

TRAM, TROLLEYBUS AND BUS SERVICES IN EASTERN-EUROPEAN SOCIALIST URBAN PLANNING. CASE STUDIES OF MAGDEBURG, OSTRAVA AND ORYOL (1950s and 1960s)¹

Article published in the *Journal of Transport History*, June 18, 2020

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Abstract

This study examines urban collective transport policy in the city planning of three European countries under the Socialist Bloc in the 1950s and 1960s. The main aim is to account for the success of the private car in approaches to urban infrastructure, and to understand how this affected tramway system planning. This then leads to a new perspective in understanding the conflict between the adoption of transport vehicles: The diversity of argument in tramway planning has been analysed using official publications, professional literature, and the urban and transport plans of the three case study cities. It results that planning solutions prioritised more national and local conditions, their logic and the singularity of their characteristics over the specific principles related to the ideology of the communist regimes.

Keywords: Trams, urban public transport, socialist urban planning, Magdeburg, Ostrava, Oryol.

I. Introduction

The role of the tram in the traffic management of modern urban planning began to be examined in countries with high levels of motorisation, such as the United States, the United Kingdom and France,

¹ Funding: This article is a part of the research of the UrbanHIST project, which has received funding from the research and innovation programme “Horizon 2020” of the European Union under the Marie Skłodowska-Curie no. 721933.

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from the 1930s onwards.⁴ Moreover, after the Second World War, the tram use went into crisis in most Western countries.⁵ The reconstruction and expansion of cities was accompanied by more tramway line closures, with some exceptions, namely countries with widespread tram culture, such as Western Germany, Belgium, Holland and Sweden. These states opted for the modernisation of rolling stock and tramway infrastructure.⁶ The triumph of Modernist Movement ideas in western European countries in transport planning implied the development of high capacity road infrastructure for private cars and a decrease in the role of land rail infrastructure and public transport in general. This was followed by a reassessment of the role of tramways in favour of buses, trolleybuses, underground and light metro services. Meanwhile, in the European countries of the Socialist Bloc tramways were also under debate, leading to some extent to their abandonment.

⁴ Glenn Yago, *The Decline of Transit. Urban Transportation in German and US Cities 1900-1970*, (Cambridge: Cambridge University Press, 2006); Arnaud Passalacqua, “Reluctant Capitals: Transport Mobility and Tramways in London and Paris 1830-1950”, *The Town Planning Review* 85:2 (2014), 143-154; Dejan Petkov, “The Uneven Path of Tramway Development in England,” in Dejan Petkov (ed.), *Tramway Renaissance in Western Europe*, (Wiesbaden: Springer VS, 2020), 229-295; Kevin D. Tennant, “Profit or utility maximizing? Strategy, tactics and the Municipal Tramways of York, c. 1918-1935”, *Journal of Management History* 23:4 (2017), 401-422; Yves Boquet, “The renaissance of tramways and urban redevelopment in France”, *Miscellanea Geographica – Regional Studies on Development* 21:1 (2017), 5-18.

⁵ The tramway declining took place after World War II, in Spain, see Jesús Mirás, “The Spanish tramway as a Vehicle for Urban Shaping: La Coruña, 1903-1962”, *Journal of Transport History* 26:2 (2005), 20-37; in some medium sized cities of West Germany like Oberhausen and Saarbrücken, see Harmut H. Topp, “Renaissance of Trams in Germany – Five Case Studies”, *Proceedings of the Institution of Mechanical Engineers: Journal of Rail and Rapid Transit, Part F*, 212:3 (1998), 223-233; the rest of the UK cities, Colin G. Pooley and Jean Turnbull, “Coping with Congestion: Responses to Urban Traffic Problems in British Cities c.1920–1960”, *Journal of Historical Geography* 31 (2005), 78–93.

⁶ Barbara Schmucki, “Fashion and Technological Change Tramways in Germany after 1945”, *Journal of Transport History* 31:1 (2010), 1-24.; M. R. Taplin, *Light Rail Transit Today* (Milton Keynes: Light Rail Transit Association, 1984), 2.

The new socialist regimes in Central and Eastern Europe were being formed under the aegis of the Soviet Union, leading to the implementation of urban growth according to principles based on the theory of socialist urban planning. The restructuring of cities was thus establishing a sound basis for a centralized system of economy, significantly featuring heavy industry. Collective public transport was very important for the provision of accessibility, social equality and the optimum functioning of socialist cities and their productive spaces. From the mid-1950s, the USSR and other European socialist countries started a programme of rationalisation in architecture and urban planning, which was followed by the reassessment of existing planning principals and an intensive study of Western European countries' experience based on the Modernist Movement principals. From the early 1960s, deployment of the principles of the Modernist Movement in socialist urban planning also cast doubt on the development of tram services, particularly in central areas, and especially those with a high density of narrow streets. This led to an increase in the role of the more flexible buses and trolleybuses. The tramway had a dual meaning in socialist urban planning: an out-dated mode of transport which detracted from an image of rapid speed and modernity of socialist cities (i) and as an efficient mode of transport for city productivity (ii).⁷ This was aggravated by some difficulties in the production and modernisation of tramway rolling stock, especially in case of the USSR itself.

Contemporary research into transport planning in Socialist Bloc cities often emphasised the importance of car infrastructure.⁸ At the same time, it was established that the tram could be considered as

⁷ The importance of tramway capacity for economic development of cities and mass movement of people to the city centre can be found in various Soviet publications, see P. K. Peshekerov and D. I. Bondarevskii, *Tramvainii Spravochnik*, (Moskva: OGIZ-Gostransizdat, 1936), 24; Akademiya Arkhitekturi SSSR, *Planirovka i Zastroika Gorodov*, (Moskva: Gosudarstvennoe Izdatelstvo po Stroitelstvu i Arkhitekture, 1956), 72.

⁸ Barbara Schmucki, "Fashion and technological change"; Elke Beyer, "Planning for Mobility: Designing City Centres and New Towns in the USSR and the GDR in the 1960s", in Lewis H. Siegelbaum (ed.), *The Socialist Car: Automobility in the Eastern Bloc*, (Ithaca: Cornell University Press, 2011), 71–91; Christoph Bernhardt, "Längst Beerdigt und doch Quicklebendig: zur widersprüchlichen Geschichte der 'Autogerechten Stadt'", *Zeithistorische Forschungen/Studies in Contemporary History* 14 (2017), 526- 540.

adapted to the paradigm of the Modernist Movement.⁹ However, there were still some differences between the countries of the Socialist Bloc with regard to rapid transit planning, but such differences are undoubtedly of interest since they can help understand the diversities and specificities in theory and practice of socialist urban planning. Considering the above-mentioned ideas, the questions raised in this study are: Were decisions on tramway system planning in communist countries significantly different? How did the idea of priority for collective public transport develop? How were conflicts between tramway infrastructure and road infrastructure resolved?

The working hypothesis is that there were differing solutions in the planning of collective public transport in the European countries of the Socialist Bloc; in the German Democratic Republic (hereafter GDR), Czechoslovak Republic (hereafter CSR, between 1945-60) and Czechoslovak Socialist Republic (hereafter CSSR, between 1960-90), in the Soviet Union (hereafter USSR) . This variation can be seen in the differences in choice of each country and the weakness in the generalisation of theoretical ideas among communist countries. There was a diversity of socio-economic criteria involved in the selection of means of transport, their infrastructure and spatial planning solutions, as well as a diversity of interpretations of the principles of the Modernist Movement. An approach to the study, primarily of urban history and transport history, raises issues regarding the history of ideas in urban public transport planning in relation to urban planning. The sources of this study are based on historical and contemporary literature. The primary sources contain books, journals, conference proceedings, and newspapers, as well as documents from the state and city archives of the three selected countries and cities. The contemporary literature includes publications on transport (private and public) and urban planning both in Eastern and Western Europe.

This article is structured in three sections. The first is devoted to the emergence of ideas concerning the conflict between tramways and other transport systems in the cities in the 1930s, which continued into the post-war period, plus discussion concerning the planning of tramway and road traffic.

⁹ Barbara Schmucki, "Cities as Traffic Machines: Transport and the City after World War II", in Colin Divall and Winstan Bond (eds), *Suburbanizing the Masses: Public Transport and Urban Development in Historical Perspective* (Aldershot: Ashgate, 2003), 149-171.

In this period tramways maintained a certain level of recognition and resistance to change. The second is devoted to the exploration of ideas about trams in the 1960s, during the most intensive period of road infrastructure development, in the midst of the development and productivity paradigm of the times. The third and last section is devoted to the study of three medium-sized cities (Magdeburg, Ostrava and Oryol) which exemplify the application of theoretical approaches to the conflict between tramways, trolleybuses and buses.

II. Socialist Public Transport Planning Policy before and after WW2

The planning of collective passenger transport was considered important for the economy and for the ideological basis of the communist regimes.¹⁰ Based on the idea of a collaborative development of the different means of collective public transport, it was considered possible to provide a cheaper, more effective, more convenient or more comprehensive public transport service.¹¹ Thus, each collective public transport system was assigned its area of application or convenience according to the objectives of optimisation of its use with regard to energy consumption, increasing frequency and useful capacity, minimising the cost of construction and operation of the transport system. Tramways were optimal in medium-sized cities with concentrated and stable passenger numbers. Trolleybuses were important, as opposed to buses, in cities located near electric power resources, in tourist cities (due to their lower noise and pollution emission) and in cities with abruptly variable physical geography (because of their traction capacity). Buses were important for their versatility and ease of organization. They could be employed in new urban areas with “unstable” traffic and in narrow streets where both private and public transport could be combined.¹²

¹⁰ John Pucher, “Capitalism, Socialism, and Urban Transportation: Policies and Travel Behavior in the East and West”, *Journal of the American Planning Association* 56:3 (1990), 278-296.

