

Commercial Spaceflight

(Current Overview: Status CCDev-2 Results, April 2011_U2)

The cancellation of the Vision of Space Exploration (VSE) Constellation program by President Obama on 1st February 2010 and the various new directions to NASA puts the focus now on commercial spaceflight plans and the associated companies.

The following table tries to compile the available information about NASA's initiatives on Commercial Transport Systems (COTS), Commercial Crew Development (CCDev) and Commercial Reusable Suborbital Research (CRuSR) to identify the major players in this new and fast growing arena starting with the first NASA COTS initiative in 2010.

The author takes no responsibility for correctness and completeness, the compilation should give an overall impression of the dynamically changing commercial space activities resulting from the recent decisions with focus on, but are not limited to CRuSR; CCDev2 and COTS assignments.

The second phase of the CCDev program was initiated in February 2011 by NASA inviting eight companies to Johnson Space Flight Center (JSC) to discuss proposals for the second round of CCDev (CCDev-2).

The table below has been updated to reflect the recent changes and the selection results of **CCDev Round 2** narrowing down the field for NASA awards to four companies: **Boeing** (\$ 92.3 million), **Sierra Nevada Space Systems** (\$80.0 million), **Space Exploration Technologies Corp.** (\$75.0 million) and **Blue Origin** (\$22.0 million).

NASA announced a third CCDev round for fall 2011.

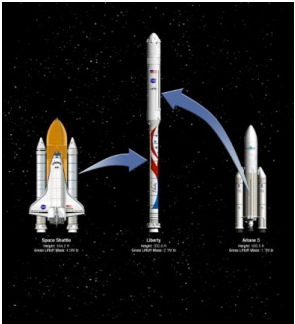
Readers are encouraged to provide corrections and/or update information to the Editor for SpaceOps News (joachimkehr@aol.com).

Glossary:


VTVL = Vertical Takeoff and Vertical Landing

HTHL = Horizontal Takeoff and Horizontal Landing



[Alliant Techsystems](#) (ATK) / HQ - Minneapolis / George Torres

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	> Liberty L/V				2013		<ul style="list-style-type: none"> > CCDev2 proposal was declined by NASA because lack of capsule developers commitments > Coop with EADS/Astrium Les Mureaux, France: Ares-1 solid rocket Ariane-5 cryogenic main stage

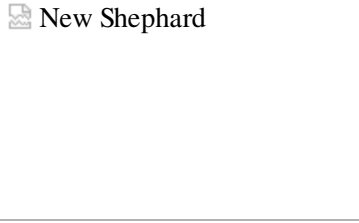
[Armadillo Aerospace](#) / Mesquite, Texas / John Carmack

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	<ul style="list-style-type: none"> > Rocket Race Propulsion > Methan Mod (Lunar Lander) 	VTVL	single person to orbit	Oklahoma Spaceport	--	--	<ul style="list-style-type: none"> > Cooperation with OTRAG founder Lutz Kayser (Germany) > Work on Lunar Lander (GLX-Price) > CRuSR candidate

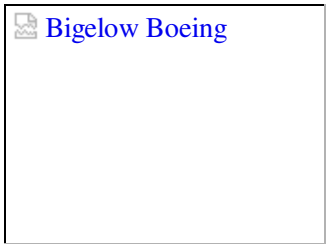
[Bigelow Aerospace](#) / Las Vegas, Nev / Robert Bigelow

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	Genesis-I Genesis-II Sundancer BA-330	Dnjepr Atlas 5 Falcon 9	6	Yasni-Russia Cape Canaveral Cape Canaveral	2012	--	 > CCDev1/2 co-op with Boeing Space Exploration

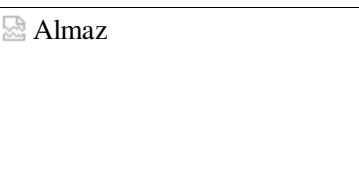
[Blue Origin](#) / Kent, Wash / Rob Meyerson, Jeff Bezos

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	> New Shepard > Escape system "pusher" > Composite pressure vessel (CC)	> Atlas-5 > VTVL	multiple: up to 3	West Texas	2012-2015	\$2.5 Mio per system flight	Suborbital to 120 km Science Rep: Dr. A. Stern > CCDev1 award > CRuSR candidate > CCDev2: Award for New Shepard crew capsule (\$22 mio)

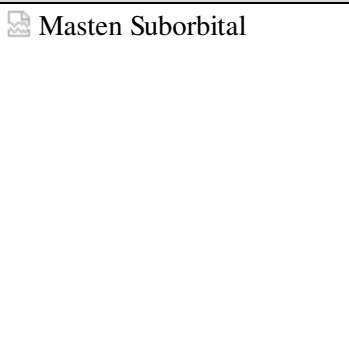
[Boeing Space Exploration](#) / Chicago, Houston / John Elbon

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	CST-100	Atlas-5 Delta-4 Falcon 9	7	Cape Canaveral	--	--	> Selected by NASA for CCDev1 (Feb. 2010) > Co-op with Bigelow > CCDev2: CST-100 capsule award (\$92.5 mio)

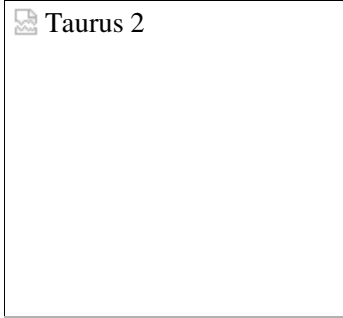

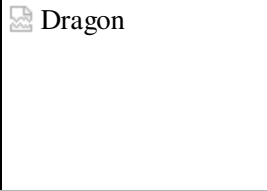
[Excalibur Almaz](#) / Isle of Man/ Leroy Chiao

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	> Crewed system based on Soviet-era space H/W	VTVL					> CCDev2 candidate, proposal declined by NASA.

