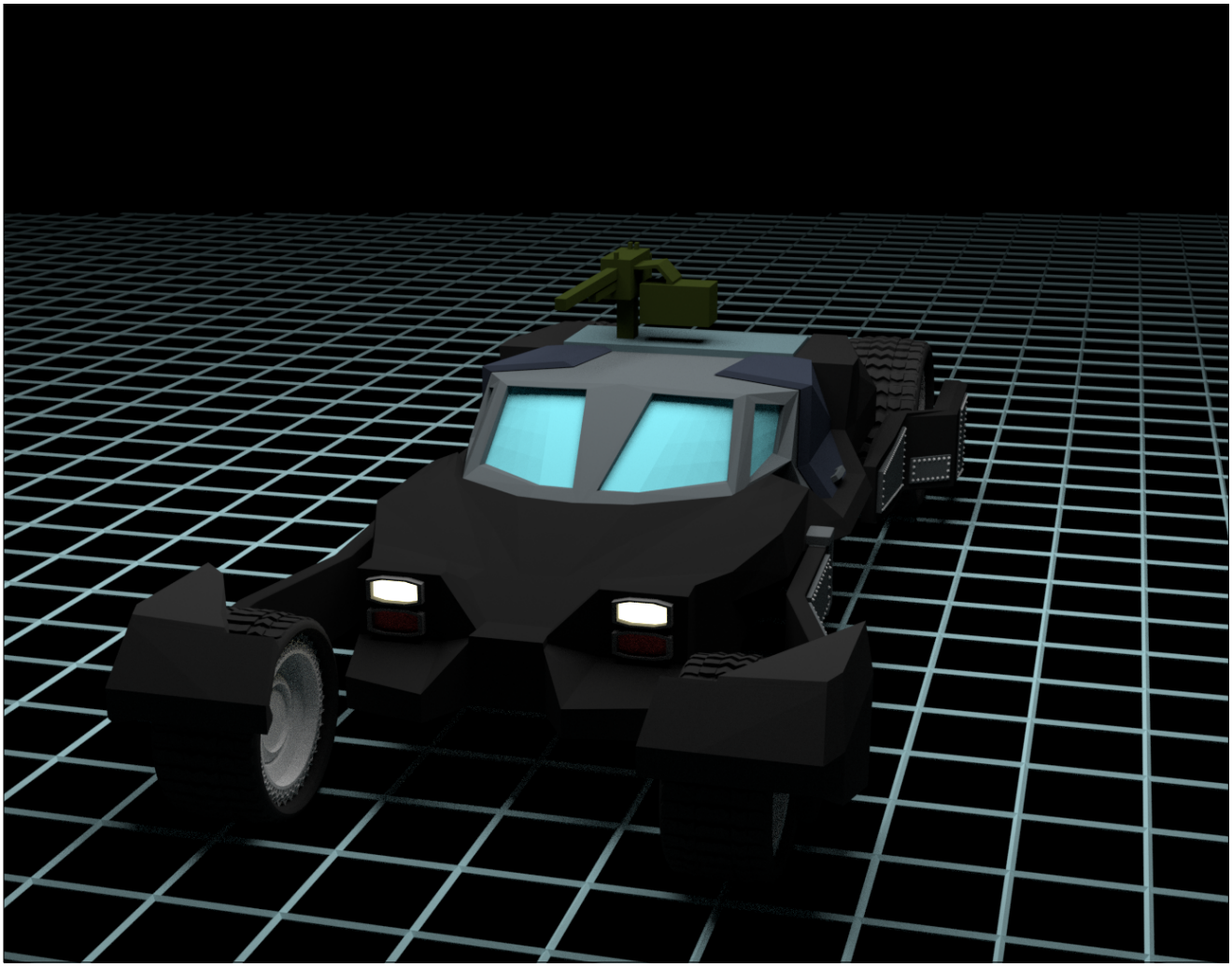

Project Proteus

Prepared for: U.S. Army xTechSearch

Prepared by: Garrett Oetken, Chief Technology Officer

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Objective

Our objective is to develop a versatile, durable and modular combat vehicle providing increased survivability to its passengers with advanced armor and contingency mechanisms, all within a modular system that is more cost effective than traditional vehicles, can adapt to several varied mission parameters and can move with greater agility than current vehicles.

