Summary Description of Previous Studies

Study Name	Date	Summary Description
Exploration Office Case Studies	1988-1989	NASA's Office of Exploration did four case studies of human space exploration. These were (1) an expedition to the Martian moon Phobos; (2) a three-mission expedition to Mars; (3) the construction of a man-tended lunar observatory; and (4) the construction of a lunar outpost to serve as the basis for construction of a Martian outpost.
NASA 90 Day Study	1989	Space Station Freedom as the stepping stone to the Moon, Mars, and beyond. Following a speech by President George H.W. Bush in 1989, this study defined what technology was necessary to enable the development of an outpost at the Moon and travel to Mars. It also estimated the costs (and other impacts) for this Human Exploration Initiative.
Synthesis Report	1990	Following the 90 day study, NASA was directed to engage in an outreach program to solicit public ideas for the human exploration of space. The Synthesis report summarized the findings of this effort, recommending 4 potential paths for the future human exploration of space. Each path highlighted technology needs, science objectives, and timelines.
First Lunar Outpost	1993	Carried out by NASA's Office of Exploration in 1992, it was intended as a reference mission against which alternative strategies could be measured. The concept incorporated many recommendations from the Synthesis Report, specifically the use of heavy-lift launch vehicle and minimal assembly operations in Earth orbit and on the lunar surface.
Human Lunar Return	1996	NASA Administrator Dan Goldin initiated the "Human Lunar Return" (HLR) study in September 1995 to investigate innovative fast-track approaches for manned spaceflight. Goals included utilizing Delta II class LVs, demonstrating orders of magnitude in cost reduction as well as demonstrating an extremely compressed schedule.
Mars DRMS	Late 1990s	These studies were meant to provide a baseline architecture for later studies to compare against. They baselined Nuclear Thermal Propusive heavy lift launch vehicles and a conjunction class mission of 500+ days.
Decadal Planning Team/NASA Exploration Team	2002-2004	Focused on developing broad requirements to guide NASA’s exploration, including human-robotic partnership and commercial participation. Reference mission included Earth-Moon L1 gateway concept.
CAIB	2003	Identified the technical and organizational causes of the Columbia accident, recommended forward actions, and offered commentary on the value of human spaceflight for the U.S.
Concept Exploration & Refinement (CE&R) Studies	2004	Response to VSE, 13 contractors paid to respond with potential architecture definitions for both lunar and Mars exploration. Concepts included the use of capsules, lifting bodies, heavy-lift launch vehicles, multiple-launch architectures, propellant depots, and in-situ resource utilization.

Summary Description of Previous Studies (1 of 2)

Study Name	Date	Summary Description
ESAS	2005	90-day study commissioned by Dr. Griffin to give the VSE a more detailed workable baseline. This resulted in the ESAS "1.5 launch" architecture
Direct	2007-2009	A series of studies performed mostly by Marshall engineers in their off-time recommending that NASA change to a two-launch architecture.
Exploration Acceleration	2008	Attempted to identify ways to increase cost confidence level for the planned 2015 Initial Operational Capacity (IOC) of Ares I and Orion. Further tried to identify ways to accelerate the IOC date.
CBO Report	2009	Highlighted budget impacts of a number of exploration scenarios given an essentially fixed NASA budget profile