Driver and Bicyclist Comprehension of Blue Light Detection Confirmation Systems

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1.MOTIVATION

- Signalized intersections present an increased crash risk for bicyclists and are a location of elevated stress.
- Currently, at signalized intersections, bicyclists are primarily detected by in-pavement inductive loops. While vehicles are almost always detected due to their size and predictable stopping location, that is not the case for bicyclists, as bicycle frames are much harder to detect which can lead to failure in detection, increased delays, and lower quality experience.
- A blue light detection confirmation (BLDC) can provide positive confirmation to bicyclists that they have been detected. Application includes a blue light placed on the far side near the signal head that lights up when a bicyclist is detected and call is placed; however, because the public does not understand how traffic signals operate, it is critical to present a message that is comprehended by most people.

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 for bicyclists is determining if detection has occurred.
- If bicyclists are given positive confirmation that they have been detected, this could lead to high quality riding experience and reduced signal non-compliance.

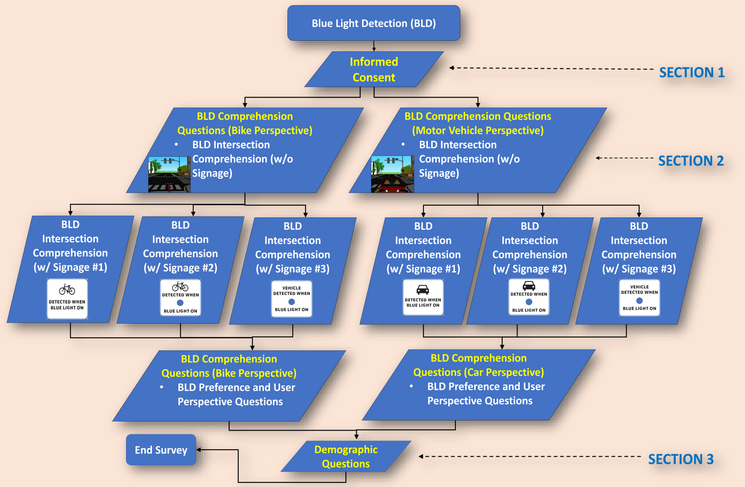
The objective of this study was:

- To investigate the use and comprehension of a BLDC system in US Context.

3.METHODOLOGY

Consisted of two (2) elements:

1) Conducting an online survey (1,084 respondents) to elicit the public's comprehension on BLDC systems, and
2) Conducting an intercept survey (151 respondents), in Oregon (Eugene and Portland), to elicit bicyclist's comprehension of BLDC systems.



Online Survey Flow for BLDC for Bicycle and Vehicle Perspective

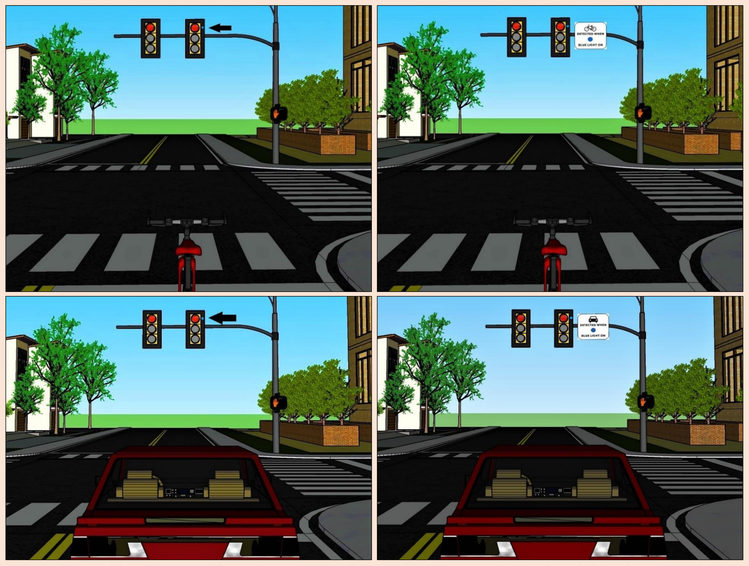
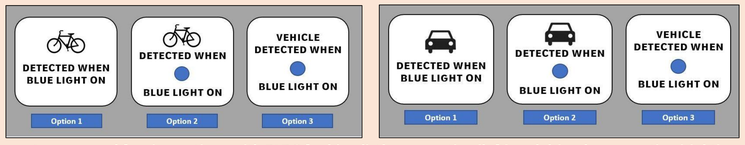


Image used for open-ended question on BLDC for bicyclist's perspective (top) and driver's perspective (bottom) with and without signage

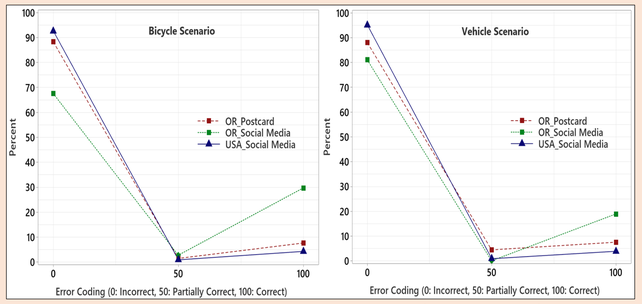


Images used for sign options with BLDC for bicyclist's perspective (left) and driver's perspective (right)

