NASA Administrator Mike Griffin
Remarks to the Space Transportation Association[1]
Washington, D.C. – Tuesday, June 21, 2005

Well, good morning everybody and thanks for diverting from your morning routine to show up and listen to me. And I would have to disagree with the esteemed Congressman from California: Congress is the main act and the rest of us are the supporting cast and I think that's the way the framers wrote the Constitution if I remember correctly, so let's not have any confusion about who's the main act and who's supporting. Thanks for being here, Congressman. It's just great to have the interest that you've displayed in the space program and helping to make NASA work right. We quite literally cannot do it without you. It cannot be done without your support. So thank you.

I know what the title of the talk says but I've been actually looking for a venue to talk about the role of commercial, entrepreneurial… what we've been calling – and I want to return to this – non-traditional contractors and contracting in NASA. And I thought that this was the venue that I wanted for that because of the makeup of the Space Transportation Association, so before I start I want to thank Rich Coleman and the Space Transportation Association for having me here this morning because this is a very diverse group of industry insiders and makes this just the best possible place for me to air some of these thoughts .

This is probably the first time I've had an opportunity, having been on the job for two months and a couple of days, the first opportunity I've had to get into an issue that I've alluded to only briefly in other speeches and in hearing testimony about making some efforts to broaden out the way we do business. So I want to go into a little more detail because I think as we proceed forward through the summer and into the fall you're going to see some of these thoughts translated into actions.

For me the whole idea of getting – and let me just use the term – "commercial space" involved, as distinguished from the kinds of classic government prime contracts that we have always had to use in the space arena because the overall industrial base just, that was how it was aligned ... the idea of putting more emphasis on commercial space comes from the observation that if we pull the stick back and climb up to the fifty thousand foot level, most of the economy…this nation has the greatest economy the most productive economy…

Mr. Hall, thanks for attending. I'd like to recognize Ralph Hall from Texas here today. Another long-term friend of NASA and the space program.

We have a 10 trillion dollar plus economy. The greatest that the world has ever seen. We produce every year 2 trillion dollars more in goods and services than we can consume ourselves.

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[1] Transcript prepared based on two recordings made at the event. While every attempt was made to ensure accuracy, this is not a perfect transcript, nor has it been reviewed or vetted by anyone at NASA, and is in no way "official".

The ability of this economy and the principles on which it is structured to generate wealth is an amazement to the entire world. It's a source of amazement to the entire world and it largely draws on the ground rules of, I want to say unfettered competition, but we actually fetter the competition in order to have rules of the road, make it reasonably fair and to make it ethical and all that. But the grounding principle of US economic growth has been competition. I've spent considerable time out in Silicon Valley and I would say if you want to see the most competitive end of the spectrum that's the place to go. It's quite eye opening. And I'm not suggesting that everyone should be like that, but everyone should know it and understand it.

So the question is in the space business and I think we can all admit that that type of competition is largely lacking from today's aerospace business. It's out there but it is not the industrial base which uses up most of the DOD space dollars or the NASA space dollars, so for me as administrator, the problem is how do we engage that engine of competition more productively, so that it can work on behalf of space business.

Now I would have to say that for all of my admiration for entrepreneurs, people who take risks, start businesses… nine out of ten of them fail and go on to start another business and fail again. One out of ten succeed, build the business up and sell it out to a larger business or take it public and then become part of the American industrial landscape. For all of my admiration of that community – and I was part of it, I was one of the failures – I think I would have to say that we all are aware that there is a cacophony of voices out there of what we will call the nontraditional, for a moment, space community… raising their hands and saying "I can do it, I can do it if the government (read: Air Force and NASA), would just put some money out available for us, that was dedicated for us, we could perform and you would see."

For the moment, however, based on actual product delivered, I have to consider that mostly noise with not much signal, because real competitive businesses find their own money, develop their own business plans – actually, in the other order they develop their plans and then find their money – they acquire a team, they produce a product and they try to see if it will sell. That's what real businesses do. They don't come to the government saying set aside some money for us and trust us… watch us perform. That's not how it works. I guess some people try to do that, but it isn't a notably successful approach. That is not in the spirit of American industrial and economic competition.

