



Megaprojects to Improve Public Transport from the User' Perspective

János Varga

Keleti Károly Faculty of Business and Management, Óbuda University, Budapest, Hungary
varga.janos@uni-obuda.hu

Ágnes Csiszárík-Kocsir

Keleti Károly Faculty of Business and Management, Óbuda University, Budapest, Hungary
kocsir.agnes@uni-obuda.hu

Abstract

Globalisation and our fast-paced world have opened up new horizons all over the world. Population growth, rising energy prices and their declining nature are creating problems for transport. Road congestion, drastic increases in journey times and rising travel costs have highlighted the importance of improving public transport. However, for public transport to be attractive, it is essential that the transport alternative itself is fast, comfortable and modern. In this paper, we examine two metro construction projects in cities with high populations from a project management perspective, with a particular focus on the main purpose of the project, its usability. In this study, we want to highlight the visible goals expressed by the end users and their reflection in the project. We want to focus on the different phases of project management that lead to the success of the project.

Keywords: Public transport; Sustainability; Project; Project management

1 Introduction

Sustainability has become a popular term today. If you search the internet for sustainability, you will get 2.2 billion results in 0.55 seconds. This shows that sustainability is a much sought-after and popular topic for many people, but it is not the only reason why we need to address it. Indeed, the planet has undergone a major transformation and the last decades have seen an unprecedented explosion in many ways. The world's GDP or the volume of world trade has risen at an unprecedented rate since 1960, as has been seen in the change in population numbers, among other things. In a very short space of time, we have witnessed large-scale increases that have shed new light on the finite capacities of our planet. We have finite resources and opportunities in the face of infinite growth, so it is only a matter of time before the two are finally separated. Sustainability has become not only a fashionable term, but also a concept that increasingly affects our lives. It indicates a major problem, behind which we can assume that something is not working very well and that major change is needed. Meanwhile, globalisation and increasingly intense change are placing new challenges on the shoulders of humanity.

The question rightly arises: in what ways can we sustainably maintain or improve our quality of life? Today, our lives are hampered by many problems. Rising energy prices, population growth and dwindling resources are all pushing us to look at sustainability in a new light. We also need to be clear that sustainability is no longer just about our consumption, but also about being sustainable in areas such as public transport, which is used by many people. In the case of public transport, too, the increasing number of passengers, the drastic rise in energy prices or the shortage of raw materials and commodities that are important for transport can cause problems on a daily basis. From this

perspective, sustainability must also be interpreted and even examined in relation to public transport, given that we are talking about a system that offers a significant proportion of humanity a choice of alternatives and services. However, while we are striving for sustainability in transport, we must not lose sight of the fact that we must at the same time be able to provide a service that is of the right quality, up-to-date and that offers maximum passenger satisfaction. We must provide a sustainable, economical, efficient and high-quality service, which is often not easy, but the challenges of the 21st century have made such demands on transport.

2 Literature Review

Sustainability is most often associated with consumption (Tseng et al, 2016), where it is often thought that all that is needed to have a sustainable world is to consume more consciously or less (Harjato et al, 2021; Wang et al, 2019). If we want to understand sustainability in this dimension for transport, we could say that sustainable transport means travelling less. Most definitions associate sustainability with the finite resources and potential of our planet, but again this implies a consumption-centred approach (Dolan, 2002; Pogutz & Micale, 2011).

However, sustainability cannot be linked to consumption alone, as the pursuit of sustainability has a well-defined purpose. Namely, to protect the condition and quality of our environment so that we can live in an environment that provides a suitable living space for all. Defining sustainability is still a challenge today, as many things can be sustainable. Sustainable systems, sustainable cities, sustainable budgets, sustainable tax systems, sustainable business environments, and so on. We also hear a lot about sustainable transport or transport systems. It is safe to say that sustainability has a slightly different meaning everywhere, as it means something different in economic, ecological or even transport terms (Morelli, 2011).

