



# Evaluation of Wheel Loader Selection Using an Integrated Approach with AHP and TOPSIS

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## ABSTRACT

Considering the growth of industrialization for construction works, the role of on-site equipment and machinery in enhancing productivity and efficiency as well as improving working standards of construction. Hence, selecting the proper construction equipment is a challenging task owing to a wide range of available types as well as a host of criteria to be considered during decision making. However, the selection may result in incorrect decision-making or neglection of factors that are as important as cost or technical features. For this reason, nowadays the decision makers use multi-criteria decision making (MCDM) methods to make the most suitable or beneficial decision on machine and equipment selection. One of the most widely used construction equipment is wheel loader. This machine is widely used in all fields of construction. Therefore, proper selection based on the real needs of the project seems necessary. Hence, in this study, the selection of a suitable wheel loader was studied using MCDM methods. In this regard, an integrated approach using AHP and TOPSIS method for evaluating wheel loader selection were used. In this regard, the Analytic Hierarchy Process (AHP) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), are used in the evaluation procedure. More precisely, AHP is applied to determine the relative weights of evaluation criteria and TOPSIS is applied to rank the wheel loader alternatives. The proposed approach also provides a relatively simple and very well suited decision making tool for this type of decision making problems.

## Keywords:

Wheel loader selection, AHP, TOPSIS, MCDM, Construction equipment selection.