PED-BIKE PROJECT DEVELOPMENT TRANSPORTATION

Date	September 8, 2020
To	Zef Wagner, PBOT
From	Nick Gross, Amy Griffiths, and Susan Wright; Kittelson & Associates, Inc. Robert Rippee; Aligned Engineering Tom Wiser; Wiser Rail Engineering
Project	NW 9th Avenue (NW Naito Parkway to NW Overton Street)
Subject	Final Concept Development Summary Document

Introduction

The NW 9th Avenue (NW Naito Parkway to NW Overton Street) project is located in NW Portland and serves as a key connection from Naito Parkway to the Pearl District neighborhood. NW 9th Avenue, NW Naito Parkway, and NW Overton Street are designated city bikeways as identified in the City of Portland's Transportation System Plan (Reference 1). Today, the short 250-foot segment of NW 9th Avenue, connecting NW Naito Parkway to NW Overton Street is not equipped with bicycle facilities and the existing curb-to-curb cross section is constrained due to the oversized center median located on the northeast side of the railroad. Furthermore, the existing roadway surface and at-grade railroad crossing is severely deteriorated resulting in an unpleasant and potentially hazardous crossing for all modes of transportation.

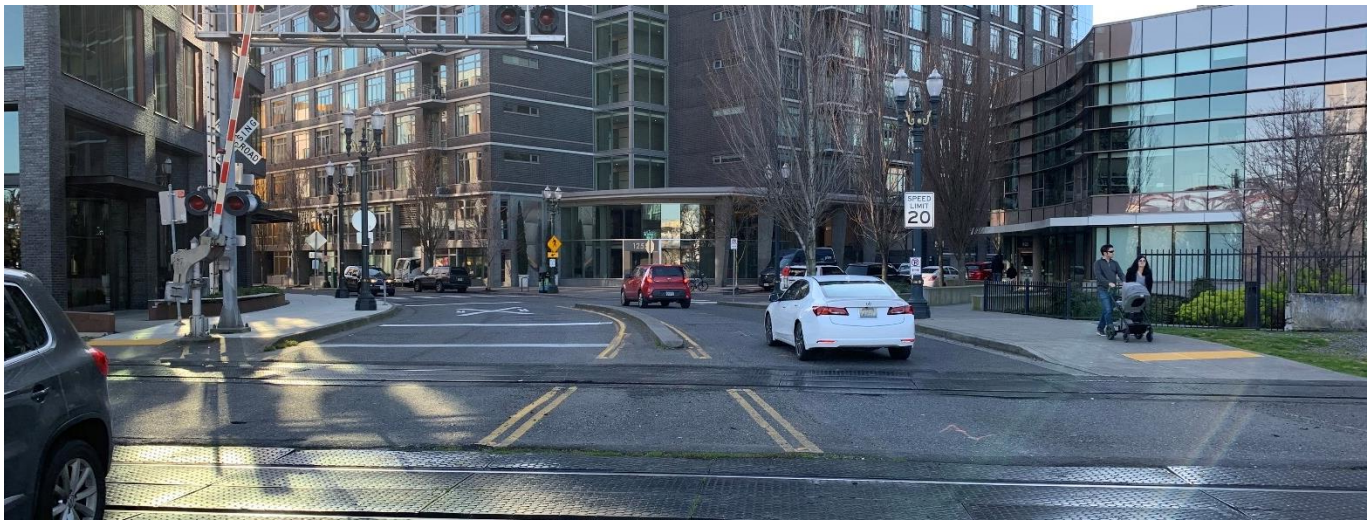
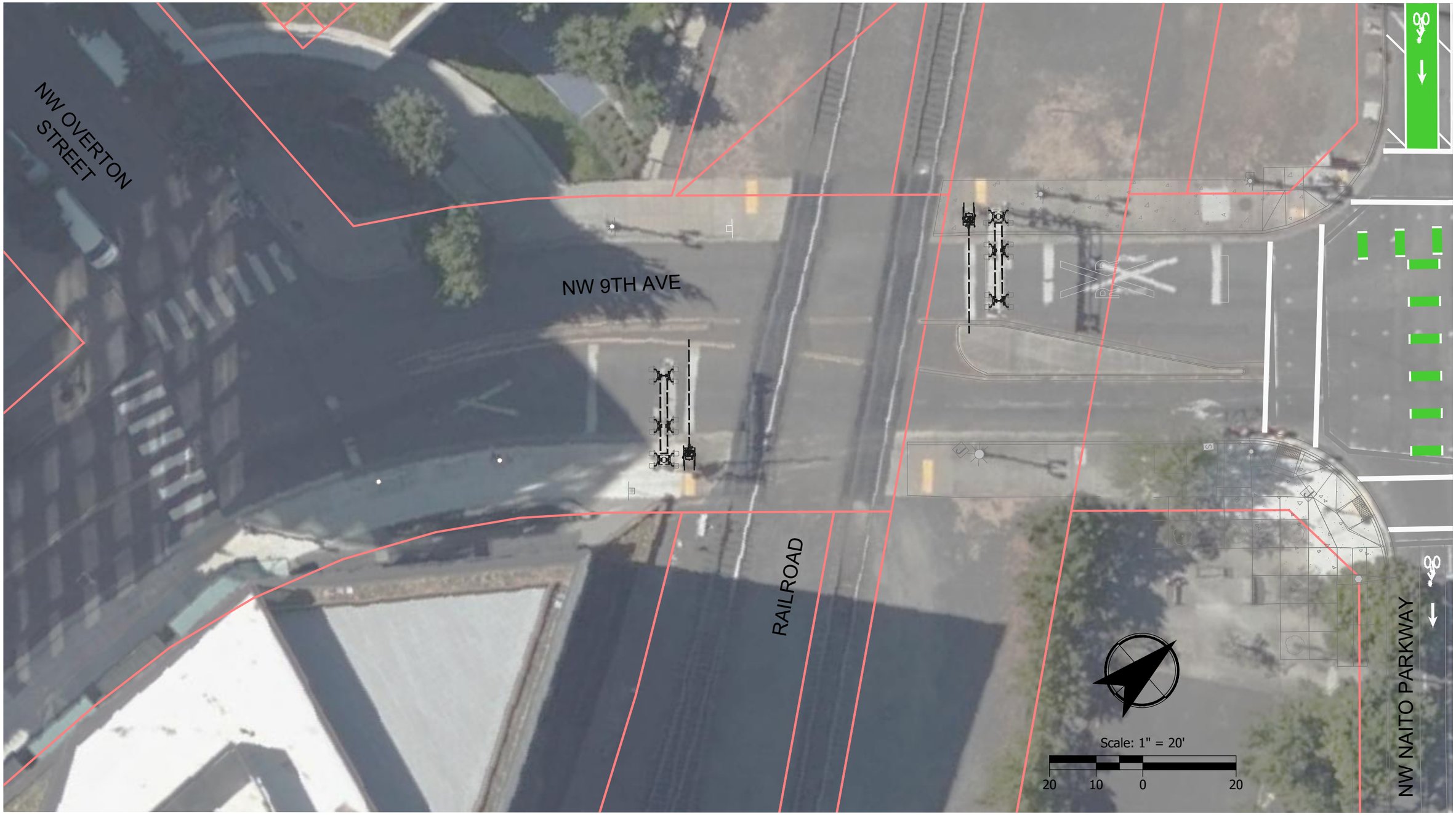


Figure 1 illustrates the project area and adjacent tax lot information.

Purpose

The purpose of the NW 9th Avenue (NW Naito Parkway to NW Overton Street) project is to fill the existing bicycle facility network gap by providing a low-stress separated facility, improve the deficient pavement conditions and enhance the existing railroad crossing to meet American's with Disability Act (ADA) requirements.



