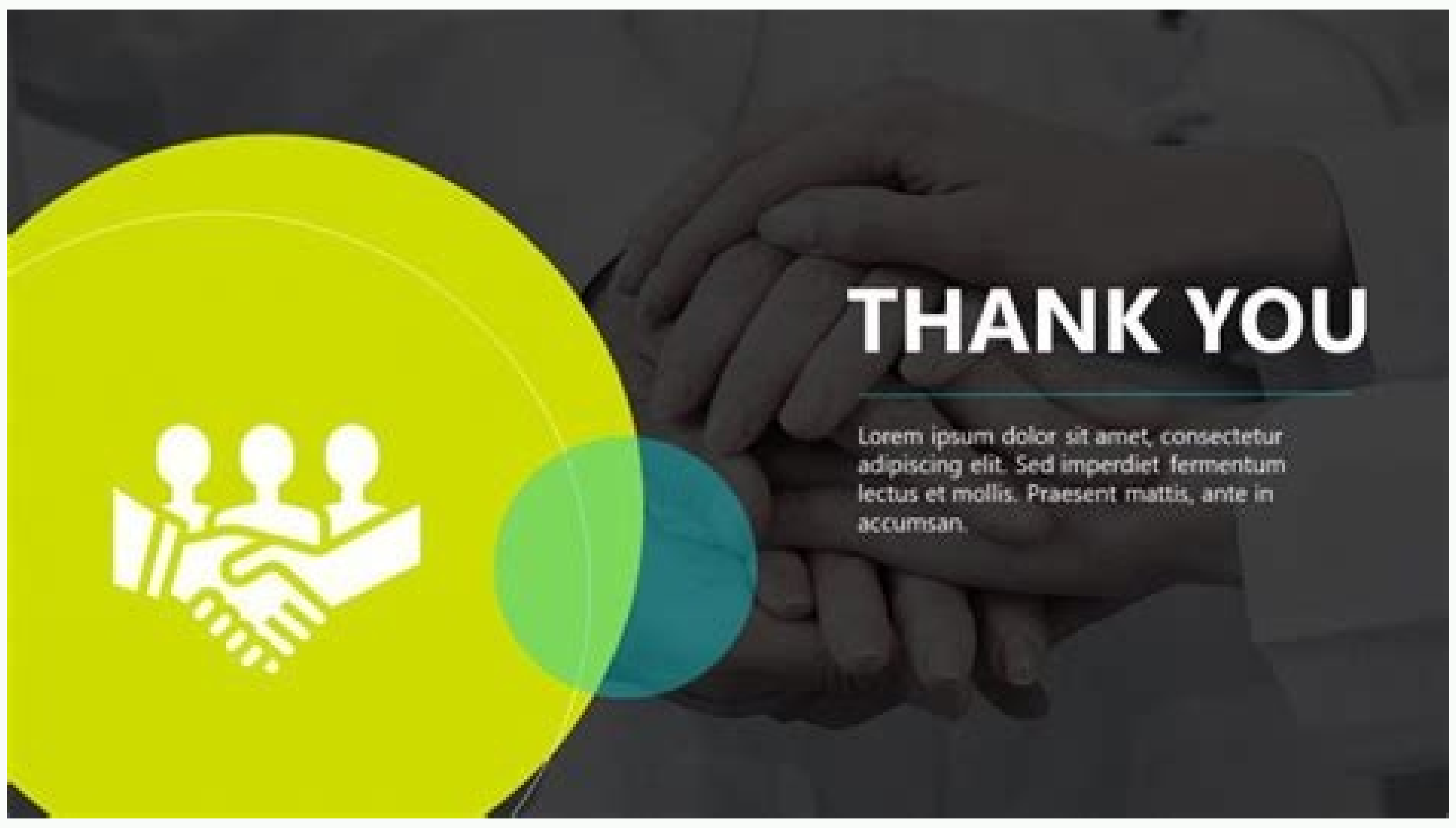
A- 100 basic aviation safety answers

I'm not robot!



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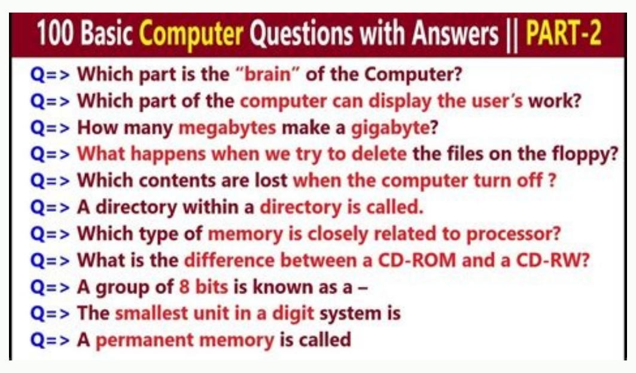

100 Basic Computer Questions with Answers || PART-2

Q=> Which part is the “brain” of the Computer?
Q=> Which part of the computer can display the user’s work?
Q=> How many megabytes make a gigabyte?
Q=> What happens when we try to delete the files on the floppy?
Q=> Which contents are lost when the computer turn off ?
Q=> A directory within a directory is called.
Q=> Which type of memory is closely related to processor?
Q=> What is the difference between a CD-ROM and a CD-RW?
Q=> A group of 8 bits is known as a –
Q=> The smallest unit in a digit system is
Q=> A permanent memory is called

How to prepare for first airplane flight. A-100 basic aviation safety final exam answers. What is aviation simple answer. A-100 basic aviation safety answers.

Thank you for your participation! [House Hearing, 115 Congress] [From the U.S. Government Publishing Office] THE STATE OF AVIATION SAFETY === (115-36) HEARING BEFORE THE SUBCOMMITTEE ON AVIATION OF THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE HOUSE OF REPRESENTATIVES ONE HUNDRED FIFTEENTH CONGRESS SECOND SESSION __________ FEBRUARY 27, 2018 __________ Printed for the use of the Committee on Transportation and Infrastructure [GRAPHIC NOT AVAILABLE IN TIFF FORMAT] Available online at: transportation?path=/browsecommittee/chamber/house/committee/ transportation __________ U.S. GOVERNMENT PUBLISHING OFFICE 31-404 PDF WASHINGTON : 2018 --- For sale by the Superintendent of Documents, U.S. Government Publishing Office, . For more information, contact the GPO Customer Contact Center, U.S. Government Publishing Office. Phone 202-512-1800, or 866-512-1800 (toll-free). E-mail, COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE BILL SHUSTER, Pennsylvania, Chairman DON YOUNG, Alaska PETER A. 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DUNCAN, Jr., Tennessee EDDIE BERNICE JOHNSON, Texas SAM GRAVES, Missouri DANIEL LIPINSKI, Illinois DUNCAN HUNTER, California ANDRE CARSON, Indiana BLAKE FARENTHOLD, Texas CHERI BUSTOS, Illinois BOB GIBBS, Ohio ELEANOR HOLMES NORTON, District of DANIEL WEBSTER, Florida Columbia JEFF DENHAM, California DINA TITUS, Nevada THOMAS MASSIE, Kentucky SEAN PATRICK MALONEY, New York MARK MEADOWS, North Carolina JULIA BROWNLEY, California SCOTT PERRY, Pennsylvania DONALD M. PAYNE, Jr., New Jersey RODNEY DAVIS, Illinois BRENDA L. LAWRENCE, Michigan MARK SANFORD, South Carolina MICHAEL E. CAPUANO, Massachusetts ROB WOODALL, Georgia GRACE F. NAPOLITANO, California TODD ROKITA, Indiana STEVE COHEN, Tennessee BARBARA COMSTOCK, Virginia HENRY C. ``HANK'' JOHNSON, Jr., DOUG LaMALFA, California Georgia BRUCE WESTERMAN, Arkansas RICHARD M. NOLAN, Minnesota PAUL MITCHELL, Michigan, Vice Chair PETER A. DeFAZIO, Oregon (Ex JASON LEWIS, Minnesota Officio) BILL SHUSTER, Pennsylvania (Ex Officio) (iii) CONTENTS Page Summary of Subject Matter....................................... vii WITNESSES Ali Bahrami, Associate Administrator for Aviation Safety, Federal Aviation Administration: Testimony.. 6 Prepared statement... 39 Responses to questions for the record from the following Representatives: Hon. Sam Graves of Missouri............................ 49 Hon. Mark DeSaulnier of California...................... 54 Hon. Daniel Lipinski of Illinois........................ 61 Akbar Sultan, Deputy Director, Airspace Operations and Safety Program, National Aeronautics and Space Administration: Testimony.. 6 Prepared statement... 63 John DeLisi, Director, Office of Aviation Safety, National Transportation Safety Board: Testimony.. 6 Prepared statement... 69 Responses to questions for the record from the following Representatives: Hon. Sam Graves of Missouri............................ 81 Hon. Mark DeSaulnier of California...................... 82 Matthew E. Hampton, Assistant Inspector General for Aviation Audits, Office of Inspector General, U.S. Department of Transportation: Testimony.. 6 Prepared statement... 85 Responses to questions for the record from Hon. Mark DeSaulnier of California.................................. 97 Captain Tim Canoll, President, Air Line Pilots Association, International: Testimony.. 6 Prepared statement... 99 Responses to questions for the record from Hon. Daniel Lipinski of Illinois...................................... 123 SUBMISSIONS FOR THE RECORD Hon. Steve Cohen, a Representative in Congress from the State of Tennessee, submission of the following: Accident Report of the National Transportation Safety Board, ``Uncontained Engine Failure and Subsequent Fire: American Airlines Flight 383, Boeing 767-323, N345AN, Chicago, Illinois, October 28, 2016,'' NTSB/AAR-18/01, PB2018-100344 \1\ Flyers Rights Education Fund, Inc. D/B/A FlyersRights.org, and Paul Hudson, Petitioners v. Federal Aviation Administration, et al., Respondents (D.C. Cir. July 28, 2017) (No. 16-1101)...................................... 124 Letter of February 26, 2018, from Air Care Alliance et al. to Hon. Mitch McConnell, Majority Leader, U.S. Senate et al., submitted by Hon. Rick Larsen, a Representative in Congress from the State of Washington.................................. 147 ---------- \1\ This 91-page accident report can be found online at the National Transportation Safety Board's website at investigations/AccidentReports/Reports/aar1801.pdf. ADDITIONS TO THE RECORD Written statement from Stephen A. Alterman, President, Cargo Airline Association... 155 [GRAPHICS NOT AVAILABLE IN TIFF FORMAT] THE STATE OF AVIATION SAFETY ---------- TUESDAY, FEBRUARY 27, 2018 House of Representatives, Subcommittee on Aviation, Committee on Transportation and Infrastructure, Washington, DC. The subcommittee met, pursuant to notice, at 10:03 a.m. in room 2167, Rayburn House Office Building, Hon. Frank A. LoBiondo (Chairman of the subcommittee) presiding. Mr. LoBiondo. Good morning. The subcommittee will come to order. And, without objection, the Chair is authorized to declare a recess at any time. And I ask unanimous consent that members not on the subcommittee be permitted to sit with the subcommittee at today's hearing and ask questions. Without objection, so ordered. Thanks again for all of you being here today. Today's hearing will focus on the subcommittee's number one priority: ensuring the safety of the aviation system and the traveling public. Our system is extremely safe; last year, nearly 850 million passengers boarded passenger aircraft within or flying to the United States and, due to the hard work of all of you and others in the aviation sector, there were no fatalities on those aircraft. This milestone, however, does not mark the end of our work. While the high level of safety we have achieved is a result of close collaboration between Congress, the Federal Aviation Administration, industry, and labor, we must remain vigilant and recognize that we can always do more and be better to ensure the safety in our skies. I would like to recognize the Colgan Air families who are in attendance today, and thank you for your steadfast support of safety issues, and we appreciate your being with us once again on this ninth anniversary of the tragic crash near Buffalo, New York. Recent events and near misses remind us of the work that remains. Last year we avoided a potentially catastrophic event when an Air Canada jet carrying 140 people accidentally lined up to land on a taxiway where 4 planes were waiting to take off. These planes carried more than 900 people, and the margin between a near miss and one of the worst aviation disasters in history was less than 25 feet. That is a pretty scary thought. This near miss and others have rightfully focused our attention on runway safety. But while we work to maintain and improve the safety of commercial airlines, we must also work to improve safety in other segments of aviation. The general aviation community makes up a large and diverse part of our national airspace, including over 200,000 aircraft and approximately 500,000 pilots. Again, due to the collaboration between Congress, FAA, and the aviation community, GA fatality rates have declined significantly over the past decade. However, in fiscal year 2016, there were still over 200 fatal GA accidents and over 350 total lives lost. Helicopter safety also continues to be an area of focus for this committee. Too often we see helicopter crashes in which occupants survive, only to be injured or killed in post-crash fires. Just 2 weeks ago, a sightseeing helicopter at the Grand Canyon crashed, killing three, seriously injuring four. In this accident, there was a post-crash fire. Crash resistant fuel systems on rotorcraft continue to be a safety priority. And while the circumstances of the recent accident are still under investigation, there is a bipartisan consensus in Congress to address this issue. Lastly, as drone operations in the national airspace continue to increase, the risk of them interfering with the safe operation of manned aircraft increases. The risk was illustrated on September 21st in 2017, when a small drone collided with a U.S. Army Black Hawk over New York Harbor, damaging the helicopter's rotor and forcing an emergency landing. While no one was injured, it is not hard to imagine that this kind of accident occurring again could have very, very serious consequences. Aviation safety is not a destination, it is a never-ending process of evaluation, analysis, and course correction. Without continuous improvements in safety, the aviation industry as we know it would have great difficulty existing. And as I said before, aviation safety has continued to improve as a result of Government, labor, and industry collaboration, but there is always a lot more to be done. The FAA has primary responsibility for aviation safety, and it must ensure oversight activities that are open and transparent, as well as streamlined and efficient. Many safety improvements stem from the basic research, the introduction of new technologies, and the management of new users making their way into the airspace. The FAA's Technical Center, located in my district--in case any of you did not realize that up to this point--Rick--plays a very critical role in the partnership between Government and industry. They continue to be a leader in conducting research and development, demonstration, and validation of the safe integration of new users and technologies into our airspace. New technology and new users bring new risk. If not properly integrated, they could have an adverse effect on the civil aviation safety. Each person on our panel has a unique role in ensuring the safety of the aviation system. We welcome these varied and unique perspectives as we continue to work together to ensure the United States continues to have the safest aviation system in the world. Before recognizing Ranking Member Rick Larsen, I would like to ask unanimous consent that the record of today's hearing remain open until such time as our witnesses have provided answers to any questions that may be submitted to them in writing, and unanimous consent that the record remain open for 15 days for additional comments and information submitted by Members or witnesses to be included in the record of today's hearing. Without objection, so ordered. I now would like to recognize Mr. Larsen for any opening remarks. Mr. Larsen. Thank you, Chairman LoBiondo, for calling today's hearing on aviation safety. This is a very important hearing. Our aviation system is safe, safer than it has ever been before. No one has died in an accident involving a U.S. flight airliner since 2009, when Colgan Air flight 3407 crashed near Buffalo and claimed 50 lives. Safe is not enough, though. This subcommittee's job is to provide the resources and oversight necessary for the Federal Aviation Administration to make the system even safer. That must be our starting point today. Everyone agrees we have the safest system in the history of flight. But what can we do to make the system safer still? Well, for starters, that means not rolling back safety rules. Some have argued for a rollback of the strong pilot training rules that require 1,500 hours of flight time that Congress mandated after the Colgan Air crash. Those standards were the product of focused oversight by this subcommittee, and were enacted without any partisan objection. If we want to talk about what Congress, the FAA, and others can do to make the airline pilot profession even more accessible to the next generation of pilots, we should have that conversation. But any reduction in the experience requirements for airline pilots is a nonstarter. Such a proposal has kept the Senate FAA reauthorization bill off the Senate floor for nearly a year. Congress has never rolled back an airline safety rule, simply to respond to the market forces of supply and demand. If there is a pilot shortage--and that is a big if--we will find ways to address it without sacrificing safety. I look forward to hearing from our witnesses about what the FAA can do to improve safety. I was pleased to join Ranking Member DeFazio and Congressman DeSaulnier last week in requesting a GAO [Government Accountability Office] study of safety in runway environments. Now is the time to take a closer look at what steps are necessary to prevent future near misses and runway incursions at airports across the U.S. A better understanding of current safety gaps would help ensure the safety of the 2.5 million people who fly in and out of U.S. airports every day. Just last year, an Air Canada flight almost landed on top of a queue of airplanes waiting to take off at San Francisco. A landing Delta flight in Atlanta lined up with a taxiway in poor visibility before going around for another approach. And a Horizon Air flight actually landed on the taxiway in Pullman, Washington, as did an Alaska Airlines flight in Seattle. Needless to say, we are fortunate that there were not any other planes on those taxiways. The NTSB is investigating several of these incidents, and I understand the Department of Transportation inspector general is assessing runway safety, as well. I look forward to hearing more from all of our witnesses about how we can prevent recurrences of these events before they lead to accidents. I am also interested in hearing from our witnesses about what we should do to reduce the risk that a drone may one day collide with a conventional airplane. A provision in the 2012 FAA bill prohibits the FAA from directly regulating the recreational operations of drones. But, as recreational drone use flourishes, should the FAA be so restricted? What can the FAA do to prevent collisions between recreational drones and other aircraft? Captain, Mr. Hampton, I know you have views on this subject and I look forward to hearing from you much more on that. Chairman LoBiondo and I have a record of working together to improve safety and efficiency. And as the chairman enters the last year of his