The project revolves around a collaboration between a company and the Technical University of Denmark. The company is hiring out products (equipment and machines) to the construction industry from various locations that are scattered across the country. The primary objective of the project is to predict the demand for various types of products and to calculate the associated inventory. Since the demand fluctuates over time and the products return to the inventory after a certain period, the inventory calculations are based on a time-dependent Markov chain formulation of a queueing system with customer rejection. Demand predictions are based on a heuristic that creates a weighted average of several Poisson regression. The secondary objective of the project is to derive a transportation model that yields how the aforementioned inventory calculations should be realized (most efficiently).