

Impact of Car Dependency

The excessive use of cars is accompanied with a wide range of problems:

A. Environmental:

1. Cars cause serious local air pollution problems, such as toxic emissions (Nitrogen Oxides, Sulfur Oxides, volatile organic compounds...) that affect our health, and smog that affects visibility.
2. Cars contribute to global environmental problems that threaten the integrity of the planet, such as acid rain and global warming (25% of CO₂ emissions in Lebanon comes from the land transport sector).
3. Cars produce substantial noise pollution, especially in Lebanon, due to the dense traffic, old engines and excessive honking.
4. Cars are a great source of solid and liquid wastes that destroy the landscape and pollute the water and air. These wastes include lubricant oils, used tires, car batteries and scrapped vehicles.

B. Socio-economic and Health:

1. High car traffic and high frustration causes increased aggressive behavior.
2. High car traffic means a lot of time lost on the road, which decreases efficiency and productivity.
3. Excessive cars combined with weak traffic management increases accident risk. Road accidents cause nearly one death per day and over 3,000 injuries per year in Lebanon.
4. The total morbidity and mortality cost of air pollution in Lebanon amounts to \$130 millions per year.
5. The highest expenditure for the government is for the maintenance, rehabilitation and construction of roads and highway (around \$26 million for the year 2000) in order to accommodate the high number of cars.

Facts On Land Transport In Lebanon

1. The ownership rate in Lebanon is around 1 car for every 3 persons. This ownership rate is one of the highest in the world, even among developed countries.
2. There are around 1 million vehicles in Lebanon that are relatively old and poorly maintained.
3. There are around 900,000 (or 90 % of all vehicles) private cars, with an average age of 14 years.
4. The transport sector consumes around 45 % of total petroleum products imported.
5. There are 1.75 million daily-motorized trips within the greater Beirut area, of which 68% are done by the private cars (This percentage of private car usage is very high, even for developed countries, where it should not exceed 50%).
6. Daily-motorized trips within the greater Beirut area are expected to increase to 3 million and 5 million in 2005 and 2015 respectively.
7. There are around 38,000 red plates for taxis in Lebanon; whereas the need for public transport does not exceed 18,000 red plates.
8. In some areas of Beirut the total suspended particles (TSP) concentration ranges from 102 to 291 $\mu\text{g}/\text{m}^3$ (where as the safe level of TSP is 75 $\mu\text{g}/\text{m}^3$).
9. In some areas of Beirut the average noise levels exceeds 75 dBA, where as the standard level for developed land is 72 dBA.
10. The government has paid around 26,155,629 for the maintenance, rehabilitation and construction of roads and highways in the year 2000, and around \$564.3 millions were disbursed in the period 1991-2000.

Benefits of Adapting TDM Strategies in Lebanon

Transport Demand Management (TDM) strategies aim at reducing the use of the car and encouraging the use of green modes of transport (public transport, bicycles, walking...) by:

1. Improving the management and quality of public transport.
2. Improving the necessary infrastructure for the promotion of non-motorized modes of transport such as sidewalks, bicycle lanes...etc.
3. Establishing good traffic flow management by enforcing traffic laws.
4. Organizing on-road parking spaces.
5. Establishing good and reliable mandatory mechanical inspection for cars.

Benefits of applying this strategy include:

1. Reducing air pollution up to 80 % and noise pollution up to 50 % in areas of implementation.
2. Decreasing traffic congestion, thus increasing efficiency and decreasing aggressive behavior.
3. Decreasing government expenditure on road construction and road maintenance costs.
4. Increasing consumer savings on the operation and maintenance cost of vehicles.
5. Increasing road safety, since fewer cars mean less congestion and less aggression leading to safer roads.
6. Improving choice of transport: Even people who don't currently use transit may value having it as a mobility option for emergencies and future use.
7. Equity: Transit provides basic mobility for people who are economically, physically and socially disadvantaged.
8. Efficient land use: Reduction of road and parking constructions from reduced travel demand, leaves the available land for more efficient use.

9. Economic development: Ex: Such as in the central district (down town), where cars are not aloud to enter. Now it is a popular attraction for tourists and entertainment.

Comparison Between TDM Strategy and Other Transport Strategy Options

Objectives	Fuel Efficiency Standards	Alternative Fuel Vehicles	Increase Fuel Taxes	Win-Win TDM
Energy Savings/CO2 Emission Reduction	2	2	2	2
Consumer costs savings	0	0	-1	1
Consumer choice improvement	0	0	0	2
User travel time, comfort and convenience	0	0	0	1
Equity impacts	0	0	0	2
Congestion reduction	-1	0	1	2
Decreasing accidents risk	-1	0	0	2
Road and parking facility costs	-1	0	1	2
Government costs reduction	0	0	1	1
Other environmental impacts	-1	0	1	2
Economic development impacts	0	0	2	1
Land use impacts	-1	0	1	2
Total	-3	2	8	20

-1 = Negative, Bad

0 = Neutral, no effect

1 = Positive, Good

2 = Very Positive, Very Good

The higher the total, the more positive is the option.

Major health and environmental effects of vehicle emissions

Substance	Major health and environmental effects
SO₂	Respiratory/cardiac problems Contributes to acid rain and wintertime smog formation
NO₂	Reacts with hemoglobin in blood, increases pulmonary infections, breathing discomfort, eye irritation Contributes to the formation of smog
CO	Replaces O ₂ in blood, increase in heart problems for cardiac patients, decreases the weight of newborn babies, increase in mortality rate of embryos and newborns, lethal at high doses
CO₂	Respiratory and cardiac problems Global warming
VOC	Respiratory problems (discomfort)
NH₄	Respiratory problems, lethal at high concentrations
PAH	Visual irritation and weakness, carcinogenic
PM	Respiratory problems, cough, chronic allergic reactions and pulmonary discomfort, eye irritation, carcinogenic
Lead	Accumulates in the bones, coma, brain damage, neurological disorders, inhibits physical development in children, anemia, headache, nausea, carcinogenic
Ozone	Forms free radicals and poisonous compounds, cough, respiratory problems
Photochemical smog and Acid rain	Metal and rock erosion