However, all definitions of sustainability have something in common. Wherever sustainability is pursued, it is always aimed at having a positive impact on the environment. We want to strive for sustainability in order to make a positive change and a positive impact on our environment. The definition of transport and sustainable transport, which is the subject of this study, is a perfect example of this. The OECD links sustainability and transport. It mentions that transport faces the same challenges of resource scarcity or increasing demand for services as other productive or service sectors. Moreover, public transport is often under an even greater burden, often having to provide a sustainable service to millions of people on a daily basis. Sustainable transport, according to the OECD, is transport that does not endanger public health and the ecosystem, but provides a service that meets transport needs at the right quality (OECD, 2022).

Sustainable transport is expected to use renewable resources at a slower rate than the time it would take to recycle them; and resources that cannot be renewed are used much more slowly than renewable resources. All this points to the need for sustainable transport in this sense to have a positive impact on people's environment, but also to ensure an adequate level of service. The significant positive and negative impacts of transport systems on both the sustainability of cities and people's lives have been demonstrated in several cases. In order to promote sustainability, a number of transport improvement projects are being launched, often with technical or financial constraints. This makes it difficult to implement such projects (Mahmoudi et al, 2021). Creating sustainable transport can be important not only at regional, state or city level. The European Union itself has set significant climate targets, one of the most important of which is the decarbonisation of the transport sector. The EU has pledged to reduce emissions to 0% by 2050 and achieve a form of climate neutrality. This requires a significant

reduction in greenhouse gas emissions, but still providing services and solutions that are affordable for citizens (EC, 2022).

Among these initiatives, we can assume a significant transformation, with a large number of investments and projects (Varga & Csiszárík-Kocsir, 2019; Dobos et al., 2022). Achieving zero emissions in the transport sector will require replacing, upgrading or adapting many of the technologies or devices that have been in place in the past. But transport cannot be left out of the continuous improvement and regular investment. Public transport is seen as a key element in building sustainable cities and should therefore be central to the sustainability of cities and regions (Miller et al, 2016). Sustainable transport is not just about the environmental quality of the means of transport themselves. It means at the same time environmentally sustainable transport, sustainable transport system and sustainability of transport processes (Cheba & Saniuk, 2016). A sustainable transport system should enable mobility for all inhabitants, but in a way that is safe and environmentally friendly. This is not an easy task, as the needs and demands of people from different income groups are different, and it is not always possible to provide this at the same level (Mohan & Tiwari, 2000). However, transport sustainability in this interpretation is also strongly linked to its impact on the immediate environment. The positive relationship between transport sustainability and quality of life has also been clearly confirmed (Steg & Gifford, 2005).

Sustainable transport also seeks to maintain a balance. This balance should not only be between transport and quality of life, but should also focus on environmental, economic and social aspects. Sustainable transport must therefore be able to provide environmental, economic and social benefits at the same time (Gilbert & Tanguay, 2000). The relationship between transport and the environment is very closely linked, and this includes the development of transport infrastructure or the modernisation of transport facilities in such a way that transport itself becomes more environmentally friendly and environmentally aware. Challenges in implementing sustainable transport programmes and projects include the complexity of transport problems in the urban environment, conflicts of interest or lack of adequate resources (Fernandez-Sanchez et al., 2020).

There is also a strong link between sustainable transport development and project management. While it has become essential to apply sustainability criteria to public transport, economic aspects cannot be ignored. Development projects often have significant cost and time requirements, in addition to the scarcity of other resources in the transport sector. In most cases, development takes the form of major projects or programmes, all with a single objective: to achieve a positive impact that safeguards environmental assets without depriving citizens of transport services. In this way, public transport projects try to achieve the desired impact by maximising resource constraints and, while at the same time being cost and time-constrained, by trying to produce an outcome that meets citizens' expectations while at the same time having a positive impact on their quality of life and the environment.

3 Material and Method

The megaprojects presented in this study are included in the top 50 projects list published by the Project Management Institute (PMI, 2021), an organisation that develops project management standards and selects each year the most inspiring and exemplary projects of the year to be used as a model for future similar initiatives. In this study, we would like to present two projects that aim to improve public transport, educate people about the use of cars and reduce the time and safety of transport. The modernisation of public transport will encourage more people to choose surface or

underground solutions rather than driving and generating congestion. The two projects presented are metro projects in cities with very high populations (Riyad and Mumbai). The two projects under study are analysed from a user perspective, so no filtering criteria were applied in the selection of the sample of respondents, i.e. educational qualifications, previous project management knowledge were not criteria, i.e. anyone could fill in the questionnaire as a basis for the evaluation. Respondents were asked to rate the selected projects on the basis of some factors related to the scope of the project. Respondents rated the factors on a scale of 1 to 4, with a score of 1 indicating a very weak factor and a score of 4 indicating a very strong factor. The characterisation of project scope is presented using a word cloud. 39.5% of the sampled respondents have a tertiary education; while 60.5% have a secondary education. 12.2% of respondents are Generation Y, 23.3% are Generation X and 64.5% are Generation Z. The survey was conducted in April and May 2022.

