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Basic Utility Vehicle Aggregate Unloader System

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BUV Aggregate Unloader System

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In a collaborative project between the University of Indianapolis and BUV Ministry, this project focuses on the design, fabrication, and testing of an aggregate unloader system that will attach to a Basic Utility Vehicle (BUV). The BUV is a small utility vehicle that is designed for and used in developing countries across the world, providing an inexpensive means of transportation that can be used in many application venues, including agricultural, medical, and construction. The student team utilized a Design for Six Sigma (DFSS) project framework called DesignSpine. This framework focuses on capturing the voice of the customer that is a part of DFSS and using DFSS tools to create a user-focused design. Throughout this process, the team has been able to deepen their understanding of the DesignSpine process and our understanding and application of Design for Six Sigma tools towards quality design by applying them to the development of the aggregate unloader system. The BUV Aggregate Unloader System will provide a safe method of unloading aggregate from the bed of the BUV that will allow the user to transport and dispense more material. The attachment will not raise the vehicle's center of gravity when compared to the alternative dump bed modifications that current users are creating. The client and users were interviewed to determine the requirements and constraints for our design alternatives. The final alternative will be a flexible pouch carrying system that will fit underneath the rear section of the ladder frame and will use a cam-locking system to lock the pouch for storing and transporting materials. The pouch attachment is covered by a removable floor within the bed of the BUV that allows for the bed to be used as if the attachment was not there and can be stored on the side of the vehicle. The attachment will be built using easy to access materials and parts commonly found in the developing countries it is used in. With the attachment being designed for simplicity, material and manufacturing cost remain low, making the attachment appealable to users. This simplicity allows for repairs and maintenance to be carried out by individuals with little mechanical knowledge. BUV Ministry plans to implement this solution as an optional attachment for those end users that choose it. Currently, the team is working on material testing for the pouch material and the methods to attach these materials together.