

EXHIBIT A AGREEMENT

This Agreement is made and entered into by and between the Portland Bureau of Transportation, 1120 SW Fifth Avenue, Suite 1331, Portland, Oregon 97204, hereinafter referred to as 'PBOT', and Oregon State University, having a principal office at A312 Kerr Administration Building, Corvallis, OR 97331-2140, hereinafter referred to as 'University', both herein referred to individually or collectively as "Party" or "Parties."

OVERVIEW

The Kiewit Center for Infrastructure and Transportation Research at Oregon State University's was established in 1962. The Kiewit Center serves as the umbrella organization for almost all research within the School of Civil and Construction Engineering. Researchers are concerned with studying transportation operations and safety issues from a multi-modal perspective.

This project seeks to:

- Evaluate vehicle-bus-bicycle user safety in Rose Lane projects, and inform future Rose lane designs.
- Justify implementing three Rose Lane designs which may be in conflict with current MUTCD standards through an FHWA approved RTE.
- Publish a peer-reviewed journal article documenting the project and its results.
- Provide evidence to support revision to the MUTCD language and, contingent on research results, seek interim approval for the corridor cross-sections which that violate existing MUTCD standards.

RECITALS

WHEREAS, PBOT and OSU researchers developed a scope of work:

Exhibit A: Project Scope of Work

Principal Investigator/Institution:	Dr. David Hurwitz, Oregon State University
Co-Investigator/Institution:	Dr. Amy Wyman, Oregon State University

WHEREAS, PBOT wishes to issue funds in the amount of \$80,000 from non-federal sources towards the project, entitled: "Evaluating vehicle-bus-bicycle user safety in Rose Lane projects", as described in Appendix A.

OBLIGATIONS

University agrees to:

1. Perform the work described in Appendix A as the lead institution for the proposal.
2. Share research findings with PBOT in accordance with Appendix A.

PBOT agrees to:

1. Submit a payment of \$80,000.00, due in full upon receipt of an invoice, to Oregon State University, Corvallis, OR 97331 to be used to carry out the Scope of Work in Appendix A.
2. Certify that funding for the submitted payment is from non-federal sources, or is from funds provided to PBOT under sections 503, 504(b), or 505 of Title 23 United States Code.

The term of this Agreement shall be: Commencing on the date of the last signature below, and ending on December 10, 2022.

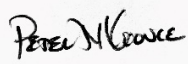
This Agreement and the attachments constitute the entire Agreement between the parties. Both parties, by the signature below of its authorized representative, acknowledges having read and understood the Agreement and to be bound by its terms and conditions.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the date set forth herein by their duly authorized representatives.

OREGON STATE UNIVERSITY

PORTLAND BUREAU OF
TRANSPORTATION

By: _____

By:  _____

Name/Title: _____
Manager

Name/Title: Peter Koonce/ Division

Date: _____

Date: 12/7/2020

Appendix A: Scope of Work

Overarching Project Objective:

- Justify implementing three corridor projects which may be in conflict with current MUTCD standards through an FHWA approved RTE.
- Publish a peer-reviewed journal article documenting the project and its results.
- Provide evidence to support revision to the MUTCD language and, contingent on research results, seek interim approval for the corridor cross-sections which violate existing MUTCD standards.

Characterization of study locations:

- Constructed an excel file containing pre- and post-treatment characteristics for study locations.
 - PBOT confirmation desired regarding which locations will be signalized in the post-treatment condition.
 - PBOT confirmation desired regarding elements of bicycle infrastructure not shown on plans. (How are bike lanes separated from traffic? Paint, curbs, vertical plastic barriers, etc.)
- This research plan considered locations along the following treatment corridors:
 - SE Hawthorne Blvd: SE Grand Ave to SE 12th Ave
 - SE Madison St: SE Grand Ave to SE 12th Ave
 - E Burnside St: SE Martin Luther King Jr Blvd to NE 12th Ave
 - SW 4th Ave: SW Caruthers St to SW Hall St
- This research plan proposes comparing locations along treatment corridors to the following two “control” corridors:
 - SE Morrison St
 - SE Belmont St

