Dream Chaser

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00:00:01,580 --> 00:00:14,480
\h Please welcome Mary Sanchez, Senior Director of Space Exploration Systems for Sierra-Nevada Corpo

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00:00:14,480 --> 00:00:16,570
\h Mary Sanchez: Good morning. This morning I'd like to talk to you about

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00:00:16,570 --> 00:00:21,340
\h following your dreams and how America can build Spaceships.

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00:00:21,340 --> 00:00:25,180
\h America is number one in Space which a lot of people seem to forget.

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00:00:25,180 --> 00:00:31,320
\h I found Luis' video interesting about NASA, they've shut their doors, they've gone away from home.

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00:00:31,320 --> 00:00:35,630
\h America still needs Spaceships. We started with the innovation.

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00:00:35,630 --> 00:00:39,900
\h Two brothers, wright brothers, back in 1903 started together.

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00:00:39,900 --> 00:00:45,670
\h They were bicycle repairmen and got together and said, we can do this flight thing.

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00:00:45,670 --> 00:00:49,470
\h We can innovate, and we can achieve. They did.

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00:00:49,470 --> 00:00:54,710
\h This went on to the cold war during the "Apollo" era where we had the rocket

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00:00:54,710 --> 00:00:59,340
\h on the launch pad here and had our nation's heroes walk on the moon.

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00:00:59,340 --> 00:01:06,590
\h In 1969, i was a 7-year-old watching a little grainy black and white TV and said, wow, this is great.

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00:01:06,590 --> 00:01:12,280

\h I want to grow up, i want to be a test pilot. I want to be an astronaut, work for NASA.

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00:01:12,280 --> 00:01:16,780
\h I want to go to mars, and i want to do all of these things in my lifetime.

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00:01:16,780 --> 00:01:21,580
\h I was really lucky. In high school, got to see the first Mars lander.

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00:01:21,580 --> 00:01:30,440
\h Got to see the pictures, the great landscapes. We recently landed a rover on mars in,

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00:01:30,440 --> 00:01:34,990
\h what was it, two weeks ago, three weeks ago. The "Curiosity" rover.

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00:01:34,990 --> 00:01:39,580
\h We're still trying to achieve. One of the things we really want to make sure

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00:01:39,580 --> 00:01:46,020
\h that America remembers is they are a Space nation, and we will get back to Space.

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00:01:46,020 --> 00:01:50,990
\h We have a mission. This mission is to send humans to Space, to send

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00:01:50,990 --> 00:01:55,050
\h humans to do exploration, to do science, to do research.

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00:01:55,050 --> 00:01:58,320
\h And we believe that America can get back there.

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00:01:58,320 --> 00:02:01,750
\h Some of these vehicles will launch from the Kennedy Space Center.

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00:02:01,750 --> 00:02:07,000
\h They will climb back once to orbit from this coast. They'll go on to orbit,

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00:02:07,000 --> 00:02:09,370
\h they will dock to the Space station.

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00:02:09,370 --> 00:02:12,160
\h They'll remain on the Space station as a rescue vehicle in order

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00:02:12,160 --> 00:02:15,170
\h to bring home the crews in case of emergency.

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00:02:15,170 --> 00:02:22,480
\h They'll come back, they'll de-orbit, and they'll come and land here at the Kennedy Space Center.

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00:02:22,480 --> 00:02:24,330
\h You'll have the crews come out.

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00:02:24,330 --> 00:02:31,760
\h They'll be able to bring their payloads out, bring their science out, and recycle and go to another launch.

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00:02:31,760 --> 00:02:34,900
\h So we can build Spaceships. One of the things i wanted to talk to

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00:02:34,900 --> 00:02:38,050
\h but is the innovation at this point Spaceship building.

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00:02:38,050 --> 00:02:42,650
\h You see the Space shuttle here, one of the most magnificent flying machines ever built.

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00:02:42,650 --> 00:02:45,770
\h I was lucky enough to work for NASA for 25 years.

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00:02:45,770 --> 00:02:51,370
\h Spent a lot of time here supporting the launch, processing landings,

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00:02:51,370 --> 00:02:56,020
\h getting to Crawl through the Space shuttle.

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00:02:56,020 --> 00:02:59,280
\h I had the opportunity to actually come and climb into the Space shuttle to help

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00:02:59,280 --> 00:03:03,840

\h pull cargo off right after it was landing where you could still smell Space.

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00:03:03,840 --> 00:03:08,160
\h I could also smell two weeks of people without showers when you went in there.

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00:03:08,160 --> 00:03:11,700
\h But it was a marvelous flying machine. It was great.

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00:03:11,700 --> 00:03:17,730
\h And it's unfortunate that we Actually as a nation had to choose to retire the Space shuttle,

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00:03:17,730 --> 00:03:22,580
\h but there are other future Spaceships coming. They're being built by multiple companies.

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00:03:22,580 --> 00:03:27,700
\h Some are in traditional contracting methods, like the Orion Spaceship where Lockheed

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00:03:27,700 --> 00:03:34,000
\h is building it using traditional government contracts, requirement, acceptance.

