Lunar Site Selection

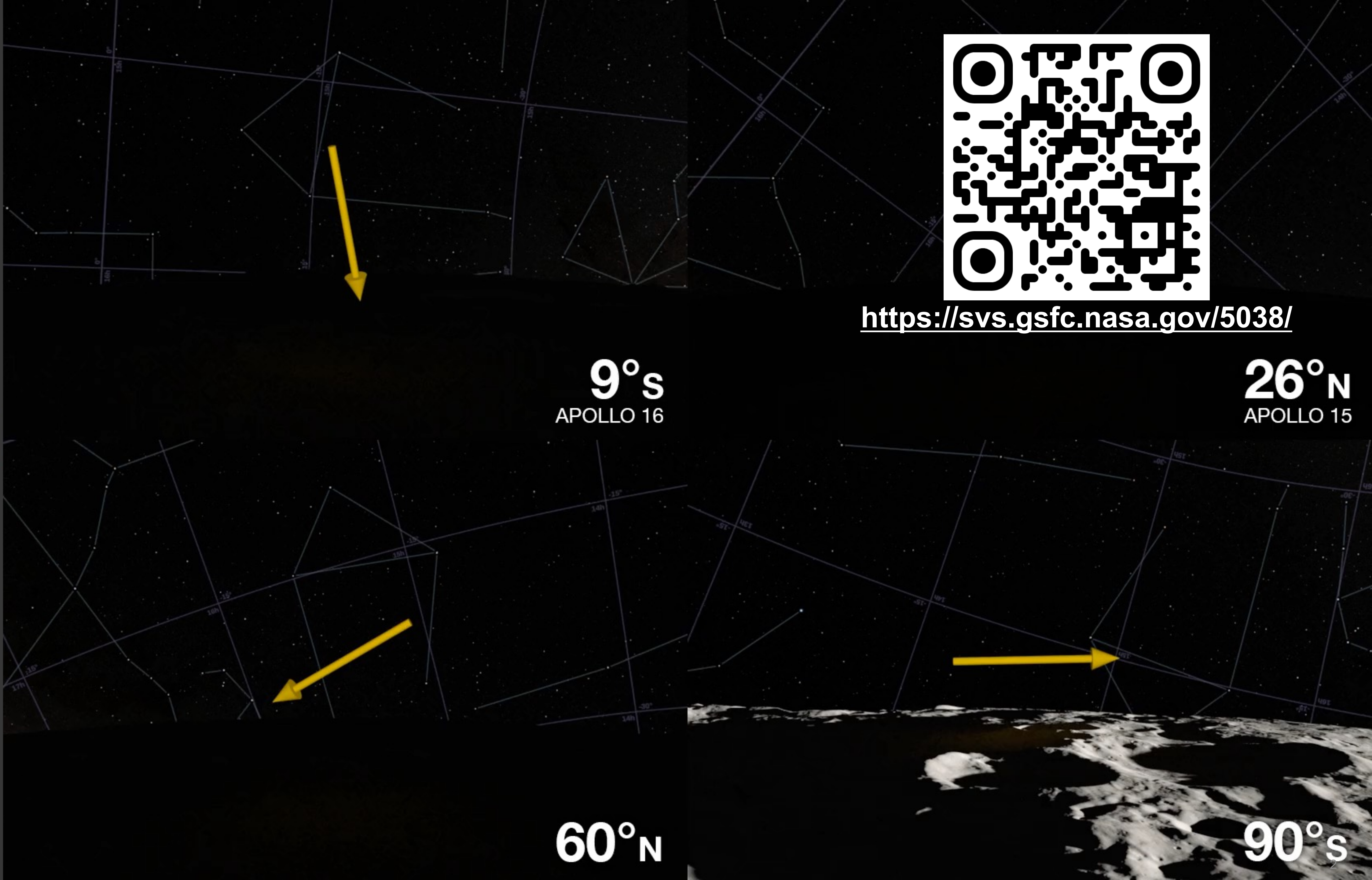
Sun Path

Looking
EAST

Subsolar Longitude
179°E

Earth Days

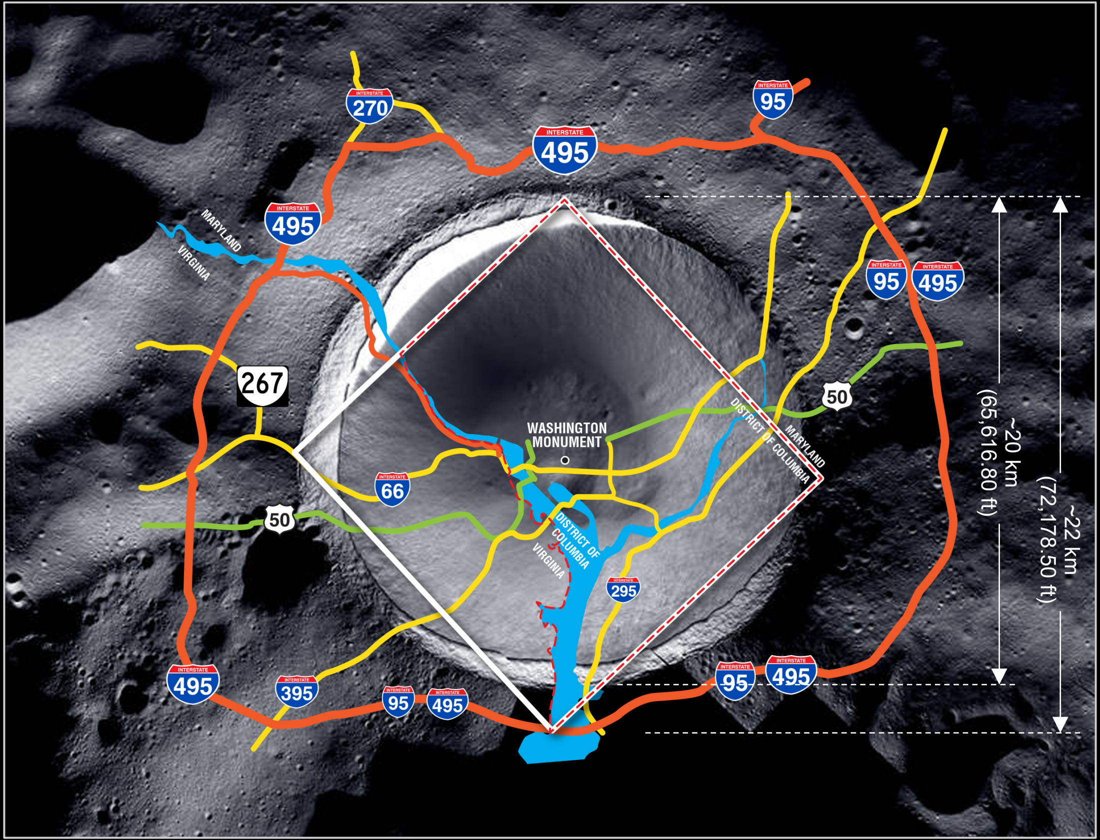
0



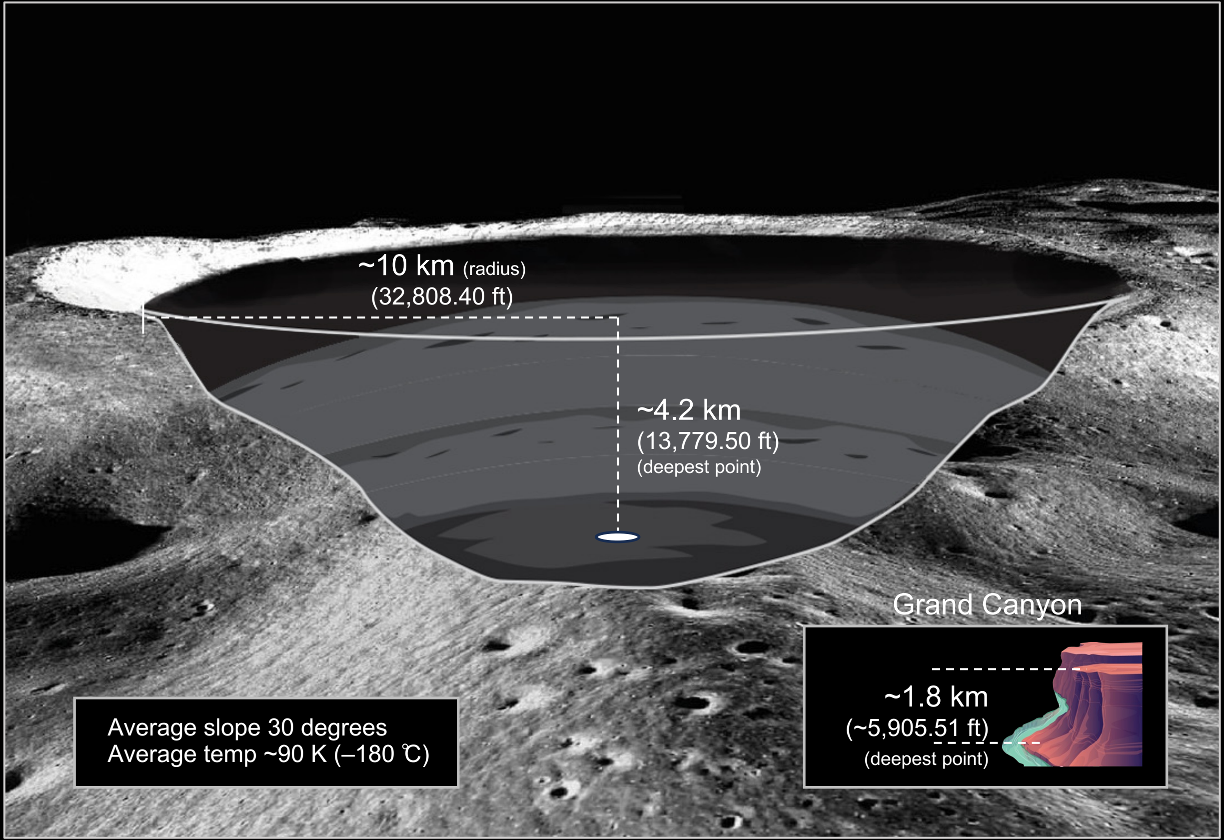
https://svs.gsfc.nasa.gov/5038/

Shackleton Crater by Comparison

Shackleton Crater's area in relation to Washington DC



Shackleton Crater in relation to the Grand Canyon



Statue of Liberty
0.093 km (305 ft)

Space Launch System
0.098 km (322 ft)

Lunar Seasons

https://svs.gsfc.nasa.gov/5229

Credit: E.Wright (GSFC/SVS)

