Sustainable Mass-Transit Options in Two Medium Size Iranian Cities
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Cycle of Traffic Generation;

- Widespread spatial expansion
- Subsequent rapid urbanization
- Population growth
- Ongoing rise in car ownership
- Lack of an adequate mass-transit
- Heavily subsidized fuel prices
- Traffic congestion levels
- Chronic air pollution
The fundamental causes of congestion:

- The availability of cheap fuel (about 10 US cents per liter),
- Massive increase in private vehicle ownership, and the development of local capacity in car manufacturing,
- Poor land-use planning and poor communications infrastructure,
- The lack of a good functional road hierarchy,
- The lack of a good road-based PT network,
- Poor road user behavior,
- Poor enforcement
Purpose of the Study:

- Examine effectiveness of various transportation measures in two typical medium size (0.5-1million) cities (Uromieh & Arak, Iran), to alleviate heavy congestion levels at peak hours.
- Assess economic benefit and disbenefit of transport policies and schemes.
- Assess mass- transit options and recommend a sustainable system.
- Draw up action plan for the two mentioned cities at forecast years.
Assessment Tools;

- Carried out a vast program of surveys, including HHIS, RSI, PT surveys, stated preferences surveys, cordon / screen line counts, etc…

- deployed Four-stage modeling approach to assess travel demand characteristics for both private and public transport at forecast years in AM, MD, PM peak and all-day (Using PTV-vision software (VISUM) )
Policies and schemes to cap travel demand and reduce forecast congestion levels;

- Congestion Charging and restricted traffic zone (RTZ),
- Staggered working hours,
- Odd/Even number plates-scheme,
- Bus network improvement and expansion of dedicated bus lanes,
- Mass-Transit options (BRT, LRT, Metro, …),
- Road network improvement (Ring Road, by-pass, new roads, widening schemes, grade-separated junctions, etc…),
- Pricing policies, fuel rationing, raise VOC, road tax, fuel prices, land use,
- Traffic Management (restraint, restriction, limitation, avoidance, …)
- Parking Strategy and Management
The Evaluation Process;

- For each item in the previous slide (scheme), a number of possibilities were identified and subsequently tested, to identify most beneficial option(s),

- These were grouped/ integrated in to a number of scenarios, resulting in packages of measures, for comparison purposes,

- Short-listed scenarios were assessed and evaluated for traffic, economic, social and environmental impacts.
Characteristics of the cities studied;

**city of Uromiyeh**
- population of 0.58 million in 2006,
- an area of 5.25 hectares,
- surrounded with agricultural lands,
- annually attracts half a million tourists.

Trip production and attraction in the morning peak hour
Characteristics of the cities studied;

**city of Arak**
- population of 0.45 million in 2006,
- an area of 5.34 hectares,
- a highly dense industrial city.

Trip production and attraction in the morning peak hour
Volume to Capacity Ratio and demand volumes in the network in base year and 2026 in Uromiyeh (AM Peak)
Volume to Capacity Ratio and demand volumes in the network in base year and 2026 in Arak (AM Peak)
in spite of all conventional measures selected, and assuming financial resources are in place to implement them, in the do–something scenarios (AM Peak), traffic levels and travel demand and consequent congestion levels remain high. Therefore, a need to adopt more radical measures.
Summary;

Congestion charging, a progressive and effective policy valued and accepted by the transport authorities. Through raising the levy, demand to enter city centers could be regulated. Such that network capacity in the city center is not exceeded. Causes business migration to outer areas and hence with time problem in transferred to peripherals.
Summary;

Staggered Working Hours, spreads the peak hour, creates more capacity during the peak period, will result in release of suppressed demand and congestion levels return to previous levels, causes hardship to families, could raise the need for vehicle ownership and could also increase travel costs to the families. This scheme was not included in the final action plan, but could remain as an option for future decision.
Summary;

Odd/even number plate schemes, shifts congestion to peripherals, increases traffic violations, causes hardship and restricts freedom of choice on travel day(s), stretches already limited police resources, creates the need to automatically control gantries through image processing cameras, need for establishing or expanding traffic control centers and hence imposed investment needs. This scheme, though evaluated, but is not included in the final measure of actions (in addition to restricted traffic zone, the scheme is currently in operation in Tehran).

Parking supply needs on zonal basis were identified and recommended. Similarly, network expansion, widening, geometric changes are planned over a number of phases.
Summary;

Dedicated bus lanes, focuses on people and not cars only, relatively easy to install, low cost of implementation, socially fair, if criteria for selection of DBL(s) are carefully studied and properly consulted, the scheme is likely to yield high benefits. If fragmented, it will constrain effectiveness, best to plan continuity in the DBL network. The scheme is adapted in most scenarios studied and relating package of measures. The scheme is recommended to be included in the final Action plan.
Summary;

**BRT systems** were shown to yield higher benefits when compared to LRT systems. Considering the issues of technology, construction costs, operational and maintenance costs, the problem of sanctions, etc. and given the high demand along some corridors and associated high benefits in implementing this system, the system is recommended in both cities. Integration of BRT with non-motorized transport, progressive land-use policies and recommended car restriction measures could form part of a sustainable package of measures in a way to achieve a more effective urban environment.
Summary;

Fuel rationing, a socially right solution, given the circumstances in Iran, it limits subsidies targeted towards relatively well-off sectors of the community, a new policy to manage demand and to achieve lower congestion, reduces pollution and traffic accidents, considering the issues of global warming and climate change, rising global demand for petrol, insufficient global production capacity, high oil prices experienced in recent years, this scheme can be highly effective in capping demand by causing forced modal shift to PT system. This scheme has been in operation since August 2007. The ration has gradually reduced from 120 litres per month, currently stands at 60 litres per month, per vehicle. For consumption needs above 60 litres/ month, the fuel costs 4 times the value offered through rationing scheme.
Conclusions;

- The availability of low fuel prices (about 10 US cents per litre), has resulted in generation of huge volume of in-essential trips, limiting reasonable access to socially beneficial trips.

- In spite of comprehensive package of measures recommended in the action plans, and associated heavy investment needs to implement the proposed schemes, the future traffic conditions do not look any brighter. Hence the need for more radical measures to complement public transport development and improvements.
Recommendations;

1. Value of traffic management in large conurbations/developing countries.
2. Fixed Matrix vs. Variable Demand Matrix
3. Travel Demand Validity when heavily subsidized
4. Problem with conventional methods in Transport Economic Evaluation

- Developed nations vs. developing countries
- bias towards private car
- Municipal financial resources
- Justice in planning accessibility
Thank you for your attention