

CIPDSS National Transportation Model Overview

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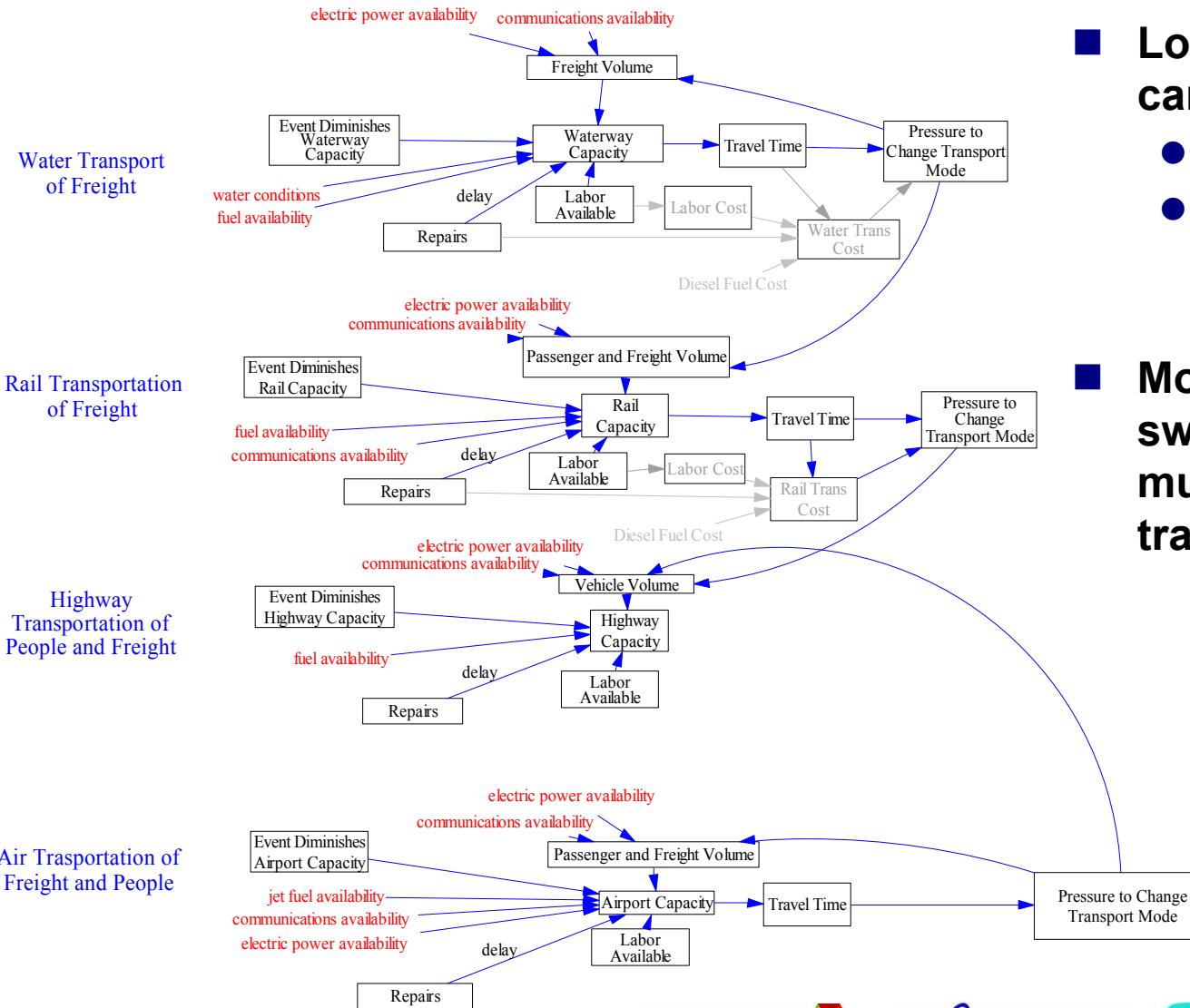


Transportation Model Scope

- Waterways
- Rail
- Road
- Air
- (Pipeline transportation is included in the corresponding energy infrastructure model – i.e., petroleum and natural gas)
- Freight transportation can be arrayed to cover a variety of commodities
 - Have used cattle, corn, dairy, grain, chemicals, coal, refined petroleum products, and air mail.



