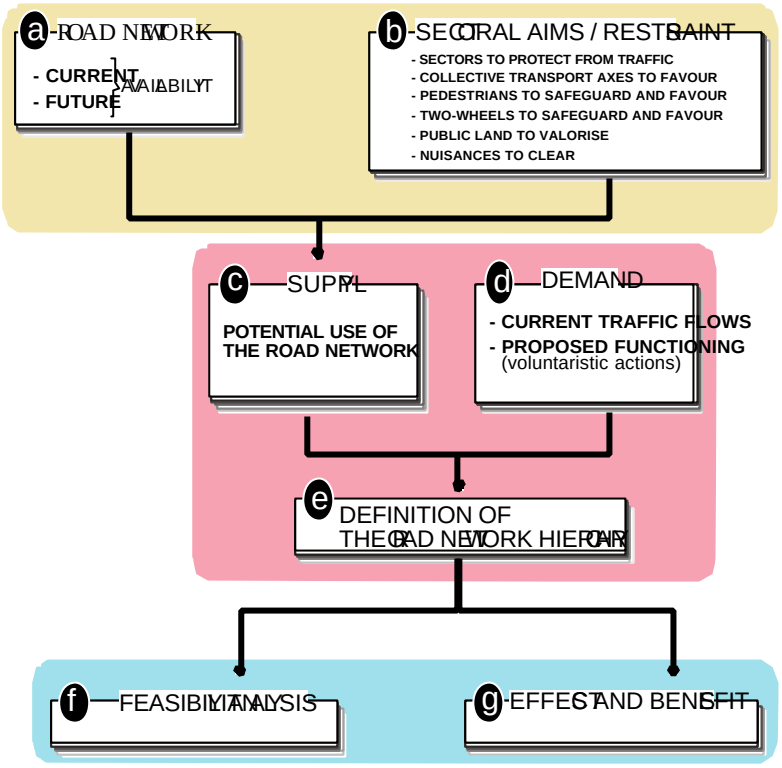

Definition of a future use road network potential: a new approach in urban transportation planning

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Abstract

When defining a plan for urban development transportation, not only the transportation criteria must be taken into account in a new organisation of town transportation, but also all quality of life improvement and environmental factors should be tackled. The communication intends to present the original approach adopted by Transitec in the past few years in many Swiss, French and Belgian towns, in relation to transportation.

The presentation sets out the methodological approach adopted, and further illustrates it through concrete examples taken from recent studies concerning traffic plans in Swiss and French towns, respectively Geneva and Grenoble.

Keywords

Urban planning – traffic – methodology - transportation – Swiss Transport Research Conference – STRC 2001 – Monte Verità

1. Introduction

Urban mobility and town transportation problematics are mainly approached, unfortunately could we say, by an unilateral way, this means "monomodal". This approach often leads to strong difficulties, when the moment is coming to realise the recommended solutions. This monomodal approach can be seen frequently in France, in the "Plans de déplacements urbains" (PDU) studies. Each transportation mode (traffic, mass transit, 2-wheels, pedestrians) is analysed for itself. In other words, solutions given for one transportation mode can be at the opposite of an other mode's solutions.

Facing this malfunctioning, urban transportation planning must be approached with a global approach, that includes a lot of parameters.

The communication intends to present the original approach adopted by Transitec in the past few years in many Swiss, French and Belgian towns, in relation with transportation.

2. Methodology's aims

Urban transportation reorganisation leads, with studies like transportation plans, to a hierarchy of the road network.

This hierarchy must allow to give a response to the previous fixed aims, which are often contradictory. This hierarchy allows then to define accepted measures for each transportation mode. It's often imposed by several factors, which are mainly based on road network exploitation, such as:

- existing traffic volumes,
- nomber of traffic lanes,
- traffic flows to assure.

Generally, this kind of reflexion does not take into account impacts on the other transportation modes.

The recommended methodology consists to give a response to a mobility request done by cars, with an available road network, that means upon which restraints of the other's transportation modes or environmental conditions (specially noise) have been taken into account.

3. Recommended methodology

The methodology developed by Transitec considers several parameters, not only in transportation domain but also concerning environment, public land redistribution, quality of life, as restraints for the **definition of a future road network**. This methodology is illustrated by examples taken from two important studies:

• *Geneva, traffic study 2005* [1]: This study concentrated on further specifying the traffic organisation defined in the C2005 transportation plan drawn up in 1993, in order to determine a road network hierarchy:

• *Grenoble, draft project of the transportation general scheme* [2]: This study concentrated on defining a transportation scheme in the built-up area of Grenoble, by taking into account the possibility of realising a new important road infrastructure, i.e. the Tunnel under Bastille.

The methodology adopted for these two studies is the following:

3.1 Analysis of the available network

This is constituted by the existing network, which is often not extensible inside towns, and by eventual projects concerning additional implementations for the same network. This is the basic offer.

