

**I-5 Southbound Off-Ramp at North Broadway Project**
**Frequently Asked Questions (FAQs)**
November 2014

**Q: How is this project going to address the problem?**

A: One component of the project is to remove the slip lane at the I-5 southbound off-ramp at North Broadway. A signalized right-turn lane will be built at the existing signalized intersection at North Broadway/ North Vancouver Street and the I-5 off-ramp. By relocating the slip lane to the existing signalized intersection, it reduces a potential collision point from North Broadway.

The design of the new right turn lane will encourage right-turning vehicles entering from the freeway to slow down when turning onto North Broadway. Right turns will be signalized to reduce collisions between turning vehicles and people walking and riding bikes on Broadway.

Another component of the project is to construct Americans with Disabilities (ADA)-compliant curb ramps at the intersection of North Broadway and North Vancouver Avenue and at other locations within the project area. In addition, the north curb along Broadway between the I-5 overcrossing and North Flint Avenue will be relocated to provide a wider, striped bicycle lane.

ODOT and PBOT are working together to design additional safety treatments for pedestrians within the area as part of this project. A pedestrian hybrid beacon – sometimes referred to as a "High-intensity Activated cross-Walk (HAWK)" signal - is proposed for the existing pedestrian crosswalk across Broadway to the street car stop between North Wheeler and North Ross. A pedestrian hybrid beacon is a pedestrian-activated warning signal designed to help pedestrians cross busy streets. More information on HAWK signals can be found here.

In addition, ODOT will partner with PBOT to design a curb extension at the southeast corner of the intersection of North Wheeler Avenue and North Broadway. A curb extension at this location will create a shorter pedestrian crossing distance across North Broadway Street and will increase the overall visibility of pedestrians crossing on this busy street. The short section of North Broadway between North Vancouver and North Flint also will be restriped to three lanes instead of four further reducing the distance for pedestrians to cross.

**Q: How are ODOT and the City of Portland Bureau of Transportation (PBOT) working together on this project?**

A: In 2010, ODOT and PBOT worked together to develop the N/NE Quadrant Plan, which identified solutions to safety and operational issues on I-5 and local streets in the vicinity of the Rose Quarter. Both agencies identified the area around the I-5 southbound off-ramp and North Broadway as a priority location for near-term improvements. ODOT identified funding to design the I-5 southbound off-ramp improvements and PBOT applied for State Transportation Improvement Program (STIP) "Enhance" funding for pedestrian crossing improvements near North Broadway and the North Wheeler Avenue area.

When the PBOT project was not selected for STIP funding, both agencies decided to combine resources and use ODOT's available funds to design both projects together.

Both the ODOT and PBOT portions of the project are currently funded for design only. The ODOT and City of Portland components of this project may be constructed concurrently or as separate state and local projects, depending on funding availability.

**Q: What other potential solutions were considered?**

A: ODOT and PBOT staff evaluated multiple design concepts to improve safety and operations in the project area. The current design concept – a pedestrian hybrid beacon at the existing pedestrian crossing near North Broadway and North Ross and a curb extension in the southeast corner of Broadway/Wheeler – was selected because it enhances pedestrian crossing safety at high demand crossing locations, facilitates smooth multimodal operations in the area, and can be realistically funded and constructed in the near-term.

**Q: What other potential design options were considered and why were they not pursued?**

A: Other potential design options that were considered and the reasons for not pursuing them further include:

- **Two pedestrian hybrid beacons**: An early proposal for pedestrian safety improvements in the project area included two pedestrian hybrid beacons (sometimes called HAWK signals); one at the existing pedestrian crossing near Broadway/Ross, and one on Broadway between Wheeler and Flint. These two locations are less than 250 feet apart and only 300 feet from the Broadway/Vancouver/I-5 off-ramp intersection. This tight spacing would provide little storage space for queued vehicles between signals. Two beacons located in close proximity to each other and a "pre-timed" signal would also be difficult to coordinate to ensure smooth operations with streetcar and to prevent traffic backups on Broadway and the I-5 southbound off-ramp. Additional concerns with the pedestrian hybrid beacon near the Broadway/Flint intersection include:
    - Close proximity of the beacon to an intersection (approximately 20 feet west of the Broadway/Flint intersection). A pedestrian hybrid beacon should be at least 100 feet from a driveway or intersection.
    - Limited visibility of the beacon and pedestrian crossing for southbound drivers turning right from Flint onto Broadway.
    - Limited visibility of the beacon for westbound drivers on Broadway due to vertical and horizontal curves.
- **A pedestrian hybrid beacon on Broadway between Wheeler and Flint:** The project team evaluated the feasibility of installing a single pedestrian hybrid beacon on Broadway between Wheeler and Flint.

This option addressed concerns about proximity to the existing pedestrian crossing near Broadway/Ross, but was still not considered feasible due to the issues discussed above (e.g., proximity to nearby intersections, limited visibility).

