Sustainability Evaluation of Transportation Systems and Neighborhood-Level Developments

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Motivation

Sustainable transportation and land development decisions should be based upon good quality evaluation of the sustainability of alternative policies, plans and projects. Although, there has been a proliferation of methodologies and tools for rating sustainability in the last 10 years, there is not an industry-wide accepted evaluation of sustainability. As the state-of-practice advances, a comprehensive overview of rating systems may reveal key evaluation components for sustainable decision making.

Objectives

- Review and assess approaches to rating the sustainability of transportation systems and neighborhood-level developments
- Highlight the state of the practice
- Outline similarities and differences in the existing approaches
- Determine when it is valuable to combine various approaches
- Identify opportunities for improving the existing practice.
- Create an educational module about sustainable design and evaluation

Findings

- Various definitions of sustainability
- Systems address environmental, economic, and social sustainability at different levels; transportation systems focusing heavily on environmental sustainability.
- Systems are at various stages of development and implementation and often build upon each other. Many neighborhood-level systems are at the pilot stage.
- Ratings are based on points awarded for meeting some minimum set of criteria:
  - Based on best practices in sustainability.
  - Built-in flexibility to capture innovations in the practice.
  - Specific criteria must often be fulfilled for certification.
- Systems are developed to be applied at various stages of project development
  - Many transportation rating systems have a narrow project-level focus.
  - The neighborhood-level systems typically take a more systems based-approach. Some are more of a framework than a rating system.
  - Neighborhood-level systems include a transportation component.
- Added value of using rating system:
  - Identify, enable, simplify, and streamline sustainable practices
  - Improve and encourage sustainability
  - Adoption of sustainability plan
- Certain rating systems may be more appropriate for specific contexts.
- A university-level educational course will be beneficial in communicating sustainability goals, practices, and design principles.
- Additional training modules could be adapted for short courses, seminars, and webinars, which would benefit STRIDE constituents, including ALDOT, GDOT, and local MPOs.

Table 1: Summary of Transportation System and Neighborhood-Level Development Sustainability Rating Systems

Year	Rating System	Description
Transportation Systems		
2007	**Greenroads** — Developed by the University of Washington and CH2MHILL.	Third-party rating system used across the country and abroad. Roadway design and construction projects that meet a set of required criteria are then scored on their sustainable attributes that surpass current standards.
2012	**INVEST** — Developed by the Federal Highway Administration.	Web-based tool to assist transportation agencies meet individual sustainability goals. Rates three phases of projects (i.e. planning, development, operations and maintenance) based on criteria developed from sustainability best practices.
2012	**envISIon** — In development by Institute for Sustainable Infrastructure.	Self-assessment tool in development to advance improvements in performance and resilience of the wide range of physical infrastructure. Rating is determined by meeting a minimum number of points in each category.
Neighborhood-Level Development		
2008	**STAR Community Index** — Developed by Local Governments for Sustainability USA.	A framework to assess the triple bottom line of sustainability for communities through a rating system with online support tools.
2008	**One Planet Communities** — Developed by BioRegional (UK).	Five-step process (including planning guidance, review, and endorsement) to support solutions for sustainable living based on ten basic principles.
2009	**LEED-ND** — Developed by USGBC LEED.	Rating system evaluates sustainable development based on principles of smart growth, urbanism and sustainable construction using a credits system for certification.
2010	**EcoDistricts Initiative** — Developed by the Portland Sustainability Institute	Performance-driven approach to creating sustainable neighborhoods by removing implementation barriers and establishing a focus on the social component of sustainability.

Table 2: Summary of Criteria in Sustainability Rating Systems

	Green-LITES	BE2ST	I-LAST	Green-roads	Green Pave	STARS	INVEST	EnvISIon	LEED-ND	Eco Districts	One Planet Communities	Enterprise Green Communities	STAR Communities	Green Star Communities
Water Conservation														
Energy Conservation														
Environmental/Ecosystem														
Sustainable Land Use														
Waste/Materials Mgmt.														
Noise/Light Pollution														
Climate Change														
Transportation Impact														
Access														
Cost Effectiveness														
Innovation/Design														
Safety														
Operations/Maintenance														
Economy/Jobs														
Affordability														
Equity/Inclusion														
Indoor Environment														
Health/Well-being														
Culture/Place-making														
Food Sustainability														