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SETTLING MARS: A CITY MASTER PLAN

Abstract

Even though Mars has usually been considered the next goal for human space exploration since the Apollo era, it has only been recently that the discussion has shifted from expensive, short, Apollo-style missions to permanent presence and settlement. With Elon Musk's intention to create a one-million-people city on Mars, this goal seems to be on the way to become a reality. However, most of the discussion is centered around how to get to Mars and in situ resource utilization, and little is said about the city planning process. This makes little sense from a strategic planning perspective: the development of the settlement and required infrastructure should be considered from the very first precursor missions, in order to reduce cost and risk through progressive build of infrastructure.

This paper aims to tackle this gap by developing the first Master Plan for building a city on Mars. City planning strategies used on Earth are adapted to the martian environment, and the key drivers for a city on Mars are identified. The preliminary layout of the city is then developed, including infrastructure, common zones, transport, waste recycling, landscape, etc. The key element for a city on Mars is how to plan and design a self-sustaining city. The city is considered to start from a small precursor base with a limited population, and develop into a population of several tens of thousands, when a new Master Plan should be developed. The preliminary Master Plan is designed based on estimation of population growth and tries to predict the required needs for infrastructure, accommodation, and all the elements that contribute in developing a self-sustainable city. The study also includes key technical challenges to be addressed, and a set of recommendations for future studies.

The result is a plan for a city on Mars that fuses technical considerations with city planning techniques to create a human city on the Red Planet that is more than a scientific outpost. The study will add a new perspective to Mars programs and accelerate the settlement of our planetary neighbour.