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A Brief, Semicentennial Summary of the History of Road Networks of a Central Eastern European Country

Árpád Kovács

Faculty of Economics and Business Administration, University of Szeged, Szeged 6722, Hungary

Abstract: The article outlines the main characteristics of the operation of the Hungarian road network during the Soviet bloc era and the three and a half decades after its abandonment, together with its social-economic environment and its development efforts and its adaptation to the Western models. After a brief presentation of the decades preceding the democratic turnaround in Europe, it summarises the main trends from the start of market operations to the present days, divided into three stages of development. It refers to professional successes and problems, to social expectations and to the limited possibilities of the country's economic performance and external conditions, to changes in financial financing and the organisation system of development management.

Key words: Road, motorway, motorway, main road, transport, motorisation, European Union, public finance, budget, financial resources, construction and maintenance.

According to proverb, without the knowledge of the past, the present cannot be comprehended. This is the case if we think of road transport—the most used public service in everyday life in society. It is also true in the road sector that successes, failures and development cannot be interpreted in isolation, but only in the context of changing conditions, circumstances and of socio-economic constraints and opportunities that shape them.

The article outlines the half-century of operation of the Hungarian public road network, the events of that turbulent period on a global scale, which led to the development of a specialized field, road transport, from the beginning to the present day in a Central European country that wanted to live in the last decades of the Soviet-type, so-called socialist system, and then turned its back on it and chose a democratic state system and market operation.

The development of Hungary's radial road network, oriented towards Buda and, from the late 19th century onwards, towards Budapest as the centre of political and administrative power, was driven by the socio-economic interests of the Carpathian Basin as a whole. Although this complex development goal became distorted after the loss of World War I and two thirds of the country's territory annexed, the previous spatial location of the main road networks living on the remaining 93 thousand square kilometres, now serving only 9.5 million inhabitants, is still crucial.

The article also focuses on road transport, taking into account changes in the socio-economic policy environment. They only affect other sectors of transport and their division of labour, transport policy considerations, insofar as they play a role in terms of loading, developing and maintaining the road network.

1. Last Decades of the Soviet—aka. "Planned Economy"—Type of Road Operation

In order to summarize the main characteristics of the development and maintenance of Hungary's road infrastructure from the socio-political and economic turnaround of 1989-90 to the present, we also have to briefly talk about the history of the previous decades.

Corresponding author: Árpád Kovács, Dr., professor, research fields: public finance, finance of transportation.

While the economies of the Western European countries were integrated into the 1957 EEC [1] (European Economic Community), the Soviet economic cooperation of Hungary and the other Central and Eastern European countries was limited to the framework of the CMEA (Council of Mutual Economic Assistance), established in 1949.[2]

In Hungary, the attempt of the so-called "new economic mechanism", i.e. some of the "simulating market developments" steps, already indicated the intention of a cautious, Western opening in 1968. Economic policy pursued a dual objective. On the one hand, the CMEA partners, and in particular the Soviet Union, have sought to establish a trade partnership with the Western world, which included the adaptation of Western European standards in the rules and technical requirements of Hungary's transport [1]. On the other hand, it attempted to better meet the transport needs of the domestic economy and of the CMEA, including under the given conditions.[3]

Although the reform attempt—on orders of the soviet regime—failed in the mid-1970s, the concept and technical standard of road transport developments aimed at achieving Western connections have been maintained. As a result of the easing in East-West relations at the end of the decade, it became inevitable for Western Europe to develop international transport network connections, in particular in Hungary, which started to dismantle the "Iron Curtain". However, for its implementation, both financial resources and well-prepared projects were lacking.

In the area of road infrastructure, the situation in terms of availability of plans was slightly better and the construction of motorways had [4] already started in 1961. However, even in 1990, there were only around 350 km (~218 mi) of such high capacity connections, while the construction of bypass roads that could alleviate the load of the road network of cities were lacking, thus the traffic with its relatively low, albeit growing number of 1.9 million passenger cars, constant congestions were oft occurring (see Fig. 1).

2. Road Network in the First Decade of New Socio-economic Set-up

In the 1990's, the conditionality for the development and operation of transport has been determined by the new external relations priorities, the changing internal and transit travel and transport needs, and the financial conditions, that for some time became even more modest than in the past due to the social shock caused by the transition to a market economy.

The CMEA ceased to exist in 1991 without a legal successor. [5] The national goal was to join the EU (European Union), the first step of which[6] was the

[1] From 1994 onwards, the European Community will be named the Union (EU).

[2] On average, the rate of economic (GDP) growth in Hungary was around 2 percent in the 1975-1990 period, which started to stagnate in the 1980 period and then led to the fall of the Soviet system, similarly to the other countries belonging to the other Soviet sphere of influence. Over the same period, the Western European countries grew at rates above 3 percent per year on average. Years have been weaker, but problems have been cushioned by the unfolding of Western European integration. Finally, the performance gap has become so large as one of the reasons for the subsequent break-up of the "socialist camp".

[3] This dual ambition was reflected in the Transport Policy Concept adopted in 1968 [2]. Define the direction of transport development and the division of labour to meet transport needs, which required the rapid development of road transport and the dismantling of a fifth of the rail network. As road network development has been modest and the dismantling of small-traffic railways is essentially complete, the (over)load of roads, which is already lacking capacity, has thus greatly increased. The programmes envisaged the complete reconstructing of approximately 2,000-2,500 km (~1,250-1,550 mi) of new tracks, i.e. the sections of the main road network that avoid settlements, and to increase the robustness of the roads [3].

[4] Motorways and roadways belong to the category "rapid roads". The former are built with a minimum of 3.75 m wide, 2 x 2 traffic lanes and one 2.5 m wide stop lane in each direction, without level crossings, and 130 km (planned) without intersections, while the latter are mostly 2 x 2 lanes, but with somewhat more modest technical parameters, a safe shoulder instead of a stop lane, and curves and visibility allowing a speed of 110 km/h. The overpasses and underpasses of roadways mostly allow for development into motorways that meet the needs of traffic without demolition or reconstruction.

[5] The Council for Mutual Economic Assistance was dissolved on June 28, 1991, in Budapest.

[6] On 16 December 1991, the EU concluded an Association Agreement with Hungary, Poland and the Czechoslovakia at the time, which included free trade and a declaration of intention to join.

