**Appendix 2**

**(Paper format)**

P. S. Ivanov[[1]](#footnote-1)

**«occupation» planning in train schedule**

**in the process of transport inFrastructure maitenance**

As the result of implemented reforms at railway transport, railways as the main organization departments of JSC «Russian Railways» (infrastructure carrier and owner) in the near perspective will realize two main business-processes: train traffic organization and transport infrastructure maintenance organization. These business-processes basically provide cargoes and passengers delivery.

Train traffic organization and transport infrastructure maintenance organization are always connected. Even if there is a traffic capacity reserve at track section, anyway, speed limit, «occupation» planning in train schedule, railway haul occupation by trains influences on the speed of cargoes and passengers delivery. But train speed increase and route safety require (using modern technologies of infrastructure maintenance) significant traffic intervals.

While performing infrastructure maintenance main works in the condition providing necessary train speeds and set level of traffic safety, required «occupation» planning in train schedule leads to trains delay and in consequence to time increase of passengers and cargoes delivery. Transport services quality factors become worse that undoubtedly will affect a company’s profit*:* a customer pays for speed («exactly in time») and safety.

In perspective main profit a company will get from cars movement effective organization. At cargo delivery «exactly in time» depending on contract conditions are possible additional payments to a carrier and in case of passengers and cargoes delivery delay a company has to pay fines, penalties, forfeits and so on.

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*K*T, *K*C = *A*/*C* — for the first railway haul;

*K*T, *K*C = (*A* + *B*)/*C* — for the second railway haul;

*K*T, *K*C = *B*/*C* — for the last railway haul.







There is the inverse proportional dependence between factors *K*T, *K*C and *K*О.

In collusion it is necessary to mention that the offered mathematical model of calendar «occupation» planning allows:

* quantitatively estimate the efficiency of «occupation» planning use in train schedule;

– decrease the influence of transport infrastructure maintenance process on traffic;

– develop work organization while infrastructure maintenance and thereby decrease the maintenance expenses.

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The article is submitted to editing 06.07.2009

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