

The Traveller's Guide to Commercial Spaceflight

(Current Overview: Status CCDev2, March 2011_U1)

The cancellation of the Vision of Space Exploration (VSE) Constellation program by President Obama on 1st February 2010 and the various new directions for NASA puts the focus 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.

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 (CCDev2). The table below has been updated to reflect the recent changes.

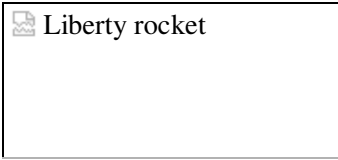
Readers are encouraged to provide corrections and/or update information to the Editor for SpaceOps News (joachimkehr@aol.com).

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 Rocket				2013		> CCDev2 candidate > Coop with 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
	> Rocket Race Propulsion > Methan Mod (Lunar Lander)	VTVL	single person to orbit	Oklahoma Spaceport	--	--	> Cooperation with OTRAG founder Lutz Kayser (Germany) > Work on Lunar Lander (X-Price) > CRuSR candidate

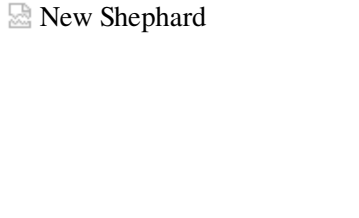
[Bigelow Aerospace](#) / Las Vegas, Nev / Robert Bigelow

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	--	

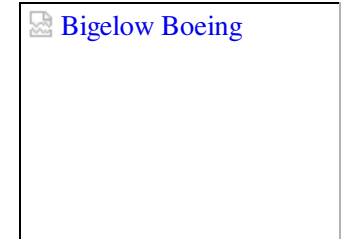


CCDev1/2 co-op
with Boeing Space
Exploration

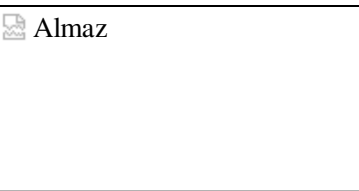
[Blue Origin](#) / Kent, Wash / Robert Millman, Jeff Bezos

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	<ul style="list-style-type: none"> > New Shepard > Escape system "pusher" > Composite pressure vessel (CC) 	Propulsion and Capsule System	multiple: up to 3	West Texas	2012-2015	2.5 Mio per system flight	<ul style="list-style-type: none"> >Suborbital to 120 km >CCDev1 award >Science Rep: Dr. A. Stern >CRuSR candidate >CCDev2 candidate


[Boeing Space Exploration](#) / Houston, Tex. / Edmund G. Memi

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	CST-100 (Orion Lite)	Atlas 5 Falcon 9	7	Cape Canaveral	--	--	<ul style="list-style-type: none"> >Selected by NASA for CCDev1 (Feb.2010) >Co-op with Bigelow >CCDev2 candidate

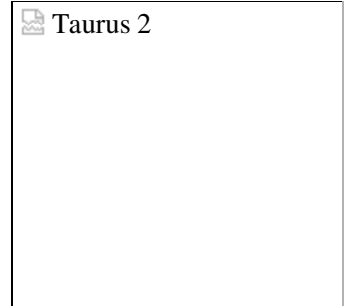


[Excalibur Almaz](#) / Isle of Man/ Leroy Chiao

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	<ul style="list-style-type: none"> > Crewed system based on Soviet-era space H/W 	VTVL					<ul style="list-style-type: none"> > CCDev2 candidate

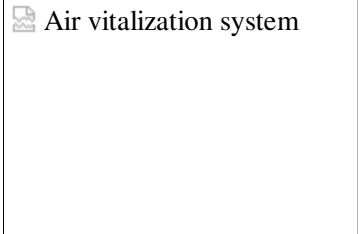
[Masten Space Systems](#) / Mojave, Ca. / David Masten

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	XA-1.0	VTVL	--	--	--	--	<ul style="list-style-type: none"> >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  <p>Lifting body S/C</p>	Atlas 5	4	Wallops Is SpacePort America	2011 2015	--	<ul style="list-style-type: none"> >COTS contract >Crewed version of the SpaceX cargo transporter for CCDev1 (Dragon)  <ul style="list-style-type: none"> >CCDev2 candidate (lifting body S/C) >Coop with Virgin Galac.

