

## Supporting Product

# Sustainable Transportation

### Purpose

This document examines transportation in the context of sustainable development, and reviews Israel's performance relative to other countries.

### Context

The term sustainable transportation describes a transportation network founded on the principles of accessibility, integration, prioritization for public transportation, and protection of the environment.<sup>1</sup>

Sustainable transportation influences quality of life. An effective transportation system is a prerequisite for an environment that supports growth and an individual's economic security.<sup>2</sup> In addition, sustainable development minimizes health and environmental risks to individuals and promises prosperity for future generations.<sup>3</sup> Therefore, advancing sustainable transportation advances the Israel 15 Vision – making Israel one of the fifteen leading nations in quality of life in fifteen years.<sup>4</sup>

### Principles of Sustainable Transportation

The Reut Institute identifies four vital principles which act as a basis for any sustainable transportation system:<sup>5</sup>

- **Enhancing accessibility** – Mobility is not an aim in and of itself, but rather a means of facilitating access to activities.<sup>6</sup> Sustainable transportation systems enhance accessibility by

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<sup>1</sup> According to the UN Agenda 21, sustainable development is development in the present that does not sacrifice future generations' resources. For further details refer to: [Division of Sustainable Development, the UN Department of Economic and Social Affairs](#).

<sup>2</sup> An environment encouraging growth is one component of economic security. See Reut concept: Economic Security.

<sup>3</sup> Protecting the environment is one component of Personal & Physical Security. See Reut concept: Personal & Physical Security.

<sup>4</sup> The Israel 15 vision includes the following components: a rich and textured vision, identification of engines of growth, incorporation of unique advantages and disadvantages, cooperation between the government, the workers, and the employers based on trust, improving the government's ability to exploit opportunities and remove obstacles, defining the key indices relevant for measuring performance in comparison to other countries, & initiating a thorough and intense national discourse See Reut concept: [Top 15 vision](#).

<sup>5</sup> The Ministry of Environmental Protection's definition of sustainable transportation also includes returning public space to pedestrians and bicycle riders. See [The Ministry of Environmental Protection](#).

Dr. Noam Gressel adds the minimization of number of injured per capita as another principle. See: ["Transport sector, ecology and the public – on sustainable mobility, reporting and transparency"](#), [Tnu'a Ve'tahbura](#) (Traffic and transportation), 2005 (Hebrew only).

<sup>6</sup> Shifts in the placement of residence and employment centers in Haifa transformed the "Karmelit" to a transport vehicle that does not connect people to activities. See: Aydat, [Haaretz](#), (12/18/2007).

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reducing traffic loads and by providing high-quality service to all riders regardless of wealth or distance from the city center.<sup>7</sup>

- **Prioritization of public transportation** – Sustainable transportation systems give priority to public transportation in its intersections with vehicles,<sup>8</sup> and forces private drivers to pay the real price of driving.<sup>9</sup>
- **Integration between different means of transportation** – Sustainable transportation systems account for the differing uses of existing methods of transportation and guarantee efficient meeting points between them<sup>10</sup> that are easy for the rider to navigate.<sup>11</sup> The organizational structure of the various authorities involved in managing the system contributes to successful integration.<sup>12</sup>
- **Environmental protection** – Sustainable transportation systems minimize environmental degradation through reduced pollution of emissions and noise and through conservation of resources such as land and fossil fuels.<sup>13</sup>

## Measurement

There are international indices that measure different aspects of sustainable transportation. Nevertheless, there is difficulty in measuring some aspects of integration and equality in accessibility to transportation.

The following tables compare the performance of different countries in different aspects of sustainable transportation.<sup>14</sup>

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<sup>7</sup> In Israel, there is a wide gap in accessibility and quality of transportation between the country's center and the periphery. See: **Adva Center and Transport Today and Tomorrow Organization**, [Roads, Environment and Social Justice](#), 1999 (Hebrew only).

<sup>8</sup> Bus Rapid Transit, a transport system developed in Brazil and adopted world-wide including Israel (Haifa), replaces trains with large buses and receives priority by transferring lanes to bus only transportation. See: Goodman, Laube and Schwenk. [Curitiba's Bus System is Model for Rapid Transit](#), **Race, Poverty and Environment**, Vol.12 No.1, (Spring 2007); Shadmi, [Intelligent Transportation systems in Israel](#), **Ministry of Transport**, (Presentation).

