

THE TRANSPORTATION SUSTAINABILITY INDEX

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Abstract

Transportation systems have significant impact on environmental, social, and economic sustainability. However, conventional metrics typically only address the mobility aspect of transportation. Our research focuses on developing a comprehensive metric for assessing these broader outcomes of transportation systems. Our Transportation Sustainability Index (TSI), will be used to evaluate the performance of the transportation systems at the state-wide level. The metrics developed is designed to provide policy makers valuable information to support planning for more sustainable transportation systems. The TSI enables greater transparency in identifying the benefits and negative impacts of transportation choices.



Low's Nested Box Model of Sustainability

Low's model is based on the three commonly accepted domains of sustainability: Environment, Society, and Economy.

According to Low, the environment is the controlling factor in sustainability since human action should be limited by the constraints of the carrying capacity of the planet.

The Definition of Sustainability

The underlying definition for our TSI is based on Low's Nested Box Model, but also considers Haughton's five equity principles:

- Intragenerational Equity
- Intergenerational Equity
- Procedural Equity
- Transfrontier Equity
- Interspecies Equity

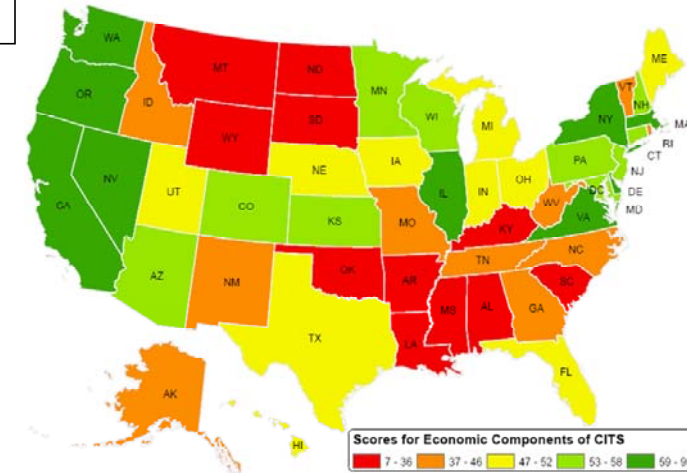
Based on these considerations the TSI is structured as shown below in 3 Domains and 12 Elements:

Domain	Elements
Environmental	1 Minimize consumption of resources
	2 Maximize land use efficiency
	3 Minimize impact on ecological systems
	4 Limit wastes & pollution
	5 Protect human health & safety
	6 Planning and management includes community input
Social	7 Promotes social interaction & social equity
	8 Meets basic access needs of all individuals
	9 Is affordable for individuals
Economic	10 Efficient movement of people & goods
	11 Financially self-sufficient at local level
	12 Resilient against economic vulnerability

"This is the end of favoring motorized transportation at the expense of non-motorized."

- Ray LaHood, Secretary of Transportation

Rating the States TSI for the Economic Domain



Top 5
District of Columbia
New York
Massachusetts
Oregon
Washington

Bottom 5
South Carolina
Wyoming
Arkansas
Montana
Mississippi