

Sustainability and Transportation, Definitions and Relationship: Synthesis

Requested by

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Prepared by

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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WSDOT staff. Online and print sources may include newspaper and periodical articles, NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs and related academic and industry research. Internet hyperlinks in the TSRs are active at the time of publication, but host server changes can make them obsolete.

Request for Synthesis:

This request is from Leni Oman, Director, Office of Research and Library Services for a Synthesis of all the definitions of “sustainability,” and research, if any related to the topic areas. Specific definitions and research are needed related to sustainability and climate change, land use, energy, and transportation. In the literature, sustainability has many linkages to smart growth principles.

Background:

There are many and divergent definitions of sustainability, although the definition of sustainable development given by the Brundtland Commission is quoted most often. This definition is not universally used and is subject to differing interpretation. Sustainability has many different definitions because it encompasses many different disciplines. This synthesis is a compilation of sustainability definitions and related research and examples in use.

A recently evolved definition for sustainable transportation accounts for the welfare of *economy*, *environment*, and *society*. Attributed to the Canadian Center for Sustainable Transportation, this “triple bottom line” approach has been adopted by AASHTO and many other organizations.

Databases Searched:

- TRIS Online
- Google Scholar
- TRB Research in Progress
- WisDOT Synthesis Reports

Synthesis Summary:

- Definitions
- Broader Discussions
- Program Applications
- Research

DEFINITIONS

Towards Sustainable Development

World Commission on Environment and Development, 1987, Our Common Future, Chapter 2, Brundtland (ed.)

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

<http://habitat.igc.org/open-gates/ocf-02.htm#>

Sustainability Website of AASHTO Center for Environmental Excellence

Sustainable Transportation:

Sustainable transportation can be viewed as *an expression of sustainable development in the transportation sector*. Sustainable transportation addresses local, regional, national, and global issues and therefore requires considerable coordination. It is important to apply sustainable transportation in a holistic and integrated manner across the various sectors (external to transportation) to ensure that key concerns such as depletion of resources, global climate change, disruption of ecosystems, and toxic pollution are effectively addressed.

Numerous authors have developed definitions for sustainable transportation for different contexts. These definitions are based on the broader concept of sustainable development as outlined by the Brundlandt Commission, adapted to meet current and future mobility and accessibility needs without resulting in undue negative externalities. Context specific sustainable transportation definitions generally focus on the three dimensions of sustainable development – *economic development, social equity, and environmental stewardship* . . .

A comprehensive definition of a sustainable transportation system developed by the Canadian Center for Sustainable Transportation states that sustainable transportation:

- “allows the basic access needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health, and with equity within and between generations;
- is affordable, operates efficiently, offers choice of transport mode, and supports a vibrant economy; and
- limits emissions and waste within the planet’s ability to absorb them, minimizes consumption of non-renewable resources, limits consumption of renewable resources to the sustainable yield level, reuses and recycles its components, and minimizes the use of land and the production of noise.”

In contrast, one state department of transportation (DOT) in the United States defines sustainable transportation concisely as “the provision of safe, effective, and efficient access and mobility into the future while considering the economic, social, and environmental needs of society.”

http://environment.transportation.org/environmental_issues/sustainability/

Transportation: Invest In Our Future

AASHTO, July 2007

From page 79 of PDF: The transportation decision-makers of the future should adopt the triple bottom line as a yardstick to evaluate the sustainability of surface transportation system policies and performance in order to ensure that transportation strategies and investments will result in

- Robust economic growth;
- Better-than-before health of the environment; and
- Improved quality of life for all citizens.

“The triple bottom line” is a term coined to encourage sustainable development by evaluating performance on the basis of social, economic, and environmental impacts. Applying it to assess projects, programs, and policies sends a message that financial, cost-benefit, and economic considerations are not the sole drivers of transportation projects. Under this approach, economic, social, and environmental factors are to be given equal consideration.

<http://www.transportation1.org/tif5report/TIF5.pdf>

Sustainable Transportation: University of Toronto Transportation Engineering and Planning

What is Sustainable Transportation?

Sustainable transportation systems are those which, for example, aim to reduce emissions, fossil fuel consumption, the consumption of agricultural land, park land and wildlife habitat. Most fundamentally, this means an emphasis on reducing the role of the private automobile as the

prime mode of transportation and shifting travel toward other sustainable modes such as public transit cycling and walking. Transportation infrastructure has a strong impact on urban land use patterns, and congestion, both of which result in profound environmental impacts. Hence, advances in the transportation planning process and in the efficiency of transportation systems through technologies such as ITS are key components of the development of sustainable transportation infrastructure.

