The facility layout is the main problem that will be focused in this paper. This problem affects the efficiency of the assembly line, which also will give a direct impact to the production performance. The main objective is to design a new alternative plant layout based on existing plant layout study and evaluation of the proposed alternative layouts using Systematic Layout Planning procedure (SLP). The performance of alternative layout was determined by using Line Balancing method. This project was conducted in one of military vehicle manufacturing company in Pahang, Malaysia. Nevertheless, this research managed to provide better understanding and valuable information on the effectiveness of plant layout, which can give impact on performance of the production. Recommendations were made to improve the plant layout in order to provide a better performance in production activity and product quality.