The main challanges of sustainable and healthy urban transport development in Georgia

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Low quality of air in urban areas is one of the main issues of concern of environmentalists throughout the world. Georgia is not an exception. In the 80-ies such cities of Georgia as Tbilisi, Rustavi, Kutaisi, Batumi and Zestafoni were included in the list of most polluted cities of the Soviet Union. At that time the main polluters of air were transport and the large industrial enterprises. In 1990-1992 due to the industrial breakdown and paralysis of transport the quality of air temporarily improved. But in 1993 along with the recovery of transport the quality of air in big cities started to deteriorate again. Since 1996 industry started to rehabilitate as well, though the entire recovery of former industry giants not seems to be realistic.

Transport and industry are the main fields that impact Georgia's environment. The expansion of environmental policies and their execution varied widely within these sectors during the past decade. But the leadership of the transport sector, as a main air polluter has stayed unchanged.

What are the key barriers for sustainable transport development in Georgia?

Legislation system. Georgian legislation system on transport and environment consists from different laws, presidential decrees, orders, rules and regulations (The national law on “Road transport” (1995); The national law on “Ambient air protection” 1999; The national law on “Traffic Movement Safety” 1999; The national law on “State Management and Regulation of Transport and Communication” (2001); The presidential decree #528 dated 1997 on "The Conception of Transport Policy of Georgia"; The presidential decree #302 on "Improvement of Ecological Safety of Road Transport" (2001); The presidential decree #211 dated 2003 “About Fuel Quality standarts”; The presidential decree # 258 dated 1997. "About approval of State program on Traffic Safety in Georgia”). Also in our country still are functioning amended Soviet Standards. But enforcement and implementation of above laws remains as the main problem.

***Fuel quality*.** The composition of fuel affects vehicle emissions. For instance, high lead or benzene levels in petrol cause high lead and benzene concentrations in the exhaust emissions.

Gasoline and diesel are products subject to the Rule on import of products subject to obligatory certification. But with fuel imported from NIS countries (usually diesel), the Georgian certificate is issued based on the NIS certificate. As a result, very little diesel is tested. For fuel originating elsewhere, the importer must submit a sample to a certified laboratory accredited for such work. The laboratory analysis is carried out according to 1970s Soviet standards. Only RON and lead content are measured. Few of the fuel-testing laboratories are functioning at this time, the lab equipment is insufficient and/or the testing protocols are not being enforced. Gas stations do not properly identify fuel quality. Overall, it is generally difficult to obtain accurate information on fuel quality.

The various technologies have different fuel-quality requirements. Soviet models can run on low octane gasoline; European models run better on higher-octane gas. One way to increase a fuel’s octane level is to add lead. Also, many older cars require leaded petrol because the lead lubricates and protects the soft valves. The EEC standards require catalytic converters on petrol-powered cars, engines designed for high octane/unleaded petrol (lead destroys catalytic converters). Georgia is importing increasing numbers of 2nd hand European cars with catalytic converters and it imports a lot of low octane gas, which is at times manipulated through the addition of lead, to obtain higher octane/leaded gasoline.

The legal basis for phasing-out lead to 0.013 grams/liter is the 1999 Law on Amendments and Modifications to Some Legislative Acts. The law does not clearly define the functions of the various executive bodies and the law does not regulate other hazardous substances, e.g., other aromatic hydrocarbons. And the law simply proved un-implementable. Georgia now aims to follow the Common Policy for NIS countries, which will phase out leaded petrol between 2005 and 2008. A special commission on Fuel Quality Improvement prepared the Strategy (Concept) of the State Programme for the Improvement of the Gasoline Quality in Georgia. The strategy was recently approved.

Improving fuel quality and the use of good quality gasoline will require a number of interrelated interventions, as listed in the documents already available in Georgia. Required interventions include: changes to the criminal code and the administrative code (with strict criminal and administrative sanctions for non-compliance); developing improved fuel standards; developing modern refining capacities (to produce lead-free high octane gas); implementing better controls at the border (about 60% of the fuel enters the country through illegal channels); providing better wages for staff involved in fuel testing; improving fuel-testing procedures and equipment; implementing strict inspection of the wholesale and retail distribution network and gas stations; requiring exact naming at gas stations; increasing public awareness of fuel-quality issues and vehicle fuel-need requirements; slowly replacing the old car fleet; improving garage services and repairs; improving vehicle testing; banning the import of lead, except for small quantities for scientific research; and developing an appropriate monitoring and control system.
An important psychological point also should not be forgotten _ the owner of old car is not interested in good maintenance of the vehicle. In case of high differences in petrol prices often prefer the cheapest one even if the other choice is financially affordable for him.