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

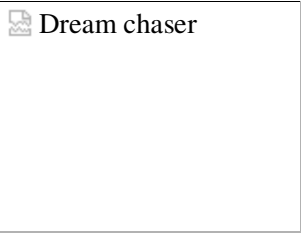

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
 <p>Air vitalization system testings</p>	Air revitalization system	--	--	--	--	--	<ul style="list-style-type: none"> >CCDev1 award: Air revitalization system. Compatible with: <ul style="list-style-type: none"> > Dragon (SpaceX) > Cygnus (Orbital Sci)

[Rocketplane](#) /Oklohoma/ Chuck Lauer

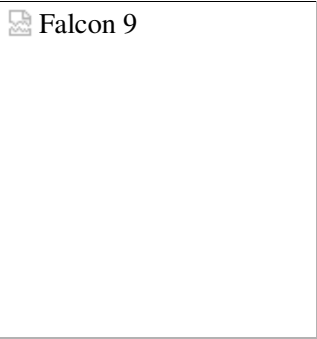

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	>Model XP	--	5			250.000US\$	Suborbital flight 45 km (?)

Model XP

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

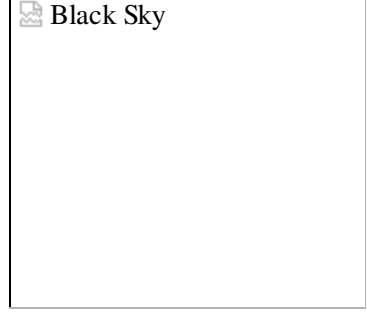
Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	>Dream Chaser (Lifting body)		6	Cape Canaveral	--	--	> CCDev1 contract (20 Mio) to built a vehicle structure and propulsion system >Dream Chaser based on NASA HL-20 >Coop with ULA for manrating Atlas-5 > CCDev2 candidate > Coop with Virgin Galactic
		Atlas-5					

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

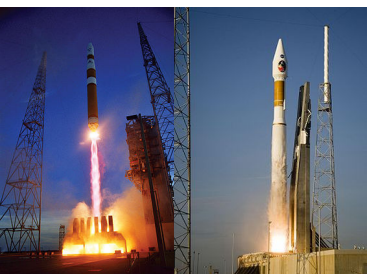
Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
	>Falcon-1 >Falcon-9 >Dragon for -Cargo or -Crew transport 	Falcon 9	7	Cape Canaveral	2011	--	> COTS contract from NASA > CCDev2 candidate: Development of a launch abort system for Dragon S/C

[TALIS - Project Enterprise](#) / Cochstedt (Germany) / Frank Marco Guenzel (DISCONTINUED IN 2010)

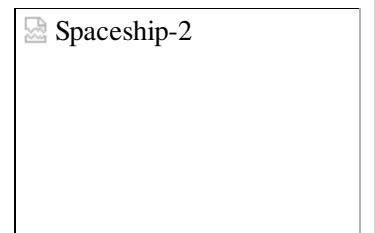

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
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	>Black Sky	HTHL	5...6	Cochstedt (Germany)	2013	150.000Euro	>Suborbital to 100 km >Coop with Xtreme Air and SPL
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[United Launch Alliance \(ULA\)](#) (Boeing-Lockheed Martin joint venture) / Denver / Mike Glass

Image	Product	L/V	Passengers	SpacePort	Dates	Price	Remarks
 <p>Delta IV Atlas V</p>	>Delta IV > Atlas V >L/V health detection system for various launch vehicles	--	--	Cape Canaveral	--	--	Health detection system compatible with: > Atlas-5 > Delta 4 >CCDev1 award >CCDev2 candidate

[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
	SpaceShip 1+2 White Knight 1+2	HTHL	6	Mojave Spaceport Spaceport America Kiruna, Sweden Coop with Saudia Arabia	2010	200.000 \$	 > Suborbital to max. 109 km > Partnership with Abu Dhabi > CRuSR candidate

[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 \$	>Suborbital flights to 60 km >Coop with South Korea >CRuSR candidate

