VEHICLE OPTIONS

A. Modify existing 4 wheel drive vehicle
B. Modify existing tracked vehicle
C. Design and build new vehicle
Option A – Modify Existing 4WD  
i.e. Opel-Astra Diesel Electric Hybrid

The Diesel Electric Hybrid power train would be a plug and play power

• 1.7L, 92 KW Turbo Diesel

• Two electric motors attached to engine, 30kW and 40 kW

• Full Electric propulsion capability

• Can be adapted to FWD, RWD and AWD

• infinitely variable drive system

• Two separate electrical systems; Conventional 12v DC and High voltage for motors

• 1.3kW battery

• GM-DaimlerChrysler collaboration
Option A – Modify Existing Hybrid Electric 4WD

Advantages:

- Low technical risk for powertrain
- Fastest path to operating chassis

Disadvantages:

- Poor off-road mobility
- Poor payload capacity
- Not unique
Option B – Modify Existing Tracked Vehicle
i.e Wolverine

High mobility tracked vehicle with the correct size characteristics.

• 45 kW Turbo Diesel
• 3,500 lb vehicle + 2,500 lb payload
• Hydraulic drive system
• Walking beam suspension with tracks-over-wheels
• Steel frame with aluminum body
Option B – Modify Existing Tracked Vehicle

Advantages:
- Good starting point for chassis
- Good off-road mobility
- Good payload capacity

Disadvantages:
- Conversion to electric drive
- Slightly overweight and under-powered
- Slow ? (20 mph)
- Skid steer
- Not unique, i.e. TAGS
CONCEPT C – New Design

Fundamental Concept
8x8 wheeled vehicle
Two 4x4 pods connected by platform
Trailing arm suspensions
Skid steering

Future Upgrade Possibilities
Tracks over Wheels
Swivel Steering
Pneumatic suspension
CONCEPT C – Background

Based on recommendations from “High Mobility Robotic Platform Study”, GDLS 1999

8x8/track-over-wheels/swiveling concept selected as Best Technical Approach for excellent mobility and immobilization resistance

Preliminary design for 1,500-2,500 lb vehicle would be scaled up by 29%

62” wide, 140” long, 57” high, 4,300 lb
CONCEPT C – Approach

• Build two symmetrical pods
  • Pod 1 houses primary power = diesel generator
  • Pod 2 houses batteries and/or alt. fuels source
• Approach will minimize risk by assuring an electric drive vehicle that will move on primary power
• Design with consideration for versatility and mobility upgrades
Option C – Build New Vehicle

Advantages:

- Designed specifically for application (versatility)
- Recommended from in-depth study but never built

Disadvantages:

- Time to design frame/chassis
- Selection and integration of powertrain components
- Cost?
VEHICLE DESIGN STATUS SUMMARY

• Continue to look at additional concepts

• Develop down-select criteria for selecting candidate
  Capabilities vs requirements
  Schedule (design effort, component availability)
  Cost (design, components, fabrication)
  Risks (meeting schedule, within budget, performance)

• Proceed with preliminary designs of 3 initial concepts