

Element F: Consideration of design viability

This entry would be likely to receive a **score of 2**, based on the EDPPSR.

The Proposed design was reviewed based on one extra-functional consideration—that of cost. The judgment that the students have reached and expressed regarding the capacity of the proposed solution to address prototype to consumer/end user viability is inadequately supported. Without more detail about who was surveyed (and how many), it is not clear that information presented as evidence is credible.

Cost is certainly an important consideration, but by no means the only or most important one, that the students involved in this project should address. Is the device capable of being manufactured? Will it be reliable? Is the anticipated technology required readily available under the conditions in which the pressure monitor will be likely to be used? What about some information about market demand? Possibly talking with bicycle store owners about their thoughts of how well the product would sell or what level of priority they would give to having this product on their shelves would be a step toward creating a more well-rounded picture of the likelihood of this idea making it from prototype to customer/end user.

Engineering Design Process Portfolio Scoring Rubric Component and Element Titles

Component I: Presenting and Justifying a Problem and Solution Requirements

- Element A: Presentation and justification of the problem
- Element B: Documentation and analysis of prior solution attempts
- Element C: Presentation and justification of solution design requirements

Component II: Generating and Defending an Original Solution

- Element D: Design concept generation, analysis, and selection
- Element E: Application of STEM principles and practices
- **Element F: Consideration of design viability**

Component III: Constructing and Testing a Prototype

- *Element G: Construction of a testable prototype*
- Element H: Prototype testing and data collection plan
- Element I: Testing, data collection and analysis

Component IV: Evaluation, Reflection, and Recommendations

- Element J: Documentation of external evaluation
- *Element K: Reflection on the design project*
- Element L: Presentation of designer's recommendations

Component V: Documenting and Presenting the Project

- Element M: Presentation of the project portfolio
- Element N: Writing like an Engineer

Please Note: Elements M and N require no submission from the portfolio author(s) and are intended to be scored based on the portfolio work as a whole from what has been submitted from Elements A through L

Element F: Consideration of design viability

- 5** The proposed design was carefully reviewed based on several relevant extra-functional considerations; a judgment about design viability based on those considerations—the capacity of the proposed solution to address the problem—is clearly realistic and well supported with credible evidence.
- 4** The proposed design was adequately reviewed based on several relevant extra-functional considerations; a judgment about design viability based on those considerations—the capacity of the proposed solution to address the problem—is generally realistic and adequately supported with credible evidence.
- 3** The proposed design was partially reviewed based on one or two relevant extra-functional considerations; a judgment about design viability based on those considerations—the capacity of the proposed solution to address the problem—is only somewhat/sometimes realistic and is only partially supported with credible evidence.
- 2** The proposed design was superficially reviewed based on one or two relevant extra-functional considerations; a judgment about design viability based on those considerations—the capacity of the proposed solution to address the problem—may be generally although not completely unrealistic and/or may be inadequately supported with credible evidence.
- 1** The proposed design was superficially reviewed based on one or two extra-functional considerations of marginal relevance; a judgment about design viability based on those considerations—the capacity of the proposed solution to address the problem—may be unrealistic and/or not supported with any credible evidence.
- 0** There is no evidence provided that the proposed design was reviewed based on any extra-functional considerations.

Evidence of Design Feasibility

Cost Considerations

We believe that we can manufacture and sell our design for the cost of \$35. According to our survey, majority of the people said they would be willing to spend no more than \$40 dollars for a device that monitored their bicycle tire pressure. Additionally, we asked competitive bicycle riders on the forums roadbikereview.com, asking cyclists if they would be willing to spend \$40 for a device that monitored tire pressure and a majority validated that this price would be relatively cheap.



Surely, the pricey \$89 sensor used in our pressure is far too expensive. However, we have found and purchased a \$10 pressure monitor that digitally reports the pressure. Therefore, we believe that a cheaper way to measure pressure does exist. With that said, our final design would not include the higher priced component but rather the less inexpensive component in addition to the wireless component in which we intend our final design to include.

We believe our product can be manufactured and sold due to the mere fact that there is no product on the market that has the ability to monitor and alert bicycle tire pressure.