ECE 411-

Requirements Specifications- Motorcycle Safety Vest

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**Objectives:**

The goal of our project is to produce a safety vest with LED lighting that meets ODOT requirements. The device will enhance visibility of motorcycle riders by displaying turn and braking signals on an LED vest, thereby more prominently displaying these signals to other motorists. The vest can be worn on top of anything else the biker is wearing; including but not limited to other safety jackets, backpacks, or normal clothing.

**Background:**

There are over 100 million motorcycles in use in the world today. Turn and brake signals on a standard motorcycle are not as easily visible as they are on other motor vehicles. The number of fatalities due to accidents for bikers is the highest of any other motor vehicle. The risks of riding a motorcycle may be greatly reduced by increasing the visibility of the biker with more prominent lighting displays.

**Functionality:**

The inputs to the device are the turn and brake signals from a motorcycle or other 2 wheel motor vehicle.

The output of the device is an LED display which indicates turning or braking of the bike.

The device will operate under weather conditions including rain, high humidity, excessive dust, and high or low temperatures. The device will also be subject to the shock of improved and non-improved roadways.

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Problem Statement

Needs Statement

Objective Statement

Background

Marketing Requirements

Objective tree

Product Design Specification

1. Identify requirements
2. customer
3. Environment
4. Technical community
5. Ensure requirements are well-formed (meet criteria)
6. Abstract
7. Verifiable
8. Unambiguous
9. Traceable
10. Realistic
11. Organize requirements
12. Similar requirements grouped together
13. Relate marketing and engineering requirements
14. Validate the requirements specification

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| Marketing Requirements | Engineering requirements | Justification |
| 1,2 | System must be “weatherproof” (immune to normal rain, humidity, wind, dust, and temperature ranges) | The device will be operated in all climate regions of the world and will be operated mostly outdoors. |
| 1,3 | System must be small enough to fit on the smallest motorcycles | Some motorcycles have limited space for which to install the device. |
| 4 | System must enhance visibility of bikers | Standard motorcycle signals are too low and too close together for maximum visibility |
| 3 | System must operate from a 9V source maximum | The device should be powered by readily available sources |
| 4 | System must receive 4 signals from a motorcycle and display 3 signals | The standard traffic signals displayed by a motorcycle are left or right turns and front or back brakes. |
| 1,2 | System should be immune to vibration effects | The device will be expected to operate on dirt roads and other non-improved roadways. |

Marketing requirements

1. The system should require little or no maintenance by the user
2. The system should operate under any normal environmental conditions
3. The system should be installable by users with minimal technical experience
4. The system should take standard traffic signals from a motorcycle and display them more prominently for other motorists.