



# User Comprehension of Bicycle Signal Countdown Timers

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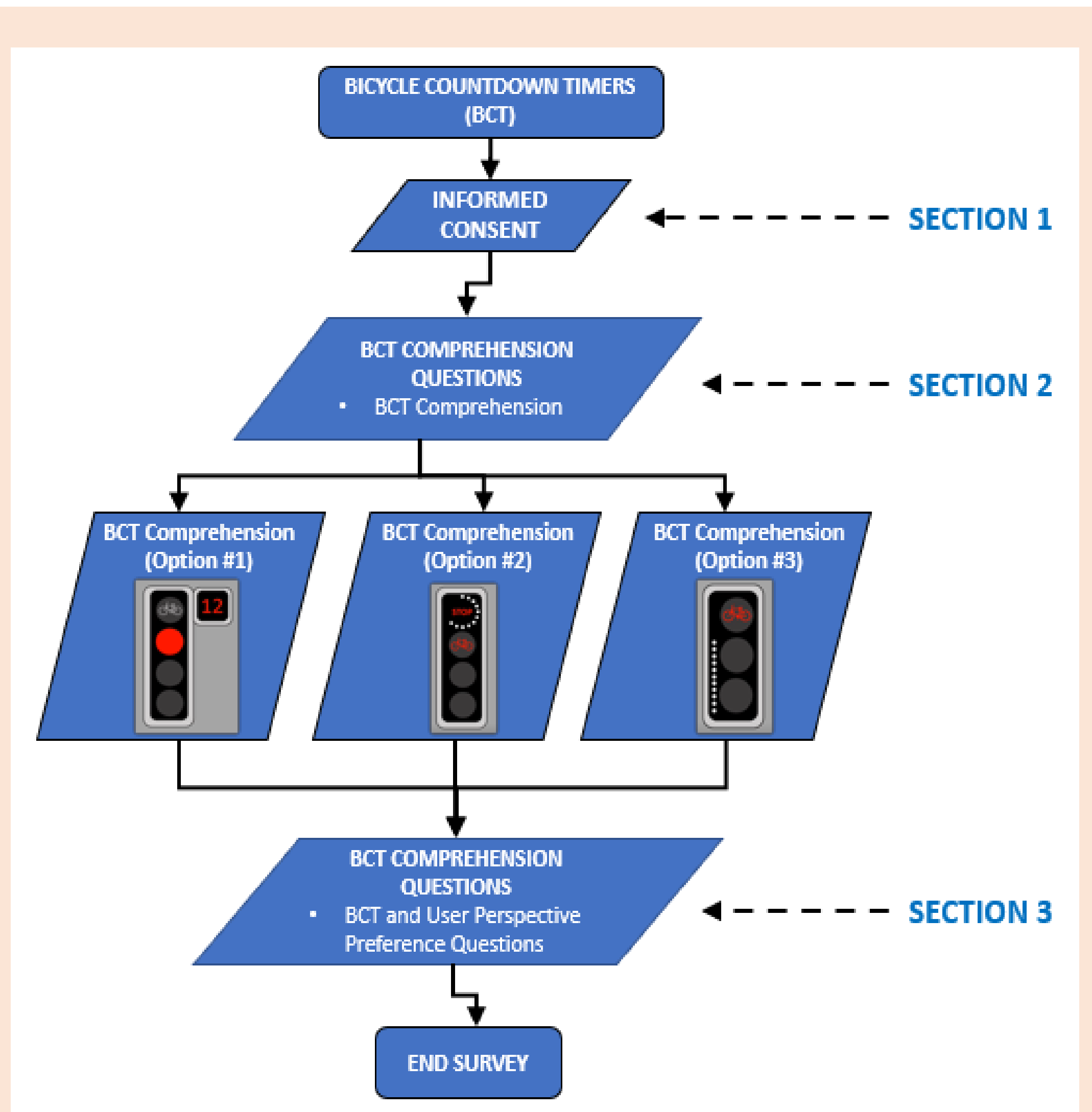