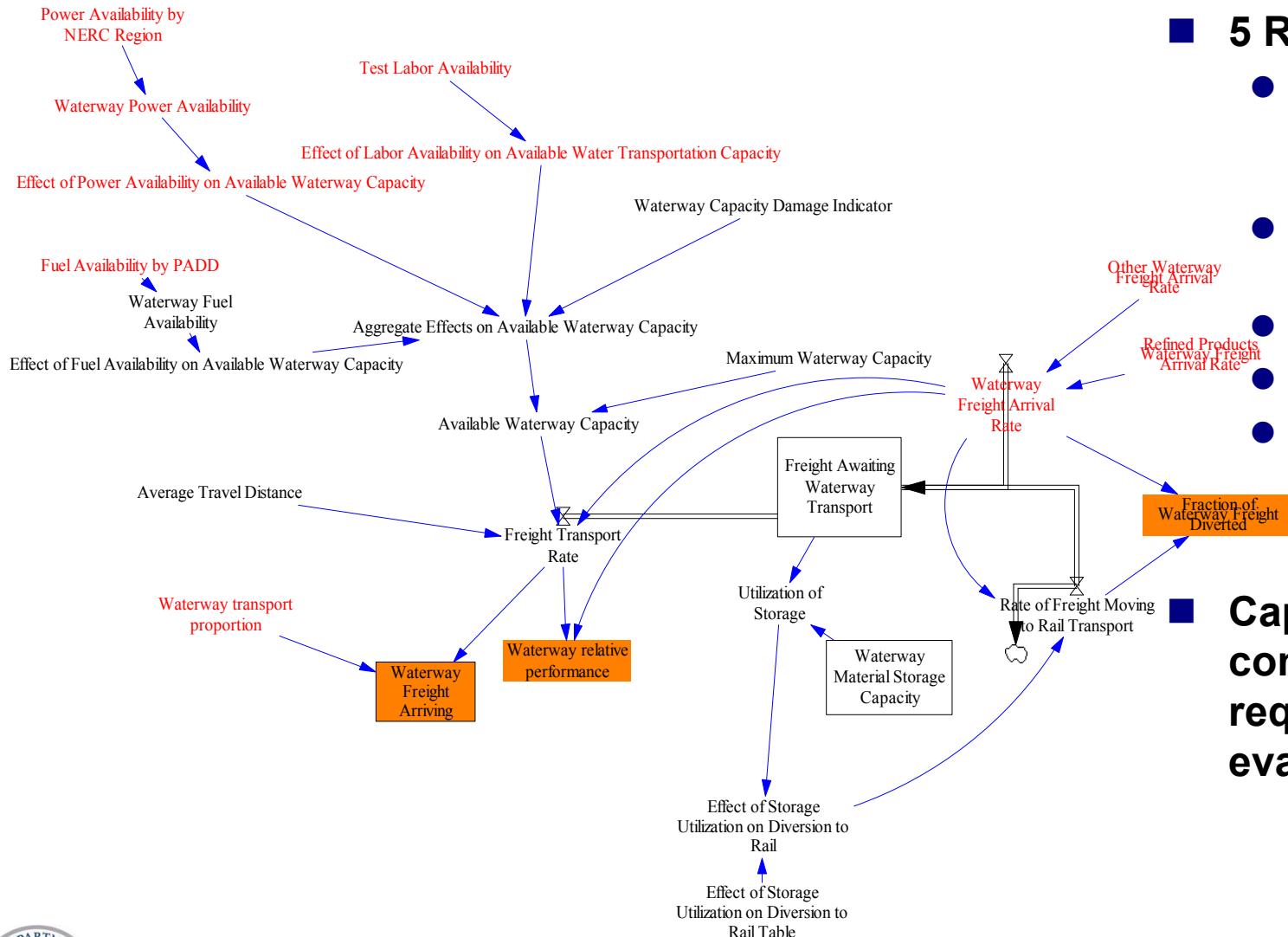
Conceptual Model



- **Loss of capacity can lead to delays**
 - Congestion
 - Use of alternative transportation mode
- **Model allows for switching between multiple modes of transportation**



