

# OPTIMIZATION OF THE MASS HAUL DIAGRAM OF AN EARTHWORKS PROJECT AND EVALUATION OF THE GREENHOUSE EFFECT GASES AND ENERGY SPENDING ASSOCIATED

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## ABSTRACT

The design of a road or a railway project leads generally to make its mass haul diagram. The MASSTER software was developed to optimize the mass haul diagram that means to reduce at its maximum the total transport distance.

Recent developments were made to add to the software a calculator of greenhouse effect gases emissions and energy spending during the work stage. The real innovation is that the software decomposes each jobsite in elementary operations, in order to calculate the impact of extraction, transports, soil implementation and fabrication of binders.

The first simulations, which have been made on a 30 km long new highway project in France, show that transport and binder fabrication have a predominant weight in the green house effect gases emissions.

Thanks to this software, we are now able to evaluate and optimize the earthworks projects, regarding the green house effect gases emissions and energy spent. In the international context of climate change and preservation of the natural resources, it is still helpful for designing infrastructures and taking decisions.