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Smarter and Greener City Owing to Travel Planners Used to Inform and Educate People – Recommendations Under the Green Travelling Project

Abstract. The article provides a discussion on a method for transferring information on capabilities of the transport system functioning in the given area by means of a specialised travel planner. Green Travelling Planner enables full review of the available travelling options, taking both individual and public transport into account. The planner’s structure makes it possible to overcome information barriers and prepare (educate) the travelling population to making more informed decisions concerning the choice of the means of transport.

1. Introduction

The term *smart city* entails application of numerous technologically advanced solutions. Flow of information is one of the fundamental conditions to be met in order for such solutions to properly function. Growth of contemporary municipalities requires implementation of a low-emission policy. Meanwhile, owing to the high availability of a passenger car, it is increasingly often that people choose the comfort of using one’s own car which, besides alienation, causes ineffective utilisation of urban space [27], [28]. Transport, including individual transport, is very land-consuming, whereas options of further expansion of the transport network, especially in heavily urbanised areas, have practically depleted. It is exactly the reason why undertaking efforts aimed at altering the modal split and reducing the share of passenger car in the overall transport volume is so important. It should be noted that reducing external costs (see [2], [6], [11], [12], [17], [18], [29] among others), and thus reducing negative environmental effects of transport, should become a priority activity in the nearest future ([5], [9], [16], [30]).

In order to improve the current state of matters, two different aspects may be taken into account in action. Firstly, one may attempt to force the travelling population to adopt specific patterns of behaviour, which may often face opposition of the community. The other solution

involves information and education, consequently triggering changes in the habits of travellers induced in an intentional and steady manner. The article concentrates on the latter approach and provides examples of practical solutions applicable in this respect. The case studies addressed have been prepared with reference to partial results of the international project entitled “A platform to analyze and foster the use of Green Travelling options” [1] implemented under the ERA-NET Transport III Future Travelling programme and co-financed by the National Centre for Research and Development.

2. Contemporary urban travelling methods

In rush hours, most travels are usually made in relation to work (from and to work) and education. They comprise a group of everyday travels. Therefore, the transition to eco-friendly travelling should primarily apply to this group. Within the recent years, owing to technological development, the traditional modal split (a division of travelling modes into walking, biking, passenger car and public transport [8]) has been substituted by a far more extensive scheme. The Green Travelling project included identification of 11 optional modes of travelling which have been implemented in Green Traveling Planner (GT Planner) [10], being the tool developed under the project (Figure 1).