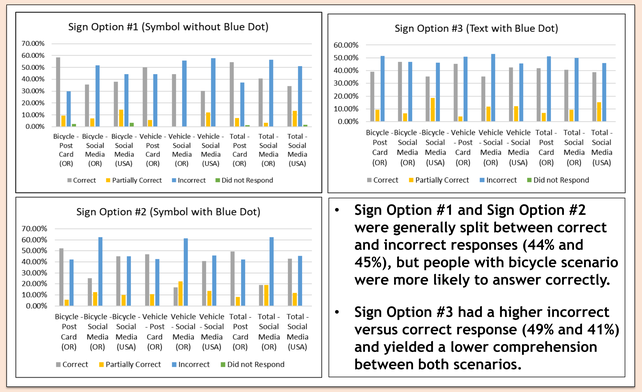
BLDC in Traffic Signal Housing with Accompanying Sign (left) and BLDC Embedded in Sign (right)

4.RESULTS AND ANALYSIS

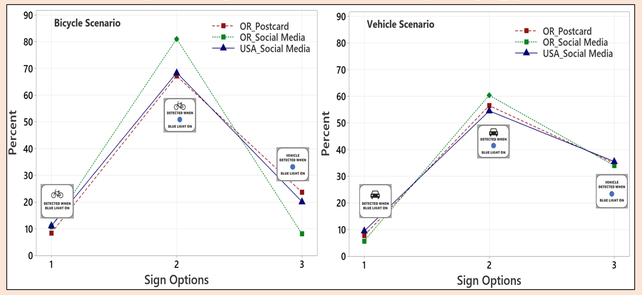
- The results were broken up into results related to comprehension (with and without signage), preferences, and attitudes/perceptions of the BLDC systems in both the online survey and intercept survey.



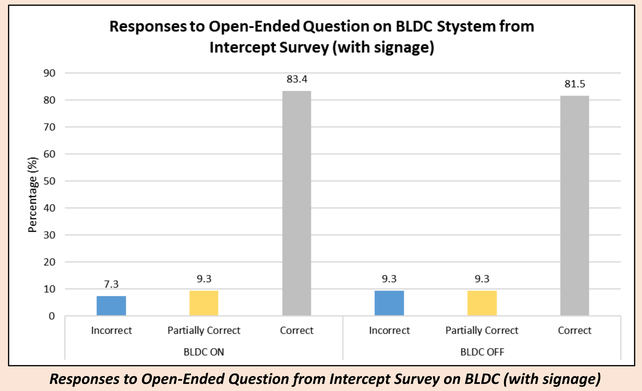
Responses to Open-Ended Question on BLDC (without signage)



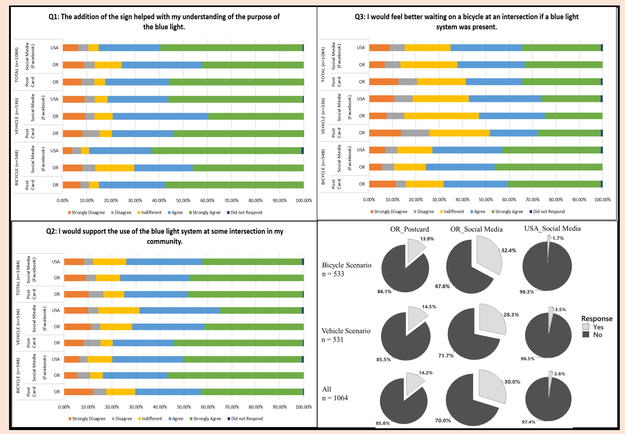
Responses to Open-Ended Question on BLDC (with signage)



Blue Light Detection Confirmation (BLDC) Comprehension (percentages selecting a particular sign)



Responses to Open-Ended Question from Intercept Survey on BLDC (with signage)



Summary Responses to Attitudes and "Experience at Intersection" Regarding Blue Light Detection Feedback

5.CONCLUSION

- Most online respondents (approximately 94% average of all three sources) indicated that they didn't know what the blue light meant or provided a response was incorrect. However, with supplemental signage, correct responses increased between 40 to 50%. Additionally, there was a strong preference for Sign Option #2 (i.e., symbol with blue dot).
- The intercept survey yielded 83% and 81% correct when the light was ON or OFF, respectively. Furthermore, the higher comprehension rates could be a result of familiarity of the device in both Eugene and Portland in Oregon.
- Respondents generally agreed that the addition of the signage helped them with the understanding of the BLDC system. Additionally, respondents indicated that they would support the use of the BLDC system in their community.

6.ACKNOWLEDGMENT

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7.REFERENCES

- Monsere, C., Kothuri, S., Hurwitz, D., Cobb, D., & Jashami, H. (2021). SPR 825: Assessment of Bicycle Detection Confirmation and Countdown Devices (No. FHWA- OR-RD-21-18).

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