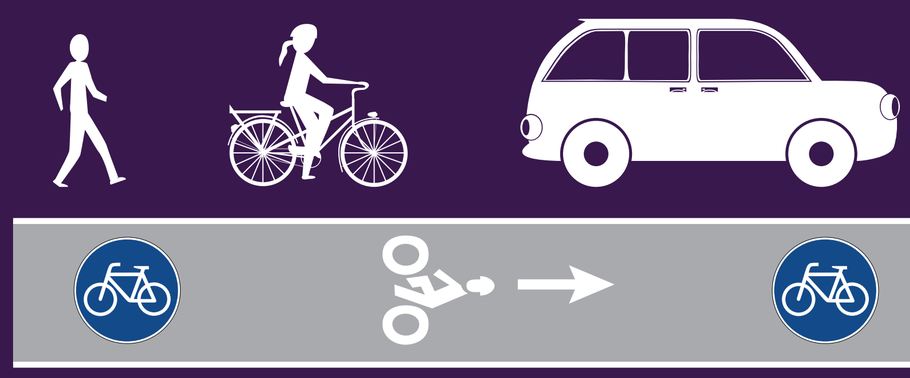
informing ROADWAY DESIGN through EMPIRICAL RESEARCH



An Observational Analysis of Road Users' Interactions with Unprotected Bicycle Infrastructure Between Intersections

MOTIVATION

Bicycle Infrastructure is Required

- Dedicated bicycle infrastructure is a vital component of a sustainable urban transportation network.
- Policies at all levels of government require infrastructure for bicyclists to meet mode split and GHG emissions targets.

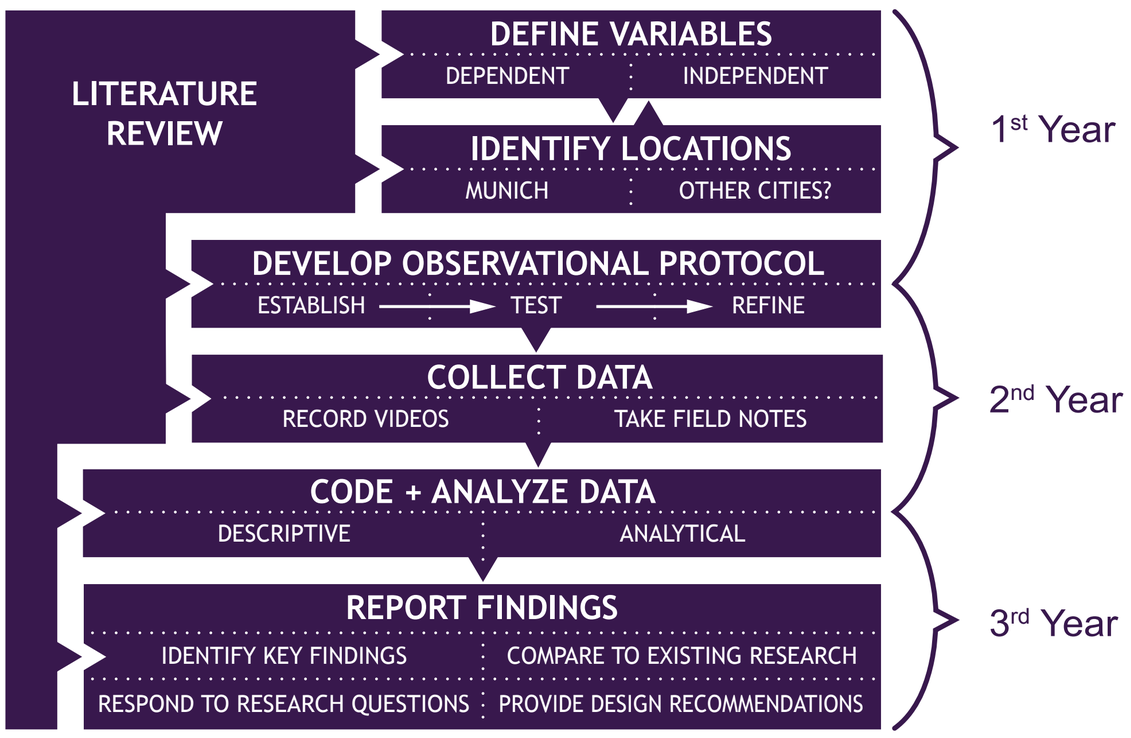
Unprotected vs Protected is Debated

- Unprotected bicycle lanes afford inherent disturbances and conflicts between bicyclists, pedestrians, and drivers, but are relatively simple, fast, and inexpensive to implement.
- Protected bicycle lanes are preferred by users and advocates, but cost more financial, temporal, and spatial resources to build.

Gaps in Existing Research and Data

- Existing research of protected vs unprotected bicycle lanes is primarily informed by travel behavior or stated preference surveys and observational research mainly looks at behaviors at intersections.
- Traffic safety data under represents minor bicycle injuries and does not capture near misses experienced by bicyclists.