PROJECT AREA

Portland, Oregon

Figure
1

KITTELSON & ASSOCIATES

Background

The project team conducted an extensive background review of existing planning and design documents relevant to the development of a conceptual design for the NW 9th Avenue (NW Naito Parkway to NW Overton Street) project including:

- GIS Tax Lot Data,
- NW 9th Avenue, NW Park Avenue, and NW Overton Street Planned Bicycle Facility Improvements,
- NW Naito Parkway/NW 9th Avenue Intersection As-Built Plans intersection, and
- NW River District Quiet Zone Plan

Based on a review of the planning and design documents noted above, the conceptual design for NW 9th Avenue (NW Naito Parkway to NW Overton Street) was developed to be integrated seamlessly into the recent bicycle facility improvements along NW Naito Parkway, future planned bicycle facility improvements along NW Overton Street and NW 9th Avenue (south of NW Overton Street), while maintaining the NW River District Quiet Zone Plan requirements set for the project area.

A detailed summary of the Background Planning and Design Documents reviewed is included in Appendix "A".

Planned Bicycle Facility Improvements

NW Overton Street is identified as a Tier 1 project in the City of Portland's Northwest in Motion Plan (Reference 2). Tier 1 projects are considered the highest priorities for funding and implementation over the next five years and are projects that have been developed to a higher level of readiness through the Northwest in Motion Plan. The NW Overton Street Tier 1 bicycle facility improvement project will convert NW Overton Street to a vehicular one-way eastbound configuration; however, bicycles will be able to travel bi-directional on NW Overton Street. A conceptual design for buffered bike lanes along NW 9th Avenue (south of NW Overton Street) is also under review by the City of Portland and identified as a near-term project in the City's Transportation System Plan.

NW River District Quiet Zone Plan

As illustrated in Figure 1, an existing raised median is located on the northeast and southwest sides of the railroad. The median is in place to prohibit vehicles from by-passing the activated railroad gate arms during a locomotive crossing. As a designated "Quiet Zone" locomotive horns are not routinely or required to be sounded during a locomotive crossing.

The design for the median located on the northeast side of the railroad identified in the NW River District Quiet Zone Plan was implemented to accommodate southbound freight and postal service vehicles turning onto NW 9th Avenue from NW Naito Parkway. Since the NW River District Quiet Zone Plan was adopted, the NW 9th Avenue/NW Naito Parkway intersection and approaching segments to the intersection have been reconstructed, converting the previous 5 lane cross section to a 3 lane cross section with buffered bike lanes. As a result, the vehicular travel lanes have been shifted to the northeast, providing additional turning clearance for a northwest bound left-turning vehicle from NW Naito Parkway onto NW 9th Avenue.

