



Barriers in Plain Sight: Pedestrian Accessibility, Safety, and Well-Being in Urban Green Space

Mia Wood | University of Washington SEFS | U District Advocates

School of Environmental and Forest Sciences

UNIVERSITY of WASHINGTON
College of the Environment



Introduction

Urban green spaces in cities provide valuable environmental and public health benefits including improved physical health, mental well-being, and climate resilience [1]. While the benefits of green urban spaces are widely recognized, access is shaped by social, structural, and mobility barriers such as unsafe pedestrian infrastructure, limited transit connectivity, and roadway design [2]. These barriers influence who is willing or able to enter the space.

The objective of this study is to:

1. Identify how user groups experience and perceive accessibility, safety, and health benefits in green urban spaces.
2. Examine disparities across different demographics to identify equity gaps.
3. Assess how proposed pedestrian infrastructure improvements may change user behaviors

We evaluated these objectives using the proposed Union Bay Trail as a case study.

Study Site Context

This study focuses on the **Union Bay Natural Area (UBNA)** a restored wetland and shoreline near the University of Washington providing ecological, educational, and recreational use. However, access to the site can be challenging for pedestrians and transit users due to barriers such as a mile-long fence and surrounding roadway infrastructure.

A trail connection has been discussed as a potential infrastructure improvement to increase connectivity between nearby neighborhoods, transit routes, and the UBNA.

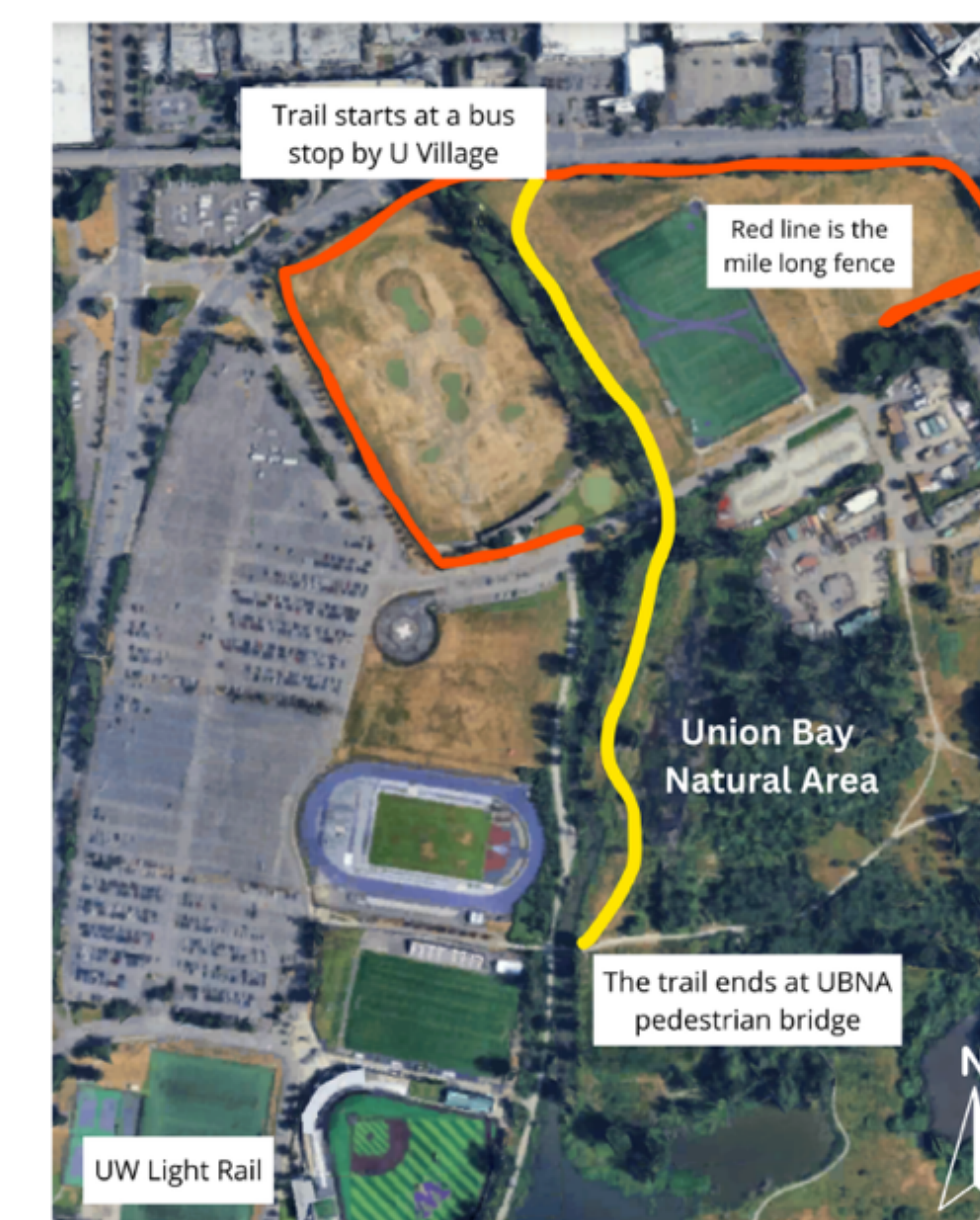


Figure 1. Proposed Trail
Highlights the existing fence barrier and proposed trail location.



