

Sustainable road transport: Energy and Environmental Aspects

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Abstract

Road transport in Israel today, especially in the big cities, is becoming increasingly crowded and dense, with serious social, environmental and energy consequences. Traffic congestion causes a serious loss of time that generates high costs to the economy, waste of fuel, and increased emissions of pollutants and greenhouse gases. Instead of conventional expansion of infrastructure, which becomes insufficient within a short time (and even encourages a growth in the demand for private vehicle use), there is an urgent need for sustainable solutions.

Alongside technological measures, such as significant improvement in energy efficiency per kilometer and moving to cleaner, less carbon-intensive fuels, steps have to be taken to change consumers' patterns of transportation use. The obstacles in Israel result not only from economic or technological reasons, but from factors that could be addressed (though not easily) by policy changes in areas such as the company car benefit and car expenses in workplaces, lack of public transportation on Shabbat, and the Ministry of Finance policy regarding income from taxes on transportation versus environmental and health considerations.

Israel's population density is higher than that of any European country and is in third place in the world after Hong Kong and Singapore. We have to think about the future of our cities, considering this fact, and how they will look in years to come, so that they will not be clogged by traffic jams. Public transportation, including bicycles, as an alternative to private, is capable of delivering a sustainable solution. When residents are provided with accessible and relatively cheap transportation, it automatically affects society and the economy, and reduces disparities in society.

Israel is significantly encouraging private vehicle use in various ways, and provides too little public transport. Behavioral change is necessary, as well as improved urban

planning, changes in the transportation infrastructure, and adequate pricing that includes externalities. There is a need to raise awareness and change social norms.

Recommendations:

1. A comprehensive examination of the lifecycle of land transportation in Israel has to be initiated, which will include direct costs and externalities, and their impact on the national economy.
2. National preference should be given to sustainable transportation in general and to public transport in particular. Within this framework, a master plan is needed for public transport: an integrated, hierarchical, and inclusive system. The development of an interurban network will be based on a fast national train network between the four metropolitan areas: Jerusalem, Tel Aviv, Haifa, and Beer Sheva, at high frequency and with short travel times. The metropolitan network will be composed of high-density passenger systems, using a variety of transport technologies, hierarchical line network, and bus networks. There is no single solution for transportation in the periphery; every place has a transportation means that is most appropriate to this particular place and time.
3. Measures have to be taken to change policies that encourage private car use, including vehicle taxation and reimbursed vehicle expenses as an element of the salary, generous supply of parking spaces, and the like.
4. The psychological aspect has to be addressed, and educational actions have to be taken to change existing behavior patterns related to transportation.
5. Appropriate measures have to be developed to improve the system's functioning, and the models and assessment tools.
6. Appropriate weight should be given to the possibilities of using natural gas for ground transportation, both directly (CNG) and as a conversion source (GTL), especially in the Israeli context, given the existence of available sources of natural gas for many years.
7. Some forum participants recommend promoting the issue of electric cars, whose energy efficiency is at least 50% higher than that of gasoline-powered

vehicles and which allows the utilization of electricity produced by a variety of energy sources, including clean sources. On the other hand, there are those who oppose this recommendation and argue that a worthwhile and viable alternative is to continue the improvements of the internal combustion engine.

8. Transportation engineers should be trained with a different mindset than the one existing at the present, and the subject of sustainability should be included in their training.