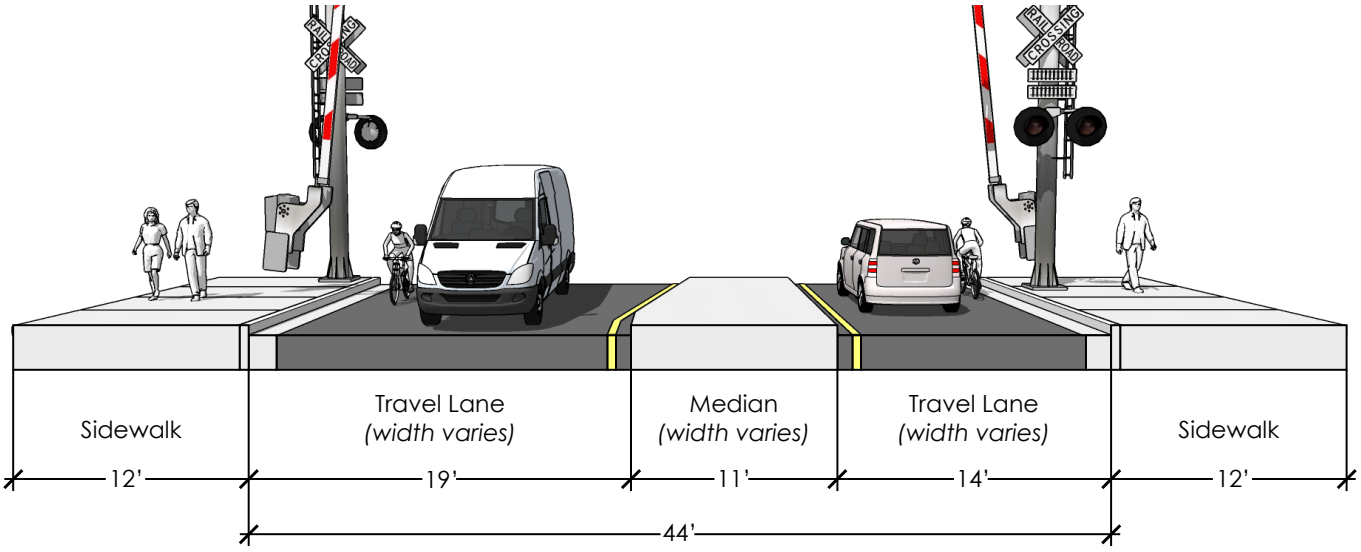
Field Visit and Reporting

The project team conducted a field visit to the project site on March 9, 2020 to document existing physical and operational conditions of the project site and to develop a further understanding of the curb-to-curb constraints, cross section elements, railroad infrastructure, and adjacent bicycle facilities. *A detailed summary of field observations, photographs, and field measurements recorded by the project team is included in Appendix "B".*

Existing Conditions

Today, the existing cross section of NW 9th Avenue (NW Naito Parkway to NW Overton Street) consists of two travel lanes (varying widths) and a raised center median (varying width); however, no dedicated bicycle facilities are provided. The curb-to-curb cross section width is approximately 44 feet. Exhibit 1 illustrates the existing roadway cross section.

Exhibit 1: Existing Roadway Cross Section



As illustrated in Figure 1 and Exhibit 1, the cross section elements and associated widths vary on the northeast and southwest sides of the railroad. To the northeast, the existing raised median is approximately 11 feet at its widest point (closest to the railroad), tapering down to a width of approximately 1-foot (closest to NW Naito Parkway). The adjacent travel lane width on the northwest side of the median fluctuates and narrows to a width of approximately 19 feet closest to the railroad.

On the southwest side of the railroad, the curb-to-curb cross section is generally consistent including two travel lanes at approximately 20 feet and a 1.5-foot wide raised center median. Closest to the railroad, the travel lane on the northwest side of the raised center median is approximately 19 feet and the travel lane on the southeast side is approximately 24 feet.