## 1. MOTIVATION

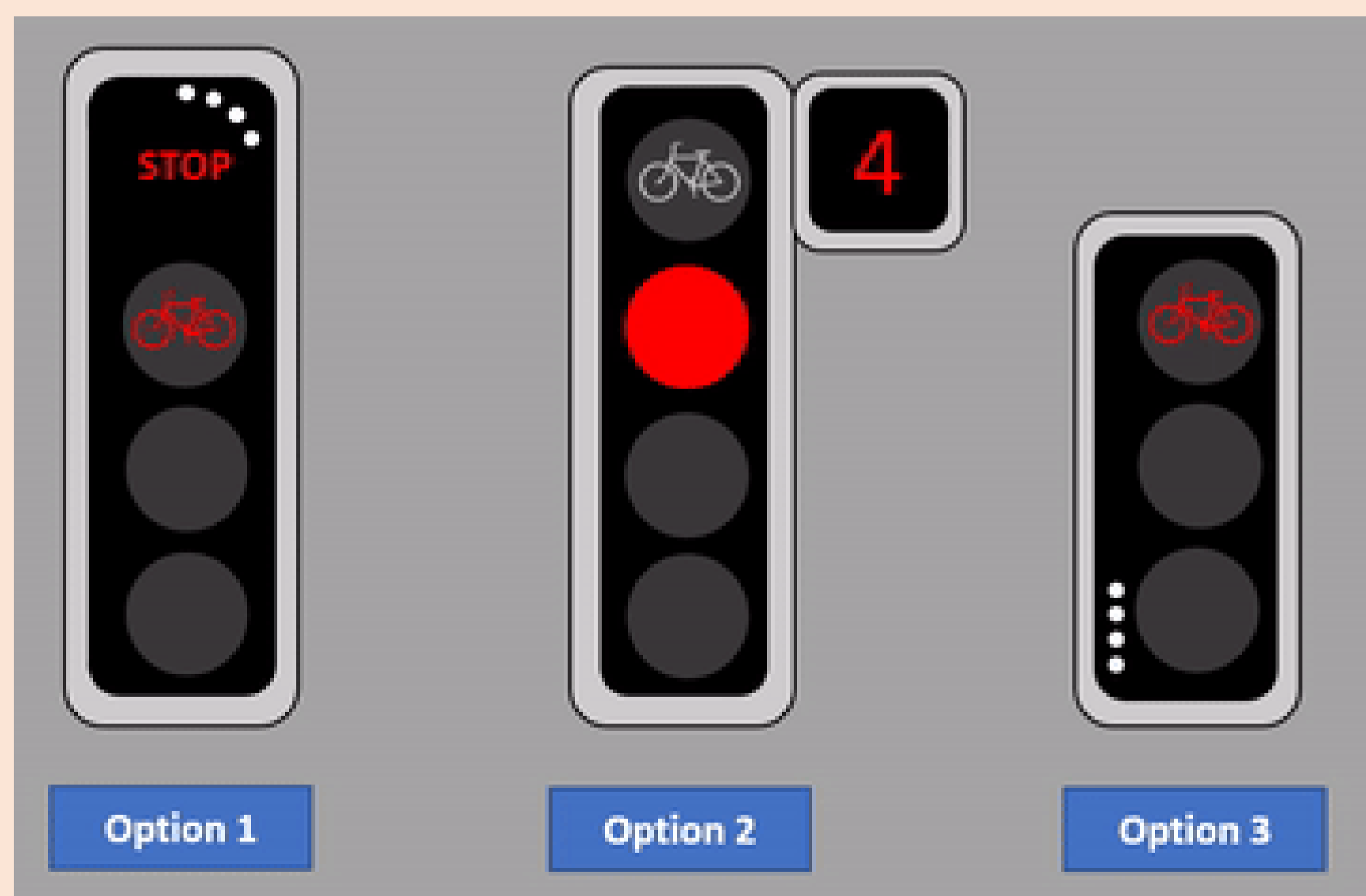
- ❖ For a person on a bicycle at signalized intersections, trail crossings, or midblock locations, knowing how long they must wait to receive a green indication is valuable information.
- ❖ Many cyclists at intersections disregard signal indications and prematurely enter the intersections on red indication due to impatience or belief there is adequate gap acceptance; however, this risk-taking behavior can contribute to crashes involving bicycles.
- ❖ Currently, the U.S. has detectors for bicyclists to indicate to the signal they are present; however, no additional feedback is provided to let bicyclist know that they have been detected or the amount of time until they receive green indication.

