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## 2020 RESEARCH PROJECT STATEMENT

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### **Research Topic:**

Effectiveness of Bicycle Boxes in Massachusetts [Research Award - max \$100,000]

### **Problem Statement and Objectives**

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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. Bike boxes provide a designated space for people biking to gather at the front of the traffic queue and are intended to generally improve bicyclist visibility and predictability of their position with the ultimate goal of addressing the right-hook collision problem.

Previous studies, one of which performed through driving simulation in Massachusetts, have documented a high driver compliance rate and understanding of the markings even when drivers are not familiar with bike boxes. However, bicyclist behavior at bike boxes has not been extensively studied. There is a need to understand if people biking use the bike box, if so how people biking use bike boxes, such as the purpose (e.g., to make right or left turns), whether they use the bike lane (when present) to access the bike box, and whether they are more or less likely to encroach on crosswalks when bike boxes are present.

The research objective is to assess the effectiveness of bike boxes by collecting 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. In order to further assess their effectiveness, a crash analysis using data from before and after the implementation of bike boxes will allow for conclusions regarding their impact on motorized and non-motorized user safety. Design characteristics of specific bike box implementations, e.g., existence of green pavement markings vs plain markings, will also be studied in combination with bicyclist behavior and crash data to conclude general bike box design guidelines.

### **Anticipated Outcomes and Deliverables**

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- An inventory of bike boxes, analysis of if people use the bike boxes, how people biking use bike boxes, and any recommendations to consider when designing roadways for people biking.
- Anticipated tasks include: review of other studies, inventory of bike boxes across Massachusetts, selection of bike box and control locations, video analysis of if people use the bike boxes, how people biking use the bike boxes, crash analysis at locations, summary of results, and recommendations.