

A Multi-Resolution Index for Intermodal Freight Connectivity

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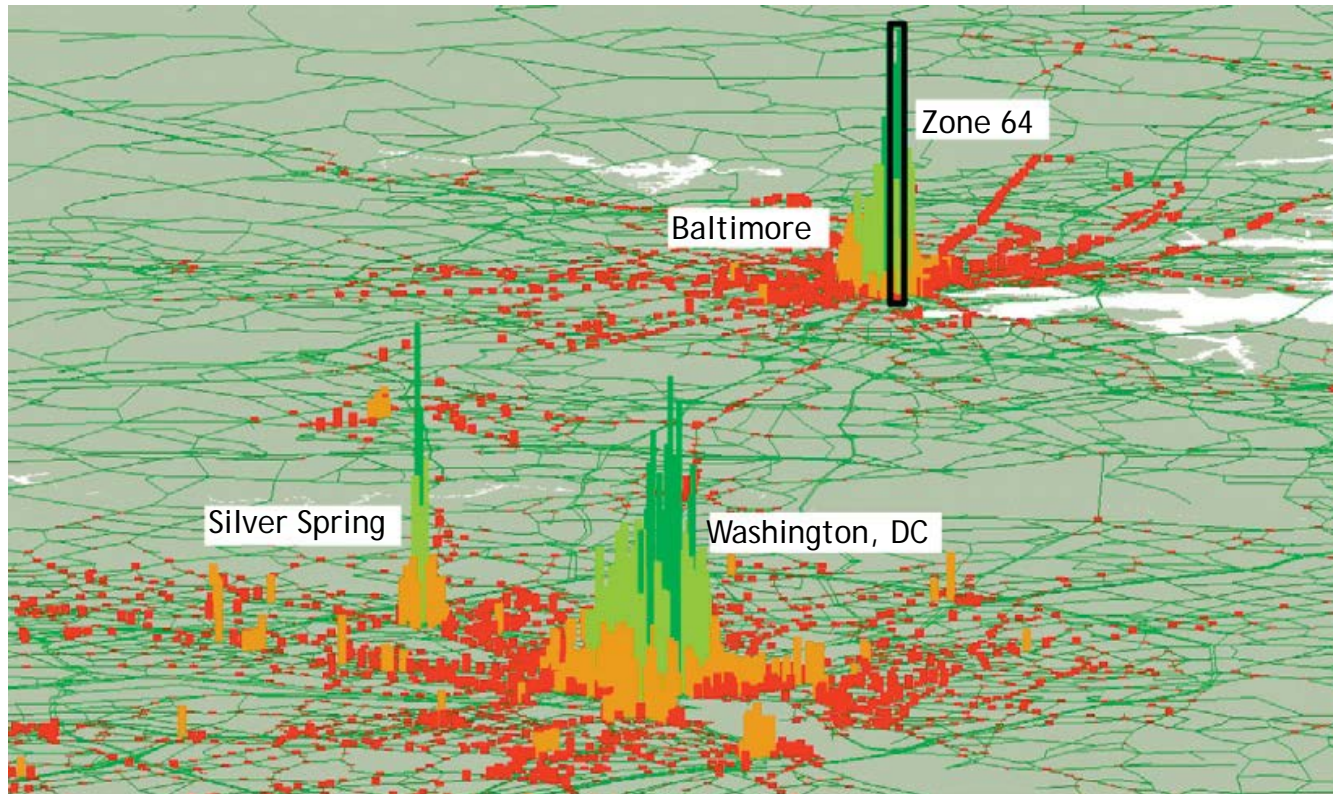
Motivation

- Each freight mode- analyzed in isolation
- Capacities are loosely defined
- Traffic assignment for multimodal freight?
 - Rare or not seen
- Improvement in multimodal freight infrastructure
 - Can a relatively simple yet reasonably comprehensive approach be developed



