

Congress of the United States  
U.S. House of Representatives  
Committee on Small Business  
2361 Rayburn House Office Building  
Washington, DC 20515-6515

To: Subcommittee on Contracting and Workforce  
From: Committee Staff  
Date: September 26, 2018  
Re: Hearing: “Troubled Skies: The Aviation Workforce Shortage’s Impact on Small Businesses”

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The Committee on Small Business Subcommittee on Contracting and Workforce will meet for a hearing titled, “Troubled Skies: The Aviation Workforce Shortage’s Impact on Small Businesses.” The hearing is scheduled to begin at 10:00 A.M. on Wednesday, September 26, 2018 in Room 2360 of the Rayburn House Office Building.

The purpose of this Subcommittee hearing is to examine the pilot and mechanic shortage in the aviation industry, in the context of small businesses. A confluence of factors has led to a widening gap between pilots and aviation mechanics leaving and entering the workforce. While the shortage has been widely documented and covered by business experts and journalists, the impact to small businesses operating as part of this pipeline remain unexamined. The hearing will allow the Subcommittee to receive testimony on the negative effects of this shortage on small businesses across the country and identify potential solutions that may help reverse this decline.

### **I. Background: Aviation Industry and Small Businesses**

The aviation industry is facing two workforce issues simultaneously: a pilot shortage and a mechanic shortage. These shortages come at a time when demand for new pilots and mechanics is expected to rise dramatically due to an increased demand on air travel in the industry and new aircraft entering the global fleet. The problem has forced a reassessment of the industry’s labor practices as well as spurring legislation.<sup>1</sup> Given the outsized role small businesses play in the aviation sector, the looming workforce shortage presents significant challenges for the aviation industry as a whole, and the United States economy.

The United States aviation sector is an enormous economic driver, supporting nearly 11 million jobs and contributing \$1.6 trillion in economic activity.<sup>2</sup> Small businesses play a

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<sup>1</sup> Most recently, H.R. 5701 introduced by Rep. Sam Graves, would establish an aviation maintenance workforce development pilot program in an effort to combat this problem.

<sup>2</sup> Letter from the Aeronautical Repair Station Association to Senators Mitch McConnell and Charles Schumer, [https://download.aopa.org/advocacy/2018/Joint\\_Industry\\_Letter\\_to\\_Senate\\_on\\_FAA\\_Reauthorization\\_August\\_2018.pdf](https://download.aopa.org/advocacy/2018/Joint_Industry_Letter_to_Senate_on_FAA_Reauthorization_August_2018.pdf).

dominant role in aviation; according to the Small Business Administration (SBA),<sup>3</sup> 95 percent<sup>4</sup> of all firms that provide air transportation are considered small businesses under the SBA's size standards. Similarly, 95 percent<sup>5</sup> of firms that provide air transportation support services (i.e., air traffic control) are considered small under SBA's size standards. In addition to businesses at the operational end of the general aviation industry, small businesses play an integral role in the manufacturing of general aviation aircraft; approximately 92 percent<sup>6</sup> of these firms are small according to SBA's size standards.

## II. Pilot Shortage

The aviation industry is facing a growing shortage of qualified pilots. Boeing projected a need to hire 790,000 pilots by 2037 to meet growing demand, with 96,000 pilots needed to support the business aviation sector.<sup>7</sup> Similarly, a study conducted by the University of North Dakota in collaboration with the Helicopter Association International, forecasts a shortage of 7,649 helicopter pilots between 2018 and 2036 in the United States: approximately half of the respondents surveyed reported increasing difficulty finding qualified pilots and believe this pilot shortage will curtail business growth plans.<sup>8</sup> A comprehensive airline transport pilot study conducted by the RAND organization in 2015 found that low-paying airlines will continue experiencing difficulty recruiting qualified pilots, which may manifest in safety issues, disrupt cargo shipments, and impact the traveling public.<sup>9</sup> To underscore the point, the study also notes that "a significant pilot shortage would deliver an economic shock to the civil air transport industry. This shock would reverberate throughout the overall U.S. economy."<sup>10</sup> The military is not immune to this shortage – the RAND study estimates a loss in military pilots as major airline hiring increases, which will impact the United States Navy and Air Force pilot population.<sup>11</sup> The study predicts a 10 percent Navy pilot shortfall by 2020 and a shortage of 1000 Air Force pilots by 2022.<sup>12</sup>

This dearth of pilots is felt acutely by small airline companies, including those operating at the regional airline level. Regional airlines are smaller subcontractors flying under the identities of the major carrier<sup>13</sup> they align with and operate a significant portion of domestic flights on behalf of the major carrier. For example, Horizon Air is a regional affiliate of Alaska Airlines. In 2017, Horizon Air grounded 600 flights in September and an additional 700 in

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<sup>3</sup> This data is from the 2012 Economic Census, the latest available to the SBA. Email from George Brown, Assistant Administrator, to author (Sept. 14, 2018, 10:30 EST) (on file with author).

