

Sustainable Transport: Definitions and Responses

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What are the ranges of definitions of sustainable transportation in practice today?

How do these definitions impact how transportation sustainability is addressed?



“Transport that meets the current transport and mobility needs without compromising the ability of future generations to meet these needs.” Black, 1996

This is based on the 1987 Brundtland report definition of sustainable development.



“Transport and mobility with non-declining capital, where capital includes human capital, monetary capital, and natural capital.”

Generally attributed to Herman E. Daly (1992) and D.W. Pearce, et al. (1993)



Daly also states conditions for any sector being sustainable:

- 1. The rate at which it uses renewable resources does not exceed their rates of regeneration;**
- 2. The rate at which it uses non-renewable resources does not exceed the rate at which sustainable renewable substitutes can be developed;**
- 3. Its rate of pollution emissions does not exceed the assimilative capacity of the environment.**



Sustainable transport is transportation where the beneficiaries pay their full social costs, including those that would be paid by future generations. Lee Schipper, 1996

He generally attributes non-sustainability to the negative externalities generated by transport.



Deborah Gordon (1995) notes the visions underlying sustainable transport. These include:

- 1. Changing people and the way that they live**
- 2. Changing technology**
- 3. Changing prices**



Centre for Sustainable Transportation (1998) views a sustainable transport system as one that:

- 1. allows the basic needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health, with equity within and between generations;**
- 2. is affordable, operates efficiently, offers choice of transport mode, and supports a vibrant economy;**



3. limits emissions and waste within the planet's ability to absorb them, minimizes consumption of non-renewable resources, reuses and recycles its components, and minimizes the use of land and production of noise.



Mobility 2001 report (MIT and Charles River Associates) defines sustainable mobility as “the ability to meet the needs of society to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values today or in the future.”



Transport Canada (Bell, et al, 1997) sought to define “a more sustainable transportation system” as “one which provides affordable access to freight and passenger service and does so in an environmentally sound and equitable manner.”



More recently Transport Canada (2003) has identified a framework that addresses the social, economic and environmental elements of a sustainable transport system. They seek “the highest practical standards of safety and security,” economic efficiency, and respect for the environment so that transport’s impact on the environment and health of Canadians is acceptable to current and future generations.

Why is the current Transport System Non-sustainable?



Diminishing petroleum reserves

Global atmospheric impacts

Local air quality impacts

Fatalities and injuries

Congestion

Noise

Low mobility

Biological impacts

Lack of equity

Impacts of Definitions on How Transport Sustainability is Addressed - I



Diminishing Petroleum Reserves:

- 1. CAFE standards; gas guzzler taxes - national**
- 2. Hybrid vehicles – industry**
- 3. ITS – industry, government and local**
- 4. Alternative fuels – industry**
- 5. Decreasing travel and fuel use through zoning - local**

Impacts of Definitions on How Transport Sustainability is Addressed - II



Global atmospheric impacts (CO₂ and CFCs)

- 1. Limit greenhouse gases (carbon dioxide, CFCs, methane) through agreement – national government, e.g., Kyoto Protocol.**
- 2. Mandate vehicles that emit less CO₂ – State of California**
- 3. Montreal Protocol for CFCs**

Impacts of Definitions on How Transport Sustainability is Addressed - III



Local air quality impacts

- 1. Emission levels – government and industry**
- 2. Inspection programs, removing older vehicles from the fleet, etc. – local and national**
- 3. Acid deposition levels – governmental regulations and legislation, e.g., 1990 CAAA**

Impacts of Definitions on How Transport Sustainability is Addressed - IV



Fatalities and injuries

- 1. Significant improvements over the years through regulations (seat belts and use, air bags, highway improvements, speed limits, misc. laws)**
- 2. Target as of March 2004 (33% decrease) through: seat belt regulations, drunk driving law enforcement, hours of service regulations for trucks**
- 3. Some of this could be helped locally – traffic calming, speed limits, etc.**

Impacts of Definitions on How Transport Sustainability is Addressed - V



Congestion

- 1. Controlled primarily on the local level through placement of ITS, highway construction or expansion, parking control, teleworking laws, creating car pooling arrangements, etc.**
- 2. Leveling off recently. It influences all other negative externalities in urban area.**

Impacts of Definitions on How Transport Sustainability is Addressed - VI



Noise

- 1. Local problems are handled by placement of sound absorbing walls and barriers.**
- 2. Not as easy to solve in Europe and Asia.**
- 3. There are technology improvements being worked on here and in Asia by industry and academia**

Impacts of Definitions on How Transport Sustainability is Addressed - VII



Low mobility

- 1. Often overlooked in discussions in developed world; major problem in developing world.**
- 2. Standard approach in developed world is the provision of transit facilities by local areas.**
- 3. Many unique ways of generating funds for this purpose (see inter alia Unfare Solutions).**
- 4. In less developed world there is a need for funds for transport development projects.**

Impacts of Definitions on How Transport Sustainability is Addressed - VIII



Biological impacts

- 1. Local negative problems to large extent that can be addressed through: protection of habitat through zoning or regulations; care in plant introductions; tunnels can decrease local animal deaths; care in handling materials.**
- 2. Positive impacts would be expansion of species, e.g., rock doves.**

Impacts of Definitions on How Transport Sustainability is Addressed - IX



Equity

- 1. Anything positive done in previous eight areas would help on the transgenerational equity issue.**
- 2. There is some confusion on the part of many as to what an equitable system is.**
- 3. Do we mean fair and just? Do we mean equal? They are not the same.**
- 4. It is a problem that will probably have to be addressed on local level.**

Impacts of Definitions on How Transport Sustainability is Addressed



Some aspects are not reviewed here:

- 1. Ability to communicate – Mobility 2001**
- 2. High level of security - Transport Canada 2003**
- 3. Several indicators – they are not the goal, but indications of something to strive for**

Impacts of Definitions on How Transport Sustainability is Addressed



It is important to address all of the significant dimensions of sustainability, but this can be overdone.

We must not place so many requirements on the concept, for if we do we may fail to achieve anything approaching a sustainable system.