Ex post evaluation of major projects supported by the European Regional Development Fund (ERDF) and Cohesion Fund between 2000 and 2013

M43 Motorway between Szeged and Makó

Hungary

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A network of National Correspondents provides the geographical coverage for the field analysis.

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LIST OF ABBREVIATIONS

AADT	Annual Average Daily Traffic
B/C	Benefit/Cost ratio
CBA	Cost-benefit analysis
CF	Cohesion Fund
DG REGIO	Directorate-General for Regional and Urban Policy
EC	European Commission
ERDF	European Regional Development Fund
EIA	Environmental Impact Assessment
ENPV	Economic Net Present Value
ERR	Economic Rate of Return
ESIF	European Structural and Investment Funds
EU	European Union
EUR	Euro
€ct	Euro cent
FNPV(C)	Financial Net Present Value of the Investment
FNPV(K)	Financial Net Present Value of National Capital
FRR(C)	Financial Rate of Return on Investment
FRR(K)	Financial Rate of Return on National Capital
FS	Feasibility Study
GDP	Gross Domestic Product
GHG	Greenhouse Gas
HGV	Heavy Good Vehicle
HIPA	Hungarian Investment Promotion Agency
HUF	Hungarian Forint
ICT	Information and communication technologies
ISPA	Instrument for structural policy for pre-accession
JASPERS	Joint Assistance to Support Projects in European Regions
KÖZOP	Transport Operational Programme of Hungary 2007-2013 (see TOP)
KTI	KTI Institute for Transport Sciences Non Profit Ltd.
LAU	Local administrative unit
MCA	Multicriteria Analysis
NDA	National Development Agency

NIF/NID	NIF National Infrastructure Developing Co. Ltd
NUTS	Nomenclature of Territorial Units for Statistics
O&M	Operation & Maintenance
RO	Romanian (border crossing)
TEN-T	Trans-European transport networks
TOP	Transport Operational Programme of Hungary 2007-2013 (see KÖZOP)
ToRs	Terms of References
VAT	Value Added Tax
VOC	Vehicle Operating Cost
VOT	Value of Time

EXECUTIVE SUMMARY

This case study illustrates the story of the construction of the M43 motorway between Szeged and Makó. This major infrastructure investment was co-financed by the EU Cohesion Fund. More specifically, this report is an ex-post evaluation assessing the long-term effects of the project and disentangles those mechanisms and determining factors that have contributed to these effects. The analysis draws on an ex-post Cost-Benefit Analysis (CBA)[1] and on an extensive set of qualitative evidence, including secondary (technical reports, official reports, press articles, books and research papers) and primary (interviews with key stakeholders and experts carried out in October – December 2017[2]) sources.

OVERALL APPROACH AND METHODOLOGY

The Conceptual Framework delivered in the First Intermediate Report was developed to answer the evaluation questions included in the ToR. In particular, **there are three relevant dimensions** of analysis:

- The **'WHAT'**: this relates to the typologies of long-term contributions that can be observed. Our team classified all the possible effects generated by transport projects (including road, rail and urban transport projects) to the following four categories: 'Economic growth', 'Quality of life and well-being' (i.e. factors that affect social development, the level of social satisfaction, the perceptions of users and the whole population), 'effects related to environmental sustainability', and 'distributional impacts'.
- The **'WHEN'**: this dimension relates to the point in the project's lifetime at which the effects materialise for the first time (short-term dimension) and stabilise (long-term dimension). The proper timing of an evaluation and the role it may play in relation to the project's implementation is also discussed here.
- The **'HOW'**: this dimension evaluates how both external and internal factors influenced the observed project performance. We identified six stylised determinants of the outcomes of the projects regarding the context, the selection process, the project design, the forecasting capacity, project governance, and managerial capacity. The interplay of such determinants and their influence on the project's effects is crucial to the understanding of the project's final performance.

The methodology developed to answer the evaluation questions consists of an ex-post Cost Benefit Analysis, which was complemented by qualitative techniques (interviews, surveys, review of official documents and newspaper archives, etc.) **combined in such a way as to produce a project history**. CBA is an appropriate analytical approach for ex-post evaluation because it provides quantifiable indicators of some of the long-term effects of the project. However, the most important contribution of the CBA is to provide a framework of analysis to identify the most important aspects of the projects' ex-post performance and final outcome. It is worth noting that the purpose of this evaluation is not to compare ex-ante and ex post CBAs and that the results of these assessments are not easily comparable, because even if they rely on the same principles and draw from the established CBA methodology, there are often important differences between how the ex-ante and ex-post assessments were scoped and what data were taken into account. At the same time, the qualitative analysis reveals such factors that determined the outcome of the project that are difficult quantify.

