How To Prove The Value Of Safety

Free ROI software from the FAA identifies the costs and forecasts the savings of improving hazardous ramp conditions.

By Dr. Bill Johnson

Your recent quality and performance data confirm an unacceptable trend. Last month you had damage to aircraft ... and ground equipment ... and people were injured. You identified the contributing factors to these three categories of challenges.

Now you must decide how to allocate resources to address the issues. And they are all important issues. How can you ensure a financial and safety return on the investments you make to fix the problems? The answer is a straightforward math problem that calculates return on investment (ROI).

Figure 1: ROI made easy.

This article describes new ROI software developed under an FAA human factors project. Management consultant Booz Allen Hamilton Inc. developed the software under contract to the FAA Civil Aerospace Medical Institute.

The goal is to deliver an effective, yet easy-to-use ROI tool into the hands of mid-level management. It has the potential to justify a variety of safety and efficiency interventions, including interventions related to human factors. This tool is provided at no cost to the industry.

FINANCIAL RETURN

ROI is merely comparing the money invested to the value returned. Figure 1, taken from the new FAA software, shows the data necessary to calculate ROI.

Let’s use aircraft ground damage as an example. Assume that you...
had 2.5 incidents of aircraft ground damage each month over the past 12 months. Counting repairs, delays, rescheduled flights, etc., the average cost per incident was $200,000. (By the way, that’s below International Air Transport Association estimates.) Once you conducted the investigations, including peer-to-peer assessments (See the September issue of *Ground Support Worldwide* for “Collecting ‘Predictive’ SMS Data”), you identified a number of contributing factors including:

- Poor ramp painting for clear zones,
- Inadequate maintenance of ground equipment,
- Improper adherence to company procedures, and
- Lack of availability of sufficiently trained personnel.

Creating an incentive program to reward personnel for reduced ground damage ($500,000).

The total investment would be about $2 million that would be spent over six quarters.

You cannot guarantee that your interventions will be 100 percent successful. Therefore, you must estimate the probability of success. The FAA software offers guidelines to help make that judgment call. Questions, based on project management, help establish the probability of success. (See Figure 2.)

For this example, we will estimate the probability of success at 80 percent. In other words, the interventions will likely prevent 20 incidents in a six-month period, and the probability of success multiplied by the return provides a net return of $4 million.

As with any analytic program, the quality of diligence and data accuracy provided will affect the accuracy of the ROI analysis.

Correcting each of these contributing factors has an associated investment cost. Of the 30 incidents in the past year, you decide you could reasonably address 25, since five of the incidents are outside your control. From a financial perspective, the return would be $5 million ($200,000 x 25) of reduced aircraft damage. From a safety perspective, you would be targeting 25 safety threats.

To calculate the investment you must estimate the following costs:

- Repainting safety zones on ramps ($500,000).
- Refurbishing selected ground equipment ($800,000).
- Developing improved procedures and training personnel to use these new procedures ($200,000).
on investment continues to grow. The graphs and depictions are dedicated to the financial ROI.

The graph shows that the project achieves payback by the third quarter. Over the six-quarter period, the payback ranges from a low of $4 million to a high of $5 million. This is a very respectable return on investment.

**ROI CAVEATS**

Crunching the financials is straightforward. Safety ROI is another challenge for many reasons. It is difficult to show that the actions above improved safety. Safety is often intangible and, as a result, it is hard to quantify. Safety is based on an integration of many activities, not just individual actions and programs. While difficult to show the safety return, the FAA research team continues to work on the issue. Safety ROI will be based on reducing events while financial ROI must be based on the money. The
intricacies of the safety calculation are described in the embedded user documentation and will be discussed in the final technical report.

Our example of 30 ground damage events is clearly an indication of existing safety hazards. Reducing ground events would help improve and ensure safety. In this case, having 30 aircraft ground damage incidents over the past 12 months and expecting the interventions will likely prevent 20 incidents over the same period will result in an estimated 10 events a year in the future. This is a likely safety improvement.

![Diagram](image)

**Figure 4: A picture tells the story.**

To get started, go to www.mxfatigue.com. That will take you to the ROI software and associated additional guidance material. Once the software works for you, then you can write the next ROI article for Ground Support Worldwide.

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