



SpaceX 10-Year Lunar Architecture Capability Study (LunA-10) Lunar Surface Innovation Consortium (LSIC) Spring Meeting

23-25 Apr 2024

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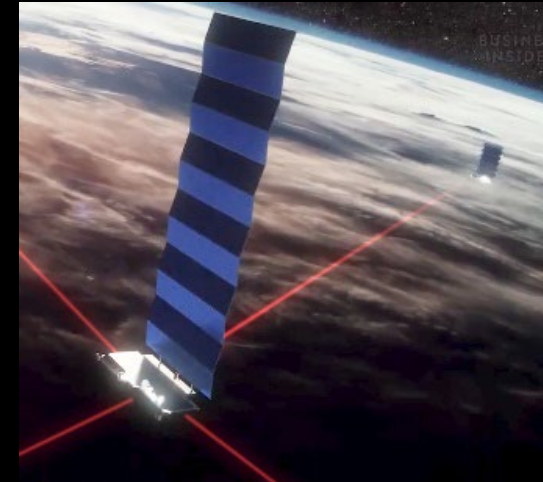
SpaceX designs, manufactures and launches the world's most advanced rockets and spacecraft.



STARSHIP



HUMAN LANDING SYSTEM



STARLINK AND STARSHIELD

Unique SpaceX competencies & technology to be leveraged to enable LunA-10 and other commercial partners

- Transportation - Starship will enable affordable and reliable access to the Moon for very large amounts of cargo and crew
- Surface Platform - Post landing, Starships are large surface platforms that can provide services and host third-party equipment
- Communications and Operations - SpaceX brings its experience operating a fleet of 6,000+ laser-linked Starlink satellites to lunar operations



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STARSHIP SYSTEM

The Starship system is designed to revolutionize human activity in space, providing Earth orbit and interplanetary crew and cargo transportation. The cornerstones of the Starship system are full reusability and in-space propellant transfer.

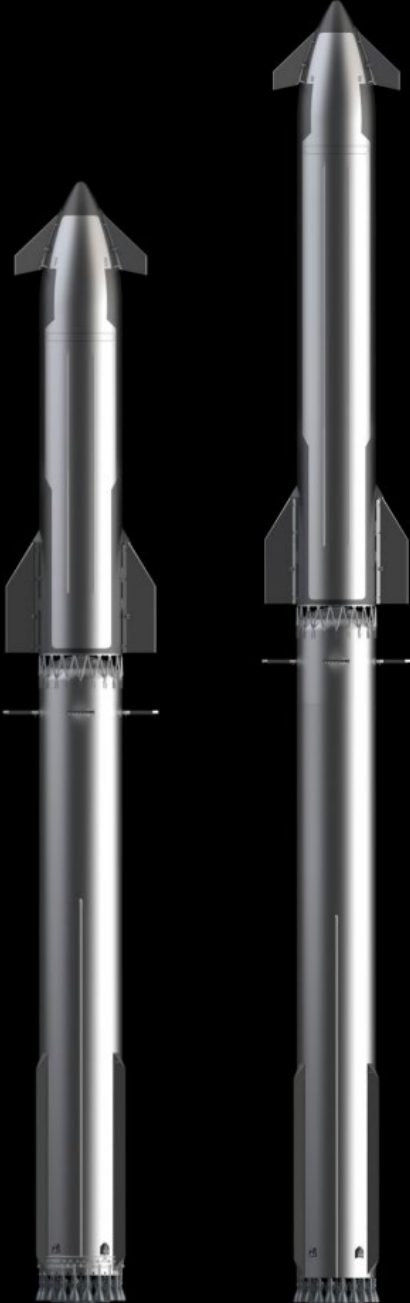
Starship is the world's most powerful launch vehicle ever developed and is designed to carry more than 100 metric tons to the lunar surface

SHIP "STARSHIP"

IN-SPACE TRANSPORTATION
VERTICAL LANDING
FULLY REUSABLE

BOOSTER "SUPER HEAVY"

REQUIRED FOR ORBITAL MISSIONS
VERTICAL TAKEOFF
VERTICAL LANDING
FULLY REUSABLE



	Starship 2	Starship 3
TOTAL HEIGHT	124.4 m / 408 ft	150 m / 492 ft
DIAMETER	9 m / 30 ft	9 m / 30 ft
THRUST	8240 tf / 18 Mlbf	9220 tf / 20 Mlbf

For more information, [download the Starship Users Guide here](#)



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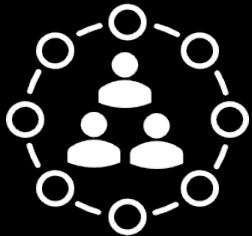
SPACEX LUNAR FRAMEWORK