## 3. METHODOLOGY

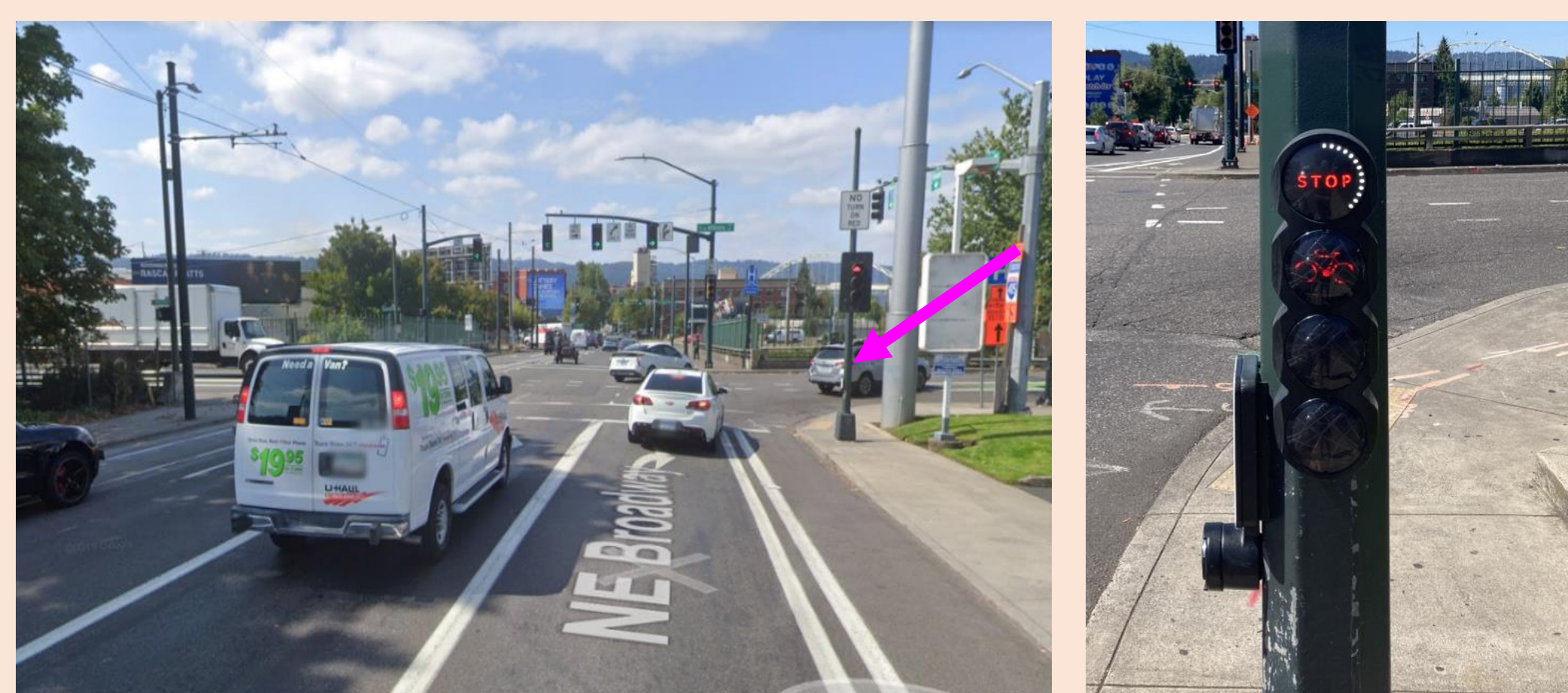
- ❖ Consisted of two (2) elements:
  - 1) Conducting an online survey to elicit the public's comprehension on bicycle countdown timers, and
  - 2) Conducting an intercept survey, in Oregon, to elicit bicyclist's comprehension of bicycle countdown timer systems.