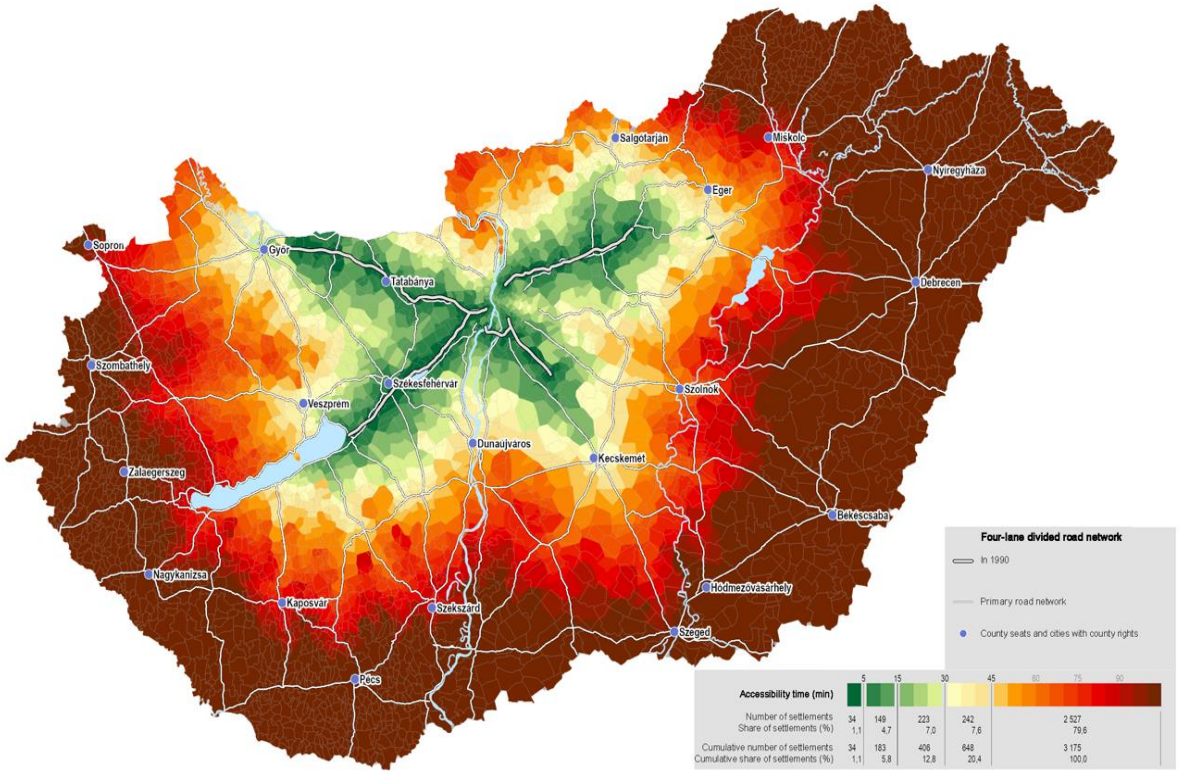

Fig. 1 Access to the motorway network in 30 minutes and 60 minutes in 1990.
Source: Ministry of Construction and Transport (MoCT)[7].

Accession Agreement concluded in 1991. Subsequently, harmonisation with the *EU's transport* legislation and standards has accelerated. At the beginning of the membership negotiations in 1998, Hungary, ahead of the other so-called 'socialist' countries, became "EU-conform" at least in terms of rules in the field of transport.

Hungary's annual economic performance (GDP (Gross Domestic Product)) only reached its pre-reform level in the mid-1990s. During this period, technical progress, motorization, the requirements for convergence in Europe, the needs of the society awaiting economic and welfare "code" from regime change, and by contrast the limited financing capacity of public finances, took place as a distinctive impact mix. The latter, unsuccessfully, was designed to be complemented by the revenues of rapid but later unsubstantiated sales of government wealth, and the increased revenues of the supposedly more efficient private sector [4]. The laws of the 1989 -1990 socio-economic turnaround ensured the transition of the Hungarian economy.[8] Private ownership also appeared in the transportation sector.

Organisations managing, developing, maintaining and operating the road network have been transformed into non-profit companies in previous decades. Privatisation processes were also possible for public road transport companies.[9] There have been problems

[7] Throughout the entire period covered in this article—both before and after the political transition—transport policy was consistently embedded within ministries that were also responsible for other service sectors, as reflected in the references cited in the bibliography. This institutional arrangement can also be identified as one of the factors underlying the "residual principle" mentioned in connection with the financing of road services.

[8] The so-called company law [Act VI of 1988], the transformation law [Act XIII of 1989] (both became part of the Civil Code in 2013), and the concession law [Act XVI of 1991] played a prominent role.

[9] The possibility for the state-owned road transport operator and large deep-building companies to raise and sell capital, as well as the concessional construction operation, has also been made possible. However, the once thriving vehicle industry culture was not able to adapt to the new market conditions, most of which were sold as bankrupt business sites and damaged. The "(small) enterprise grunding" ramp has also become an almost popular movement in the transport system's ancillary services, such as cleaning, vehicle maintenance, passenger information, etc. [4].

that, despite constitutional conditions [10] and the emergence of enabling economic laws, discussions continued on the role of the state in the economy and its responsibility as a public service provider. The privatisation of unshared companies in road freight transport was the first in a few years. However, this is not the case for public passenger transport, as even today, ownerships of those belong to the national and local governments, the capital and the larger cities.[11]

The establishment of greenfield passenger vehicle manufacturing plants that served domestic motorization and broad foreign market interest has begun,[12] while at the same time the large vehicle manufacturing companies formerly serving the public transport needs of the inland, Soviet bloc and the third world have failed.[13] In the area of transport construction, Hungary's deep-building companies were excluded from the launch of larger-scale developments. In the course of privatisation, most of them became part of large international companies and thus gained domestic job opportunities. The fate of the road and bridge construction companies, or rather company fragments, that came under Hungarian private ownership after the liquidations and transformations remained a struggle for survival.

In addition to moving to agglomerations, the economic-transformation crisis in the decade after the regime change and the surge in the use of passenger cars have contributed to changing the needs of public transport. The concentration of jobs in Hungary has also accelerated with the transition to a market economy. Passenger cars have become an integral part of life to travel to work every day and to meet other needs.[14] However, the degree of change was also attributable to the fact that public transport was unable to adapt to the changes in demand with the necessary flexibility due to the lack of resources for the necessary improvements.[15]

The opening up of socio-economic plans has made it possible to lay the groundwork for new development goals in transport. 1991 saw the completion of a long-term development programme for the national road network, which was reflected in the new transport policy gaps.[16]

As road network developments have not followed demographic and industrial deployment changes at a sufficient pace, the traffic load of the road network,

[10] The revised rules of the Constitution include those that were absolutely necessary for the socio-economic transition, compared to decades of previous party state regulations [Act XXXI of 1989]. The road network also included basic standards for the operation of a market economy, the definition of forms of ownership, etc. The Constitution, as amended in autumn 1989, remained valid until 2011, when it was replaced by the new one [Fundamental Law 25 April 2011].