So leaving all that aside, I return to the point that I am, as all senior managers in government, literally besieged by entrepreneurs who insist that if I just dump the money in their area we will get results. so ok maybe so, but I have to deal with the fact that if I gamble money in that direction and product is not delivered then public money has been spent on something that didn't come true. It was money that could have been spent on a higher odds proposition and I have to account for why I did that. So the task in front of me as a manager of our civil space program is how to recognize and deal with the fact that publicly-funded space programs have goals and objectives which have to be achieved. The NASA Administrator, the Director of the NRO, the Secretary of the Air Force – all of the folks that have high level budgeting and strategic authority on where the money goes – have goals and objectives that have to be met and the meeting of those goals and objectives can't be treated as a lottery, where we'll just spread the money around and let a thousand flowers bloom. But at the same time, I think that we as stewards of public money have to recognize that a way needs to be found, as I've said earlier, to engage this engine

of competition. What measure of our success in allocating public dollars is helping to use those public dollars to help create the kind of economy that made the rest of America great and that has largely been lacking from the aerospace industry. So it is a real dilemma, it is a real dichotomy: how do we engage competition, positioning ourselves to take advantage of the successes and accept the failures which inevitably occur in that environment while at the same time meeting the goals and objectives that we have as managers.

For NASA, what I've come to after considerable thinking and with some discussion and modifications to come, but what I've come to is that for NASA the best way to do that is to utilize the market that is offered by the International Space Station's requirements to supply crew and cargo as the years unfold. For the next few years we are going to be completing the assembly of the space station and supplying cargo to it using the Space Shuttle. That's consistent with the President's policy direction initiated on January 14 of 2004 in his major speech and following up with the space transportation policy, so next year that's what we're going to be doing.

In the post shuttle world, after 2010, we will have available a Crew Exploration Vehicle that will be the follow on to the shuttle for getting people into space and the CEV will have the requirement to be able to carry astronauts to the moon and later to Mars, but it will also have the requirement to carry astronauts to and from the space station and in our architecture planning we're making certain that unmanned versions of that system can also carry cargo to the station, so there will as there must… there must be a Government-derived capability to service the space station, even after the shuttle is retired. But because there must be such a capability does not imply to us that that is the way we would most prefer to have cargo and crew logistics requirements for the station satisfied. What I would like to do is to be able to buy those services from industry and in fact I would like to be able to buy those services from an industry represented by the Space Transportation Association.

In other venues the Government operates military air. I've been on many military airplanes. But the Government also buys tickets on commercial airlines. So one approach does not exclude the other. Today we don't have the basis or the equivalent of airline tickets or airline cargo delivery services, but using the NASA market for this traffic to the space station I believe we can create that and I believe that if we do it will lower the amount of money that we have to pay for such services because I think we all know that when we can engage the engine of competition – American industrial prowess – services will be provided in a far more efficient fashion that when the government has to do it.

So, in keeping with this thought, what can we expect… how am I are trying to balance the conflicting requirements between the appropriate stewardship of public money and the desire to engage the engine of competition? What should you expect over the next few months?

Well there is a line in our budget called ISS crew and cargo services, some of you may have seen it. It's not overly well-funded right now, a couple hundred million dollars, I don't keep the number in my head and I don't need to. But it exists and we plan to use that to get started on this process.

I would expect to see right from the outset a departure from the more traditional RFP leading to a prime contractor that we've all come to expect from NASA. You might expect to see a BAA for example. You might expect to see Other Transactions Agreements, as NASA can do, as opposed to classic contracting. There was a Rand corporation study a couple of years ago citing the efficacy of Other Transactions Agreements for the federal government as a mechanism for accomplishing appropriate stewardship of public funds. It's a very interesting report that I thought I might recommend to you.

Expect to see the government looking to make a deal in a commercial sense, again rather than issuing a prime contract focused on process and on very detailed specifications of how to do things, look for a deal-making arrangement where we tell you what it is that we want the requested service or goods to be able to perform. For those of you who have spent any time at all in the world of commercial communication satellites look for that to be the model for procurement rather than, say, the CEV procurement.

What are some characteristics of a deal that we might be willing to make? Well despite the wishes or entreaties of those who might want me to dump 400 or 500 million on their enterprise, hopefully, but some enterprise, and to stand back and wait to see if the results come in, that's not going to happen because if you're familiar with true commercial space arrangements, both sides have to have skin in the game.

If I'm a provider of communication satellite capability to a firm that really only wants to make money and from their point of view the satellite is just a transponder on a tall telephone pole, there's kind of a tension, a very healthy tension that operates. The satellite owner has to pick a satellite provider. It doesn't have the money to go out and pick two or three. It might have a leader-follower or carry a couple along, but by and large it has to pick one in fairly short order and get on with it, but having picked a provider for a couple of hundred million dollar procurement, even in commercial terms, it's a little bit like the joke about owing money to a bank. If you owe $10,000 dollars to a bank you've got a problem; if you owe $10 million dollars to a bank they've got a problem.

