



SYS 660 Managing Director  
SYS 660, Inc.  
1 Castle Point  
Hoboken, NJ 07030

April 12, 2019

RE: VSL: The Value of Statistical Luggage

Dear SYS 660 Managing Director:

The Department of Transportation has become increasingly concerned with performance metrics in the US passenger airline industry, requiring companies to verify data such as number and percent of late flights, customer complaints, and mishandled baggage claim incidents. SITA notes “a mishandled bag is a report of a delayed, damaged and / or pilfered bag recorded by an airline, or its handling company, on behalf of a passenger, for handling as a claim”. Such claims lead either to the baggage being located and delivered to the customer by a third party at the airline’s cost, or for the airline to reimburse the customer for the value of the baggage and its contents if not located.

These baggage claim incidents in general note the number of passengers who show up at the baggage carousel, do not find their bags there, and file a report to find it. Their bags may have missed their plane, been sent to the wrong airport, or they could have been stolen. News reports about baggage thefts at US and international airports<sup>1</sup> and recently raised fees to fliers for checking baggage make this a relevant problem. The question is what might best be done to prevent thefts?

Given the media attention about stolen bags, there is increasing discussion about how we might avoid such problems with increased attention or technology. For you youngsters, it should be noted that 25 years ago, bags were rarely stolen from airports because when you left the baggage area you needed to show your checked baggage “receipts” that you are given at check-in and they were matched by an airport employee to the luggage you were leaving with. Sometime in the past 25 years this practice disappeared as airports and airlines cut costs. However reverting to a manual airport “exit baggage matching” system is a possibility to reduce thefts.

Another possibility is to use technology. In this case you would use your existing barcoded luggage tag receipt to match the barcode printed on your luggage sticker at check-in. After claiming your bag at your destination, you walk through a scanner like you do at the security checkpoint (or at the self-checkout aisle at the grocery store). If your barcoded bag tags and receipts do not match, the alarm would go off that alerts security personnel to verify your bags or

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<sup>1</sup> <https://milbankmonitor.com/arrests-in-connection-to-globetrotting-crime-spree-thai-airports-crack-down-on-luggage-theft/12/04/2019/>  
<https://sanfrancisco.cbslocal.com/2019/03/23/brazen-san-francisco-international-baggage-theft-suspect-taken-into-custody/>

arrest you. Machines like this would cost about \$10,000 each. A downside of either the manual or machine-assisted checks is the potential for delays.

In the questions below, you'll answer several open-ended questions about the cost and efficiency of various alternatives. Please remember to answer the question given, and to think about and reflect on your answer by putting the answer into perspective or into the context of the question.

### **Resources:**

Enplanements by airport

[https://www.faa.gov/airports/planning\\_capacity/passenger\\_allcargo\\_stats/passenger/](https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/)

Mishandled baggage:

<https://www.bts.dot.gov/topics/airlines-and-airports/number-30-%E2%80%93-technical-directive-mishandled-baggage-effective-jan-1-2019>

Summary of Lost Luggage Liability Limits, for example as found on Northwest Airlines website, <http://www.nwa.com/travel/luggage/delayed.html#liability> (no longer online since they merged with Delta, but old website pasted as last page of this file).

Airline fees for checked bags at all the top US Airlines:

<https://www.airfarewatchdog.com/blog/3801089/airline-fees-u-s-carriers-updated/>

### **Questions:**

- a) Give an overview of the values or ranges of key data underlying the problem – number of passengers per year in the US, number of bags checked, number of lost baggage reports, etc. In less than one page, quantitatively and qualitatively assess how large the general problem of mishandled baggage is, as well as the related problem of stolen baggage.
- b) Estimate a range of the total annual cost to the airlines of the status quo, i.e., the total costs of mishandled bags and separately the costs for stolen bags (if needed estimate costs – and note it may not be equal to the liability limit on a per-bag basis!). Who is paying these costs, airlines, airports, or passengers?
- c) Consider the case of the Newark International Airport (EWR) with its over 40 million annual enplanements and deplanements. Assume EWR wants to solve the stolen baggage problem, and needs to choose to either have employees manually do exit baggage matching or to install screening machines similar to the metal detectors used at TSA checkpoints.
  - Estimate ranges of costs of the manual and machine methods for exit baggage matching at EWR. How would it be funded?
  - Should EWR do it? How much might it reduce costs of stolen luggage?
  - How sensitive are your findings to the parameters used? Does your answer change?
  - What problems would you anticipate if EWR tried to do this as an experiment?
  - Should a small commercial airport with only 5,000 passengers per year try to do this?

- d) Given your results above, estimate a range of costs of a government program requiring the top 500 commercial US airports to either implement manual or machine exit baggage matching.
- e) What if, instead of or in addition to the program above, the government decided to change the legislation that caps the lost bag liability? How sensitive are your results to the liability limit?
- f) Many airlines are charging fees to check your bags. How do the amount of these fees, and their existence, affect the decision making of airlines, airports, and passengers in this problem?
- g) In two pages or less, give a recommendation for how the problem of stolen baggage might be solved given your analysis above. Talk specifically about the responsibility of airlines, airports, and passengers to solve the problem. Also discuss how fees would be charged and who would pay for them (and who should pay for them). Feel free to add other alternative solutions on the topic.

We are eager to receive the result of your analysis in a maximum of 10-page report by May 19, 2019 end of the day. We will also be at your office on May 7, 2019 to hear your presentation and guide you through findings.

Enclosed please find a list of resources we thought might help you in your investigation. This is not an all-inclusive list; you might find some of the material more relevant than others.

Thanks in advance for your support on this.  
Sincerely yours,

Yeganeh M. Hayeri  
Senior Vice President at DeciMake, Inc.

Sample “Contract of Carriage Terms” for a Specific US Airline (Assume all have the same language):

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#### Liability Limitations

Domestic Liability Limits: Northwest will compensate domestic passengers for all reasonable, documented expenses (with receipts) incurred as a result of the loss, damage or delay in delivery of baggage subject to the following limitations:

Northwest's liability for the loss, damage or delay in the delivery of passenger's baggage is limited to the fair market value at the time of loss, damage or delay, not to exceed \$3,300 USD. Wheelchairs and other assistive devices are not subject to this \$3,300 USD limitation. Report of lost, damaged or delayed baggage must be made within 24 hours of arrival at airport location where travel was completed.

#### Excess Valuation Insurance

If you are traveling with items valued beyond the standard liability allowances, you may declare a higher value for checked baggage by purchasing excess valuation insurance at the time of check-in. Northwest provides excess valuation insurance for domestic travel at the one-way rate of \$1.00 USD for each \$100.00 USD of higher declared value than Northwest's maximum limitation of liability (\$3,300.00 USD). Northwest will accept baggage up to a maximum declared value of \$5,000.00 USD. Excess valuation insurance is not available on all items. When excess value is declared, the customer's baggage and its contents may be inspected by Northwest.

Source: <http://www.nwa.com/travel/luggage/delayed.html#liability> (but again, assume it is/would be the same as read on any airline's website)