distinguished career in Congress, I look forward to continuing that work and moving the needle further. Again, Mr. Chairman, I thank you and I look forward to hearing from our witnesses. Mr. LoBiondo. Thank you, Rick. Chairman Shuster? Mr. Shuster. Thank you, Chairman LoBiondo. And I want to associate myself with the remarks made by both Ranking Member Larsen and LoBiondo. I share their observations, views, and concerns about safety in the air. I also want to echo Chairman LoBiondo's thanks to the Colgan Air families for being here today, and your continued engagement in safety in our aviation system. As pointed out many times, the United States has the safest aviation system in the world. That can never be taken for granted. It comes at a cost, it comes from hard work by the air traffic controllers, the flight attendants, the pilots, and the companies that all engage and work every day to make the system as absolutely safe as possible. So I want to thank them for that. But it will take all of us working together, Congress included, and the administration, to make sure that we have the gold standard. And safety is our highest priority. And, with that, I yield back. Mr. LoBiondo. Mr. DeFazio? Mr. DeFazio. Thank you, Mr. Chairman. In the 3 years since we last held an oversight hearing on safety in this committee, there have been 90 accidents involving commercial carriers. Thankfully, none of those were fatal. But still, there are a number of concerns. In December, in my State, a SkyWest plane on approach to Medford went way below minimums and almost crashed into terrain before they did an evasive climb. Five days later, up in Washington State, a Horizon Air plane landed on the taxiway in Pullman. And in July an Air Canada A320 nearly landed on top of five jetliners with more than 1,000 people on board waiting to take off in San Francisco. In view of this, Representatives Larsen, DeSaulnier, and I have requested the GAO review safety in the runway environment. These sort of incidents are not acceptable. And luckily, thus far, they haven't caused fatalities. But they could in the future. I have also raised questions about the evacuation standards. We are now--as they jam more and more and more seats into airplanes, we are not actually physically testing the evacuation standard any more. They use computer modeling. And I have asked for an investigation of whether that is adequate. I mean we had one example--and this was a plane that doesn't have the more and more and more jammed-in seats, it was a 767 at O'Hare--when it took the passengers 2 minutes and 21 seconds to exit a burning aircraft, as opposed to 90. Imagine if that had been one of these low-budget airlines, where you can barely get your knees in between the seats, given the reduction in pitch. You know, we are not going to dictate comfort, but we can certainly be concerned about safety. It took me 7 years to get a rule to get the overwing exit spacing after that horrible fire, where people were burned up trying to get out of a plane in Manchester, England. It took them 6 months. We can't be complacent about these kind of things. For more than--just about a quarter of a century--since I had a certified mechanic working on my staff, I have been pursuing the whole issue of unapproved parts with the FAA. We are going to have the IG report soon, and we have not yet tightened up the way we need to tighten up, in terms of certifying SUPs [suspected unapproved parts]. I had the bizarre and absurd argument when I was pushing this issue before that if you take a life-limited part that could be burnished up to look kind of like new, but was only good for scrap, that you couldn't require that it be shredded or otherwise indelibly damaged, because it is a property right. And I said, ``Well, if the only value is scrap, and they are not going to try and sneak it back into the chain by burnishing it up, what is the property right that we are protecting here?'' And apparently some airlines are catastrophically destroying the parts. My staff witnessed United Airlines doing that in San Francisco. But others aren't. And you have got to wonder what happens to those parts, which could very easily take down a plane. And we have got to get that resolved. After the ValuJet crash, my amendment, which I had offered a number of times over the years, to strip the FAA of its promotional duties and say they should focus on safety issues, was rejected in the FAA bill that year and was not in the Senate bill. But after the ValuJet crash they called me up and said, ``Where would we put this in the bill?'' I said, ``Well, it is not conferenceable. Wasn't it out of the bill? You rejected it.'' Well, most of it ended up in the bill in the end, but we still have progress to make there, in terms of FAA oversight. As was noted by Ranking Member Larsen, we have the strongest pilot training rules in history. Unfortunately, it took a horrific accident to get to that point, and now there is tremendous pushback on that. But when you look at the first officer in that case living in her parents' basement, commuting across the country because she was earning $15,800 a year, but, you know, had probably spent a couple of hundred thousand dollars to get her license, they say, ``Oh, that is--we have got a horrible shortage here.'' Well, market forces are starting to work. Some of these airlines are having to raise their salaries. Yes, you are going to have a shortage if you try and pay them less than a Greyhound busdriver when they paid a quarter million bucks to get the certificate to fly the plane. I have yet to meet a person in the air that says, ``Geez, if I could have got $10 off, I would be happy to have someone who has 250 hours in the front seat.'' Huh-uh, I don't think so. There is some pushback here that has got to be dealt with. And then drones. Congress, rather stupidly, adopted an amendment in the FAA bill restricting the FAA regulation of drones flown by recreational users because the model airplane people objected. Well, now there are hundreds of thousands of these things out there with people who have been interfering with firefighting, they have flown one into a helicopter. We have had many near misses with jetliners. Finally, FAA, 2\1/2\ years ago, I said, ``Could you figure out what happens when a drone hits a plane?'' And their first studies are it can cause catastrophic damage because these are brittle and hard. And they haven't even done the engine test yet, sucking one in and see whether we have an uncontained explosion of the engine. So, we have got to change that, and we have got to get a handle on these recreational drones before they take down a commercial airliner and kill people. A lot of work to do. Thank you for holding the hearing, Mr. Chairman. Mr. LoBiondo. Thank you, Peter, and I want to thank our witnesses today. We have Mr. Ali Bahrami, Associate Administrator for Aviation Safety for the FAA; Mr. Akbar Sultan, Deputy Director of the Airspace Operations and Safety Program at NASA; Mr. John DeLisi, Director of the Office of Aviation Safety of NTSB; Mr. Matthew Hampton, assistant inspector general for aviation audits in the Office of Inspector General of the U.S. Department of Transportation; and Captain Tim Canoll, president of the Air Line Pilots Association. I would like to remind and ask each of our witnesses to do your best to limit your opening remarks to no more than 5 minutes. Mr. Bahrami, you are recognized for your opening statement. Welcome. TESTIMONY OF ALI BAHRAMI, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION; AKBAR SULTAN, DEPUTY DIRECTOR, AIRSPACE OPERATIONS AND SAFETY PROGRAM, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; JOHN DELISI, DIRECTOR, OFFICE OF AVIATION SAFETY, NATIONAL TRANSPORTATION SAFETY BOARD; MATTHEW E. HAMPTON, ASSISTANT INSPECTOR GENERAL FOR AVIATION AUDITS, OFFICE OF INSPECTOR GENERAL, U.S. DEPARTMENT OF TRANSPORTATION; AND CAPTAIN TIM CANOLL, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL Mr. Bahrami. Thank you, Mr. Chairman. Chairman LoBiondo, Ranking Member Larsen, members of the subcommittee, thank you for inviting me to appear today to discuss the current state of aviation safety. We are proud to say we are in the safest period in history. We have achieved this record of safety by working with industry to identify and address risks to our system. With the support of this committee we have worked to take a more proactive approach that instills a culture of safety, both within the industry and inside the FAA. The result is the safest, largest, most complex, and most efficient air transportation system in the world. There has not been a fatal U.S. commercial passenger accident since 2009. Last year we had the safest year ever for general aviation. All of us at the FAA are proud of the hard work that has gone into providing a basis for achieving this level of safety. A number of initiatives led to this safety record, and I will discuss a few of them this morning. We are actively facilitating policies and management processes that transform safety culture, both within the FAA and outside organizations. For example, we are restructuring the Flight Standards Service. This organization plays a vital role in the safety of the U.S. aviation system. We want to make sure we continue to provide a high level of service. By moving away from our organizational structure based on geographical locations to one built around functions, these changes enable flight standards to operate with greater accountability, better use of resources, and flexibility to adapt to change. The FAA expects the restructuring to yield benefits to both the agency and aviation community by improving our ability to keep pace with changes in the aviation industry. In the area of aircraft certification, the FAA has gone beyond the reforms that Congress directed in the FAA Modernization and Reform Act of 2012. We are transforming our aircraft certification service to meet the demands of today's dynamic aviation environment. Refreshing the certification strategy means FAA will take a systems approach, allowing us to focus on areas of higher risk. The impressive gains in safety are due, in part, to voluntary actions by industry and Government. The work of CAST, the Commercial Aviation Safety Team, has been extremely successful. It has moved beyond the historic approach of examining accident data to a more proactive approach that focuses on detecting and mitigating risks. Today, using a disciplined, data-driven approach, we strive to identify hazards before accidents or serious incidents occur. Together, Government and industry have adopted nearly 100 voluntary safety enhancements. We also are expanding this type of cooperation in the general aviation community. Together we have been working toward a goal of 10 percent reduction in the fatal GA accidents by the close of fiscal year 2018. I am pleased to say we already surpassed that goal. Before I conclude my remarks, I would be remiss if I did not acknowledge the support of Chairman Shuster and subcommittee chairman Mr. LoBiondo. You have been instrumental in providing the FAA with the direction and necessary resources to maintain our position as the global leader in aviation. Your guidance and insight have made a difference in aviation, both here and abroad. This concludes my statement. I will be happy to answer any of your questions at this time. Mr. LoBiondo. Thank you, Mr. Bahrami, for your statement. Mr. Sultan, you are recognized for your statement. Mr. Sultan. Thank you, Mr. Chairman. Chairman LoBiondo and Ranking Member Larsen, Chairman Shuster of the committee, Ranking Member---- Mr. LoBiondo. Excuse me, can you pull your mic a little bit closer? Mr. Sultan. I apologize. Chairman LoBiondo and Ranking Member Larsen, Chairman Shuster and Ranking Member DeFazio of the committee, and members of the subcommittee, thank you for this opportunity to appear before you today to testify on NASA's aviation safety research. NASA has made decades of contributions to aviation. Every U.S. aircraft and U.S. air traffic control facility has NASA- developed technology on board. NASA has worked with FAA and industry on the long-term research to produce information and technologies to fundamentally solve aviation risks. For example, in the 1980s, NASA initiated research efforts associated with synthetic and enhanced vision systems to allow aircraft to land in low-visibility conditions. Today a large number of aircraft offer these capabilities and multiple manufacturers have developed systems for tablets that can be used on board general aviation aircraft. Another good example from the late 1970s was NASA research that led to the identification of cultural norms within the aviation community that resulted in increased vulnerability to crew communication errors. NASA developed training methods and technologies, techniques to support improved Crew Resource Management, or CRM. Since then, CRM has become a global standard with training requirements mandated by the FAA, ICAO, and EASA, the European Aviation Safety Agency. Now, as we look forward, aviation is on the verge of a significant transformation with a rapid evolution of new technologies, vehicles, and operations on the horizon, while retaining the high standards for safety to which we are accustomed. Maintaining a safe system will require recognition and timely mitigation of safety issues as they emerge before they become hazards or lead to accidents. A shift toward proactive risk mitigation will become critical to meet these needs. In collaboration with the aviation community, NASA has developed a vision for safety assurance that is achieved by leveraging growing sources of aviation data, commercial data, analytics methods, architecture, and innovative things to enable monitoring, prediction, and prognostics capabilities. In addition, NASA is addressing difficulties associated with assuring the safety of increasingly complex and autonomous aviation systems. NASA is developing improved methods, tools, and guidance to support cost-effective verification and validation and certification of software-intensive and complex systems. NASA contributes to the Commercial Aviation Safety Team, or CAST, Aviation Safety Reporting System, otherwise known as ASRS, and Aviation Safety Information Analysis and Sharing, also known as ASIAS. NASA has delivered technologies to prevent loss of airplane state awareness, and is currently completing the research and development of cockpit systems with predictive algorithms to alert pilots, models for aircraft stall performance to improve fidelity of training environments, and specific flight crew training methods. Special attention is being directed toward assuring safety of emerging operations, such as unmanned aircraft. Ongoing research is dedicated to understanding hazards unique to these vehicles and identifying data needs associated with monitoring such operations for potential risks. Specifically, NASA's UAS [unmanned aircraft systems] in the NAS [National Airspace