Cross docking operations seek to eliminate/reduce the intermediate storage of packages in a distribution center during the shipping process. However, in an environment with limited space, limited material handling resources, multiple operations and realistic scheduling needs, some short-term staging/storage is required. The objective of this research is to determine what staging strategy is most appropriate in a cross docking operation as a function of freight attributes (dimensions and number of different types of boxes), and container loading requirements.

The problem is described in mathematical terms and then a hybrid analytic/simulation approach is used as the basis of a cost analysis and analyzing operational performance of the different staging strategies. Staging strategies will are evaluated with respect to average and maximum staging requirements, average cross dock flow time, outbound trailer cube utilization, and material flow system / space cost. It was observed that a strategy of ‘Zoned Staging with Simultaneous loading’ results in greater profit in comparison with four other strategies considered. The integrated model approach also helped increase the outbound container volume utilization by 31% in contrast to the current practices. The result of research can be helpful in selecting staging strategies to improve outbound container utilization in a crossdock environment. The improved utilization will mean that a same amount of freight can be shipped in less number of trips therefore, increasing profit margin.