The two projects selected are both in countries where both GDP and population have grown enormously since the turn of the millennium. Population growth requires that country leaders think about improving public transport and implement them in the form of huge megaprojects; and GDP per capita clearly shows the room for manoeuvre of cities in terms of the technologies and constructions used, which explains the differences between the two developments.

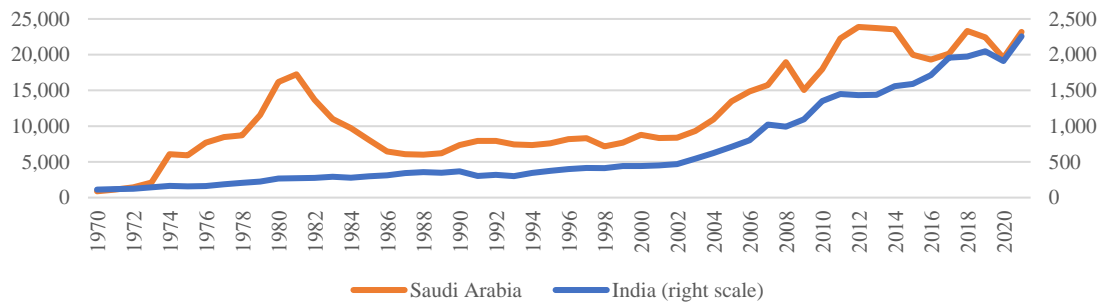


Fig. 1: GDP per capita in the countries hosting the examined megaprojects

4 Results

4.1 Evaluation of the Riyadh-Metro project

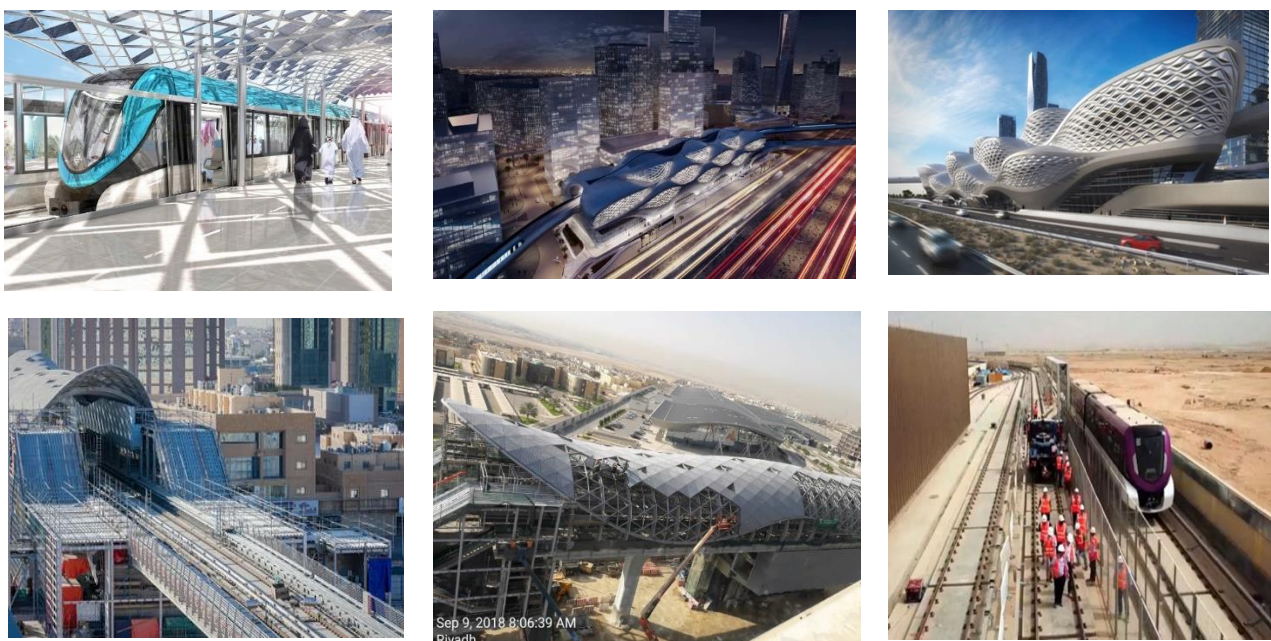


Fig. 2: Visual plans and process of metro construction

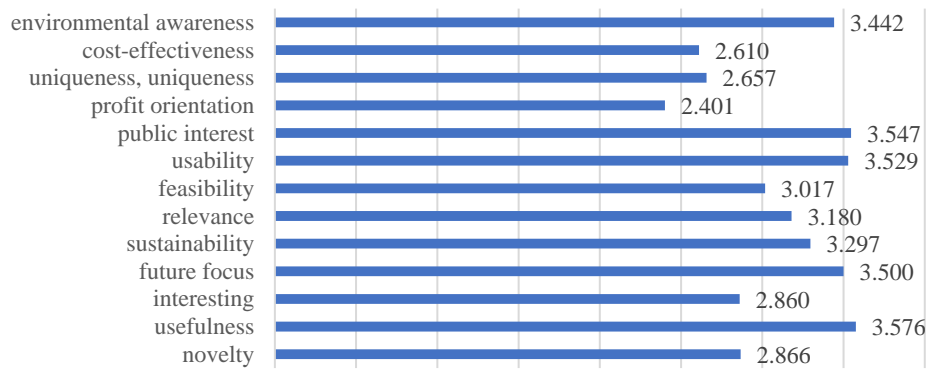


Fig. 4: Evaluation of the scope of the Riyadh-Metro project

4.2 Evaluation of the Mumbai-Metro project

Mumbai is one of the world's most populous cities. The city's rail system moves more than 7 million people commuting daily, which means that situations that endanger passengers are very common. Due to the large crowds, passengers often fall in front of trains or get injured in the crowd. This is why the city authorities decided to modernise the public transport network. The construction of metro line 3 was a huge challenge for the contractors. The first step was to create one of the longest tunnel systems in the world, 33.5 km of underground tunnels with 27 stations. This was a huge challenge, as the line ran through highly populated parts of the city, passing under many tall and listed buildings, and was complicated by overpasses, metro viaducts and railway lines. Getting the tunnel boring machine to the starting point was also a major challenge. During the construction, 8,000 workers and 17 drilling machines worked 24 hours a day to ensure that the plans could be kept on schedule. (PMI, 2021). However, an outbreak of the coronavirus made it very difficult to complete the work on time. Every time a worker fell ill, a team was quarantined, resulting in huge delays to the project. In addition, the works were scheduled during the monsoon season, which meant that flooding also posed a risk to the people working in the tunnel. This project was also specifically designed with the environment in mind. The basic mission of the project is also to reduce the city's carbon dioxide emissions, both by reducing the number of vehicles and by the forest development associated with the project.

