

THE CALCULATION OF TRAIN SPEED PATHS TO SAVE ENERGY

The train control group of the Research and Development Division, British Rail have investigated ways of improving the regulation of trains moving in a rail network subject to perturbed as well as normal train running. Part of this work is aimed at investigating how train speed should be controlled in order to save traction energy consumption.

The short-term objectives for studies on energy savings were:

- Determine which speed path uses the minimum traction energy for any given set of input data.
- Provide a means of quickly, cheaply and reliably deriving these best speed paths.
- Assess the likely level of financial return on the investment of employing these methods.

Two techniques for calculating speed paths are considered in this report: Minimisation of Energy for Transport Systems (METS) package, and Extended Time Running Using Decreased Energy (EXTRUDE) program. Several examples of how they can be used to calculate speed paths are given.

The report concludes that good energy savings can be achieved by using “coasting speed paths” to achieve given running times. More work is recommended to determine optimum energy savings in given circumstances. The report shows that both METS and EXTRUDE provide great assistance in achieving the short term objectives of the energy work and also provide facilities for evaluating algorithms for real time control of train speed paths.