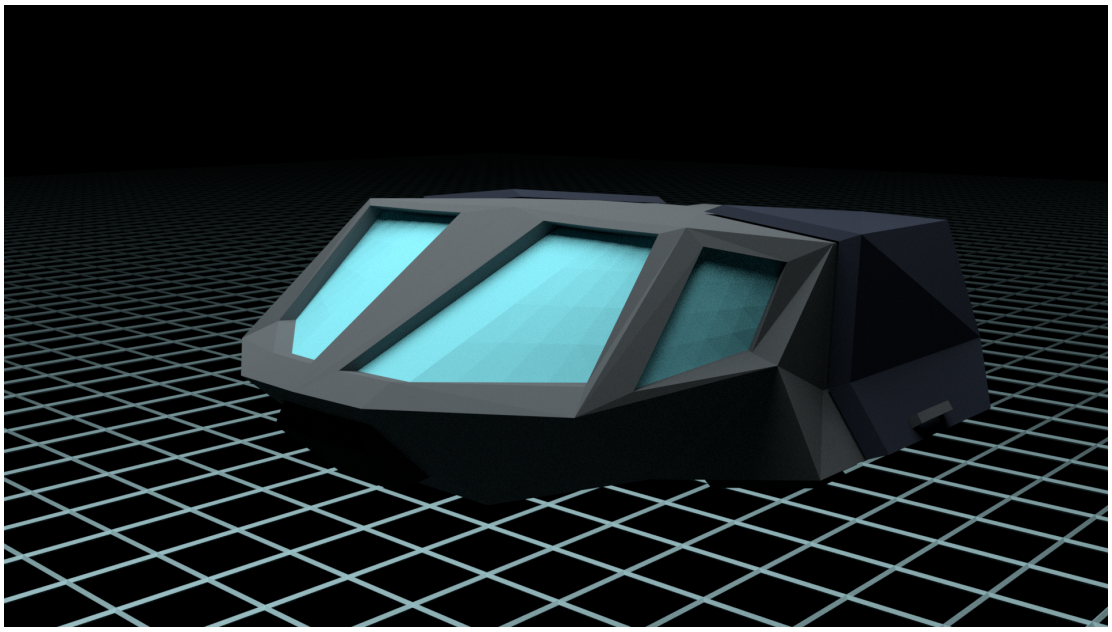
Solution

We have conceptualized a modular electric vehicle with armor that can withstand immense amounts of force and disperse the kinetic / concussive energy to create a minimal amount of internal energy that would normally be transferred to the personnel and equipment inside the vehicle. The modularity of the vehicle would allow it to have multiple configurations, allowing for each mission to have a custom-tailored combat vehicle. Additionally, the vehicle would be very cost effective, with technology upgrades being much more economical due to only having to replace a portion of a vehicle instead of the whole machine in its entirety. The modularity of the vehicle and internal cockpit components would also allow training time to be dramatically reduced. A driver would use a familiar set of controls for a wide range of vehicle types and missions.