<http://www.civ.utoronto.ca/sect/traeng/sustainable/index.htm>

Well Measured: Developing Indicators for Comprehensive and Sustainable Transport Planning

Todd Litman, December 2008, Victoria Transport Policy Institute

Some example definitions of sustainability and sustainable transport (p. 4):

- "...sustainability is not about threat analysis; sustainability is about systems analysis. Specifically, it is about how environmental, economic, and social systems interact to their mutual advantage or disadvantage at various space-based scales of operation." (TRB, 1997)
- Environmentally Sustainable Transportation (EST) is: Transportation that does not endanger public health or ecosystems and meets needs for access consistent with (a) use of renewable resources at below their rates of regeneration, and (b) use of non-renewable resources at below the rates of development of renewable substitutes. (OECD 1998)
- "The goal of sustainable transportation is to ensure that environment, social and economic considerations are factored into decisions affecting transportation activity." (MOST, 1999)

A sustainable transportation system is one that (ECMT, 2004; CST, 2005):

- Allows the basic access needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health, and with equity within and between generations.
- Is affordable, operates efficiently, offers choice of transport mode, and supports a vibrant economy.
- Limits emissions and waste within the planet's ability to absorb them, minimizes consumption of non-renewable resources, limits consumption of renewable resources to the sustainable yield level, reuses and recycles its components, and minimizes the use of land and the production of noise.

This last definition is preferred by many experts, including the Transportation Research Board's Sustainable Transportation Indicators Subcommittee (ADD40[1]), the European Council of Ministers of Transport, and the Canadian Centre for Sustainable Transportation, because it is comprehensive, and clearly indicates that sustainable transportation must balance various economic, social and environmental goals, often called a *triple bottom line*.

<http://www.vtpi.org/wellmeas.pdf>

Addressing Sustainability in Transportation Systems: Definitions, Indicators, and Metrics

Christy Mihyeon Jeon and Adjo Amekudzi, March 2005, Journal of Infrastructure Systems 11(1): 31-50, ASCE

Characteristics of sustainable transportation and development from two U.S., seven Canadian, and other international sources are reported (p. 33). Some specific definitions not outdated or listed elsewhere in the synthesis:

- Transport Association of Canada (1999)
 - (1) In the natural environment: limit emissions and waste (that pollute air, soil and water) within the urban area' ability to absorb/recycle/cleanse; provide power to vehicles from renewable or inexhaustible energy sources (such as solar power in the long run); and recycle natural resources used in vehicles and infrastructure (such as steel, plastic, etc.).

(2) In society: provide equity of access for people and their goods, in this generation and in all future generations; enhance human health; help support the highest quality of life compatible with available wealth; facilitate urban development at the human scale; limit noise intrusion below levels accepted by communities; and be safe for people and their property.
(3) In the economy: be financially affordable in each generation; be designed and operated to maximize economic efficiency and minimize economic costs; and help support a strong, vibrant, and diverse economy.

- European Commission's Energy, Environment and Sustainable Development Programme (1999)

A sustainable urban transport and land use system:

(1) Provides access to goods and services in an efficient way for all inhabitants of the urban area;
(2) Protects the environment, cultural heritage and ecosystems for the present generation; and (3) Does not endanger the opportunities of future generations to reach at least the same welfare level as those living now, including the welfare they derive from their natural environment and cultural heritage.

<http://www.webs1.uidaho.edu/ce501-400/resources/Addressing%20sustainability%20in%20transportation%20systems.pdf>

Renewed EU Sustainable Development Strategy

Council of the European Union, June 2006

The overall objective of sustainable transport is “to ensure that our transport systems meet society’s economic, social and environmental needs whilst minimising their undesirable impacts on the economy, society and the environment” (p. 10).

<http://register.consilium.europa.eu/pdf/en/06/st10/st10917.en06.pdf>

Sustainable Measures Website

Definitions of sustainability:

There may be as many definitions of sustainability and sustainable development as there are groups trying to define it. All the definitions have to do with:

- Living within the limits
- Understanding the interconnections among economy, society, and environment
- Equitable distribution of resources and opportunities

<http://www.sustainablemeasures.com/Sustainability/Definitions.html>

What Sustainability Means To ODOT: Key Messages

Oregon DOT, May 2006

An accepted general definition of sustainability is “using, developing and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic and community objectives” . . .

