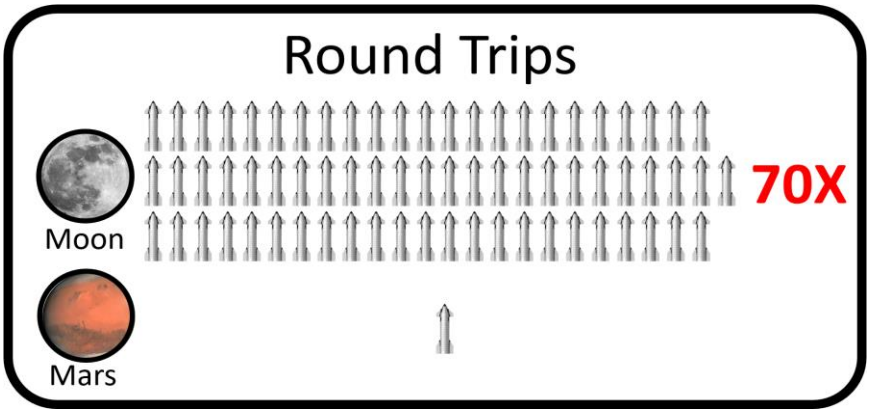
02 – Why the Moon?

Why should lunar development be a space policy priority?

To be clear, this book isn't arguing for limiting our program only to lunar exploration. The argument isn't that we should send a few government astronauts to pick up some more rocks to add to the Apollo collection, pat ourselves on the back and then abandon the Moon for Mars.

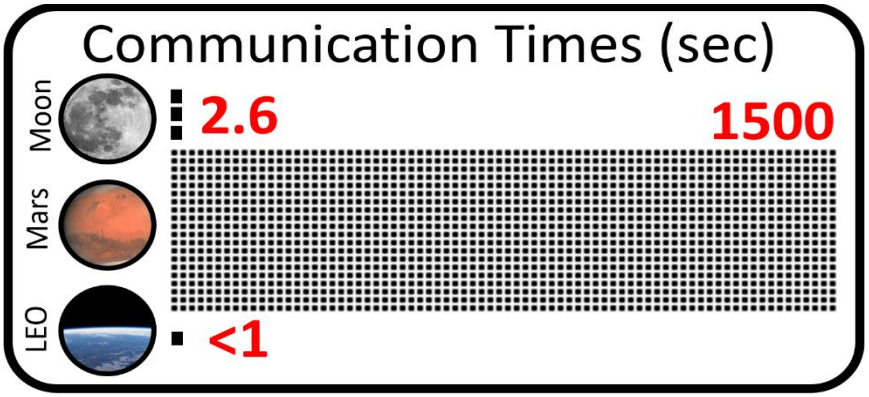
Rather, this book argues that the time is ripe, the Starship fleet is being built, and that America should take full advantage of this unique opportunity to lead the other nations in establishing humanity's first, permanent foothold off Earth. Subsequently, we should then lead the other nations as we establish an International Lunar Base which will quite naturally transition to the largest and rapidly growing off-Earth settlement. America needs to seize this opportunity. It won't happen unless our space policy leaders recognize the opportunity and then marshals Congress and NASA to establish a space policy that ensures that it becomes a reality that not only inspires the next generation but will amaze the other nations and draw them to follow our lead.

Here I succinctly lay out the nine reasons why the Moon should become a space policy priority.

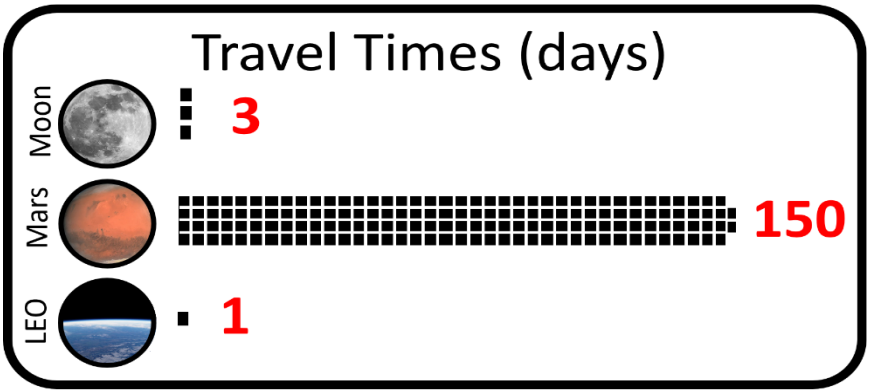


Because it is Close / Safe

The Moon is only three days travel time away and is only 2.6 seconds away by speed-of-light communications. As seen in the first infographic, this means that each translunar transport system can complete 70 round trips to the Moon for each round trip to Mars. This practically guarantees that the lunar base / settlement with be developed faster than anything Mars. Does America want to be in the lead when it comes to establishing the rules in humanity's largest off-Earth base / settlement? Then we'd better recognize the opportunity that the Moon represents.