System] project may enable routine access to larger UAS and to regular controlled airspace by delivering data to RTCA rulemaking committees. In addition, NASA's UTM [UAS Traffic Management] research project may enable beyond-visual-line-of-sight access by small UAS to the uncontrolled low-altitude airspace below 400 feet through technology demonstrations to validate operational concepts. NASA is building on a long history of conducting research that advances state-of-the-art technologies to reduce the risk of flying in hazardous conditions. The phenomena that creates engine icing issues is not well understood. NASA has conducted flight tests to better characterize the environment, and has emulated these conditions in a ground facility that has already proven to be very beneficial to industry. NASA and FAA have established Research Transition Teams, or RTTs. The RTTs have been a best-practice mechanism between NASA and FAA in ensuring effective coordination in transition of research to implementation. Through the RTTs, NASA works jointly with FAA's William J. Hughes Technical Center on joint simulation and testing of assurance tools to help FAA assess aviation systems. NASA has a long and successful history of aviation safety research that has made a real difference in the remarkable safety record that our system enjoys. And we are constantly looking for ways to continue to contribute, with a major emphasis on more prognostic approaches that will allow the aviation community to get out in front of issues before they become safety risks. Let me conclude by thanking you again for this opportunity to appear before you to discuss NASA's research and to answer any of your questions. Mr. LoBiondo. Thank you. Mr. DeLisi? Mr. DeLisi. Good morning, Chairman LoBiondo, Ranking Member Larsen, and members of the subcommittee. Thank you for inviting the National Transportation Safety Board to testify before you today. The NTSB is an independent Federal agency charged by Congress with investigating every civil aviation accident in the United States, and issuing safety recommendations aimed at preventing future accidents. We investigate about 1,300 accidents per year. The U.S. aviation system is experiencing a record level of safety. Since the crash of Colgan Air flight 3407 in 2009, there have been no passenger fatalities on board U.S. part 121 air carriers providing scheduled service. However, there were 412 aviation deaths in 2016; 386 of those fatalities occurred in general aviation accidents, and 26 occurred in part 135 commercial operations. Although we would all like to see no fatalities, the good news is that the general aviation accident rate fell below one fatal accident per 100,000 flight hours for the first time in the NTSB's 50- year history. The number one cause of general aviation accidents continues to be loss of control in flight, leading the Board to place this issue on our current most wanted list of transportation safety improvements. We are working with stakeholders to increase awareness, education, and training to address the risk of these events. In April we will hold a roundtable with industry and Government experts to discuss technologies and training to combat loss of control. I want to highlight several accidents we have investigated in the last 2 years that have raised safety issues. In 2016 the deadliest U.S. aviation accident in almost a decade occurred in Lockhart, Texas, when a commercial hot air balloon pilot and his 15 passengers died when the balloon struck power lines. The investigation found that the pilot had been previously diagnosed with medical conditions known to cause cognitive deficits, and had taken a number of impairing medications. However, commercial balloon pilots are exempt from the requirement to hold a medical certificate. The NTSB recommended that the FAA remove that exemption. In July 2015 a helicopter crashed after takeoff in Frisco, Colorado. The pilot was fatally injured, and the other two occupants were seriously injured. We found that the impact forces of the accident were survivable. However, the post-crash fire contributed to the severity of the injuries. The NTSB made recommendations that continue to push for the installation of crash-resistant fuel systems in helicopters. In November 2015, a part 135 air taxi crashed on approach to Akron, Ohio, and all nine people on board died. We found that the flight crew failed to follow a number of company standard operating procedures, and operated the airplane in an unsafe manner. However, the airplane was not equipped with any type of recording device that would have allowed for the company to monitor daily operations and identify deficiencies such as noncompliance with procedures. As a result, the NTSB recommended that all part 135 operators install flight data recording devices capable of supporting a flight data monitoring program. In October 2016, an American Airlines flight experienced an engine failure and caught fire during takeoff at Chicago O'Hare International Airport. Although everyone evacuated the airplane with only one serious injury, our investigation found that the evacuation was hindered by a lack of communication between the flight deck and the cabin crew, as well as by numerous passengers retrieving their carry-on baggage. In July an Air Canada flight was cleared to land on runway 28 right in San Francisco International Airport, but instead lined up on a taxiway where four air carrier airplanes were awaiting their takeoff clearance. The flight descended below 100 feet before executing a go-around as it overflew the other aircraft on the taxiway. We are continuing to investigate this incident. Advances in aviation technology, such as unmanned aircraft systems, are posing new safety challenges. The NTSB just completed the first investigation of an incident resulting from a mid-air collision between an aircraft and a drone, which occurred near Staten Island, New York, in September. The drone pilot intentionally flew his drone far beyond visual line of sight and was unaware that it had impacted the helicopter. Thank you again for the opportunity to be here today to discuss the work that the NTSB is doing to investigate accidents and make aviation safer. I will be happy to answer any questions. Mr. LoBiondo. Thank you, Mr. DeLisi. Mr. Hampton, welcome. Mr. Hampton. Thank you. Chairmen Shuster, LoBiondo, Ranking Members DeFazio, Larsen, and members of the subcommittee, thank you for inviting me to testify today on aviation safety. As the committee is well aware, FAA and the industry have achieved a remarkable and impressive safety record. My statement today will address the key aviation safety challenges that were highlighted in our recent report on the top management challenges facing the Department. First, regional airlines now serve about 20 percent of all airline passengers, rely on a unique business model, and operate in a highly competitive environment. Our work shows that FAA can provide better guidance and tools to its inspectors so they can proactively identify risks due to changes at airlines and adjust oversight accordingly. For example, FAA's main risk-assessment tool does not yet account for severity of risks such as key staff turnover or rapid service expansion. Second, addressing concerns about suspected unapproved parts, or SUPs. As we recently reported, FAA lacks the mechanisms needed to have a full and complete picture of risks with unapproved parts throughout the industry. For example, we found multiple inaccuracies in the database FAA uses to capture such cases, and the agency does not ensure all reports of suspected unapproved parts from its local inspection offices make it to the central hotline office at headquarters. Furthermore, once unapproved parts are identified, FAA does not take action to confirm that airlines and repair stations actually take them out of the supply chain. We recently learned that FAA closed one case, but we are looking into how the parts actually made it back into the supply chain. Third, we are concerned about the number of close calls in the air and the ground at the Nation's airports. This includes the Air Canada flight 759 incident at San Francisco Airport last summer, which the safety board is currently investigating. Our work focuses on runway incursions, which have seen an overall increase. FAA has taken several efforts over the last decade to address runway safety issues. Our results thus far show that FAA has made progress on educating pilots on visual aids at high-risk airports and communicating more with the aviation community. However, FAA faces challenges with other initiatives, including some new technologies that were very promising. The key to addressing the upward trend in recent incidents is for the industry to continue setting priorities and measuring the effectiveness of initiatives. History has shown that FAA can, with sustained attention, successfully address runway safety issues. But a sense of urgency is needed at FAA. Finally, UAS presents one of the most vexing and rapidly evolving safety challenges FAA has faced in decades. As UAS operations have increased, so too have sightings and concerns by pilots and others, with over 2,100 events reported in 2017. We are currently assessing FAA's efforts to grant waivers, a process the agency established to accommodate some high-value operations not covered in the small UAS rule published in 2006. FAA has received more than 15,000 applications for waivers to date. Thus far, the agency has granted about 1,500 of them, most of them for nighttime operations. There are over 6,500 applications still pending review, and the backlog continues to grow. FAA is working on rulemaking for expanded UAS operations, but these are complicated endeavors, and it is unclear when they will be completed. Our work shows that FAA can take steps now to advance elements of a risk-based system for UAS. This includes, among other things, completing a comprehensive system to track and analyze UAS sightings, and giving inspectors more guidance and information. Also, FAA is reaching an inflection point, where education must give way and be bolstered with more effective oversight and enforcement. Mr. Chairman, that concludes my statement. I would be happy to answer any questions you or any members of the subcommittee may have. Mr. LoBiondo. Thank you, Mr. Hampton. Captain Canoll, you are welcome. Mr. Canoll. Thank you and good morning, Chairman LoBiondo and Ranking Member Larsen and the subcommittee for the opportunity to be here today. Chairman LoBiondo and Chairman Shuster, this may be my last time testifying before both of you. On behalf of ALPA's more than 60,000 members, please let me express our sincere appreciation for your leadership in advancing aviation safety. I have been an airline pilot for 28 years. I keep current and I fly the MD-88 as often as I can. I am also proud to have served in the United States Navy Reserve as an F-18 strike fighter squadron commanding officer. And I can tell you, after flying for more than three decades, that experience counts when operating complex equipment in a changing environment. So does constantly maintaining and sharpening your skills and judgment through training. Flying experience enables pilots to learn how to gather information through their senses about their environment and their aircraft. It cannot be simulated in training. It is learned only from time spent at the controls. The examples of the value of real-world experience are almost infinite. An airline pilot might encounter multiple aircraft talking on the radio at the same time, unexpected turbulence, or an engine malfunction, or all three at once. Today's simulators simply can't replicate the complexity of commercial flight. Real-world experience is essential. ALPA pilots know this, know that this subcommittee recognizes the value of flight experience, qualifications, and training for airline pilots. You led Congress in passing the Airline Safety and FAA Extension Act of 2010, the set of regulations that resulted in improved pilot training and updated certificate and type rating requirements. The results speak for themselves. In the 20 years prior to the congressional action, more than 1,100 passengers lost their lives in U.S. part 121 airline accidents. Since Congress acted, that number has been reduced to zero. ALPA is aware that some believe we can reduce training hours, substitute simulator or unstructured class time for experience, and still keep our skies safe. To put it plainly, we disagree. The current system allows for credit hours for different levels of training and experience. This system is working. It is keeping our passengers, crews, and cargo safe. Let me be clear. No one is more committed than ALPA to ensuring that we have enough pilots to keep the U.S. airline industry strong and competitive. Today we have more fully qualified pilots than there are commercial positions available in this country. But how do we make sure we have the pilots we will need in the future? One important element is protecting our industry safety record. Our union is helping lead the way. For example, we are pushing to do more to safeguard the transportation of lithium batteries by air. For similar reasons we are also working to eliminate the risk of undeclared dangerous goods. In addition, ALPA is driving hard to reduce the safety threat from unmanned aircraft systems. We commend recent action by Congress to enable the FAA to require UAS operators to be registered. This allows us to locate responsible individuals, if needed. But we also must fix the loophole that prevents the FAA from regulating UAS used by hobbyists. Congress must repeal section 336 of the FAA Reauthorization Act of 2012. Attracting new pilots to our industry in the future also means that U.S. airlines must offer aviators good salaries, a healthy work-life balance, and a predictable career progression. And there is more we can do. For example, we can reform the Federal student loan programs to encourage young people to pursue our profession. Our industry can also step up efforts to reach new audiences and inspire them to work in aviation. At ALPA, we are building on decades of outreach to students of all ages. Hundreds of ALPA volunteers visit schools every year, and we have helped launch Aviation Works 4U, a one-stop shop website for exploring a career in our industry. We are also focused on doing more to provide reliable air service to communities all across America, including in rural areas. With safety always the priority, there is more work to be done there, too. I hope you share my optimism today as we consider the U.S. airline industry's incredible safety record. Take it from us, your pilots, experience saves lives. We look forward to working with this subcommittee to make aviation even safer. And I would be glad to take any questions that the subcommittee has. Thank you, sir. Mr. LoBiondo. Thank you, Captain. Chairman Shuster? Mr. Shuster. Thank you very much, Mr. LoBiondo. My