At ODOT, we want employees to think about sustainability with regard to three key areas: access, activities and assets. These areas provide the mental framework for articulating how ODOT can incorporate sustainability.

Access includes a number of different elements relating to quality of life. ODOT must support, in an equitable manner for all Oregonians, access to: (1) essential goods and services; (2) economic opportunities; (3) transportation choices; (4) vibrant and livable communities; (5) healthy natural resources . . .

Activities are all the day-to-day tasks that ODOT employees carry out to provide a safe, efficient transportation system. These include everything from on-the-ground activities such as road

construction and maintenance to office activities such as planning and design, as well as behind-the-scenes support functions. For each activity, we must consider the life cycle impacts on financial resources, local communities and the natural environment

Assets are all the different parts of the transportation system, such as roads, bridges, signs and guardrails. Assets also include the equipment, buildings, materials and data we use to manage the transportation system, as well as “soft” natural resource assets such as roadside areas, landscapes and water systems. We should manage assets with a view to the social, economic and environmental context while optimizing performance over the life cycle.

This mental framework reflects the cross-divisional nature of ODOT’s Sustainability Program, because the terms **access**, **activities**, and **assets** have meaning for each of ODOT’s divisions. It also supports the existing CS3 (context sensitive and sustainable solutions) framework, which is ODOT’s primary means of incorporating sustainability goals into the highway project delivery process.

We summarize what sustainability means to ODOT with the following phrase:

Sustaining **access** for future generations through careful management of our **activities** and **assets**.

http://www.oregon.gov/ODOT/SUS/docs/SustainabilityKeyMessages_061306.pdf

Sustainability Home: http://www.oregon.gov/ODOT/SUS/what_is_sustainability.shtml

Action Plan on Sustainable Development for Minnesota State Government

Report to the Minnesota Environmental Quality Board by a Working Group of the Sustainable Communities Partnership, April 1999

This report states principles of sustainable development, characteristics of sustainable development policies and sustainable communities, and defines a state sustainable development program (p. 4):

A state program or activity could be considered a “sustainable development program” (whether or not the term *sustainable development* is specifically mentioned in statements of the program’s purpose) if its purpose corresponds with the statutory definition of sustainable development. Minnesota Statute 4A.08 defines sustainable development as “development that maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend.”

http://www.mnplan.state.mn.us/pdf/1999/eqb/sdi_act3.pdf

Incorporating Sustainable Land Transport into District Plans: Discussion Document and Best Practice Guidance

Tonkin and Taylor Ltd, November 2008, New Zealand Transport Agency Res. Rpt. 362

In its discussion of sustainability and sustainable transportation, the report states the New Zealand Transport Strategy’s integrated triple-bottom-line approach to transportation management (p. 21):

To ensure that transport is underpinned by the principles of sustainability and integration, transport policy will need to focus on improving the transport system in ways that enhance economic, social, and environmental well being, and that promote resilience and flexibility. It will also need to take account of the needs of future generations, and be guided by medium and long-term costs and benefits (MoT 2002).

Significantly, this statement acknowledges that:

- transport should be underpinned by the principles of sustainability;
- the transport system will need to be improved in ways that enhance economic, social and environmental well-being; and
- the principles of resilience and flexibility in the transport system need to be promoted.

Following are discussions and definitions from other agencies, as well as the OECD, World Business Council for Sustainable Development, and UK Department of Transport.

<http://www.landtransport.govt.nz/research/reports/362.pdf>

Sustainable Transportation Indicators: A Recommended Research Program for Developing Sustainable Transportation Indicators and Data

Todd Litman, 2009, TRB Annual Meeting 2009 Paper #09-3403

From abstract. This paper, developed through a cooperative effort by the Transportation Research Board's Sustainable Transportation Indicators Subcommittee (ADD40 [1]), identifies indicators that can be used for sustainable transportation evaluation. The paper discusses sustainable transportation definitions and concepts, describes factors to consider when selecting indicators, exemplify specific sustainable transportation indicators, discusses issues of data quality, and provides recommendation on further research and development in the field.