MAIN PROJECT FEATURES

The project is located in Csongrád (NUTS3) County, in the south-eastern part of Hungary. The investment of the M43 Motorway between Szeged and Makó (CCI Number: 2008HU161PR016) concerns the construction of a **31.6 km long section** of the M43 motorway, which is connected with the M5 motorway towards Budapest in the North-West direction and runs towards the Romanian state border in the east direction while **crossing the city of Szeged and the town of Makó and several small settlements** between them.

The objective of this investment was to accomplish one of the targets of the Hungarian **Transport Operational Programme (2007-2013),** namely to **improve the international accessibility of the country** as well as to construct the missing section of the expressway network towards the national border. The project also aimed at **eliminating one of the existing bottlenecks in the TEN-T corridor** No 4 by providing safer traffic conditions. In the absence of the project, the corridor traffic would have used the parallel main road and other local roads.

The project was in line with the national strategies and policies, including the planned motorway development programme" and in particular with its indicative project list.

The main beneficiaries of the new motorway are road users of the existing main road No 43, including business and private commuters, freight transport and transit transport vehicles of the TEN-T Corridors. Among the beneficiaries are the residents of Szeged, Makó and the settlements along the main road No 43 as well because the transit traffic caused an unnecessary traffic jams before the investment.

The funding decision No C(2009)10151 concerning the major project (EC, 2009) was made on 14 December 2009 by the European Commission. According to EC (2009), the total budget of the project reached **EUR 197.2 million** (at current prices), of which EUR 167.6 million (85%) was CF contribution.

The construction phase took place between 2008 and 2011, while the operational phase started in April 2011. Almost seven years have passed since the opening of the new road. During these years, several other elements of the network have been completed and opened for traffic including the next section of M43 motorway towards the Romanian border (2015) and the A1 motorway sections on the Romanian side. All these improvements have affected the project under consideration, as discussed later in this report.

PROJECT PERFORMANCE

Project relevance and coherence

The objectives of the project correspond to the development needs and the priorities established at the local, national and EU level. The project facilitated the efficient movement of goods and people and thus **ensured and increased the competitiveness of Szeged – Arad cross-border region**. Most notably, **time savings have been realized and transport costs decreased significantly due to the investment**. The project also positively influences the quality of life and well-being in that **it protects residents in the surrounding settlements from noise pollution**

and emissions because the heavy transit traffic, which was a grave problem in the project area, now avoids those settlements. In the absence of the project, it would have resulted in the overloading of existing infrastructure, which would have deteriorated the quality of life in the affected settlements and congestion would have increased.

The socio-economic convergence of the region is an important objective but in the short run the M43 motorway had limited contribution to reaching this goal.

The objectives of the project fit into the national development priorities. The main goal of the Hungarian transport strategy[1] on the development of transportation infrastructure is the extension of the main network structure to improve economic competitiveness and regional accessibility. The strategic objectives of the project also reflect the local development plans, of which **primary goals are to improve the accessibility of the region.**

From a European perspective, **the project improves the Pan-European Transport Network as the M43 motorway constitutes part of the Hungarian section of** the TEN-T Network (**The Orient/East-Med Corridor**).

Project effectiveness

The project provides a coherent route, higher capacity, improved traffic speed and service levels for the international transit traffic of the Pan-European transport corridor IV heading towards Romania and then to the Black Sea.

The traffic of main road No 5 and 43 has decreased significantly after the opening of M43 motorway: 33% of the passenger cars and 81% of the heavy traffic have been diverted from these roads to the new motorway.

As the travel time (and the length of the journey) decreased between Szeged and Makó, vehicle operating costs (VOC) decreased also, but the benefit of faster traffic is almost cancelled by the higher than optimal speed of the light vehicles on motorways. **The largest benefit is that the heavy vehicles now avoid the inhabited areas** (this affects almost 20 kilometres of road leading through inhabited zones). This represents a win-win situation in that the quality of life of the inhabitants has improved and there are better speed conditions for the HGV drivers on the motorway (as their speed can be closer to the optimal). **The total estimated benefit of heavy traffic is around EUR 134.7 million** at 2017 values**.**

M43 motorway between Szeged and Makó significantly reduced the risk of accidents in the settlements and also on the roads connecting them. 22 major accidents (3 fatal ones) occurred on the route throughout the year before the start of the investment, and the number of accidents with less serious injuries was 29. A year after the project was completed the number of major accidents decreased by 8, while the number of accidents with less serious injuries decreased to 11. The M43 achieved the objective of improving quality of life as traffic now does not pass through the settlements, but outside of the populated areas. Consequently, the inhabited areas are now less exposed to air pollution, noise and vibration.

The evolution of the traffic flow and the economic, environmental and social impacts of the M43 motorway suggest that the project significantly contributed to the improvement in the quality of life.

