Tipping Points of Disruptions on Urban Road Networks

Abstract: Adding small amounts of weight – little by little – to a balanced object makes it topple at a tipping point. Do such tipping points exist on complex systems; and are they identifiable? The presentation poses this question in the context of disruptions at different locations on urban road networks. In such a case, innumerable combinations of disruptions ensue, which makes it hard to identify a specific combination at which the network shifts from a superior state to an inferior one. The definitions of disruption, its impact, and the differentiation of states into superior and inferior ones are also not straightforward. The presentation shares a methodology underpinned on conventional notions of urban road network analysis, to find the tipping points. Further, if at all the problem is solved, what results is an abstract theoretical network-state, with almost zero probability of realization. The presentation also attempts to enlighten the practical significance of identifying such abstract network-states in a planner’s perspective.

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