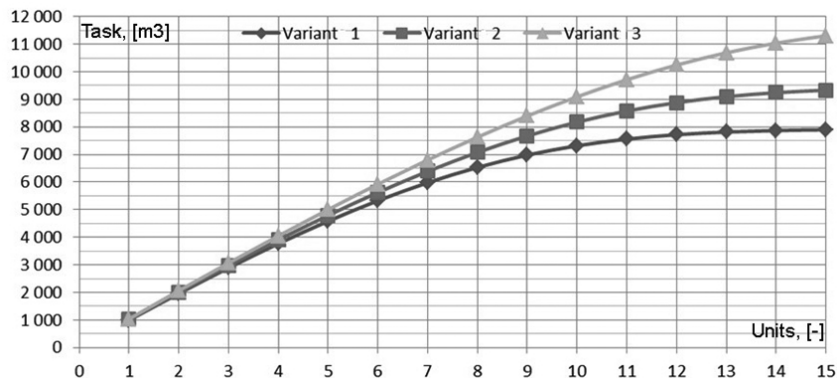


Č. JARSKÝ, V. USMANOV. *Application of queuing theory in construction industry*. *Gerontechnology* 2012;11(2):295; doi:10.4017/gt.2012.11.02.334.00 **Purpose** Each production process in construction is closely connected with the question of costs and deadlines. In every project an investor or customer, as well as the construction company, has to meet the planned completion date and the estimated costs associated with the construction. In practice, determining the duration of construction at minimum costs is still not based on the reliable calculation, and in the planning of costs, the connection between terms and financial costs is rarely taken into account. **Method** The queues theory examines systems with operating channels, where the process of queues formation takes place and subsequent servicing of the customers by servicing centers<sup>1</sup>. The main objective of the queues theory is to determine the laws under which the system works, and further to create the most accurate mathematical model that takes into account various stochastic influences on the process<sup>1</sup>. The entire construction process can be examined from the point of view of a customer who is waiting in the queue and is interested primarily in the waiting time, as well as from the point of view of servicing centers. A waiting element decides if you join the queue, or to go to another system entirely. In terms of servicing centers, the priority is to determine the occupancy of the channel and the probability of failure, including the time of repair. A servicing center should also reliably identify the time per customer service, taking into account the current construction task. **Results & Discussion** The present study demonstrates that it is possible to simulate the complex process of construction, containing hundreds of individual construction processes, mathematically and technically, with a number of simplifications, and then perform various calculations and changes for effective and long-term planning of construction. The mathematical simulation should show that some variants of machines combinations fail to accomplish the task under the given conditions, some will not be optimal in terms of costs or other parameters, other variants will be optimal in the view of costs required to fulfill the construction task (*Figure 1*). The simulation software allows a look at the results in graphical form or to export data to other programs. Application of the queues theory allows the introduction into the system waiting time the servicing elements and to approximate the mathematical model to a real working tasks on site<sup>2</sup>.

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- Keywords:** queues theory, optimal choice, machines combination, construction, simulation  
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**Full paper:** doi:10.4017/gt.2012.11.02.334.700



*Figure 1. Calculation of the required number of auto trucks by means of the queues theory*