Performance Measures

The following data will be collected on the entire intersection approach of interest, regardless of presence of bicycle facilities:

- Conflicts (surrogate safety measures): Interactions between a bicyclist and other transportation system user involving an evasive action to attempt avoiding a crash. An evasive action in this case would involve a brake light indication or a weaving maneuver.
 - Classification: Type of Conflict.
 - Frequency: Number of times a Conflict occurs.
 - Injury severity: Map from Conflict type based on existing literature.
- Whether the Conflict resulted due to a traffic violation by a system user (bicyclist, pedestrian, or motorist).
- Traffic violation type.
- Traffic violation frequency.

For the remainder of this document, “conflicts” describes all the bulleted data to be collected.

Data Collection

Data will be collected for each site for one work week (Monday through Friday) during peak morning (7 am to 9 am) and evening (4 pm to 6 pm) hours at the intervals described below. A total of 20 hours of data per week will be collected for each site.

Suggested measurement intervals:

- a. Before (any week, but would like to do this before the weather turns)
- b. 1 Week after treatment installation
- c. 1 Month after treatment installation
- d. 3 Months after treatment installation

The intervals at which data is collected will address the question: How does exposure change the observed conflict rates for each comparison? How long does it take for conflicts to reach equilibrium after a new treatment is installed?

Throughout the longitudinal study, data will be collected for at least one control site. The control sites will be intersections located on Morrison and Belmont. Morrison (WB) and Belmont (EB) were suggested by PBOT to act as control corridors because they mirror the configurations of Hawthorne & Madison, both treatment corridors. Selecting one intersection each from Morrison and Belmont may be beneficial to account for any directionally-related traffic patterns, since all the treatment corridors are one-way.

Data Comparisons

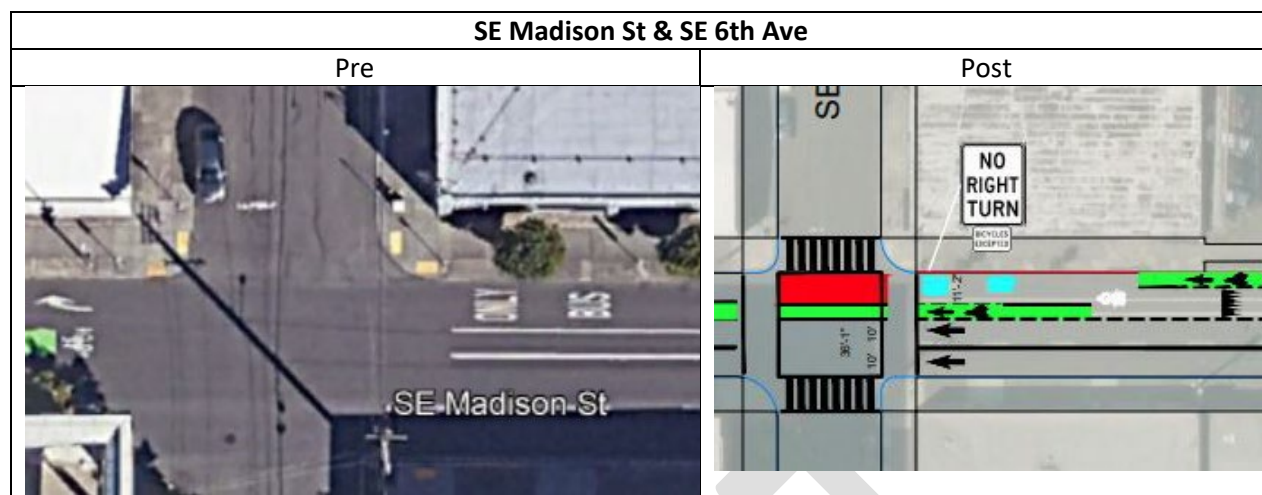
Note: Here, a dedicated turn-lane refers to a bus-only lane that becomes a dedicated turn-lane for vehicles.

