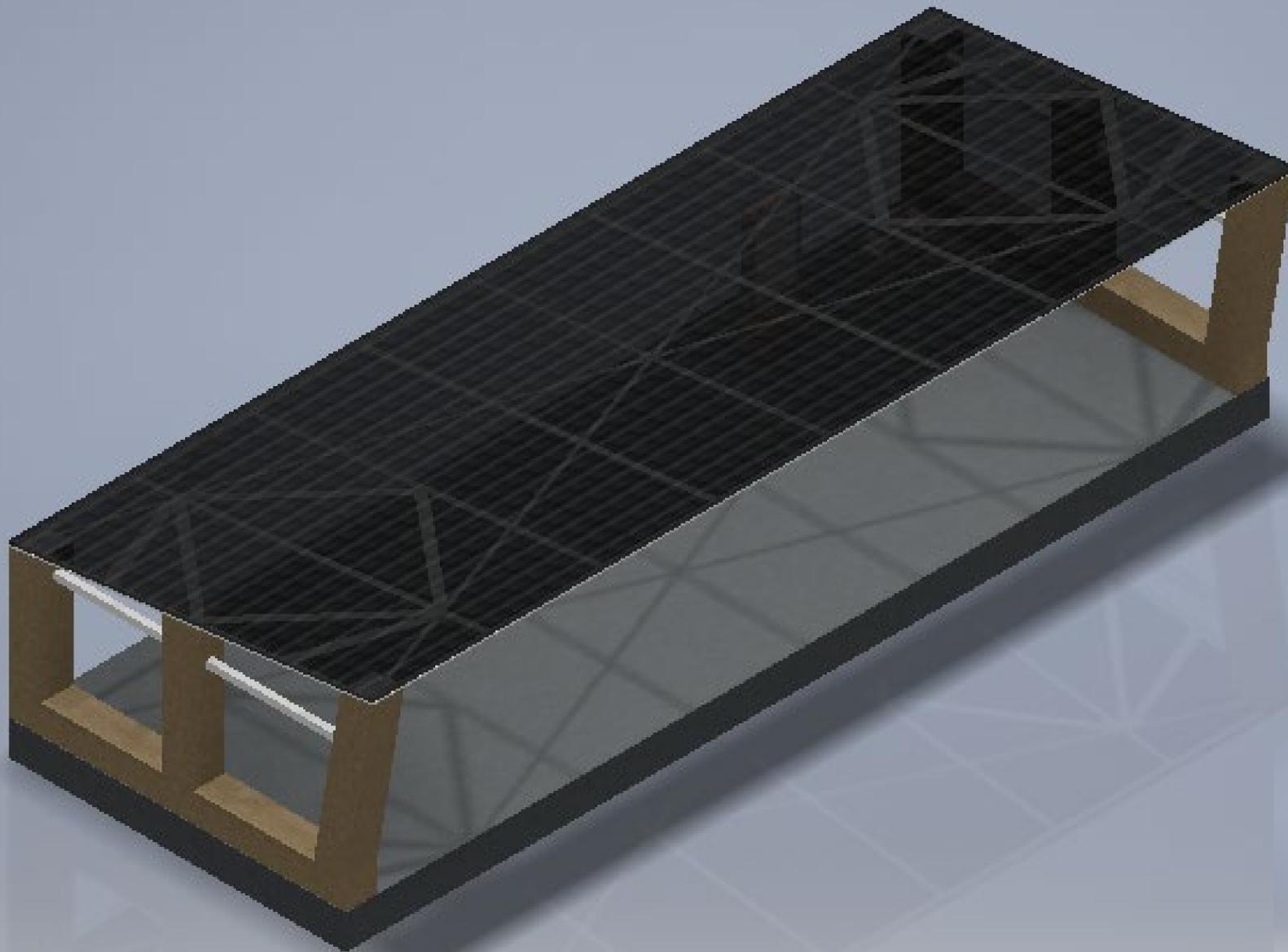


Free E-Bike

Sustainable Public E-Bike Station



WHAT IS IT?

Our goal for this project was to create a shared electronic bike shelter that was as eco-friendly as possible as well as being an asset to the community with amenities such as bench seating on the sides, and personal charging docks for electronic transportation, and helpful public transport information displayed on an interactive kiosk.

WHY IS IT NEEDED?

North Vancouver is a city with opposite seasons, during the summer it is very sunny and hot, while the winters are very rainy. We decided we need to accommodate for riders that want to cycle at any point in the year. Therefore, we added a solar panel that doubles as a roof that keeps the bikes and the riders dry in the wet seasons and gives shade to the riders during the sunny seasons. We felt the need to make our structure out of glulam, which is a very strong engineered lumber, because using lumber is a lot more energy efficient during the production and compliments the natural scenery of beautiful North Vancouver. We also have an interactive kiosk that can calculate routes for bikers and give information on local events and tourist attractions, as well as take payments for renting the bikes. Along with this there are personal e-transportation charging docks/locks where a customer can charge their own e-bike or scooter using their own charging cable. As this setup is self-sufficient and generates income, we see it has great value as over time and usage the station will pay for itself, as well as benefit the environment and its community.

OUTCOMES

In terms of structural integrity, the roof is very strong and safe, and can withhold lots of pressure, which we calculated using a stress analysis simulation, as well as the glulam beams being able to withstand the same amount of pressure. The solar panels that were chosen we calculated to be incredibly efficient and can charge not only all the e-bikes, but most likely the whole station as well. There will be less power available from sunlight in the winter, but according to solar panel manufacturers we have contacted the station will still be able to power itself.

NEXT STEPS

The next steps would be to scale the project up from small 3D printed objects and miniature solar panels and kiosk screens to bigger and more 'life sized' prototypes before starting the real project. Contacting the manufacturers and developers of the materials and solar panels to get quotes and quantitative figures on the properties of the materials and the panels and screens.

HOW IT WORKS:

- The solar panels will extract the electricity from the sun and store the energy in a battery. This energy is then used to charge the bikes.
- The station is built to fit most e-bike companies public charging dock configurations that has its own anti-theft and charging set ups
- The kiosk we designed can show routes to bike, local events and tourist attractions, show ads when inactive, and serve as a place of payment
- The personal e-bike charging stations will have an outlet that people can attach their own charging ports and charge their personal electric transportation devices