¹¹ Vyacheslav Konstantinovich Petrov and Vasilii Georgievich Sosyantz, *Gorodskoi Transport* (Moskva - Leningrad: Izdatelstvo Narkomjoza RSFSR, 1939), 16-17.

¹² Abram Khaimovich Zilbertal, *Problemy Gorodskogo Passajirskogo Transporta*, (Moskva-Leningrad: Gosudarstvennoe Transportnoe Izdatelstvo, 1937), 232-234. Zilbertal was one of the first theorists in the 1930s to

Since the 1930s the success of the private car in rich countries (such as United States, Australia, New Zealand and Canada) prompted a fierce debate concerning their competition with trams, trolleybuses and buses, and their respective roles in the city. Among the most important books which compared the characteristics of land means of public transport, we can highlight those by Tomas Adams *Recent Advances in Town Planning* (1932) and by Henry Watson *Street Traffic Flow* (1935). The main idea in these studies was that the tramway should be adapted to the needs of road traffic, by effectively replacing them with buses in the central areas (aside from the convenience or not of the subway) and providing vertical separation of road and tramway infrastructure.¹³ The ideas in these books were also extensively debated by Soviet experts and served as a reference for future urban development. This can be assessed in the 1937 work by Zilbertal, Kurenkov and Kobzar, and in the 1939 publication by Petrov and Sosyantz,¹⁴ which also proposed considerable reconsideration of the role of tramways in motor traffic improvement and for urban traffic rationalisation.

Unlike in the USSR, in inter-bellum Germany, the tram maintained its importance as a major means of public transport since it had always contributed to efficient urban working. Tram lines remained virtually unchanged and were supplemented by buses on the periphery. In “*Straßenbahn und Omnibus im Stadtinnern*” by O. Blum, H. Potthoff and C. Risch, published in 1942,¹⁵ the authors argued that the

devote his work to the problems of public urban transport choices and tramway transport development issues in Soviet cities, the onother notable work was *Tramvainoe Khozyastvo*, (Moskva-Leningrad: Gosudarstvennoe Transportnoe Izdatelstvo, 1932).

¹³ Thomas Adams, *Recent Advances in Town Planning* (New York: Macmillan Company, 1932), transl.

L. M. Perchik, *Noveishie Doctizheniya v Planirovke Gorodov*, (Moskva: Izdatelstvo Vsesoyuznoi Akademii Arkhitekturi, 1935), 211, 249; Henry Watson, *Street Traffic Flow* (London: Chapman and Hall, 1933), transl. N. V. Reshetnikov and M. P. Sheremetievskii, *Ulitchnoe Dvijenie* (Moskva-Leningrad: Gostranstechizdat, 1938).

¹⁴ Zilbertal, *Problemy Gorodskogo Passajirskogo*; P. A. Kurenkov and S. G. Kobzar, *Transport pri Planirovke Gorodov* (Moskva-Leningrad: Glavnaya Redakciya Stroitelnoi Literaturi, 1937); Vyacheslav Konstantinovich Petrov and Vasiliï Georgievich Sosyantz, *Gorodskoi Transport* (Moskva - Leningrad: Izdatelstvo Narkomjoza RSFSR, 1939).

¹⁵ Otto, Blum, Hermann Potthoff and Kurt Risch, *Straßenbahn und Omnibus im Stadtinnern* (Jena: Verlag von Gustav Fischer in Jena, 1942).

"new" type of traffic, car traffic, should not influence existing public transport traffic. It was stressed that the tramway should be maintained as much as possible because of its efficiency. Hence, it should also work on narrower streets.¹⁶ Another advantage of the tramway was its infrastructure, which was independent from unstable motorised traffic.¹⁷ The lanes of buses and trolleybuses were uncertain and unsafe because they shared their infrastructure with motorised traffic; speed and efficiency could worsen in cases of congestion. Among other arguments in favour of trams was the possibility of creating trains with 2 or 3 times more capacity for transportation than buses and trolleybuses.¹⁸ In addition, there were also favourable opinions about the importance of trams in military economy, related to the economic impossibility of replacing trams with buses during World War II,¹⁹ as well as to the possibility of trams being driven by women in case of evacuations.²⁰

Meanwhile, in Czechoslovakia future tramway planning was not as clear cut as in Germany. On the one hand, the role of the tramway was stressed with regard to preserving the quality of urban spaces.²¹ Likewise, its prevalence with regard to operational capacity and economy was also considered to be a positive factor.²² Buses and trolleybuses were to supplement the tram in urban areas with less traffic density. On the other hand, the dilemma between tram and bus services in the city centre also arose. For example, in *Stavba Měst* by Jaroslav Vaněček published in 1934, the author emphasises the possibility of replacing trams with buses in city centres.²³ The tram was also objected with regard to its interference with the rapid flow of private car traffic at street intersections.²⁴

¹⁶ Blum, Potthoff and Risch, *Straßenbahn und Omnibus*, 6.

¹⁷ Otto Blum, *Städtebau* [zweite, umgearbeitete Auflage] (Berlin: Verlag von Julius, 1937), 230; Reinhold Niemeyer, *Städtebau und Nahverkehr* (Leipzig: K. F. Koehler Verlag, 1941), 40.

¹⁸ Otto Blum, *Gutachten Inwieweit ist der Ersatz von Strassenbahnen im Stadtinnern durch Omnibus zulässig?* (Hannover: Technische Hochschule Hannover, approx.1930), 37.

¹⁹ Fritz Lehner, *Straßenbahn und Omnibus im Stadtinnern*, *Verkehrstechnik* 23:23 (1942), 337-339, here 337.

²⁰ Blum, *Städtebau*, 72.

²¹ Alois Mikuškovíc, *Technika Stavby Měst* (Praha: Klub Architektů v Praze, 1933), 100.

²² Mikuškovíc, *Technika Stavby Měst*, 100.

²³ Jaroslav Vaněček, *Stavba Měst* (Praha: České Vysoké Učení Technické, 1934), 79.

²⁴ Emanuel Hruškha, *Dopravní Síť v Krajiněm Řešení* (Praha: Ústav pro Stavbu Měst při M.A.P., 1934), 63.

These variations in the discussion could be considered as a result of the differences in the historical development of cities. European cities in the Socialist Bloc had a heritage of territorial and urban structure which was quite different from that in the USSR.²⁵ The territories of Czechoslovakia and Germany were notably urbanised, with relatively dense structure and the prevalence of small and medium-sized cities.²⁶ In contrast, in the USSR the level of urbanization was low and cities had lower density which can be explained mainly through its isolated industrial development.²⁷ There were also differences in tramway development in these countries. In Germany, tramways had consolidated networks which were well linked to urban areas that had formed as a result of early industrial development. In Czechoslovakia the tramway development process was not so regular. Some cities like Brno and Ostrava experienced rapid tramway development, at the beginning of the twentieth century, due to rapid municipalisation processes,²⁸ while other cities had quite limited tramway network development. In the USSR the role of electric traction tramways was mainly enhanced from the 1930s when mass industrialisation began. However, this development was restricted mainly to industrial cities. These differences in pre-existing conditions of urban and tramway development could be considered as an important framework for discussion of its further development.

It comes as no surprise to notice how, after World War II, each country tried its own way to rationalise its existing collective public transport situation, as a consequence of some variation in urban and transport planners' thinking.

This difference of approach can be traced in the report of Moscow International Union of Architects Congress (1958) devoted to the sharing of experience in urban reconstruction and construction in the period 1945-57. This report points out differences with regard to urban transport solutions. For

²⁵ Jiří Musil, "Why Socialist and Post-socialist Cities are Important for Forward Looking Urban Studies", European Science Foundation Conference, *Forward Look on Urban Science*, Helsinki, 26-28 May (2005).

²⁶ György Enyedi, "Specific Urbanization in East-Central Europe", *Geoforum* 21:2 (1990), 163-172, here 166.

²⁷ Thomas S. Fedor, *Patterns of Urban Growth in the Russian Empire During the Nineteenth Century* (Chicago: The University of Chicago, Department of Geography Research Paper, 1975), 175.

²⁸ Michaela Závodná, *Koleje a město. Problematika městské kolejové dopravy ve vybraných moravských a slezských městech v letech 1850–1918* (Ostrava: Bohumír Němec – Veduta, 2016), 161-164.

example, in the GDR, the main means of public transport for cities with 80,000 to 300,000 inhabitants was the conventional tram, while the “rapid” tram was in cities with 300,000 to 750,000 inhabitants²⁹ and with more than 100,000 inhabitants in CSSR.³⁰ While in the USSR the number of inhabitants was not clearly defined. The trolleybus was considered the main means of transport in cities with a population of 80,000-250,000. The advantages of trolleybuses were basically that their greater manoeuvrability compared with trams, the importance of railroad lines in the city, as well as the reduction in tram use from 85.6 per cent in 1940 to 43.6 per cent in 1956.³¹

The other aspect in a comparison of transport policy between these countries may be the volume of transported passengers, which was a determining factor in the selection of urban land transport. In the GDR, the use of tramways was possible with fewer passengers than 5,000 per hour, and it was the main mode of transport for between 5,000 and 14,000 passengers.³² While in the USSR, fewer than 5,000 passengers per hour were allocated only to buses and trolleybuses, passenger flow between 5,000 and 15,000 per hour was allocated to trams, buses and articulated trolleybuses and, in case of 15,000 - 25,000 passengers per hour, rapid trams should be employed. From this comparison, it is possible to observe the weakened role of trams in the planning of Soviet cities, as opposed to the extensive reconstruction of tram infrastructure in the cities in the GDR and the CSSR.