<sup>4</sup> 2,620 firms, *Id.*

<sup>5</sup> 4,175 firms, *Id.*

<sup>6</sup> 1,340 firms, *Id.*

<sup>7</sup> BOEING, PILOT OUTLOOK: 2018-2037, available at <https://www.boeing.com/commercial/market/pilot-technician-outlook/2018-pilot-outlook/>.

<sup>8</sup> UNIVERSITY OF NORTH DAKOTA & HELICOPTER ASSOCIATION INTERNATIONAL, EXECUTIVE SUMMARY, (on file with the Committee).

<sup>9</sup> Michael McGee, *Air Transport Pilot Supply and Demand: Current State and Effects of Recent Legislation*, RAND ORG. xiii (March 2015), [https://www.rand.org/content/dam/rand/pubs/rgs\\_dissertations/RGSD300/RGSD351/RAND\\_RGSD351.pdf](https://www.rand.org/content/dam/rand/pubs/rgs_dissertations/RGSD300/RGSD351/RAND_RGSD351.pdf).

<sup>10</sup> *Id.* at 7.

<sup>11</sup> *Id.* at xiii.

<sup>12</sup> *Id.*

<sup>13</sup> Major carriers are those most familiar: i.e., American Airlines, United, Delta, Southwest, JetBlue, etc.

October, citing lack of pilot resources as a primary driver for the cancellations.<sup>14</sup> Republic Airlines, previously the second-largest regional carrier in the United States, filed for Chapter 11 bankruptcy despite reporting a profit for eight consecutive quarters.<sup>15</sup> Republic Airlines cited losing more pilots than it can hire as one of the primary reasons for their filing.<sup>16</sup>

*a. Factors contributing to the pilot workforce shortage*

While a detailed accounting of these reasons is beyond the scope of this memorandum, it is worth briefly identifying a few causes of the shortage. First, the demographics of current pilots present a unique problem for the aviation industry. Baby boomer pilots consist of almost 50 percent of the pilots flying today<sup>17</sup> and many are about to retire.<sup>18</sup> The increase in United States pilot retirements will begin as early as 2021<sup>19</sup> and it is anticipated that United States airlines will have to replace approximately 30,000 retiring pilots by 2026.<sup>20</sup> This exodus of retiring pilots is problem for major carriers and regional airlines alike, however the challenge is greater for smaller air transit companies. Major carriers have the resources to lure senior pilots away from regional pilot jobs, enticing them with highly coveted, better paying positions. As these senior pilots advance to more prestigious positions or face retirement, there is a dwindling pool of young, up-and-coming pilots to replace them at the regional level, where smaller companies operate.

This leads to a second cause of the pilot shortage. The high cost of entry and historically low initial return on investment have deterred many potential young pilots from pursuing a career as a licensed commercial pilot. The average pilot must invest many years and significant financial resources in flight training and education for an airline job,<sup>21</sup> often starting at the regional level.<sup>22</sup> Salaries at regional carriers have traditionally been low, schedules are demanding, and benefits can be uneven; in addition, the potential for upward mobility decreases as more prestigious jobs are taken by senior pilots.<sup>23</sup> To combat this shortage, some regional carriers have amended their business models, attempting to build a sustainable pipeline of

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<sup>14</sup> Caleb Diehl, *Horizon Air Closes the Gap in Pilot Hiring*, OREGON BUS. (July 9, 2018),

<https://www.oregonbusiness.com/article/transportation/item/18409-horizon-air-closes-the-gap-in-pilot-hiring>.

<sup>15</sup> James Briggs, *Why Republic Airways Filed for Bankruptcy Even Though it's Profitable*, USA TODAY (Feb. 27, 2016), <https://www.usatoday.com/story/travel/flights/todayinthesky/2016/02/27/why-republic-airways-filed-bankruptcy-even-though-s-profitable/81035522/>.