Online Survey Flow for Bicycle Countdown Timers



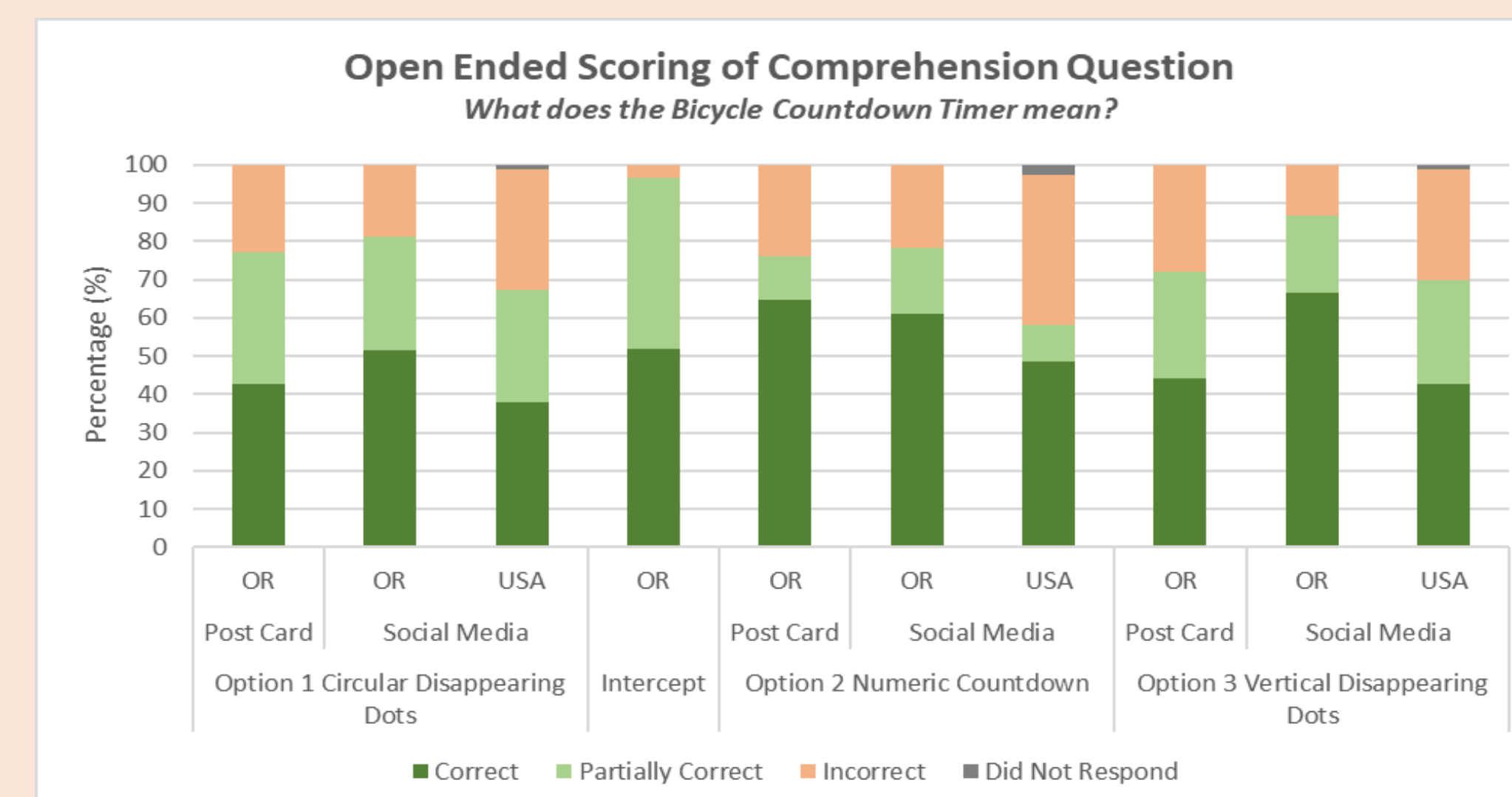
Bicycle Countdown Timer Options in Online Survey