There is obvious necessity of development of the sufficient fuel quality control system.

Traffic management. Although more than half of the Georgian population lives in cities, urban areas are not well planned to separate their inhabitants from poorly controlled sources of pollution. As a result, residents are exposed to extreme air pollution, hazardous materials and other wastes, and noise from traffic. Road and parking lot designs promote traffic congestion, and result in increased emissions from vehicles. Parks and recreational green areas are very limited in cities. In recent years, with the development of the market economy, new commercial ventures, market places and service facilities have been built without due regard to the environment.

The city has poor network of avenues and wide streets. The state of most streets and roads today is extremely unsatisfactory. Apart from the main two or three streets the holes, trenches and chasms on the road surface provoked by roadwork, rain or heat is typical. In addition traffic lights (telemathics) are not functioning in many places. Certainly this causes the non-optimal operational regime of traffic and as a consequence an accelerated growth of emissions.

The situation is worsened by bad conditions of secondary streets and lack of special parking facilities.

An additional burden to the town is posed by transit movement of traffic. Transit cars pass through main avenues and streets of the town. Only the two main roads, linking Tbilisi with the west, are adapted to reasonable heavy traffic and even they would not carry the load that a major transit system would entail.

Insufficient organization of traffic results in jams and worsens air quality. Main streets (Rustaveli av., Tsereteli av., Kostava St.) in Tbilisi are overloaded (4200-4500 vehicle per hour in both direction). Towards unloading of streets some activities have commenced.

Vehicles conditions. Majority of road vehicles (total number of vehicles approx. 323614) in Georgia today both public and private is of 15-20 years old. This is only the one reason of poor conditions of the vehicles on move. The owner of the old car has little interest to maintain the car properly even if he can afford such service. The other reason is non-sufficient car service system. The service is undertaken by technicians without any special qualification or by the garages without any certificate. Recently few local offices of well-known automobile companies have been opened so one could expect that at least new cars whose owners are able to pay for proper service would have sufficient maintenance. But this is of great suspect. Even in such offices technicians lack knowledge on modern automobile systems _ at least we could not find any person understanding construction of modern emission control systems of vehicles. This companies usually provide Georgian clients with cars without any control devices _ otherwise they can't guarantee the duration of operation and safety of the car.

Age profile of vehicles in Tbilisi

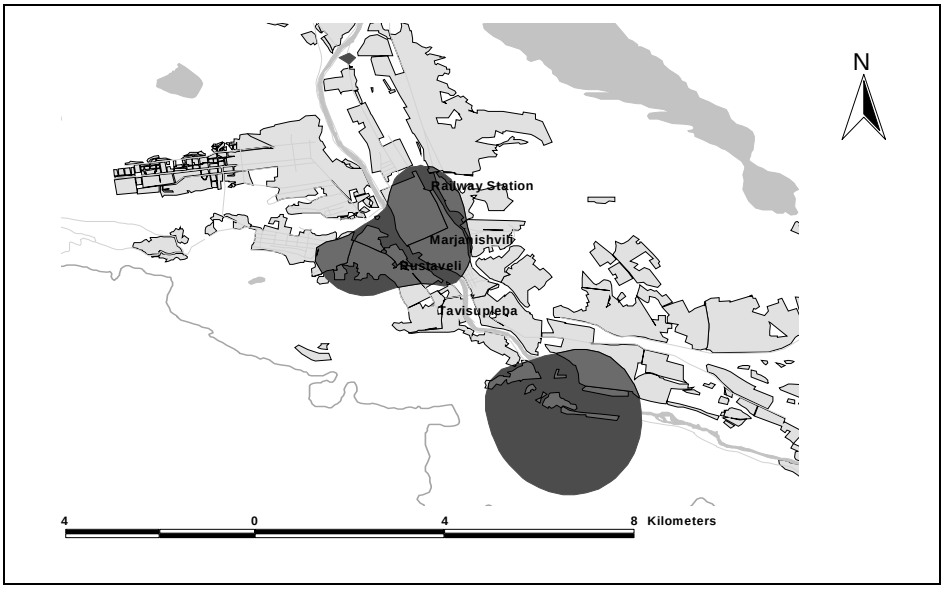
Age range	0-5	5-10	10-15	over 15
%	10	30	40	20

Yearly vehicle inspection is based on out-of-dated standards and thus is not effective. No inspectors have any understanding of construction of the modern vehicles and their emission control systems.

