Using Systems Dynamics to Evaluate the Efficiency of Multimodal Transportation Systems

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This presentation introduces systems dynamics (SD) and outlines the benefits of using SD to create a multimodal transportation system (MTS) simulation model. The SD model enables the user to frame the causal relationships between disruptions and better understand the resultant impact on efficiency. Although previous studies have identified sources of major disruptions, these studies do not evaluate the causal relationships behind the failures and the proposed solutions are often static, rather than dynamic. In the SD model, various disruptions are chosen as the control variables for simulation, and the impact of different policy scenarios on managing these disruptions is analyzed. The SD model allows decision makers to determine how the disruptive factors of the supply chain are related to the efficiency of the system and develop strategies that will improve MTS performance.

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