<sup>16</sup> *Id.*

<sup>17</sup> Marisa Garcia, *A 'Perfect Storm' Pilot Shortage Threatens Global Aviation*, FORBES (July 27, 2018),

<https://www.forbes.com/sites/marisagarcia/2018/07/27/a-perfect-storm-pilot-shortage-threatens-global-aviation-even-private-jets/#1e7718fd1549>.

<sup>18</sup> The mandatory retirement age for airline pilots is 65, changed from 60 in 2009. Jacob Agnew, *The Pilot Shortage: A Current and Future Threat*, MBA (March 21, 2017), <https://www.mba.aero/the-pilot-shortage-a-current-and-future-threat-mba-insight-series/>.

<sup>19</sup> Jon Ostrower, *The U.S. will Face a Staggering Shortage of Pilots*, CNN (July 31, 2017), <https://money.cnn.com/2017/07/27/news/companies/pilot-shortage-figures/index.html>.

<sup>20</sup> *Id.*

<sup>21</sup> Dan Reed, *Who's Going to Fly the Plane? Forecasted Global Pilot Shortage Could Limit Future Air Travel Options*, FORBES (Aug. 8, 2017), <https://www.forbes.com/sites/danielreed/2017/08/08/whos-going-to-fly-the-plane-forecasted-global-pilot-shortage-could-limit-future-air-travel-options/#2c522b72aa56>.

<sup>22</sup> Patrick Smith, *The Pilot Shortage is Real and Airlines Must Change Before it Becomes a Full-Blown Crisis*, BUS. INSIDER (July 20, 2017), <https://www.businessinsider.com/airline-pilots-reveals-truth-myth-pilot-shortage-2017-7>.

<sup>23</sup> *Id.*

talented pilots by increasing sign-on bonuses,<sup>24</sup> subsidizing flight school bills, and raising wages and benefits.<sup>25</sup>

Third, legislative changes stemming from highly-publicized air crashes implemented a wide range of safety and training initiatives, including increasing the flight time minimums for new pilots from as few as 250 hours to a minimum of 1500 hours.<sup>26</sup> Some airlines attribute this increase in flight hours to slowing the pipeline of prospective pilot applicants since airlines must wait until their applicants have accrued the necessary hours before they may be hired.

### III. Mechanic Shortage

The looming threat of a shortage of aviation mechanics undermines the inevitable expansion and modernization of United States airline fleets. The UND-HAI study previously mentioned warns of large-scale deficits in the number of certified mechanics, projecting “a shortage of 40,613 certified aviation [helicopter] mechanics in the United States between 2018 and 2036.”<sup>27</sup> Research conducted by Oliver Wyman corroborates that finding, projecting that airlines will more than double the size of their fleets in the next 20 years, which will require a corresponding 480,000 new technicians to maintain the fleet.<sup>28</sup> The study also estimates that “the gap between the supply of mechanics and demand for them should develop in the United States by 2022 and reach a peak of 9 percent by 2027.”<sup>29</sup> Unsurprisingly, the study anticipates that the number of maintenance technicians leaving the workforce will outpace the number of technicians entering the workforce for the majority of the next decade,<sup>30</sup> mirroring the gap in the pilot shortage. Likewise, the 2018 Boeing Pilot & Technician Outlook projects that North American airlines will require approximately 189,000 new technicians over the next decade.<sup>31</sup>

This shortfall in maintenance experts is a cause of growing concern for those in the maintenance, repair, and overhaul (MRO) industry. According to a 2017 Oliver Wyman survey of MRO executives, a major proportion of survey respondents indicated an increasing difficulty in hiring mechanics in order to keep up with market demand.<sup>32</sup> A 2018 survey conducted by Aeronautical Repair Station Association (ARSA) corroborates this finding, citing technician shortage as a top concern for the industry. The survey reported that 82 percent of respondents

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<sup>24</sup> *Id.*

<sup>25</sup> *Supra* note 14.

<sup>26</sup> There are some exceptions; the FAA later revised this rule allowing graduates of certain flying programs and military pilots to hold restricted Airline Transport Pilot Certificates (ATP) with as few as 1,000 and 750 hours respectively. *Supra* note 17.