question is directed at the NTSB, the FAA, and NASA, and it is concerning space and travel--space travel. I watched a couple weeks ago the Falcon Heavy take off, and Elon Musk said it was a 50/50 chance it was not going to succeed, and it did. It was quite impressive. But as we saw last year, there were 18 launches into space. This year they are projecting 20. And I have seen estimates that in the next several years it could be 100, over 100 launches every year, and that is critical, with the FAA, NASA--coming to work together to make sure that the airspace is safe. And so, just wanted to first ask, starting probably with NASA, how has your relationship been with the FAA? And then, from there, move to FAA, but also then to--and the NTSB and talk about how do we--how do you investigate and how has it worked with these two other agencies when you go there? So, Mr. Sultan, if you would be---- Mr. Sultan. Thank you for the question. In regards to a relationship between NASA and FAA, I would describe it as it has been the closest it has ever been. We work very well, and this is the best in the history that we have ever worked together. Currently between the two agencies, we have established these--we call them the RTTs, the Research Transition Teams. Mr. Shuster. Can you move your mic a little closer to you? Mr. Sultan. Yes. Mr. Shuster. That whole box will shift. There you go. Mr. Sultan. Thank you. Between the two agencies we have established these RTTs. We call them the Research Transition Teams. And right now we have six of them active on very specific, unique, and tangible products that the two agencies cooperate, and what we are doing is making sure that the work that we do as a research is, first, well coordinated with the implementing agency so that it is put on their implementation timeline well before we do the handoff, and then FAA knows actually what to do with it, and also do the implementation. Furthermore, at the executive level, we hold, you know, extensive quarterly meetings. This is at Associate Administrator levels between the FAA's AVS [Aviation Safety] group, Air Traffic Organization, the NextGen Office, as well as international environment and energy, where the Associate Administrators do coordinated work to make sure that our efforts are fully aligned with each other's needs. Mr. Shuster. So the bottom line is it has--from your point of view, it has been working extremely well. Mr. Sultan. Absolutely. Mr. Shuster. All right. And Mr. Bahrami? Mr. Bahrami. Mr. Chairman, let me highlight what you already mentioned, which is the increased number of launches. And one of the issues that we are taking very seriously is collaboration with other Government agencies that have tremendous experience, including NASA. And on the other part of the work that we are doing is a thorough risk assessment prior to each launch, and using the expertise that we have in-house, and using the safety management principles to make sure, in the event we have an issue that we are protecting other aircraft and vehicles in the airspace. So, as was mentioned by Mr. Sultan, we have a good working relationship, we continue to work together and improve things as we move forward. Mr. Shuster. Thank you. And Mr. DeLisi, if you could, also just comment on what you have seen in the interaction and then investigations and how you would operate in that environment. Mr. DeLisi. Sure, thank you. Commercial space is certainly a game changer. It is something that didn't exist when our agency was founded, but we stand at the ready now to investigate the commercial use of space. A few years ago we completed the investigation of the Virgin Galactic scaled composite SpaceShipTwo fatal accident. It was our first fatality involving a commercial space vehicle. But we have a relationship with the FAA's Office of Commercial Space Transportation, and our party process allowed us to form an investigation using our normal procedures, making some recommendations to both the FAA and the Commercial Spaceflight Federation regarding the design of the cockpit switchology in commercial space vehicles. One big difference, however, would be the definition of an accident. For a commercial space vehicle that carries a command destruct system, we would not consider it to be an accident if a launch were going off target and a command destruct were initiated. As long as the debris fell in the cleared area, that would be--the substantial damage to the vehicle would not trigger an NTSB investigation. We would only get involved if there were fatalities or debris that ended up outside the expected pattern. Mr. Shuster. Well, thank you. My time has expired, but I think we got to watch this very closely, because we are going to see more and more of this, and making sure, from a policy standpoint, that the right agencies are in the right place making these decisions, and not trying to set up new and different agencies that don't have the experience that you three do. So thank you very much. Mr. LoBiondo. Peter? Mr. DeFazio. Well, and talking about agencies that don't have experience, we have the Pipeline and Hazardous Materials Safety Administration, so-called, as the principal regulator of lithium batteries on commercial aircraft. Now, isn't that interesting? And that is, you know, at the behest of this administration. And then, of course, Congress has prohibited the regulation of lithium batteries beyond any weak rules that ICAO might adopt, which doesn't seem really wise to me--Captain Canoll, you obviously raised this concern, and you certainly know that UPS flight 1307 in 2006, UPS flight 6 in 2010, and Asiana Airlines cargo flight 991 in 2011 all were destroyed because of lithium batteries. Now, is there anybody on this panel who thinks that Congress should prohibit the FAA from investigating the dangers of lithium batteries, and proposing more stringent regulations than those adopted by the international consensus authority, ICAO? Anybody want to raise your hand, say that that is a prudent thing we are doing here? OK, thanks. How about the other prohibition that Congress has adopted because of the clout of the model aircraft lobby? Now, I know model aircraft operators, people--I used to build little planes when I was a kid. My brother did, too. You know, they are generally responsible, knowledgeable people. But there's a few hundred thousand of them, and there are now millions of people with these little, crappy recreational drones flying around, and we have already talked about those problems. Anybody on the panel want to raise their hand and say that we, Congress, should continue to restrict the FAA from regulating beyond ``we are going to educate you'' about where you should fly your drone? Anybody want to raise their hand on that one? OK, well, maybe---- Mr. Bahrami. Mr. DeFazio, may I make a comment on that? Mr. DeFazio. Yes. Mr. Bahrami. Absolutely. We agree that something needs to happen to give us better control of the situation. And we also want to acknowledge that the work that modelers are doing from the perspective of STEM and promoting aviation within the younger generation is really important. And as we move forward, it is very important that we work with you and your staff to find out what is the best way to go forward. I absolutely agree with you; we need to do something. And I do not know what that is at this point. But we are certainly willing to work with you to make that happen. Mr. DeFazio. Right. Well, we had that core challenge, and now we can't even require registration and/or licensure for these things. I mean in my hometown someone was using a UAS as a peeping Tom device and someone managed to bring it down. But, of course, we have no idea who it belonged to, because we can't trace them back. It seems to me that is pretty minimal, that we would require, you know, that they be registered and/or potentially licensed. I want to go back to the suspected unapproved parts. Mr. Hampton, I mean I have been working on this for so many years. And you mentioned at the end something that--it was something about the--I don't think it was in your testimony, exactly, about some--a SUP that got back into the supply chain that is being investigated. Mr. Hampton. Yes. Thank you for the question, Mr. DeFazio. During the course of our review there was a case. A gentleman put a number of parts, 65,000 Boeing parts, on the internet. And FAA investigated it and found out that he was not going to sell 65,000 parts. And we thought it was taken care of, and the issue was put to bed. We subsequently opened another case, and we are looking into it. It appears they have now been reintroduced into the supply chain, and we are going to find out what happened to those parts. So, it is a perfect example. It is not just the instance of what happens to a suspected unapproved part, but it has to be taken out of the supply chain. The problem is, as you well know, in many of the cases, a suspected unapproved part doesn't affect civil aircraft, it can affect a military aircraft. Some aircraft, like in the Boeing series, can go back and forth to military and civilian fleets. So the trick there is--and it is very important--to make sure they don't make their way back into the supply chain. Because you know the term ``pedigree of the part,'' once it is back in, it is very hard to trace. So we will keep the committee apprised. We are trying to figure out what happened. We don't know exactly whether these things will be used in an aviation mode; we just don't know. But we are concerned about that. And that illustrates the importance. And we have an open recommendation: FAA is finalizing how they will get their inspectors to make sure that the parts are actually taken out of the supply chain. Mr. DeFazio. How about we all follow the United Airlines model and they are shredded? I mean I have never understood this property right argument that, gee, well, I don't know, maybe somebody wants to take this part that could be burnished up to look like brandnew, and turn it into a lampholder. And so, therefore, it is more valuable than scrap metal. So gee, you know? But I mean what is the deal? Seriously. Mr. Hampton. We understand that FAA can't destroy it, but they have to have the person who is in possession of it take care of it and destroy the part. But your point is well taken. And that is the importance of getting rid of the part actually out of the supply chain. Mr. DeFazio. OK. Thank you. Thank you, Mr. Chairman. Mr. LoBiondo. Thank you. Captain Canoll, ALPA has endorsed the 21st Century AIRR [Aviation Innovation, Reform, and Reauthorization] Act, and has said that the bill improves the safety of our transportation in the United States. Can you tell us how you believe that will happen, and why it does improve safety? Mr. Canoll. So the act, in general, has many provisions that would enhance safety, one being the enhancement to our voluntary reporting systems, which--a lot of our improvements recently have been based upon the concept that voluntarily disclosing a problem in the system and, in return receiving a level of immunity, has given us a volume of information far beyond what we had before to anticipate problems before they actually occur in the system. We can see a particular airport, for example, has higher examples or higher incidents of unstable approaches. Then we can modify our training syllabus to address that particular approach so that the fleet of aircraft and pilots out there operating to that airport know that that is a known hazard and have been trained to deal with it. That is one example. The---- Mr. LoBiondo. Can you--excuse me. Can you address how ALPA believes that the air traffic control reform and modernization contributes to the improvement of air safety? Mr. Canoll. So, in all proposals with regard to reform of the ATC system, we approach it incrementally. And the first step is an analysis of: is the proposal deemed to provide an equivalent level of safety that we have today, which, of course, as we all know, is extremely high. Our analysis of this proposal that is currently in the House does just that, it does provide an equivalent level of safety that we are experiencing today, a very high one. Mr. LoBiondo. Thank you. Mr. Sultan, can you describe how NASA uses Research Transition Teams to hand off NASA aeronautical research at the FAA Technical Center? Mr. Sultan. So the hand-off occurs to multiple organizations within the FAA. What we do is we work jointly with the FAA Tech Center in New Jersey on the simulations and the evaluation of and validation of the concepts in an integrated fashion with the real-world systems. So the tech center offers us that unique capability. Likewise, on the systemwide safety assurance RTT, we work jointly with the FAA Tech Center researchers on the V&V of complex and software-intensive systems in developing algorithms and testing those algorithms in order to help certify and speed up the certification process of software-intensive systems. Mr. LoBiondo. OK, thank you very much. Mr. Larsen? Mr. Larsen. Thank you, Mr. Chairman. Captain Canoll, would you support the FAA reauthorization bill that we have been discussing if the ATC privatization was not in it? Would ALPA support it without the ATC privatization? Mr. Canoll. I hadn't contemplated it, but, you know---- Mr. Larsen. Well, contemplate it. Would you support it without---- Mr. Canoll. Yes, sir. Mr. Larsen. Thank you. Mr. Canoll. We would, because it has many other factors that advance safety. Mr. Larsen. Thank you. Mr. Bahrami, the FAA bill--I am sorry, the FAA budget proposes $197 million in cuts, including $27 million to the FAA's operation account, $69 million to the F&E, and $101 million to the FAA's research, engineering, development accounts. That is the proposal for 2019. What specifically would you do to ensure that these cuts, if enacted, would not adversely affect safety? Mr. Bahrami. As you know, this is not the first time we are faced with these types of cuts. We typically reprioritize. We look at the sense of urgency, we look at the type of research that can only be done by Government agencies, including the FAA, and we also try to rely on those types of researches happening in industry, and try to promote and advance those types of activities. And bottom line, we are going to have to reevaluate our work. We have to figure out where the priorities are, and fund those activities that are critical to our safety mission. Mr. Larsen. And you would choose a safety mission first, then? Mr. Bahrami. Safety mission and enabling activities. And in terms of enabling activities, fortunately, in a lot of areas industry takes the lead, and we will make sure that we can work with them closely in those areas. Mr. Larsen. Mr. Hampton, based on that, what would you say--it is kind of tough to pick and choose, there is plenty of issues that we are dealing with on aviation safety, but what would be the biggest threat, in the IG's view, to aviation safety? Mr. Hampton. Thank you for the question, Mr. Larsen. We