1. How do conflicts compare for a bike lane positioned adjacent to a dedicated turn-lane vs. a bike lane required to merge inside a dedicated turn-lane?
 - a. Option pre/post-study locations: None.
 - b. Option between-locations comparisons:

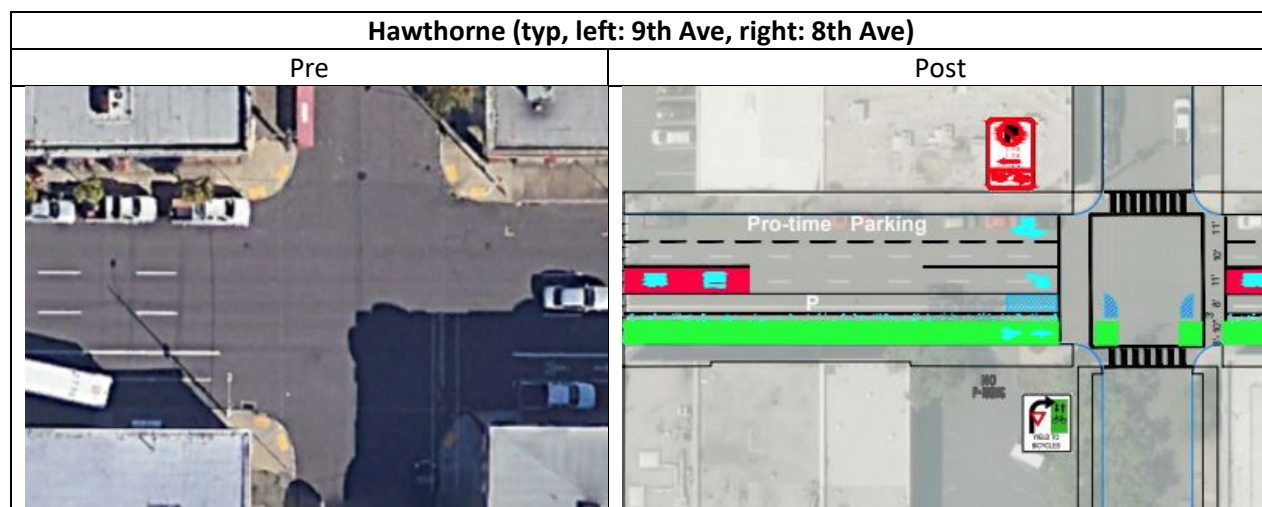
	Bike Lane Adjacent Dedicated Turn- Lane	Required Merge Inside Turn-Lane
Existing	Right-turn lanes: • Possibly Morrison from 11th Ave to 7th Ave (unsig.), depending on how bus lane is used (verify with PBOT) • Morrison & 7th Ave (sig.) uses a bike box	Right-turn lanes: • Belmont & SE 7th Ave (sig.) • Morrison and Grand (sig.)
Proposed	Right-turn lanes: • Hawthorne & 7th (sig.), 8th – 10th (unsig.) Ave • Madison & 7th (sig.), 8th & 9th (unsig.) Ave • Burnside & 6th – 11th Ave (sig.) Left-turn lanes: • 4th Ave & SW Hall St (sig.)	Right-turn lanes: • Madison & SE 6th Ave (unsig.?)