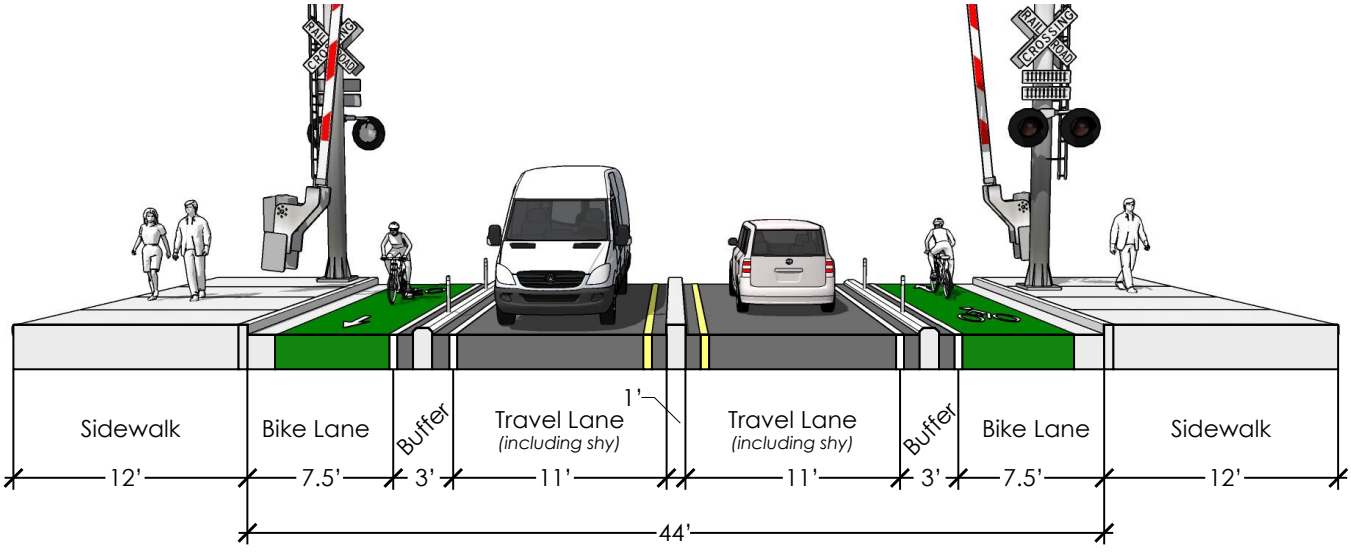
Railroad Infrastructure

The existing crossing is composed of rubber OMNI crossing panels on the two-track crossing. It utilizes two cantilevers with six sets of flashing-lights on each and two automatic gates. Combined with the raised concrete center medians, the railroad infrastructure meets the qualifications for a FRA mandated quiet zone.

Conceptual Design

The concept design for NW 9th Avenue has been developed to a 5-10% concept level and is intended to support future grant applications for funding and implementation. The conceptual design relies on the opportunity to reconstruct the median located on the northeast and southwest sides of the railroad in order to free up space for bicycle facilities within the existing curb-to-curb cross section. Exhibit 2 illustrates the proposed cross section.

Exhibit 2: Proposed Roadway Cross Section



As illustrated in Exhibit 2, the concept proposes to reconstruct and relocate the existing medians on the northeast and southwest sides of the railroad to a width of approximately 1-foot, consistent with the design requirements identified in the NW River District Quiet Zone Plan[1].