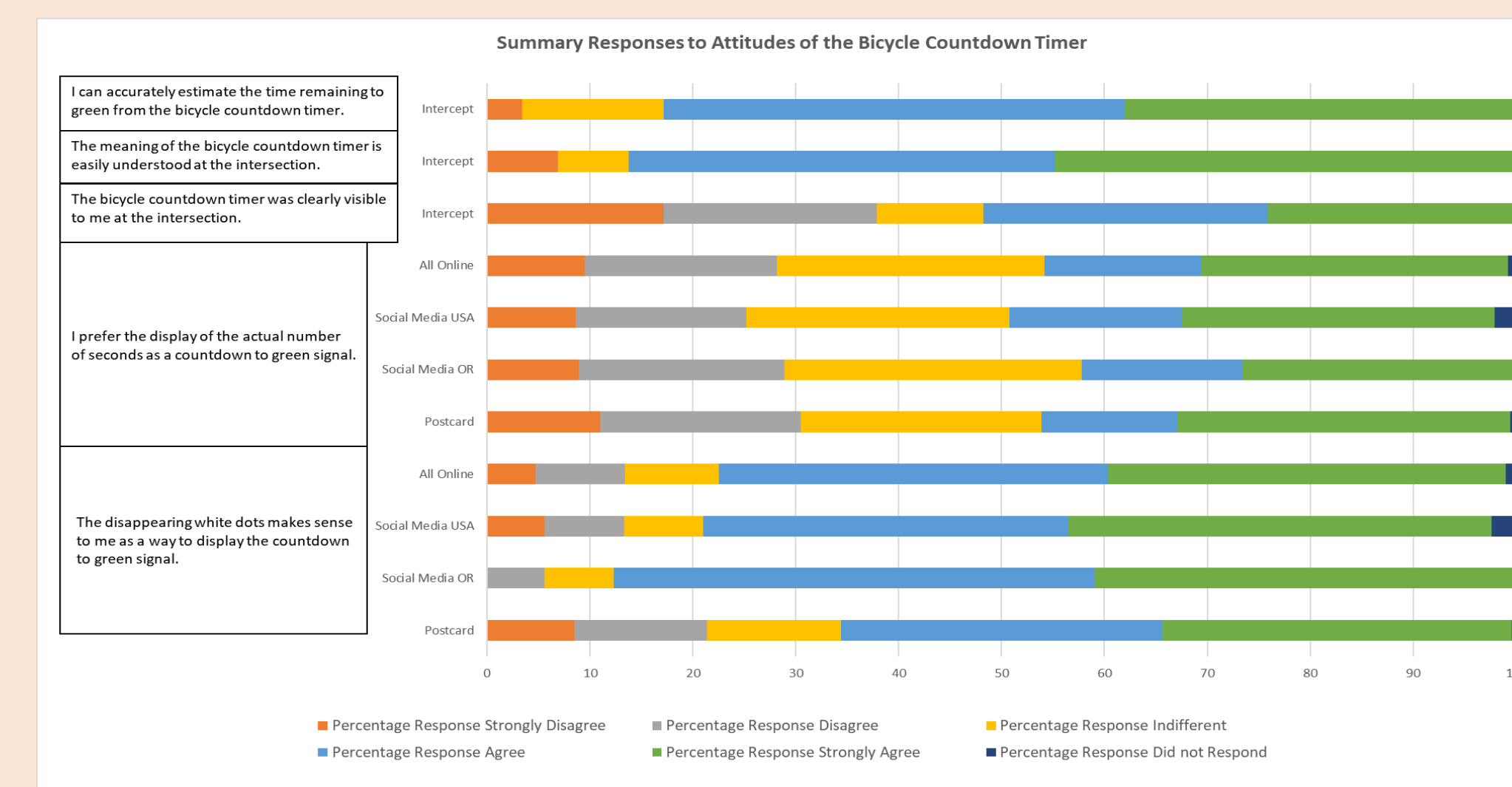
Location where Bicycle Countdown Timer was Installed (left) and Bicycle Countdown Timer (right)

