



MEMORANDUM

Date: September 30, 2016

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator 

Re: **Article by Former NASA Associate Administrator and Current World View Chief Science Officer Regarding the Rise of the High-altitude Balloon Industry**

Since we announced the County's agreement with World View, the company has been criticized by some in the community as a frivolous offering of pie-in-the-sky balloon rides. Nothing could be further from the truth.

World View is an earnest and growing company that has found a unique niche in the rapidly growing commercial space industry. There is a burgeoning market for high-altitude commercial payloads, and homegrown World View is uniquely positioned to capitalize on it.

World View is developing brand new, high-altitude aircraft called stratolites that can remain aloft for extended periods; from several days to several months. It has a renowned team of scientists and engineers developing these products; and its Chief Science Officer is Dr. Alan Stern, formerly a NASA Associate Administrator who was NASA's head of all space and Earth science programs and the leader of its incredibly successful New Horizons mission to Pluto.

Attached is an article by Dr. Stern in *Space News*, a space industry news publication, that explains the myriad uses for high-altitude balloons and how World View and other companies are developing the systems and products to address this demand.

Progress on construction of the World View headquarters building remains on schedule for completion before the end of the year; and construction of the launchpad, County-owned Spaceport Tucson, is complete.

World View has already hired 30 new employees, and our agreement with the company has attracted significant interest in Pima County and the Sonoran Corridor from other space industry companies. We anticipate another space-related company will soon announce their intent to join World View in the County's Aerospace, Defense and Technology Business and Research Park.

I remain highly confident World View will be a very successful company, and our agreement with them will prove a catalyst for a new era of space-related economic development in Pima County.

CHH/mjk
Attachment



Spot On.

A 21st century renaissance in high altitude ballooning

by [Alan Stern](#) — September 25, 2016



World View is one of several companies that plans to develop a balloon system to carry payloads and people to the edge of space. Credit: World View

High altitude ballooning has begun to undergo a renaissance that is creating exciting new capabilities, therefore enabling a wide array of new applications of interest to researchers and entrepreneurs in many fields. These new capabilities are breathtaking in both their scope and their expected impact. They include:

- **Station-keeping.** This is the ability to place balloon platforms over a narrowly-define location, rather than being forced to drift away due to winds.

- **Point-to-point flight.** This enables balloons to transect a user's defined flight path over the ground or through the atmosphere, further removing ballooning's longstanding limitation of being tied to the mercy of atmospheric currents.
- **Routine long-duration flight.** Whereas most high altitude ballooning has been limited to flights lasting just a fraction of a day, with only rare, nearly heroic efforts being needed to mount long duration flights, affordable capabilities are now enabling flights of weeks and even months to become routine.
- **Onboard personnel.** Systems that allow people to cost effectively fly at high altitude are now on the drawing boards and are expected to take flight within a few years, offering to lower many kinds of experiment costs as automation is avoided, and opening up stratospheric ballooning to commercial tourism.
- **Advanced balloon manufacturing.** Whereas high altitude ballooning has always been limited by the intensive, hand labor nature of balloon construction, the application of artificial intelligence and other advanced manufacturing techniques now promise orders of magnitude increases in balloon production rates, enabling worldwide flight volume to soon grow from dozens to thousands per year.

Each of these capabilities is individually revolutionary. But the combination of these many revolutionary capabilities coming on line almost simultaneously is opening an almost dizzying array of new high altitude ballooning uses and markets. We can only barely imagine what will develop over the next decade or two, but we already foresee new high altitude balloon applications that include commercial, scientific, civil, and defense applications, such as:

- Communications applications that range from arctic shipping and air commerce where geostationary communications satellites are disadvantaged, to critically needed voice, data, and commercial services above weather, earthquake, and fire disaster locales experiencing infrastructure outages.
- Science applications that enable dense atmospheric monitoring to improve weather and crop forecasts, new kinds of long-duration astronomical observations at a fraction of the cost of satellite systems, and wide area, high resolution oceanographic capabilities that neither satellites nor buoys allow.
- Edge of space tourism that offers longer flight experiences for just a fraction of the cost of a rocket ride, and does so without the rigorous training or understandable safety concerns of riding on rockets.

- Technology demonstrations that allow the routine testing of sensors and experimental techniques at high altitude before they are sent to orbit, giving sensor developers the twin advantages of early risk reduction and competitive leverage.
- Surveillance applications that range from crop and traffic monitoring, to drug and border enforcement, to defense and domestic security.

The high altitude ballooning company World View, where I am involved, is one of a number of companies that are developing and applying the new ballooning capabilities to open new markets in the high altitude of the stratosphere. World View was formed by entrepreneur technologists Jane Poynter and Taber McCallum, former Space Shuttle commander Mark Kelly, and myself. Our missions are to pioneer and then apply new technologies that open the stratosphere up to commercial applications in the same way that satellites opened low Earth orbit and geostationary orbit to commerce, and to offer flight services that are open the black sky and curved Earth experience to a much broader range of individuals than can withstand or afford suborbital tourism. We are doing flights for NASA's Flight Opportunities program, such as one for the Southwest Research Institute in early September.

We consider ourselves pioneers in 21st century ballooning, but we are not the only such pioneers. We are joined in commercial high altitude ballooning by Google's Loon, Near Space Corporation, and Zero 2 Infinity. Soon, we expect, even more firms will enter this market. With so much going for it, the future of high altitude ballooning is as bright and this new century is young.

Alan Stern is a planetary scientist and the chief science officer of World View ballooning. He is the former head of all science missions at NASA and the chairman pf the board of directors of the Commercial Spaceflight Federation. A version of this essay previously appeared in The Space Review.

BUSINESS