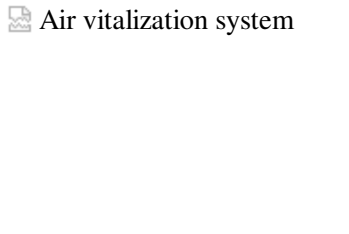
[Masten Space Systems](#) / Mojave, Ca. / David Masten

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	XA-1.0 Xaera (reusable)	VTVL	--	Space Florida (Cape Canaveral A/F launch complex 36)	--	--	> eXtreme Altitude Vehicles (XA) for vertical takeoff and landing. > CRuSR candidate

[Orbital Science Corporation](#) / Dulles Va. / Dave Thopson

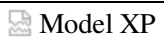
Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	<ul style="list-style-type: none"> > Taurus 2 > Cygnus (Cargo capsule) > Lifting body S/C for CCDev2  Lifting body S/C	Atlas 5	4	Wallops Is SpacePort America	2011 2015	--	> COTS contract:. > CCDev1 : Proposal for the crewed version of the Space-X cargo transporter for Dragon: <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"></div> > CCDev2 : Lifting body S/C rejected by NASA in favor of Sierre Nevada >Coop with Thales- Alenia (Turin) for Cygnus module delivery >Coop with Virgin Galac.

[Paragon Space Development](#) / Tucson / Jane Poynter



Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
 Air vitalization system testings	Air revitalization system	--	--	--	--	--	> CCDev1 award: Air revitalization system. Compatible with: - Dragon (SpaceX) - Cygnus (Orbital Sci)

[Rocketplane](#) /Oklohoma/ Chuck Lauer



Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
-------	---------	-----	------------	-----------	-------	-------	---------

 Model XP	>Model XP	--	5			\$250.000	Suborbital flight 45 km (?) based on a modified commercial jet-plane
---	-----------	----	---	--	--	-----------	---

[Sierra Nevada Corporation \(SNC\)](#) / Sparks Nev. / Mark Sirangelo

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
 Dream chaser Dream Chaser	>Dream Chaser (Lifting body)	 Atlas-5	6	Cape Canaveral	--	--	> CCDev1 contract (\$20 Mio) to built a vehicle structure and propulsion system >Dream Chaser based on NASA HL-20 >Coop with ULA for man-rating Atlas-5 > CCDev2: Award for advancing Dream Chaser (\$80 mio) > Coop with Virgin Galactic

[Space Exploration Technologies](#) - SpaceX /Hawthorne Ca / Elon Musk

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
 Falcon 9 Falcon 9	>Falcon-1 >Falcon-9 >Dragon for -Cargo or -Crew transport  Dragon Dragon	Falcon 9	7	Cape Canaveral	2011	--	> COTS contract from NASA > CCDev2: Award for the development of a launch abort system for the Dragon S/C (\$75mio) in coop with ULA

[TALIS - Project Enterprise](#) / Cochstedt (Germany) / Frank Marco Guenzel

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
-------	---------	-----	------------	-----------	-------	-------	---------

Black Sky

>Black Sky

HTHL

5...6

Cochstedt
(Germany)

2013

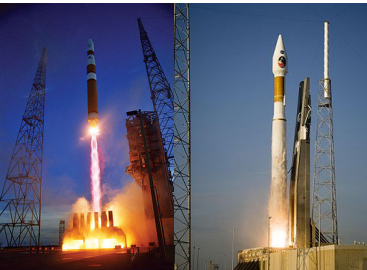
150.000Euro

Suborbital to 100 km

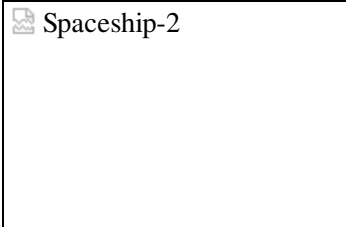

>Coop with Xtreme Air and SPL

>**TALIS dissolved the company in 2010**

[United Launch Alliance \(ULA\)](#) (Boeing-Lockheed Martin joint venture) / Denver / Mike Glass

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
 <p>Delta IV Atlas V</p>	<p>>Delta IV >Atlas V</p> <p>L/V health detection system for various launch vehicles</p>	--	--	Cape Canaveral	--	--	<p>>CCDev-1 award: for health and emergency detection system compatible with: - Atlas-5 - Delta 4</p> <p>>CCDev2 standalone proposal for man-rating Atlas-5 and Delta-4 was declined by NASA</p>

[Virgin Galactic](#) / Mojave / Bob Rutan (Scaled Composites), Paul Anderson (Mojave Aerospace Ventures), Sir R. Branson (V.G.)

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
 <p>SpaceShip-2</p>	<p>SpaceShip 1+2</p> <p>White Knight 1+2</p>	HTHL	6	<p>Mojave Spaceport Spaceport America Kiruna, Sweden</p> <p>Coop with Saudia Arabia</p>	2011 2012	\$200.000	 <p>> Suborbital flights to max. 109 km</p> <p>> Partnership with Abu Dhabi</p> <p>> CRuSR candidate</p>

[XCOR Aero](#) / Mojave Ca / Jeff Greason

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
Lynx	Lynx Mk1	HTHL	1 plus pilot	Mojave Air and Spaceport	2011 marketing ongoing	\$95.000	<p>>Suborbital flights to 60 km</p> <p>>Coop with South Korea</p> <p>>CRuSR candidate</p>