[11] This was the way in which many of the former senior staff of public road transport companies obtained ownership using preferential loans to cover the shortage of capital in Hungary and various management-buy-out solutions supported by the government. The private sector continues to participate in public long-distance and local road passenger transport for reasons of profitability, which is also subject to tariff limits and for service safety reasons, only as contract subcontractors.

[12] Suzuki, Opel and Audi moved to Hungary at this time.

[13] Ikarus was one of the world's largest companies, producing 13 thousand buses annually, a few years ago.

[14] In the country of ten million people, the number of passenger cars rose by five hundred thousand by the millennium, reaching more than 2.4 million. At the same time, domestic public road transport performance decreased from 2,617.1 million passengers per year to 2,089.9 million passengers/year.

[15] In 1990, 1.2 million people, more than 26 percent of the employed, were commuting from their place of residence. At the end of the decade, their number increased to 1 million 340 thousand people, which accounted for 30 percent of the employed. The increase is also due to the additional labor demand brought about by the successful economic consolidation. In addition to the problems of public passenger transport services, the individual solution of daily work-related transportation is also facilitated by the employer's practice, which, in addition to the use of public transport (purchase of passes, wage supplements), also supports individual transportation (so-called kilometer money, gasoline cards, wage supplements)

[16] "The Theses of the Hungarian Transport Policy Concept" was completed in 1992. The transport policy target system adopted in 1995 was based on this [5]. This included almost everything: the creation of a new main network structure that would improve economic competitiveness, the improvement of regional accessibility, the development of urban and suburban transport, the prevention of road wear caused by vehicles with high axle loads, etc. The government estimated the costs of implementing the program at around 4 billion dollars, but within this generous framework, the scheduling and the consistency with the resources, the EU integration process, and the goals of efficient operation and maintenance were already contingent. It would have been important for planning and programming activities to determine the "necessary" and "sufficient" scale, because this would have allowed an opinion to be expressed on the financial needs. However, this was not usually the case [6].

especially around the capital, has risen to levels that—to this day—still cause congestion, increased environmental pressures and deteriorating road conditions [7].

There has also been a change in the road vs. rail distribution of freight transport.[17] In addition to the general increase in road traffic, international transit has also increased.

In the past, relations between the east and the south were paralyzed by the collapse of the Soviet Union, the break-up of CMEA and the civil war that led to the[18] division of Yugoslavia at the beginning of the decade. The latter situation was resolved following the end of the war in Yugoslavia.[19] In addition to changing external trade relations and changing commodity composition, the sharp increase in traffic in high load vehicles in transit has been accompanied by a widening gap between the needs and the adequacy of the road network.

The changes to the economic and public finance regulations introduced by the regime change in the system also rewrote the financing of road transport.[20] The fast-paced development of road infrastructure, in particular the highway network[21], has been a key strategic objective by setting up the Road Fund[22] and extending concessional solutions for crowding in private capital. Although significant progress has been made,[23] the economic and political crisis in the countries of destination for transport, the temporary fallout of the southern transport destinations, and not least the programme's commitment to replace them at the same time resulted in an unavoidable shortfall regarding the targets set. Private equity was not able to maintain any part of the highway network at its own risk on a permanent basis, despite high user charges:[24] As a consequence, they went bankrupt and were bought as a result of the government's service security considerations of 1998-2002.

Hungary's integration into the EU reached another step in 1998. Accession negotiations have started. In addition, major segments of Hungary's public finances

[17] Domestic road freight transport performance in the overall transport performance was increasingly higher than that of rail, increasing from 118.8 million tonnes/year to 142.4 million tonnes/year between 1990 and 2000.

[18] The M5 motorway, which is the Serbian connection, has only a fraction of the traffic considered when preparing the concession, and the M7 connection between Croatia and Slovenia, which leads to the Adriatic Sea, has also had a similar fate. The transit function has been "lost" for years, which has led to the impossibility of concession contracts and the postponement of construction up to the national border. Similar consequences have been encountered in the case of the M3 motorway, which leads to the east and north, where the connections up to the common meeting point have only been established in recent years, and will be built in the near future.

[19] The 1999 accession to the North Atlantic Treaty Organisation (NATO), which also helped to restore transport links with the former Yugoslav successor states bordering Hungary.

[20] The sources of public road construction and operation after the change of regime: general and specific-purpose tax and duty revenues, loans taken out by the state or local government, their own economic organizations with state guarantees; ticket revenues, road usage and parking fees, investments used to finance public-partnership projects at the expense of private capital and loans taken out without state guarantees, and non-repayable international subsidies.

[21] In the first decade after 1990, developments dominated the installation with the technical parameters of motorways, and later became typical of network development, which takes better account of traffic needs, built on less source-intensive roadway parameters (20 to 30 percent in specific terms).

[22] The amount paid into the Road Fund per liter of fuel sales could be used for the development, maintenance and operation of public roads, as well as for the repayment of loans taken out for such purposes. Since the amount to be paid was not determined as a percentage of the price, its real value decreased in the inflationary environment. In the second half of the 1990s, the repayment and interest on loans already exceeded one third of the revenues. The Road Fund was replaced by the Road Maintenance and Renovation Target Appropriation of the state budget between 1999 and 2005, with the real value of its resources remaining at least the same as the expenditures in the last year of the Road Fund's operation. However, this was not achieved due to the scarcity of resources [Act XXX of 1992].

[23] The 43 km long M1 motorway section built between Győr and Hegyeshalom in the concession scheme [Act XVI of 1991] reached the border in 1996—thus Budapest became the first East-Central European capital to be connected by a motorway to the Western European motorway network. A toll was collected for the use of the motorway section. In a similar scheme, the nearly 100 km long M5 motorway section between Budapest and Kiskunfélegyháza and the approx. 100 km long tolled section of the M3 motorway between Budapest and Füzesabony were completed by 1998. Meanwhile, the construction of other motorway sections progressed at a moderate pace as state investments. Some of these were only completed a decade later.

[24] The direct link between traffic size-dependent toll revenues and financing was eliminated by "buy back" of the concession (M1) motorway section, which became loss-making as a result of the end of the road fund and the lower-than-expected traffic revenue, and the conversion of concession contracts to a charge-based basis (M5).

have undergone modernisation and western sample-tracking changes, also supported by funds related to European integration preparation. [25] Development activities that avoid urban areas and reduce the burden on the internal road network of municipalities were limited and the technical adequacy of the main network has not improved, while the lower ones have deteriorated. At the time, the relief role of the motorways built at the time was only local.[26] It has mitigated the overloading of the country's main road network in the Western main direction, but not sufficiently even there[27] (see Fig. 2).

