Our concept option consists of a more effective and efficient method for recycling aluminum goods, specifically potato chip bags and aluminum foil wraps. Many students and faculty members consume chips and foods wrapped in aluminum foil, but do not realize that it is actually made out of aluminum. As a result, chip bags and aluminum foil is either littered or tossed in the regular trash bins and therefore, the aluminum is not properly disposed of and recycled. In order to alleviate this issue, trash bins explicitly labeled for chip bags, aluminum foil, and other food packaging products that use aluminum that aren’t as obvious may be placed within campus. This concept appropriately disposes the aluminum so that it can be recycled and used for other purposes.
A. Definition of Needs and Requirements

Penn State University Park understands the importance of recycling throughout campus. Several initiatives have been implemented to expedite the process of recycling with the goal of further building a sustainable campus. Trash bins for compost, landfill, paper, plastics, and metals have been placed on every dorm floor, the HUB, and many other areas of mass consumption. Although there are many recycling options, students and faculty members fail to recycle certain goods containing aluminum. As a result, significant amounts of aluminum are not properly disposed of and are not recycled. Specifically, chip bags, aluminum foil, and other food packaging products of the like are not properly recycled. A solution to this issue is needed to alleviate this problem. Our team has proposed an idea to appropriately approach this subject—recycling bin explicitly labeled for the disposal of chip bags, aluminum foil, and products of the like. Such recycling bins will be added to the line of disposal bins located on every dorm floor and areas of mass consumption.

B. Detailed Description of Competing Alternative Conceptual Options

Solution 2:

Introduction of more aluminum frames within the transportation system of Penn State, including the CATA bus system, transportation vans and other vehicles.

Problem: Steel frames require more energy to move and are less environmentally friendly than aluminum frames.

Solution: Replace these steel frames with aluminum frames, which would reduce greenhouse gas emission and would require less gas to move.

Human factors: Not many human factors are involved, besides many people use the CATA bus transportation system, and including these aluminum frames would increase the efficiency that people get around.

Innovative: Since these aluminum frames are not utilized within the Penn State campus, this idea is innovative. This initiative has been taken around the world.

Quality of Life: Quality of life would increase from this because since it requires less energy to operate, less costs are needed to supply the transportation, lessening costs on all levels of
production. Also, less greenhouse gas emissions allows for a cleaner environment, which helps everyone and the quality of life by helping conserve the ecosystem.

Implementation: Implementation of this product would be difficult since new vehicles would be needed for the aluminum frames to be implemented. With this, the transportation system may be taken down for a day to put these frames in. Aluminum frames, however, can be readily made since aluminum can be welded very easily during the manufacturing process.

Economic viability: The economic incentive to implement this idea is very high. Even with the day off of transportation services, the costs of usage for years to come will be significantly decreased. Studies have shown that the replacement of steel frames with aluminum frames can significantly decrease the energy required to operate the vehicle, meaning less gasoline is needed to run the vehicle. With less gas needed, transportation vehicles will not need to fill up as much. With gas prices being very high, this is a very economically viable option.

Option 3:

Encourage recycling of aluminum by students and faculty members all over campus.

Problem: People on campus tend to avoid recycling aluminum mainly due to ignorance of what can be recycled or the importance of recycling.

Solution: Increase the availability of aluminum recycling bins all over campus. Hold aluminum recycling seminars to show the importance of recycling and its positive effects on the environment. Give public speeches and get people on campus to sign pledges. Finally, hold friendly competitions to get people to recycle aluminum.

Option 4:

Use Aluminum for to go food packaging, not Styrofoam

Problem: For to go, Campus dining including other food services uses Styrofoam for the packaging. Styrofoam, which refers to Polystyrene, has serious problem that it takes at least 500 years to decompose, and furthermore, it contains toxic substances that are extremely perilous to our health.

Solution: Replace Styrofoam with Aluminum for food packaging in campus.

Human factors: Aluminum is non-toxic, and non-tainting. Aluminum packaging offers a high level of corrosion resistance, so people can get fresh food protecting from external influences.
Innovative: Aluminum is widely used for food packaging such as for the cans and Aluminum foils. If we also use aluminum for to go, recycling will be easier due to elimination of Styrofoam for food.

Quality of Life: Using Aluminum for to go packaging will help to prevent environment due to its handful recycling. As Aluminum can restore heat better than Styrofoam, people can still enjoy fresh food even they missed their meals.

Implementation: For the implement, we just need to replace Styrofoam with Aluminum for to go packaging.

Economic Viability: This system will be economical since it makes our recycle system extremely easily. Most food products are made of aluminum (cans, foils) and plastic (forks, spoons, and knives), and just by not using Styrofoam for to go packaging, it takes less time to both workers for recycling and consumers to recycle. Aluminum is also lightest packaging material that leads the way in doing more with less for source reduction in packaging. This saves both raw materials costs and energy resources.

C. Concept Options Analysis/ Selection and Combination

- Appropriate Technology: No complicated technology is needed.
- Available Materials: Recycle bins of the like are already available on campus.
- Affordable Cost: Because no complicated technology or products are needed, this proposal is very affordable.
- Ease of Maintenance: Housing staff of the campus can easily maintain the recycling bins.
- Safety: There are no dangers or safety hazards in this proposal
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<th>Appropriate Technology</th>
<th>Available Materials</th>
<th>Affordable Cost</th>
<th>Ease of Maintenance</th>
<th>Safety</th>
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Sum of totals: Sum of WF = 100%

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D. Detail Description of the selected final conceptual proposal

- Human Factors: Giving another source of recycling to help benefit the cause and cause less waste.
- Innovative: Recycling bins dedicated to this purpose are very innovative because none of them exist already, which would help with recycling purposes
- Quality of Life: Allowing another source of recycling will help the quality of life because it will prevent more trash from entering landfills and will put more recycled aluminum back into the sustainability cycle, helping the environment and eliminated unnecessary costs.
- Implementation: Implementation of this product would not be difficult since most buildings have recycling, but not this specific type of recycling. These recycling cans can be placed in the average spots where normal recycling already exists within buildings.
- Economic Viability: This would be economically viable since most people do not recycle these products from not knowing they can be recycling. With the introduction of these bins, people will know that they can be recycled and people will recycle them, probably at the same percentage that other aluminum products are recycled.