wonder back at the IG--we talked to Mr. Scovel on what keeps the inspector general up at night--and I think right now the safety of unmanned aerial systems is the big concern. It is not when but if there is a collision with a commercial aircraft. And we just hope there are no passenger injuries or fatalities. That is our top safety concern, followed closely by the close calls at airport runways and taxiways right now. Mr. Larsen. Yes. And in your recommendations with regards to UAS, could you reiterate those recommendations? Mr. Hampton. Sure. Most of our recommendations focus on helping FAA become more risk-based and getting their information systems lined up: a single depository for tracking all their sightings; another one for getting their systems in place. Another one is having better guidance to their inspector workforce--information to better position the agency to respond to the impact of technology on FAA and the industry. The UAS is probably one of the most difficult and cross- cutting things that is going to affect the agency. So those are two of the recommendations we think that they can move out forthwith and make some progress on. Mr. Larsen. Yes. Thanks. Mr. Bahrami, do you think the FAA has that authority to move forward on those particular steps, or do you think that you need a direction from Congress? Mr. Bahrami. We are working on a number of initiatives. When we talk about UAS and the risk of UAS in aerospace, basically the issue is being able to validate and verify the sightings. This is a huge problem. We know that we started an ARC [Aviation Rulemaking Committee] that looked at the ID, remote ID. So until such time we are able to go forward with that, we are going to continue to have challenges identifying and enforcing the rules. Mr. Larsen. That is fair. And Mr. Sultan, the role that NASA plays in developing a traffic management system with UAS, can you tell us where NASA is on timelines to get us to a point where we can start, you know, if you will, seeing that in the sky? Mr. Sultan. Thank you for the question. So we have two different projects. One is focused on the larger class, higher altitude controlled airspace access---- Mr. Larsen. Right. Mr. Sultan [continuing]. And one is on the low altitude, below 400 feet, small UAS. In regards to the UTM, which is the lower altitude one, we have a set of high-fidelity field trials conducted almost on an annual basis, which will look at integration of these vehicles in higher density operations. So we started off with just operating in rural areas. The next level was with some additional, you know, people and objects nearby. And the third one is operating beyond visual line of sight with additional vehicle integrations, manned operations. And of course, the fourth one, which will be conducted in 2020, is mainly focused on dense, urban operations, or a simulated environment of that. The key is that this industry is still very much in infancy, in terms of the data needed in order to certify these vehicles and generate the regulation. So what NASA is doing in both of their high altitude, as well as the low-altitude UAS projects, is generating that data and delivering it to the FAA, as well as the standards organizations, such as RTCA, so that they can make informed decisions on what the regulations and certifications ought to be. In a nutshell, we don't know what we don't know. That is what it boils down to in regards to, you know, the UAS operations. And that is the gap that NASA is trying to fill. Mr. Larsen. Yes, thank you. I yield back. Mr. Davis [presiding]. Thank you, Mr. Larsen. The Chair recognizes the gentleman from California for 5 minutes. Mr. LaMalfa. Thank you, Mr. Chairman. Thank you to the witnesses for appearing with us here today and for your expertise. Just a couple of things. Mr. Hampton, I wanted to direct to you here, I come from an extremely rural district in northern California, and wanted to see if you can update on the issue of contract towers versus the regular ATC towers. A 2012 study at your office had shown they were just as safe and effective as a regular ATC tower-- that being the contract towers. So, you know, it is a good cost-saving measure, it helps our rural airports, rural areas, to hang on much longer than if they had higher costs. And so, again, having so many rural airports in my district or a lot of districts like it in the West, I just wondered. Does that remain a priority or a good tool? Do you have any findings on contract towers? Mr. Hampton. Thank you for the question. Historically, we have looked at the contract tower program, and it has been a very cost-effective and safe program. We recently received a request from this committee to update our work, and we intend to start that assignment in the not-too-distant future and complete it. Probably some time next year. Mr. LaMalfa. Are those that are questioning them or wanting to do away with them, is there any movement that way you are aware of? Mr. Hampton. Not that I am aware of. Mr. LaMalfa. OK, good, good, just making sure you keep funding. Mr. Bahrami, do you have any input on it, as well? Mr. Bahrami. Sir, I just want to point out that we are supportive of contract towers, and we are currently revising our cost-benefit analysis for contract towers. And my role, my organization's role, is to oversee ATO. And we are making sure that those particular towers are safe and operating. And at this point I have to tell you that everything is working fine, and it is safe. Mr. LaMalfa. OK, thank you. Let me follow up on the drone question, as well. You know, coming back to the very rural needs we have, and remoteness, it is a great tool, used properly, for inspection of hard-to-get-at power lines and, you know, some roadways, or maybe under bridges. A lot of infrastructure, where it is a very handy tool. So, what are your thoughts that we can--instead of--in certain areas I see what the issue is. But others, we need expanded use of this. We need better permission to use them, maybe even an out-of-sight basis, as is appropriate, because we have a lot of issues with timber, timber that could be--you know, we have 129 million dead trees and counting in California, with the interface of that--with power lines or just other issues. So it is certainly a lot better way to keep abreast of what is going on with dead trees and other infrastructure issues. So what do you think we can do to expand the use of that, where appropriate, in those types of very rural situations? Mr. Bahrami. I fully agree with you, that we have to use a risk-based approach to deciding on operational applications, and using it in areas that are not heavily populated makes a lot of sense. And we are doing that. When you look at the process that we have in place through the waiver process under part 107, we have issued many waivers for those types of operations. Also, on the integration pilot program, we are soliciting input from those interested applicants who want to introduce new and innovative applications. The idea behind it is, of course, to continue to promote the UAS and also make sure that we learn from those experiences and apply it appropriately. Also, as I mentioned earlier, we are in the process of proposing a rule that facilitates operation over people and at night, and that will significantly reduce the number of waivers that we have currently in house, and working on that. Going forward with ID, remote ID, we could actually address the concerns that we have from our security partners, and we can move forward. All of that---- Mr. LaMalfa. Quickly, quickly---- Mr. Bahrami [continuing]. Is going to help. Mr. LaMalfa. Quickly, quick question on--just a quick one on do we want to have States and locals have their own sets of rules, or do we want to keep this kind of a more broad approach with one Federal jurisdiction, instead of multijurisdictions having their own rules? Mr. Bahrami. One of the important benefits of the IPP [integration pilot program] is to actually evaluate what needs to be done with the State and local authorities with respect to their jurisdiction, and what we can do under Federal rules and regulations. What we learn from that actually is going to help us, moving forward, with the very same issue that you highlighted. Mr. LaMalfa. OK, thank you. I appreciate---- Mr. Davis. The gentleman's time has expired. The Chair recognizes the gentlelady from Texas, Ms. Johnson, for 5 minutes. Ms. Johnson. Thank you very much, Mr. Chairman. I really do appreciate the perspectives of the--at NASA on the importance of aviation safety research, and the partnerships that are required between the Federal Government and industry. As ranking member of the Committee on Science, Space, and Technology, I believe that research is absolutely essential to developing unbiased practices and techniques that we can deploy to mitigate risk. Can you, Mr. Sultan, speak more to the value of these partnerships between the Federal Government and industry, and identify areas where the Federal Government could benefit from additional resources to address the emerging challenges in the aviation space? Mr. Sultan. Thank you for the question. So in regards to the partnerships between Government and industry, it is absolutely critical. Because for us in the NASA research, first of all, we use it as a guiding principle in trying to determine what are actually the community needs, what are the tall poles that the eventual users of our systems will need and will apply? So, getting that feedback is critical. In addition, as we develop these systems, it is critical to be able to constantly evaluate the benefits of our research products in the operational environments as exercised by the users. A good example I can give is, for instance, on our development of prognostic tools for data mining, using the data mining of the data that is within the ASRS data--we work extensively, for instance, with Southwest Airlines out in Dallas, where they exercise our algorithms and provide feedback in terms of how useful they are and what additional safety issues those tools and algorithms unearthed that were otherwise unknown. So these are kind of examples that I can provide. Likewise, when it comes to UAS, these small operators, they have tremendous capability in terms of being able to provide capabilities, in terms of detect and avoid and communication capabilities that already exist in other realms, not just aviation, that can be brought to bear. So we work quite extensively with--I mean you can look at it in terms of the IT sector on how far advanced certain capabilities are, and can we leverage those to essentially apply it towards the aviation community. Ms. Johnson. Thank you very much. Mr. Bahrami, we have probably the safest system in the world, in terms of our safety record and our complex aviation system. Your testimony speaks to investing in the right safety enhancements by aviation industry. It is my belief that probably Congress should not dictate whether to invest in a particular technology. Rather, it should encourage the FAA to establish technology-neutral standards for industry to pursue. Given that the United States has already deployed a comprehensive network of ground-based ADS-B receivers, and there is a mature ATC modernization outlined in the NextGen roadmap, what is the benefit of space-based ADS-B for the United States? And how does that benefit, compared to the projected cost of space-based ADS-B on the annual basis? Mr. Bahrami. Thank you for the question. As you know, this was one of the mandates, that we have to study the benefits of the space-based ADS-B. And that work has been going on for some time. And I think, once we have the information, and through the NextGen Advisory Committee, and recommendations that will come to the FAA, we will decide what we can do. At this point I can see how you may feel that there would be duplications. We already have a system in place. But until we have the experts taking a look at that to see if there are other places that we are--we do not have coverage and we could get that through the--space-based ADS-B, at this point I can't make any more comment beyond that. Ms. Johnson. Thank you very much. My time has expired. Mr. Davis. Thank you. The Chair now recognizes the gentleman from Michigan, Mr. Mitchell, for 5 minutes. Mr. Mitchell. Thank you, Mr. Chair. Captain, let me ask you a couple of questions, if I can, please. My colleague gave you an interesting question, a closed choice between an FAA reauthorization without ATC modernization of the current system, which, of course, isn't necessarily the choice, so I am going to ask you a different question. If you had the choice between the 21st Century AIRR Act with ATC privatization, simply FAA reauthorization without ATC--leaving it the way it is, or the progression it is on now, and the current system, which one do you want to have? Mr. Canoll. From a safety perspective, it is neutral for us. We believe that with or without the reform, we are going to maintain the safest system we have. If the question is not based on safety, we are looking at a profound need for a long- term, stable source of funding for our air traffic control system. We believe the one that is being offered now will provide that in the current House action. Mr. Mitchell. Which is the 21st Century AIRR Act, correct? Mr. Canoll. Yes, sir. Mr. Mitchell. OK. Mr. Bahrami, I am confused, but I believe your agency actually supported the 21st Century AIRR Act, did it not? Mr. Bahrami. Administration, yes. Mr. Mitchell. That would be the pertinent question. Mr. Bahrami. Yes. Mr. Mitchell. Thank you. A question for you, if I can, Mr. Hampton, before I have to leave for another--quite some time ago, after 9/11, the FAA was directed by law to update and upgrade the identification process for A&P and pilots, so they had more information in terms of photos, biometrics to better secure access to airports. To date, to the best of my knowledge, that really hasn't been--let's put it this way--significantly undertaken, let's put it that way. And I guess--I know there is another committee on which I serve is going to get into detail. Can you give us an outline as to--I think that is a safety risk that we need to look at. Mr. Hampton. I would have to get back to you on the biometrics. Most of our work is focused on the updates on the pilot records database, which is currently underway. And we will get back to you on the biometrics. Mr. Mitchell. I appreciate--well, I appreciate that, in terms--and additionally, in terms of identification, their identification information and for A&P and mechanics, which appears to me to be a significant safety risk, where you have the ability for---- Mr. Hampton. Absolutely. Mr. Mitchell [continuing]. People to access---- Mr. Hampton. Yes, sir. We will get back to you. We focus mostly on the pilot records database. Mr. Mitchell. I appreciate that. Mr. Hampton. Thank you, sir. Mr. Mitchell. I think it is a significant safety concern we need to be