Motivation

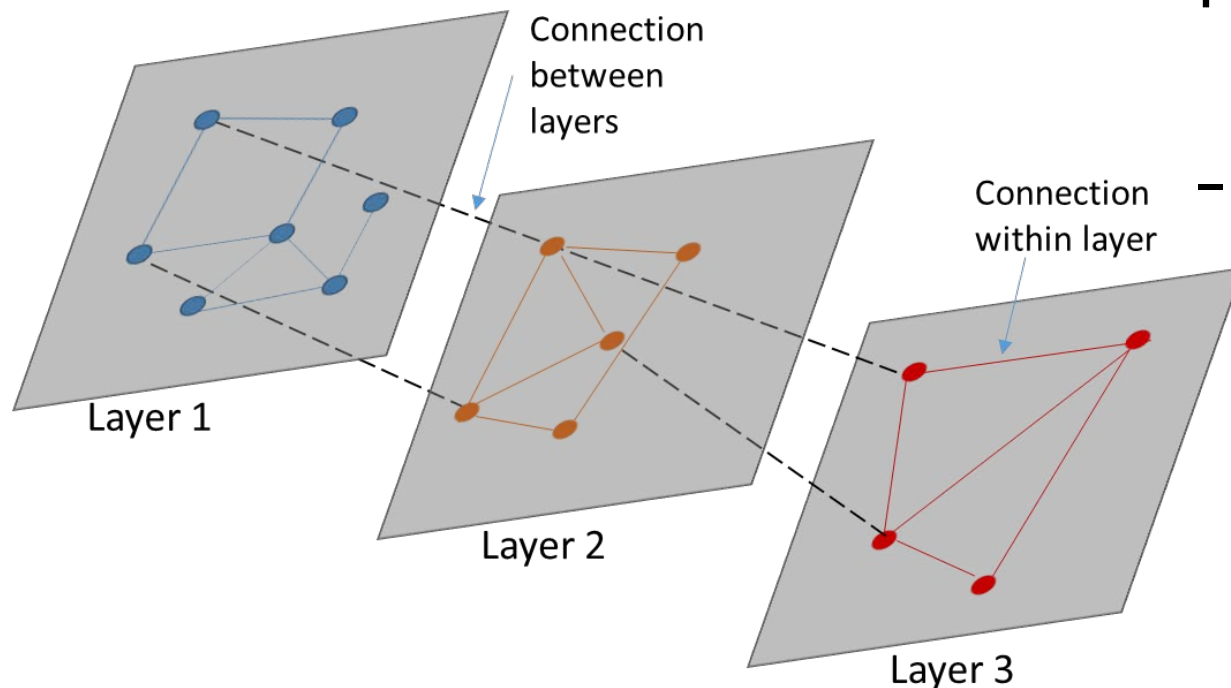
- A connectivity index?



Mishra et al, 2012. Performance Indicators for Public Transit Connectivity in Multi-Modal Transportation Networks. *Transportation Research Part-A: Policy and Practice*, vol. 46(7). , pp. 1066-1085

Goal

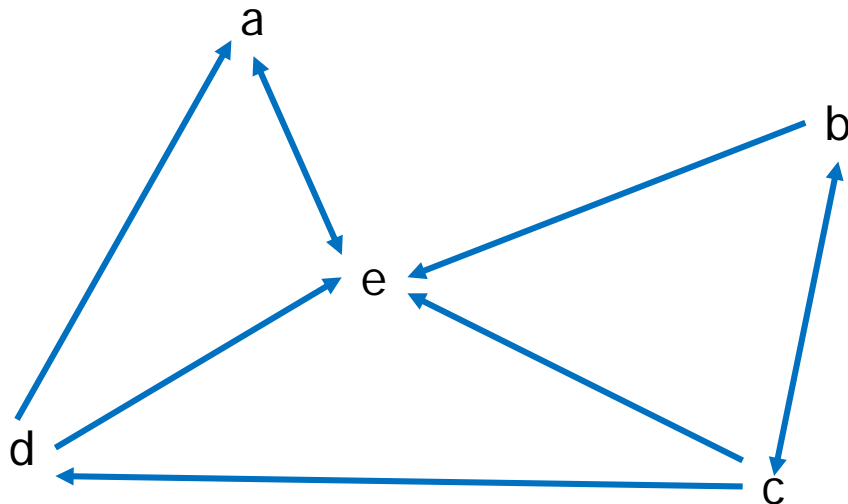
- To develop an index for freight connectivity
 - Intermodal
 - Multiple shortest paths
 - Indirect routes
 - Multi-Resolution
 - Scalable
 - Transfers