[Check WSDOT Library for availability]

Sustainable Transport: Definitions and Responses

William R. Black, July 2004, Integrating Sustainability into the Transportation Process: 35-43, TRB Conference Proceedings 37

Provides a synthesis and analysis of definitions beginning on page 35.

<http://onlinepubs.trb.org/Onlinepubs/conf/CP37.pdf>

BROADER DISCUSSIONS

Transportation, Land Use and Sustainability

James A. Moore, Ph.D. and Julie M. Johnson, ASLA, AICP, 1994, Florida Center for Community Design and Research, University of South Florida and the Center for Urban Transportation Research, University of South Florida, Tampa, FL

What is Sustainability?

A discussion of definitions of "sustainability" is included as a chapter of this report, along with the various areas of disagreement. A few characteristics of sustainability cited:

Oft-cited features of sustainable development include:

- **balance:** between the built and the un-built, between Man and Nature, between different forms of community, different types of transportation;
- **diversity:** of types, forms, peoples, activities, etc;
- **ecology:** awareness of and reverence for natural systems; unwilling to let human concerns overwhelm natural systems;
- **flexibility:** of means for achieving given ends;
- **holism:** every system is comprised of smaller sub-systems, and as a sub-system of larger systems;
- **integration:** of different forms and types; in contrast to "segregation"; variety: of means, systems, ends, etc;
- **sympiosis:** sustainable design suggests supplementing and complementing existing forms and systems rather than replacing or destroying them;
- **systems:** all elements of the environment are seen as interactive and malleable networks rather than rigid or fixed hierarchies.

<http://www.fccdr.usf.edu/upload/projects/tlushtml/tlus30.htm>

Transportation and Sustainability:

Transportation and land-use are the fundamental factors of development, and are inextricably linked to each other and to the ultimate form of any human settlement. To the degree, however, that changes in transportation policy and technology imply and effect changes in the way land is used, transportation can be seen as the dominant factor in the relationship. Both directly and

indirectly, sustainable community design implies enormous changes in transportation. Sustainable community design seeks to dramatically reduce the use of non-renewable fossil fuels which are the dominant energy source for today's transportation systems. In addition, sustainable community design seeks to minimize the impact of development on the natural environment by promoting higher density development, more compact community forms, and greater physical integration of land uses. Reducing fossil fuel consumption has dramatic implications for today's auto-based transportation systems. Similarly, compressing development into reduced areas dramatically decreases the operational efficacy of the private car. In short, the primary impact of sustainable community design will be a dramatic reduction in the number of private cars, a reduction in the number of automobile trips, and a decrease in the total vehicle miles traveled. Affecting these goals implies additional changes: new alternative forms of mobility and different patterns of land use.

<http://www.fccdr.usf.edu/upload/projects/tlushtml/tlus90.htm>

Full Report: <http://www.fccdr.usf.edu/upload/projects/tlushtml/tlusauth.htm>

The Necessary Revolution: How Individuals and Organizations Are Working Together to Create a Sustainable World

Peter Senge et al, 2008, Random House

How to evaluate green or sustainability standards:

- Is the rating scheme itself open and transparent? Will it increase the competition with other standards and/or lead to confusion and diminish agreement in this area?
- Did it come about through a collaborative process among a meaningful cross section of all the key players/partners and users in the industry, government and non-governmental organizations?
- Does it consider the larger context and how other systems might be affected?
- Does it include a process for continuous review, assessment and evaluation and an opportunity to test and incorporate new innovative techniques?
- Does it reflect a true collaboration among all affected interests and will it really lead to sustainability outcomes?

Sustainable Development, International Encyclopedia of the Social and Behavioral Sciences

J.C. Burgess and E.B. Barbier, 2001, p. 15329-15335

The article cites several important steps in developing sustainability policies, including:

- Improve efforts to measure economic and ecological consequences of depletion and degradation of natural capital,
- Determine the economic value of environmental resources, and
- Determine causes of environmental degradation (particularly due to policy failure) and demonstrate how correction leads to improved incentives and investments for efficient and sustainable management of natural capital.

[Check WSDOT Library for availability]

The Sustainable Communities Network Partnership

The SCN was founded by CONCERN and the Community Sustainability Resource Institute in 1993. They worked with the founding partners to identify quality resources on sustainability and to disseminate them in a timely way to the public. In 1996, they launched the SCN web site on the World Wide Web. CONCERN and the Community Sustainability Resource Institute co-directed the SCN from 1993 to May 2001. CONCERN now directs the SCN and its related activities.