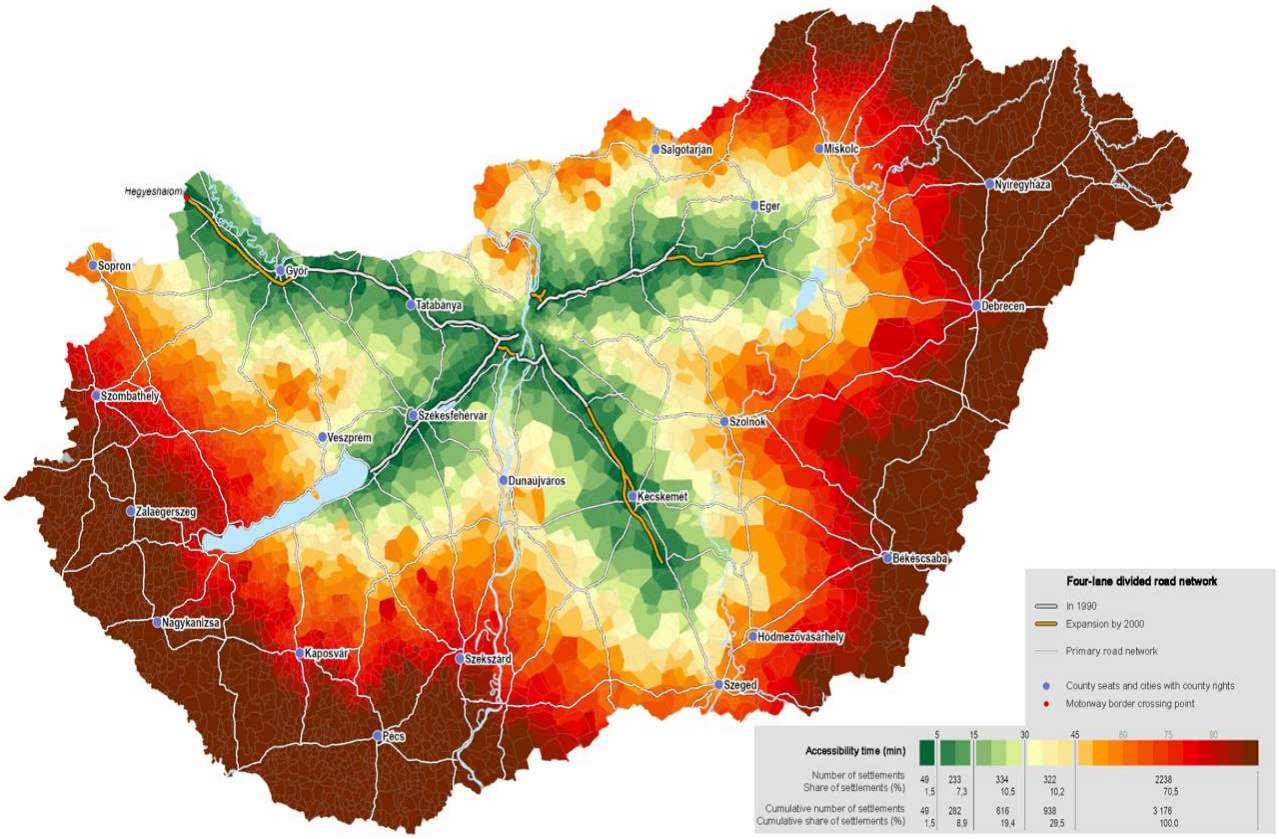

Fig. 2 Access to the motorway network in 30 minutes and 60 minutes in 2000.
Source: Ministry of Construction and Transport (MoCT).

[25] In 1999, a 10 million Euro EBRD (European Bank for Reconstruction and Development) loan and 9.5 million Euro PHARE aid helped finance road developments. This was also the time when the restored Hungarian-Slovenian railway line and the Esztergom-Sturovo Danube bridge, which is important for the Hungarian-Slovak road connection, were put into service, which was made possible by long years of preparation and a combination of EU financing (loan and aid).

[26] The study "Hungary on the Move" in 2001 assessed that despite the results of socio-economic transformation, the level of development of transport lags behind the EU average. Transport is a determining factor in international competitiveness, which must adapt to social and economic changes [7].

[27] Due to the high tolls, a significant part of the traffic used the roads next to the motorways, causing accelerated deterioration, air pollution at the crossing sections of settlements, and noise and vibration damage. Tolls had to be paid on the motorway built with private capital, while on the other, built with public funds, they did not. Finally, in 1998, a system was introduced on the motorway network, which provided a "windshield sticker" following the so-called Euro-vignette system, and then from 2008, a "e-sticker" system based on license plate reading, providing a certain period of use. In line with EU directives, in 2013, an electronic toll collection system (HU-GO) proportional to the use was introduced for vehicles with a total weight of more than 3.5 tons on expressways and on the approximately 5,300 km long main road network used by international traffic.

3. The Road Network of the Years Following the Transition to Market Economy

The 10 years after 2000 are divided into two phases. After years of consolidation across governments and years relying on national resources, in the first period after the change of government in 2002, the new government cycle, which over estimated the supportive role of EU accession in 2004, [28] promised a "framework of prosperity". However, this was not the case. After the break, the crisis in the financing of public finances, the debt spiral and the long-lasting rise in unemployment made life difficult in Hungary, amplified by the spill-over effects of the 2007-2008 overseas financial crisis to Europe.[29]

Economic growth, driven by continued external financing flows since 2002, has led to severe imbalances in both the public and private sectors. The fiscal adjustments introduced from 2006 were not effective because fiscal and monetary policy has failed to coordinate real economic and budgetary measures. Social tensions have increased, causing political instability, that made management increasingly difficult.

Thanks to the investments started at the end of the previous decade, the road network continued to develop by attracting private foreign capital, unlike other areas of transport and public finances [8].

In the early 2000s, the distribution of transport labour underwent a significant reshuffle. In the second decade following the regime change, passenger numbers in public transportation continued to decline. By contrast, growth in individual car traffic remained very strong. The role of public roads has also strengthened in freight transport.[30] There has also been a further dynamic increase in transit traffic, which is particularly challenging for road congestion.

In the second decade of socio-economic transition, the budget was more likely to finance the maintenance and operation of the existing road network and, to a lesser extent, the main road reconstructions. The construction of the motorway network, which is a priority for developments, and even the construction of the tracks triggering the urban crossings of the main roads were mostly supported by external funds[31]—loans and EU funds—and the use of financing solutions involving public-private partnerships became the norm.[32] Funding has increased since 2005 not only as public-private partnership solutions, but also by the share of EU funds[33]. However, the deterioration of the position of public finances after 2002 ruled out that

[28] Transport managers also faced challenges in these years, including preparing for accession to the European Union and then adapting to EU regulations. Progress was cautious, with some of the preparatory work being postponed to the following year in 2003. On the day of accession, 1 May 2004, a number of harmonisation preparatory studies and decisions were still missing, the completion of which was postponed to the second half of the year. Hungary, together with nine other countries (Cyprus, the Czech Republic, Estonia, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia), became a full member of the EU. Then, in 2006, Bulgaria and Romania also became EU members.