concerned about, is the safety of our---- Mr. Hampton. Interesting. We just had a discussion with another committee about that. I will get back to you, sir. Mr. Mitchell. Thank you, sir. I yield back, thank you. Mr. Davis. Thank you, Mr. Mitchell. As a followup, Captain, to Mr. Mitchell's question, you mentioned a stable funding source that you believe the 21st Century AIRR Act would provide. That stable funding source, would you agree, would allow more safety upgrades and technological upgrades, to make it safer for everybody in the industry? Mr. Canoll. I don't necessarily agree that more funding is going to make us more safe. I think we are safe now. The funding would be more along the lines of expanding and making it more efficient. The safety is going to be maintained. That is an absolute, and it is an absolute requirement. We are not looking for new ways to be safe. But if we are going to continue to have the safety we experience today with increased volume, which is the objective of a new system, then, yes, we will need more funding. Mr. Davis. The Chair now recognizes Ms. Brownley for 5 minutes. Ms. Brownley. Thank you, Mr. Chairman. And Captain, I would like to also ask you a question with regards to pilot shortages, or not having pilot shortages. But we do continue to hear from our regional carriers about a pilot shortage, although the FAA data seems to paint a different picture, in that there has been a 200-percent increase in pilot licenses that have been issued since 2009. Yet we continue to hear about it, and from both large and small carriers leaving their market. So I was wondering if you could explain a little bit more in further detail about how you think business economics are driving airline service issues in smaller communities. Mr. Canoll. So, ma'am, you are absolutely correct. There is no present-day pilot shortage. The FAA data is very clear. There are almost two pilots for every job available out there. The challenge is that the industry went through a rather dramatic downturn in the previous 10 to 15 years, many bankruptcies. And it, quite frankly, wasn't a very desirable profession for almost an entire generation coming through. The good news is we have seen a turnaround in the industry, from a profitability standpoint. And when our employers are profitable, our members make more money. So that is now attracting a new generation of fliers. And we have seen enrollment at the flight schools up dramatically over the last 2 years. We have seen the production of airline transport pilot and restricted airline transport pilots increase, so the trend is very positive on the long-term picture. For those who are having troubles attracting pilots today, they just need to look at those airlines that are not having troubles attracting pilots. And it is the free market at work, which we fully support. We fully support the activity of the free market. And while some are having no problems, we can see clearly why they pay a good wage and they have a good work-life balance and they have good career progression options for the incoming pilot. And those who are having trouble do not, in almost all areas. It is almost that simple: supply and demand market economics. Ms. Brownley. And is there a certain profile of the new pilot coming on board? Mr. Canoll. So the pilots that we see today coming into the part 121 carriers are products of the new rule, since it has been in place for almost 5 years now, and that new rule calls for very structured academic training, and then a certain baseline, depending on which form of structured academic training you had. Let's say it was a 2-year aviation degree. You would need 1,250 hours of experience. A 4-year aviation degree, you would need 1,000 hours of experience. But if you came from the military, you could obtain a restricted ATP (Airline Transport Pilot) with 750 hours. So we are finding that those structured programs and that experience is producing a very high-quality candidate. We went through a transition period right after the rule came in, where we had some people coming back into the industry who already had ATPs, but hadn't flown for many, many years, who struggled a little bit in the air carrier training course. But we have seen that wane away, and now we are seeing a very high-quality candidate. Ms. Brownley. Thank you for that. And there has been a lot of discussion today on unmanned aircraft in our national airspace. And I am just wondering, from your perspective--I haven't heard your perspective yet, although I heard you make comments in your testimony. But how do you see the Federal Government's role in developing, you know, flight standard, certification, air traffic requirements for the use of drones in our airspace? Mr. Canoll. So the Air Line Pilots Association is fully supportive of the development and deployment of these technologies, just as quickly as possible, as long as safety is not compromised. From a systematic approach to it, we look at it very simply. If the vehicle under consideration is intended to fly into the national airspace--which I define as airspace shared by our general aviation community and our airlines in the military--or the vehicle has the capability to do it in a lost link concept, then the development of procedures, certification, and operation of that vehicle must be very much aligned with what we do today in manned aviation. It shouldn't be a new set of standards. The standards exist for operating in the national airspace. We need to have those same standards. One example would be collision avoidance technologies that are mandated on all the airliners my members fly. That type of equipment must be installed on any unmanned vehicle that is intended to fly in the national airspace, as well. Ms. Brownley. Thank you, sir. My time is up. I yield back. Mr. Davis. The Chair recognizes the gentleman from Minnesota, Mr. Lewis, for 5 minutes. Mr. Lewis. Thank you, Mr. Chairman. Thank you to everyone who is appearing in front of the committee today. We do appreciate it. Administrator Bahrami, I have got a question on the 21st Century AIRR Act and how it applies, or some of the criticism that has been expressed on the other side of the aisle from moving air traffic control from the FAA to a nonprofit private entity. And I would reiterate the point that this particular piece of legislation has nothing to do with privatizing profits. They don't go to the stakeholders, they are reinvested back into the system. But it is just a more nimble way to make certain that air traffic control is up to date, and just merely the model of so many other nations. But nevertheless, some of my--our colleagues on the committee have expressed concern about managing airspace and aviation operations, and doing that the right way. Now, I want to ask you a question about how the FAA currently contracts with private general aviation pilots. I understand there is a couple of contractors that we already use that are outside the realm of Government. Is that true? Mr. Bahrami. Sir, I am not familiar with the specific contracts you are referring to. Mr. Lewis. Yes, go ahead. Mr. Bahrami. If you want to either elaborate or give me the questions, I will make sure that I provide you the response. Mr. Lewis. Right now the FAA contracts with folks like Leidos, which has a presence in my district, in Minnesota, to run the flight services center which aids all general aviation pilots in planning and executing flights in the national airspace. And I guess my question is, if that is good enough for that, what would be the fear in the 21st Century AIRR Act for moving to a similar model? Mr. Bahrami. Earlier there was a question with respect to the contract towers, and we mentioned that this is something that we support. We are supportive of the contract towers. And my focus is on safety. And I want to point out that, from the safety perspective, the ATC reform that is included in the proposed act, there would not be any adverse impact to safety. That is my belief. And I base that on the fact that there are 60 or so countries that have already done that, and the level of safety, based on various studies decided that it stayed the same or has improved. Mr. Lewis. So there are these successful examples. I believe, additionally, the FAA recently established the LAANC [Low Altitude Authorization and Notification Capability] program, is that right, that approves private-sector, third- party companies to manage unmanned aviation in specific other areas to make certain that our national airspace is safe? So there are examples of non-Federal entities operating portions of the national airspace in a very proficient and safe manner, correct? Mr. Bahrami. LAANC, you mentioned, is a good example of that. It has been working very well. And we are looking forward to expanding it to 50 other airports. Mr. Lewis. And the FAA still retains safety oversight of these programs, as it would the ATC, if it were operated independently. Is that correct? Mr. Bahrami. That is correct. The responsibility of oversight is always with us, sir. Mr. Lewis. Very good, thank you. I yield back, Mr. Chairman. Mr. Davis. Thank you. The Chair recognizes the gentlelady from Michigan, Mrs. Lawrence, for 5 minutes. Mrs. Lawrence. Thank you so much. Captain, in your testimony you talk about how we need to ensure that safety regulations should not be driven by economic decisions. Can you elaborate on that? Mr. Canoll. I think the easiest example is if you listen to some of the chatter in town, and certainly in this subcommittee as well, about those who believe there is a need to reduce the number of hours required or the structured training that is currently required for an ATP or restricted ATP. Those are attempts to address a market forces issue with regard to pilot supply with a safety provision, which I do not believe is what the flying public wants us to do. If you look more on the economic side, it is a problem for the industry that we are going to have to work through together to provide service to small communities at an affordable rate. We are not blind to the fact that if the airplanes cost more, the fuel costs more, the pilots cost more, eventually the cost of that operation to a small community will make it unaffordable for those who want to access that. Hence the Essential Air Service and other programs that are meant to offset some of that cost. So I think, you know, a lot of attention could be focused on that, to see if we can find ways to make it more affordable to fly into those things. But reducing safety--and, by the way, we are firm believers that just reducing the number of hours or reducing structured flight training will not address the problem of attracting pilots to the job. That is not going to solve the problem, no matter what anyone says. I know what attracts pilots to the job, and it is a good work-life balance, career progression, and a fair wage. Mrs. Lawrence. Captain, I want you to know that I agree with you. And so many things that--so often, when Government looks at associations or unions or labor groups, they are labeled as the other side, where you are the ones--you are flying that plane, you are in that seat. You have the ability to speak at a level of expertise that we need to hear. And I just want you to know I do appreciate you, and because all of us fly a lot, we are so appreciative of your service, sir. I want to ask this question to the panel. I don't think it is an exaggeration to say that the hurricane response--we will look back on it as a landmark evolution of drone usage in this country. The University of Michigan's College of Engineers is building an outdoor fly lab for testing autonomous aerial vehicles called the M-Air. I wanted to ask this panel what are some of the challenges faced by educational institutions today, as they look at R&D in the UAS airspace? Mr. Bahrami. I will start. In terms of challenges, I think there are tremendous innovative ideas out there. And often what we are learning is the best way to go forward is through prototyping, and actually put those ideas in place and document what lessons we learned, and identify those things that maybe we did not know prior to conducting that particular research. And to some degree, collaboration with the Government agencies, industry, will help identify the research requirements, going forward. And I think that is how we can take what is happening in academia, and actually transfer it into regulatory and safety requirements. Mrs. Lawrence. And in that vein, to ensure that we do not stifle this industry, what are some of the recommendations that you have when it comes to regulations, the timeframe? We often hear that our regulations stifle the growth. And this industry is moving very rapidly. Do you have any recommendations for us? You all are not into the drone industry? Mr. Canoll. Ma'am, I sit on the Drone Advisory Committee. I am a member of the Drone Advisory Committee. Mrs. Lawrence. Thank you. Mr. Canoll. And we struggle with that question every day. Mrs. Lawrence. OK. Mr. Canoll. The industry wants a lot of things. They want flight beyond visual sight, they want flight at night, they want flight over populations. These are all very desirous of the industry to make more money. But we also have to take a focus on all the challenges to doing that safely. The most recent example of success is the UAS ID and Tracking ARC results on--in that ARC--we were a member of that Aviation Rulemaking Committee, as well. It went wonderful, and now the FAA has those recommendations, and we should be seeing rulemaking in very short order, which will enable a lot of the things the industry wants to do. That is the first and most present example of if we are actually making progress. As long as the industry and the FAA keep coordinating at the very high level they are doing right now, I think we are going to get there. You know, we are going to have to be measured, but we are going to get there. Mrs. Lawrence. Thank you so much. My time is up and I yield back. Mr. Davis. The gentlelady's time has expired. The Chair begrudgingly recognizes the gentleman from Pennsylvania, Mr. Perry, for 5 minutes. Mr. Perry. Well, thank you, Mr. Chairman. I appreciate your indulgence, begrudging indulgence. Gentlemen, thanks for being here. I am going to stick with the line of questioning from the gentlelady from the great State of Michigan. And let me just say before I start that I was encouraged that the committee adopted an amendment I had last year, the reauthorization bill which provided the Administrator the authority to part 107 waivers for UAS carrying property beyond the line of sight. And I will also tell you, as a rotary-wing guy who operates in the low-altitude airspace, I am particularly concerned about getting this right here on a regular basis, especially from my friends in the EMS community about close encounters, because they seem to just--you know, they are headed to an accident, and so is everybody else, right? And they want to have their own view