

Public Abstract

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Department:Industrial Engineering

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Title:LOGISTIC SYSTEM DESIGN OF AN UNDERGROUND FREIGHT PIPELINE SYSTEM

Underground Freight Pipeline (UFP) systems utilize the underground space in metro areas that is otherwise not utilized for freight transportation. Two fundamental logistics issues in the design of a UFP system are network configuration and capsule control. This research develops two capsule control models that minimize total tardiness squared of cargo delivery and associated heuristic algorithms to solve large-scale problems. Two network design models are introduced that minimize both operational and construction cost of UFP system. The UFP network design Comprehensive Model can only be solved to optimality for small sized problem. To reduce the computational complexity, the UFP network design Two Step Model that is able to generate high quality network design solutions is developed. Then, a case study of a UFP network design in Greater New York area is presented.