	• 4th Ave & SW College St (unsig.)	
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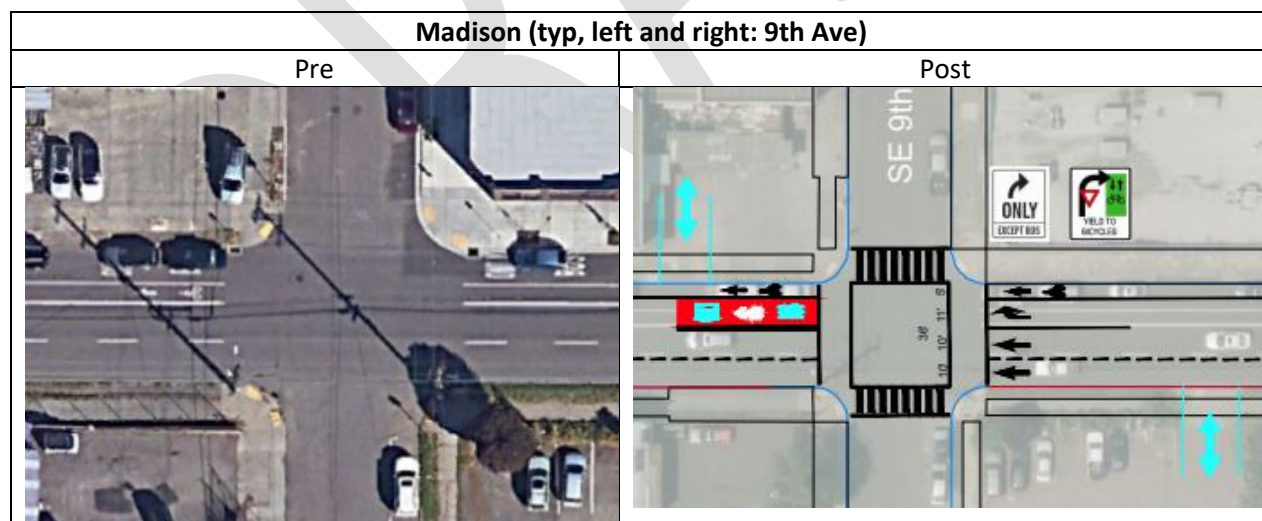
- a. Possible between-locations comparisons:
 - i. Measure conflicts for existing configuration of Madison & SE 6th, 8th, and 9th Aves as a baseline. Then measure how conflicts change when locations are modified—6th Ave becomes an inside merge and 8th and 9th Aves become an outside bike lane adjacent to a dedicated turn-lane. Compare the change between locations. Note the independence assumption would be violated.
 - ii. Compare change in conflicts between existing and proposed conditions for Madison & SE 6th Ave (proposed inside merge) and Hawthorne & either 8th, 9th, or 10th Ave (proposed dedicated turn-lane).
 - iii. Compare existing configuration conflict differences between Belmont & SE 7th Ave and Belmont & SE 9th Ave (existing signalized inside merge vs. existing configuration similar to existing Hawthorne & 9th configuration) with pre/post conflict differences for Hawthorne & 9th Ave (post condition is dedicated turn-lane)? One downside to this comparison is that the Hawthorne location is unsignalized in the pre and post conditions, while Belmont & SE 7th Ave is signalized.
2. For bicycle and vehicle traffic traveling in the same direction on a one-way street, does the answer to (1) change depending on whether the bicycle lane is located on the left or right side of the road?
 - a. Option pre/post-study locations: None.
 - b. Option between-locations comparisons:
 - i. Compare the change in conflicts between existing and proposed treatments across locations.
 - ii. Signalized
 1. 4th Ave & SW Hall St (left-turn lane) and SE Hawthorne St & 7th Ave (right-turn lane): Both are signalized and have proposed separated bike lanes, separated from a bus-only lane with parking.
 - iii. Unsignalized
 1. 4th Ave & SW College St (left-turn lane) and SE Hawthorne St & 9th Ave (right-turn lane): Both are unsignalized and have proposed separated bike lanes, separated from a bus-only lane with parking.
3. For bicycle and vehicle traffic traveling in the same direction on a one-way street, how do conflicts compare for bike lanes positioned adjacent to a shared thru+turn lane vs. a required merge to the inside of a dedicated turn-lane?
 - a. Option pre/post-study locations:
 - i. We could compare the pre/post change in conflicts at the below location to the difference in conflicts between existing shared thru+turn vs. required merge sites to add data from a few more locations here.
 - ii. SE Madison St & SE 6th Ave