<http://www.sustainable.org/information/partnership.html>

Sustainable Communities Network Home Page: <http://www.sustainable.org/>

About Smart Growth

Sustainability and Transportation, Definitions and Relationship
Research

Smart Growth Online, website of the Smart Growth Network

In communities across the nation, there is a growing concern that current development patterns -- dominated by what some call "sprawl" -- are no longer in the long-term interest of our cities, existing suburbs, small towns, rural communities, or wilderness areas. Though supportive of growth, communities are questioning the economic costs of abandoning infrastructure in the city, only to rebuild it further out.

Spurring the smart growth movement are demographic shifts, a strong environmental ethic, increased fiscal concerns, and more nuanced views of growth. The result is both a new demand and a new opportunity for smart growth.

The features that distinguish smart growth in a community vary from place to place. In general, smart growth invests time, attention, and resources in restoring community and vitality to center cities and older suburbs. New smart growth is more town-centered, is transit and pedestrian oriented, and has a greater mix of housing, commercial, and retail uses. It also preserves open space and many other environmental amenities.

The Smart Growth Principles and Issues below describe in greater details the various aspects of planning and development that make up smart growth.

<http://www.smartgrowth.org/about/default.asp>

President Obama: More Effective Regional Transportation Planning Needed

Smart Growth News (online), February 2009

"I think right now we don't do a lot of effective planning at the regional level when it comes to transportation. That's hugely inefficient," [President Obama] said. "Not only does it probably consume more money in terms of getting projects done, but it also ends up creating traffic patterns, for example, that are really hugely wasteful when it comes to energy use. If we can start building in more incentives for more effective planning at the local level, that's not just good transportation policy, it's good energy policy."

<http://www.smartgrowth.org/news/article.asp?art=6999&state=52>

Obama Interview Transcript [Excerpt on Transportation and Energy Efficiency Policy]

E.J. Dionne, February 2009, Washington Post

[Question related to Infrastructure Band, Transportation Reauthorization Bill, and Planning]

Q. Mr. President, if I could ask you about infrastructure, you've got infrastructure spending in the stimulus package. The need is much faster than that and the money is tight. Do you anticipate any significant further additions in federal infrastructure spending in the reasonably near future, and are you making plans to establish an infrastructure bank?

Obama: Well, number one, we've got the transportation reauthorization bill that's going to be coming up. So one thing to keep some perspective about on the recovery package is this is supposed to provide a jolt to the economy above and beyond what we're doing already in the federal budget. And so I expect that Secretary LaHood, working with the various transportation committees are going to be moving forward on a transportation bill. I would like to see some long-term reforms in how transportation dollars flow, and I'll give you just a couple of examples. I think right now we don't do a lot of effective planning at the regional level when it comes to transportation. That's hugely inefficient. Not only does it probably consume more money in terms of getting projects done, but it also ends up creating traffic patterns, for example, that are really hugely wasteful when it comes to energy use.

If we can start building in more incentives for more effective planning at the local level, that's not just good transportation policy, it's good energy policy. So we'll be working with transportation committees to see if we can move in that direction.

http://voices.washingtonpost.com/postpartisan/2009/02/obama_interview_transcript.html

Preparing for Climate Change

King County and Center for Science and Earth Systems, UW
(Includes links to relevant research)

<http://cses.washington.edu/db/pdf/snoveretalgb574.pdf>

UW Center for Science in the Earth System—Search Definitions of "Sustainability"

<http://www.google syndicated search.com/u/csese?hl=en&ie=UTF-8&q=Sustainability&start=0&sa=N>

PROGRAM APPLICATIONS

GreenLITES, NYSDOT Project Design Certification Program

Transportation sustainability at NYSDOT is a design philosophy that ensures we:

- Protect and enhance the environment.
- Conserve energy and natural resources.
- Preserve or enhance the historic, scenic, and aesthetic project setting characteristics.
- Encourage public involvement in the transportation planning process.
- Integrate smart growth and other sound land-use practices.
- Encourage new and innovative approaches to sustainable design.

<https://www.nysdot.gov/programs/greenlites>

What Makes a Highway Green?

Green Highways Partnership

Green Highways are defined by an effort to leave the project area "better than before" through community partnering, environmental stewardship, and transportation network improvements in safety and functionality.