Once I bet on you, if I'm a commercial communications satellite procurer, owner of the service, once I bet on you as a provider I'm now stuck, so I need to make sure that both sides have skin in the game. You never, if you're providing a satellite to me on commercial terms, you never go into the black until that satellite is up, operating, and working, and maybe working It may [have for some time.

In financial terms you're always just a little bit in the pink. I can't afford to let you go deep red, because you might go out of business and I won't get very many offerers. If I make you do the whole thing on a vendor financing arrangement, the way I buy a car, I go down to the car shop and buy a car that somebody has already put their own money into building… that doesn't work in the satellite world, because what vendor is going to offer a several hundred million dollar satellite built on spec? Not too many… and if they do the price will be very high and competition is limited.

So there's a tension between buyer and seller. The buyer has to provide milestone money, progress payment money, depending on him meeting and achieving certain milestones in the

development of the bird, but the seller never really makes money until the final product is delivered and working well. We need some kind of… we need arrangements like that as we begin to develop this ISS crew and cargo procurement.

Another focus that we would be, I think, emphasizing, and I talked about this before and I want to add a little bit to it: performance rather than process. In the communications satellite world, I'm interested in numbers of transponders, throughput of those transponders, projected lifetime of those transponders on orbit, pointing control of the satellite so that it, you know, the antenna goes in the right direction, numbers of spot beams, a variety of things like that, power levels, all of which can be categorized in performance terms.

It's not up to me as the procurer of that service to determine how the engineers working for you, the provider, provide that service. I do insist that you meet certain standards capable of qualifying for insurance, because if I'm a procurer, I want to buy insurance on the spacecraft and the launch as part of the overall business package and so just like when we build ships and airplanes there are standards to which such objects have to be designed and built or they can't be insured. The same thing is true in the true commercial space arena and I would look for us to supply a floor of such standards to which you must work.

For example: Human Rating Requirements, if you're going to provide commercial crew delivery to us, Human Rating Requirements must be respected. They don't have to be respected to every I dotted and T crossed and we're interested in push back on what is value added and what is not value added, but it's more that the bulk of that must be accepted; I think you get the point. Fundamentally we're going to be focusing on what sort of performance crew and cargo delivery systems would require as opposed to what kind of process they would have to follow.

Look for us to conduct such a procurement as a competitive procurement. And look for us to pick a leader with whom we will get started and also fund a couple of followers at the study level in case the leader falls off the track because the leader is only going to continue to get his money if progress continues to be met. We will set up verifiable milestones agreed upon in the deal, the way any commercial deal would be done; and when the terms and conditions will be met, the money will be provided.

Look for us to conduct our contracting on a fixed-price basis. This is the way people buy things out in the world. I don't go and buy a car or an airplane or pretty much anything else on the basis of why don't you build me this car and tell me how much it costs when you're done. That's not the way to do things. In exchange for that, look to be required to provide a commitment to sell at a specified price if I provide a commitment to buy a specified number. Those are the kind of commercial terms that we will insist on; when you close a deal you usually have an option to buy a certain number of units at a certain price, so there won't be balloon payments at the end and there won't be get-well arrangements if you screw up. On the other hand, there will be fairly substantial rewards for people who can deliver.

Now when I say all of this and I relate it to the one aspect of the space business that is truly commercial or to other aspects of our economy with which we are all familiar, buying things, why is it that we call this type of procurement in the space business Non-Traditional? We go around town and we talk about setting aside money for Non-Traditional providers. That had been

a feature of our Exploration Systems Mission Directorate. One of which I heartily approve. But in fact what I would offer is that we in the space business and in the government acquisition business in general, are the Non-Traditional procurers. Even as big as government procurement is it is still, fortunately, only a fraction of the overall US economy. The government budget is only $2.5 Trillion and the economy is $10 Trillion. So the traditional providers are the ones who are working in the fashion that I'm describing and that I want to bring to the space business. The Non-Traditional providers are what we have been doing and not that it hasn't worked well, and accomplished many great things on our behalf, I still don't think we're likely to buy an ICBM or a launch vehicle quite yet from a "Non-Traditional provider," although I'd like to get there.

So I think my feet are fairly firmly grounded in reality, but I'm also grounded in the idea that we need to change some of the definition of reality and I think if we think about it the traditional providers are the ones we really want to engage as we go forward. So over the next few months look for these kinds of trends from us. I'm going to try and meet many challenges and I expect to do it with all of your help.