Waterway Transportation Model

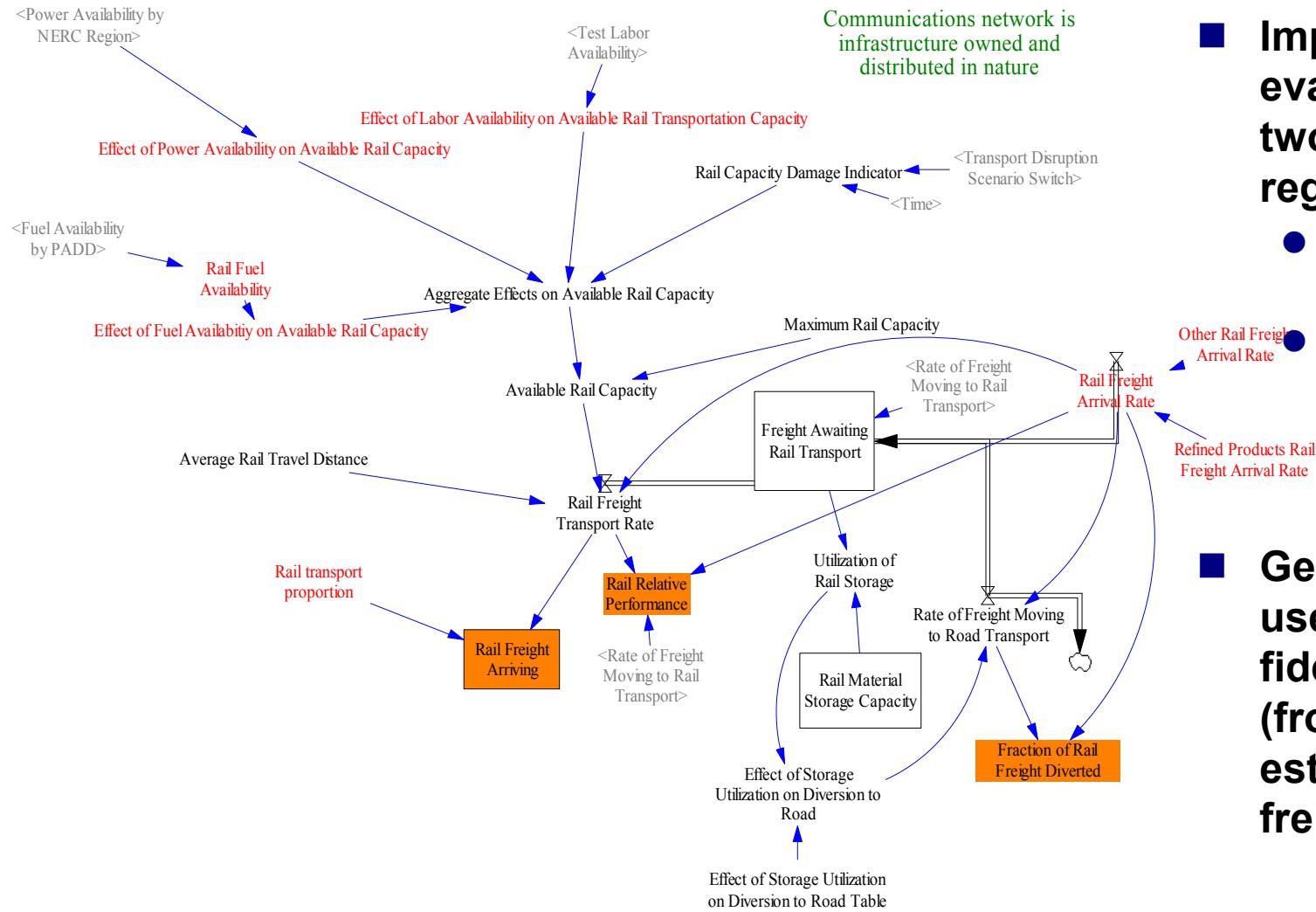


- **5 Regions:**
 - Columbia River and West Coast
 - Mississippi River
 - Gulf Coast
 - Great Lakes
 - East Cost