[1] *Unified Transportation Development Strategy 2008-2020* (Ministry of Transport, Telecommunication and Energy, 2008)

Project efficiency

The ex-ante CBA included a total investment cost of EUR 324.8 million. 72.9% of this (EUR 236.6 million) was planned to be financed by the Transport Operational Programme 2007-2013, of which 85% (EUR 201.1 million) would have been Community assistance.

According to the project decision (14 December 2009) the budget was approved with a total funding of EUR 197.2 million, of which EUR 167.6 million (85%) represented the contribution from the Cohesion Fund. In these costs VAT was not included, which was finally covered by the state budget.

The total costs of M43 project exceeded the initially planned budget by 9.0% (by HUF 7.2 billion), while in euro the budget was less by 3.8% (by EUR 12.2 million). This additional sum was allocated for the project by the Hungarian Government.

The construction of the M43 motorway between Szeged and Makó was completed and the road was open in April 2011. **A 7-month delay occurred in its implementation because of the exceptionally rainy weather (Ministry of National Development, 2017) and the bankruptcy of one of the contractors (SZEVIÉP)**. The delay directly affected the construction of LOT 2 but also the interconnected LOT 3, which had been completed earlier, but was not possible to put into operation without LOT 2.

The ex-ante CBA, which was affected by some deficiencies in the demand analysis as well as some unrealistic and some different assumptions (see Section 4.4. Forecasting Capacity), presented a cost-benefit ratio of 18.66 which is substantially higher than the B/C ratio calculated in the ex-post evaluation (1.54). Although the difference is large, a cost-benefit ratio above 1 suggests that **the project was nevertheless cost-effective.**

EU added value

According to the funding decision the budget was approved with total funding amounting to EUR 197.2 million, of which EUR 167.6 million (85%) represents CF contribution.

Based on the qualitative evidence collected via interviews, **EU-funding was crucial for the project**. Formerly, the project had been identified as a top priority but probably the motorway would not have been built without the availability of EU funding. Besides the funding, the role of EU was also important during the planning and the implementation of the project. **The institutional background serving the project was established with EU support** and the cooperation between the project management and JASPERS contributed to the successful implementation of the project. However, the EU added value is not limited to project implementation: the **National Development Agency gained relevant experiences about the project application procedure**. Becoming familiar with EU standards and the relevant legal background proved useful in connection with other major infrastructure projects that were later supported by the Cohesion Fund. As our interviewees revealed, the insights gained through the planning and implementation of the **M43 motorway contributed to the easier and more efficient implementation of the other section of M43 motorway between Makó and Csanádpalota (RO border crossing),** and also played an important role in other major Hungarian major projects.

The European Council and the European Parliament accepted the TEN-T guideline for transportation in 1996. Its objective was to establish an **integrated surface, naval and aerial transport infrastructure network in the Community area**. Today, the M43 motorway between Szeged and Makó is an important part of the Orient/East-Med

Corridor. First and foremost, the M43 motorway ensures fast and safe connection between two EU member states, Hungary and Romania. Second, this connection also contributes to the competiveness of the cross-border region which, in turn, positively affects the socio-economic development of the macro region.

MECHANISMS AND DETERMINANTS

In terms of mechanisms and determinants explaining the project performance, a number of findings can be drawn based on the project assessment.

The project objectives were in line with the development needs identified at the local, national and European level and also reflected the major problems of the region. The project will remain relevant over the coming years because its effects will persist in the future. However, **preliminary studies focused mostly on the transport perspective, and the project objectives were later complemented with the aspects of quality of life and well-being.** At the European level, the contribution of the project to the implementation of the Pan-European Transport Network is also an important factor. Even though the preparation of the investment commenced in the early 1990s, the selection process concluded only in 2008. During the selection process, the content and the objectives of the motorway were not modified significantly.

The smooth management of the project greatly contributed to its successful implementation. In spite of some minor delays, **the project management was able to keep most of the deadlines and the investment was realized within the planned budget.** Coordinating the high number of stakeholders posed a challenge to the project management but the well-established governance system and the clearly delegated responsibilities provided a good institutional background for coping with such tasks. **The main negative event was the bankruptcy of one of the building contractors,** which threatened the successful implementation of the project. However, an efficient solution to this problem has been found, which raised further the positive image of the managerial capacity of management team.

As mentioned above, among the possible options for project design, the implemented centre line was the optimal solution. It means that the project design has provided a positive contribution to the overall performance of the project.

With respect to the forecast, the performance of the project is mixed. As we mentioned earlier, the **forecasting was slightly too optimistic** due to several technical mistakes made during the planning. This is the reason why the expected results do not fit to the observed reality. **More specifically, while the observed project performance is positive, it remains below the expectations.**

The success of the project was influenced by two exogenous events. The completion of the construction of the remaining section of M43 between Makó and Csanádpalota (RO border crossing) is responsible for the positive results of the project (shorter travel time, lower transport costs). At the same time, the socio-economic crisis of the region provided a negative context to the overall performance of the project, at least in the short run.

