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User inequity implications of road network vulner...

Erik Jenelius

Abstract

An important purpose of the road transport system is to allow people to commute in efficient and reliable ways. For various undesired reasons, however, link capacities are sometimes reduced and links are closed completely. To assess and reduce the risk of such events, a key issue is to identify critical links that are particularly important, i.e. roads where disruptions would have particularly severe consequences. This paper presents a method for incorporating user equity considerations into link importance measure. As a complement to measuring the total increase in vehicle travel time, we also measure the disparity in the distribution among individual users. These two components are combined to form an equity-weighted importance measure. We study the properties of this measure both analytically and in a full-scale case study of the Swedish road network. A main result is that increasing the weight put on the equity aspect transfers importance from the main road network to local roads. The use of the measure in transport policy and planning is discussed.

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TABLE OF CONTENTS

Reading Tools

User inequity impl...

Jenelius

- [Review policy](#)
- [About the author](#)
- [How to cite item](#)
- [Indexing metadata](#)
- [Print version](#)
- [Look up terms](#)
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