The USSR's proposals were based on the elimination of tramway lines in squares and in the city centre, with the aim of “relieving narrow streets of unwieldy rail transport”.³³ The elimination of trams also took place in smaller towns with 80,000-150,000 inhabitants such as Kostroma, Mogilev,

²⁹ International Union of Architects (IUA), *Construction and Reconstruction of Towns* (Moscow: State Building and Architecture Publishing House, 1958), 12.

³⁰ IUA, *Construction and Reconstruction of Towns*, 26.

³¹ IUA, *Construction and Reconstruction of Towns*, 28-29.

³² Hans Krüger, Klaus-Jürgen Richter and Rudolf Stuhr, *Der Städtische Nahverkehr in der DDR* (Berlin: Transpress, VEB für Verkehrswesen, 1961), 212.

³³ Alexei Aleksandrovich Polyakov, *Organizatsiya Dvizeniya i Planirovka Ulits* (Moskva, Gosudarstvennoe Izdatelstvo Literaturny po Stroitelstvu i Arkhitekture, 1953), 236; IUA, *Construction and Reconstruction of Towns*, 28.

Kirovograd, Pskov, etc., where the tramway network was not reconstructed after World War II. Despite this negative attitude, the undeniable advantage of tramways was their ability to carry large numbers of passengers by adding carriages as well as the pre-existence of infrastructure. This was intensified, probably, with lesser development in the capacity of trolleybuses and buses, and the lack of road infrastructure in the 1950s. Thus, tramways still maintained a certain level of importance on the periphery of large and medium-sized industrial cities, especially those with 250,000 to 450,000 inhabitants and the intensive movement of workers, such as Magnitogorsk, Stalinsk, Prokopevsk, Zaporozhie and so on. However, the size of the city was not always a decisive factor; sometimes effective and direct connectivity between industrial and residential areas was more important. Thus, some cities with 70,000-150,000 inhabitants developed the tramway system exclusively. Among them, it is worth mentioning new industrial cities such as Angarsk, Salavat, Volzhsky, Osinniki, with tram systems were built in the 1950s and early 1960s. Some historical cities that experienced industrial development in the 1950s, such as Biisk, Novochoerkassk, Cherepovetz, Orsk, also relied solely on tramway systems. The tramway network in these cities usually had a main line with some branches connecting a large industrial area with residential districts.

Meanwhile, even with many efficient trams, the post-war period in the GDR and the CSSR also saw a period of development in the trolleybus system. In the CSSR this development resulted in the replacement of trams by trolleybuses in small towns such as Opava, České Budějovice, Jihlava, Mariánské Lázně with populations of 40,000 - 60,000 inhabitants. In the GDR trolleybuses were introduced in larger towns without replacing trams. The abandonment of old tramway systems and the introduction of buses in the GDR took place in the period 1960-70 in some small towns with fewer than 80,000 inhabitants, such as Stassfurt, Eisenach, Stralsund, Mühlhausen, etc. From this, it can be concluded that in the GDR and the CSSR trams were mostly discontinued in small towns while they remained in medium-sized ones. Probably, in both cases the abandonment was conditioned by the need to optimize economic resources and relieving financial difficulties for their further development.³⁴ This great difference between the GDR, the CSSR and the USSR in the 1950s can be explained mainly by two things. Firstly, because the USSR assumed Western ideas from the post-war period regarding the conflict

³⁴ We are owing this idea to one of our (double-blind) reviewers.

over tramway infrastructure. Secondly, because the USSR did not have a significantly developed tramway infrastructure, with services that belied the overwhelming modernity of the use of private car transport.

However, these ideas were still not very widely developed in the post-war period in communist countries. The cities which had been bombed did not have the possibility of a mass development in road infrastructure. They were mainly engaged in rebuilding cities and providing the collective mobility of people with trams. The principles of city planning and reconstruction were not yet formed, and planners hesitated between continuing traditional planning and reconsidering this in relation to motorised transport. Communist countries were, however, not the only ones to maintain trams for these economic reasons as well as the continuation of their planning tradition. In capitalist European countries, such as West Germany, Italy or Sweden, these theoretical ideas also worked, combining rail and car transport for practical reasons.³⁵ All this changed from the late 1950s, when the ideas of the Modernist Movement started to be more important in socialist urban planning and when trolleybuses and buses started to experience their greatest technological development.

III. Conflict Development: Tramway and Road Infrastructure Planning in the 1960s

In the 1960s a period of development of socialist urban planning theory began. The theory was mainly based on the experience and the functionalist and rationalist ideas of the Modernist Movement. The main idea of the Modernist Movement in this field was to establish favourable conditions for the rapid circulation of cars, using spatial separation between other types of urban traffic and the construction of new road infrastructure. The private car, considered the new universal means of transport, reflected the image of modernity in cities. The extensive application of these principles in American and British cities

³⁵ Christopher Kopper, “Why the ‘Los Angelization’ of German Cities Did Not Happen: The German Perception of U.S. Traffic Planning and the Preservation of the German City”, in Christopher Kopper and Massimo Moraglio, *The Organization of Transport a History of Users, Industry, and Public Policy*, (New York: Routledge, 2015), 108; Martin Emanuel, “Constructing the Cyclist: Ideology and Representations in Urban Traffic Planning in Stockholm, 1930-70”, *The Journal of Transport History* 33:1 (2012), 67-91, here 159.

in the post-war period, was accompanied by continuous debate and criticism of them, which had been intensifying since the beginning of the 1960s. Notwithstanding, the acquisition of these Western ideas was based on translations of the most important texts carried out in communist countries; for instance, the *Highway Capacity Manual* (1965),³⁶ or through participation in international urban and transport planning congresses. In the post-war period, the urgent reconstruction of cities and the transition from a war economy to a peace economy did not permit these ideas to develop, especially in the reconstruction of cities where urban traffic had not yet been “rationalized or ordered”.³⁷ However, neither a developed theory nor any disciplined ideas on urban traffic planning in socialist cities were yet established. This lack of definition conditioned different approaches, interpretations and solutions in urban traffic and transport planning, which can be explained by the following ideas:

1. *There was a more radical vision of the reconstruction and adaptation of cities to the principles of the Modernist Movement in the USSR, in comparison with the GDR and the CSSR.* The main reason must be the prevalence in the USSR of the idea that existing cities were the outcome of the capitalist period, whose planning logic (mainly of allocating land use) had to be disregarded. This, in turn, worsened the conditions for achieving pure functionality and a high level of productivity in cities. As a result came this concern for the modernity of Soviet cities. This can also be seen in the preference for trolleybuses in the 1960s, which can be explained by the possibility of their operation on road infrastructure, being silent as well, which was difficult to achieve in tram operation.³⁸ In the GDR and the CSSR, conventional tramway operation was of low speed, and its insufficient capacity was not desirable either, because it did not correspond to the required image of modernity, especially its operation in city centres since it had been studied in the 1960s.³⁹ However, the tramway in the GDR and the CSSR was

³⁶ Alexandr Kulakov and Konstantin Trofimenko, “Transport Planning and Transport Modelling”, in Mikhail Blinkin and Elena Koncheva (eds), *Transport Systems of Russian Cities, Transportation Research, Economics and Policy* (Cham: Springer International Publishing AG, 2016), 1-37, here 12.

³⁷ *Vsesoyuznoe Soveshanie po Gradostroitelstvu SSSR* (Moskva: Gosudarstvennoe Izdatelstva Literatury po Stroitelstvu, Arkhitekture i Stroitelnyim Materialam, 7-10 June 1960), 120, 140.

³⁸ Ivan Semyonovich Efremov, *Troleibusy. Teoria, Konstrukciya i Raschet* (Moskva: Vysshaya Shkola, 1969), 15.

³⁹ Elke Beyer, “Planning for Mobility”.

considered the main means for providing collective mobility.⁴⁰ Therefore, considering the extensive pre-existence of tramway systems and an understanding of their efficiency, it seems to be an issue which could be improved eminently by gradual modernisation of both rolling stock and infrastructure.

2. *Different capacities in the construction of tramway infrastructure and in the production of trams also influenced the diversity of planning solutions.* It is important to differentiate between conditions in collective public transport infrastructure, since a common policy of communist countries was to choose solutions with the least possible investment.⁴¹ In the GDR and the CSSR, where sufficient tramway infrastructure already existed, operating costs and modernisation of the tramway system were required, while the trolleybus system needed further development. Thus, the lack of a need for capital investment in the construction of tramway infrastructure, on the one hand, and the low cost of operation, especially traction and personnel systems, on the other, explains the priority of tramway development in the GDR.⁴² Trolleybuses were therefore considered to be a means of transport only under exceptional circumstances. They were planned for only in areas with abruptly variable physical geography, and should be replaced by buses in some medium and larger cities.⁴³ This was explained mainly by the high investment required for both trolleybuses and their electrical equipment compared with other means of

⁴⁰ Jean-Pierre Wolff, “Les Tramways En Allemagne: Permanence Et Adaptabilité Des Réseaux De Tramways”, *Transports Urbains* 1:120 (2012), 10, 62; Ondřej Mulíček and Daniel Seidenglanz, “Public Transport in Brno: From Socialist to Post-socialist Rhythms”, in Tauri Tuvikene, Wladimir Sgibnev and Carola S. Neugebauer, *Post-Socialist Urban Infrastructures* (London: Routledge, 2019), 158-177; Richard Zelezny, “Tramway-oriented Development: What Results in What Context? Comparative Approach between France and the Czech Republic”, Conference *Transportation Research Arena*, Paris - La Défense, France, April, (2014).