Green Highways characteristics:

- Provides net increase in environmental functions and values of the watershed
- Goes beyond minimum standards set forth by environmental laws and regulations
- Identifies and protects important historical and cultural landmarks
- Maps all resources in the area in order to identify, avoid, and protect critical resource areas
- Uses innovative, natural methods to reduce imperviousness, and cleanse all runoff within the project area
- Maximizes use of existing transportation infrastructure, provides multi-modal transportation opportunities, and promotes ride-sharing/public transportation
- Uses recycled materials to eliminate waste and reduce the energy required to build the highway
- Links regional transportation plans with local land use through partnerships
- Controls populations of invasive species, and promotes the growth of native species
- Incorporates post project monitoring to ensure environmental results
- Protects the hydrology of wetlands and stream channels through restoration of natural drainage paths
- Results in a suite of targeted environmental outcomes based upon local environmental needs
- Reduces disruptions to ecological processes by promoting wildlife corridors and passages in areas identified through wildlife conservation plans
- Encourages smart growth by integrating and guiding future growth and capacity building with ecological constraints

http://www.greenhighways.org/Makes_Highway_Green.cfm

Sustainable transport, New Zealand Ministry for the Environment

Sustainable transport is about finding ways to move people, goods and information in ways that reduce its impact on the environment, the economy, and society.

Some options include:

- using transport modes that use energy more efficiently, such as walking or cycling and public transport
- improving transport choice by increasing the quality of public transport, cycling and walking facilities, services and environments
- Improving the efficiency of our car use, such as using more fuel efficient vehicles, driving more efficiently, avoiding cold starts, and car pooling
- using cleaner fuels and technologies
- using telecommunications to reduce or replace physical travel, such as tele-working or tele-shopping
- planning the layout of our cities to bring people and their needs closer together, and to make cities more vibrant and walkable
- developing policies that allow and promote these options, such as the New Zealand Transport Strategy.

<http://www.mfe.govt.nz/issues/transport/sustainable/>

Vision, Goals, and Objectives: Towards Sustainable Transportation: Development of a Regional Transportation Plan for the Greater Toronto and Hamilton Area

Greater Toronto Transportation Authority, May 2008

From page 6: Vision—An integrated transportation system for our region that enhances prosperity, sustainability and quality of life.

A generation from now, the nine million residents of the Greater Toronto and Hamilton Area will use a well-integrated transportation system that supports:

- **A high quality of life.** A high quality of life for all people in this region will be our greatest motivator. Our cities, towns, suburbs and rural areas will be more liveable, with more options for getting around the whole region conveniently, comfortably and safely.
- **A thriving, healthy, and protected environment.** We will plan, establish, and maintain a transportation system that conserves resources and leaves a legacy of a healthy and clean environment for our children and grandchildren.
- **A strong, prosperous, and competitive economy.** At the heart of Canada's economy, our region will be competitive with the strongest regions in the world, based on an efficient and convenient transportation system. It will help attract and retain the best and the brightest, and make the shipping of goods and delivery of services efficient.

<https://ozone.scholarsportal.info/bitstream/1873/13482/1/281765.pdf>

Edmonton, Halifax, and Yellowknife Honored as Canada's Most Sustainable Cities

Smart Growth News (online), January 2009

[Note: This article contains information on the "Sustainability" Criteria used in the assessment including: ecological integrity, economic security, governance and empowerment, infrastructure and built environment—including transportation, and social well-being.]

Assisted in its third annual ranking of Canada's most sustainable cities by a national advisory board composed of The Natural Step Canada (TNS), Greening Greater Toronto (GGT) and Smart Growth BC (SGBC), Toronto-based Corporate Knights Magazine gave the top honors in the large, medium and small city categories, respectively, to Edmonton, Alberta; Halifax, New Scotia, and Yellowknife, Northwest Territories.

The ranking involved Canada's 10 most populous cities and the largest one in each of its seven provinces and territories -- all 17 assessed for ecological integrity, economic security, governance and empowerment, infrastructure and built environment, and social well-being.