Transit & Mobility



Communications



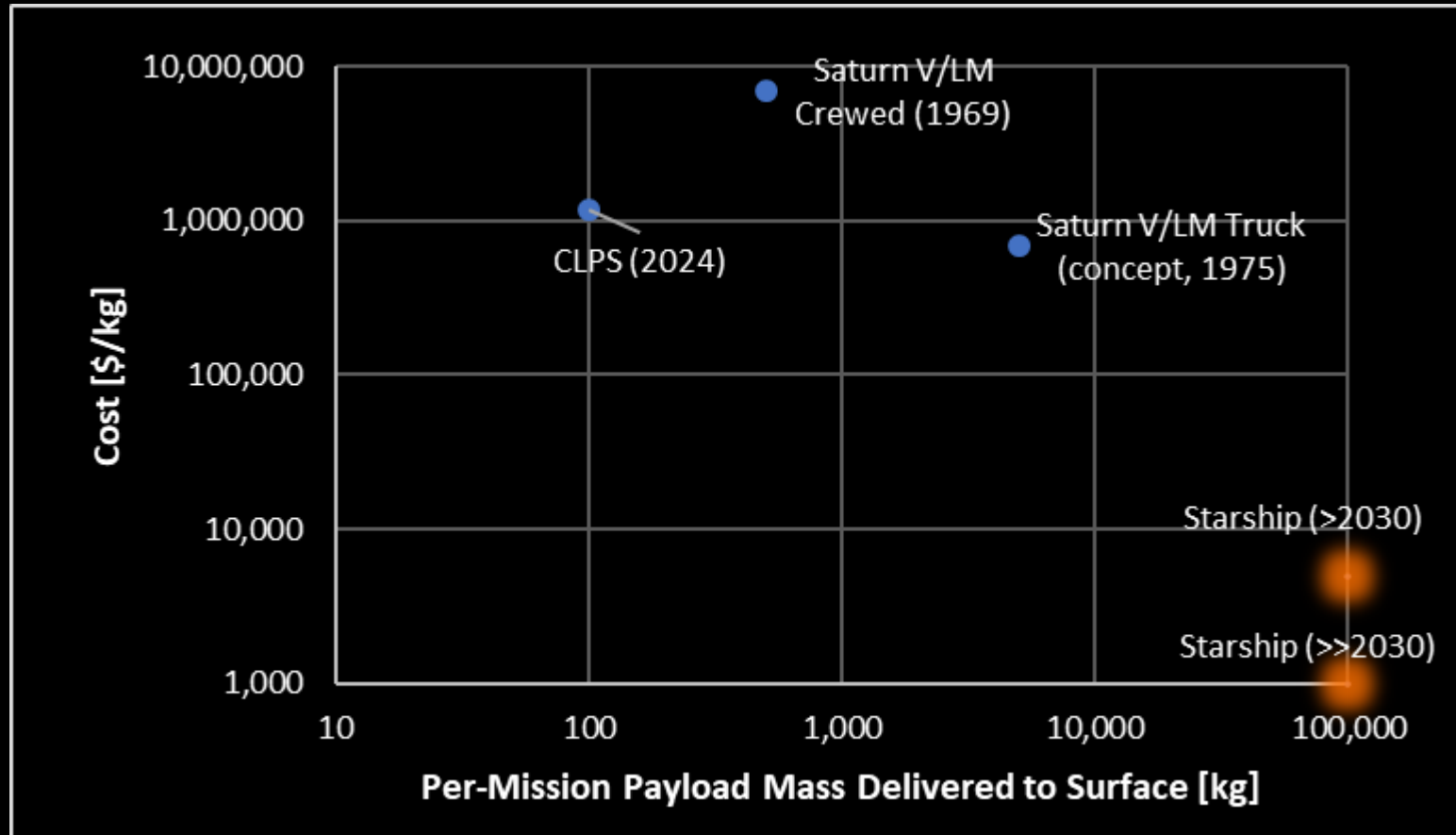
**Third-Party
Hosting & Services**



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TRANSIT & MOBILITY (EARTH-MOON): ECONOMIC OUTLOOK



- Affordable mass transfer between Earth & Moon is foundational to enabling sustainable lunar access.
- Starship will recoup R&D investments via a variety of use cases including terrestrial satellite launches.



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3 STARSHIP LANDINGS BEGIN A ROBUST LUNAR BASE

1. Utility Starship

Hub for power,
communication, data,
commodities storage

2. Rolling Stock Starship

Rovers, construction
equipment, ISRU plants, and
other site-specific payloads

3. Habitation Starship

Serves as crew hab for the site



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UTILITY STARSHIP

- Starship lands, deploys cargo & services
- Provides backhaul between Moon and Earth
- Local connectivity through hosted payloads
 - Starship provides ~55m height
- Provides on the order of tens of kW to hosted payloads & surface users
 - Can provide 100+ kW if configured



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Artist Concept - Lunar Landing | SpaceX

POST-LANDING UTILITY OF LUNAR CARGO DELIVERY STARSHIPS

**STARSHIP CAN DELIVER
100+ TONS OF LUNAR
CARGO AND REMAIN AS A
SURFACE ASSET ITSELF**

- Propellant and Fluid Storage
 - Empty prop tanks provide fluid storage space
 - Oxygen tanks hold ~1,000 tons LOX
 - Could use tanks to store other liquids or gases
 - Ullage methane/boil-off available for lunar surface users

Unneeded components (such as engines) on landed Starship can be harvested and processed into raw feedstock material



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Starship enables affordable, reliable cislunar transportation by significantly reducing delivery cost per kg and significantly increasing payload delivery capability.

Landed Starship surface, platforms provide:

- Power
- Habitation
- Communications connectivity
- Fluid and commodity storage
- Components and materials

SpaceX's extensive experience with optical and RF comms in space can be leveraged to connect Earth and Lunar networks



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Questions?