Features

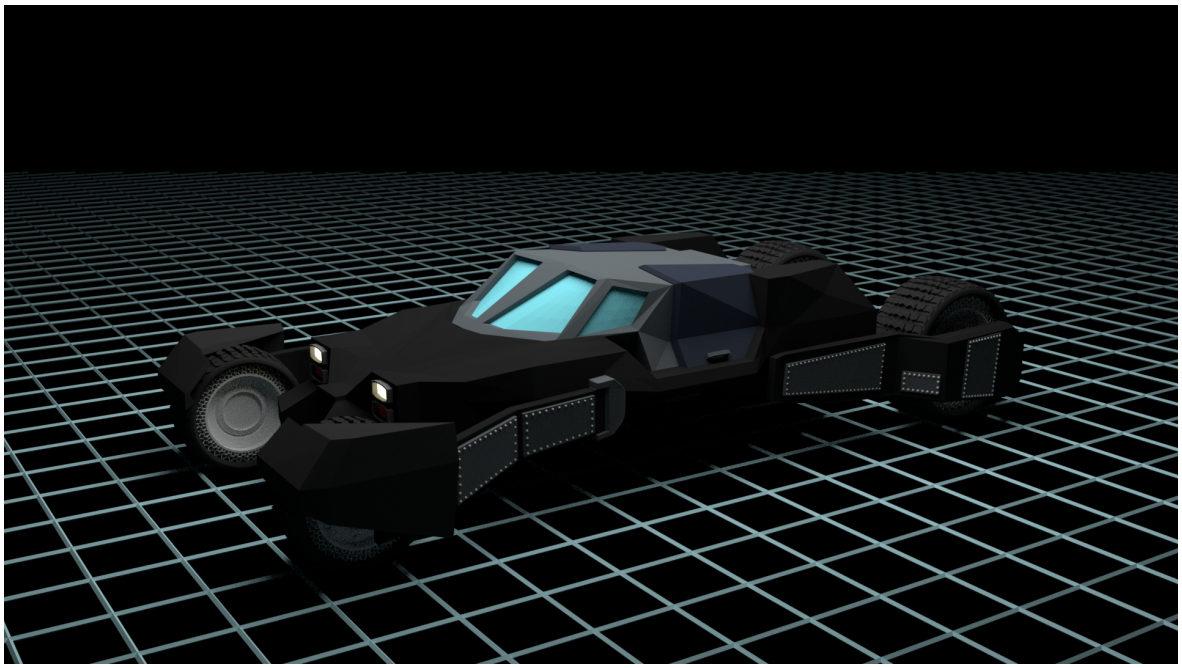
The vehicle is broken up into three modular parts: the **cockpit pod**, the **rear module**, and the **main vehicle body**.

The modular platform's cockpit pod is what makes this design second to none in modularity and safety. It contains room for one driver and one passenger, along with a built in redundant battery pack. This pod would be buoyant enough to float in the event of mission in/near a water environment. The cockpit pod is heavily armored with light and incredibly durable "new material" and incorporates bulletproof glass in the windows, as well as non-Newtonian fluid within the armor plating, in order to absorb kinetic energy and keep the passengers safe while minimizing the chance of traumatic bodily / brain injury (TBI). The doors on the cockpit pod are fitted with charges at the hinges so that the door may be blown off in the event of an emergency. This option is much more conducive to escaping the vehicle in an emergency situation than current used technology in MRAPs or HUMMVEEs (250lb up armored doors are almost impossible to move while wearing full kit especially if the vehicle is on it's side or upside down).