3.2 Definition of sectoral aims and restraints

It entails the listing of, along the axes included in the study:

• *sectors to protect from traffic*, particularly residential areas that show a certain homogeneity, which must not be cut by through traffic. Only local accessibility is allowed;

• *collective transport axes to favour*, with existing or projected axes. Future mass transit axes are particularly important, because they will induce traffic capacity restrictions (reduction of number of lanes, crossroads priorities, …);

• *pedestrians or two-wheels* to safeguard and favour;

• *public land* to valorise;

• *nuisances* to clear (air pollution, noise).

One example drawn from a recent study illustrates a way of taking into account one of those restraints:

Geneva

The **noise restraint** is usually determined by the extent of the sound emissions along the axes, on the basis of existing noise registers and according to the clearing priorities (e.g. with regard to Swiss legislation, exceeding danger values, non-respected immission values).Concerning the taking into account of noise-related aims and restraints, all thought based itself on the sound immissions register drawn up by the State of Geneva's Division of Ecotoxicology. A weighting was carried out of the places where danger levels (according to the OPB) were reached, according to population area and jobs per area, in order to underline the main sensitive points. Of these aims which rest upon "solid" bases, three levels of priority were determined for the clearing of the major roads of Geneva (axes to clear in 1st, 2nd and 3rd priority), and reported on the aims and restraints maps for each of the studied sectors (see Figure 1).

The synthesis of these aims and restraints (for each study) is presented with a map that contents all those elements, as shown in Figure 1 below, on the example of Geneva.

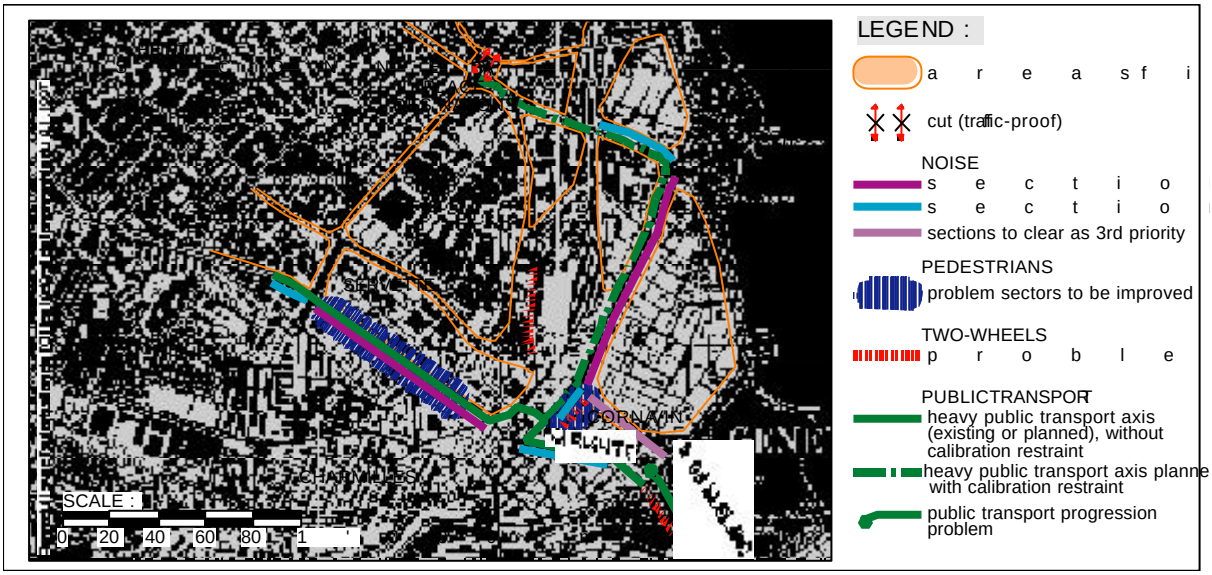

Figure 1: Actual and future aims and restraints (*Geneva, C2005*)

3.3 Available offer: network use potential

The superposition of an available road network and of sectional aims and restraints determined for this network leads to the definition of **network use potential. Contrary to most studies where the offer taken into account is simply the physical offer (number of lanes, intersection capacity,…), this approach consists in integrating right from the start the "global" offer, thus integrating the set of parameters connected with urban life**.

Questions that may be asked at that moment are the following:

"Should this road axe …

… accept more traffic level ?

… at worst, be maintained in its current state ?

… be solicited by less traffic volumes ?

… be reduced in terms of number of traffic lanes ?

… be closed for through traffic ?"

The result is expressed by means of a map of the area studied which displays:

- - axes where traffic volume reductions are necessary;
- - axes where actual volumes may be maintained;
- - axes where traffic volumes may be increased.

