Launching a New Era in Space Exploration

Today the Obama Administration is launching a bold and ambitious new space initiative that invests in American ingenuity to propel us on a new journey of innovation and discovery. This new effort will enable our nation to explore new worlds, develop more innovative technologies, foster new industries, strengthen international partnerships, and increase our understanding of the earth, our solar system, and the universe beyond.

Our endeavors in space can inspire our imaginations and kindle our collective spirit of discovery and adventure. Expanding our understanding of space awakens our ingenuity, spurs our innovative potential, and helps us better understand our place in the universe. For such reasons the President's commitment to exploring further into space remains strong and unwavering. Yet we must make sure that the course we chart does not fall back on the technologies and mindsets of the past, but rather, that we are pushing the frontiers of innovation in a way that puts America on a more sustainable and enduring path for achieving its boldest aspirations.

In May of this year, the Office of Science and Technology Policy (OSTP) launched an independent review of the National Aeronautics and Space Administration's (NASA) Constellation program -- a plan to return to the Moon using an approach similar to the Apollo program, 50 years after that program's triumphs. We tasked an independent committee with reviewing U.S. human space flight plans and activities, with the goal of ensuring that our nation is pursuing the best trajectory in this arena – one that is safe, innovative, affordable, and sustainable. The analysis and findings provided by this review committee, which was chaired by Norm Augustine, indicated that the Constellation program is challenged by a broad spectrum of problems and fundamentally "unexecutable."

Based on the facts openly discussed by the Augustine Committee in the most public and transparent review of the U.S. space program ever conducted, certain conclusions were immediately clear: the current program is over budget, behind schedule, and suffers from decades of under-investment in space technology development. It would require enormous budget increases to land even a handful of astronauts back on the Moon before 2030. Further, the program's strong emphasis on returning astronauts to the Moon has left us reliant on Russia for access to the International Space Station for many years to come after the Space Shuttle retires.

Meanwhile, NASA's efforts in recent years to pursue its Moon goals have forced cuts to other critical NASA programs, including Earth observation, aeronautics, robotic space exploration, space science, and education. NASA also had to plan to cut short the operational life of the International Space Station, at the height of its promised potential.

Put simply, the Constellation program threatened other important parts of NASA's endeavors and mission, while failing to achieve the trajectory of a program that was sustainable, executable, and ultimately successful. The Augustine Committee reflected on this situation, and found that a root cause of this troubled state was a decades-long, systemic under-investment in new technology and innovation. We essentially were trying to recreate the glories of the past with the technologies of the past, and, not surprisingly, the result was a program anchored in the past. This is not the vision that the President has for NASA, nor is it the best way to move forward on our efforts in space.

We believe that the technology shortfall we face is so fundamental that incremental changes or tinkering on the margins will not be sufficient to address current and future needs. Rather, a fundamental "re-baselining" of our Nation's exploration efforts is needed. We must invest in fundamentally new innovations for space technology, and new ways of doing business, if we are to develop a space exploration and development program that is truly sustainable over the long term.

We want to thank the members of the Augustine Committee for their dedicated service, thorough analysis, and comprehensive assessment. While NASA will certainly face some challenges going forward, the necessary course adjustments we are announcing today will enable some enormous new opportunities that result from making smarter policy choices. The Committee's findings provide the foundational elements for America's future space exploration activities. Today we are putting NASA on a more innovative, dynamic, and sustainable trajectory for achieving our nation's space ambitions. Toward this end, President Obama has directed us to cancel the Constellation program, in favor of a new approach unfolding on five fronts.

First, NASA will plan (working together with its international partners) to extend the operation of the International Space Station (ISS), likely to 2020 or beyond, and to expand efforts to utilize the ISS for scientific, technological, diplomatic and educational purposes. Further, NASA will partner with the aerospace industry in a fundamentally new way, making commercially provided services the primary mode of astronaut transportation to the International Space Station. A greatly strengthened U.S. commercial space industry competing for this critical part of NASA's mission will harness our nation's entrepreneurial energies, create thousands of new jobs and catalyze the development of other new businesses that capitalize on affordable human access to space. The United States can and will lead these new industries. Further, American companies have proven their ability to build systems of high safety and reliability in many transportation sectors, including space – and we are confident that, working closely with the NASA team, they will do the same in this effort. Pursuing this approach will allow NASA to focus on the hardest challenges for which it is singularly suited – advancements in technology, scientific discovery, and exploration of new frontiers.

Second, in order to explore those new frontiers effectively, the President has directed a vigorous new technology development and test program that will begin to reverse decades of under-investment in new aerospace ideas and re-engage our greatest minds. NASA, working with industry, academia, and international partners, will increase its support for transformative research, prioritize new technology

development like in-orbit fuel depots, and build, fly, and test in Earth's orbit several key technologies that can increase the technological capabilities, decrease the costs, and expand the potential opportunities for all future space activities. A new heavy lift and propulsion R&D program will be an important component of this effort. NASA has long been one of the greatest innovation centers for the United States, and this renewed effort will ensure that it remains so into the future.

Third, NASA is going to expand its reach into the solar system by initiating a steady stream of new robotic exploration missions to scout locations for future human missions, demonstrate new technologies, and provide scientific dividends and discoveries. We are going to touch the surface of solar system destinations such as the Moon, near-Earth objects, and Mars with ever more frequency and sophistication, with robots leading the way for later human explorers. Combining an aggressive test program for new enabling technologies with new scouting missions offers our Nation a better, far more sustainable strategy for space exploration – one that takes a step-by-step approach toward our long-range objectives and ambitions while providing near term benefits and achievements. Shaped by new scientific discoveries and complemented by emerging technologies, future explorers will not have the limited alternatives we have faced for so long now, but instead a broad range of opportunities for how and when we get to new destinations in space.

Fourth, this new approach will breathe life back into the rest of NASA's science and aeronautics programs. NASA's Earth science program provides the ultimate high-ground from which we can foster a unique scientific understanding of the Earth system and improve our ability to understand climate change and its wide ranging effects. NASA's space probes and telescopes have revolutionized humanity's scientific understanding of the cosmos, from recent discoveries of planets orbiting other stars to those incredible rovers on Mars. And the President also seeks more green aviation and a more efficient air transportation system. NASA will focus on technologies and applications to reduce fuel needs, noise, and emissions of aircraft. These improvements to future air transportation through vigorous support of the Next Generation Air Transportation System, or Next Gen, will promote both the economic and environmental health of this country. Now more than ever, we need the talented civil servants and contractors of the NASA family fully engaged on these national challenges – we simply cannot achieve these goals without them.

Last, and in many ways most importantly, President Obama wants NASA to inspire more young people to engage in science, technology, engineering, and mathematics. NASA's Summer of Innovation, for example, will work with thousands of middle school teachers and students to engage students in stimulating, evidence-based math and science-based education programs.

The President has asked us to work together in developing a detailed strategy for executing this plan in the weeks to come. Our goal is to revitalize NASA and introduce the reforms needed to lay a long-term foundation for the agency's continued excellence and success. We are going to invest in more cutting edge technologies for exploration into the solar system, expand our view of the Earth from orbit, and drive the creation of a new space flight industry. These necessary changes will make good on our obligations to future generations by not standing pat on a record of past achievement, and by not settling for what *could be* if we use old technologies and old ideas. Instead we will deliver on the

promise of what *should be,* and what *will be*, by moving forward on a new and bold course of innovation and discovery.

Charles Bolden

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February 1, 2010