of it, and so on and so forth. At the same time, I think that potentially we are getting behind, we are behind, we are missing opportunities in this space. And I just want to encourage us to continue safely in this regard, but diligently. I was pleased to know that the DOT and the FAA place strong emphasis on the application and the roll-out of the new UAS integration pilot program, so I just want to--UAS IPP is the acronym, just to be clear here. Mr. Bahrami, acknowledging package delivery is, for the time being, prohibited under part 107. How does the FAA envision enabling delivery operations in the pilot program? Do you know if that is part of that, and how that is being worked out? Or where does that stand? Mr. Bahrami. At this point I am not familiar with all the proposals. We are going through the process, as you know. We are following a very strict process. But I can tell you that, even outside the IPP, there are companies that have already approached the FAA. And we are going to be working with them to identify the operational rules that need to be in place for those types of operations. And there are two ways we could deal with this situation. One would be for us to start looking at the regulations and come up with a proposal that goes out for public comments and all that. But the other way would be to engage with industry and let them propose ideas that are workable, given their nature of designs, and put the safety requirements, performance-based rules, that then actually can go forward and design their vehicles to those type of requirements. We have chosen the latter. We want to work with them because we believe that would be the quickest way for us to learn some of the challenges that we are going to be facing. Mr. Perry. Right. And I agree with you. I hope they are not mutually exclusive. I think that we should engage with industry as the experts on this. But at the same time, I think the public comment is important. As a person who is fairly familiar, I consider myself, having flown for 30 years, familiar with the aviation process and so on and so forth, but I am also concerned about privacy, about the airspace incursions, whether for safety or for privacy, what have you. And I think those are important conversations to have. I would encourage you to continue. I understand that DOT is required to enter into UAS IPP agreements with at least five jurisdictions by early May. That is my understanding. So if I am wrong, just please correct me. Do you anticipate a program being announced by then, or not? Mr. Bahrami. I can tell you that we are on schedule. Mr. Perry. OK. Mr. Bahrami. And I can also tell you that Secretary Chao recently announced that the number would be 10. We are doubling the numbers. Mr. Perry. Excellent, OK. So on schedule, doubling the numbers. I think this is good news for those of us that are interested in this. And whether--just like you said, Captain Canoll, we are concerned for safety and the airspace and interoperability and a traffic management system. Nobody wants a 50-pound metal object coming through the windscreen at whatever hundred miles an hour you are headed. It is going to be catastrophic, right? So we can't afford those kind of incidents. But at the same time, we need to move forward with technology and the things that are in our world today, and just do the best we can. So I appreciate your answers today, sir, and I thank you for your diligence, gentlemen. Thank you. Mr. Chair, I yield. Mr. Davis. Thank you to my good friend, Mr. Perry. The Chair now recognizes the gentleman from Tennessee, Mr. Cohen, for 5 minutes. Mr. Cohen. Thank you, sir. This has been the greatest period of safety in civil aviation, I think, in our history. And yet we have got the largest, most complex system. So thank you for that. But we still have to remain vigilant to maintain those high safety standards which we have established in the United States. Mr. DeLisi, if I can ask you on--if you recall, October 28, 2016, American Airlines flight 383 experienced an uncontained engine failure and subsequent fire. There were 161 passengers, 7 flight crew on the plane, 168 people. Several injuries were sustained, and NTSB subsequently issued an extensive investigation. First, Chairman, can I have entered into the record the investigative report on that record, without objection? [Pause.] Mr. Cohen. Without objection? Thank you. Mr. Davis. Yes. [The 91-page accident report referenced by Congressman Cohen entitled ``Uncontained Engine Failure and Subsequent Fire: American Airlines Flight 383, Boeing 767-323, N345AN, Chicago, Illinois, October 28, 2016'' is available on the website of the National Transportation Safety Board at investigations/AccidentReports/Reports/aar1801.pdf.] Mr. Cohen. Thank you. Mr. DeLisi, you are familiar with the NTSB's investigative report regarding the flight? There were 168 people on board. Was that the capacity of that plane? Mr. DeLisi. I would have to check into that. I don't recall if that was a full flight. Mr. Cohen. So you don't know how many passengers could have flown that plane or a similar flight. Not necessarily. Mr. DeLisi. I could find that. Mr. Cohen. Thank you. Mr. Bahrami, let me ask you this. In the investigative report following the accident, the NTSB recommended--some passengers evacuated and they took their carry-on bags, and that is a problem. They shouldn't have done that. Does the FAA consider the efficient, timely evacuation of planes an important factor in passenger safety, and how to accomplish that? Mr. Bahrami. Absolutely. We have specific rules that-- emergency evac must be completed within 90 seconds. And when we conduct that test, we have the maximum passenger loading on-- and adverse situations, such as some of the exits are closed and those kinds of situations, to make sure that we get as realistic as possible to potential scenarios that may happen in service. Mr. Cohen. Thank you, sir. Ninety seconds is what current Federal law requires all passengers to be able to evacuate. In the case of flight 383 it took 2 minutes and 21 seconds to evacuate the passengers. Three exits were operable. The flight was below passenger capacity, yet it took 51 seconds longer, or 63 percent more time than is permissible under Federal regulations. Subsequent to that, post to that, a U.S. circuit court decision was issued in July of 2017. And Mr. Chairman, I ask unanimous consent to enter into the record the U.S. court of appeals decision of July of 2017. Mr. Davis. You didn't get me this time. Without objection. [Flyers Rights Education Fund, Inc. D/B/A FlyersRights.org, and Paul Hudson, Petitioners v. Federal Aviation Administration, et al., Respondents (D.C. Cir. July 28, 2017) (No. 16-1101) is on pages 124-146.] Mr. Cohen. Thank you, sir. You are familiar with that decision, I presume, FlyersRights versus U.S.A.? Mr. Bahrami. Yes, I am. Mr. Cohen. In that decision the panel remarked that the FAA's justifications to reject the public petition to review airline seat safety as a matter of safety risk was vaporous. Even after the dangerous accident involving American Airlines flight 383, even after the NTSB's clear recommendation to review passenger deplaning times, the FAA took no significant action. Now the U.S. court of appeals has ordered the FAA to take action to review the safety impact that changes in seat size and pitch may have. I am concerned the FAA has not taken seriously the concerns of the National Transportation Safety Board, or even the U.S. court of appeals decision, or this committee, which included a study. Can we expect some study soon on pitch size and width of seats that are getting smaller and smaller and smaller? Mr. Bahrami. As you mentioned, we have the court order to respond, and we are working on that response. It is a coordination. And I think, once that is made public, we know what type of work we need to be doing in order to satisfy the directives that we have. Mr. Cohen. Well, I hope you will do it quickly, because lives could be in the balance. I am deeply concerned about the flight safety for the flying public. We shouldn't wait until somebody dies to respond and to take action to make our planes evacuatable within the 90 seconds that is required by law. Seat size and pitch continue to shrink, while the average American gets larger and larger and taller and taller. And while I care about comfort, my bill, the SEAT [Seat Egress in Air Travel] Act, is focused squarely on the risk of the flying public and safety. This was part of the FAA reauthorization package. Even if airlines did not oppose the amendment, which they didn't--everyone is for safety--I think it should be a grave concern of the American public that the FAA has repeatedly failed to act in accordance to the guidance and recommendations of not only the National Transportation Safety Board, but even the U.S. court of appeals. It is clear to me the American public is on our side in urging your agency to issue standards to keep Americans safe in our skies. And pitch and width is part of that, Mr. Bahrami, and I hope this administration will do that. If I can have just an extra second, Captain, I want to thank you for your service---- Mr. Davis. No. Mr. Cohen [continuing]. And ask you this. Do you carry a gun in the cockpit? Mr. Canoll. No, sir, I am not an FFDO [Federal flight deck officer]. Mr. Cohen. OK---- Mr. Davis. The gentleman's time has expired, thank you. Mr. Cohen. I yield back the balance of my time. Mr. Davis. The Chair recognizes the gentlelady from Nevada for 5 minutes, Ms. Titus. Ms. Titus. Thank you, Mr. Chairman. I would like to follow up on the question earlier about package delivery. I know that you say that there are some plans that are going to be announced in May. You don't want to tell me if Nevada is going to get one of those proposals, do you, so I can go back with some good news? But I just worry that all of this is kind of conditional, and it is all in the future, and you are all studying and planning. As the FAA reauthorization continues to be controversial and held up over that one provision about privatization--all the rest seems to have pretty much bipartisan and industry agreement--is there anything that we can be doing to help speed along this drone package delivery? We just see it happening every day right now, it is a reality in Europe, and we seem to be falling further and further behind. Mr. Bahrami. Let me start by highlighting that we are leading when it comes to integration of drones into airspace. Many countries have chosen to segregate. But what we are trying to do is integrate, which is the--which is--puts us ahead of other countries. Having said that, as it was mentioned several times, there is tremendous amount of energy, passion, and enthusiasm amongst the companies to move forward with these types of initiatives. Frankly, FAA does not have a choice than to continue to work with those parties and move things forward. So, we are at the point right now that the demands are upon us to respond, and we are doing so. We are doing it in terms of partnerships for safety plans with specific companies that are in that particular business. We are trying to learn from their work and see what we could do as we move forward. And at this point I could tell you that that is a high priority for us. Ms. Titus. Well, I am glad to hear that. And Nevada has one of the test centers in the State, and there is a lot of potential use for drones there. I know some of our utility companies would like to see them used in remote areas, because that would be very helpful--out of line of sight. Some of the casinos would like to use drones to deliver drinks poolside. I mean that is--let's be creative. I noticed even in one of the big fashion houses during fashion week they had drones going down the runway, carrying ladies' purses. So, I mean, it is endless. But I appreciate that you all have made that a priority. One thing, too, that concerned me was this rule of the administration, this two-for-one Executive order on the development of regulations, and how that affects the drone industry. I wrote Mr. Mulvaney about that, to ask him, and he wrote me back and he said that he thinks maybe that the--he says that the OMB believes that maybe the rulemaking that expands the use of drones would be considered deregulatory, so it wouldn't come under that arbitrary two-for-one elimination. I wonder if you all have accepted that. Have you received that directive? And does the DOT agree with it, and the FAA? Mr. Bahrami. Yes, we are following the directives outlined in Executive order. And when you view the requirements in there, or the draft, you are looking at two things: first, safety; and the other one is enablers, rules that are enablers. In those cases, we are moving forward with those. And in the area of what--the rules that are considered deregulatory, which--there are a number of them identified by both industry and other sources. In those cases we have to answer two questions: what is the impact on safety if we go forward with that action, and what is the impact on FAA's roles and responsibilities? Can we still do that job? Those things go into the consideration. And at this point we are following that guidance. Ms. Titus. So you don't feel like that two-for-one Executive order is hindering you in the development of drones or regulations that are needed? Mr. Bahrami. Not so far. I think what it does is that it forces us to do a lot more planning, because we need to know what rules we have got going and what are some of the deregulatory items, and be able to match them together so that the net effect is a positive, in terms of benefits, or neutral. And that is the work that we have to do in advance before our regulatory agenda is published. Ms. Titus. Thank you. Thank you, Mr. Chairman. Mr. Davis. The gentlelady's time is expired. Glad I get a chance to ask my questions. You know, many that I had actually have been asked already. So it has been pretty interesting to listen to some of my colleagues. My good friend, Mr. Larsen, and I, we kind of stopped when we heard about technology delivering drinks to the pool. So we would like to get some opinions on--can you push that technology to the head of the line with your risk-based approach, sir? A simple yes or no is good. Mr. Bahrami. We will do our best. [Laughter.] Mr. Davis. Thanks. Speaking of--a lot of this hearing I don't think many originally thought would center on drone and UAS technology, but I just want to let you know I appreciate the FAA's risk-based approach on UAS, and I look forward to continuing to work with you. As you may know, and many on the panel may know, I introduced an amendment to the 21st Century AIRR Act that would create a microdrone category. And I would hope that that language is being utilized as part of your risk-based approach, as part of any advisory committee that you may be a part of, Captain, because my feeling is that manufacturers will begin to manufacture that technology in a much more safer way for our