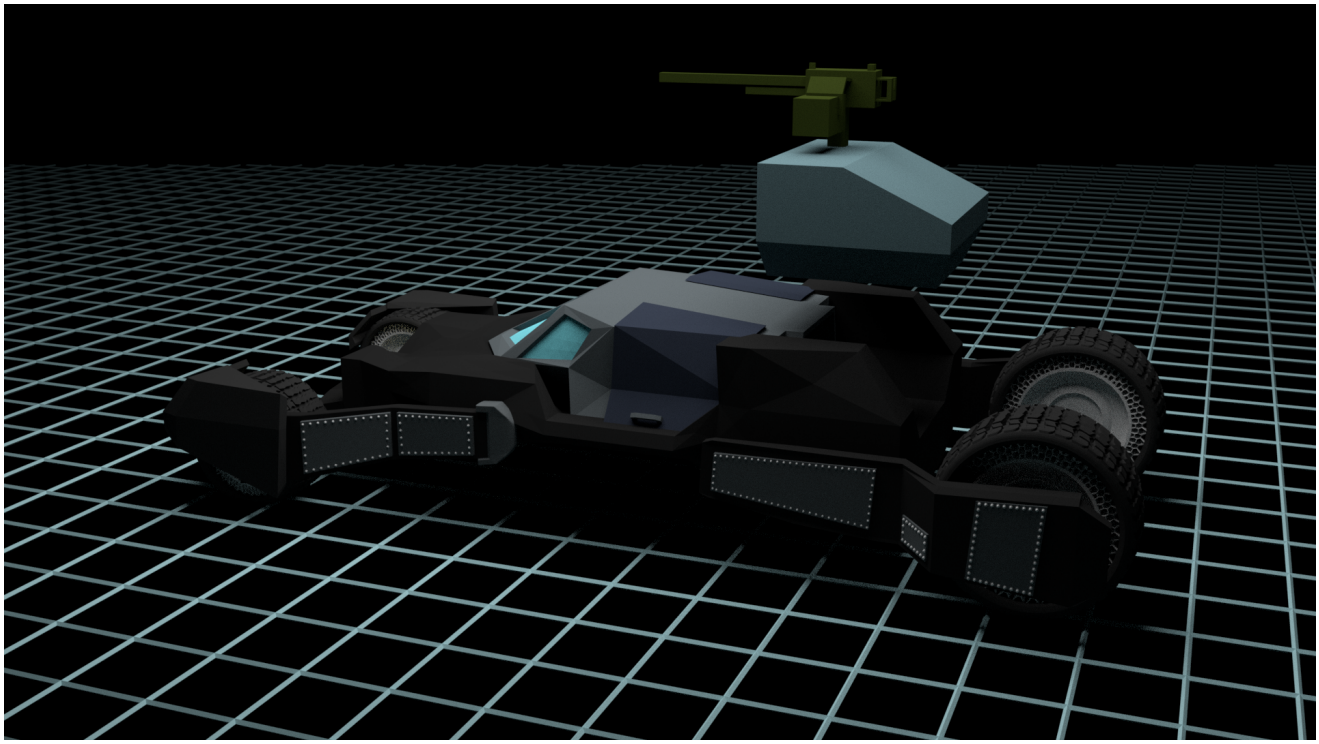


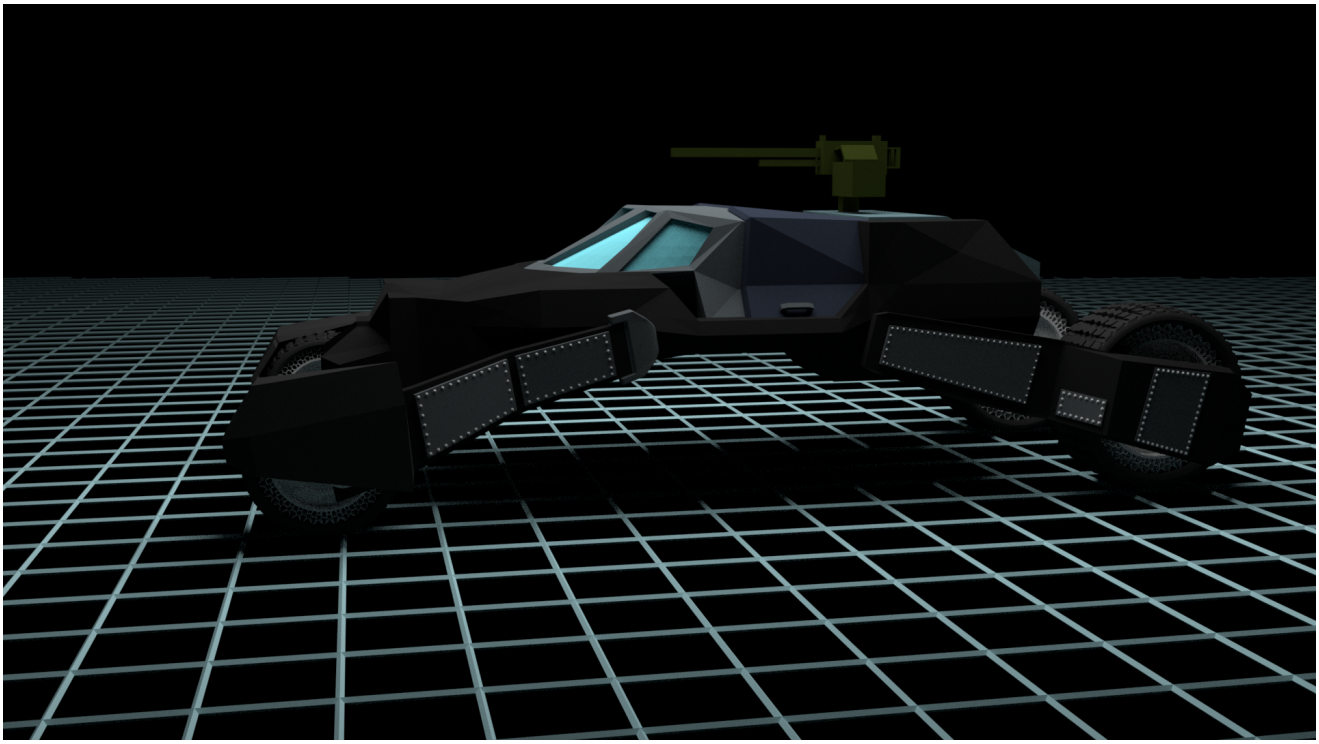
This cockpit pod is the main focus of this entire design. It is inserted into the body of the vehicle via a series of simple quick-detach connection points (magnetic locking system) that transfer information and electricity, very similar to a USB port on a computer. The body has its own battery that works in conjunction with the cockpits battery to share power and allocate energy resources where necessary or in the event of an emergency. For example; in the event of being stranded in the desert it might be more important to allocate energy to keeping the occupants cool as opposed to powering the weapon systems. This cockpit can be dropped into any chassis with the software package recognizing the different configurations as soon as power flows between the two units. This information flow is almost instantaneous as the connection is made.

The main body also has a slot in the back for a drop-in rear module that can be easily installed for each mission. Modules have access to the cockpit pod for power trading, passenger access, and other needs. Possible modules include: command center (additional passengers and logistical equipment), weapons attachments (machine guns, light artillery, small missile launchers), additional battery (for long range missions), drone deployment pod (in this case, a single vehicle could use onboard computers to manage several small drones), and



simple storage. This rear module gives an almost unlimited number of variations to the vehicle for just as many different mission parameters.