<sup>27</sup> AVIATION PROS, IT'S OFFICIAL: ROTORCRAFT PILOT AND MECHANIC SHORTAGE VERIFIED, (Mar. 1, 2018) available at [https://www.aviationpros.com/press\\_release/12400924/its-official-rotorcraft-pilot-and-mechanic-shortage-verified](https://www.aviationpros.com/press_release/12400924/its-official-rotorcraft-pilot-and-mechanic-shortage-verified).

<sup>28</sup> Geoff Murray, *The Storm on Aviation's Radar: How to Reroute the Young into the Aviation and Aerospace Workforce*, OLIVER WYMAN 3 (2014), [https://www.oliverwyman.com/content/dam/oliver-wyman/global/en/files/insights/aviation/2014/finalSIN-MKT20101-013\\_aviation\\_summit\\_digital\\_flattened.pdf](https://www.oliverwyman.com/content/dam/oliver-wyman/global/en/files/insights/aviation/2014/finalSIN-MKT20101-013_aviation_summit_digital_flattened.pdf).

<sup>29</sup> Brian Prentice & Derek Costanza, *Aging Baby Boomers Cause Aircraft Mechanics Shortage as Global Fleet Expands, Modernizes*, FORBES (Apr. 24, 2017), <https://www.forbes.com/sites/oliverwyman/2017/04/24/looming-aircraft-mechanic-shortage-may-threaten-the-growth-of-the-global-fleet-and-raise-costs/#37abd8314984>.

<sup>30</sup> *Id.*

<sup>31</sup> *Supra* note 7.

<sup>32</sup> Brian Prentice et al., *MRO Survey 2017: When Growth Outpaces Capacity*, OLIVER WYMAN (2017), available at <https://www.oliverwyman.com/our-expertise/insights/2017/apr/mro-survey-2017.html>.

had difficulty finding workers, detrimentally impacting repair stations and customers relying on high-quality and timely maintenance of their aircraft.<sup>33</sup> The labor shortage and difficulty finding trained and qualified technicians lays the groundwork for rising maintenance costs and longer turnaround times for scheduled maintenance, resulting in airlines grounding more flights due to servicing delays.<sup>34</sup>

*a. Factors contributing to the aviation mechanic shortage*

Similar to the discussion earlier regarding the causes contributing to the pilot shortage, a detailed accounting of the reasons behind the aviation mechanic shortage is beyond the scope of this memorandum. However, it is worth noting that these causes are parallel to the causes contributing to the pilot shortage. For instance, a significant proportion of maintenance technicians are also baby boomers and in the next decade many will be eligible to retire, depleting the workforce considerably.<sup>35</sup> Additionally, the 2017 Oliver Wyman MRO executives survey found that “51 percent of respondents identified [low] wages and benefits as an obstacle.”<sup>36</sup> The Aviation Technician Education Council (ATEC) finds a similar deterrent effect, estimating that “30 percent of those who finish an aviation maintenance training course end up accepting employment in another industry.”<sup>37</sup>

*b. Incongruence between legacy and modern aircraft is worsened by Federal Aviation Administration mechanical training regulations*

In addition to the anticipated fleet growth and a rash of retirements spurring demand for new technicians, another layer of complexity adds to the workforce shortage – the disparity between older planes and modern ones. Modern aviation mechanics need to be tech-savvy diagnosticians in addition to being mechanically inclined.<sup>38</sup> As technology advances, so does the need for an expertise in computer systems, advanced analytics, electrical systems, and many other new disciplines that require highly specialized training.<sup>39</sup> This causes an internal conflict: older, legacy aircraft will require old school methodologies and training that newer generations of technicians are unlikely to receive until they obtain their first jobs, while newer aircraft will require new specialized training which will be particularized to small group of newly-trained mechanics. Thus, employees must hire a wide range of mechanics that can service both legacy and modern aircraft; a lack of employees with the requisite knowledge may contribute to flight delays and increased costs to the consumer.

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<sup>33</sup> ARSA, ARSA SURVEY SHOWS INDUSTRY POISED FOR GROWTH, FACING TECHNICIAN SHORTAGE HEADWIND, (Apr. 24, 2018), available at <http://arsa.org/survey2018/>.

<sup>34</sup> *Supra* note 32.

<sup>35</sup> Brian Prentice & Derek Costanza, *Aging Baby Boomers Cause Aircraft Mechanics Shortage As Global Fleet Expands, Modernizes*, FORBES (Apr. 24, 2017), <https://www.forbes.com/sites/oliverwyman/2017/04/24/looming-aircraft-mechanic-shortage-may-threaten-the-growth-of-the-global-fleet-and-raise-costs/#37abd8314984>.