⁴¹ Ivan Plicka and Jaroslav Vandas, “Betreffend Stadtverkehrsmittel – Straßenbahnen und Obusse”, Internationales Symposium, Prag, 19-27 Juni (1965); Andrei Evgenievich Stramentov and Mikhail Samuilovich Fishelson, *Gorodskoe Dvijenie* (Moskva: Gosudarstvennoe Izdatel'stvo Literature po Stroitel'stvu, Arkhitekture i Stroitel'nim Materialam, 1963), 32-40.

⁴² Krüger, Richter and Stuhr, *Der Städtische Nahverkehr*, 212.

⁴³ František Jansa, *Městské Dráhy Elektrické*, Volume II (Bratislava: Vysoká Škola Dopravná v Žiline v Slovenskom Vydavateľstve Technickej Literatúry, 1967), 150, 247.

public transport.⁴⁴ Consequently, the decision was taken to choose the tram and to accompany it with buses. In comparison, in the USSR both tramway and trolleybus systems needed all their initial investment in order to be implemented. One of the decisive differences was that trolleybuses needed less investment than trams, as they did not require tram rail construction. Therefore, the general decision in the USSR was to develop the trolleybus-bus combination.

On the other hand, the production of tramway vehicles was also an important issue. This was a challenge for the USSR since it was lagging behind in other rolling stock production practices.⁴⁵ From the 1950s, several models of trams were assembled, but they still continued having operational problems and needed revision. Rolling stock was frequently produced with defects.⁴⁶ The agreement with ČKD Tatra (large Czechoslovak rail transport production company founded in 1927) who had specialised since 1959 in the production of tramcars for COMECON (The Council for Mutual Economic Assistance, economic organisation of socialist countries from 1949) members,⁴⁷ should have solved these technical difficulties in the USSR. However, due to economic problems, the purchase of Tatra trams was limited and could not meet the high demand. Hence, the production of tram models KTP-1/2 and KTM-1/2 and RVZ-6 in the USSR continued, though none of them had large capacities nor any margin for the improvement of dynamic characteristics. Only since the late 1970s was it possible to improve tramway production with new rolling stock models.⁴⁸ Therefore, the 1950s and 1960s were very difficult for Soviet cities' transport planning. Meanwhile, the Gotha factory successfully produced new tram models in the 1950s in the GDR, although modernisation of rolling stock was not to Tatra's level. After the agreement, Tatra was fully

⁴⁴ Plicka and Vandas, "Betreffend Stadtverkehrsmittel – Straßenbahnen".

⁴⁵ Iliya Vladimirovich Shpakov and Pavel Valdimirovich Zyuzin, "Sostoyanie Otrashi Gorodskogo Elektrotransporta v RSFSR v konce 1980: Problemi y Perspektivi", in A. Tretyakov (ed.), *Kraevedcheskie Zapiski, Sbornik Statei* (Kursk: Investsfera, 2016), 61-68.

⁴⁶ Gosudarstvenni Archiv Ekonomiki (hereafter GAE), fund 5, inventory 5, file 69, "Proekt Postanovleniya Soveta Ministrov SSSR ob Uluchshenii Obslujivaniya Naseleniya Gorodskim Transportom", 14 May 1963.

⁴⁷ Andrew. H. Dawson, *Planning in Eastern Europe* (New York: Routledge Revivals, 2015), 300.

⁴⁸ Iliya Vladimirovich Shpakov, "Istoriya Proektirovaniya Otechestvennikh Sochlenennikh Tramvainikh Vagonov na Ust-katavskom Vagonostroitel'nom Zavode imeni S. M. Kirova", *Gramota* 4:71 (2013), 212- 214.

responsible for the supply of trams to GDR cities. There was cooperative work between Tatra engineers and the GDR Ministry of Transport on the adaptation and modernisation of Tatra rolling stock in German cities.⁴⁹ This was accompanied by the development of technical documentation, unified standards in technology, and service and repair of Czechoslovak trams.⁵⁰ At the same time, there were difficulties in integrating Tatra trams into the USSR, especially in repair service and provision of details which also had a negative influence on extensive introduction of Tatra trams.

3. *There was a variety of technical approaches to transport economy and engineering which continued into the communist period.* The difference in urban public transport policy between the three countries can be explained not only by their own socio-economic needs, but also by differences in their approach to the technical criteria for the selection of their means of public transport. In the 1960s, the development of bus, trolleybus and tram capacities became the main driving factor in socialist urban planning. In the USSR the success of buses and trolleybuses was linked to the idea that vehicle transportation capacity was quite manageable, while in the GDR and the CSSR there was a more elaborate vision based on long-term development. In this regard, the 1963 book by A. E. Stramentov and M. S. Fishelson, *Gorodskoe Dvijenie* (City Traffic) evaluated German public transport policy in the GDR and West Germany on the basis of the concept of “tram-bus combination,” concluding that in the case of the USSR it was not necessary to “blindly” follow the established tram-bus combination, but that it was necessary to combine the modes of transport to reach “rational and sequential” solutions.⁵¹ Within a context of road infrastructure development, it was necessary to increase the capacities of Soviet public road transport. To this end, a “trolleybus train” project was carried out in 1966. It was based on the coupling of two vehicles to reach a capacity of 170-220 people, which allowed increasing the movement of up to 12,000 passengers/hour. The T3 tram from the Czechoslovak manufacturer Tatra had a capacity

⁴⁹ The German Federal Archives (Bundesarchiv), fund DM1, inventory 51, file M306, “Der Hauptabmessungen des vierachsegen Strassenbahn Kurzgelenktriebwagen KT4D des einer Wagenkastenlänge 17.0 m”, (Praha: CKD Tatra Smíchov, 1969).

⁵⁰ Bodo-Lutz Schmidt, “Intensivierung der Instandhaltungsprozesse an Straßenbahn Fahrzeugen”, *Kraftverkehr* 9 (1977), 166-167, here 166.

⁵¹ Stramentov and Fishelson, *Gorodskoe Dvijenie*, 32-40.

of 250-300 passengers (2 tramcars) and could provide up to 18,000 passengers/hour,⁵² which was probably considered similar to the capacity of the “trolleybus-train”. This type of trolleybus was often put into practice in Soviet cities, quickly organizing itself into the existing road infrastructure. However, it was not carried out in the GDR and the CSSR, as articulated trams based on the existing tram infrastructure were extensively developed instead.

As for the bus service, there were also differences in understanding with regard to its implementation. The use of surface space was a key factor for the application of public road and rail transport. In the CSSR and the GDR, wide streets were considered necessary for good road traffic performance since this was not compatible with narrow streets.⁵³ The future possibility of an increase in car traffic and the consequent reduction of bus and trolley speeds was thoroughly considered. In contrast, trams had comparative advantages because they were better adapted to narrower streets, could carry more people and used less public space. In the CSSR and the GDR the dominant idea was that there was no other viable solution for higher traffic volume than the tramway system.⁵⁴ In the USSR, as noted above, the opposite was understood: trams because of their reduced manoeuvrability, congested narrow streets, and buses with trolleybuses were the most versatile means of transport. In short, Soviet planners were particularly concerned with the speed of road traffic, understanding that it would worsen with tramway lines. Buses and trolleybuses were successful in almost all Soviet cities since the 1960s.⁵⁵ Something similar happened in Western European countries, such as the United Kingdom, France or Spain, where

⁵² Antonín Honzik, *Mezinárodní Konference o Vývoji Městské a Příměstské Kolejové Dopravy po roce 1970* (Praha: ČKD Praha, 1967).

⁵³ Jansa, *Městské Dráhy Elektrické*, p. 247.

⁵⁴ See the work of Honzik, *Mezinárodní Konference o Vývoji*, where the author undertook a comparison of technical and economic factors among all means of collective public transport, stressing the importance and advantages for the maintenance and development of the tramway system. Similar opinions were among the GDR planners, for example, in Hans Glissmeyer, “Der städtische Verkehr – eine Schwerpunktaufgabe für Forschung und Praxis”, *Die Strasse* 10:1 (1969), 68, where it was highlighted that the replacement of the traditional tram should be done by rapid tram or in some cases by suburban train, and only in exceptional circumstances by buses.

⁵⁵ Sergei Tarkhov, *Empire of the Trolleybus, Volume 1, Russia* (London: Rapid Transit, 2000); Shpakov and Zyuzin, “Sostoyanie OTRASLI Gorodskogo”.

planners intensified the use of buses and trolleybuses to address the problem of private car traffic congestion.

