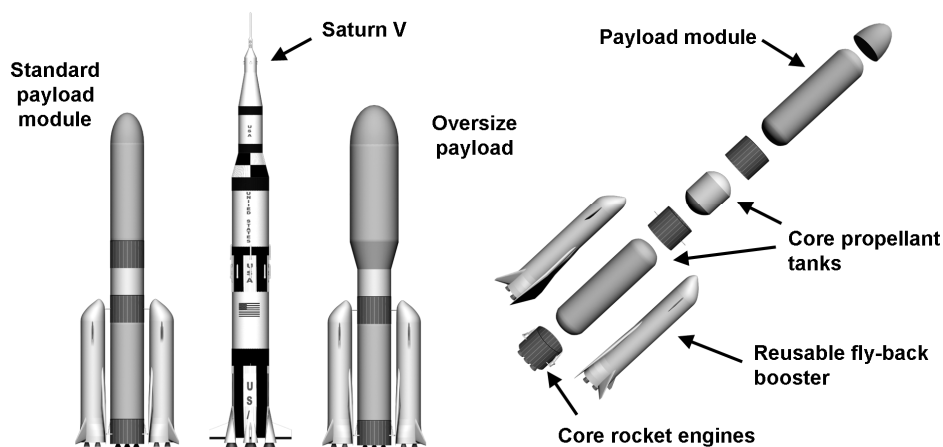
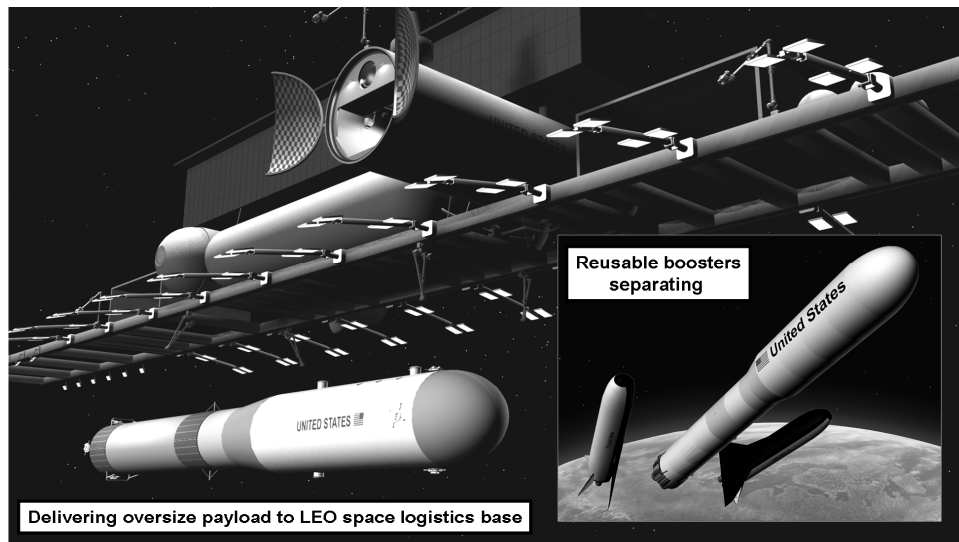


## Spacefaring Logistics Infrastructure Fact Sheet



1. System name: **Shuttle-derived Spacelifter**
2. Infrastructure phase deployed: 1
3. Function: Provide transport to low Earth orbit (LEO) for heavy and oversize cargo
4. 2007 Technology Readiness Level: 6-9
5. Description:
  - Cargo carried on top of core vehicle propellant tanks.
  - Two side-mounted reusable fly-back boosters based on the Gen 1 aerospaceplane's booster; uses shared ground infrastructure for booster maintenance and preparation.
  - Core propellant tanks are a redesigned version of the Shuttle External Tank.
  - Core propellant tanks designed for pressurized reuse in orbit as storage tanks and non-complex habitat volume.
  - System makes use of Kennedy Space Center Vehicle Assembly Building (VAB) for final assembly and mating.
6. Technical data (very general estimates):
  - Transport large payloads and on-orbit facility and spaceship modules.
  - Capable of carrying up to 6 Gen 1 aerospaceplane cargo containers in special cargo module.
  - Gross weight: ~5-6 M lb
  - Payload: 60-100 tons delivered to 270 nm @ 51.6°
  - Core propellants: LOX/hydrogen
  - Booster propellants: LOX/kerosene
  - Flight rate (IOC): 4 per year
  - Flight rate (FOC): 12 per year; based on 4-month average assembly and prep time in each of the VAB's four bays
  - Maximum expected flight rate: 24 per year; assuming two-month average assembly and prep time and available launch pads

## Spacefaring Logistics Infrastructure Fact Sheet



*DirectLaunch.Com's concept for the Shuttle-derived Launch Vehicle*

### 7. Shuttle-derived spacelifter design evolution:

- Baseline: Today's Space Shuttle
- Block 1:
  - Near-term Shuttle-derived launch vehicle (such as the DirectLaunch.com's concept)
  - Unmanned with cargo with 50 ton to very low LEO, without upper stage, and 100 tons with upper stage
  - Manned with crew capsule
  - Uses existing Solid Rocket Boosters
  - Core propellant tank dumped in ocean
  - Infrastructure use: deploy space tug and first methane/LOX space propellant station
- Block 2:
  - Crew capsule replaced with passenger spaceplane; first model of passenger spaceplane that will be used with the Gen 1 aerospaceplane
  - Upper stage configured to launch the Space Construction Station
  - Infrastructure use: transport passengers; deploy space construction station; deliver supplies to space construction station
- Block 3:
  - Replace core propellant tank with new tank using updated manufacturing methods (e.g., spin forming)
  - Replace Solid Rocket Boosters with fly-back boosters based on Gen 1 aerospaceplane booster to achieve full design payload performance
  - Infrastructure use: Deploy large payloads and enable reuse of core propellant tanks