4. How do conflicts compare for a bike lane positioned outside adjacent to a dedicated turn-lane vs. outside adjacent to a shared thru+turn lane?
 - a. The majority of locations in each corridor will be converting from a shared thru+turn lane configuration to a dedicated turn-lane configuration. We can choose maybe one location from each corridor to measure the pre/post change and then compare that change across Hawthorne, Madison, Burnside, and 4th Ave. Suggest using 4th Ave & College St (unsignalized) and 9th Ave intersection with Hawthorne, Madison, and Burnside (unsignalized) for consistency and because Hawthorne & 9th Ave was an intersection of particular concern to PBOT.
 - b. Would it also be useful to choose a couple similar locations on at least one corridor, say Hawthorne & 8th and 10th Ave, to use as “controls” for the Hawthorne & 9th Ave location that will be compared across corridors? Knowing that we will try to minimize the amount of data to reduce, is there value in doing this for only one corridor?
 - c. Option pre/post-study locations:
 - i. Right-turn lane configuration
 1. SE Hawthorne St & SE ... Note: Bike lane throughout is buffered from turn-lane by parking lane.
 - a. 9th Ave: Currently unsignalized. Suggested priority location. PBOT indicated concern here.
 - b. 8th & 10th Ave: Currently unsignalized. Similar existing and proposed configurations to 9th Ave.
 - c. 7th Ave: Currently signalized. Similar in configuration to (a) and (b), but signalized and the existing condition has a bike box, which may affect study results.

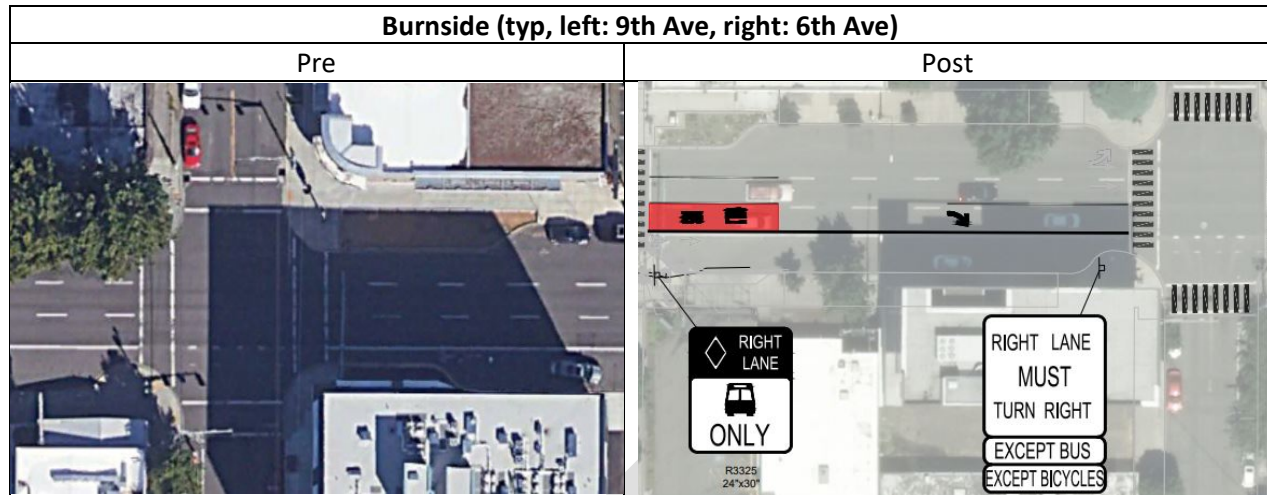


2. SE Madison St & SE Note: Main difference from SE Hawthorne St in the proposed condition is the bike lane is directly adjacent to the turn-lane. Main difference from Hawthorne in the existing condition is that Madison is only two lanes, with the bike lane adjacent to the left of a morning bus-only/afternoon parking lane.
 - a. 8th and 9th Ave: Currently unsignalized. Similar to each other, and similar in configuration to Hawthorne & 8th and 9th Ave locations.
 - b. 7th Ave: Currently signalized. Compare to (1c)—similar configuration to 8th and 9th, but signalized and may include bike box (I couldn't tell from the plans what this was).



