

# The Design of Sustainable Urban Means of Transport for Tourism Use

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**Abstract.** The paper identifies economical transport solutions for a tourist use for visitors in the big cities of Romania and east-European countries as well. The experience of western countries has proven the efficacy of light railway transport systems for tourists, fact which led to the improvement of the time duration throughout a tourist circuit and, thus, to the growth of the life quality of the inhabitants of urban environments, by car traffic decongestion with coaches and minibuses. The reference examples are followed by a study case regarding a concept made at the Faculty of Visual Arts and Design, Iași. This study refers to the conversion of a conventional Tatra T4 tram into a vehicle adapted to the special requirements of tourist transport in the context of the constant growth of foreign visitors in Romania.

**Key words:** *public transport, tourism, design, sustainable technologies, life quality.*

## Introduction

Big European cities hold an impressive architectural heritage, a cultural thesaurus which attracts millions of people from all continents, each year. Since the end of the 1970s west-European cities have started to struggle with the tourist overcrowding problem, phenomenon which caused traffic jams, the growth of pollution indexes by using coaches and minibuses for moving around tourist objectives, factors which led to a lower life quality for residents. The configuration of historical cities, with narrow streets and tight road turns, does not allow the use of large vehicles for tourist transport, fact which led to the search of alternatives. One of the most effective alternatives has proven to be the use of trams for these special routes, historical cities having a wide network of tram rails since the 19<sup>th</sup> century. The economical solution meant the conversion of old trams, even some decommissioned, in order to meet the specific requirements of a tourist vehicle, such as: wide windows, comfortable chairs, shelves/ snack and drinks table, mini-bar, audio/video system. As a reference for this function one can see the historical tourist trams (Figure 1) in Lisbon (Portugal), The Hague (the Netherlands), Dresden (Germany), Prague (Czech Republic), Vienna (Austria), Istanbul (Turkey), etc. One can also see some vehicles which were readapted as a mobile restaurant, pub, café or brewery, besides having the tourist function, reference examples being in Brussels (Belgium), The Hague (Netherlands), Bern (Switzerland), Nuremberg (Germany), Milan (Italy), Turin (Italy), Brno (Czech Republic), Timișoara (Romania), Moscow (Russia), as well as in the USA or Australia. The converted vehicles become vectors of tourism development in their cities, encouraging the inhabitants to use as well an ecologic and sustainable transport system.



**Figure 1:** Tourist trams in the The Hague (1), Lisbon (2), Vienna (3)

### Analysis. Reference examples

Perceived as an enhancer of local tourism, the tram has had several new roles in the last decades, such as a mobile restaurant or brewery. In 2013, in Brno, Czech Republic, the well known brewery tram was launched, for the first time, equipped with beer dispensers and tables. The wagon brings a significant contribution to the image of the city which is a traditional producer in the beer industry, attracting thousands of tourists each year. In November 2013, in Timișoara, a tram modified after the same principles was inaugurated, dedicated to Timișoreana beer. The GT 4 Wegmann tram had its interior redesigned in order to serve the role of a mobile brewery and of a tourist tram. The nature of a tourist tram is strongly connected to the Timișoreana beer factory, the first one built on the present territory of Romania. The tram interior was completely reshaped, the interior design being made by designer Silviu Dănescu. He placed the bar area in the front side of the vehicle, after the driver's cabin. This area was equipped with characteristic furniture, beer dispensers, a fridge for refreshing beverages and storage spaces. The placement of the seats facing each other allows the fitting of tables with cup holders. The tram was equipped, in the rear side, with a complete sanitary group, having a septic tank. On the exterior, the tram was personalised both chromatically and graphically, in accordance to the interior aesthetics, the tourist feature of the vehicle being suggested through the inscription *TRAM TM TUR* (Figure 2).