<sup>9</sup> The car usage price does not take into account the negative affects that result from time loss in traffic, pollution, and damage caused by car accidents.

<sup>10</sup> Different means of transportation answer different needs. For example, urban buses efficiently connect railroad stations with the passenger's final destination in terms of price, land usage and time. In Paris there is a system of short-term bicycle rental which improves accessibility of short to mid distance destinations. For further information see: Dworschak, [Der Spiegel](#), (11/2/2007); Verma and Dhingra, "[Developing Integrated Schedules for Urban Rail and Feeder Bus Operation](#)", **Journal of Urban Planning and Development**, (9/06).

<sup>11</sup> A user friendly interface that provides the passenger with the capability to plan a trip from the beginning to its end regardless of transport type enhances integration. For example, [Transport for London](#) supplies information on busses, the subway, and trains. Another example of a user friendly interface is a "smart card" which enables a passenger to travel by several transport vehicles using single card. See: Hazelcorn, [YNET](#), (8/20/2007) (Hebrew only).

<sup>12</sup> For more information on the influence of organizational structure of a metropolitan authority on the efficiency of urban transport system see: Cervero R. "The Transit Metropolis: A Global Enquiry", **Island Press**, Washington DC, 1998.

<sup>13</sup> For example, the transport system in Portland runs several programs to encourage sustainability such as minimizing air pollution. For more information see: [The city of Portland's office of transportation website](#).

<sup>14</sup> The data is taken from different sources: IMD – efficiency of infrastructure, maintenance and development; GCI – quality of railroad infrastructure; Economist – crowded roads, car ownership, rail use per capita; ESI – fuel price; EPI – urban pollution.

<b>Variables Measuring Accessibility</b>			
Country Rank	Infrastructure Efficiency	Maintenance and Development	Quality of Railroad Infrastructure
1	Singapore	Singapore	Switzerland
2	Denmark	Switzerland	Japan
3	Switzerland	Austria	France
4	Austria	Hong Kong	Germany
5	Germany	Iceland	Hong Kong
6	Hong Kong	Denmark	Belgium
7	USA	France	Finland
8	Iceland	Luxemburg	Denmark
9	Sweden	Germany	Singapore
10	Belgium	Chile	Sweden
Israel	29	22	36

<b>Variables Measuring Integration and Prioritization of Public Transportation</b>			
Rail Use per Capita (km per capita per year)		Crowded Roads (cars per km of road network)	
Switzerland	2077	Hong Kong	286.7
Japan	1900	Germany	194.5
France	1237	Singapore	168.9
Germany	1169	Taiwan	148.6
Austria	1039	South Korea	138.4
Denmark	1036	Israel	105.9
Netherland	893	Italy	73.3
Italy	815	Portugal	62.5
Belgium	802	Japan	62.3
Britain	671	Britain	62.3
Israel	Less than 600	Netherland	57.9
Fuel Price compared to international average <sup>15</sup>		Car ownership per 1,000 people	
Britain	1.93	New Zealand	578

See Reut concepts: [Global Competitiveness Index](#); [The IMD Business School in Lausanne](#); [Environmental Performance Index](#). See also: [Environmental Sustainability Index 2005](#); Pocket World in Figures 2005 Edition, The Economist, Profile books, London.

<sup>15</sup> The fuel price in a state is divided by average global price.

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Iceland	1.9	Luxemburg	576
Finland	1.84	Iceland	561
Netherland	1.84	Italy	542
Denmark	1.79	Germany	516
South Korea	1.79	Austria	495
Sweden	1.79	Switzerland	493
France	1.74	Australia	488
Italy	1.72	USA	481
Belgium	1.7	France	477
Israel	1.48	Israel	233

<b>Variables Measuring Environmental Protection</b>	
State	Urban pollution
Sweden	15.3
France	16.7
New Zealand	16.9
Australia	18.6
Britain	19
Finland	20.6
Norway	20.7
Iceland	20.8
Germany	22.3
Canada	22.4
Israel	51.8

End.