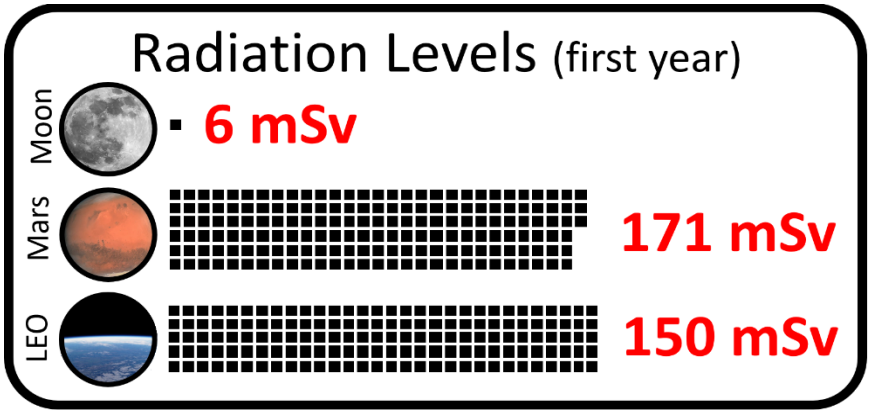


Also, because this close, people living on the Moon will be able to remain in telepresence contact with their loved ones. Any regular advocate attending space conferences knows that we need to be mindful of the ladies and their differing interests. And older couples who've lived long enough to save enough to go will include a spouse who will like to be virtually present in family gatherings and with her friends back on Earth. Occasional video emails aren't quite the same. It's not a factor that husbands will be allowed to brush aside -- nor should we.



Going to Mars means losing a small chunk of one's remaining life. Returning to Earth means losing a second chunk of life. But by settling on the Moon, one always retains the option of returning to Earth quickly. If a family / health emergency arises, that is still an option.

Also, because the Moon is close, passengers will experience only a brief, 3-day trip exposed to space radiation before landing and entering a radiation-shielded base. However, passengers to Mars will experience far greater radiation exposure. In LEO, passengers orbiting at an inclination that will give them views of most of the earth will daily be exposed to the trapped radiation in the southern Atlantic anomaly. As a result, they will have significant radiation exposure over time.



Because it can be Done Soon

In Chapter 4, "How Soon?" I make the case that the time is ripe to develop the Moon. After decades of waiting for cheap access to space (CATS), it is finally arriving in the for of SpaceX's Starship fleet and the lunar-specific vehicles by Blue Origin. The space policy decision-makers in DC need to stop the old way of thinking (a few government astronauts on incredibly expensive science missions) and fully embrace the remarkable opportunities that the Starship fleet offers. It is only somewhat forgivable that they hesitate until Starship demonstrates every last capability before changing the policy. During the Apollo Program space policy embraced the Saturn V system even before it was demonstrated. Starship now has enough demonstrations and the remaining hurdles are sufficiently small. It is past time to embrace what this capability represents and align space policy likewise.

From a China policy standpoint, it matters more how many nations we are working with on the Moon than who got back to the Moon first. If we make it about large scale, international exploration and base using the Starship fleet then we can't lose.

Because the Cost is Reasonable

This book doesn't call for an increase to NASA's budget. But rather, NASA's budget be re-oriented to cut the fat and replace it with systems that are far more cost-effective. In the process, the American taxpayer will get far more bang for their buck.

If one looks for places to save money in NASA's budget, it is a target rick environment. At an estimated $4.1 billion per mission, SLS, Orion, Gateway, and Mobile Launcher 2 don't represent a cost-effective approach. Previously Acting Administrator Sean Duffy called the current Artemis Program "unsustainable". That's stating the obvious. But what

should replace it. This book describes an alternative scenario that is entirely doable and would yield remarkable achievements.

Also, because the trip to the Moon is so short compared to a trip to Mars, more people can fit into one Starship. They need fewer consumables and they need less "elbow room". For this reason, the ticket price will be substantially lower than the ticket price for Mars. And for many people on the lower end of the wealth curve, they won't really have a choice. They can afford to go to the Moon but not to Mars. And for many, that will be the determining factor.

Finally, shipping bulky items like counters, bathtubs, furniture, floors, etc. will not only be costly but those items will displace passengers thereby reducing revenue for the transport companies. So, there will be a strong incentive for the International Lunar Base to start producing these things from local resources. Chapter 29 describes how metals can be extracted from the lunar dirt and processes into sheet metal and other pieces of equipment.