Thank you very much.

[Applause]

I keep saying that when I was doing this when I was younger, I didn't need the reading glasses and I didn't need the notes and it was a nice combination, but now I need both.

[Laughter]

Q & A

As you know a year ago a Commission headed by former Undersecretary of Defense Pete Aldridge, for the President, made a number of recommendations. I wanted to know if you could you comment as to whether or not you feel bound by any of the Aldridge recommendations as a framework for your deliberations.

Well the question was the Aldridge commission recommendations, do I feel bound by them? Are they a framework? Whatever? But You're going to get my standard answer which refers to recommendations. If I'm to be bound by a recommendation then I need to resign and you need to put the recommender in charge, which I'm happy to do by the way after about two months on this job. [Laughter.] In fact don't ask twice.

I have few better friends in this business than Pete Aldridge and actually he's been a fairly consistent source of good advice to me, and frankly is a mentor. And the whole thrust of my comments today is that I do support that recommendation that we've got to get commercial enterprise into the space business. The simple fact is that there's no future for us. There's no future for us continuing to build manned spacecraft that cost $200,000 a pound and where all of that goes to is that we've got to do better. And that will only do better if we have some true competition.

But with respect to any advisors, any study groups; any recommendations we receive; I listen very carefully to recommendations. I discuss them with the authors of those recommendations. I work them into the strategy going forward. We at NASA, at the management level, work closely through our strategy. But I cannot possibly feel bound by them because, well, they may not fit the overall plan.

What are your thoughts with regard to the development of a NASA Heavy Lifter? With regards to funding, etc…

I've said in the past that NASA owns a heavy lifter. It lifts about 120 tons every time it takes off. Of that 120 tons, 20 is cargo and 100 is payload shroud. The payload shroud is the orbiter. I mean from the point of view of the cargo, the orbiter is payload shroud. From the point of view of the crew, it's their vehicle and their lifeboat, but those who've known me, agree or disagree, like it or don't like it, those who've known me know that for 25 years I've been saying that we don't want to be mixing crew and cargo up. My car has a trunk. That's the amount of cargo I want in a crew vehicle. So as we look into the future, the system, our CEV system that we will be operating will ship cargo. It will also ship crew. Most of the time it will not ship both of them on the same launch. For the heavy lifter I am looking to adapt shuttle-derived systems because of the needs of Mars[?] and because we already have a vehicle that is in the class that I want. We'll see how that works.

With regard to your heavy lifter, you're under [garbled] a lot of recommendations from the CAIB report. [Garbled]…do you think they went too far, not far enough, or what?

The question was where do I see NASA with respect to implementing all of the CAIB recommendations? How strictly do we have to do that? And the fact is that the CAIB recommendations in their full scope are recommendations and they are not all implementable. I said this for the first time on literally my first day in office. You can beat me all you want, but you can't make me smarter than I am. Many have tried. [Laughter.]

We do not know how to effect a tile repair in accord with the CAIB recommendation. Now the recommendation itself is fine. It's a great recommendation: You should figure out how to fix tiles and reinforced carbon-carbon on orbit. It's a great idea. We haven't been able to do it. So unless somebody walks in with the magic recipe sometime in the next few days, we're going to have to sign up to launch Discovery and Eileen Collins and her crew without having met that recommendation because we can't. And that's one example, there are others.

Again, I'll say what I've said before, I've been in this business for 35 years. I've served on a lot of failure boards, unfortunately, but they don't call them failure boards because it was a great day. I've headed failure boards. Failure boards parachute in, they study the situation, they study the organization, they make recommendations and then they pull their rip cord and jump out and that's what they should do. And no one has recognized this more firmly and more publicly than Admiral Gehman. Admiral Gehman has been very clear: These were our recommendations at that point in time, use them as you think best. And we're doing… absolutely everything we can to do that, but at the end of the day the line management of the implementing organization has to be in charge and at NASA, our line management is in charge. I'm at the top of that pyramid and if we do [garbled] we'll be fired and I would expect to be. Other questions…

Your transition since coming in has created a great cottage industry in rumors and speculation. Are you feeling that things are pretty much on schedule… that you've been laying out for the architecture study, for the RFP on the CEV or are there changes coming, or is it too early to tell?

Well let's see… with regard to feelings: I don't do feelings. Just think of me as Spock. [Laughter.]

