Smart, Secure and Sustainable Roofing Materials

Overview
The city of New Kensington is one of the many “Rust Belt” cities, meaning it has a low population, economic decline, and urban decay. This is currently creating issues in the roofing structures of buildings in NK rendering them unusable. Due to the low income, a conventional roof is not affordable and the city is in need of a “temporary solution” (~5 years) until a permanent solution could be affordable.

Objectives
The mandatory requirements for the temporary solution are to be effective in cost and application. The optimal product should be modular, affordable, resilient, sustainable and adaptable to increase the value and functionality of the buildings in the city.

Approach
• Gather the customer needs and/or requirements by seeing the problem first hand in New Kensington
• At Materials Day at Penn State, a brainstorming session was held with multidisciplinary people who proposed possible problems and solutions for the project
• Analyse all conventional/existing roofing products
• Research all possible temporary roofing/covering methods
• Research material capabilities and compare them with researched data of all weather conditions for the target area
• Creation of a product and 3D model using Autodesk Inventor

Outcomes
• The total cost of the product was appropriate for an investor or renter
• The use of an existing structure being applied to a problem is a great example of market development
• The product designed will allow the possible revitalization to the Corridor of Innovation in New Kensington by giving the property owners access to a solution for their roofing problems