Figure 2. Fence at the site
Shows the fence barrier located by the start of the proposed trail location.

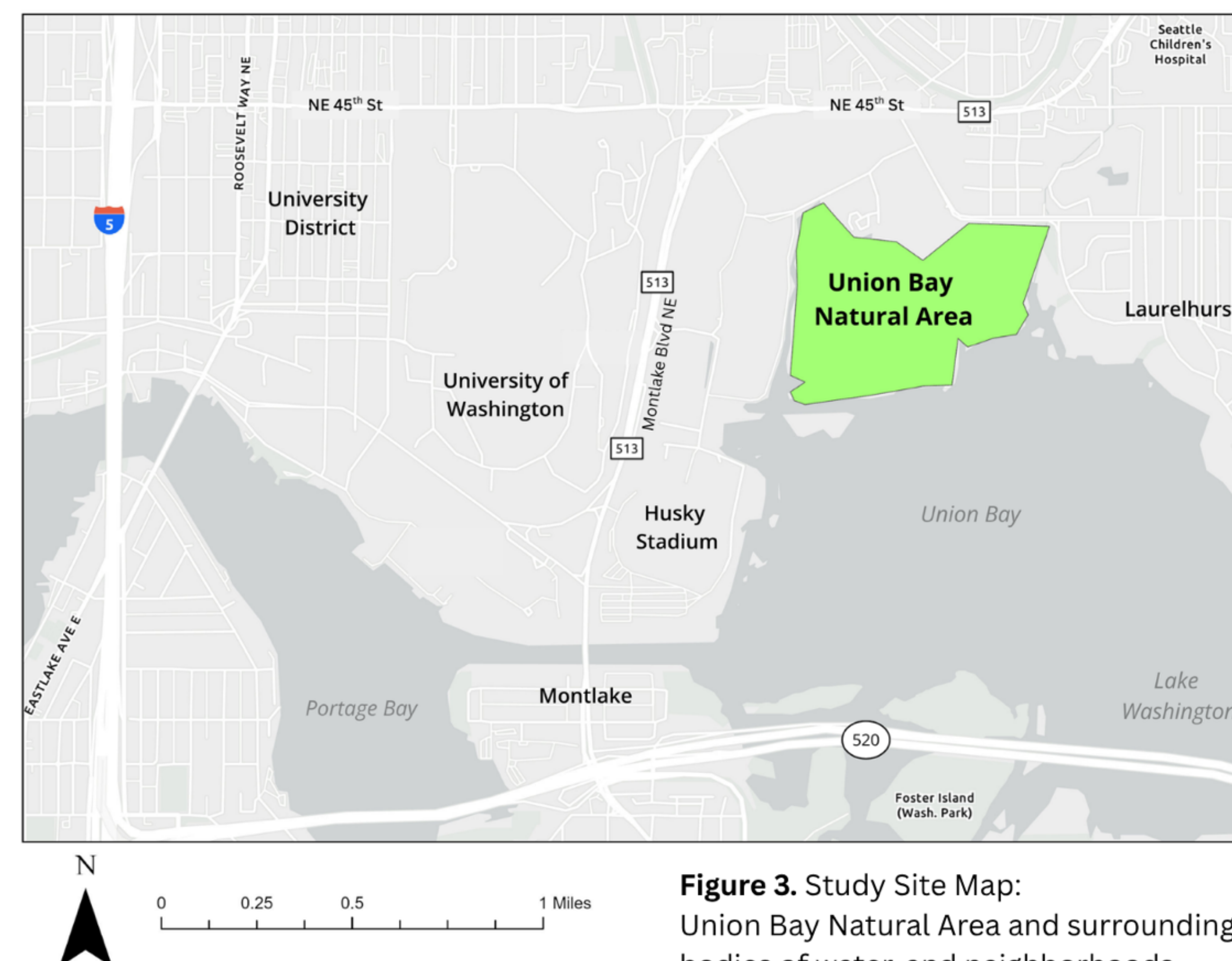


Figure 3. Study Site Map:
Union Bay Natural Area and surrounding roadways, bodies of water, and neighborhoods

Results

Survey responses show that proposed trail connection increases willingness to visit the UBNA and shift transportation behavior toward more active modes of travel.