- **A full traffic signal at Broadway/Wheeler or Broadway/Flint**: A full traffic signal on Broadway between Wheeler and Flint would provide a signalized pedestrian crossing at this high demand location and could be coordinated with nearby signals to maintain streetcar operations and traffic flow. A full traffic signal does not meet conventional traffic signal warrants based on vehicle or pedestrian volumes at this location, however it does meet the warrants for a pedestrian hybrid beacon. As noted above, a hybrid beacon was not considered feasible, and as such, a full signal was deemed the minimum necessary to control all of the movements. Due to the lack of warrant justification, special approval for conventional traffic signal would also be required. Due to the close spacing of side streets, the signal would have to be designed to control Broadway/Wheeler and Broadway/Flint as a single intersection. While a traffic signal can assist pedestrians in getting across Broadway at this location, the signal could not be operated in a typical fashion with both intersections. It was determined that this would cause additional confusion and create conflicts that don't exist today (violating "No Turn on Red" conditions, etc.). This design option would be significantly more expensive than other options and less likely to be funded and constructed in the near- term. Signalizing Broadway/Flint is also inconsistent with the N/NE Quadrant Plan recommendation to remove the Flint overcrossing of I-5 and the Flint/Broadway intersection in the long-term.
- **Rectangular Rapid Flashing Beacons (RRFBs):** RRFBs are flashing amber LED lights that supplement pedestrian crossing warning signs at un-signalized intersections or mid-block crosswalks. They flash in an irregular pattern that is similar to emergency flashers on police vehicles and are activated when pedestrians push a button. RRFBs are frequently used to increase the visibility of pedestrian crossings and to increase driver yielding behavior. They are activated "on demand" and can't be coordinated with other signals, so they can have significant disruption to operations when closely spaced. RRFBs are less expensive to install than pedestrian hybrid beacons or traffic signals, but they do not provide a red indication that requires vehicles to stop. PBOT analyzed crossing locations in the study area based on pedestrian and vehicle volumes, speeds, and roadway characteristics and determined that a pedestrian crossing treatment with a red indication (e.g. pedestrian hybrid beacon, pedestrian signal) is the most appropriate crossing treatment for the study area.
- **Closing the left turn slip lane from Broadway to eastbound Weidler:** The N/NE Quadrant Plan calls for the left turn "slip lane" from westbound Broadway to eastbound Weidler to be closed in the long term. New surface street connections identified in the long-term plan would provide alternative routes for vehicles that currently use the turn lane. The project team evaluated the feasibility of removing the left turn slip lane in the near- term in order to reduce weaving movements and conflict points between autos, bikes, and pedestrians in the project area.

Until the new street connections identified in the N/NE Quadrant Plan are constructed, vehicles that used the left turn lane would need to travel two blocks west to make a U-turn at the signal at Broadway/Benton. PBOT reviewed video of the left turn slip lane and determined that a number of vehicles currently using the facility are 30-foot trucks that are not capable of making a U-turn at the Broadway/Benton intersection. Closing the left turn slip lane would require reconstruction of part of the Broadway/Benton intersection to accommodate 30-foot trucks or construction of the alternative local street routes identified in the long range plan. As a result, PBOT does not anticipate closing the left turn lane as a near-term improvement.

**Q: Is the project funded for construction?**

A: Both the ODOT and PBOT portions of the project are currently funded for design-only and may be constructed concurrently or as separate state and local projects, depending on funding availability. Current funding constraints and uncertainty exist for the N/NE Quadrant Plan improvements but ODOT and PBOT agree the current project scope is a priority and is the best solution to construct improvements in this area in the near term.

**Q: Is this project part of the N/NE Quadrant and I-5 Broadway/Weidler (N/NE Quadrant Project)?**

A: Yes, this project is a result of the N/NE Quadrant Project that was identified as a key pedestrian and bicycle safety issue that ODOT and the City of Portland will jointly address. The removal of the slip lane from the southbound I-5 off-ramp to Broadway and the project elements on the city streets are components of the I-5: Broadway/Weidler Interchange Improvements Facility Plan.

**Q: Will this project address congestion on Interstate 5 following this project?**

A: The purpose of this project is to improve safety and operations at the southbound I-5 exit ramp at the Rose Quarter/City Center (Exit 302-A) that connects to North Broadway in Portland. The purpose of this project is not specifically targeted at addressing congestion on I-5.

**Q: Will this project change access from North Broadway to North Wheeler?**
A: No. This project will not remove the island restricting westbound vehicles on Broadway from making right turns onto northbound Wheeler.

**Q: When completed, will this project impact on-street parking on North Broadway?**

A: The only on-street parking on North Broadway is located between North Vancouver and North Wheeler. A small amount of parking will need to be removed to accommodate the additional signal equipment

**Q: When is construction expected to begin? When will it end?**

A: The project is currently in the design phase. Construction is dependent on construction funding.

**Q: How much is this project estimated to cost?**

A: At this time, the estimated project cost is approximately $2.6 million.