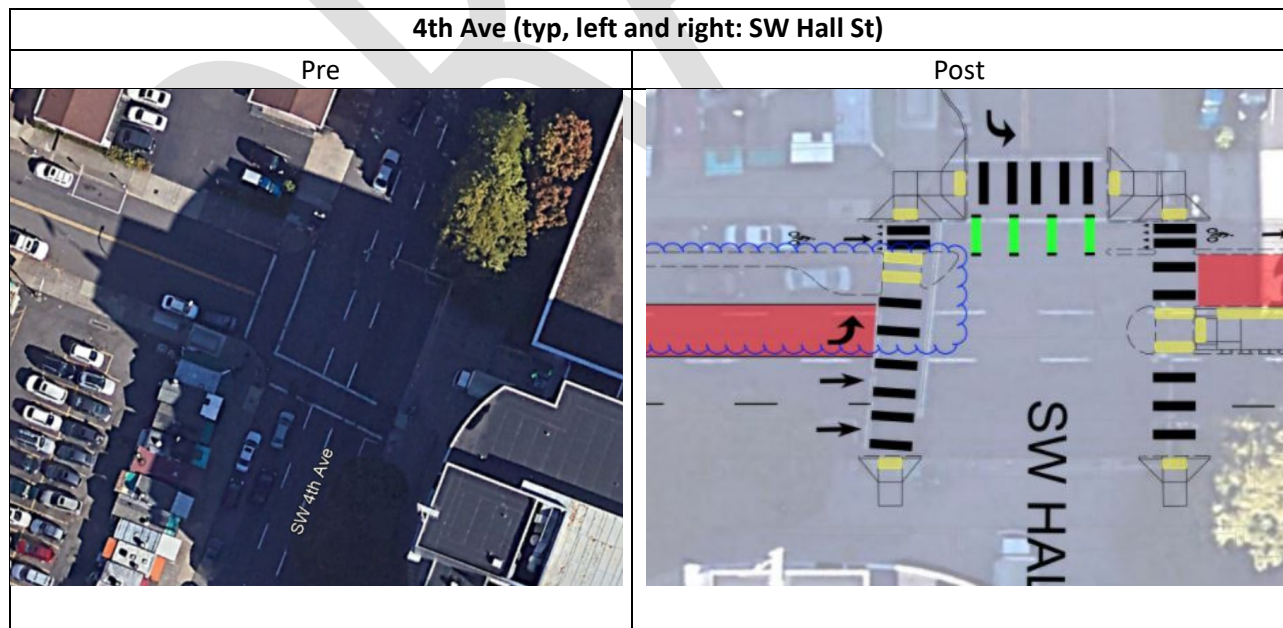
3. E Burnside St & NE Note: Proposed configuration is similar to Madison in that the bike lane is also directly adjacent the bus-only turn-lane. The proposed configuration here is more similar to Hawthorne than Madison, with three lanes and no bus-only lane, but different in that all locations along Burnside are signalized.

- a. 6th through 11th Ave are all similar, except the bus stop on the approach to 8th Ave. Currently all signalized.



ii. Left-turn lane configuration:

1. 4th Ave & Note: No existing dedicated bike facilities.
 - a. SW Hall St: Currently signalized with crosswalk across west and south legs.
 - b. SW College St: Currently unsignalized with crosswalk across north and south legs. Proposed configuration is similar to SW Hall St except that the bus-only lane continues straight through the intersection (it doesn't shift to the left of the roadway).



- d. Option between-locations comparisons:

- i. Suggest comparing pre/post change across four locations discussed previously (one intersection along 4th Ave, Hawthorne, Burnside, Madison) and one or two control locations on Morrison and/or Belmont.

Summary

Knowing that we can only select a subset of locations for comparison, the locations we propose collecting data for, with priority indicated in parentheses, are:

Experimental Sites:	Control Sites:
• Madison & SE 6th Ave (1)	• Belmont & SE 7th Ave (1)
• Madison & SE 9th Ave (2)	• Belmont & SE 9th Ave (1)
• Hawthorne & SE 9th Ave (1)	• Morrison & SE 9th Ave (2)
• Hawthorne & SE 8th Ave (2)	
• 4th Ave and SW College St or Hall St (1)	
• Burnside & NE 9th Ave (2)	