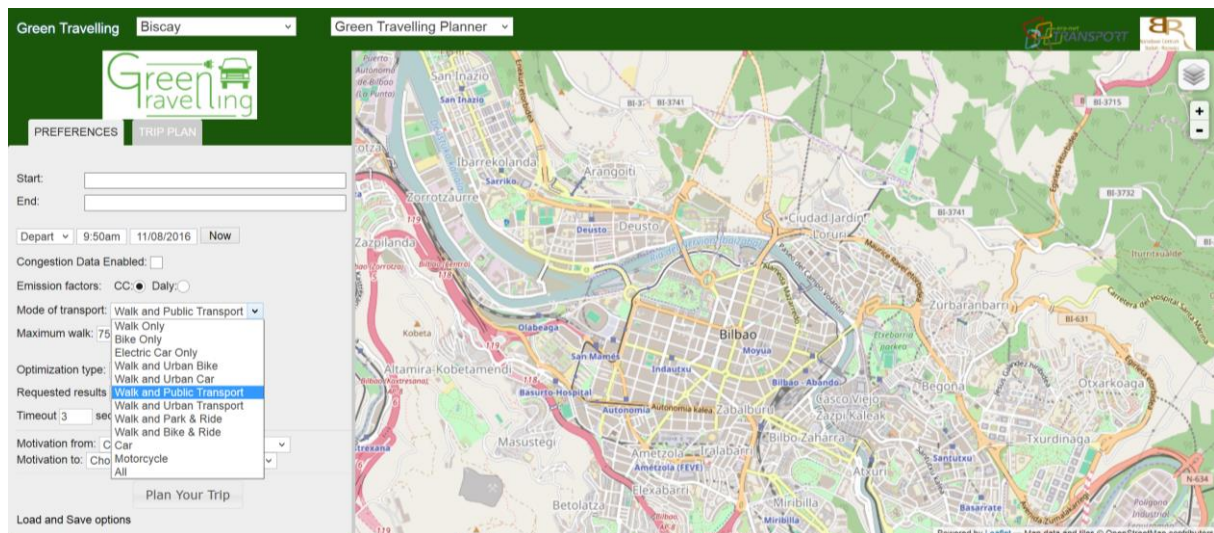


Fig. 1. GT Planner – available travelling modes (source: own research)

Despite the development of highly advanced technologies and organisational solutions, many city dwellers have decided to stick to their “regular” travelling modes. It is frequent that these

persons' knowledge does not reach deeper into the matter of the opportunities offered by the transport system of the given area. Consequently, information transfer appears to be indispensable in such a case. For only full knowledge about these opportunities allows for informed choices to be made. Among the alternative solutions offered by municipalities, one should mention urban bicycle rental or eco-friendly car rental services. They are solutions which do not match the traditional modal split of traffic, since on the one hand, they belong to the category of individual means of transport, but on the other hand, they are also rendered by local authorities (which makes them alternative forms of public transport). As far as collective transport (bus, tram, railway, underground etc.) is concerned, public transport is also subject to ongoing upgrading and development. The change in question applies to means of transport as well as to infrastructure and organisational elements. Nevertheless, the introduction of the change itself, without sufficient information and possibility to compare travelling offers, does not trigger any significant transition in the modal split of traffic to the benefit of new solutions. From such a perspective, the passenger car seems to be the only non-eco-friendly means of transport in this group, and so its share in traffic should be minimised. However, as technology evolves, what has been introduced into the market is cars whose drive systems reduce the transport-induced environmental nuisance to a considerable extent (by reducing noise and emission of harmful substances) [13]. Electric cars are the most popular solution in this respect. With regard to the foregoing, it is recommended that specific incentives be introduced, e.g. a system of recharging facilities.

On the other hand, the organisational solutions which should also be taken into account while planning a trip include Park&Ride systems, among others. They enable changing the means of transport from the individual into the public one, thus reducing downtown congestion.

This change has created new opportunities in terms of education of the travelling population. One should bear in mind that the choice of the means of transport depends on habit and tradition. The habit is what the given person is used to, and it has been moulded by parents, life experience and education. The behaviour patterns stemming from tradition define the generally acceptable mode of one's behaviour in the given sphere, considered as the most traditional or the most frequent one [4]. The solutions described in the paper may change the travel behaviour [23], [24], [25] pattern of travellers in both cases.

3. Application of GT Planner for information and education purposes

In contemporary smart cities, information transfer is prerequisite for their smooth and effective functioning [14], [15], [21]. The said transfer should ensure that travellers’ needs are appropriately defined (in line with the sustainable development definition [19]) and should support travelling persons in making decisions about the route and the mode of travelling [26]. One may distinguish between different forms of education, however, research implies that a habit or a strong conviction about legitimacy of a specific activity or attitude is attained most quickly by frequently and repeatedly addressing the given person with information about specific attitudes. In light of the foregoing, the option of using everyday solutions making life and existence easier gains a new educational dimension.

With regard to transport, a travel planner is indeed an example of such a solution [3], [7]. Many people travel around the given area without full information about the alternatives they are offered. It is a particularly frequent case that they choose a passenger car to travel because they do not know locations of public transport stops and consider timetables unintelligible.

The solution proposed, namely GT Planner, features specific characteristics of a travel planner, however, on account of the number of implemented travelling modes and route optimisation criteria, it may also be a major element supporting the development of smart cities through wide-scale provision of information about different transport-related solutions available in the given area. In the case discussed, there are two main goals pursued by that means:

- to communicate the full range of available travelling modes and consequences of choosing them (with reference to time, route length, cost, but also negative environmental effect);
- to indicate the most eco-friendly solutions and educate the travelling population by that means.