IV. Three Case Studies Magdeburg, Ostrava and Oryol: The Variety of Solutions in Tramway Network Planning

In order to understand better the general tendencies in tramway planning, this section is focused on the analysis of three case studies. The selection of these cases, among the several that were studied, is explained by the fact that they can exemplify the different cultural contexts in three socialist countries in urban transport planning. They can mark distinct perspectives that occurred in these countries in the 1950s and 1960s: maintenance of tramway networks (Magdeburg, the GDR), maintenance of tramways in consolidated city areas and their development on the periphery (Ostrava, the CSSR), selective replacement by buses and trolleybuses in consolidated city areas, with urban expansion based on trolleybuses (Oryol, the USSR).

The selection criteria were also based on average demographic size (between 200,000 and 500,000 inhabitants). All three cities were bombed during World War II, which is also an important factor which facilitated decisions on changes in tramway networks. Finally, these three case studies represent different dynamics in terms of urban growth and industrial development during the study period, which helps to understand the relationship between urban and transport planning.

a. Magdeburg. The strength of the pre-existing tram system and discussion about trams in the city centre.

In the case of Magdeburg, it is a medium-sized city with a fairly well-developed tram network where the tramway system was completely rebuilt and barely unchanged, after being destroyed during World War II. Similar cases to Magdeburg could be Dresden, Bratislava and Cottbus. In Magdeburg the tramway infrastructure and rolling stock were almost completely ruined, and all bridges were devastated, which prevented rapid reconstruction of the tramway network.⁵⁶ Before World War II the population of the city was about 340,000, but after losing almost 80 per cent of the buildings during the war, the population dropped to 100,000 inhabitants and grew again, to 250,000 inhabitants after post-war

⁵⁶ Magdeburger Verkehrsbetriebe, *100 Jahre Magdeburger Straßenbahn* (Magdeburg: Magdeburger Verkehrsbetriebe, 1977).

reconstruction.⁵⁷ The reconstruction of the tramway network was completed in 1948 and it continued to be the main means of communication for its inhabitants (Figure 1).

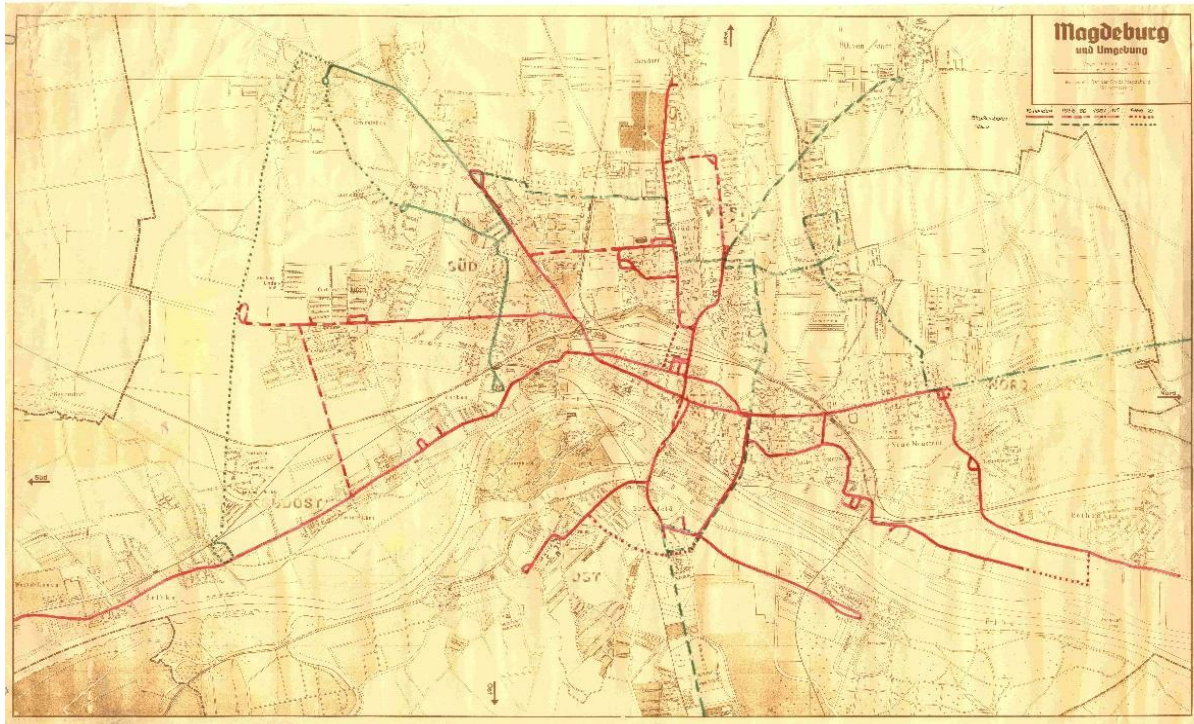


Fig. 1: Plan Magdeburg und Umgebung, June 1953. Plan of the development of public transport system in Magdeburg realised by City Council of Magdeburg. Maintaining existing lines and opening new tramlines on the periphery. Source: Magdeburg City Archive, Kartensammlung, KS_I_277.

Among the plans and projects for the development of collective public transport, the urban plan for Magdeburg from 1952 (Figure 2) was noteworthy. It proposed the development of tramway lines through new transversal connections between the existing radial axes. The proposal for the development of the tramway infrastructure was ambitious, with the ideas of connecting the peripheral areas and extending the tramway lines, as well as creating new bus lines. This development was supported by the modernisation of rolling stock. The city was able to introduce 4-axle articulated trams (Gothawagen G4-61) with a capacity for approximately 150 people,⁵⁸ which enhanced its role in the maintenance of the

⁵⁷ Landeshauptstadt Magdeburg, Stadtplanungsamt Magdeburg, *Städtebau in Magdeburg 1945-1990. Planungen und Dokumente*, (Magdeburg: Landeshauptstadt Magdeburg, Büro für Öffentlichkeitsarbeit und Protokoll, 1998), 63.

⁵⁸ Gerhard Bauer, *Straßenbahn Archiv: Raum Cottbus, Magdeburg, Schwerin, Rostock*, (Berlin: Verlag für Verkehrswesen, 1986), 48.

tramway network. On the other hand, a period of the development of buses and trolleybuses which was planned mainly on the periphery of the city was also started.



Fig. 2: Functioning of tramways in Magdeburg city centre in 1953. Source: Magdeburg City Archive, Fotobestand Hochbauamt, 29273-75.

However, from the early 1960s, with the spread of the ideas of the Modernist Movement, the development of the tramway slowed down. The first discussions concerned the role of tramway in the central area of the city. Firstly, the tramway line on *Erzbergerstrasse* was eliminated, leaving it free for car traffic only, while *the parallel Karl Marx Strasse* was reserved only for tramway and pedestrian traffic (Figure 3). However, the discussions about the tramway were not finished. During the reconstruction of the residential area near *Jakobstrasse*, one of the proposals was to eliminate the tramway line to leave the street free for residential use only.⁵⁹ As a result of these proposals, several tramway lines which connected the northern part with the rest of the city were eliminated.⁶⁰ In addition, the proposal for the development of the city centre made by *Büro für Stadtplanung Magdeburg* (Magdeburg City Planning Department) in 1965 created a distribution hub near the railway station and, also, eliminated the tram line in the central *Otto-von-Guericke Strasse* (Figure 3). However, this did not mean total tram limitation; in the modal distribution of public transport the tramway continued to be a very considerable part of

⁵⁹ Volksstimme, Streit um die Strassenbahn in der Jakobstraße, 8 November 1961.

⁶⁰ Werner Kaleschky, *Magdeburger Verkehrsanlagen* (Magdeburg: Stadtplanungsamt, 1998), 46.

passenger transportation (74.5 per cent),⁶¹ which was combined with buses, trolleybuses and suburban trains (Figure 4).

The 14th Plenary Session of the SED (Socialist Unity Party) in 1966 was devoted to studying the necessity of the provision of general urban transport plans for German cities.⁶² In 1966, it was proposed that the general plan for urban transport in Magdeburg should be implemented in 1969. This plan did not recommend any radical changes to the public transport system, with only some extension to the north and south of the tram lines. However, in parallel, discussions started concerning city development and restructuring. In connection with this, consideration began of the need for discussion about the model of urban growth and the development of urban public transport. The solution was seen to be in the extension of road infrastructure or the modernisation of tramway infrastructure.⁶³ The main idea regarding the urban model for the city was the extension in a north-south direction in relation to some main axes of urban transport, developing a linear configuration⁶⁴ and having two industrial areas (Buckau-Südost and Nord-Rothensee) as the extremes of articulation for urban growth. The dilemma was whether to continue with the tramway system, or to replace it with buses and suburban trains.⁶⁵ City architect Heinz Michalk, who began his work in 1966, was one among others who defended and achieved the maintenance and enhancement of tramway system. This contributed to the effective modernization of tramway infrastructure in Magdeburg from the late 1960s.

⁶¹ Magdeburg City Archive (Magdeburg Stadtarchiv), 46_02326, Büro für Verkehrsplanung des Rates des Bezirkes Magdeburg, "Generalverkehrsplan Magdeburg", (1969), 6.

⁶² Kaleschky, *Magdeburger Verkehrsanlagen*, 63.

⁶³ Magdeburg City Archive, *Generalverkehrsplan Magdeburg*, 8.

⁶⁴ Kaleschky, *Magdeburger Verkehrsanlagen*, 60.