Proposed Bicycle Facility Improvements

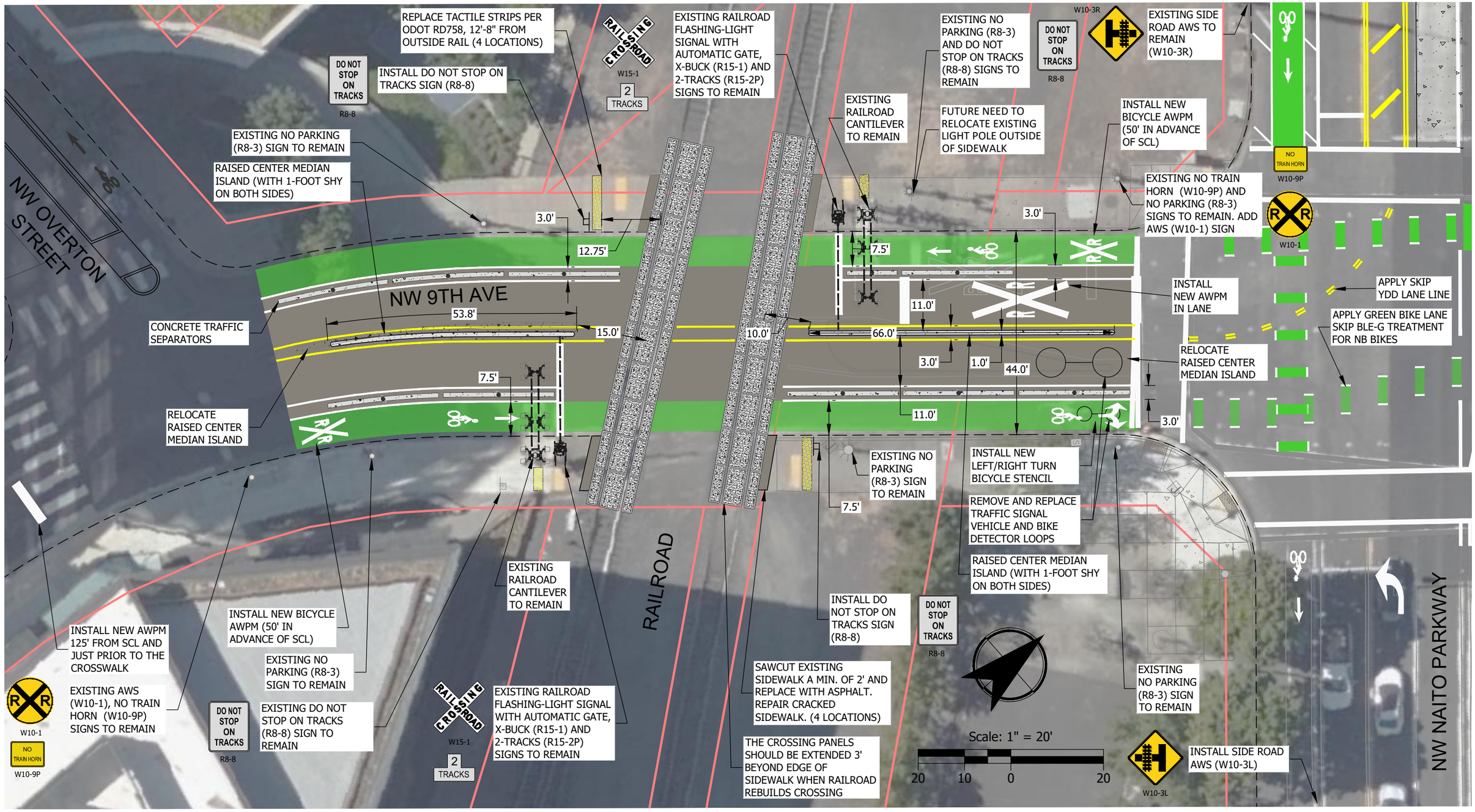
As part of the roadway reconstruction, the cross section is proposed to be restriped to include two 11-foot travel lanes (including one-foot shy distance from curbs), two 7.5-foot bike lanes with 3-foot buffers including raised concrete delineators with flex-posts, and a 1-foot center median island. In constrained locations, the buffer may be required to be reduced; however, the 7.5-foot bike lane is proposed to remain throughout the project extents.

Based on the Bicycle Level of Traffic Stress (BLTS) methodology, the proposed cross section and associated bicycle facility will achieve a BLTS 1 score due to the posted speed of 25mph, number of travel lanes, bicycle facility width, and buffer space (vertical and horizontal). The BLTS 1 score is regarded as a suitable facility for people biking at all ages and abilities.

Conceptual Design

Figure 2 illustrates the 2D conceptual design for NW 9th Avenue (NW Naito Parkway to NW Overton Street). Exhibit 3 illustrates a 3D bird's eye perspective of the recommended improvements.

1 The final design should be refined to further meet the detailed requirements identified in the NW River District Quiet Zone Plan