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00:03:34,000 --> 00:03:37,080
\h That's how the Space shuttle was president. That's how "Apollo" was built.

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00:03:37,080 --> 00:03:40,870
\h That's how many of the other Spacecrafts would have been built in this nation.

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00:03:40,870 --> 00:03:44,420
\h The other thing happening is a commercial crew program where there are

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00:03:44,420 --> 00:03:48,610
\h three companies working to do things a little bit more innovatively.

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00:03:48,610 --> 00:03:53,480
\h To work in a partnership with NASA, where companies co-invest with NASA.

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00:03:53,480 --> 00:03:59,250
\h Each of the companies have brought forth their own money and ideas, and they're designing a

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00:03:59,250 --> 00:04:07,380
\h Spaceship that will meet NASA requirements and also serve other markets and hopefully will commercia

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00:04:07,380 --> 00:04:16,340
\h One of the neat things about the way that the commercial crew program works is NASA gives companie

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00:04:16,340 --> 00:04:20,610
\h They say build me a Spaceship that will do these things.

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00:04:20,610 --> 00:04:24,510
\h But then the companies have an opportunity that to see come back to NASA.

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00:04:24,510 --> 00:04:29,880
\h The expertise in human Spaceflight lies within NASA. The propulsion expertise,

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00:04:29,880 --> 00:04:34,650
\h the rendezvous and docking expertise, the launch, the landing well.

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00:04:34,650 --> 00:04:41,160
\h All of those areas rely within NASA at Kennedy Space Center, at the Centers, Johnson Space Center,

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00:04:41,160 --> 00:04:46,140
\h Goddard, Marshall, all of those places have a world classwork force.

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00:04:46,140 --> 00:04:48,860
\h The contracting mechanism with the
commercial Spaceflight allows

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00:04:48,860 --> 00:04:54,030
\h the government an innovative way to do business.

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00:04:54,030 --> 00:05:00,330
\h The government says, okay, there are some things we can do better and contract back out to you,

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00:05:00,330 --> 00:05:07,720
\h the contractor, to allow you to get the best in class, the best available.

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00:05:07,720 --> 00:05:11,180
\h One of the Spaceships that's being built is the "dream chaser."

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00:05:11,180 --> 00:05:16,010
\h this is kind of interesting because it actually started in a very circuitous route.

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00:05:16,010 --> 00:05:20,460
\h back in the 1980's the russians saw the space shuttle and thought this is really neat.

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00:05:20,460 --> 00:05:25,720
\h we wish we had a vehicle that could go to
space, come back, launch and land on a
runway.

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00:05:25,720 --> 00:05:29,330
\h they invented what they called the Bor-4 spaceplane.

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00:05:29,330 --> 00:05:35,030
\h The Spacecraft was designed to be a Space-based fighter plane.

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00:05:35,030 --> 00:05:40,340
\h It was going it launch with the crew of one, the original concept was you would put

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00:05:40,340 --> 00:05:44,520
\h three in a launch vehicle, they would go up and do war in Space.

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00:05:44,520 --> 00:05:48,370
\h They would protect Space, they would protect their assets.

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00:05:48,370 --> 00:05:53,770
\h Well, back in the '80s, we happened to get photographs of it back in the height

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00:05:53,770 --> 00:05:57,130
\h of the cold war when everybody spied on everybody and took pictures of everything.

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00:05:57,130 --> 00:06:01,510
\h And the U.S. Government went to NASA and says, okay, we just saw this thing.

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00:06:01,510 --> 00:06:08,290
\h What does it do? So NASA Langley built it and said this is pretty good, they did improvement,

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00:06:08,290 --> 00:06:13,240
\h wind tunnel testing, did a lot of piloting handling evaluations.

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00:06:13,240 --> 00:06:21,830
\h And in the early '90s came one a concept that would be a crew return vehicle for the Space station.

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00:06:21,830 --> 00:06:24,330
\h NASA being NASA, they changed their mind.

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00:06:24,330 --> 00:06:28,950
\h They actually ended up funding a different program which I worked as a NASA engineer

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00:06:28,950 --> 00:06:34,470
\h called the X-38, also used in lifting body. This was all heritage NASA work.

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00:06:34,470 --> 00:06:41,840
\h So the "Dream Chaser" is based on NASA heritage work taking benefit of what's already been done.

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00:06:41,840 --> 00:06:45,680
\h We talked about the Russians. From the United States to Russia,

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00:06:45,680 --> 00:06:49,810
\h there was a lot of the lifting body work going on, a lot of lifting body testing.

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00:06:49,810 --> 00:06:57,300
\h The X-38 that I mentioned was based on the X-24 shape which was flown pie the air force.

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00:06:57,300 --> 00:07:00,060
\h It was flown by suborbital flights as well as crew flights.

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00:07:00,060 --> 00:07:03,240
\h And NASA actually built that and tested it in the '90s.

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00:07:03,240 --> 00:07:07,180
\h You see some of the other vehicles that they've tested.