■ **Capacity constraints require further evaluation**



Rail Transportation Model



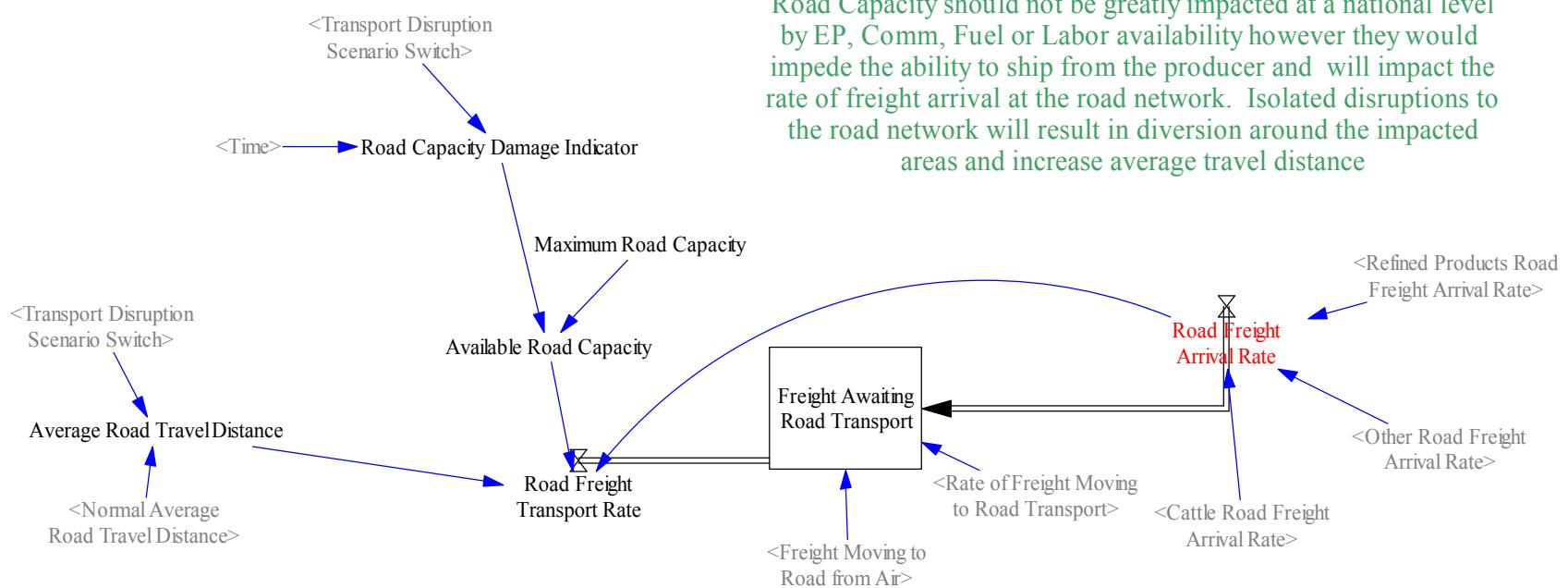
■ Impacts evaluated using two or more regions