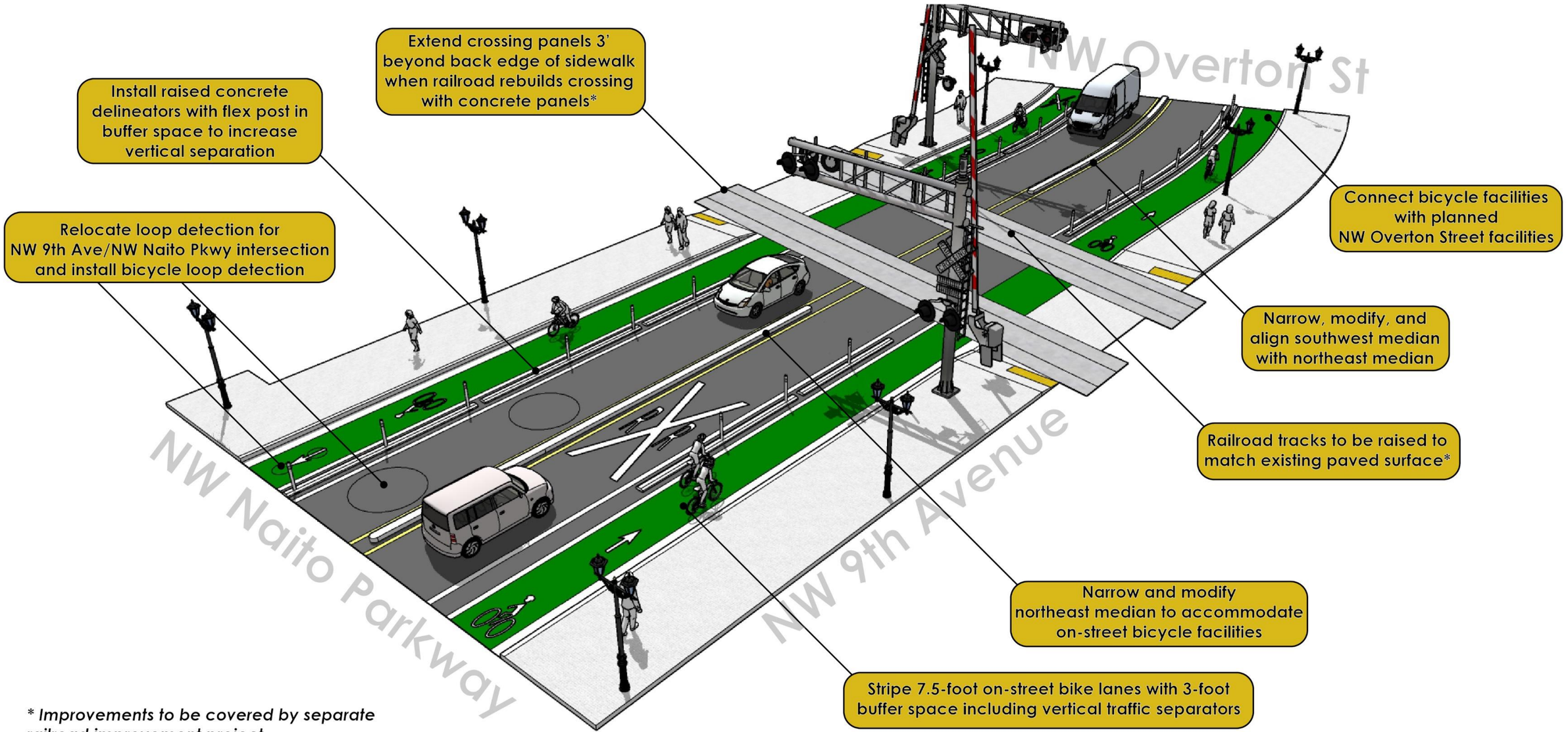


DRAFT 2D CONCEPT DESIGN

Portland, Oregon

Figure 2

Exhibit 3: Conceptual 3D Bird's Eye Perspective



** Improvements to be covered by separate railroad improvement project*

Recommended Improvements

As illustrated in Figure 2 and Exhibit 3, the recommended improvements for the NW 9th Avenue (NW Naito Parkway to NW Overton Street) support a low-stress, and continuous bicycle facility treatment suitable for all ages and abilities.

Bicycle Facilities

As described previously, the conceptual design for NW 9th Avenue proposes 7.5-foot buffered bike lanes with raised concrete delineators located within the 3-foot buffer zone. The proposed bicycle facilities are planned to tie into the existing NW Naito Parkway bicycle facilities and future improved bicycle facilities along NW Overton Street.

Median Modifications

All improvements for the NW 9th Avenue concept design rely on the relocation and modifications to the existing center median. By narrowing the median to a consistent width of 1-foot, bicycle facilities can be accommodated within the curb-to-curb cross section throughout the project extents while maintaining the design guidance outlined in the NW River District Quiet Zone Plan and needs of the Railroad.

