A STUDY ON THE SOLUTION APPROACH FOR THE VEHICLE ROUTING WITH BACKHAULS PROBLEM

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ABSTRACT

IN THE TRADITIONAL VEHICLE ROUTING PROBLEMS WITH BACKHAUL (VRPB), IT IS ASSUMED THAT BACKHAULING CUSTOMERS CANNOT BE VISITED UNLESS ALL THE LINEHAULING CUSTOMERS HAVE BEEN VISITED. THIS ASSUMPTION BECOMES IMPRACTICAL FOR SOME LOCAL INDUSTRIES IN TAIWAN, IN WHICH, SOME CUSTOMERS REQUIRE BOTH THE LINEHAULING AND BACKHAULING SERVICE. USING THE TRADITIONAL TRANSPORTATION PLAN WOULD SURELY COMMIT SOME EXTRA TRANSPORTATION COST. IN THIS STUDY, WE HAVE RELAXED THE CONSTRAINT REGARDING THE VISITING SEQUENCE FOR THE LINEHAULING AND BACKHAULING CUSTOMERS, AND PROPOSE A NEW MATHEMATICAL MODEL FOR THE REVISED VRPB (RVRPB). IN ADDITION, THE CONDITION THAT SOME CUSTOMERS REQUIRE SPECIFIC SERVICE TIME WINDOWS IS ALSO CONSIDERED. A SIMULATED ANNEALING ALGORITHM IS PROPOSED TO INCREASE THE SOLVING EFFICIENCY FOR THE REVISED VRPB. SA PARAMETERS THAT CAN OBTAIN GOOD SOLUTION IN A REASONABLE AMOUNT OF TIME ARE DETERMINED THROUGH SOME EXPERIMENTS. FROM THE COMPUTATIONAL RESULTS, IT CAN BE OBSERVED THAT IN SOME INDUSTRIES THE PROPOSED RVRPB MODEL DOES REDUCE THE TRANSPORTATION COST.

Keywords : VRPB, VRPBTW, SIMULATED ANNEAL ALGORITHM.

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