## 4. RESULTS AND ANALYSIS

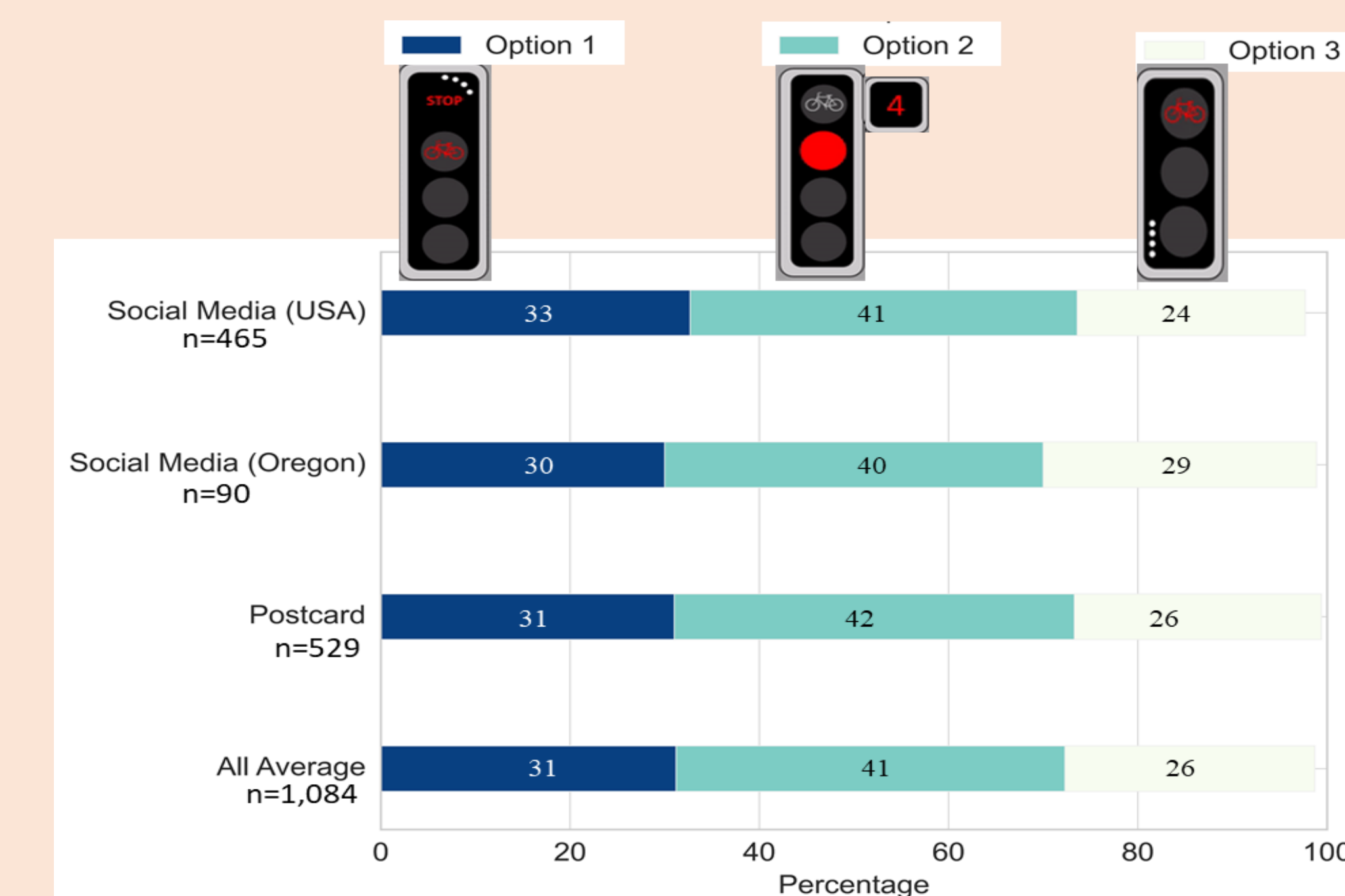
- ❖ The results were broken up into results related to comprehension, attitudes, preferences, and perceptions of the bicycle countdown timers in both the online survey and intercept survey.