[29] The gross domestic product was $47.28 billion in 2000 and $131.9 billion in 2010. The country's average annual growth rate of 2.5 percent was partly financed by debt from 2002 onwards, which was supplemented by EU funds amounting to 1-2 percent of public expenditure after 2004. After 2006, due to internal imbalances, the international financial crisis and failed attempts at fiscal consolidation, employment fell, reaching 48.7 percent by the end of the decade.

[30] The number of passenger cars exceeded 3.5 million in 2010. The domestic public road passenger transport performance was 1,659.2 million passengers/year. Domestic road transport output was 199.8 million tonnes/year.

[31] These amounts should not be assessed as purely external sources, since according to EU regulations, a so-called "own share" of 25 percent or more must be allocated from the central budget. With the subsidies, the public finances gained additional financial resources amounting to 1-2 percent of GDP. Through the budget distribution system, 6-10 billion forints of this went to transport in these years.

[32] The essence of this solution is that the implementation of the facility is carried out under state responsibility, but entirely—in terms of financing, construction and operation—by private means, and the state repays this as an availability fee over the available time, for example 25 years, so that instead of the construction costs, a fraction of them appears in the budget. We can also consider this as a hidden loan.

[33] The European Union-funded transport developments in the period 2004-2006 were fundamentally determined by the fact that, due to Hungary's favourable transport and geographical position, the east-west and north-south trade routes pass through here. It was necessary to improve the connection with Western European transport axes as soon as possible, to accelerate network development and to conduct transit traffic as quickly and in a more regulated manner as possible in order to facilitate integration into European economic and trade processes.

these could be reported as a surplus in transport funding compared to the past.

The conceptual changes in the creation of the financial background is illustrated by the fact that the study[34] carried out in 2001 was put aside and three[35] transport policy documents were produced in four years, followed by another one in 2007.[36] They reflected not only a change in the policy view but also on the limits of the ability of the economy to finance the severe crisis. As the nature of the financing of new transport policy ideas,[37] which seeks to mask a lack of budgetary resources, was not in line with EU practices, it was necessary to draw up a further document.[38]

Although EU standards had been gradually incorporated into the regulatory framework of Hungary's public finances by the time of its accession in 2004, the regulatory, institutional, and administrative conditions required for their effective implementation—entailing structural adjustments in both the economy[39] and in public finances—were lacking.

As a result, the European Commission had already initiated an excessive deficit procedure for Hungary in 2004.[40] Compliance with EU public finance standards, as evidenced by the European Commission's year-to-year assessments, was furthest in the years 2004-2010.[41]

In order to correct the imbalances in public finances, economic policy has been accompanied by a patchwork of "lawn-mowing/dietary" recipes, albeit ineffectively. Due to a fall in Hungary's GDP of around 6 percent, transport expenditures also decreased.

Investments aimed at slowing the deterioration of the existing primary and secondary road network, as well as increasing its load-bearing capacity and overall capacity, and the construction of metropolitan bypasses, could have been undertaken to a greater extent using the funds available upon Hungary's accession to the European Union in 2004. However, the scale of these developments was far from sufficient to close the gap between traffic demand, network load, capacity constraints, and technical standards. As a result, although the motorway network expanded significantly—from 530 km (~329 mi) in 2000 to 1,240 km (~770.5 mi) by 2010—supported by the reintroduction of concession schemes and PPP (public-private partnership) arrangements, it still fell well short of the requirements of transit traffic and territorial accessibility. In addition, parts of the previously constructed network[42] had already deteriorated under increasing traffic loads and required rehabilitation, while certain sections had become capacity-constrained—problems that could not be adequately addressed due to a lack of financial resources (see Fig. 3).

[34] Transport Policy 2003-2015 [9], Transport Policy Concept 2004 [10], and since the concept was not adopted by the EU, in 2006 the Single Transport Development Strategy [11]. EU funds from 2005 have already been subject to the common rules for spending these funds and safeguarding the financial equilibrium of the general government as a whole.

[35] After the change of government in 2002, the socialist (neo)liberal approach was replaced by the socialist (neo)liberal approach for two cycles.

[36] In order to obtain resources from EU funds complemented by domestic self-participation, the concept of transport development had to be updated. This was the case in 2007 in the White Paper of the Single Transport Strategy [12]. The main road network objective was also to improve economic competitiveness, improve regional accessibility, improve urban and suburban transport, and prevent road use from high-axis vehicles.

[37] Although the description of the track sections to be built up until 2007 and the money considered necessary for its construction were included in the documents, with a significantly underestimated resource, it did not include the funds. The EU rejected the extra-budgetisation of funding for the construction of motorways under construction or in preparation. Actual expenditure was lower than foreseen in the Budget Act each year: 50% in 2004, 71% in 2005, 80% in 2006, 55% in 2007, 40% in 2008 and 30% in 2009.

[38] The document was completed in 2006 [11].

[39] The country's own potential growth capacity fell close to zero in the first decade of the 2000s.

[40] European Commission 2005.

[41] By 2009, public debt had risen to more than 80% of GDP. Between 2002 and 2009, the average annual GDP growth rate was about 2.5 percentage points higher than the average annual GDP growth rate of 4%. During this time, the public deficit target set in the so-called convergence programmes for joining the eurozone was not fully met in any year.

[42] M1, M3 motorways, the stage of the M7 motorway leading up to the Balaton resort area, the distributional connection of the M7 motorway, which avoids the capital from the south.