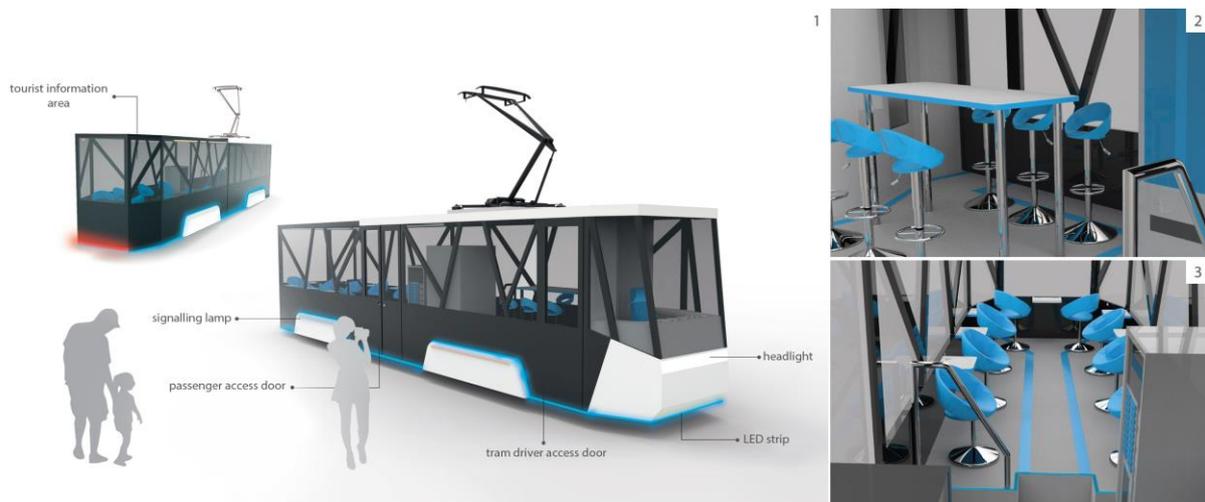


**Figure 2:** Brewery/ tourist tram (Timișoara)

### Case study

One of the most popular and reliable urban railway vehicles produced during the communist period is the Tatra T3 and T4 tram, thousands of units still functioning nowadays, after over 50 years of activity. Designed by the Czech designer Frantisek Kardaus, Tatra trams received a functional body shape, aesthetically neutral, easy to build and, afterwards, to maintain. The vehicles have proven their reliability in various operation conditions, both topographical, as well as climate, thus continuing the expression of the globalisation process in the industrial design domain. The Tatra wagons have managed, in only three decades, to be the most numerous light railway vehicles in the world. Hundreds of European and Asian cities are still using Tatra T3 and T4 trams, part of these being of interest for the future, fact due to which they have been included into extensive technical and aesthetic modernisation programs. In Romania, Tatra T3 and T4 trams have functioned in Arad, Botoşani, Brăila, Cluj-Napoca, Galaţi, Iaşi, and are still functioning in Bucharest, Craiova, Oradea.

Starting from the shown context, at the “George Enescu” National University of Arts Iaşi, Faculty of Visual Arts and Design, Specialisation Design, an experimental project regarding the conversion of a Tatra T4R tram into a tourist tram was developed. The conversion referred to various design interventions on its interior and exterior functionality, on its aesthetic side in order to meet the specific functions, using recyclable materials and high-end technologies on an existing chassis (Figure 3).



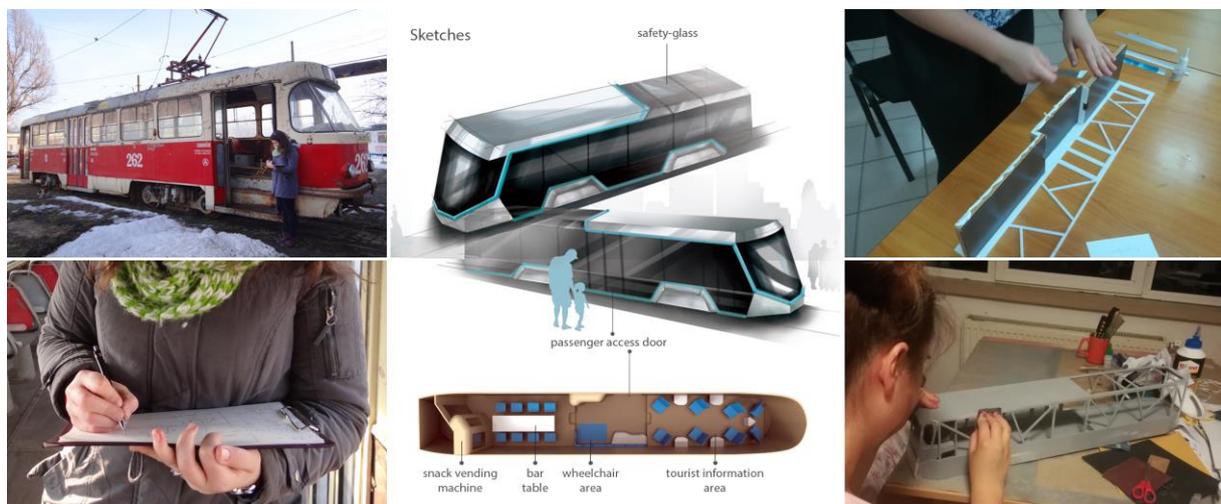
**Figure 3:** TurTram Concept (1) – Lounge area (2) – Tourist information area (3)

The project made by the student Irina Andriesei, under the guidance of Professor PhD. Jeni Pralea and Assist. PhD. Silviu Teodor-Stanciu, implies the rebodding and adaptation of a wagon made in Czechoslovakia in 1978 to the current transport requirements characteristic to a tourist vehicle. The costs of the rebodding and adaptation of an existing wagon are 50% lower than the fabrication of a new vehicle. TurTram (Figure 2), the tourist tram concept, solves the problems of its category of vehicles, both through the exterior design, as well as the interior one. The concept is impressive with the angular body shape inspired from the contemporary architecture, with large glazed areas, in proportion of 80%, which offers the passengers the opportunity of fully admiring the urban landscape.

