Research in Progress

Effectiveness of Bike Boxes in Massachusetts

Research Need

Several bike boxes have been installed in the Commonwealth, yet a comprehensive evaluation of bike box effectiveness, mainly in reducing right-hook collisions, is still missing. There is a need to study bicyclist behavior at bike boxes as well as bike box design characteristics in order to assess bike box effectiveness in improving safety and develop design guidelines.

Goals/Objectives

1. Collect real-world data on bicyclist behavior from various intersections with bike boxes and some without (for control) to assess whether they are utilized as intended. Anticipated outcomes are an understanding of the effectiveness of bike boxes as expressed based on the proportion of bicyclists that utilize them to turn right vs. left, and the proportion of motorists that stop behind the stop line.

2. Perform a crash analysis using data from before and after the implementation of bike boxes to study their impact on motorized and non-motorized user safety. Key anticipated outcomes are an understanding of whether bike boxes improve safety for motorists and bicyclists.

3. Relate bike box design characteristics, e.g., the existence of green pavement markings vs. plain markings, with bicyclist behavior to develop bike box design guidelines. The anticipated key end product will be an inventory or bike box design characteristics and general guidelines on bike box features that are more effective in improving bicyclist and motorist safety.

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Project Information

This project is being conducted as part of the Massachusetts Department of Transportation (MassDOT) Research Program with funding from Federal Highway Administration (FHWA) State Planning and Research (SPR) funds.

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Project Start Date:
March 23, 2020

Expected Project Completion Date:
March 22, 2021

Methodology

Task 1: Literature review focusing on bike box design, driver and bicyclist behavior, as well as safety implications of bike boxes.

Task 2: Bike box inventory
Subtask 2.1: collection of bike box design and location information from existing sources
Subtask 2.2: inventory of bike box locations and their characteristics using LiDAR.

Task 3: Crash analysis of selected sites before and after the installation of bike boxes to assess their impact on bicyclist safety.

Task 4: Field data collection on selected sites to analyze bicycle behavior at bike boxes.

Task 5: Final report summarizing findings and outlining guidelines on the design, location, and implementation of effective bike boxes.

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