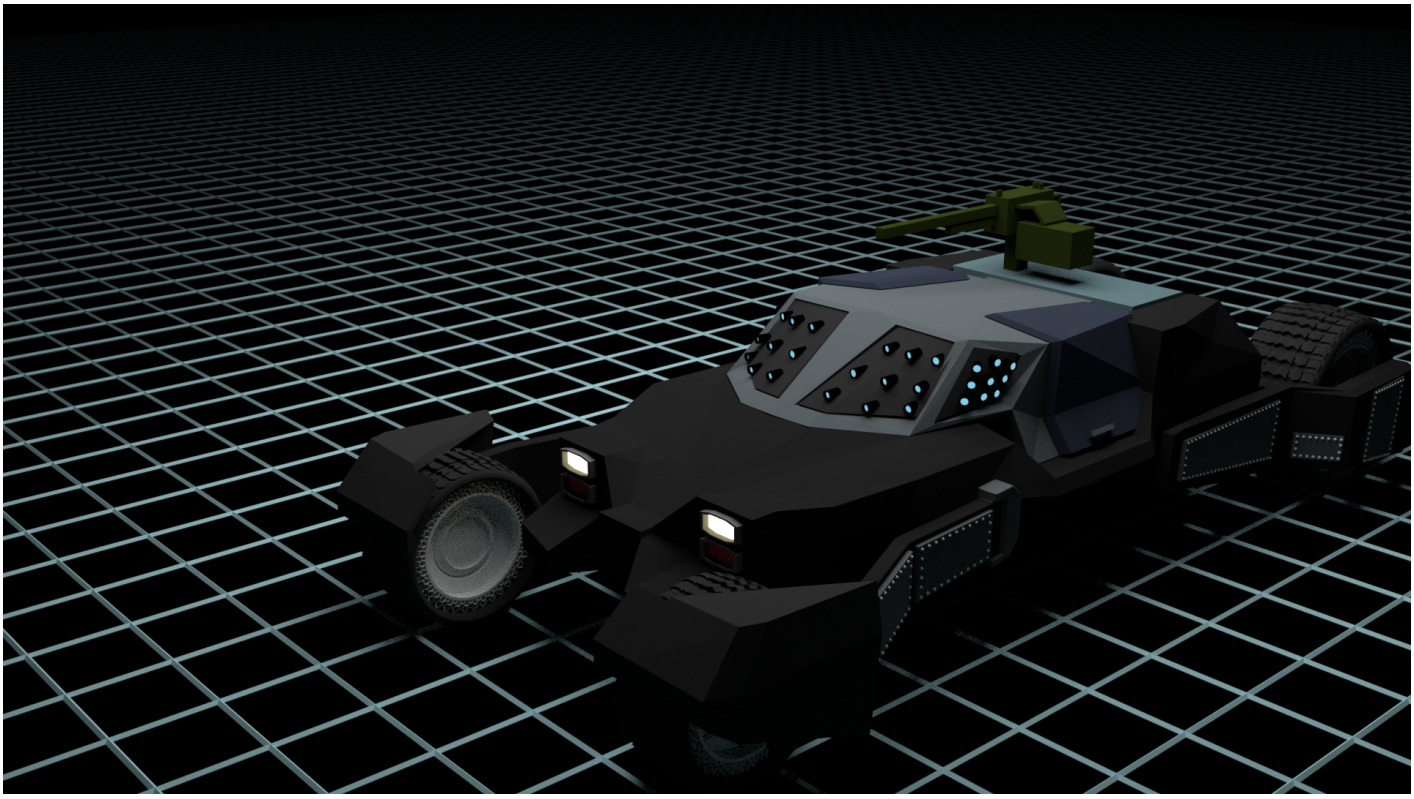




The wheels in the car module are mounted on “arms” that can rotate to lift the car, providing ground clearance for off-road missions as well as lowering the car for a low center of gravity in more urban environments. These “arms” allow the vehicle to travel at high speeds over rough terrain with little to no jostling around for the personnel and equipment inside. The wheels are also “run flat” technology based, not needing tubing or air to function. Each wheel system contains its own power source independent from the rest of the vehicle.