⁶⁵ Heinz Michalk, "Einige Probleme der Generalbebauungsplanung in Magdeburg", in Deutsche Bauakademie (ed.), *Generalbebauungsplanung der Städte der DDR* (Berlin: Deutsche Bauinformation, 1969), 52.



Fig. 3: Tramways in Karl Marx Strasse, central avenue of the city with pedestrian and tramway traffic, photo was taken in the 1970s. Source: Magdeburg City Archive, Sammlung Lück, unknown photographer.

Detailed analysis of the transport systems at that period revealed that travel time by suburban train and by tram for a distance of 7.5 km was similar (40 min), while the overall length of Magdeburg's territory was under 4 km.⁶⁶ Suburban trains had to cover a longer distance between stops, which increased the discomfort of passengers. Therefore, the tramways, despite their physically deteriorated infrastructure, would not be replaced by either buses or suburban trains. Finally, the tramway system was defended in recognition of its functional role, i.e. its capacity, its dense network and its close spatial relationship with the urban structure.

On the other hand, the city centre received special attention. It was found that the rapid tram used the road surface to a lesser extent than the other means of public transport.⁶⁷ Despite the widespread idea that the city centre should be free of all means of urban transport, there was a positive argument for the importance of tramway use in the GDR during this period. It was argued that it was important not only to connect the city centre with the rest of the city, but also to provide services within the city centre. This criterion seemed to be decisive for the GDR planners for the maintenance of the tramway system in

⁶⁶ Michalk, "Einige Probleme der Generalbebauungsplanung", 53.

⁶⁷ Büro für Verkehrsplanung des Rates des Bezirkes Magdeburg, *Generalverkehrsplan Magdeburg*, 8.

central area of the city. In general, it can be noted that in the 1950s and 1960s the tram system was maintained and the bus system was widely developed, especially on the periphery of the city. The tramway was maintained in more central consolidated area and there was no net growth in the tramway network. This can be explained by their pursuit of the city's containment policy that resulted in low residential and industrial development in the 1960s.⁶⁸ The maintenance of the lines was accompanied by some changes to simplify the flow of tram traffic and selective replacements by buses in some central areas to improve road traffic circulation.

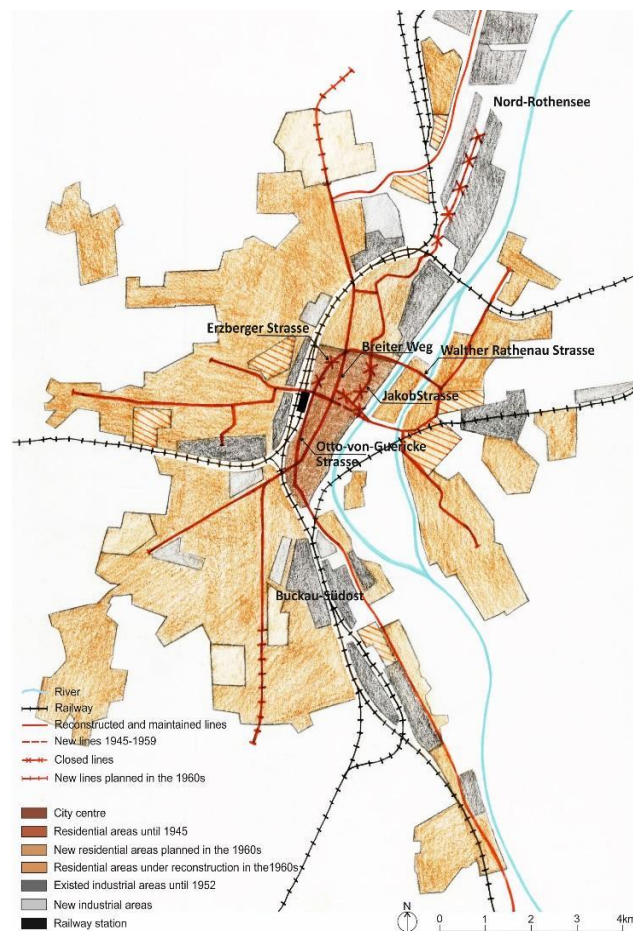


Fig. 4. Plan of Magdeburg in the late 1960s with main changes in the city centre and some extensions on the periphery. Source: Elaboration of Khairullina, E., based on tramway and urban plans of the 1950s and 1960s.

In short, the following can be learned from the case of Magdeburg: that the tramway survived because of the power of the pre-existing network and the unequivocal decision to rebuild it; that the modifications to the tramway network in the city centre were related to rationalist ideas of urban

⁶⁸ Deutsche Bauakademie, *Stadtzentren. Beiträge zur Umgestaltung und Neuplanung* (Berlin: Deutsche Bauinformation, 1967), 83-84.

planning; and that a recognition of the important role of the tramway in the late 1960s led to its development and modernisation in the 1970s.

b. Ostrava. The tramway for the consolidated city and for the new residential-industrial development.

The city of Ostrava represents a case for the maintenance of the tramway network both in the consolidated city and in the peripheral growth area. The other examples of a similar solution could be also Košice, Smolensk, Pyatigorsk. In Ostrava the period of reconstruction and urban development was a simultaneous process after World War II. There was intensive development of industrial activity and the problem of insufficient residential accommodation.⁶⁹ In this industry – residential interrelation, the need to provide fast and direct connections through collective public transport was immediately understood. Being important for the economic development of the whole country, Ostrava's industry received special attention from the authorities. Apart from the need to establish these connections, the development of a coherent and integrated urban structure itself was also considered important. This was a challenge, as the city had “a fragmented and poorly distributed structure”.⁷⁰ The aim was to form concentrated, functionally specialised and well-connected urban areas based on urban public transport lines. Thus, in the post-war period the intensive development of industry was accompanied by the equally intensive development of residential and tramway infrastructure. The tramway was very useful not only for the provision of transport services, but also for arranging and compacting the distribution of new urban areas.

Ostrava had a radio-centric tram system which was connected to a strong hub at the city centre. The main extensions of the tramway lines were associated with both industrial and residential areas (Vítkovice, Zábřeh and Hrabová), all located in the southern direction.⁷¹ The development of the tramway system can also be explained by early modernisation of the rolling stock in the CSSR. From the mid-1950s to the early 1960s, Ostrava received Tatra's T2 and T3 wagons, with larger capacity and improved

⁶⁹ Kimberly E. Zarecor, “Infrastructural Thinking: Urban Housing in Former Czechoslovakia from the Stalin Era to EU Accession”, *Architecture Publications* 9 (2013), 73.

⁷⁰ Karel Zmija, “Reshenie Problemi Gorodskogo Transporta v Ostrave v Budushie Gody” [International Conference on the Development of Urban and Suburban Transport in the period after the 1970] (Praha: ČKD Praha, 1967), 9.

⁷¹ Zmija, “Reshenie Problemi Gorodskogo”, 5.

technical characteristics (Figure 5). Therefore, in the 1950s, the importance of the tramway was already widely recognised in Ostrava, mainly because of its capacity, as two tram trains joined into one train could carry up to 300 persons.⁷² Moreover, the 1955 city master plan and the 1964 urban transport plan assumed that trams should be the main means of public transport, with the plausibility of its future modernisation into a rapid tramway system. Therefore, tramways in Ostrava served to connect concentrated, dense, and distant areas, and the decision was to maintain tramway infrastructure in relation to its main advantage: the possibility of carrying large number of passengers (Figure 6).



Fig. 5. Tatra T3 tramways in the streets of Ostrava in the 1960s. Source: Dopravní Podnik Města Ostravy, U Divadla Zd. Nejedlého, k 70 výročí založení městské dopravy v Ostravě (Ostrava: DPMO, 1969).

⁷² Ostrava city Archive (Archiv města Ostravy), Městský Národní Výbor Ostravy, 154. 24, W. Wolný, “Směrný Plán Města Ostravy: Doprava”, (1958-1960).

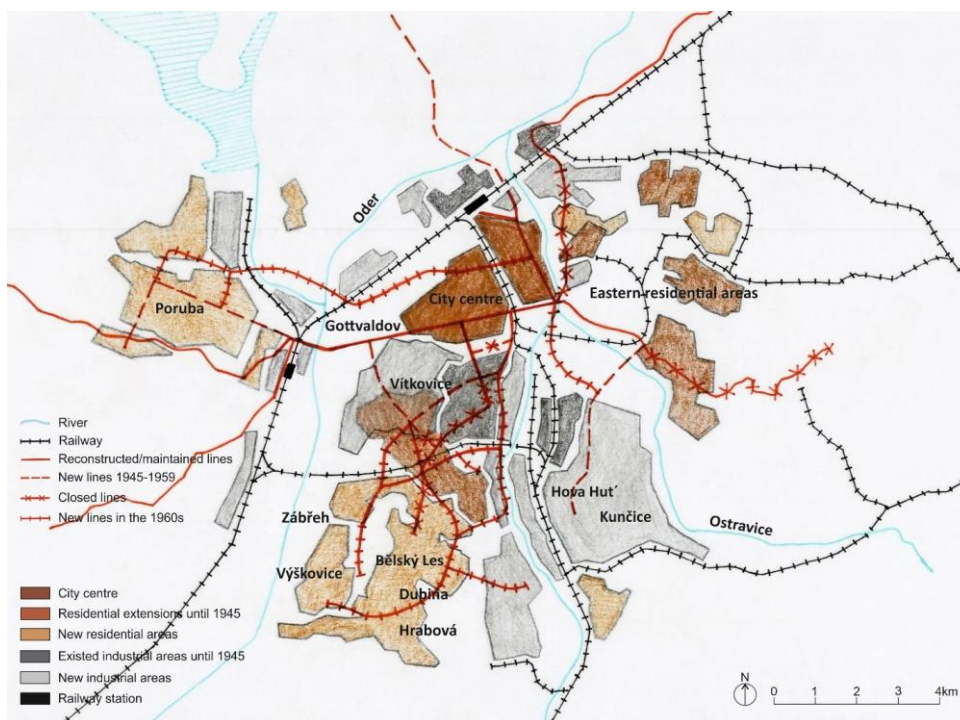


Fig. 6. Residential and industrial areas development in Ostrava in the 1950s and 1960s supported by the extension of tramway lines. Source: Elaboration of Khairullina, E. with the superposition of transport and urban plans of Ostrava from the 1950s and 1960s.