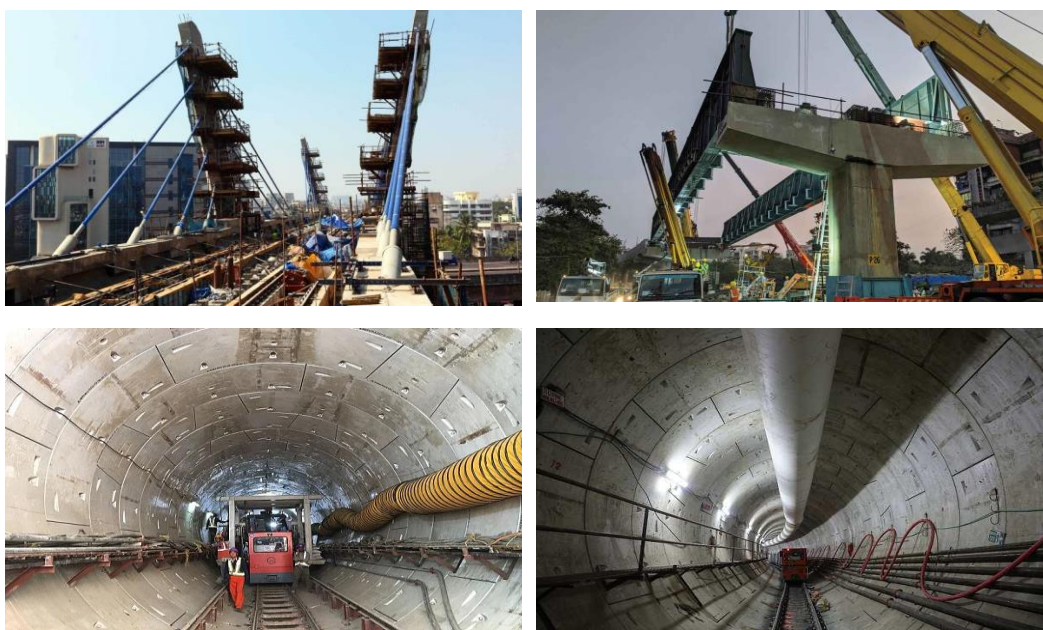


Fig. 5: The process of metro construction

The present project was also described by respondents mainly in terms of its visible objective. The most frequently mentioned scoping elements were the words “public transport” and “metro”. These were followed in terms of frequency of mention by ‘useful’, ‘appropriate’ and ‘important’. In several cases, the project scope was interpreted as infrastructure or development, but the words safe, challenge and public interest also appeared.



Fig. 6: Characterisation of the scope of the Mumbai-Metro project

When respondents were asked to characterise the project scope along the given characteristics, it was seen that it was rated as being of public interest, useful and usable with a much higher ratio compared to the previous project, as the average score for these three characteristics was above 3.6 in all cases. This was followed by a markedly lower average score (around 3.2) for relevance, future focus and feasibility. Respondents ranked the project scope as the least cost-efficient and innovative, with the uniqueness and uniqueness of the project ranking third.

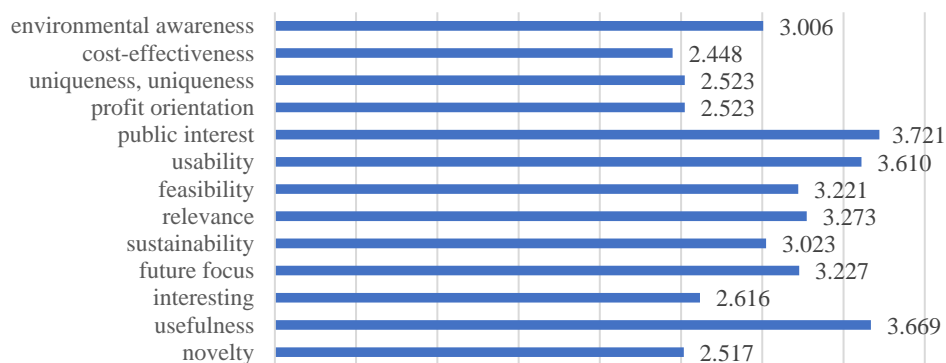


Fig. 7: Evaluation of the scope of the Mumbai-Metro project

5 Conclusion

If we evaluate the two projects as a whole, it can be said that the social utility of each of them is outstanding. Many cities, including Riyadh and Mumbai, have realised that while car transport is more convenient and practical in many cases than public transport, it still places a huge burden on cities and therefore the planet. Public transport offers an alternative to environmentally damaging car travel, by providing an efficient way to get large numbers of people where they need to go. By reducing air pollution, congestion and the negative impact on the environment. The evaluation of the projects shows that they were very positively received by the respondents, even though they may not be direct users. The message value of the projects was that they were perceived as being of most

public interest, useful and usable, as these three main characteristics dominated the top three places in the respondents' opinion. In terms of cost-effectiveness, however, respondents had doubts. Obviously this is not a coincidence, as a project to improve public transport is implemented with a huge budget, the benefits of which will only be felt after several years or even decades. Adequate quality public transport and education can certainly be a solution to the environmental problems of our time. The two projects presented in this case and their evaluation by users are certainly a message for future developments, which can help to determine the purpose and direction of similar projects.

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