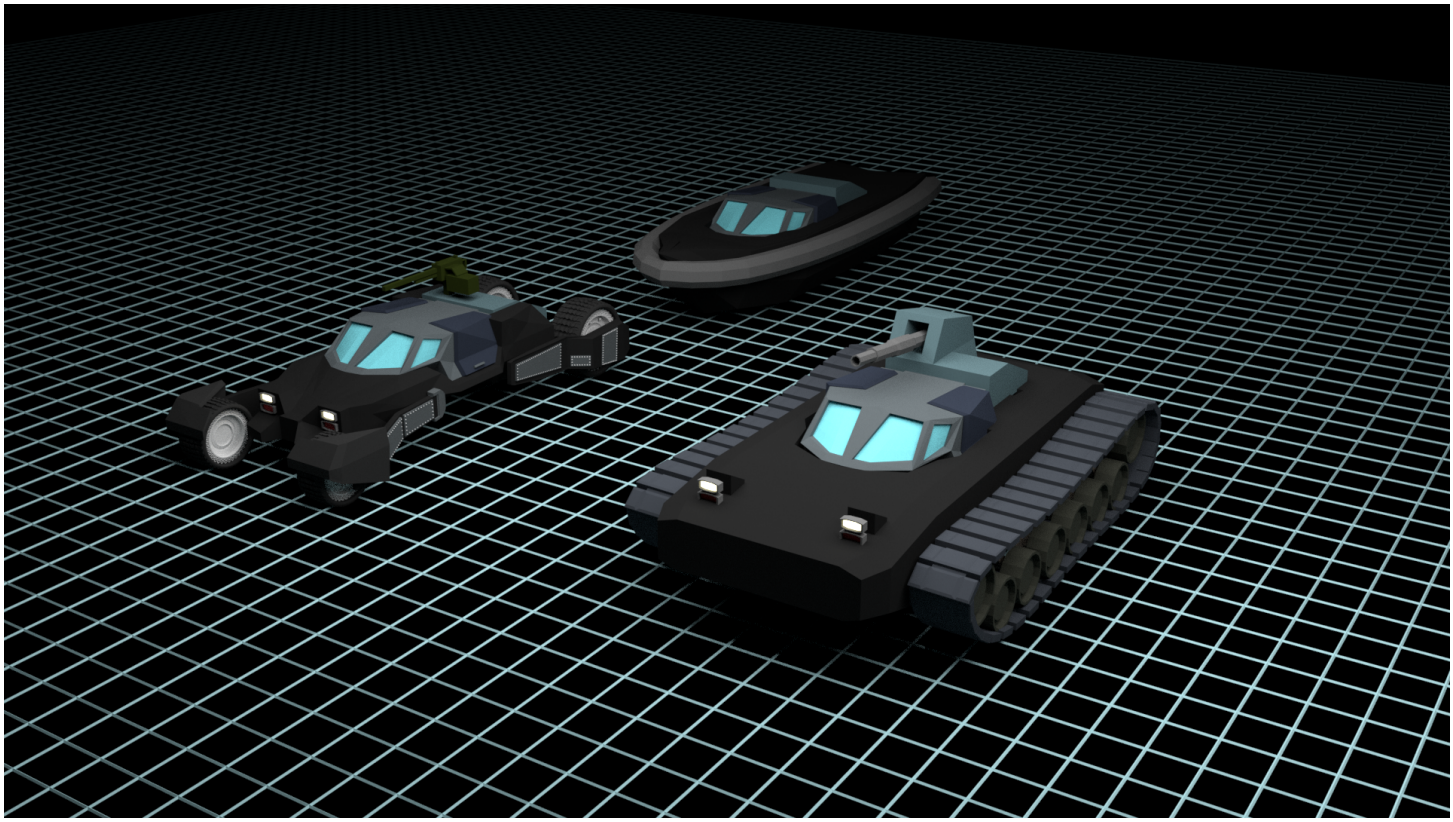
Other features of the standard vehicle body are:

- Advanced armor - incorporates non-newtonian fluid to mitigate damage in addition to the armor plating.
- Standard headlights
- Infrared headlights - combined with driver's infrared headset



The cockpit pod has a modular attachment that replaces the bulletproof windows with additional armor and a camera network. The cameras will then feed data either to displays within the cockpit pod or directly to an augmented reality helmet that the driver wears for a 360-degree view of the surrounding area

The cockpit pod can fit onto other vehicle chassis, allowing the driver to retain familiarity of controls with any mode of transportation required for the mission. This creates a naturally intuitive experience for the driver, allowing for reduced training time. Examples of alternate body types are: vertical takeoff and landing transport, underwater / marine, tracked / assault vehicle (pictured), boat (pictured), reconnaissance and others.



Conclusion

Our modular combat vehicle would provide a cost-effective solution for our armed forces that would make soldier survivability and mission versatility priorities. Passengers would be protected from direct hits with advanced armor to disperse incoming kinetic energy to minimize concussive trauma injury to anyone inside. The project lends itself to being very adaptable, which allows for cost effective upgrades later, as well as reduced cost when repurposing or repairing an existing vehicle. The modular design also reduces training time by providing a familiar set of controls and an intuitive interface for several vehicle types and mission sets. With these features, we believe this project could be the future of combat vehicles.