RESEARCH DESIGN



METHODS:

- Video Recordings to Document Road Users
- Descriptive and Inferential Analysis of Observed Behaviors

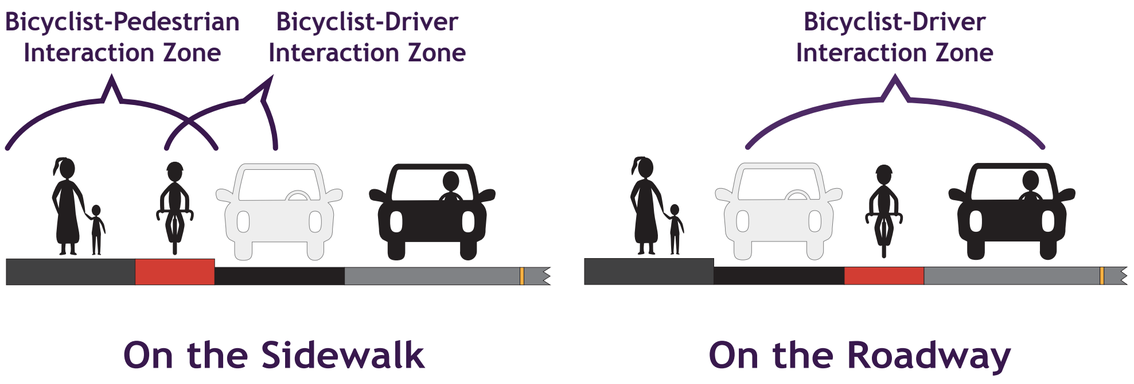
RESEARCH QUESTIONS

1) Under what circumstances do road users respond to unprotected bicycle lanes in place between intersections in the way design treatments and regulations intend?
2) What percentage of bicyclists encounter drivers and pedestrians encroaching into unprotected bicycle lanes? What percentage of bicyclists experience conflicts with drivers and pedestrians encroaching into unprotected bicycle lanes?
3) What, if any, design or policy recommendations can be supported by quantitative evidence to implement safe unprotected bicycle lanes?

INFRASTRUCTURES OF FOCUS

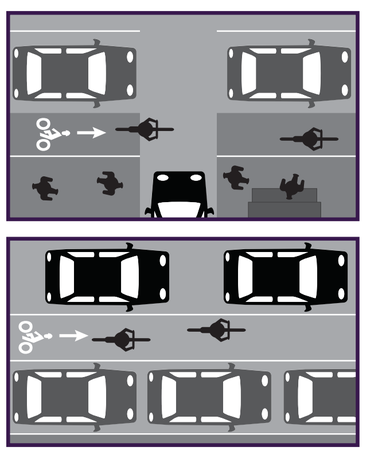
UNPROTECTED BICYCLE LANES:

- No Grade Separation
- No Vertical Physical Barriers



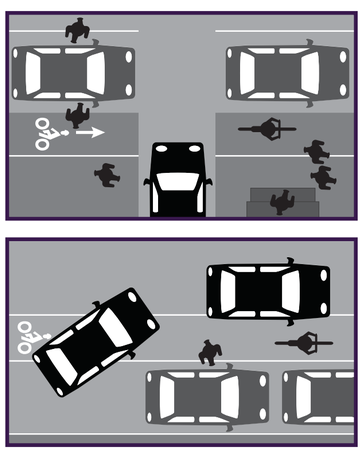
COMPONENTS OF OBSERVATIONAL STUDY AND STATISTICAL ANALYSIS

DEPENDENT VARIABLE: Ordinal categories of bicyclists' interactions with other road users on or adjacent to unprotected bicycle lanes.



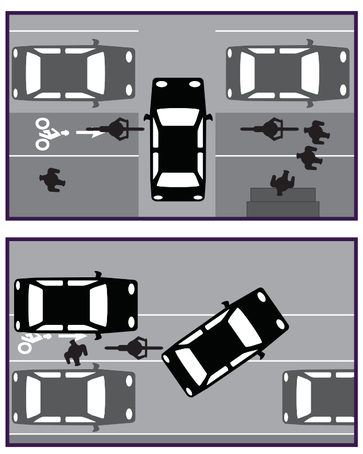
Unobstructed

No other road users encroach into the bicycle lane and no objects are obstructing the bicycle lane when a bicyclist is present.



Disturbance

Another road user, road users, or objects encroach into the bicycle lane when a bicyclist is present. No collision occurs and the bicyclist is able to ride in the bicycle lane.



Conflict

Another road user, road users, or objects encroach into the bicycle lane when a bicyclists is present, causing a collision or causing the bicyclist to stop to avoid a collision.

INDEPENDENT VARIABLES: Groups of variables describing the behaviors and circumstances documented at observation locations.

Behavioral

Road users' actions on or adjacent to unprotected bicycle lanes.

Locational

Geometric design of and semiotic devices at observation locations.

Regulatory

Traffic regulations and laws applying to observation locations.

Circumstantial

Time of day, weather, and road conditions during observations.

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