Background: Graph Theory Methods



Background: Graph Theoretic Approaches



Degree Centrality

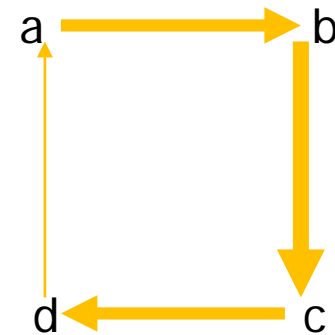
$a = 2$

$b = 1$

$c = 1$

$d = 1$

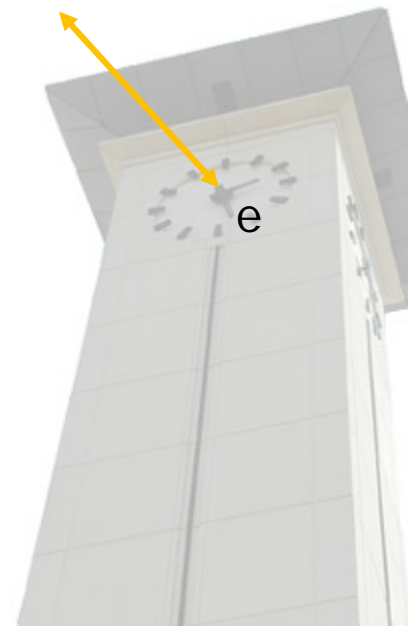
$e = 4$



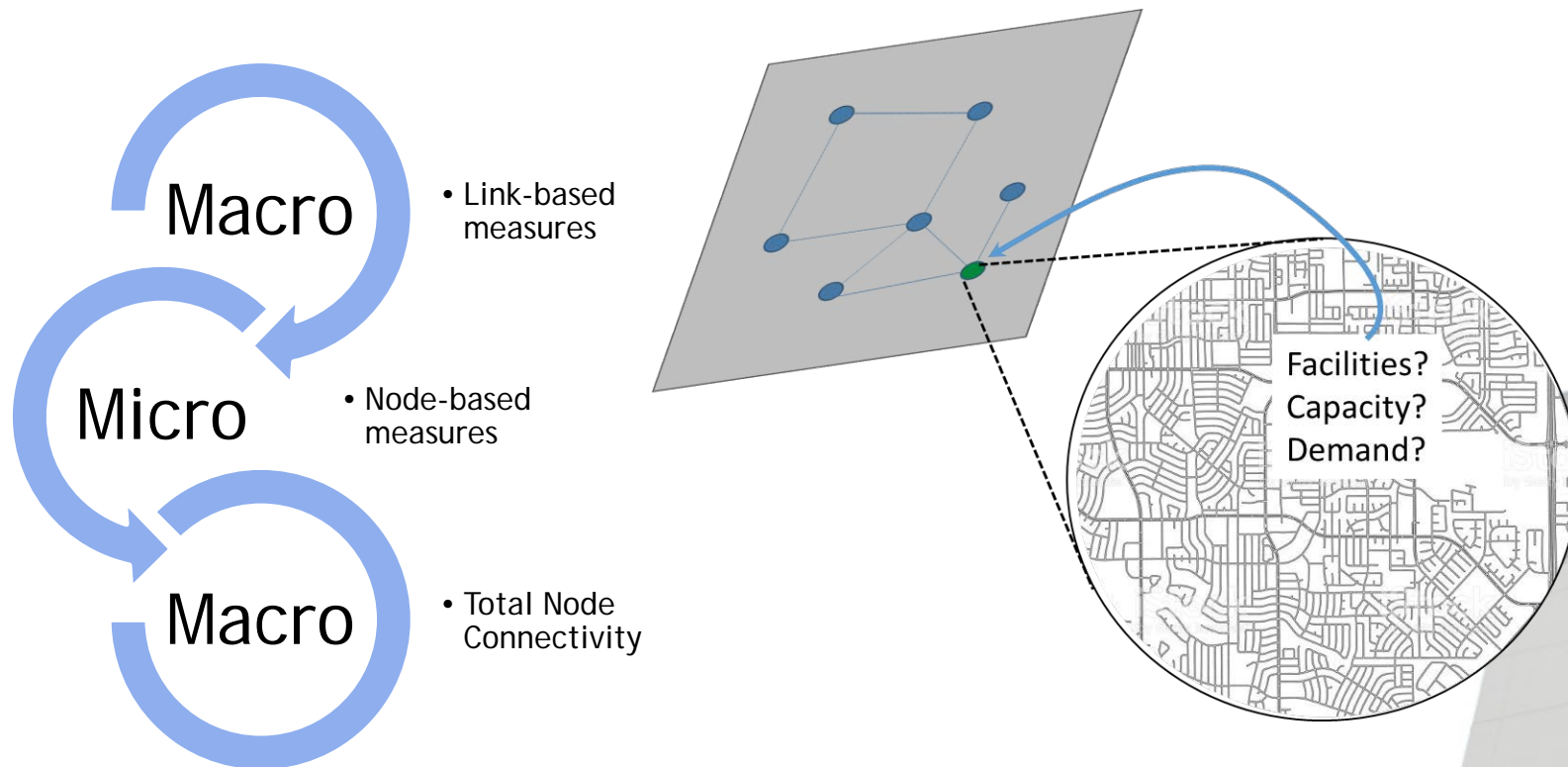
