Multimodal Transportation Operations and Planning Software Review and Evaluation

Presentation

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Abstract

NETSCORE21, an ongoing project at Iowa state University and funded by the National Science Foundation, studies the interdependencies between energy (generation, transmission, distribution) and transportation (transportation fuels, technologies and fleets), while accounting for sustainability, cost, and resiliency over a time horizon of 40 years (2010 – 2050). In order to calibrate the transportation system components of the NETSCORE21 software (NETPLAN), a review of already-available public and private simulation software has been conducted, so as to better assess the contribution of NETPLAN into modeling air, highway, waterway, and railroad transportation (both passenger and freight). Each model is reviewed with regards to various factors, such as resiliency to attack or natural event, environmental sustainability, interdependency with other networks, and routing logic that dictates the path of travel to be chosen. The review has highlighted certain software that are worthy of further consideration, where software functionality mimics desired features, or allows a comparison of system accuracy and performance. Furthermore, several publicly-available software packages were selected for further discussion and testing, and the corresponding results. These packages include CARVER2 and TRAGIS, and are used to evaluate and compare various transportation resiliency and routing logic scenarios. The review and comparison between these models will identify the attributes not currently available in any of these models that our proposed software (NETPLAN) would provide.

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The primary format of this submission will be a presentation, including a visual representation of the different software systems and their relationship to one another. A non-analytical paper will be included with the presentation, and it will provide a solid framework from which transportation researchers can pursue further review and testing of transportation modeling technologies.

**Keywords:** transportation software – modeling – interdependency