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00:07:07,180 --> 00:07:09,720
\h And I like this because you see the video going on.

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00:07:09,720 --> 00:07:14,160
\h If you look on the left side of the picture, those are all pictures taken from the air.

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00:07:14,160 --> 00:07:20,200
\h Those were taken from an Australian p-3 of where the Australians saw the Russians

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00:07:20,200 --> 00:07:23,730
\h recovering something from the ocean and went and took pictures.

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00:07:23,730 --> 00:07:28,040
\h This was the original pictures they sent NASA were coming from.

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00:07:28,040 --> 00:07:33,310
\h On the right, it's the pictures that the Russians did of the recovery.

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00:07:33,310 --> 00:07:38,930
\h In one of the views you'll see the p-3 overflying -- you actually see the full

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00:07:38,930 --> 00:07:47,220
\h circle of each side taking pictures of what they're doing. I'm a home build pilot.

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00:07:47,220 --> 00:07:54,210
\h I helped build two, I'm building a third airplane. I love flying. I love building when i fly.

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00:07:54,210 --> 00:07:57,670
\h One of the really great things about the new, innovative partnership,

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00:07:57,670 --> 00:08:01,650
\h is it allows you to build a little, to test a little, to fly a little.

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00:08:01,650 --> 00:08:05,290
\h And in that process you bring up the innovation of engineers.

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00:08:05,290 --> 00:08:11,950
\h You've heard talk about collaboration, about innovation, involving people in the decision making process

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00:08:11,950 --> 00:08:17,310
\h What you see is called an engineering test article used for captive carry

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00:08:17,310 --> 00:08:20,440
\h flights and relief flights at the end of the year.

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00:08:20,440 --> 00:08:27,810
\h One of the great things about this type of sponsorship you allow engineers to do hands-on work.

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00:08:27,810 --> 00:08:35,330
\h We had painting parties late at night where we had managers drilling holes to install the final air shelf.

105
00:08:35,330 --> 00:08:40,550
\h We had engineers working with paint trying to get the vehicle painted doing the hands-on work

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00:08:40,550 --> 00:08:47,500
\h to where they felt ownership and commitment in the product that they were building.

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00:08:47,500 --> 00:08:51,550
\h See great scenery, turns out Colorado's a great place to do test flights. Most people think of

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00:08:51,550 --> 00:08:56,610
\h Edwards Air Force base which is actually a great place to do test flights to out of the research center.

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00:08:56,610 --> 00:09:03,320
\h The captive carry of this vehicle was done just east of boulder, Colorado.

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00:09:03,320 --> 00:09:06,090
\h One interesting thing is you look for a great big area when you're

111
00:09:06,090 --> 00:09:08,570
\h doing something that was helicopter flight.

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00:09:08,570 --> 00:09:14,140
\h You look for a great, big area when you're carrying a helicopter that has no population, no people.

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00:09:14,140 --> 00:09:18,650
\h There's a little place near boulder called rocky flats where they use today to make plutonium.

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00:09:18,650 --> 00:09:26,660
\h No people there. It's a really good place to fly over. But you really don't want to land there.

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00:09:26,660 --> 00:09:30,200
\h And so you can see the helicopter, you don't get to see the barren ground

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00:09:30,200 --> 00:09:33,790
\h where they scooped up all the earth from this view.

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00:09:33,790 --> 00:09:37,340
\h So we are looking at America's stain in Space.

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00:09:37,340 --> 00:09:44,660
\h America returning to Space, and American back to having human Spacecraft to where we don't rely on

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00:09:44,660 --> 00:09:49,520
\h where we look at innovative and collaborative approaches toward partnership.

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00:09:49,520 --> 00:09:53,950
\h One thing to remember is that while NASA is doing this for the first time,

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00:09:53,950 --> 00:09:56,240
\h this is actually in the history of America.

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00:09:56,240 --> 00:10:01,640
\h When you look at the original airlines that they were all started out with some input from government

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00:10:01,640 --> 00:10:07,900
\h funding, with the companies doing their own resources and turning it into a commercially viable busines

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00:10:07,900 --> 00:10:11,660
\h you look at airlines and you look at air mail.

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00:10:11,660 --> 00:10:14,560
\h Government started out funding all of the air mail.

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00:10:14,560 --> 00:10:19,060
\h It went -- city to city, landmark to landmark, to deliver that.

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00:10:19,060 --> 00:10:25,250
\h Now you have Fedex and UPS Doing it all commercially where it is a completely viable business.

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00:10:25,250 --> 00:10:27,520
\h So there are different ways to do business.

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00:10:27,520 --> 00:10:29,300
\h There are different ways to do innovative,

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00:10:29,300 --> 00:10:35,400
\h collaborative partnerships between the government and between industry that bring value to the govern

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00:10:35,400 --> 00:10:40,220
\h that bring value to the taxpayer because there's a lot less government dollars and some

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00:10:40,220 --> 00:10:42,750
\h corporate dollars invested where you end up with a cheaper,