Aerobridge Providing Multiple Access To Aircraft Vehicle

Dynamite Obinna, Senior Aeronautics with Minor in Engineering Science
Embry-Riddle Aeronautical University, Daytona Beach, Florida

The Problem

- Wish growing technology in making air travel faster, aircraft manufactures have con-
tinually increased the carrying capacity of aircraft.
- Using a single jetway, it takes a remarkable amount of time to board a large number
  of passengers. This causes departure delays and forcing passengers to arrive at the
  gate at a much earlier time than necessary.
- Every year, airlines lose millions of dollars in delay-times.
- Prolong delay-time means airlines fly fewer routes for a particular plane. Conse-
  quently, this leads to non-optimum utilization of airplanes, which in turn, reflects in
  extreme negative impact on the amount of revenue that airlines can generate

Current Solutions and their Pitfalls

Airlines have explored various ways to reduce turn-times. One attempt is
through selective loading by zones (Figure 2A). A further attempt to reduce
the problem associated with the present practice is the use of multiple door
for boarding and deplaning passengers (Figure 2B).

Why Bother?

TIME SAVED = MONEY SAVED!
With a minimum of $30/minute in terminal parking fees, a reduction in total boarding
time can result in significant benefits for the airline industry. By minimizing boarding
time, airlines can improve their on-time performance and increase their aircraft/crew
utilization thereby, increasing profitability.

The Solution

The Aerobridge Providing Multiple Access To Aircraft Vehicle (patent pending) is de-
signed and engineered to mate with the aircraft and extend its structures laterally to go
over the aircraft wing, thereby, providing a common passageway over which passengers
and cargo can enter and exit the aircraft via multiple access doors simultaneously. This
invention reflects a deviation from current single telescoping units used to service mid-
large sized airplanes and addresses the aforementioned problems associated with cur-
rent practices (Figure 2B). Using this novel jetway, airlines will gain high efficiency in
the aircraft turn-time process.

Simulation Results

Base-turn-time
Accessing 2 doors: 7 mins saved
Accessing 2 doors + alternate boarding method: 17 mins
Accessing 3 doors: 12.5 mins saved
Accessing 3 doors + alternate boarding method: 23 mins
Accessing 4 doors: 17.7 mins saved
Accessing 4 doors + alternate boarding method: 29 mins
Accessing 5 doors: 22.6 mins saved
Accessing 5 doors + alternate boarding method: 33 mins

Figure 3: Delay-time significantly decreases as the bridge is used to servce more doors for passenger ingress and egress

Structural Test

The Aerobridge Providing Multiple Access to Aircraft Vehicle is designed to meet the
structural and load standards set by the Federal Aviation Administration. The struc-
tural design was tested based on a combination that imposes the most adverse load-
ing. Besides the dead loads and strain caused by movement, the structural design will
support:
- Floor live load of 40lb/ft²
- Roof live load of 25lb/ft²
- Wind live load of 2.5lb/ft²

Figure 4a: Stress Analysis using Steel as the frame material
Figure 4b: Stress Analysis using Aluminium as the frame material

Economic and Social Benefits

- Reduced delay-time for airlines
- Compatibility with conventional systems
- Cheaper system for providing multiple access to airplanes
- Better boarding experience system for the elderly and handicapped
- Smooth and enjoyable boarding process on regional and international flights

References

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For further inquiries or updates about this project please contact: Dynamite Obinna
Phone: 267.991.5998
LinkedIn: dynamite-oblina-44404780
Website: www.dynamiteobinna.net
Email: info@dynamiteobinna.net