Because Elon Won't Pay for it

The SpaceX Starship's design is optimized for Mars and not the Moon. It will work fine for the Moon because it is so over-sized. And SpaceX is fully willing to fly to the Moon if paid to do so. But SpaceX is rightfully focused on their goal of Mars with Elon pledging Starlink revenue to go towards Mars infrastructure.

If a large and growing International Lunar Base is going to be developed, we need a space policy for that purpose. NASA can still do Mars by partnering with SpaceX's Mars program. But the lunar base won't develop itself. The space policy decision makers need to decide that lunar development should be one of the main objectives of our space program at this time and partnering with SpaceX for Mars being the other main objective.

Because of the Historic Opportunity

There will be only one first woman on the Moon, only one first astronaut exploring a lunar lava tube, only one first permanent base on the Moon, only one first puppy born on the Moon, and only one story of the first humans to sell their homes on Earth and be the first if humanity to settle down off Earth. These are the type of things that we know will go down in history. All these historic firsts are within our reach if we only choose to seize those opportunities. The book is a call for us to not miss those opportunities while we stupidly watch other countries seize those firsts.

Because it Will be Inspiring

What will be the first words spoken by the first woman to set foot on the Moon? Billions of people will one day know the answer to that question. What will be the name of the female dog that is part of the Initial Permanent Crew? A billion children worldwide will know its name. And what will its puppy be named? America has the opportunity to astonish the upcoming generation of young people with what we can do. Don't we want that? Wouldn't that foreign policy coup be worth directing a part of NASA's human spaceflight budget towards that goal? Chapter 12 describes the sort of life that the Initial Permanent Crew will be able to demonstrate to the watching world.

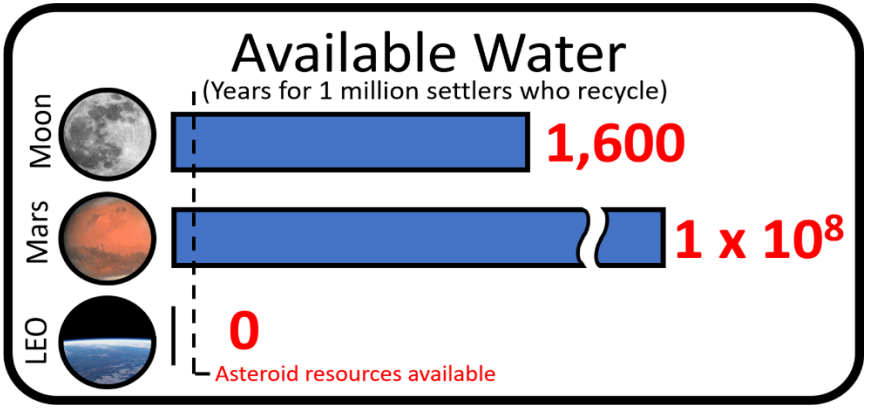
Because America Can Lead the Way

As of this writing, 60 nations have joined with the United States is signing the Artemis Accords. These are a set of principles that the nations have agreed to abide by when going to the Moon. The large number of nations agreeing to these Accords demonstrates American leadership as we start to move beyond Earth.

The NASA Administrator needs to meet with the other Artemis Accords countries and figure out what comes next in terms of a coordinated International Lunar Exploration Phase (ILEP) and International Lunar Base and then carve out portions of its budget dedicated to purchasing Starship missions to the Moon and Mars.

Because the Moon has Abundance

Mars advocates often point to the huge (volatile) resources on Mars relative to the scant resources on the Moon and therefore conclude that Mars is the only place where off-Earth settlement can have a future. They routinely cite the parts per million concentrations of water in the sun exposed lunar dirt (regolith) while ignoring the copious amounts of water and carbon and nitrogen-containing chemicals published in NASA's 2009 LCROSS experiment. To show how wildly off their data picking is off, consider one more infographic:



If a settlement has grown to the size of a million people and the recycling of water has advanced no more than it is today on the ISS, how long until the lunar water ice runs out?

So, each settler requires about one kg of water per day after recycling. The current best estimate of how much water there is at the shadowed areas of the lunar poles comes to about 600 million cubic meters. How long would that last the higher settlement? The answer is 1,600 years. You could easily fit the history of the development of the United States more than six times into that space. And do you think that during those 1,600 years, alternative resources could be developed and imported such as from asteroids and comets? In other words, the Moon will never run out of resources. What it has is far more than enough.

Because the Largest Settlements Will be There

With flights to the Moon being as much as 70 times more frequent than for Mars, it seems apparent that the fastest growing base will be on the Moon and with increased flight rate, that it will be able to transition to a private settlement sooner. For these reasons, the Moon will take the lead in off-Earth settlement and remain that way for decades to come.

In other words, the future is on the Moon.