

Spacefaring Logistics Infrastructure Fact Sheet

1. Infrastructure phase: 3

2. Phase description: Extend routine transportation throughout the Earth-Moon system

3. Capability deployed:

- Transport passengers and cargo from LEO space logistics depots to and from destinations of interest within the Earth-Moon system
- Provide on-site logistics servicing support throughout the Earth-Moon system
- Provide emergency search and rescue of humans throughout the Earth-Moon system

4. Systems deployed:

- Space ferry: a medium size, fully-reusable spaceship capable of transporting payloads up to 15 tons to GEO, Earth-Moon Lagrangian points, and lunar orbit. The space ferry is also used to transport passengers, conduct limited in-space servicing, and perform space search and rescue.
- Space transport: a large, fully-reusable spaceship that serves as a mobile space logistics base to provide temporary on-site logistics support for satellite assembly and operations.

5. Operational concept:

- For cargo delivery missions, the space ferry departs LEO, delivers the cargo to the destination of interest, e.g. low lunar orbit, and then returns to the LEO space logistics depot. For cargo retrieval missions, the space ferry flies to the destination, secures the cargo, and then returns to LEO. Depending on up/down cargo mass and required mission ΔV , cargo delivery and return may be performed on the same mission.
- For passenger transport missions, the space ferry uses a crew module to ferry passengers.
- For space servicing missions, the space ferry may be operated robotically. Provisions for direct human support with on-site EVA is provided to perform space servicing and emergency glitch repairs.
- When required on-site maintenance and assembly support exceeds the capabilities of the space ferry, the space transport is deployed to the mission site to act as a mobile space logistics base. The space transport's space hangar provides the same logistics servicing support as is available at the LEO space logistics base, including pressurized, shirt-sleeve maintenance and assembly support and external component handling.

- Space ferries transport cargo and passengers to and from the space transport while it is deployed.

- Phase 2 space tugs, deployed with the space transport, provide local material handling, passenger transport, and space search and rescue.

- Space ferries have a limited space search and rescue capability within the Earth-Moon system.

6. Deployment concept:

- Space ferries, being too large to be transported to orbit using the aerospaceplanes, are transported to orbit using the Shuttle-derived spacelifters.
- The space transports are modular in design. The modules are transported to LEO using the Shuttle-derived spacelifter and the aerospaceplanes. The transport is assembled at the LEO space logistics base's space dock.

7. Support concept:

- Space ferries and transports are based at the LEO space logistics depots.
- The space ferries and transports are berthed at the space logistics bases between missions.
- Maintenance and servicing of the space ferries is conducted in the LEO space logistics base's space hangar while propellant replenishing is conducted at the space propellant station. Payload mating is performed within the LEO space logistics base's space hangar.
- Maintenance and servicing of the space transports is conducted at the LEO space logistics base's space dock.
- Propellant servicing for the space transports will require an expansion of the Phase 2 space propellant stations to store and dispense upwards of 1,000 tons of propellants per mission, when using conventional chemical propulsion.

8. Acquisition concept:

- The Phase 3 systems, with the exception of non-chemical propulsion subsystems, are TRL 6-9. If required for achieving adequate mission performance, further development of non-chemical propulsion (e.g., solar electric, nuclear thermal, etc.) is required.
- The systems will be acquired and operated as federal infrastructure, utilizing government-backed bonds for development and acquisition funding and user fees for debt retirement and operational expenses.