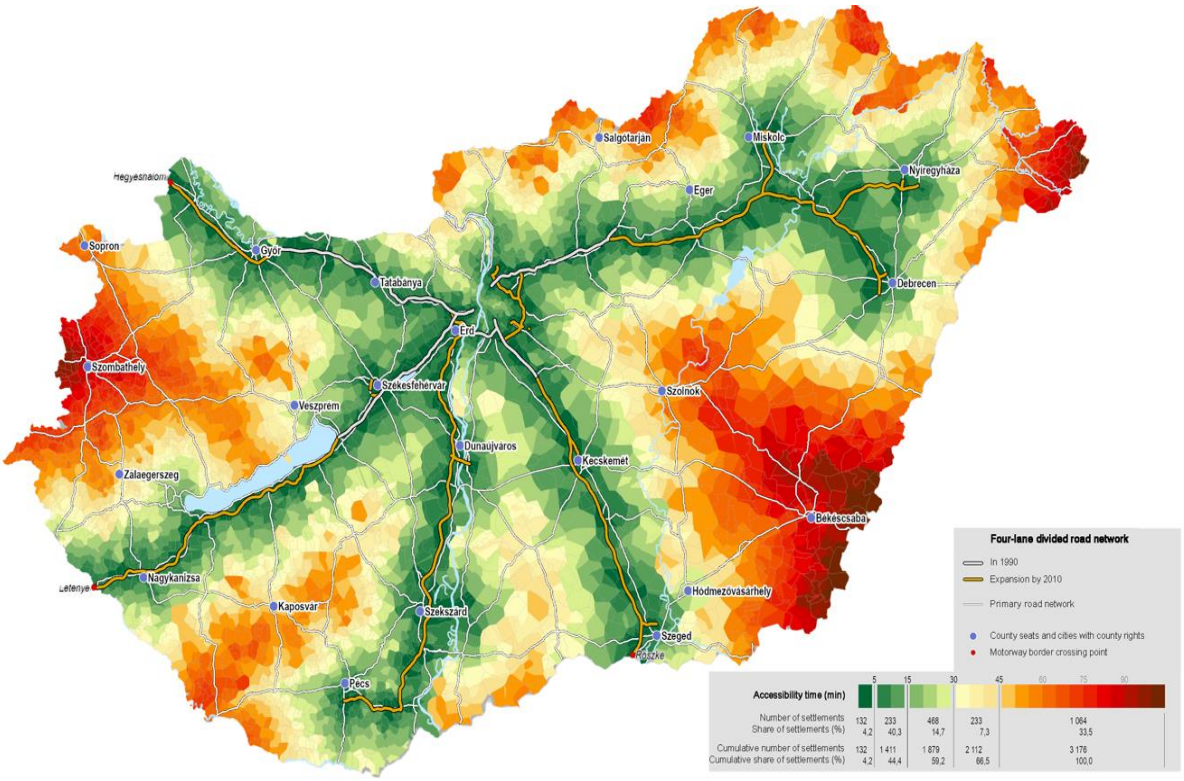

Fig. 3 Access to the motorway network in 30 minutes and 60 minutes in 2010.
Source: Ministry of Construction and Transport (MoCT).

4. One and a Half Decades of Completing the Road Modernization

The period from 2010 to the present can be divided—based on its external environment and prevailing economic conditions—into two contrasting phases: a supportive phase lasting until 2019, followed by a period marked by severe difficulties. However, the results of the first phase contribute to resilience in the face of the increasing burden of the second phase.

The success of the financial stabilisation achieved between 2010 and 2013 was decisive for further growth in socio-economic developments.[43] Thereafter, the improvement in the performance[44] of the Hungarian economy improved strongly in the area of roads and transportation as well. Consolidation meant more than creating fiscal stability—in fact, a reorientation of economic policies[45]. It has fundamentally changed economic regulation and social benefits. The first result was Hungary's exit from the EU's excessive deficit procedure[46] as early as 2013. From then on, public finances were gradually on a balanced path, with increasing resources. Favourable conditions were maintained until the COVID crisis, thanks to EU

[43] At the beginning of the period 2010-2013, Hungary was also hit by the second wave of the global economic crisis. Instead of ambitious growth and equilibrium goals, the primary aim was to manage crises and achieve financial stability in public finances.

[44] Between 2013 and 2019, the Hungarian economy's own potential growth capacity—excluding external (EU) resources, favourable international cyclical effects such as the prices of manufactured goods and the price of raw materials and energy costs—increased to 2-3 percent according to various expert estimates. Accordingly, in these years the average increase in social product (GDP) was around 4 percent, reaching 8 percent at the end of the period.

[45] This was expressed in 2011 by the Fundamental Law, which dedicated specific paragraphs to public finances and the protection of financial stability. One of the most important elements of the Fundamental Law's rules on budget is that it also determined the amount of public debt that could be planned on a yearly basis.

[46] The EDP (Excessive Deficit Procedure) is the European Union's monitoring mechanism which aims to maintain budgetary discipline in the Member States. It starts if a Member State exceeds the limits set in the EU Treaties: a deficit above 3% of GDP and a debt level above 60% of GDP if it is not decreasing at a satisfactory pace. In the course of the procedure, the European Commission makes recommendations to reduce the deficit and ensure their enforcement.

support and favourable external conditions.[47] This has also led to significant improvements and modernisation of services on the roads.

In the third decade after regime change, until 2019, passenger transport showed a slightly increasing, balanced performance, before dropping very sharply by one third in 2020 as a result of the COVID pandemic.[48] At the same time, private transport and passenger car traffic continued to grow dynamically. The stock of passenger cars was close to 3.8 million at the end of 2020 and 4.5 million in 2025.[49] Commuting stabilised in 2021, disrupting the upward trend of the previous decades, halting at around 1.35 million people.[50]

The internal rates of the EU passenger transport work distribution for the entire 15-year period remained essentially unchanged. Road and urban public transport accounted for 61 percent and 33-34 percent of the number of passengers transported at the end of the decade. The annual quantitative performance of freight transport, reversing the downward trend, increased significantly between 2014 and 2019 thanks to economic consolidation, but was brought back to the level of the early decade by the pandemic. It had a share of 66 percent of the total shipped goods by road. Hungary's transit role is linked to the continuous increase in the flow of heavy-duty vehicles passing through. This means more than one hundred thousand trucks and lorries with net weight above 5 tons per year.

Due to the COVID crisis[51] and the resulting economic crisis, progress has only temporarily stalled. In 2021, GDP already exceeded the pre-COVID level.[52] However, the negative effects of the war in Ukraine and the energy crisis and the sanctions policy negatively affected the possible economic performance in Hungary.[53] GDP growth declined or was very modest. In its problems the downgrading European industrial performance and the disrupted functioning of integrated European supply chains played and play a decisive role.

Economic patriotism from 2010 to date went hand in hand with the finalisation of the discussions on ownership of national strategic companies in the services sector. Government perception has become inextricably linked to the dominance of governance and ownership rights over transport infrastructure. This involved standardising charges for the use of state-owned motorways and privately funded motorways, resulting in significant revenues, repurchasing certain concession phases and the creation of a Hungarian private management developer company[54] [13].

[47] With the exception of the COVID period, the government debt-to-GDP ratio decreased steadily, with the related debt service burden declining from close to 10 percent of the budget to a fifth in 2019. 2017 was the first year in which the inflow of EU funds exceeded the amounts paid for public debt management (interest).

[48] In Hungary, taking into account various virus mutations, the pandemic appeared in several waves from the beginning of 2020. The most severe ones were the first (spring) and second (autumn-winter) of 2020 respectively. The night lockdowns, restrictions on the abandonment of dwellings, the emergence of home offices had a clear negative impact on the continuation of transport projects, and the interruptions made the development of transport infrastructure more difficult.

