

**MEMORANDUM**

March 14, 2018

**To:** Honorable Brian Fitzpatrick  
Attention: Mace Flitter

**From:** Bart Elias, Specialist in Aviation Policy, [belias@crs.loc.gov](mailto:belias@crs.loc.gov), 7-7771

**Subject:** **Cost Estimates for Secondary Cockpit Barriers**

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This memorandum has been prepared in response to your request regarding the estimated costs of installing secondary cockpit barriers on airliners as called for in the Saracini Aviation Safety Act of 2017 (H.R. 911). All official cost estimates are done by the Congressional Budget Office, however, CRS has provided informal estimates based on one scenario. These estimates could change depending on cost and benefit assumptions.

H.R. 911 would require the installation of secondary cockpit barriers on most commercial airliners that carry more than 75 passengers. Secondary cockpit barriers are lockable gates constructed of metal and metal cables. The barriers would primarily serve as a means to prevent or deter access to the cockpit when a hardened cockpit door is opened, for example, when a flight crew member exits the cockpit to use the lavatory.

H.R. 911 defines “covered aircraft” that would be required to install the barriers as any commercial aircraft equipped with more than 75 passenger seats and a gross takeoff weight of more than 75,000 pounds operated under 14 C.F.R. Part 121.<sup>1</sup> While the bill would require installing cockpit barriers on existing aircraft above a certain size and passenger capacity, two other bills pending in the 115<sup>th</sup> Congress, the 21st Century Aviation Innovation, Reform, and Reauthorization Act (H.R. 2997) and the Federal Aviation Administration Reauthorization Act of 2017 (S. 1405), would require all newly manufactured passenger aircraft operated in air carrier service under 14 C.F.R. Part 121 to come equipped with secondary cockpit barriers. Congressional Budget Office (CBO) cost estimates of those bills, which are the main legislative vehicles for Federal Aviation Administration (FAA) reauthorization under consideration in the 115<sup>th</sup> Congress, cited estimates from industry sources that the barriers would cost between \$5,000 and \$12,000 per aircraft.<sup>2</sup> CBO concluded that installing the barriers on all newly manufactured aircraft operated under 14 C.F.R. Part 121 would cost no more than \$15 million annually.

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<sup>1</sup> 14 C.F.R. generally applies to U.S. commercial airlines operating scheduled flights with greater than 9 passenger seats or a maximum payload of more than 7,500 pounds.

<sup>2</sup> Congressional Budget Office, *Cost Estimate: H.R. 2997, 21st Century Aviation Innovation, Reform, and Reauthorization Act, As ordered reported by the House Committee on Transportation and Infrastructure on June 27, 2017*, July 11, 2017, <https://www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/hr2997.pdf>; Congressional Budget Office, *Cost Estimate: S. 1405, Federal Aviation Administration Reauthorization Act of 2017, As ordered reported by the Senate Committee on Commerce, Science, and Transportation on June 29, 2017*, August 29, 2017, <https://www.cbo.gov/system/files/115th-> (continued...)

According to FAA data for 2016,<sup>3</sup> the main-line air carrier fleet consisted of 3,971 large jets and 97 regional jets. Additionally, regional air carriers operated 1,677 passenger aircraft with a seating capacity of over 40 seats. Given that 50- to 70-seat regional jets and smaller turboprops remain common among regional airlines and scope clauses in many main-line air carrier agreements with pilot unions restrict the size of aircraft that regional airline partners can operate to 70 passenger seats or less, a majority of the regional aircraft have seating capacities less than the 75-seat minimum and would not be covered under the proposal. In sum, CRS estimates that about 4,500 existing aircraft in the air carrier fleet would be considered covered aircraft under the proposal in H.R. 911, assuming that about 80% of the total fleet (most main line aircraft and a small fraction of regional jets) would meet the definition of a covered aircraft. At \$5,000 per aircraft, the one-time cost of fleet-wide compliance would total about \$23 million. If the per-aircraft amount is \$12,000, then the total fleet-wide cost would be estimated at about \$54 million.

Globally, Boeing forecasts and annual average aircraft replacement rate of 3% and average annual commercial airline fleet growth of 3.3% over the next two decades.<sup>4</sup> However, FAA forecasts an average annual growth rate of only 0.8% in the number of aircraft flown by U.S. carriers during this period.<sup>5</sup> FAA does not provide data on projected replacement rates for the U.S. commercial fleet. Based on these data, replacement and growth rates among U.S. Part 121 carriers would result in roughly 160 to 285 additional covered aircraft entering service annually. Based on these projections, the estimated annual cost to equip new covered aircraft under the requirements proposed in H.R. 911 would range between \$800,000 and \$3.5 million.

An additional consideration is the expected useful lifespan of the barriers and the annual cost of maintaining the barriers. CRS was unable to identify any information regarding the expected life of the barriers or estimated annual maintenance and repair costs. Given that the barriers have few moving parts and mechanical features, it appears likely that these costs would not be significant.

Finally, you requested an estimate of the per-passenger or per-ticket cost of installing the barriers. CRS cannot make an accurate estimate of this without more definitive data regarding the expected service life of the barriers. According to FAA forecast data, there were about 726 million passenger enplanements in 2016 with an expected annual growth rate of 3.4%. Based on these data, to bring the initial installation cost for the existing fleet below one cent per passenger enplanement on a fleet-wide basis of covered aircraft, installed barriers would need to remain in service for at least 4 years if the cost is \$5,000 per aircraft, assuming that 80% of all enplaned passengers (about 581 million) travel on covered aircraft. To bring the initial cost below one cent per passenger enplanement on covered aircraft if the installation cost is \$12,000 per aircraft, the barriers would need to remain in service for about 9 years.

Most aircraft remain in service longer than this, so for newer aircraft the cost of the barriers per passenger enplanement would likely be less than one cent assuming that the secondary cockpit barrier does not require major repair or replacement during the period that the airline operates it as a covered aircraft. The per-passenger cost would be higher for airlines that must equip older aircraft with secondary cockpit barriers, particularly if an airline is required to install the barriers on aircraft that are nearing the end of

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[congress-2017-2018/costestimate/s1405.pdf](https://www.congress.gov/records/costestimate/s1405.pdf).

<sup>3</sup> Federal Aviation Administration, *FAA Aerospace Forecast: Fiscal Years 2017-2037*, [https://www.faa.gov/data\\_research/aviation/aerospace\\_forecasts/media/FY2017-37\\_FAA\\_Aerospace\\_Forecast.pdf](https://www.faa.gov/data_research/aviation/aerospace_forecasts/media/FY2017-37_FAA_Aerospace_Forecast.pdf).

<sup>4</sup> Boeing, *Current Market Outlook 2017-2036*, <http://www.boeing.com/resources/boeingdotcom/commercial/market/current-market-outlook-2017/assets/downloads/2017-cmo-6-19.pdf>.

<sup>5</sup> Federal Aviation Administration, *FAA Aerospace Forecast: Fiscal Years 2017-2037*, [https://www.faa.gov/data\\_research/aviation/aerospace\\_forecasts/media/FY2017-37\\_FAA\\_Aerospace\\_Forecast.pdf](https://www.faa.gov/data_research/aviation/aerospace_forecasts/media/FY2017-37_FAA_Aerospace_Forecast.pdf).

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their service with the airline. In general, the longer an aircraft remains in service and the longer a barrier remains operational without the need for repair or replacement, the lower the per-aircraft and per-passenger costs of installing and maintaining the barriers would be.

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