Some changes could be noticed in the south and western parts of the city, where the directions of the lines were changed in relation to the need for the planning of new residential areas. The Poruba residential area in the west of the city was located on the main transport axis called Gottvaldov. This connection had several functions: the connection with the industrial area Kunčice, with the recreational areas in the east and with the city centre. Therefore, a new tram line was proposed parallel to the main transport axis Gottvaldov which connected also to the city centre. New industrial area Nová Hut' located in Kunčice was connected directly to Poruba also through the Gottvaldov axis extension.

The other residential development towards the southern part of the city in the 1950s was Hrabuvka, which relied on the extensions of tramway lines. Meanwhile the main urban development began in the early 1960s with the residential districts Zábřeh, Výškovice, Dubina and Bělský Les, which were accompanied by tram line developments. This was explained by unsatisfactory communication of these residential areas with the city centre by railways.⁷³ Connections with public transport were mainly

⁷³ Karel Zmija, "Doprava a Komunikace v Ostravě", in Josef Bartoš and Miloň Dohnal, (eds), *Ostrava: Sborník Příspěvků k dějinám a výstavbě města* (Ostrava: Profil, 1985), 303.

aimed at improving relations between industrial and residential areas, rather than with the city centre.⁷⁴

The city centre was not so important, less substantial for planners than the spaces with an industrial function. The Vítkovice and Nová Hut' industrial areas were the main focus of decisions on the location of new residential areas.

The need for urban growth intensified the need for a comprehensive urban transport plan. The first plan was made relatively early, between 1960 and 1964, with the objective of managing urban development. This plan was based on a complex and extensive urban transport study. The transport planner of Ostrava, Karel Zmija was one of the advocates of tramway transport for the city. Comparisons between the development of Ostrava's means of collective public transport in a hypothetical future urban development considered buses and trolleybuses unstable and unattractive in the event of growth in private car traffic. At that time, the growth of private transport traffic was not denied as in the USSR,⁷⁵ but it was expected that its future growth should result in "conflicting interests" of private and public road transport.⁷⁶

The concern about motorised traffic congestion during the operation of collective public transport can also be seen in the discussions about Poruba's connections to the city. Poruba had only one access route via the Gottvaldov axis, which also served to provide the connection to central and industrial areas at Kunčice (the east side), as well as the residential area in the south. Since the Poruba connection, which was supported only by buses, could increase traffic at the main transport axis Gottvaldov, the tramway system was chosen as the most appropriate solution.⁷⁷

Ostrava was one of the European cities where the separation of activities by zones was radical. The role of the tramway in overcoming the distances between zoned and fragmented urban areas was

⁷⁴ Zarecor, "Infrastructural Thinking: Urban", 62.

⁷⁵ One of the most widespread ideas in the USSR was "the reasonable limitation" of the number of cars (*Vsesoyuznoe Soveshanie po Gradostroitelstvu*, 1960, 121; Vladimir Aleksandrovich Cherepanov, *Transport v Gradostroitelstve* (Moskva: Izdatel'stvo Literaturi po Stroitelstvu, 1964), 5, which implied that there should be no problems in shared operation of road infrastructure by cars, buses and trolleybuses.

⁷⁶ Zmija, "Reshenie Problemi Gorodskogo", 52.

⁷⁷ Zmija, "Reshenie Problemi Gorodskogo", 47.

recognized from the very beginning. Based on the maintenance and development of the tramway system, the idea of reorganizing the urban structure using the functional separation of urban areas was completely carried out in the city. The tram served both the consolidated city and its peripheral area.

c. Oryol. The tramway for the consolidated city and urban extensions supported by trolleybuses.

The case of the trams in the Russian city of Oryol can exemplify the maintenance solutions of the tramway system with the development of a trolleybus infrastructure. This type of situation was also similar for cities such as Yaroslavl, Sumgait, Tula. The city of Oryol had had a tramway since 1885 and its greatest development took place in the 1920s and in the 1930s. However, the city's tramway was not a consolidated network as it did not connect all urban areas. The network consisted of 4 radial axes connected at the mouth of two rivers. In the post-war period, the city, which had been bombed, needed to rebuild its tramway lines. The reconstruction of the tramway also started the period of its urban development in the 1950s. The tramway lines extended significantly, from 12.3 km in 1944 to 26.8 km in 1957.⁷⁸ However, in spite of the reconstruction of quite a few tramway lines, the direction of the network was orientated towards limiting its operation to the central streets of the consolidated city. Thus, the tram line on Komsomolskaya Street, which connected with the industrial area, was not reconstructed and the new tram line was laid out on Sakko Vancetti Street. In 1953 there was a plan for the tramway system, which provided for the extension of the lines and the development of new directions in the northwest part of the city, without eliminating any existing tramway lines.

The period of change in this policy began in the early 1960s. The location of the new steel industry in Oryol (Staleprokatny) in 1961 meant that the city's population was growing: its 150,000 inhabitants in 1959 were to be increased to 230,000.⁷⁹ This required a decision to be taken so as to whether the tramway network should be extended and connected to the new residential areas, or a new means of transport, such as the trolleybus, should be introduced. This period of decision coincided with a plan for the development of a collective public transport system in the cities of the Russian Socialist

⁷⁸ State Archive of Oryol Region, fund P-2577, inventory 1, file 359, "O Razmeshenii v Plane Orla Stroitelstva na 1959-1965 gody", 1959, 509.

⁷⁹ State Archive of Oryol Region, fund P-2577, inventory 1, file 450, "Upravlenie Glavnogo Arkhitekтора Goroda Orla," 1961, 36.

Federation of Soviet Republics (RSFSR) for 1966-75, during which time period the decision was announced to stop tramway development and provide intensive trolleybus development.⁸⁰

During the very same period, the authorities were more concerned with issues of improving the rolling stock and its capacity than with the reconstruction and extension of the tramway network itself.⁸¹ In spite of this, the introduction of four-axle trams did not take place until the beginning of 1970, while cities relied on two-axle trams. In the 1960s the trams KTP-1 (maximum speed 40 km/h), KTP-2 (maximum speed 45 km/h and capacity 123 passengers, with eight persons per m²),⁸² (Figure 7) operated in the city. Production of two-axle trams in the 1950s and 1960s was insufficient, even the old trams of the 1930s were insufficient. Rolling stock was first sent to larger cities such as Moscow, Leningrad, etc. In medium-sized cities such as Oryol, there was a lack of trams⁸³ that made both the operation of the tramway system and future infrastructure planning more difficult. Only at the beginning of the 1970s was the four-axle tram KTM-5M3 introduced into the city, with a doubled capacity over the previous ones.⁸⁴

⁸⁰ Gosudarstvenni Arkhiv Rossiiskoi Federatsii (hereafter GARF), fund A - 314, inventory 3, file 8589, “Perepiska TK KPSS i Sovet Ministrov RSFSR po voprosam tramvaino-trolleibusnogo khozyaistva”, volume 3, 1967.

⁸¹ State Archive of Oryol Region, fund P-2577, inventory 1, file 359, “O Razmeshenii v Plane Orla Stroitel’sstva na 1959-1965 gody”, 1959, 514.

⁸² GARF, fund A314, inventory 3, file 4744, “Dokumenty po Razrabotke, Ispitaniyu i Vnedreniyu Novoi Tekhniki”, tom 2.

⁸³ “To provide the tram service on Pushkinskaya, Volodarskogo, Vokzal-Botanika lines there are about 24-25 trams. This number of vehicles during peak hours is insufficient. It is not possible to mitigate the situation by using additional trams because of their deficiency,” (State Archive of Oryol Region, fund P-15, inventory 2, file 41, “Spravka o Rabote Tramvaya v Gorode Orle”, 1956, 102).

⁸⁴ Sergei Tarkhov, *Istoriya Orlovskogo Tramvaya*, Orel, 1998, 192.



Fig. 7: KTP-1 and KTP-2 tramways in Komsomolskaya street in the mid of the 1960s before its replacement by trolleybuses.

Source: State Archive of Oryol Region, fund 7081.

Since 1968, the new trolleybus ZIU-5 with a capacity of 122 passengers, began to compete with tramways. The plans for trolleybus development appeared earlier, at the beginning of the decade, when the station and trolleybus workshop were built in the new residential area of Severny (70,000 inhabitants) near the steel industrial plant. At the end of the decade, with the technical development of trolleybuses, the residential district was connected to the city via a new trolleybus line.