<http://www.smartgrowth.org/news/article.asp?art=6979&State=54>

RESEARCH

The Sustainable Mobility Paradigm

David Banister (david.banister@ouce.ox.ac.uk), March 2008, Transport Policy 15(2): 73-80, ISSN: 0967070X, DOI:10.1016/j.tranpol.2007.10.005, Accession No.: 29376389

Abstract. This paper has two main parts. The first questions two of the underlying principles of conventional transport planning on travel as a derived demand and on travel cost minimization. It suggests that the existing paradigm ought to be more flexible, particularly if the sustainable mobility agenda is to become a reality. The second part argues that policy measures are available to improve urban sustainability in transport terms but that the main challenges relate to the necessary conditions for change. These conditions are dependent upon high-quality implementation of innovative schemes, and the need to gain public confidence and acceptability to support these measures through active involvement and action. Seven key elements of sustainable mobility are outlined, so that public acceptability can be more effectively promoted. [Copyright 2008 Elsevier]

[Document available through WSDOT Library]

Using the sustainability footprint model to assess development impacts of transportation systems

Adjo A. Amekudzi et al, 2009, Transportation Research Part A 43(2009): 339–348

From abstract. A review of the sustainability literature reveals the lack of viable frameworks and management tools that can be used to accommodate both spatial and temporal variability in how stakeholder entities meet their sustainable development goals, taking into account the fact that different entities may need to pursue different priorities and also deal with different constraints and schedules at different stages of their development. This paper presents a sustainability footprint framework and model that may be used in analyzing the impacts of transportation and other infrastructure systems on regional sustainable development. A specific application of the framework is in the quality of life contributions that transportation systems may make to communities as a function of their impacts on natural assets that contribute inputs and absorb the byproducts of development.

[Check WSDOT Library for availability]

Sustainable urban transport: Four innovative directions

Todd Goldman and Roger Gorham, 2006, Technology in Society 28(1-2): 261-273

This paper argues that most sustainable transportation policies developed since 1996 fall short, failing to deal with the complexities of greater networks in which transportation is embedded or to provide meaningful goals for policymakers. A more helpful tool is the European Union's Sustainable Mobility, policy Measures and Assessment program (SUMMA), which allows for analysis of sustainability policies.

[Check WSDOT Library for availability]

Sustainable Mobility, policy Measures and Assessment [European Commission program]

SUMMA aims to operationalise sustainable mobility and transport, and to assess the performance of policy measures with respect to economic, environmental and social sustainability. SUMMA helps policy makers to develop more efficient and effective transport policies that cater to the need for mobility while reducing transport's adverse impacts to acceptable levels.

<http://www.summa-eu.org/>

Sustainability in Transport: Implications for Policy Makers

Anthony Dormer May and Mary Crass, 2007, Transportation Research Record 2017: 1-9

Abstract. This paper draws on a review prepared for the meeting of the European Conference of Ministers of Transport in May 2006. Four separate studies were considered: reducing CO₂ emissions from transport, accessibility for those with reduced mobility, implementation of sustainable urban travel policies, and road safety. The purpose of this paper is to draw together the common strands related to sustainable transport and to make recommendations for ministers and their advisers. In doing so, it concentrates on the barriers to achieving sustainability and the ways in which they might be overcome. The paper starts by considering definitions of sustainability and the underlying objectives that governments might pursue. It then considers the varying contexts within which these objectives might be pursued. It reviews the policy instruments that might be employed in achieving these objectives and reviews the barriers to their introduction. Finally, it offers a series of recommendations to governments on ways of overcoming those barriers. The issues raised are of concern to international policy makers. To focus discussion, the questions for ministers in the original version have been recast as issues that policy makers may wish to consider in their own contexts.

[Check WSDOT Library for availability]

Partnerships for Progress: Toward Sustainable Road Systems

Roger Toleman and Geoff Rose, 2008, Transportation Research Record 2067: 155-163, TRB Accession No. 01116566

From abstract. The paper first reviews four perspectives of sustainability: negative, superficial, weak, and strong. It then evaluates how the ethical principles of strong sustainability could translate into transportation sector policy, based on the Swedish Vision Zero approach to road safety, within the overall concept of sustainability across society. Understanding of the implications of a possible sustainable road transportation infrastructure policy involves a preliminary evaluation of potential changes in current transportation institutions in the light of a number of indicated outcomes in a framework of pricing and investment, integration, mobility, and modal change. Four broad classifications of road infrastructure organization are then reviewed: departmental systems, public agencies with a degree of political independence, government-owned companies, and public-private partnerships. In each case, the structures are reviewed to understand the potential for sustainable outcomes from current systems, together with the likely consequences for future elected government functions. The paper concludes with a brief examination of the political process of change and the need for change to bring together community partnerships to support progress.

[Check WSDOT Library for availability]