Roadway Resurfacing & Striping

Resurfacing the roadway through a mill and overlay process provides the opportunity to raise the railroad tracks to match the roadway surface, reducing the current abrupt and uncomfortable railroad crossings for all modes. As part of the roadway resurfacing, the existing loop detection for the NW 9th Avenue/NW Naito Parkway intersection approach will be relocated.[2]

Railroad Infrastructure & Striping

The existing railroad infrastructure (railroad cantilever, flashing-light signal with automatic gate) is recommended to be maintained, as improvements to the NW 9th Avenue project will not impact the railroad infrastructure. The Portland Terminal Railroad (PTR) has proposed to replace the existing rubber crossing panels with concrete panels. In addition, it is recommended that PTR raise the tracks to match the roadway surface elevation as part rubber panel replacement project.

New vehicle and bicycle Advance Warning Pavement Marking (AWPM) striping is recommended to be installed at railroad crossing approaches as well as new Stop Clearance Lines (SCL) at the gates.

As identified in Figure 2 and Exhibit 3, the concept design recommends extending the newly installed concrete panels 3 feet beyond the edge of sidewalk when the railroad improvement project is advanced. All four tactile warning strips at sidewalk approaches to the railroad crossing are recommended to be replaced. Additionally, two "Do Not Stop on Tracks" signs are recommended to be installed on the opposite side of the tracks to the vehicle movement as well as an Advance Warning Sign's (AWS) along NW Naito Parkway alerting motorist of the railroad crossing. *Further details on railroad improvements and modifications are included in Appendix "C".*

General Improvements

The existing light pole on the west side of the roadway (north of the railroad) is recommended to be relocated outside of the sidewalk to create a wider and more passable walkway.

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[2] Railroad improvements are anticipated to be completed by railroad and are not included in planning level cost estimate.

Truck Turning Analysis

A truck turning analysis was conducted using AutoTURN to determine the location and feasibility of relocating the northeasterly most portion of the median on the northeast side of the railroad. Based on conversations with PBOT, the analysis used a T-1 Fire truck for the turning movement design vehicle to determine whether the design vehicle could turn left or right from NW Naito Parkway onto NW 9th Avenue without impacting the proposed median location. Based on the analysis, the proposed median may be modified as proposed without impacting truck turning. *The detailed truck turning analysis and associated figures are included in Appendix "D".*

Planning Level Cost Estimates

Planning level cost estimates were produced in PBOT agency format for the proposed improvements associated with the NW 9th Avenue (NW Naito Parkway to NW Overton Street). The cost estimate assumes no acquisition of ROW. Improvements made to the railroad infrastructure, including the raising of the existing railroad and replacing rubber panels will conducted by Railroads (BNSF; UPRR; PTTR). No environmental, parks, zoning, Bureau of Environmental Services (BES) coordination is anticipated.

Based on the preliminary planning-level cost estimate, the total cost for implementing the recommended improvements is $473,000.

- Total Construction: $211,000
- Project Management: $13,000
- Design Engineering: $45,000
- Construction Management: $27,000
- Overhead: $69,000
- Total Inflation and Allowance for Design Refinement: $108,000

The detailed cost estimate breakdown in PBOT agency format is provided in Appendix "E".

Next Steps

The recommended conceptual design considers existing conditions and planned bicycle facilities to address the existing bicycle network gap and deficient pavement conditions along NW 9th Avenue between NW Naito Parkway and NW Overton Street. The conceptual design has been developed based field observations, a review of background data and existing infrastructure, input from PBOT staff, and is intended to support PBOT in developing a grant application to secure funding for project implementation.

Appendix A
Background Planning and Design Documents

Appendix B
Field Observation & Reporting Memo

Appendix C
Final Railroad Tech Memo

Appendix D
Truck Turning Analysis

Appendix E
Planning-level Cost Estimates