On the other hand, the idea of eliminating tram lines in the city centre was also developed in Oryol. The most representative streets, Komsomolskaya, Moskovskaya, Lenina, and Gorkogo, in which administrative and cultural buildings were located, were to be freed from the tramway, since it worsened their urban image. In 1960 the city council made a decision to remove the tram line from the railway station square and Moskovskaya Street, explaining this with emphasis on reconstruction work.⁸⁵ In addition, the proposal to eliminate the tramway lines in the city centre in order to relieve urban traffic

⁸⁵ Tarkhov, *Istoriya Orlovskogo Tramvaya*, 177.

came from the city's chief architect S. Fedorov in 1963.⁸⁶ Thus, on Moskovskaya Street the tram was replaced by trolleybuses, changing its route but keeping its destination to the railway station (Figure 8).

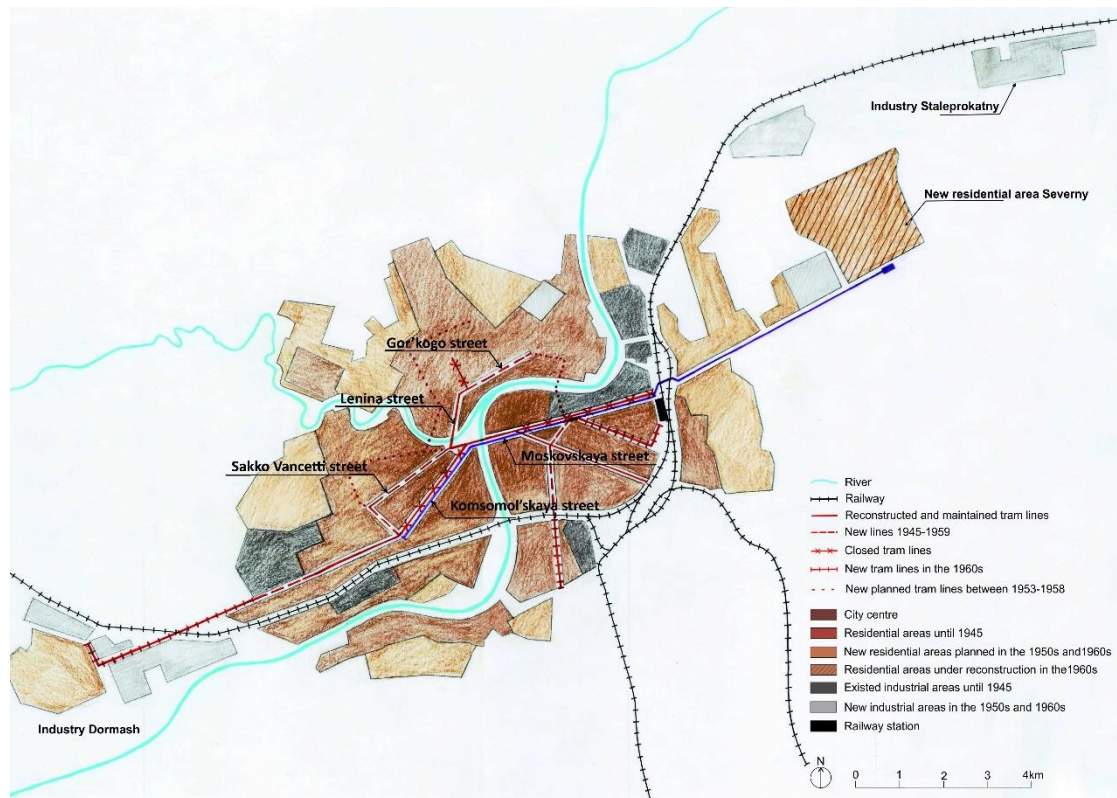


Fig. 8: Changes in tramway system in Oryol in the 1950s and 1960s. Source: Elaboration of Khairullina, E. with the superposition of transport and urban plans, transport schemes, tourist plans and bibliography about city development.

There were not any extensive transport studies on urban transport; the general plan of collective public transport in Oryol was developed only at the end of 1970s, which can be explained by the smaller size of the city. Since the official Decree on the necessity to provide general transport plans with less than 250,000 inhabitants in the USSR was only passed in 1978.

Tramway lines were extended in the western and northern directions in 1967 to connect with new residential areas. No new tram lines were built and existing residential areas in the south and east areas were connected with a new trolleybus system. The tramway system remained only in the consolidated city area, while some lines were moved from main streets to secondary ones. There were several explanations for this, the old or non-modern image of trams versus trolleybuses (trolleybuses looked new

⁸⁶ State Archive of Oryol Region, fund 2577, inventory 1, file 457, “Zonalnoe Soveshanie po Voprosam Perspektiv Razvitiya Goroda Orla”, 23-24 June 1963.

and modern compared to old trams),⁸⁷ the low level of functionality or social profitability of tramways in Oryol⁸⁸ and the impossibility of modernisation due to a lack of state funding.

V. Conclusion

There has been little research into comparative analysis within European communist countries, and this despite its relevance.⁸⁹ The analysis carried out above enables an understanding of transport policies in the USSR, GDR and CSSR in relation to their different assessment of economic, technical and cultural issues. The persistence and planning of tramway networks as well as the understanding of conflicts, technical solutions and spatial priorities pose a much more complex and diverse historical problem than has been considered before. Planning solutions prioritised more national and local conditions, their logic and the singularity of their characteristics over the specific principles related to the ideology of the communist regimes.

The manner in which the social profitability of tramway systems was considered was different. The pre-existence of tramway infrastructures in the GDR and the CSSR, as well as the availability of developed industry in producing rolling stock, made maintaining and developing tramway networks in the cities possible. Whereas, in the USSR, both the quality of the infrastructure and the level of development of the lines were relatively low. Likewise, the production and supply of rolling stock was a slow process, which made it difficult to improve the capacity and speed of tramways in Soviet cities. This contributed to a shift in attention to cheaper and more modern means of transport, such as trolleybuses and buses.

⁸⁷ In 1968 the Orlovskaya Pravda newspaper published an article devoted to the beginning of trolleybus operations, where the explanation of the modernity of the new means of transport can be seen: “The first trolleybus goes from one stop to another. The passengers waiting for the bus do not understand what is happening. And then, excited, they enter a large, bright trolleybus hall and occupy comfortable seats” (Orlovskaya Pravda, 31 October 1968).

⁸⁸ GARF, fund A-314, inventory 3, file 8590, “Perepiska TK KPSS i Sovet Ministrov RSFSR po voprosam tramvaino-trolleibusnogo khozyaistva”, volume 4, 1967.

⁸⁹ Gregor Feindt, “Making and Unmaking Socialist Modernities: Seven Interventions into the Writing of Contemporary History on Central and Eastern Europe”, in Raphael Lutz and Doering-Manteuffel Anselm, (eds) *Nach dem Boom: Perspektiven auf die Zeitgeschichte seit 1970* (Göttingen: Vandenhoeck and Ruprecht, 2012), 133–154, here 139.

The role of the tramway, in general, began to decline from the early 1960s with the strengthening of the policy of the rationalisation of urban traffic and the triumph of the ideas of the Modernist Movement in communist European countries. The degree of acceptance of, or resistance to, the ideas of the Modern Movement was also different. In general, the USSR, compared to the GDR and the CSSR, was more willing to follow the ideas of the Modernist Movement. Its urban planning logic was more radical and avoided the continuity of inherited solutions. Tramways were seen as a functional tool which should carry large numbers of passengers, without much disturbance to road traffic circulation; hence, the tramway lines in city centres were eliminated, displaced or developed limitedly, replacing them with trolleybuses and buses. A certain reluctance can be noted in the USSR for tramway investment, as opposed to the more industrialised European countries in its imperial orbit.

The case studies of medium-sized cities that were bombed during World War II represent both a similar logic and partially differential solutions in tramway network planning. The difference between Magdeburg and Oryol lies in the degree of development of the tramway networks. In the case of Magdeburg, the tramway network was not expanded, but it still represented a well-connected and developed network. While in case of Oryol the tramway network still needed to be developed and the plans to connect certain urban areas were not implemented in the 1950s and 1960s. It seemed easier to maintain the existing tram system than to build it again. In Ostrava, tramways had strong support from the public administration and local planners, as it was strategically important in establishing effective connections between residential and industrial areas. Ostrava, like Oryol, experienced urban growth in the 1960s, but decisions about the tramway were quite different. Thus, in Ostrava the main decision was to choose the tramway, whereas in Oryol it was to develop the trolleybus.

As a result, the differences between these three communist countries remained strong and visible. The main issue among the countries was not so much about the existence of collective public transport, but rather about the pace of diffusion,⁹⁰ distribution and intensity of its use (especially in areas of conflicting interests). In the GDR and the CSSR the tram maintained its role, both because of its strength in service provision and because of the understanding of its advantages in capacity and speed. While in the USSR the modernisation of the tramway system was a dubious and unclear issue, related to, on the

⁹⁰ Álvaro Costa and Ruben Fernandes, "Urban Public Transport in Europe: Technology Diffusion and Market Organization", *Transportation Research Part A: Policy and Practice* 46:2 (2012), 269-284, here 270.

one hand, economic-technical difficulties, and, on the other hand, to a radical vision of the modernity of transport and urban traffic in Soviet cities. This left its footprint on the subsequent development of trams in these countries during the 1970s and 1980s. The CSSR and the GDR were able to continue with the modernization and development of trams based on their existing infrastructure, while, in the USSR, this remained a selective and limited question.

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