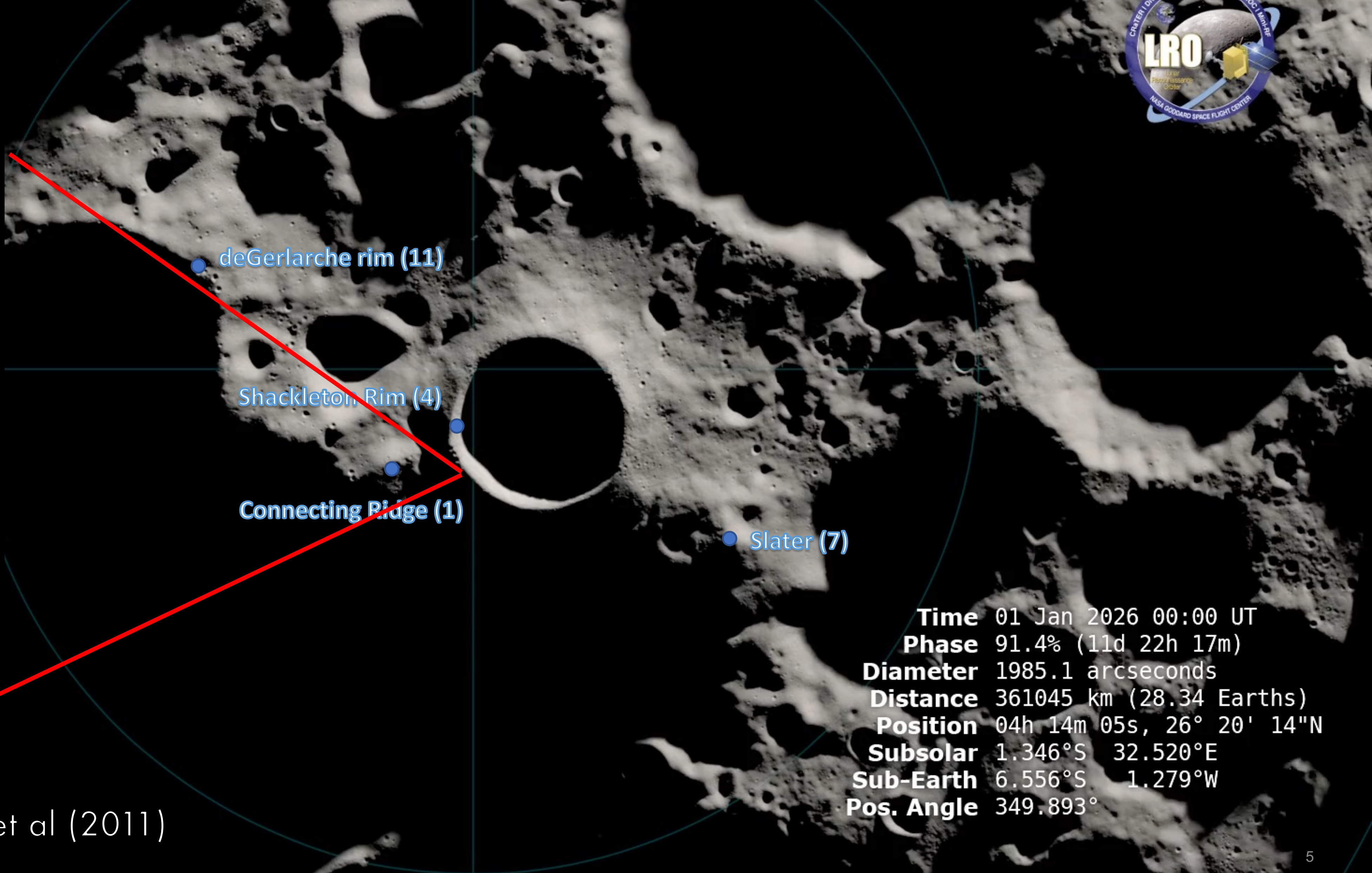
Landing Accuracy

White Paper
Safe and Precise Landing at Lunar Sites

South Pole 2026

Early mission success requires illumination along the approach trajectory with future missions having more flexibility in capability.