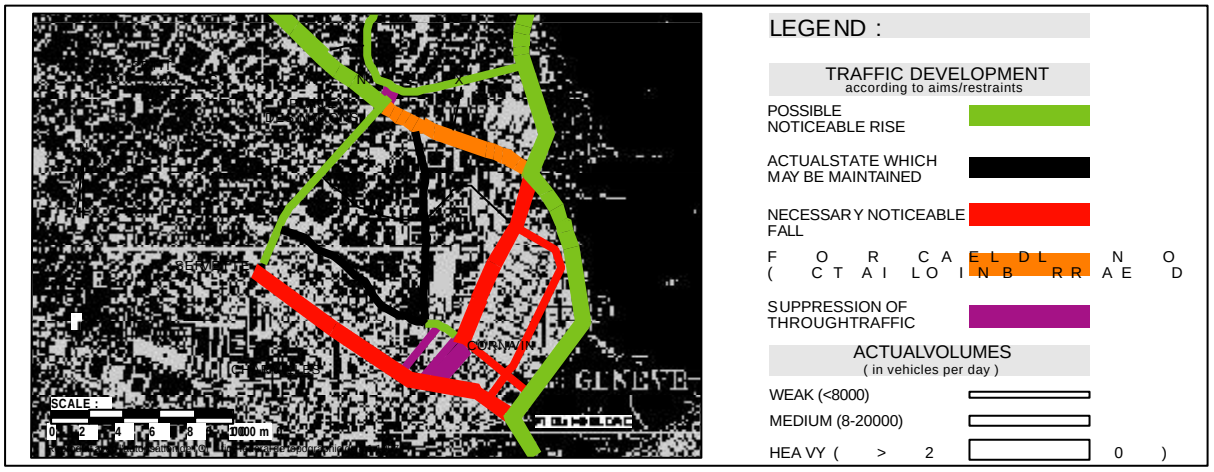

Figure 2: Network use potential (*Geneva, C2005*)

3.4 Transportation request definition

Needless to say, the former relies on:

- actual traffic (actual request satisfied),
- future developments,

but also, originality,

- of voluntarist functioning, chiefly based upon a transportation concept.

This concept concentrates on, for e.g., a selective accessibility to districts, a reinforced use of motorway infrastructures, and for a modal transfer of the road towards collective transports.

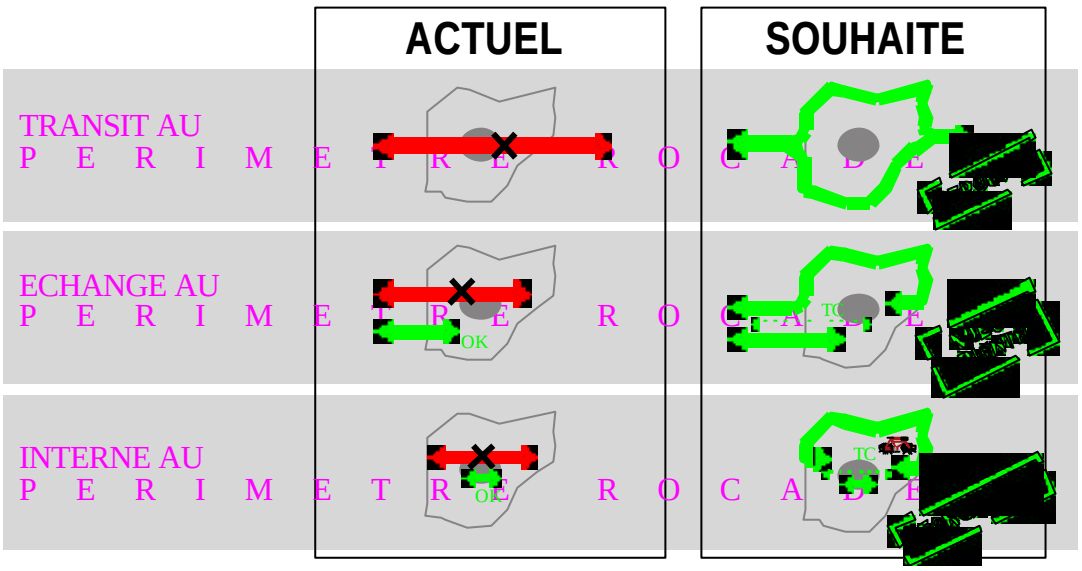

Figure 3: Transportation concept (Grenoble, Avant-projet d'organisation générale des déplacements)

3.5 Hierarchy of the future road network

The analysis of the transportation request, voluntarily orientated, and the network potential use previously defined shall indeed lead to a **hierarchy of the future network** in accordance with the transportation multimodal concept, thus enabling the attainment of the various determined aims.

4. CONCLUSIONS

The elaboration of a new traffic plan must contribute, to a certain extent, towards public land redistribution, quality of life and environmental conditions improvements in an urban area. This kind of reasoning should be systematically integrated in every single transportation planning approach.

Such a methodology gives an unique opportunity to work with other people like environmental engineers, architects, urban planners in a real multidisciplinary approach.

5. References

[1] Transitec Ingénieurs-Conseils (1997), Genève-Circulation 2005-Hiérarchie du réseau routier, DJPT-OTC

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