[49] Although the ageing trend of the stock is worrying, it is not comparable to the situation in the 1990s. At the time, the stock of motor vehicles with an average age of 9 years was not yet in line with any EU standard. On the other hand, today's 15-year-old motor vehicles are Euro IV and V standards. Their greenhouse gas emissions are far lower than in the years of regime change, with rapid electromobilisation playing an increasing role. The number of electric cars exceeded hundreds of thousands at the end of 2025.

[50] However, commuting remained high in the capital area. According to census data, around 60 percent of the population of Pest county, around Budapest, commuted between his home and his workplace. This rate is outstanding in a European comparison as well. Source: HCSO.

[51] As a domestic impact, GDP decreased by 4.5%, the general government deficit increased to 7.5% of GDP.

[52] After overcoming COVID, Hungary's GDP grew by 7.1 %.

[53] The economic consequences of political differences have become particularly acute in recent years, when compared to the 2010s, the EU Commission, citing rule of law and other political reasons—migration, rejection of sanctions related to the Ukrainian war, management of universities, etc.—reduced by a third the actual payment of already approved EU funds, which also support transport developments.

[54] The buyback/replacement of public-private-partnership solutions and concessions between 2002-2010 was directly or indirectly transferred to the budgets of later years (although the termination of the concessions of the motorways established in this form was ultimately not carried out due to the scarcity of available state budget resources; according to the valid contracts, the so-called availability fee payable annually to the concession motorway companies remained a heavy burden until the HU-GO electronic toll collection system, which brought significant additional budget revenues, was put into operation in mid-2013).

Funding for the years 2020, up to the pandemic period, has made it possible to reduce the dominance of foreign ownership in transport's investment, construction and operation tasks, and to make large domestic companies fit for these tasks.[55]

In these years, Hungary has become a "high power in the automotive industry" by foreign direct investments form the West and East Asia. [56] Electromobility capacities have also been built. Improved social-economic conditions have opened up new opportunities to take greater account of environmental interests, supported by the use of electric cars and the development of the electric bus plant for urban public goods transport.

In this more successful period, transport's development and maintenance spending needs consistently exceeded available resources. Direct [57] and indirect revenues from road use were in the order of 1,500-2,000 billion in current prices except for the years of the pandemic period, while the resources for the network accounted for around a third of the revenue. This is also why the consequences of earlier residual-based funding practices have not yet been fully eliminated. The condition of the secondary and distributor road network remains less favorable. As insufficient resources were allocated to the maintenance of both these roads and urban roads during this period, their condition continued to deteriorate. As a result, short-distance traffic between interchanges increased along long-distance expressway corridors.

Despite financial constraints—at times particularly severe and largely dependent on overall economic performance and external EU funding—the total length of the road network expanded to 131,000 kilometers (~81,400 mi), of which 9,000 kilometers (~5,600 mi) constitute primary roads. The vast majority of these meet the EU axle load requirements. Investments in expressways and urban bypass sections continued, and upgrades were launched to expand capacity and ensure the technical compliance of previously constructed motorways. [58] Today, Hungary's expressway network is more extensive and offers better accessibility than those of neighboring EU Member States, with a total length of 2,600 kilometres (~1,616 mi) (see Fig. 4).

[55] With the strengthening of Hungarian private capital in services, it was a step in line with the interests of the majority of domestic owners that the development and operation of approximately two-thirds of the expressway network in concession form became the responsibility of a Hungarian capitalist group, the Hungarian Concession Infrastructure Development Company (MKIF), as a service provider from 2022. Among other things, the work of domestic contractors is praised by the handover of the new Körös bridge on the M44 motorway in 2019, the completion of the half-elliptical pylon, cable-stayed Tisza bridge on the M44 motorway, and the completion of the Tisza bridge in Szolnok on the M4.

[56] Such are the new investment by Mercedes, the greenfield development of BMW and BYD, and the series of investments related to electromobility—also dependent on the alternating fluctuations of world politics and professional opinion. Today, 7-9% of GDP is due to the automotive industry.

[57] The annual amounts collected from road tolls directly improve the funding of road transport services through the budget redistribution mechanism. Since the introduction of the system in 2013, approximately 4,000 billion forints of additional budget revenue have been generated. The size of toll revenues—as the possibilities for increasing tariffs are limited—depends on economic development, tourism, and European cooperation (transit).

[58] The concessionaire MKIF launched its expressway road renovation program in 2023, under which a significant part of the 1,237-kilometer road network under management will be renovated. In 2025, the pavement was replaced on 24% of the network, nearly 4.5 million square meters. Since the start of the program, a total of more than 10 million square meters of pavement have been renewed, and where necessary, the deeper structural layers (bonding and base layers) are also replaced. The renovations cover the M1, M3, M7, M30, M35, M4 and M8 motorways and expressways. In 2024, almost half of the works took place on the M3 motorway. The Hungarian Public Roads Nonprofit Co. Ltd. is carrying out more modest renovations on the approximately 28,000-kilometer network managed by the state. Thus, especially on lower-level, local-function roads, the renovation backlog has increased, and the compliance indicators have deteriorated.

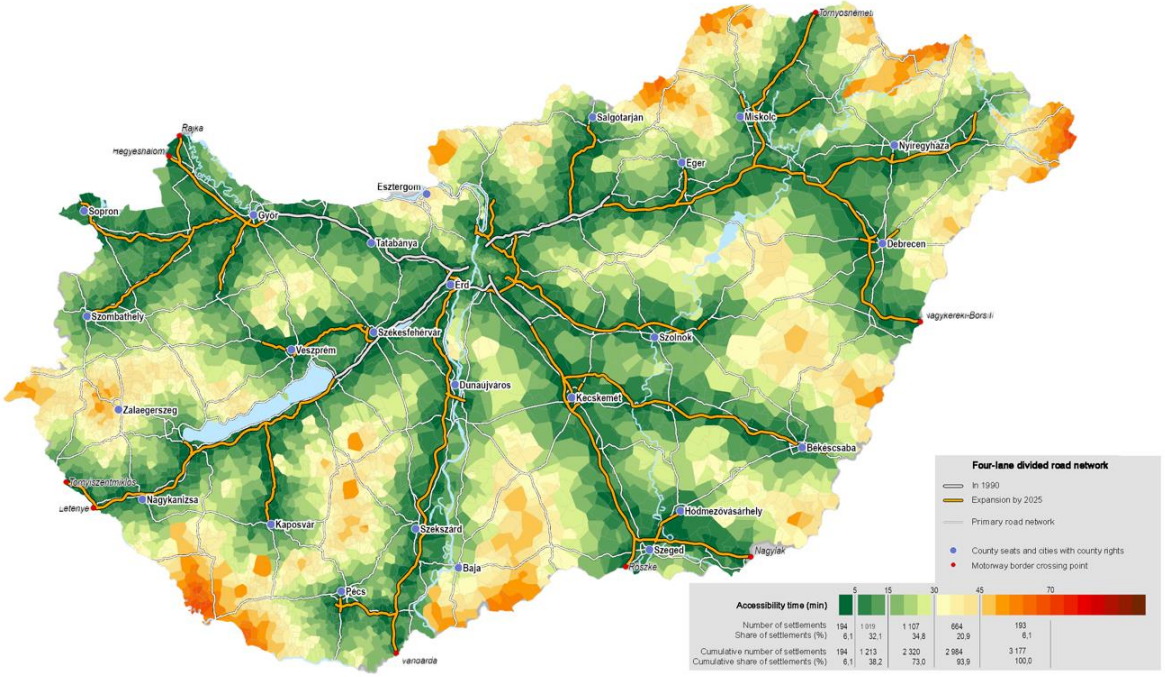

Fig. 4 Access to the motorway network in 30 minutes and 60 minutes in 2025.
Source: MCT.

