Executive Summary

The Henry Ford's model for the mass production of automobiles was established in 1913 which succeeded in reducing the time it took to assemble one car from more than 12 hours to one hour and 33 minutes. This model has been successful in increasing the production capacity and hence efficiency of automobiles manufacturing, but its applicability for the aircraft manufacturing industry is being questioned, whether it is really the best method for producing aircraft on a much smaller scale than automobiles. This study was conducted on behalf of the client, de Havilland, and in this regard, the de Havilland aircraft manufacturing facility in Toronto is used as a case study to evaluate the impact on a new method of production in terms of reducing cost, line stoppage, and aircraft damage which so far has cost quarter of a billion dollars. These constraints formed the scope and deliverables of this study and four new methods of production are developed and compared with each other.

The first concept makes use of Autonomous Guided Vehicles (AGVs) to move the scaffolding to the aircraft hence reducing cost and time of manually setting the scaffolding up, the second concept uses an underground facility to store and move the scaffolding upwards to the stations and the third concept moves the aircraft vertically in a multilevel building.

The study was divided into two phases, A and B. Phase A dealt with the study of the physical arrangement of the production process which was Series and Parallel. Phase B dealt with the logistics evaluation of the assembly methods proposed. In the series arrangement the aircrafts are assembled in one line/lane while in the parallel arrangement the aircrafts are assembled in multiple lanes.

The results of the analysis of Phase B showed a possible profit of $105M with an increase production capacity of 20% annually. A decision tree was employed to select the best method of production out of the four proposed and the method with a parallel arrangement with AGVs was selected as the most efficient.

The information gathered for this study was via the livestream of the facility and from the internet resource as on-site visit was not possible in these times.