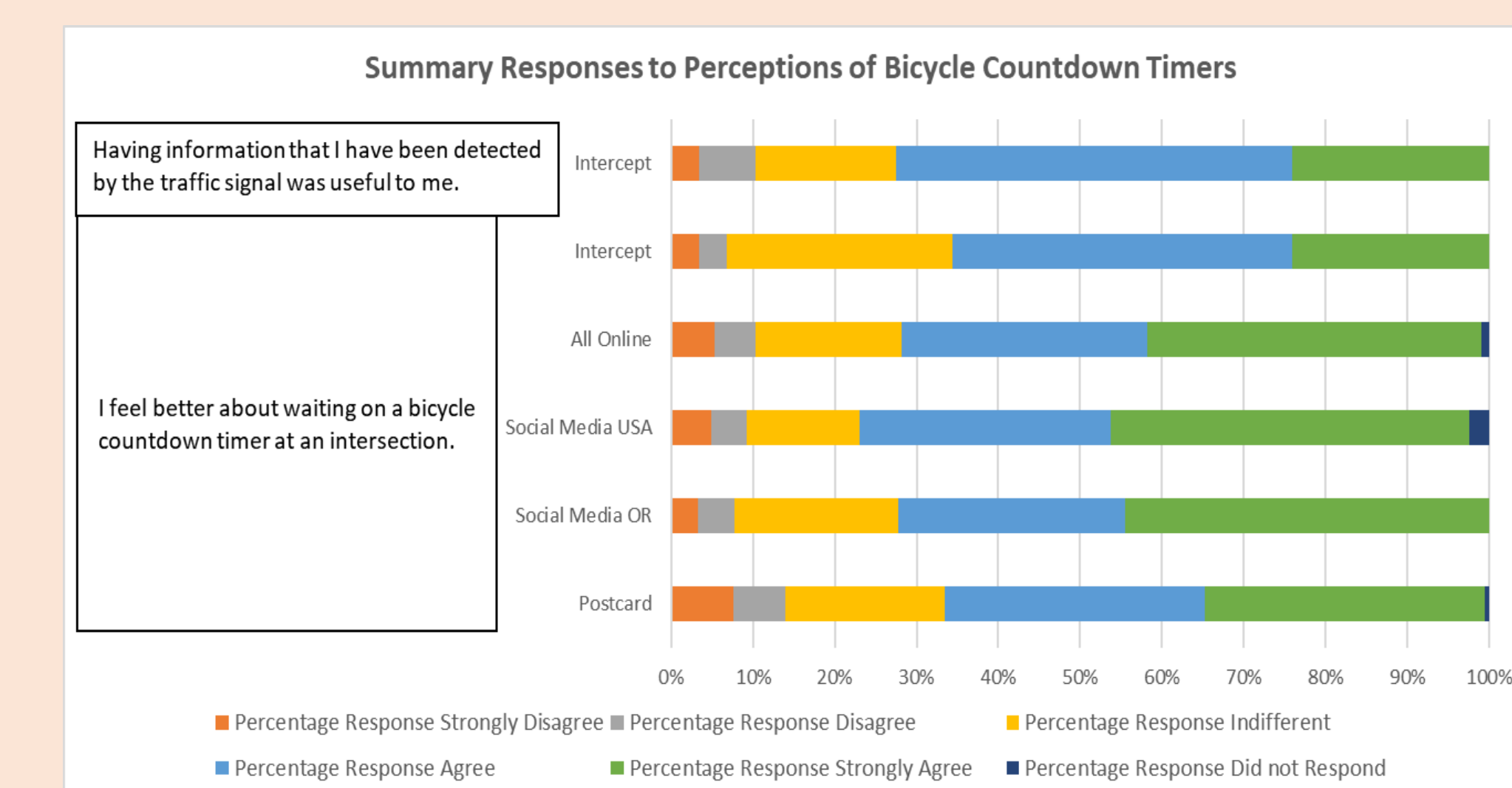
Summary of Open Ended Scoring of Comprehension Question