5. Concluding Remarks

In the 60-80's of the last century, the quality of domestic transport infrastructure fell significantly short of that of Western European countries. The fundamental reason for this was that the resources of the ambitious, planned-economy-oriented ideas were in reality determined during budget redistribution based on the so-called residual principle.

Over the past 35 years, our convergence with the EU, our accession and then membership have been decisive in the international relations of Hungarian transport, which has, however, also meant that the EU's transport relations with third countries have changed national space in traditional bipartite and multilateral international cooperation.

Two fundamental factors have played a role in the economic policy of changing governments, in addition to the former government's mission approach and taking into account the reality of the economy. On the one hand, Hungary's foreign partners in all federal and economic organisations, the international advisory institutions (credit rating agencies), called for a budgetary balance to be achieved and maintained as soon as possible; they welcomed an austerity policy, without addressing the burden of socio-economic transition with a society with little control over the burden of the socio-economic transition, while living with the hope of welfare and development of the regime change. On the other hand, economic policy has also had to respond to societal needs, including the development of transport services.

The capacity and quality characteristics of transport infrastructure cannot be separated from the evolution of the flow of financial resources to this sector. From the regime change to the early 2020's, six different transport policy concepts were developed. The early ones were based on one another, but accession to the European Union has fundamentally changed their composition (due to the content and format requirements in line with EU standards, the harmonization of transport modes, the alignment of project lists with them, etc.).

However, apart from the short periods of the systemic shock, the economic crisis of 2007-2008 and then the pandemic period, as well as the so-called war

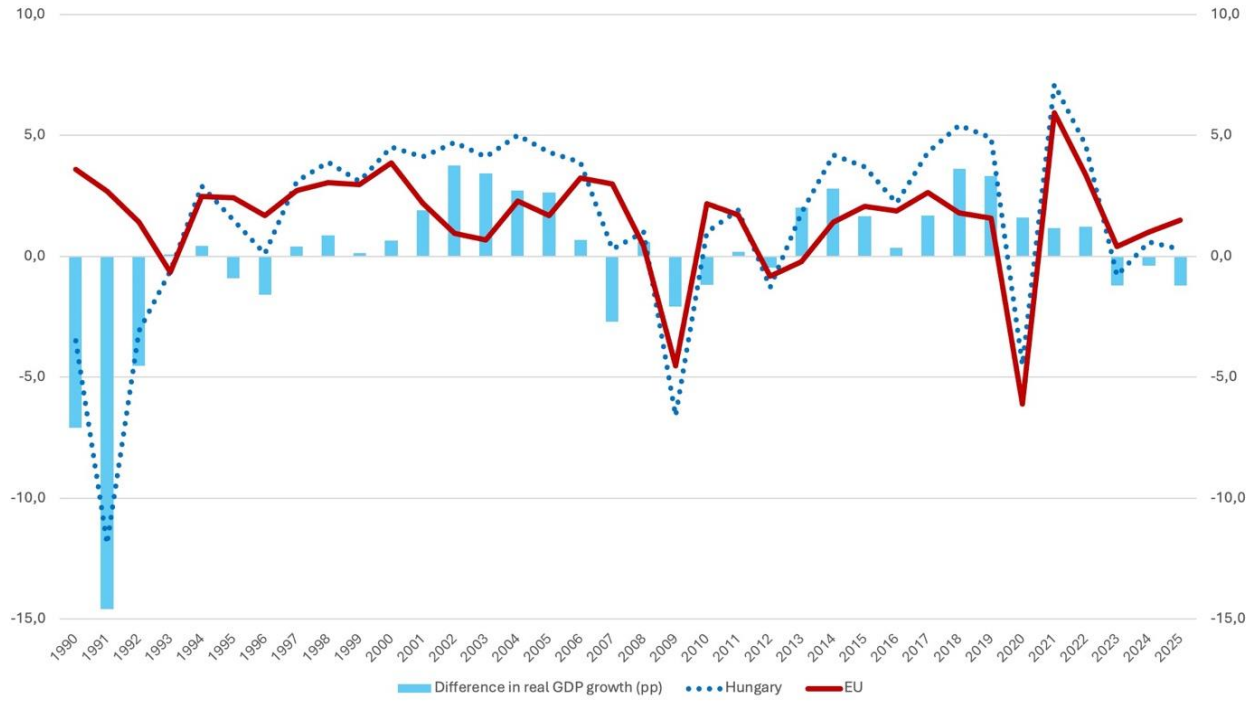

Fig. 5 From systemic change to today's economic growth EU comparison.

Source: HCSO, Eurostat.

sanctions policy affecting today, Hungarian economic growth has consistently exceeded the European Union average (see Fig. 5).

Longer-term developments in government expenditure are also key for the development and functioning of the transport system. Government expenditure on road transport exceeded 3 percent of GDP only in 2006-2007 and amounted to 2-3 percent in 2002 and 2018-2021. In all other years, road expenditure accounted for only 1-2 percent of GDP.

As a result of the social and economic policy factors and circumstances described, the development and operation of Hungary's transport was characterised by an increase in road motorization and a steadily growing socio-economic demand for road network developments, which, however, was only followed by investments in high-speed travel. By 2025, the main elements of the road network had provided the possibility for the motorway network to be available from 80 percent of municipalities within 15 to 30 minutes. The construction of complementary interconnections for the distribution of network traffic and the expansion of highest traffic loaded motorways to three-three traffic lanes towards Vienna and Lake Balaton have been launched.

At the same time, although significant improvements have been made, the construction of the sections of main roads that avoid settlements progressed slowly, and the quality indicators of the road network have not improved significantly either. The state of the lower distribution network and municipal roads has significantly deteriorated due to the lack of technically justified maintenance operations.

All of this shows that, building on the results, the allocation practice of future Hungarian road developments over several decades has to be changed in order to ensure balanced and proportionate development and maintenance. Without this, full road motorization cannot become a factor of quality of life and competitiveness, and cannot provide as a condition for the country's further development.

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