**Analysis & Optimization of G4S Cash-In-Transit Transport Operations**

**Introduction**
Management at G4S are considering the acquisition of a new type of armoured vehicle (Lancet), with the aim of improving performance and reducing costs by replacing the existing fleet of Hino 300 vehicles.

**Aim**
Two types of vehicles were analysed and compared using the Analytical Hierarchy Process, to select the best vehicle for G4S Cash Solutions Cash-In-Transit operations based on operating costs and performance. The project also optimized the vehicle route schedules at G4S Cash Solutions Pretoria branch.

**Analytical Hierarchy Process (AHP)**
The Analytical Hierarchy Process is a structured way of making decisions using sound judgement, qualitative and quantitative data, and input from essential stakeholders. This process is accomplished using matrix algebra via the use of pairwise comparison matrices and Eigen value vectors.

**Capacitated Vehicle Routing Problem (CVRP)**
The Clarke and Wright savings algorithm is one of the simplest and most accurate algorithms used to solve Capacitated Vehicle Routing Problems.

**Conclusion**
The Hino 300 delivers the best results for use in Cash-In-Transit operations in areas with very high customer density such as Pretoria (even though the Lancet wins the AHP analysis, mainly due to a larger payload capacity). The Lancet vehicle can however be used in rural areas where customer density is low, which would off-set the capacity advantages of the Hino.