GT Planner makes it possible to find solutions for a specific travelling mode (e.g. “Cars”) and creates a list of available optimum routes according to a user-defined criterion (e.g. “Quicker”). At the same time, among the solutions found, one which is characterised by the least negative environmental impact is automatically highlighted (Figure 2a). In many cases, a solution only slightly inferior in terms of time, and sometimes even more advantageous in terms of cost, may prove to be more eco-friendly. The same applies to a full review of travelling modes (criterion “All”), as shown in Figure 2b.

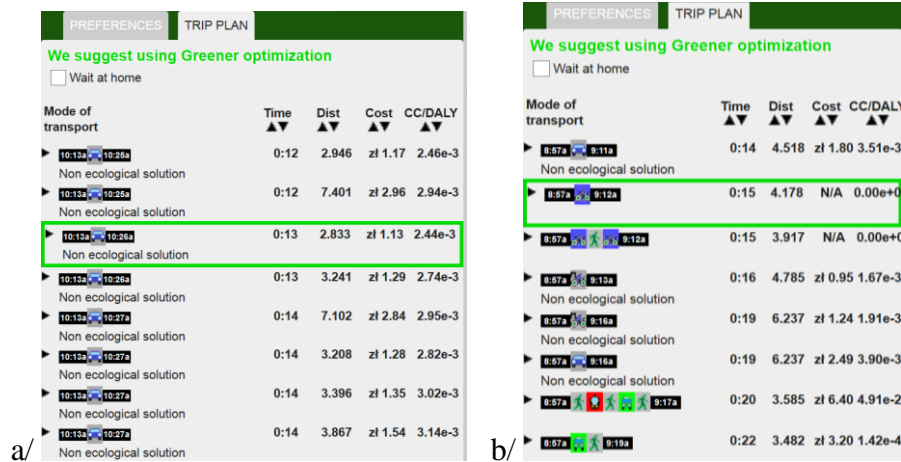


Fig. 2. Environmental education in GT Planner – indication of the most eco-friendly way to complete a travel regardless of the chosen travelling mode (for two different areas): a/ for the “Cars” criterion, b/ for the “All” criterion (source: own research).

Moreover, the solutions such as “Cars” or “Motorcycles” are marked as a “Non-ecological solution”. Also the information provided to a travelling person is assumed to perform an educational function. One of the criteria implemented in the planner is a search for the most eco-friendly solution (criterion “Greener” [20]). When any other criterion is chosen, GT Planner encourages users to apply environmentally friendly solutions [22]. Furthermore, users may each time sort the results obtained according to a secondary criterion, which improves the content received by enabling them to perform a two-step search (e.g. finding the fastest and then the most eco-friendly solution; see Figure 3).

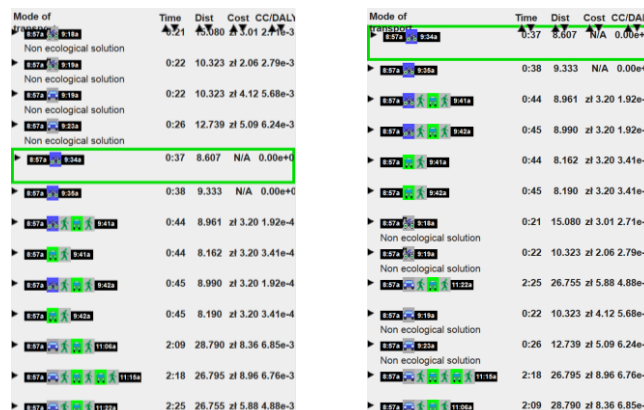


Fig. 3. GT Planner – sorting of results, i.e. the best travelling modes according to a different criterion (as the second step of the search) (source: own research)

4. Conclusions

Frequent everyday travels are made intuitively, without additionally searching for and reviewing all the available options. The core of the solution proposed (Green Travelling Planner), when perceived from such a perspective, is education through communication of two types of messages:

- full information about available travelling options (considered the best according to a specific criterion pre-set by the travelling person),
- in the event that a non-eco-friendly mode of travelling has been chosen, a hint about which of the solutions taken into consideration would affect natural environment the least.

Education in this scope brings knowledge on estimated external costs and fosters environmental responsibility among inhabitants.

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