The approach trajectory is different for each landing opportunity. [Notional range designated in red]



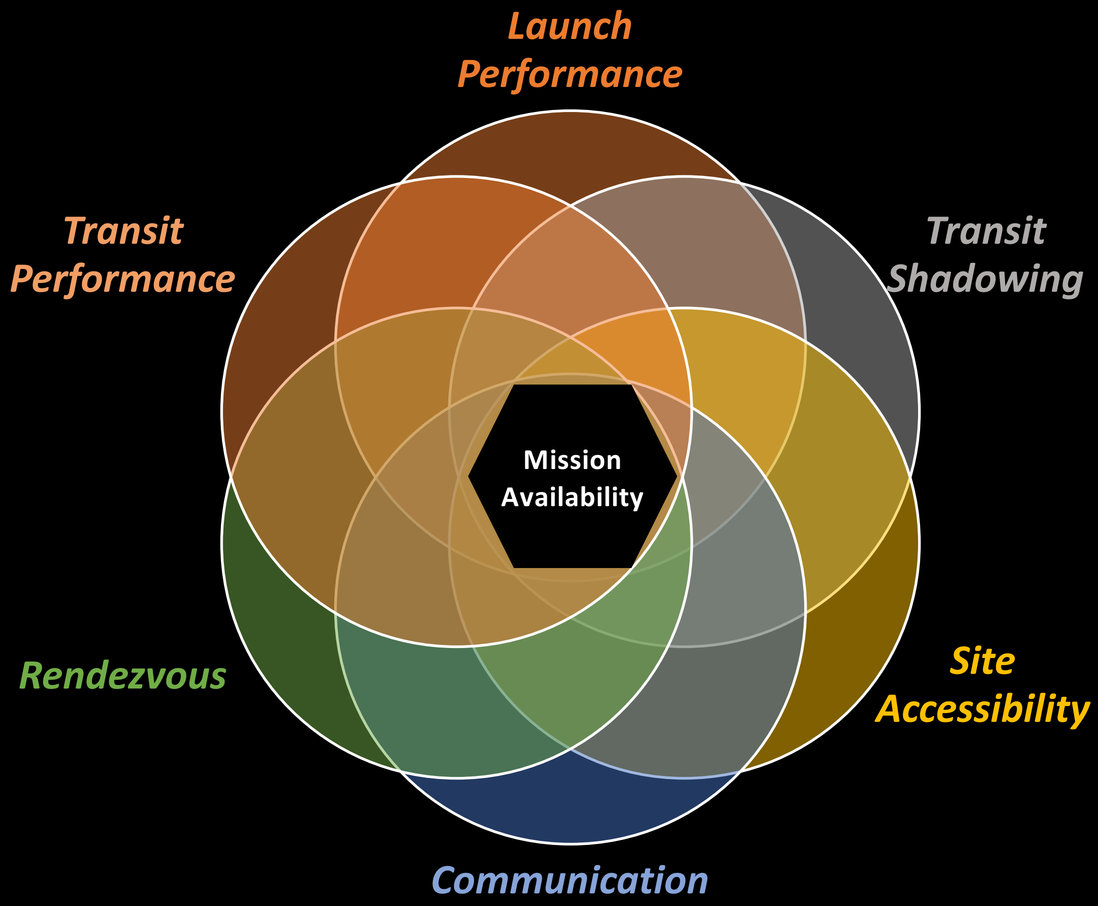
Sites from Mazarico et al (2011)

https://svs.gsfc.nasa.gov/5228

Credit: E.Wright (GSFC/SVS)