The project implies the use of dimming safety glass, which offers the passengers a visual comfort on a sunny day. Aesthetically, the vehicle has a neutral, timeless aspect which makes it easy to integrate in any urban centre. The body monochromy, highlighted by the LED light strip, distinguishes the vehicle in traffic, both by day and night, increasing the safety of passengers and being easy to spot during the Hop on – Hop off mode. The interior of the vehicle is divided into three areas: the access area, the lounge area and the tourist information area. The access area, situated centrally, has a double access door and low floor, obtained by modifying the central sector of the chassis, according to the Tatra T3R PLF project, successfully applied in Prague (Czech Republic) since 2007. The central

platform has a ticket dispenser, coffee machine and special spaces for a wheel chair and stroller. The lounge area is placed in the front third of the vehicle, having a bar for snacks and refreshing beverages throughout the trip. The tourist information area is placed in the back third of the tram, having swivel armchairs and individual audio information systems. Thus, the tourists can admire the objectives in great detail due to the 360 degree swivel function of the armchairs, as well as due to the glazed roof.

Also, the side walls have shelves with USB ports for the passengers to use in order to charge their devices and cup holders, ideal for the placement of the refreshing beverages throughout the trip. The interior is chromatically neutral, being able to receive certain colour accents, according to the identity colour of the cities where the tram would function. Inside one can find a smart LED lighting system, the light intensity adjusting itself through photocells, fact which offers more visual and emotional comfort to the passengers.



**Figure 4:** Phases of the design process of TramTur

The design process (Figure 4) implied taking on-site measurements of the structural elements of the backup vehicle, at the depot of the Iași Public Transport Company. A special attention was paid to the tram accessibility by measuring the chassis in order to adapt the existing high floor to a “low-floor” one, meant for persons with motor disabilities. The vehicle’s back door was cancelled for an increasing efficiency of the interior, the obtained space being used for the extension of the tourist information area. Also, the front door, destined exclusively for the driver’s use, has been reduced to half its width, more space for the bar being created. The 3D model of the vehicle was made in Autodesk Fusion 360 based on the taken measurements, followed by the 1:20 model, out of plastic, with the help of the 3D printer and laser.

The TramTur project was publicly presented during the exhibition “Public Transport – Sustainability, Innovation, Design” (Figure 5), of the Innova Sump European program, in partnership with Iași City Hall, Iași Public Transport Company, “George Enescu” National University of Arts and “Alexandru Ioan Cuza” University, Iași, in November 2018. The concept was also presented in 2020 at the “Electroputere VFU Pașcani” company, specialised in the maintenance and modernisation of train wagons, freight wagons and trams. The project was analysed with interest in the context where both in Romania, as well as in the neighbouring, east-European countries, there are hundreds of Tatra T3 and Tatra T4 trams still functioning, qualifying for the conversion process.

If trams in general are of utmost importance for the community in which they function, tourist trams can be seen as a vital element for the economic, social and cultural development of the same area.

Taking all of these into account, a proper design of the tourist tram, both the interior design, as well as the exterior one, can make a big difference on what concerns the number of possible future

passengers. Thus, the design process represents the key enabler of tourism development in any community.



**Figure 5:** Project presentation during the exhibition  
“Public Transport – Sustainability, Innovation, Design”

### **Conclusion**

The design of a tourist vehicle by converting a conventional one leads to a significant production price reduction, to sustainability through the prolongation of the duration of the product and to the engaging of local industries. The use as a base of the old Tatra trams, found in over 100 east-European cities, favours the process of conversion and integration in traffic of the obtained tourist vehicles. The use of trams as transport means with a tourist role improves the travelling experience through stability, quietness and fitting into the historical city areas, with narrow streets and tight road turns, unapproachable by coach. Also, the use of the tourist tram leads to the improvement of the life quality of citizens by reducing the traffic values generated by tourism and, implicitly, by lowering the phonic, visual and air pollution. Apart from all these functional aspects, the tourist tram becomes a vector of tourism advertising in the city of origin, an element of connection between history and the contemporary period. The conversion of old Tatra trams into modern vehicles, with a tourist role could lead to the development of tourism in east-European countries, to the valorisation of the cultural heritage and to the prevention of the situations found in west-European countries.

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