Path Power

$a \rightarrow e$: X

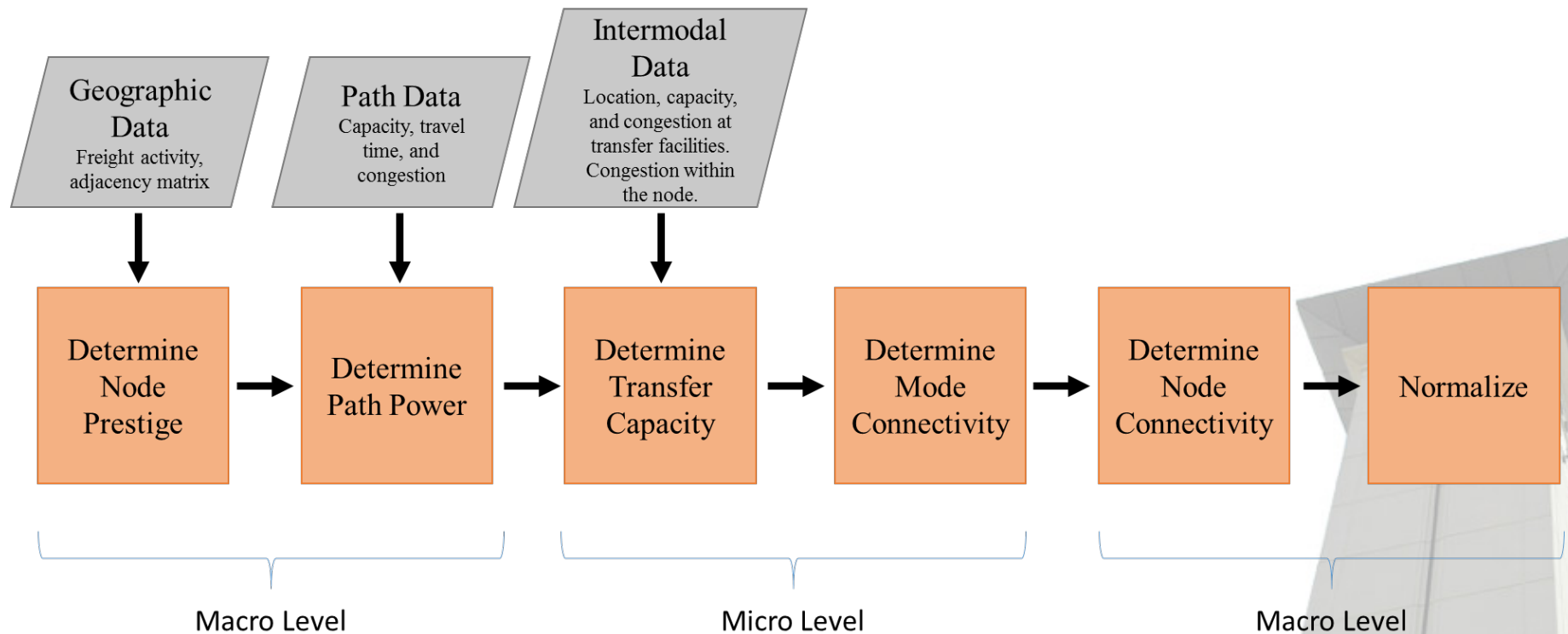
$e \rightarrow a$: Y



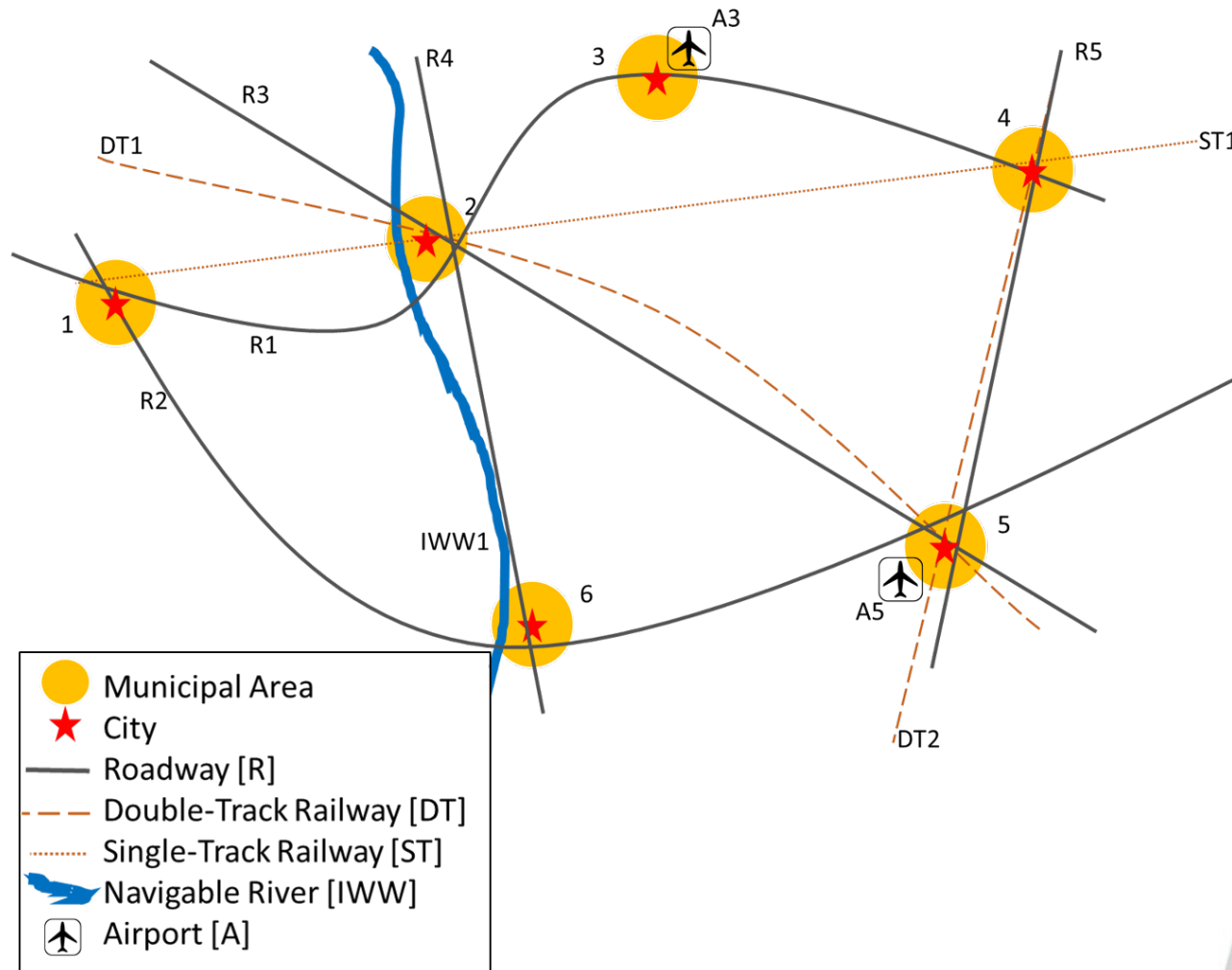
