

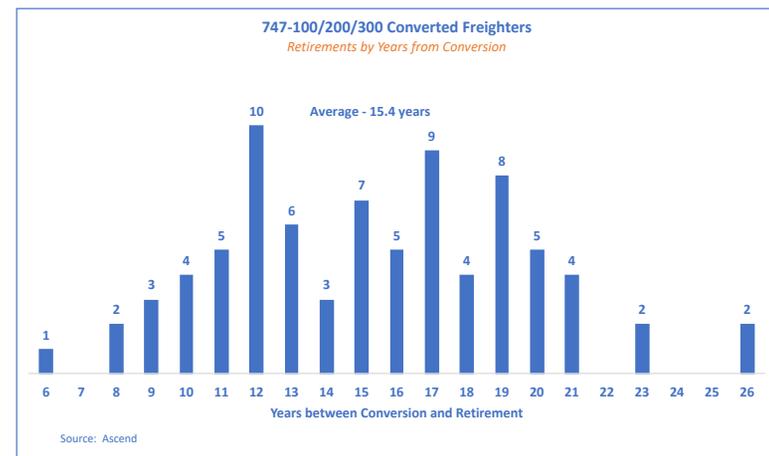
The decision to invest money into the conversion of a passenger aircraft to freighter is complex, with a number of unknown variables. Essentially, the investor, lessor or owner/operator must determine whether they will make a compensatory return for this additional investment. The income for this return is derived from the incremental revenue (i.e. sales or lease revenue) received over the assumed remaining economic life post-conversion. The amount of incremental revenue will ultimately be determined by market supply and demand. In addition, there will be off-lease periods for a lessor or low season and scheduled maintenance for the operator when no revenue is received. All in all, a difficult decision that requires several critical assumptions.

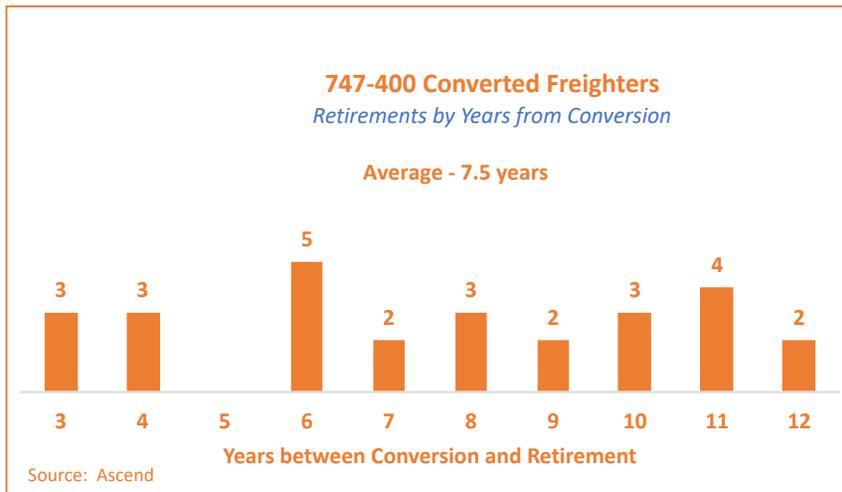
The 747 has been the most widely converted widebody freighter with over 200 units converted between 1974 and 2017. The 747-100F, -200F and -300F (“747 Classic Freighters”) account for 118 of the total conversions. With the benefit of hindsight and the help of FlightGlobal data, it is possible to determine how many of those aircraft have been retired and how many years of productive economic service were provided. This will enable us to determine if there was sufficient time to recoup the freighter conversion cost and make a profit.

The first 747 Classic conversion occurred in 1974 when the first passenger aircraft was only four years old. The passenger carriers who had placed large launch orders for 747 passenger aircraft such as American Airlines realized in hindsight that they did not need as much capacity as they originally anticipated. Concurrently, transpacific air freight was growing rapidly. Boeing recognized the duress the excess capacity was causing their launch customers and developed a freighter conversion program. Twenty-four aircraft in total were converted when they were less than ten years old and placed in cargo service with the original customers or sold to cargo operators such as Flying Tigers. Given the unusual circumstances surrounding these conversions, they are not considered in the analysis that follows.

Of the remaining ninety-four 747 Classics converted, eighty have now been retired. The length of time between conversion and retirement for these aircraft are displayed in the graph at right.

On average, these aircraft had over fifteen years of economic life as freighters. Assuming a conversion cost of \$25 million and without consideration of the time value of money, a lessor and/or operator would have to receive at least \$140 thousand per month of additional rent to cover the conversion cost. Given feedstock values, freighter lease rates and air freight demand during the 1990s, the incremental revenue most often would have covered the conversion cost and provided a modest return.





In 2000, the first 747-400 was converted to full freighter for Asiana Airlines, while 2005 saw the last 747 Classic conversion. The fate of the converted 747-400s turned out to be much different than earlier models. As of this date, eighty 747-400s have been converted to full freighters, with seventy-nine converted since 2005. An astounding twenty-seven aircraft or 1/3 of the fleet has already been retired. Six aircraft were retired less than four years after conversion and, as a whole, the average time in service as a freighter was 7.5 years.

Assuming a \$28 million 747-400 conversion cost and an average of 7.5 years of service as a freighter, a lessor and/or operator needed to receive at least \$360 thousand per month in additional revenue

to cover the cost of conversion. During the period of these retirements (2012-2018), 747-400 converted monthly lease rates struggled to reach \$400 thousand reflecting a greatly diminished demand. Needless to say, these conversions did not turn out as planned and investors or operators were faced with waiting until conditions improved, and hope to eventually recover their investment, or to harvest the aircraft for parts and chalk up a loss.

One may argue that by looking at the first twelve years of steady 747-400 conversion production (2005-2017), the analysis is skewed in favor of the 747 Classic which covers a longer period of time. However, during the first twelve years of continuous 747 Classic conversions (1988-1999), seventy-four aircraft were converted with no retirements (five of the 1970s vintage aircraft mentioned previously were retired in this period).

The reality is that the 747-400 freighters fell victim to the Global Financial Crisis which occurred in 2008. International air freight declined significantly and a large portion of the 747 freighter fleet was sidelined for an extended period. For 747 lessors, finding a lessee at any rental rate during this period was quite challenging. Interestingly, 747-400 conversions continued after 2008, almost exclusively for owner/operators, with twenty-nine aircraft completed between 2009 and 2017. With the rebound in air freight and the uncertain future of the 747-8F, investors who retired the younger converted aircraft may wish they had chosen a different path.

Converting a passenger aircraft to a freighter is an expensive proposition, and one fraught with significant financial risk. While a prudent investor will need to assess and quantify the variables inherent in this process, not all potential investors are well-equipped to do this. Fortune Aviation would be happy to bring its experience in and deep knowledge of many aspects of the all-cargo business, including the aircraft conversion process, to work with those in need of assistance in addressing these issues.