- **62.6%** of respondents say they would be **more likely** to visit with a direct trail connection if it were created (Figure 4).
- **3.8%** of respondents indicated they would be **less likely** to use the trail.

User travel patterns also changed under the proposed trail scenario (Figure 5).

- Responses for walking and biking increased
- While car usage decreased by 46.4%

These findings suggest that improved pedestrian connectivity may encourage greater use of active transportation when accessing the UBNA.

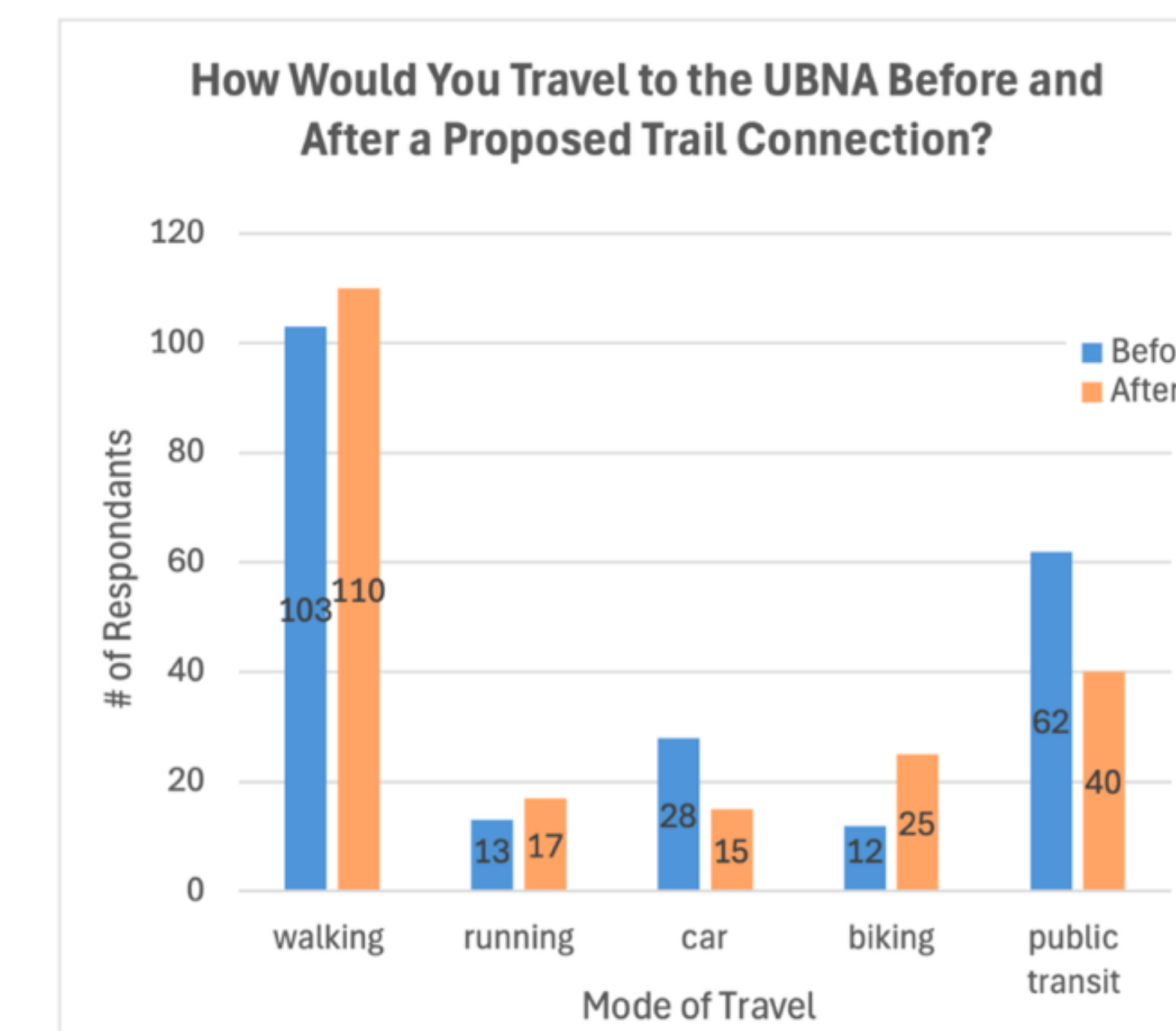


Figure 4. Mode of Travel to UBNA
Figure shows the change in user's mode of travel to the UBNA before and after being presented the proposed trail scenario.