Mission Availability is a Multidimensional Challenge

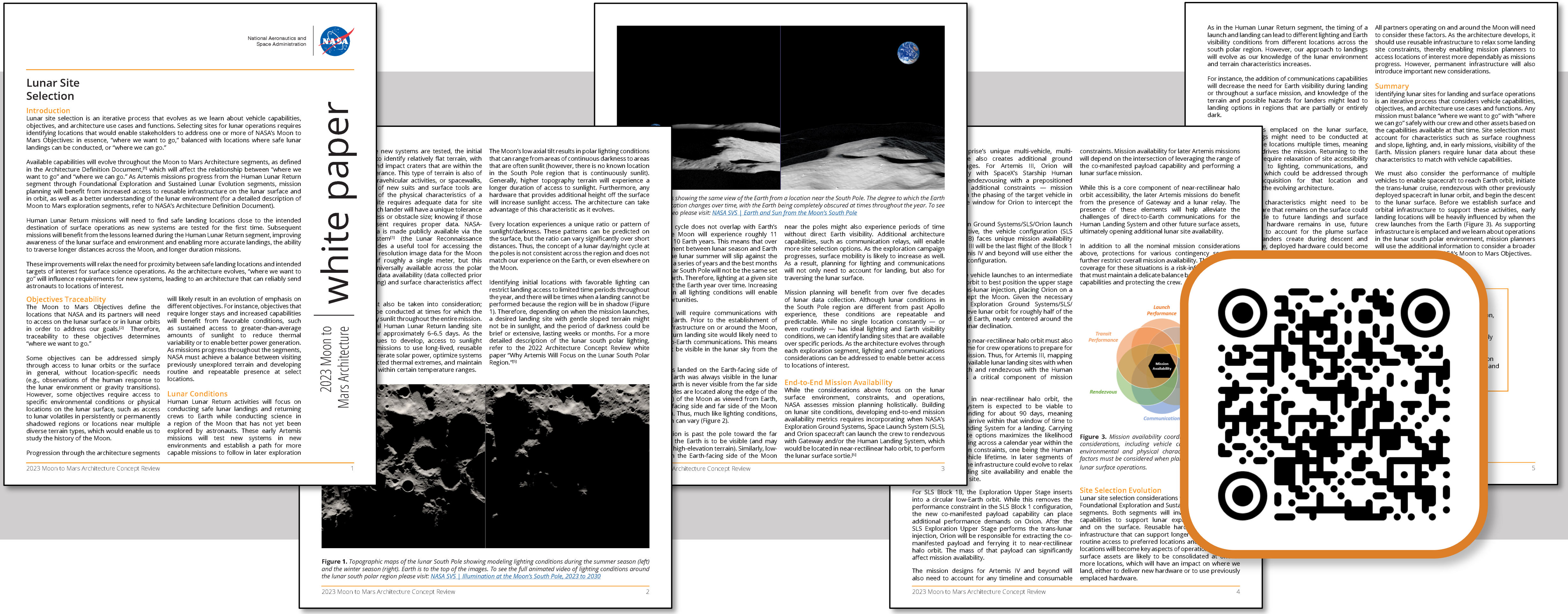
- Mission Availability is opportunity frequency at which the end-to-end mission can be viably conducted
  - Actual launch days, windows, periods
  - Some may acceptably be more constrained than others to achieve different objectives
- A distinct set of additional constraints must be incorporated when planning a human exploration mission (compared to robotic missions)
- Mission Availability analysis is an iterative process through design and development



Apollo 12, EVA 1

AS12-46-6762

White Paper


National Aeronautics and Space Administration
Lunar Site Selection
white paper
2023 Moon to Mars Architecture
Introduction
Objectives Traceability
Lunar Conditions
End-to-End Mission Availability
Summary
Site Selection Evolution
2023 Moon to Mars Architecture Concept Review