

Re: DIY space transport

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- *From:* Charles Buckley <rijrunner@xxxxxxxxxxxxxxxxxxx>
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George William Herbert wrote:

Pete Lynn <pete@xxxxxxxxxxxxxxxxxxxxxxxx> wrote:

Even this seems to assume an inflexible pre-furnished module approach, not a bare shell approach that one then moves furnishings into. Kind of like buying a fully furnished caravan and then trying to attach it as one unit onto the side of a house, instead of buying a shell of a room and then adding light weight furnishings to taste.

The issue here is that the shell, structure, and hatches are a small fraction of the total weight. Most of the weight is systems and payload.

On the other side of that is the issue that most of the volume in the modules is air. Not shell, structure, hatches, systems, and payload. I seem to recall that volume constraints tend to drive launch vehicle choice as much as mass issues.

Not sure what the whole rationale was for ISS, but it looked a lot like they said "We have something of X size possible, let's put as much as we can into that size container to the limits of the launch vehicle".

Take two equations dealing with roughly equal masses in terms of systems and payload, then look at dry vs wet. With hard shell modules, I agree with you. You really have no gain with launching dry vs wet. But, if you can intergrate to an equal size mass, then have an inflatable grow to a larger volume, then there is something to be said for dry. Habitable volume is generally the item that loses in tradeoffs. The error

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they made in NASA with TransHab was feature growth. They started packing as much as they could into it until it essentially was the same as a hard module in terms of cost.

Even if we do reduce the cost of astronaut-hours in space, we need to make their time usage as efficient as possible. It is not cost effective, considering nearerterm likely orbital manpower costs, to fit out modules on orbit. You still have to fly the systems to orbit in a pressurized container, for many of them, and once you do that you might as well make that container the module, and not have to spend time moving stuff around and plugging it in and debugging the wiring harness and cooling water plumbing once you're up in zero-G.

If a magic vehicle appeared tomorrow with \$100/lb launch costs for payload inside its reusable shell, with a payload of 250 kg or 500 kg, that cost tradeoff might be different. But that's not nearerterm credible.

-george william herbert
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