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A Practical and Glorious Space Program

The Commission on the Future of the U.S. Aerospace Industry, chaired by Robert Walker, noted we have no "audacious" space goal but did not recommend one. The report recommended more efficient business as usual, but this is not enough.

The United States — Congress and NASA — needs to step back and look at our long-term space policy to determine what we should be doing for the next several decades.

The current path, business as usual, is not a fruitful option. We are going nowhere, and space is about going somewhere. We need a worthwhile goal.

NASA faces continuing problems. Having observed and participated in space policy for decades, I know the problems are old with no sign of improvement.

For example, in the 1992 book "Space Policy Alternatives," Ronald Brunner, Roger Pielke and I wrote the following about the international space station: "NASA and space station supporters have been unable to 'build it right' and the opposition has been unable to 'not build it at all' and so the program continues."

The underlying dynamics continue to constrain the agency even now.

Each NASA program has too much on its plate, such as

plans bigger than available budgets. The heart of the program, human exploration of space, is stuck in low Earth orbit.

The space station and the space shuttle are limited to low Earth orbit. The international space station program is billions over budget, and cannot fulfill promises made to our international partners or to U.S. scientists.

Thinking that the space station would be available anyway, some scientists committed to use it, but it may never have the capabilities they signed up for.

The international partners are annoyed. By absorbing a large fraction of an over-committed budget, the station functions mainly to anchor our program in low Earth orbit.

Other programs have similar problems. The space shuttle continues to be very expensive and will approach obsolescence in a decade or so. Cost and technology preclude development of a replacement.

Our space science programs are overcommitted: Planned missions call for a doubling of the science budget.

Our technology programs lack focus, having no programmatic guide to set priorities.

Given wars, entitlements, and tax cuts we are not likely to find more money for a business-as-usual program.

Thus until we set a course to move beyond the station and shuttle we will have no funds for more exciting things. If we accept the current budget but eschew business as usual, there is a way.

Consider two alternative plans:

First, a design-to-budget Mars program: We should set the glorious goal of human exploration of Mars, and to fund it phase out support of yesterday's human exploration programs — the international space station and the space shuttle.

Together they spend over \$7 billion annually, enough for a substantial Mars program.

The United States should focus technology programs on getting humans to Mars and back, especially a new vehicle. Continue the science that already supports Mars exploration.

Because of commitments to scientists and partners and be-

cause some research to support going to Mars may need to be done on the international space station, getting away from the space shuttle and space station completely may take close to a decade.

But knowing we will end them, we can take some money out now, to begin Mars studies. The Mars program should begin developing a contingent, flexible, resilient, and cost-conscious program, including transportation.

The station will do some worthwhile science, but never enough to justify its cost. In this plan, cost and effectiveness determine where and how to do science, not the existence of the station, which is now a deciding factor.

Although we cannot simply dump the station we should exit as quickly as honorable, perhaps offering ownership and operation to the international space station partners.

Progress in the Mars program depends on what funds can be extracted from the shuttle and the space station. That provides incentive for efficiency and focus in getting out of the old programs and on with the new.

If Mars lacks political support, go to plan B, focus on space science, aeronautics: Phase out the space shuttle, the international space station, and other unjustifiable programs,

and several related NASA centers, such as, Marshall, Johnson, most of Kennedy; cutting roughly half of the U.S. space agency's budget.

Since the National Oceanic and Atmospheric Administration has operational responsibility for Earth studies, funds and responsibility for Earth sciences, including responsibility for developing new generations of weather satellites should be transferred to the National Oceanic and Atmospheric Administration.

After space science demonstrates exciting results within budget it can argue for growth.

Either plan will be very unpopular because NASA's general function has been to funnel funds from the U.S. Treasury to contractors and NASA centers, and to scientists at universities, all of which reside in congressional districts.

The money will continue to go to many of the same groups, but only after a shakeup. And there will be incentives for efficiency. Both shakeup and efficiency unnerve established interests.

We must overcome such fears: The people deserve a better space program.

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