I think that the exploration study, architecture study is solidly on track. Everyone here, everyone in this town, is familiar with our budgeting cycles, and all that. So we have certain need dates from our exploration architecture so as to be consistent with OMB and the Hill and folks who are, frankly, trying to help us. So we have the study goals and I think we're doing fine on them. The other big conundrum that we have is that we will be retiring the shuttle in 2010 and we have 113 flights of history. We know, to the extent that something can be done through statistics, we know that we can't launch 28 shuttle flights, which is the current station assembly manifest between now and when they retire. We have a very high likelihood of getting 19 to 20 shuttle flights, and I can say a near certainty of getting 15 or 16. So somewhere in there -- and a best case of maybe 23 – so somewhere in there represents an achievable number of shuttle flights that we can do. We have to figure out how best to assemble and/or utilize, or the best combination of assembly or utilization for, the International Space Station going forward in the next five years using the assets that we have, flying it as many times as we expect to be able to fly it, and then how much of the station tasks should be left to the new systems, or possibly other mechanisms. That's the other study we have gotten into, and I think it's great.

As far as the cottage industry of rumors, I… you know what's out there. There are basically two approaches to all of that. I can address, you know, rumors and commentary and most of the time I think I have a reasonably intelligent response to rumors and commentary. Others might disagree about such tactics. But if I start engaging in addressing all of that, Alan, what happens is that taps my whole day, because there are more of them than there are of me. Or I can just ignore it, and just do, you know, with the management team, you know we try very hard to do what we think is right in the best interest of the taxpayer and as being effective stewards of public finance. We try to just let the record speak for itself and that's kind of where I choose to go. Good question, thanks.

On the ISS crew/cargo you've outlined, I think it's great to have the Non-Traditional approach. I'm wondering A) do you think large companies should look to this, since that's you favored approach or do you really think that's for Non-traditional or smaller companies… start-Ups? And B) How would you expect somebody to put skin in the game to try and bid for a Non-Traditional approach, since you're probably doing a cargo version of CEV that the government is actually funding? Since that might be unfair competition…

The question was does the government… I've made mention earlier that the government had to have the ability to supply crew and cargo to station, and doesn't that form competition for entrepreneurial or other providers and will what we're doing going forward be restricted only to entrepreneurial providers.

Second question first, no of course not. Competition is competition, everybody gets to play. Our terms, our business terms are going to be business terms and whoever wants to wander in the door and raise their hand and say I want to play is welcome to do it. Anybody who can meet the business terms by definition will be doing the kind of things we want. If I fail in setting forth my business terms to specify what I want, then shame on me, not shame on the provider.

Now about competition, yes you raise a very good point and the pledge that I must make because I want to make it is that the government will not provide the requested or required service if there is a commercial provider who can do it. Now for that I will need the cooperation of the Congress, you two gentlemen here, plus many more because there is an opportunity cost. It has been a Congressional goal, oft stated to me, "You Mike, pay attention, listen up, Mike, you need to get, you know, commercial industry involved in this." Well, I support that, so I salute and say "yes sir, throw me in that briar patch."

There is… it doesn't come free… there is an opportunity cost. We must have for ourselves, for the government, the capability to move crew and cargo around. We cannot be hostage to an individual provider that can stop or go out of business. That happens. So we have to have our capability. If we want to build an industry we have to use the industrial capability, if it's available. That means that with public money we will be spending a certain amount of money to keep a capability in being that may not be as fully utilized as it could be. Now hopefully, you know, I and the folks who are working on this will design an architecture that allows us, with relative efficiency, to move those assets toward exploration and away from supplying the space station. I want to make those assets as fungible as possible so that they can be moved to the thing where it will be more government-oriented enterprise, you know, going to the moon. But if we want to establish a commercial space industry in this country that can compete in the world, there will be an opportunity cost to do that. I think we should just face up to that right now. I think it's worth it, but I think kidding ourselves is not what I do. Those were good questions. Other questions.

Where do you see international partners in terms of human rated flights?

The United States needs its own strategic capability to put people into space; a launch system and crew vehicle. If there are other systems out there provided from beyond our shores, I think that's great. We'd be in a hell of a spot today if the Russians weren't space station partners, but irrespective of the existence of other capability, which we might or might not choose to purchase, depending on the terms and depending frankly upon Intergovernmental Agreements, that we do need our own capability. And we will have that if I have anything to say about it. [Garbled]

Back to the business terms, what kind of commitment can we expect, what do you have in mind for the ISS? Like number of flights per year? For the OTA or BAA do you mean no FARs? What do you see as the timing of the RFP? And the timing of the service? You know I have to ask these questions.

