Affordable Spacecraft: Design and Launch Alternatives

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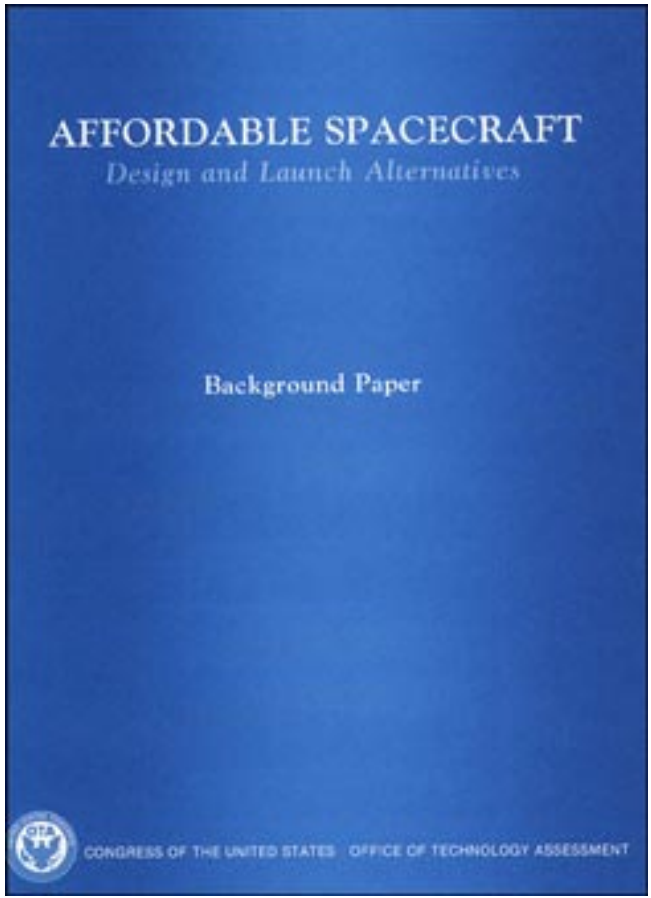

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Foreword

Several major DOD and NASA programs are seeking ways to reduce the costs of launching spacecraft. However, it typically costs much, much more to build a spacecraft than to launch it into a low orbit. Therefore, unless the costs of building spacecraft are reduced, even dramatic reductions in costs of launching to low orbit would reduce total spacecraft program costs by only a few percent.

This background paper examines several proposals for reducing the costs of spacecraft and other payloads and describes launch systems for implementing them. It is one of a series of products of a broad assessment of space transportation technologies undertaken by OTA at the request of the Senate Committee on Commerce, Science, and Transportation, and the House Committee on Science, Space, and Technology. In 1988, OTA published the special report *Launch Options for the Future: A Buyer's Guide* and the technical memorandum *Reducing Launch Operations Costs: New Technologies and Practices.* In 1989, ***OTA*** published the background paper *Big, Dumb Boosters: A Low-Cost Space Transportation Option?* and the special report *Round Trip to Orbit: Human Spaceflight Alternatives.* A summary report on space transportation, entitled *Access to Space* to be published in the spring of 1990, will be the final report in the space transportation series.

In undertaking this effort, OTA sought the contributions of a wide spectrum of knowledgeable individuals and organizations. Some provided information; others reviewed drafts. OTA gratefully acknowledges their contributions of time and intellectual effort. OTA also appreciates the cooperation and assistance of the Air Force and NASA. However, OTA is solely responsible for the content of this background paper and the other OTA publications.

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NOTE: OTA appreciates the valuable assistance and thoughtful critiques provided by the advisory panel members. The views expressed in this OTA report, however, are the sole responsibility of the Office of Technology Assessment. Participation on the advisory panel does not imply endorsement of the report.

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