

## Design and Development of a Safety Equipment and Accessory for Bicycle Users

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**Abstract :** Safety plays a significant role in everyone's life on a day-to-day basis. We wish ourselves and our loved ones their safety as we all venture out on our daily commute. The road is undeniably dangerous and unpredictable, with abundant traffic collisions and pedestrians experiencing various injuries. For bicycle users, the risk of accidents is even more exacerbated, and injuries may be severe. Even when cyclists try their best to be safe and protected, the possibility of encountering danger is always there. Despite being equipped with protective gear, safety is never guaranteed. Cyclists often settle for helmets and standard reflector vests to establish a presence on the road. There are different types of vests available, depending on the profession. However, traditional reflector vests, mostly seen on construction workers and traffic enforcers, were not designed for riders and their protection from injuries. With insufficient protection for riders, they need access to ergonomically designed equipment and accessories that suit the riders and cater to their needs. This research aimed to offer a protective vest with safety features for riders that is comfortable, effective, durable, and intuitive. This sheds light and addresses the safety of the biker population, which continuously grows through the years. The product was designed and developed by gathering data and using the cognitive mapping method to ensure that all qualitative and quantitative data were considered in this study to improve other existing products that do not have the proper design considerations. It is known that available equipment for cyclists is often sold separately or lacks the safety features for cyclists traversing open roads. Each safety feature like the headlights, reflectors, signal or rear lights, zipper pouch, body camera attachment, and wireless remote control all play a particular role in helping cyclists embark on their daily commute. These features aid in illumination, visibility, easy maneuvering, convenience, and security, allowing cyclists to go for a safer ride that is of use throughout the day. The product is designed and produced effectively and inexpensively without sacrificing the quality and purpose of its usage.

**Keywords :** bicycle accessory, protective gear, safety, transport, visibility

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