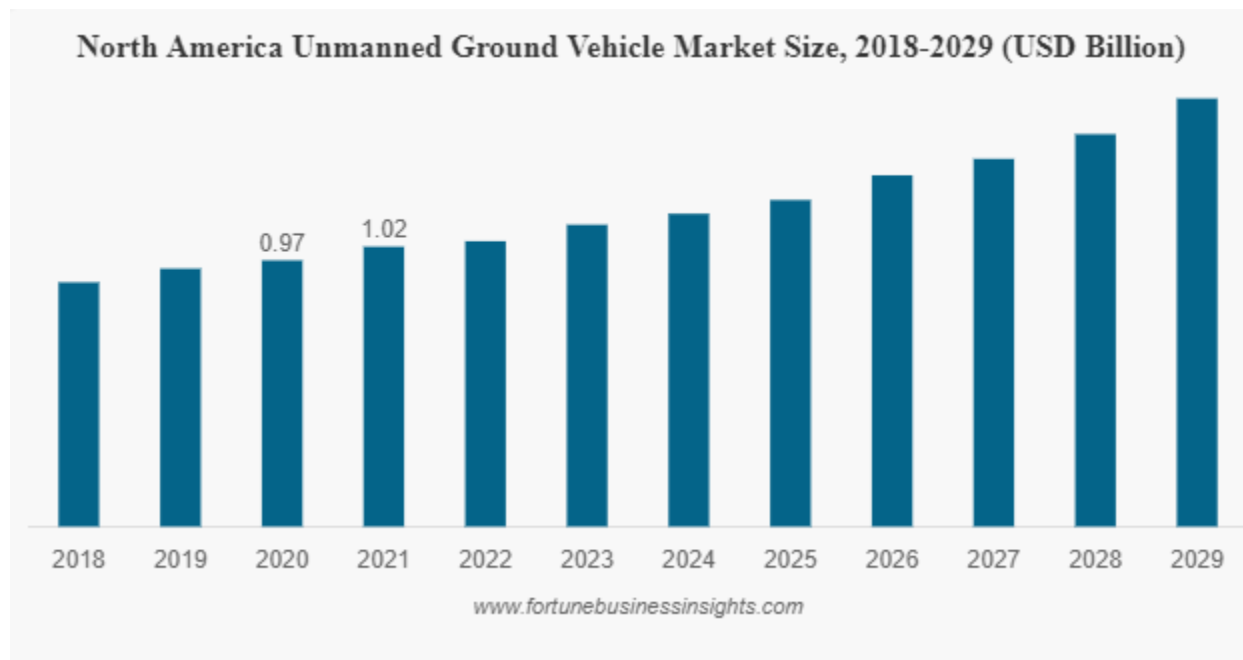


# Drone-Rover Hybrid Market/Business Justification

<https://www.fortunebusinessinsights.com/unmanned-ground-vehicles-market-102525>

- Rover market is projected to have modest to low growth
  - Attributed to COVID trends
  - 3.09 billion USD in 2022 to 4.55 billion USD in 2029
- Mobility researched was wheeled, tracked, hybrid, and legged
  - Drone-Rover integration not researched



<https://www.factmr.com/report/hybrid-drone-market>

- Drone market expected to rise from 8610.6 million USD in 2023 to 54,662.5 million USD in 2033
- The US is expected to drive most of the demand, specifically for military applications

## Current Drone-Rover Hybrids on the Market (Commercial)

[https://www.researchgate.net/publication/349330844\\_A\\_Hybrid\\_Unmanned\\_Aerial\\_Vehicle\\_With\\_A\\_Rover\\_For\\_Disaster\\_Rescue\\_Management\\_Operation](https://www.researchgate.net/publication/349330844_A_Hybrid_Unmanned_Aerial_Vehicle_With_A_Rover_For_Disaster_Rescue_Management_Operation)

- Research paper demonstrating use for UAV/UGV hybrid in a natural disaster rescue scenario
- Legged hybrid unit

<https://www.caranddriver.com/news/a15342140/this-special-land-rover-discovery-is-a-mobile-drone-dock-for-disaster-relief/>

- Land Rover (car) with drone docking port at top
  - Drone can launch and return while the vehicle is in motion through self-centering technology and magnets

<https://huuver.eu/>

- HUUVER Drone (Hybrid UAV-UGV for Efficient Relocation of Vessels)
  - Flight and Ground travel capability

<https://www.colorado.edu/aerospace/sites/default/files/attached-files/drift.pdf>

- Drone-Rover Integrated Fire Tracker developed by Aerospace Engineering Team from Colorado University

<https://ieeexplore-ieee-org.libweb.lib.utsa.edu/document/6943249>

- Quadroller proof of concept
- Modified off the shelf drone adapted for ground control

## Drone-Rover Design Ideas

- Drone system with rover module attached to bottom of drone
  - “Rover” module would essentially just be wheels added to the bottom of the drone
- Separate detachable Drone and Rover systems
  - Rover module is a payload here that operates independently of the drone
- Hybrid Drone-Rover system
  - Rover module is a payload, but is also able to have full control while drone is on top
    - Including autonomous takeoff and landing of the drone
  - Most difficult to implement, but would be the most beneficial for an end user