air system if they know what the minimum standards are. And that, to me, would ensure that we would keep that technology moving forward. Mr. Bahrami, I also wanted to ask you for an update on a piece of legislation that was signed into law back in 2016. It is section 2309 of the FAA Extension, Safety, and Security Act of 2016. I had a provision based on my legislation, the Families Flying Together Act, which required DOT to review and, if appropriate, establish a policy requiring air carriers to enable children to sit with a parent or an accompanied family member. The deadline for implementation was July 15, 2017. Do you have an update on this? Mr. Bahrami. Sir, consumer protection issues are handled by the Department of Transportation, and I will be glad to take the question and provide you with an update. Mr. Davis. All right. And in--thank you for doing that, I appreciate your relaying that to the DOT Aviation Consumer Protection Division. If you could, would you ask them to reach out to my office? And I would love to schedule a meeting to get a personal update from that team. Mr. Bahrami. Absolutely. Mr. Davis. All right, thank you. Mr. Bahrami. Thank you. Mr. Davis. Captain, you mentioned something. I don't remember--the hearing has gone on long--if it was your opening testimony or if it was in response to one of the initial questions, but you mentioned student loans and the debt that pilots may incur. Do you know what the average student loan debt is for a pilot going into aviation, coming out of training? Mr. Canoll. No, sir, we don't. I don't. We don't keep those statistics. We do know it is expensive. And the problem with the traditional student loans is the current system of caps and forbearance. So in the higher education bill, we are urging a broader look at how student loans could help an individual interested in, let's say, being a pilot, factor in the higher cost that flight training is going to have to be included. And that would mean higher caps for that particular profession, like it has provided in other professions, and then maybe a different mechanism for forbearance on the repayment of those loans. Still a loan construct, still not the best way to do it, because loans are expensive. But nevertheless, the only way for a lot of people. Mr. Davis. Well, I appreciate your comments on the forbearance issues and the Higher Ed Act, but I want to bring your attention to a bill that I have introduced called the Employer Participation in Student Loan Assistance Act. And what it does, it sets up a voluntary, private-sector approach that would allow for a company to receive a tax benefit to offer up to a little over $5,000 per year to an employee. And the benefit would be the employee wouldn't be taxed on it, either. So it is something that could get us to pay down student debt even more, and allow it to be negotiated as part of a benefits package. So I would love for ALPA and any other organization, the Allied Pilots Association, and Southwest Airlines Pilots Association, and all of the different pilots organizations to take a look at that, because it is an idea that I think could help get much of that debt off the plate of some of your youngest pilots, and give them a chance to go into your profession easier. And if you look at polling, millennials right now, the biggest concern they have is student loan debt. Mr. Canoll. Yes. Mr. Davis. And they are not going to go into an expensive profession to get that education like aviation if we don't give them this assistance. So take a look at that. I appreciate the opportunity to bring that up. Thanks for your comments. Mr. Canoll. Yes, sir. Mr. Davis. And I will yield back the balance of my time to Mr. Larsen, very quickly. Mr. Larsen. So Mr. Chairman, without objection, I would like to enter a letter into the record with 443 signatories of folks who oppose any attempts to privatize the air traffic control system, including the Washington Pilots Association from the great State of Washington, just to show the wisdom of this move. So I would like to enter this into the record. Mr. Davis. No. [Laughter.] Mr. Davis. Without objection. [The letter referenced by Congressman Larsen is on pages 147- 154.] Mr. Larsen. Thank you. Mr. Davis. The Chair recognizes the gentleman from California, Mr. DeSaulnier, for 5 minutes. Mr. DeSaulnier. Thank you, Mr. Chairman. And I want to thank the chairman of this subcommittee, the ranking member, and the ranking member of the full committee on their opening comments in mentioning an issue that is very important to me and the residents of the San Francisco Bay area, and acknowledging those incidents there. And I want to also thank, first, the captain and your association for being so great for myself and my staff to work with. I have had a lot of input from your members individually and when you have come to see us on the issue of runway incursions and near misses. I have learned a lot. Then I want to acknowledge both the NTSB and the FAA. My initial contacts, to be honest, were not as productive as I thought. But subsequent to that, I really appreciate the meetings. So I say this in a tone, first of all, acknowledgment that there is a problem. And although I get now in regular--still followed very closely by the bay area media, it was on two stations this past weekend--and trying to put it in context, that we should acknowledge the safety record. But on the other hand, we should be doing everything to make sure that what is happening is not a regression of the means, that we are so comfortable with our safety record that we are not looking at these near misses and learning from them. So, Mr. DeLisi--and thank you for your career. I have great admiration for what you have done and the value you have given to the traveling public. So I want to talk a little bit about your most wanted list issue area. First, you mentioned that expanding use of recorders, both audio visual and voice and other recorders, are on your wish list. So could you expand on that? And what is the cost for us to be able to get that, either the private sector or the Federal Government, to help you with that? And how would that help with these near misses and the runway incursions? Mr. DeLisi. Well, thank you. Certainly in the part 121 airline operation realm, aircraft are equipped with flight data recorders and cockpit voice recorders, the cockpit voice recorders only capture 2 hours' worth of information. They are designed with an impacts, which--they are really a tool for accident investigation. If the airplane is involved in an accident, it will stop recording and preserve the data. However, in an incident in which the airplane is undamaged, likely power will remain on as passengers disembark, and the next load of passengers will get on board and, very quickly, that data is going to be overwritten. So we know that ICAO is looking at a new standard for 2021 to go to a 25-hour recording standard for CVRs [cockpit voice recorders]. We think that would be very helpful. In the part 135 realm, we see accidents in which airplanes fall below the threshold of being required to have a flight data recorder. And in airplanes like that, when there is not an optional flight data monitoring recorder, there is no way for a company to understand how that flight is being operated. There is no way to monitor procedural compliance and stabilized approach criteria being met. There is no insight. And the accidents that we have investigated recently, like the one in Akron, Ohio, and a more recent one in Teterboro, New Jersey, show that those airplanes are not being flown in accordance with company procedures. So the push on the part 135 operators is to require a low- cost, lightweight flight data monitoring recorder to allow that sort of monitoring. Mr. DeSaulnier. So just the jurisdictional issues of looking at these near misses and what the triggers are--we have talked to you and looked at, is it specifics of the airport, why this--at SFO we are pushing, we are very busy, we are happy about that--the design of the airports? But it does seem that, given all the proper restrictions for privacy and for the good relationships between the operators, the pilots, it--from a lay person's standpoint, if you made sure all of those were consistent, as they are for the voice recorders, you can go to Best Buy right now and get a device that would record the last half hour, so you at least know that conversation and what the human factors were happening in that cockpit when it happened. Could you comment on that? Mr. DeLisi. Yes. We are seeing companies--operators that are voluntarily equipping their fleets with a device like an Appareo Vision 1000 recorder that does video, audio, and some parameters, and it is a great tool for monitoring flights, and it certainly comes in handy, should those aircraft be involved in an accident or an incident. Mr. DeSaulnier. So it would be helpful? Mr. DeLisi. Yes. Mr. DeSaulnier. OK. Anything from the FAA in this regard, either the incursions or getting more information from the cockpit? Mr. Bahrami. Well, as was mentioned by Mr. DeLisi, we definitely would like to see as much information as possible, in order to transpire what occurred prior to accident. And recorders--in this case, voice recorder--is one of those tools. And there are other ways to be able to decipher what transpired. And at this point I think we know, historically, any kind of a visual recording has been quite controversial. And if we decide to go that route we have to go through the process and deliberation and discussions before we make any policy decisions. Mr. DeSaulnier. Well, thank you. I want to thank the chairman, too. I recognize again--and I know I have run out of time--the amazing safety record. However, if that 59 feet had finalized in a tragedy, and if it happens in the future, we are all going to be held to account, which I think would be appropriate. So we want to avoid that. Thank you, Mr. Chairman. Mr. Perry [presiding]. The Chair thanks the gentleman from California. The Chair now recognizes Mr. DeFazio from Oregon. Mr. DeFazio. Thank you, Mr. Chairman. Mr. Bahrami, I keep hearing about our outmoded radar-based system, and how good it could be, and about the space-based ADS-B. Have we deployed an operable, currently operating ADS-B system that covers the entire continental United States and Alaska and part of the Gulf of Mexico? It is a simple question. Have we? Is there such a system today that operates? Mr. Bahrami. Yes, yes, of course. Mr. DeFazio. OK. So we have that. Mr. Bahrami. Yes. Mr. DeFazio. Why aren't all the commercial airlines using it? Oh, because they haven't purchased the equipment to use it, is that correct? Mr. Bahrami. Well, it is also the rule is not in effect. Mr. DeFazio. Yes, we didn't mandate it until 2020. Mr. Bahrami. Yes, it is---- Mr. DeFazio. That is correct. But it isn't like--that we can't develop the system, it doesn't exist, you know, and we are so far behind. We have it, and we are not using it, because the airlines haven't invested in the equipment because we didn't make them invest until 2020. OK? Mr. Bahrami. That is right. Mr. DeFazio. Thanks. So that is one of the myths here that is a bit disturbing. Now, Captain Canoll, I understand the frustration and I understand the frustration of others, because of idiots in Congress who adopt things like sequestration and shutdowns and apply it to programs that are fully funded. That is easily solved. All we have to do is take the current system of funding off budget. But you are supporting a bill that actually reduces the revenues by $8 billion over 10 years to support the air traffic control system. The pilots will have a place at the table, the airlines will have a place at the table to determine what new fees will be paid by passengers or airlines. How are you going to raise $8 billion? The ticket tax goes away, 80 percent of it. That is how we fund the system now. That is $9.9 billion over 10 years. Eighty percent goes away. We have just lost $8 billion. And the airlines are going to raise their tickets by 7.5 percent, just like they did when then-Congressman Mica let it go when we temporarily suspended the tax because of some dispute he was having. For 3 weeks, every airline in America, except Alaska, raised their tickets 7.5 percent, got a windfall of $400 million. That didn't go into the trust fund. This time they are going to get a windfall of $8 billion when they raise their ticket taxes. How do you, as, you know, your organization, as one of the organizations supporting this bill, intend to raise the $8 billion from passengers or airlines after privatization takes effect? Mr. Canoll. So our concept, or our policy, requires that the test be applied to ensure that any fee structure that is put in place in a successor organization is fair. And we---- Mr. DeFazio. Would a head tax on passengers be fair? The airlines have just claimed the $8 billion of new windfall, and now they are going to say, ``Well, gee, I think we are going to have to say everybody that gets on a plane pays $25 to use the national airspace.'' Would that be fair? Mr. Canoll. That and many other ways might be fair. Mr. DeFazio. Great. So we pay for higher tickets, and you pay to use the airspace every time you fly. And somehow this is an improvement over the current system? The only problem with the current system is the idiots I work with. That is the only problem. We are raising more than enough money, we have deployed the new system. The airlines haven't bought the equipment. They are not using it. And here we are, saying, oh, we need to privatize. I mean, seriously. I know that there are some who are saying, ``Oh, gee, we might be considering pilot training if-- oh, OK, well, all right, we won't consider it.'' You know, I don't like the way this place is working right now. And I think there is some groups supporting this privatization who really, in their hearts, don't support it. With that, I yield back the balance of my time. Mr. Perry. The Chair thanks the gentleman from Oregon. Before we adjourn, Mr. Bahrami, can you just--in keeping with the recent testimony and questioning, what is the current general aviation ADS-B equipage rate? Do you have any idea where they stand? Mr. Bahrami. We are--I don't have the exact number, but I can tell you that it is not where we would like it to be. Mr. Perry. Can you get back to us with the exact number---- Mr. Bahrami. Absolutely. Mr. Perry [continuing]. At this time? Mr. Bahrami. Of course, of course, we will do that. Mr. Perry. All right. I appreciate that. If there are no further questions, I would like to thank the witnesses for being here this morning. We appreciate it. Gentlemen, this has been informative and helpful, and we appreciate your time and willingness to come and sit in the hot seat. With that, the subcommittee stands adjourned. [Whereupon, at 12:08 p.m., the subcommittee was adjourned.] [GRAPHICS NOT AVAILABLE IN TIFF FORMAT]

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