A Multi-Resolution Approach



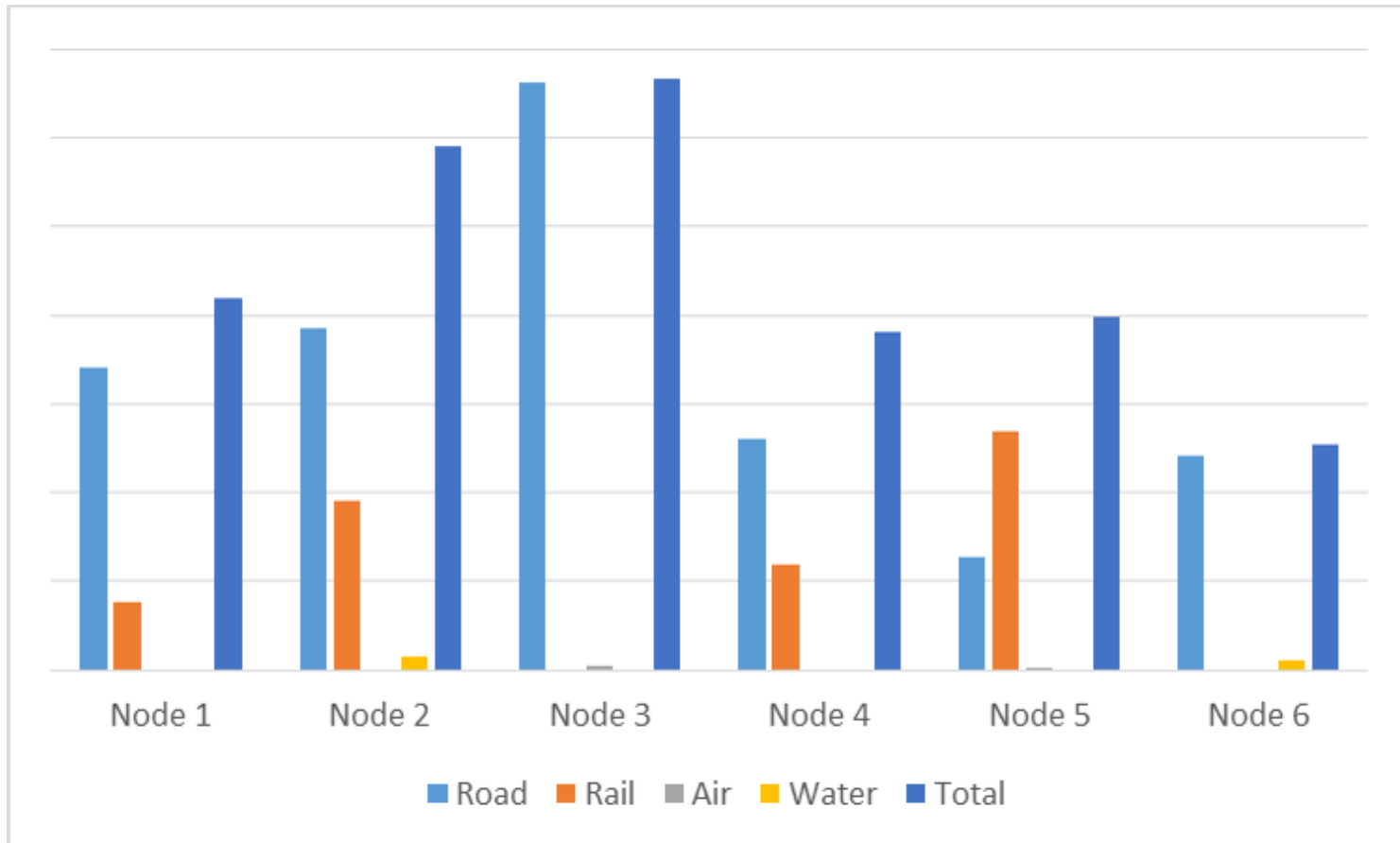
Putting it all together



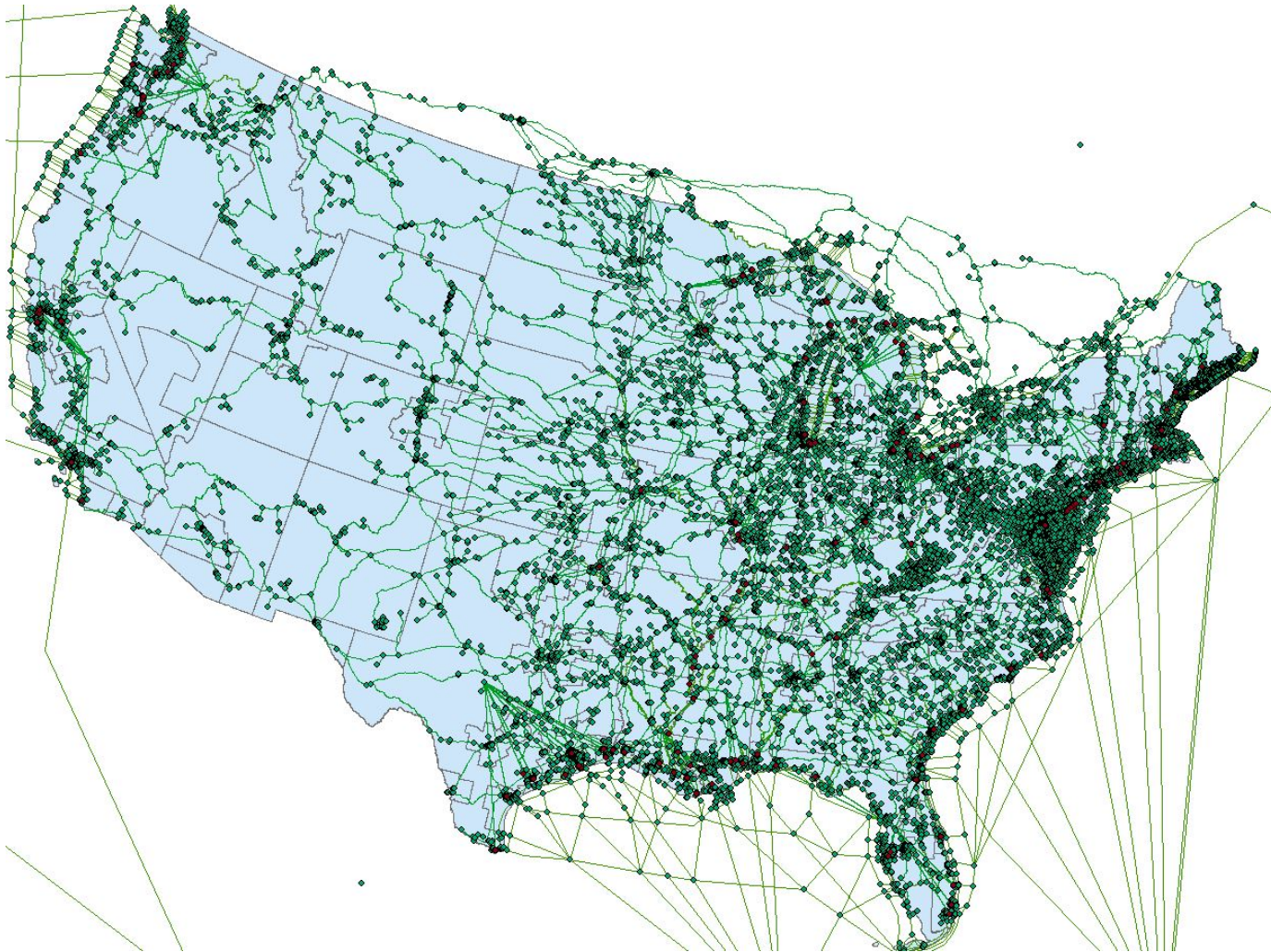
Example Network



Example Network: Results



Next Steps



Thank You Q&A

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