Lots of detailed questions from Debra… that I can't answer yet. I'm not so much interested in numbers of flights as delivery of a certain tonnage of cargo, up-mass and down-mass, a certain number of crew rotations per year and how you apportion, how do you split the package up

except to the first order, is not my concern. When we look at it the offered service can't look stupid, but the whole point of specifying what we want at an appropriate and high level is to allow people to have different approaches for meeting those requirements. This stuff will all be rolled out… first of all we have to put it together, we've kind of had other priorities like return to flight. I just wanted folks to know where we're going and time frame over which we're going there is the next few months. Look for something by early fall. This is the first day of summer. Look for something by very early fall. Part of the message to the commercial sector is, it's not that I don't care, it's not that we, this management team, doesn't care, it's that we're busy, we're real busy. But we do care and this kind of the first heads up about that.

Having come into this industry from the satellite communications industry I very much appreciated your analogy. I also, like you, have had a hard time understanding why cost plus contracting is considered traditional and commercial contracting is considered non-traditional and very much appreciate where you're going with that. Related to Deborah's question, I'm less concerned in some respects about the timing of the RFP and all of that relating to ISS resupply, but can you talk I guess in longer timeframes on when actually you would hope for this commercial capability, coming from what has been considered the non-traditional contractors, when do you actually hope that those flights will be taking place? What's the time frame actually for delivery of cargo and over what period of time?

Well we, in doing this at the start of my tenure, my hope is… well we've got three and a half years left, and I would hope that such arrangements would be if not… probably not at fruition, but would be within sight of fruition by the time I walk out the door and will be part of our planning moving forward. Now in 2009, we will still be assembling the space station and we will still have the shuttle available to do that, but we will be within very close sight of retiring the shuttle, and we would need other mechanisms. And so the very firm hope is that as the Shuttle retires in 2010, there are going to be commercial mechanisms for resupply, up-mass and down-mass, and later on for crew, will be in place, and we'll be using them.

The one model that has been very successful is Comsat, Intelsat and space communications.

I didn't want to get into names.

Well, you know, they are there and the discussion in '58 through '61 is very very interesting. Could you see that once the Shuttle gets out of business that maybe the Space Station could be transformed organizationally into something that is not totally governmental and is also not totally private, but where people can put in equity and follow the Comsat/Intelsat model and then maybe extending that also further beyond? You don't have to answer that, but I mean sometimes one finds a long dichotomy between government and industry, and there's a big river in-between. And maybe there are institutional bridges like Comsat/Intelsat which actually have been very, very successful.

Sure

But that would require legislation.

Yes, but that's not my first concern right now, but I think it's something to think about down the road.

You said something just a moment ago about cargo first and then crew. Do you see a need for near term cargo to help with supporting ISS before assembly complete or not?

I said cargo first and then crew because in my head is first you've got to prove to me that you can deliver cargo and then deliver crew, but what the nature of what constitutes a crew has to be left up to the provider and purchaser as we would consummate the deal. I don't have a religious preference in that. Our cargo needs are… up-mass and down-mass… are fairly well understood for ISS. Those will be able to be specified.

When we looked at alternate access to station before, one of the stumbling blocks was always the down-mass requirements, do you see that in the call for services, is there going to be a specific requirement as well as up-mass?

Well the way you do a business deal is you specify what you want and then negotiate for what you can get. In a contract… obviously you want a business that can make money, which naturally we have to do, but we'll say what we want in the way of down-mass and I do recognize the difficulty of it and providers will offer what they think they can provide and we'll negotiate on a price and a frequency. I don't know any other way to do it that doesn't get back into the prime contracting mold that I want to break out of. So the most intelligent thing that I can do is to start with here's what I want, now tell me what you can do.

Back to ISS Cargo delivery, for technical reasons, delivery to the door has a lot of issues.

Right

Would you consider a hybrid solution where you accept delivery to the curb, and the government takes it the rest of the way?

Absolutely, We're open to, I mean I do get it, the visiting vehicle requirements on the station can be kind of onerous, so could there be a middle man who makes money by being that middle man? The analogy is when a big ocean liner comes into port, they send a pilot out to take it the last mile.

I'm trying to avoid a description of a fixed solution. I'm trying to say: here are the people we need. Here are the cargo we need. Let's try to figure out a way to build an industrial capability that can do this. So I want to be more flexible rather than [garbled]. I want to be flexible rather than prescriptive.

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