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*

<sup>38</sup> The term “mechanics,” used in this memorandum interchangeably with the term “technicians,” can encompass a number of different proficiencies including expertise in composite materials, skill in airframe repair, engine maintenance, hydraulics, and so forth. Robert Goyer, *Do We Really Have a Pilot Shortage?* PLANE & PILOT (July 6, 2018), <https://www.planeandpilotmag.com/article/do-we-really-have-a-pilot-shortage/#.W5laHM5Ki71>.

<sup>39</sup> *Supra* note 35.

Exacerbating the problem between the old and new is a decades-old Federal Aviation Administration (FAA) required curriculum. Title 14 of the Code of Federal Regulations part 147<sup>40</sup> governs the regulations for aviation maintenance technician schools holding an FAA certificate. These regulations dictate subject areas taught and have remained substantially unchanged since 1962.<sup>41</sup> Rapid advances in technology have modernized aircraft in a way that is unrecognizable, yet remain unaddressed in FAA-dictated training programs. Although dated, a GAO report issued in 2003 found that “the required curriculum at aviation maintenance technician schools does not fully prepare [airframe and power plant] A&P mechanics to work on commonly flown, technologically advanced commercial aircraft... today’s modern aircraft require A&P mechanics to have a different set of skills than those taught at aviation maintenance technician schools.”<sup>42</sup> While the FAA has taken steps towards updating part 147,<sup>43</sup> the final rule has yet to be promulgated. In the meantime, schools continue to abide by the outdated FAA curriculum and the onus is on companies hiring new graduates to teach them the skills necessary to work on modern aircraft.

#### **IV. Conclusion: Discovering the Impact on Small Businesses**

Though the implications of these aviation workforce shortages on small businesses remain largely underreported, the anticipated effect will have widespread impact not only across the aviation sector but to the general economy as well. Delayed or cancelled flights may disrupt air travel for consumers, delay the transportation of goods, hinder disaster relief efforts, and inhibit other essential services fulfilled by the aviation sector.<sup>44</sup> Significantly, a 2017 ARSA study projected a potential \$1.95 billion dollar economic loss to the aviation industry if vacant technician positions remain unfilled.<sup>45</sup> Anecdotal evidence suggests small businesses may be more vulnerable to increases in labor cost resulting from these shortages, which may stunt a small business’s ability to grow. For example, a small airline charter company may be forced to decline business opportunities if they lack the pilots needed to fulfill the demand for air travel.

In addition, smaller operations face greater competition as the labor pool shrinks, worsening concerns of employee poaching by other aviation companies. Not only are small businesses vulnerable to losing employees to similarly situated competitors, they must compete against major airlines aggressively recruiting from this pool of pilots and mechanics. Flight schools experiencing unsustainable drops in application and attendance due to the high cost and low reward of a piloting career may be forced to close their doors, further exacerbating the pilot shortage. The testimony received from the witnesses will help the Subcommittee understand the real-world effects of the shortages to small businesses throughout the country.

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<sup>40</sup> 49 U.S.C. § 106(g), 40113, 44701-44702, 44707-44709.

<sup>41</sup> Crystal Maguire, *Aviation Struggles with 50-Year-Old Maintenance Training Regulation*, THE HILL (Aug. 7, 2017) <http://thehill.com/blogs/pundits-blog/transportation/345631-aviation-struggles-with-50-year-old-maintenance-training>.

<sup>42</sup> GAO, AVIATION SAFETY: FAA NEEDS TO UPDATE THE CURRICULUM AND CERTIFICATION REQUIREMENTS FOR AVIATION MECHANICS 21 (GAO-03-317) (2003).

<sup>43</sup> The FAA issued a notice of proposed rulemaking in 2015. 80 FR 72404, available at <https://www.fdds.gov> <https://www.federalregister.gov/documents/2015/11/19/2015-29505/aviation-maintenance-technician-schools>.

<sup>44</sup> *Supra* note 9.

<sup>45</sup> ARSA, SKILLS GAP COULD COST REPAIR STATIONS \$1.95 BILLION IN REVENUE, SURVEY FINDS (May 12, 2017), available at <http://arsa.org/survey2017/>.