No restrictions on the age of vehicles on road, even for public transport.

There is obvious necessity of further development of the vehicle control system especially in terms of differentiated approach to the Soviet-made and European, as well as to the old and new cars.

Health Effect. Estimation of number of people exposed to NO_2 high concentrations showed that more than 165 thousand inhabitants of Tbilisi are affected by traffic.
Regarding *emissions,* the available data indicates that mobile sources are responsible for an increasing share of the total air emissions, from about 70% in 1991 to about 91% in 2001. Of note, mobile sources contributed 31% of the dust, 37% of the SO_2, 98% of the CO, 82% of the NO_x, and 90% of the non-methane VOC in Georgia in 2001. Transport is also contributing an increasing share of the CO_2, from 11%–31% in the 1990–1997 period. There are no routine data available on some of the other important transport sector emissions, such as hydrocarbons (HC) [also called "volatile organic compounds" (VOCs)], ozone (O_3), noise, and *persistent* compounds, such as lead (Pb) and polynuclear aromatic hydrocarbons (PAHs). Of note, for a number of reasons, (e.g., age and origin of the vehicle fleet and insufficient fuel-control system, vehicle-control system, traffic circulation management, and public transport management), vehicles in Georgia generate very dirty emissions.



Public transport. Tbilisi used to have quite well developed public transport system represented by underground, city buses, trolley buses, tram, mini-buses and taxis. Buses and trolley bus moved regularly from the very early morning up to the midnight, although in rush hours congestion was a problem.

The "big-bus" and "electric transport" focus of the Soviet period collapsed following independence due to financial constraints; to fill the severe shortage in public transport, private operators entered the system. The use of electric transport [trolleybus (272 km), underground (27 km), and tramway (36 km)] —the most economical and more ecological means of transport— showed a slight negative trend in the 1993–2001 time period, whereas the number of bus passengers first collapsed and is now slowly increasing. People have for the most part been drawn to the more numerous, flexible, and frequent mini-buses. The users do complain about the bad condition of the vehicles, the poor driving habits of the operators, and the lack of cleanliness on board, but in general, service frequency, overcrowding, and cost are the customer concerns. Drivers are often risking security in order to maximize profits and overload their vehicles.

Electric transport still remains in state ownership. It suffers from lack of new vehicles, bad maintenance of existing ones and the main problem of the town _ continuing electricity cuttings, especially in winter season.

No proper management of the public transport exists. Even the ownership is not clear yet. So-called Municipal Enterprise Tbiltrans owns city buses and trolley buses. Minibuses and taxis are mainly private.

There is obvious necessity of proper development of transport demand management programme and the public transport management system in the town.

Public participation. Public awareness in the field of environment has a substantial legal basis in Georgia. Free access for everybody to the environmental information is declared by the Georgian Constitution. Public involvement in decision-making is one of the EIA process requirements actually on stream. Two dozen of NGO-s with environmental interest are vigorously cooperating with official authorities.

The problem of the basis for effective decision-making in Georgia is a very important one. Communication on environmental issues, through the mass media, publication, reporting and public participation in decision-

making, is considered vital in achieving environmental objectives. But the information generally available mostly consists of rather crude estimations poorly suited to decision-making.

But today there are whole sectors of Georgian life, which are informational white spots due to both the general technical/financial and legislative inadequacies and the absence of a strong incentive to fill the gaps. For example, people in Georgia are not aware about public transport and traffic safety and pollution problems.

It is in the interest of the whole society to develop new concepts for improving all areas affecting the road safety and the environment, and also all other areas having impact on road safety, i.e. improving roads and roads signs, information to the public, surveillance of road users, improving the traffic awareness both among youngsters and adults, and so on.