- At least one impacted region
- Un-impacted region

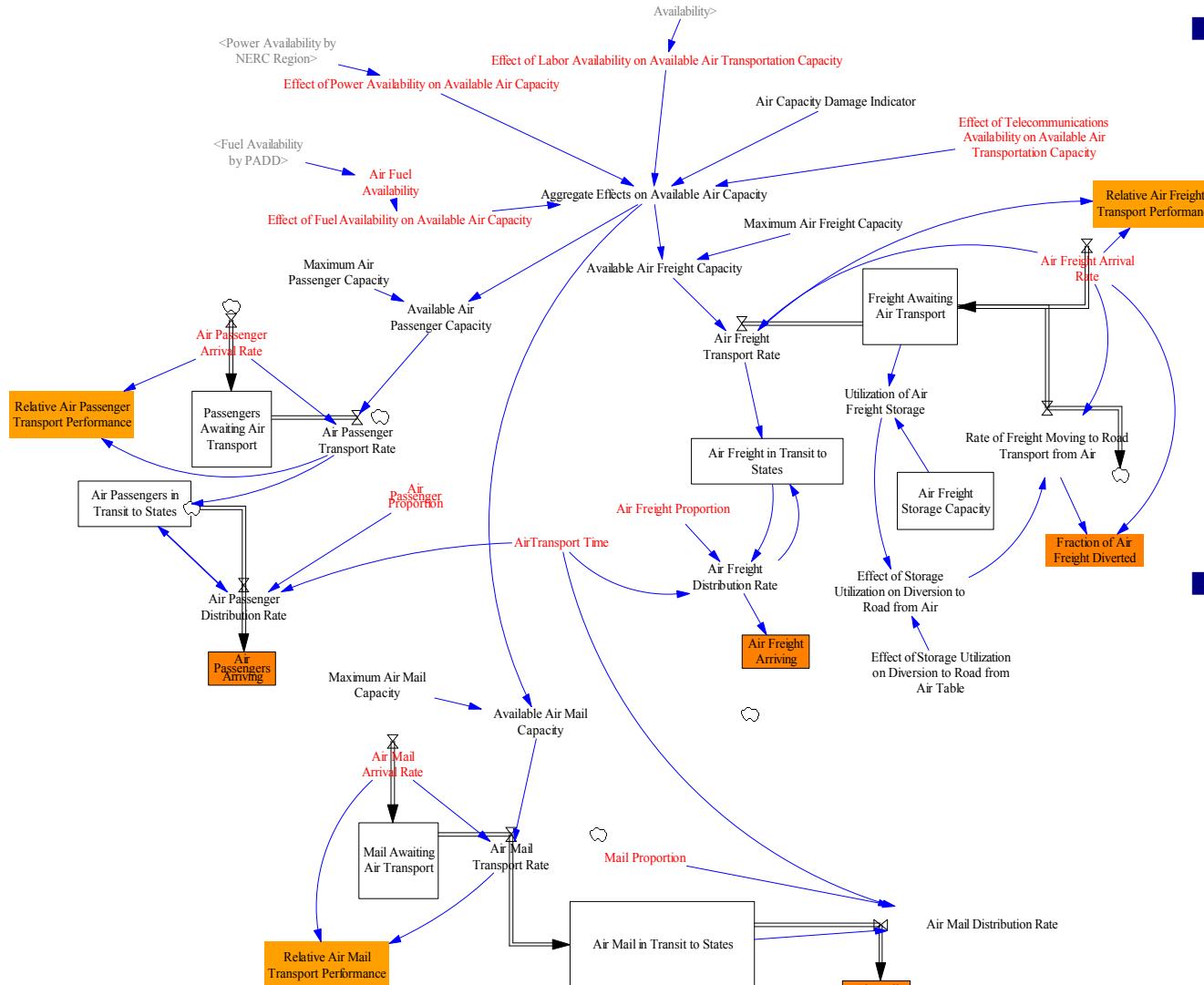
■ Generally have used a higher fidelity model (from NISAC) to estimate rail freight impacts



Road Transportation Model



Air Transportation Model



- **Structure replicated for 8 hubs:**

- ATL
- BWI
- CLT
- DFW
- JFK
- LAX
- ORD
- Memphis

Data for freight and passenger movements are based on Bureau of Transportation Statistics data