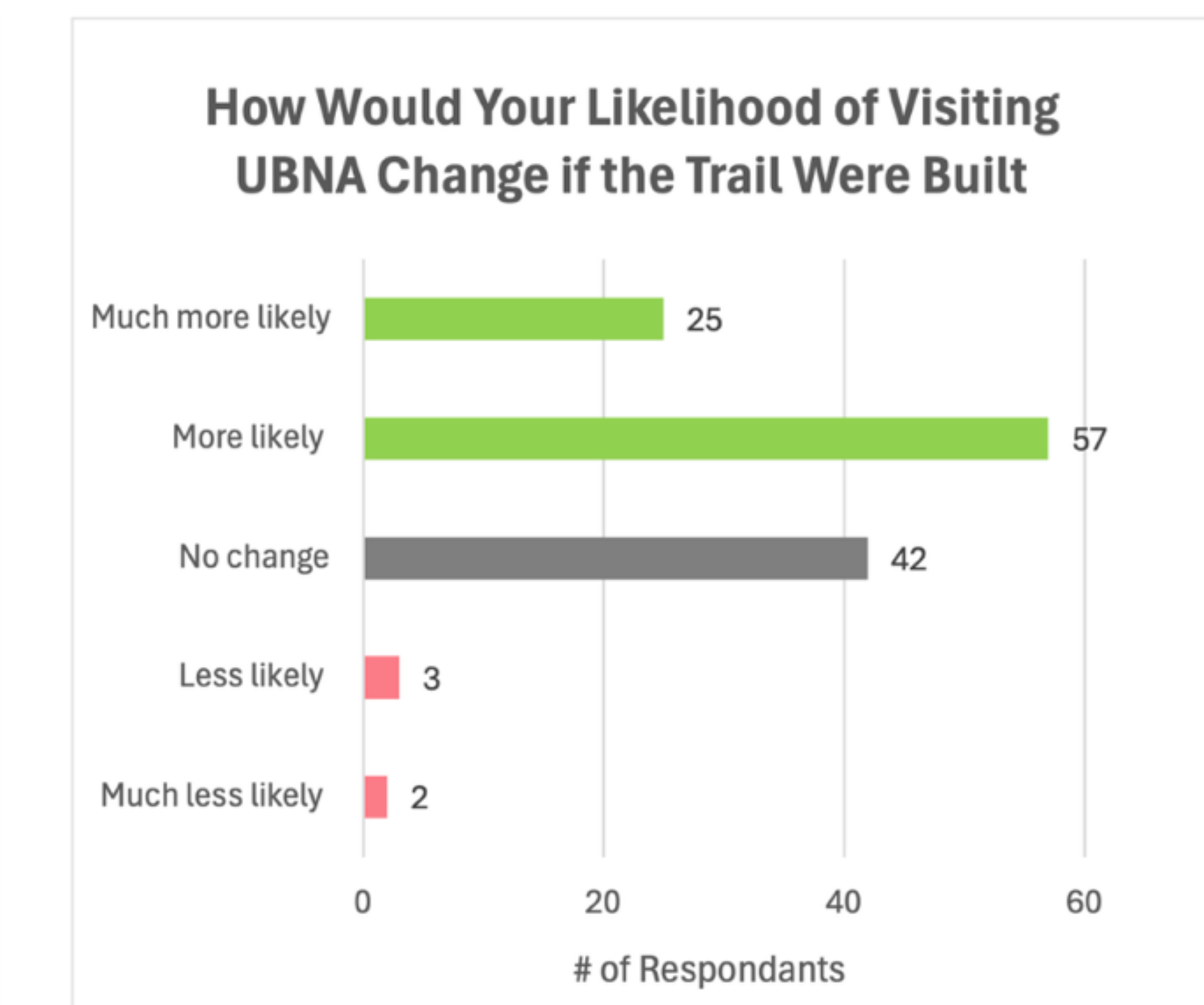


Figure 5. Site Visitation
This figure shows how user likelihood of visiting changed if a more direct pedestrian connection was to be added through UBNA.

Methods

This study evaluates the Union Bay Natural Area (UBNA) current site accessibility, safety perceptions, and visitation patterns among users, as well as how a proposed trail connection may influence these experiences and behaviors.

A cross-sectional survey was distributed through community outreach and intercept surveying. Survey questions assessed travel behavior, site familiarity, perceived safety, accessibility, and willingness to visit under the proposed trail connection scenario. Responses were analyzed to identify differences across user groups and behaviors.

Acknowledgements

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References:

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- [2] Wolff, M., Mascarenhas, A., Haase, A., Haase, D., Andersson, E., Borgström, S., Kronenberg, J., Łaszkiewicz, E., Biernacka, M. (2022). Conceptualizing multidimensional barriers: a framework for assessing constraints in realizing recreational benefits of urban green spaces. *Ecology and society*, 27(2), <https://doi.org/10.5751/ES-13180-270217>