Summary Responses to Attitudes of the Bicycle Countdown Timers



Preferences for Bicycle Countdown Timer Options in Online Survey



Summary Responses to Perception of Bicycle Countdown Timers

## 5. CONCLUSION

- ❖ Bicycle signal countdown displays were intuitive, and understood by 60% of respondents. This is encouraging as is reasonable to assume that most respondents were answering questions about hypothetical conditions (i.e., stated-preference survey).
- ❖ The display with the numerical countdown timers had the highest percentage of correct responses in the online survey and was preferred by most respondents.
- ❖ The bicycle countdown timer, with circular disappearing dots, located within the field, yielded 52% correct responses to comprehension of intercepted cyclists. An additional 45% of responses were coded partially correct.
- ❖ Respondents generally agreed that the presence of the countdown timer while waiting at an intersection would improve their experience, with 70% strongly or somewhat agreeing from the online survey, and 65% strongly or somewhat agreeing from the intercept survey.

## 6. ACKNOWLEDGMENT

The authors thank the Oregon Department of Transportation (ODOT) and Federal Highway Administration (FHWA) for funding this research. Additional students at Oregon State University helped collect and reduce data (Logan Scott-Deeter, Eileen Chai, Travis Larson, Amy Wyman, Leena Breuer, Jasmin Woodside, Dylan Horne, and Ananna Ahmed, graduate research assistant).

## 7. REFERENCES

- ❖ Monsere, C., Kothuri, S., Hurwitz, D., Cobb, D., & Jashami, H. (2021). Assessment of Bicycle Detection Confirmation and Countdown Devices (No. FHWA- OR-RD-21-18).
- ❖ Federal Highway Administration (FHWA), 2009. Manual on Uniform Traffic Control Devices. U.S. Department of Transportation.

## 2. INTRODUCTION

With an increase in bicycling rates, there is a critical need to invest in active transportation to help create a safer, more connected and accessible transportation system. A key link in the bicycle network is at intersections and crossings.

- ❖ One stressor at intersections is knowing how long one must wait to receive a green indication.
- ❖ In international context, small, nearside bicycle signal heads that contain a countdown timer that visually estimates the amount of waiting time is provided; however, in U.S. context, MUTCD only allows countdown timers for pedestrian signals indicating the duration of clearance interval.

The objective of this study was:

- ❖ To evaluate the comprehension of bicycle countdown timers and to determine whether they influence the quality of the cycling experience in the U.S. context.

