Introduction
The Department of Defense (DOD) uses the 463L pallet nearly exclusively in the movement of war and peacetime palletized cargo. Since its introduction in the 1960s, the pallet has been used on DOD aircraft and civilian charter cargo aircraft to move defense materials. Unfortunately, the Boeing 777, the current freighter of choice by many air carriers, is unable to accommodate the 463L pallet in a traditional configuration. AMC is very concerned with the limitations that newer CRAF aircraft purchases such as the Boeing 777 create and their ability to provide the necessary wartime support when needed. This research uses a formula to determine if 463L incompatibility within the CRAF will affect a wartime mobility capacity requirement and if so, what the extent of those impacts are.

This research focuses on an analysis of the 463L pallet and its compatibility with CRAF aircraft. It uses this quantitative information to maximize pallet loading on aircraft without modification. This analysis takes into account pallet dimensions and aircraft cargo floor limitations and flexibility. Additionally, it uses SMEs within the mobility community and the AMC CRAF office to identify these interoperability issues.

Research Focus
This research focuses on an analysis of the 463L pallet and its compatibility specifically with the Boeing 777. It takes this information to apply the equivalent number of 777s required to fulfill the capability shortfalls of the retirement of ageing wide body CRAF aircraft.

Methodology
This research uses formulas and assumptions created by AMC and publicly available data to determine the capability in wide body equivalents (WBE) for the proposed introduction of a Boeing 777 to the CRAF long-range international cargo segment. Two versions of the Boeing 777 are used. One with an unmodified aircraft, capable of only 14 centerline pallets, and a modified aircraft, capable of 37 pallets. These two capabilities are compared to the likely retirement of older CRAF aircraft and the WBE shortfall they would create. The approximate number of Boeing 777s required to fulfill the shortfall is analyzed. Additionally, a snapshot of four years of pallet data is used to determine average pallet heights to determine the impact of lower deck cargo on newly acquired aircraft. Finally, CRAF aircraft ages are compared to determine the fleet types that create the greatest impact to WBE requirements due to their likely retirements.

Summary of Research
This research identifies that the likely aircraft for retirement are the MD-11 and 747 classic (747-200 and 747-400). These two aircraft types provide the majority of the current CRAF capability in WBE. This, coupled with the possible introduction of the Boeing 777 aircraft that are currently not readily compatible with the 463L pallet, create a potential for difficulties in managing aircraft allocated to the CRAF. Currently, this research suggests that there appears to be enough 463L compatible aircraft within the CRAF to reallocate as older MD-11 and 747 aircraft are retired. However, there needs to be additional research for a long term solution such as a modification to the 463L pallet or a hardware modification to non-compatible aircraft such as the Boeing 777 to enable planners in the DOD to permanently ensure that wartime capabilities will not be impacted.