CONCLUSION

Several lessons can be learned from the ex-post assessment of this major project:

- **Closely observing the development needs is one of the most important factors during the planning phase.** It ensures that the project objectives will not change during the implementation and the project will remain coherent. It is also important to define which strategic objectives to fulfil in the short and the long run. The objectives of the M43 motorway are consistent with the overall development needs and priorities established at the local, national and EU level**.**

- **The role of the project management is crucial for the successful implementation of the project.** Good project management rests on clear responsibilities and efficient internal communication, which serves effective and fast problem solving. Apart from the 7 months delay in implementation, the M43 project demonstrates that good project management can generate a positive outcome even if external factors influence the implementation in a negative way. The bankruptcy of one of the building contractors represented the biggest challenge but the project management handled this problem quickly and efficiently and ensured the continuation of the project implementation.
- Investigating feasible alternatives and clarifying the advantages and disadvantages of each possible version are crucial for finding the optimal solution. If the decision-making process is transparent, then there is no barrier for the stakeholders to commit to the selected alternative. In the case of the M43 motorway the feasibility study investigated the potential centre lines. As a result of the clear classification of the pros and cons, an optimal solution was selected that combines most of the advantages of the alternative options and reduces the disadvantages to the minimum. This was the main reason why the chosen version was not questioned by the stakeholders during the planning process.
- It is essential to examine the demands for related services of the project to avoid the situation in which the project creates conditions for a profitable investment but the market participants do not take advantage of the opportunity. Although petrol stations had been planned along the M43 motorway and the spaces for them were also constructed, none of the petrol companies showed interest in the public procurement for building and maintaining a fuel station. The reason for this is that drivers may not need any additional fuel stations at this 60 kilometre long section as there are plenty of stations close to the border in Romania, along the M5 motorway or in the nearby settlements (e.g. Maroslele) as well. The fact that the public procurement proved unsuccessful gives a slightly negative tone to the project.
- **B/C ratio calculated in the frame of this ex-post evaluation (1.54) shows that the project was economically efficient.** This figure is significantly lower than the one calculated (18.66) in the ex-ante CBA, which was affected by some deficiencies in the demand analysis as well as some unrealistic and some different assumptions (see Section 4.4. Forecasting Capacity). B/C ratio is also lower than it was (4.78) at the first ex-post CBA (Szeged-Makó Consortium, 2013). The largest share of the quantifiable total benefit is time savings with an estimated EUR 820.8 million (net present value), which is 82.7% of the total estimated benefit (EUR 992.1 million). Vehicle operating costs savings contributed to the total benefit with 154.0 million (15.5%), while the role of accident savings (EUR 8.3 million) and noise savings (EUR 8.9 million) remain rather marginal. At the same time, the effects of the project on climate change and air pollution are negative.

1. PROJECT DESCRIPTION

The project of the M43 Motorway between Szeged and Makó (CCI Number: 2008HU161PR016) concerns the construction of **a 31.6 km long section** of the M43 motorway in Hungary, which is connected with the M5 motorway towards Budapest in the North-West direction and runs **towards the Romanian state border in the east direction while crossing the city of Szeged, and the town of Makó and several small settlements between them**. The objective of this investment was to accomplish one of the targets of the **Hungarian Transport Operational Programme (2007-2013)**, namely to improve the international accessibility of the country as well as to construct the missing section of the expressway network towards the national border. The project also aimed at eliminating one of the existing bottlenecks in the TEN-T corridor No 4 by providing safer traffic conditions. In the absence of the project, the corridor traffic would have used the parallel main road and other local roads.

The project was in line with the national strategies and policies, including "The planned motorway development programme"[2] and in particular with its indicative project list[3].

The main **beneficiaries of the new motorway are road users of the existing main road No 43 including: business and private commuters, freight transport, and transit transport vehicles of the TEN-T Corridors**. Among the beneficiaries are the **residents of Szeged, Makó and the settlements along the main road No 43** as well.

The funding decision No C(2009)10151 concerning the major project (EC, 2009) was made on 14 December 2009 by the European Commission. According to EC (2009), the total budget of the project reached EUR 197.2 million, of which EUR 167.6 million (85%) was CF contribution. The total eligible cost amounted to EUR 270.6 million (at current prices). The final eligible investment cost was EUR 229.4 million (decreased by 15.3% in EUR) because of the depreciation of the Hungarian Forint due to the global financial crisis.

The construction phase took place between 2008 and 2011, while the operational phase started in April 2011, when the project was finalised. Almost seven years have passed since the opening of the new road. During these years, several other elements of the network have been completed and opened for traffic including the next section of M43 motorway towards the Romanian border (2015) and the A1 motorway sections on the Romanian side. All these improvements have affected the project under consideration, as discussed later in this report.

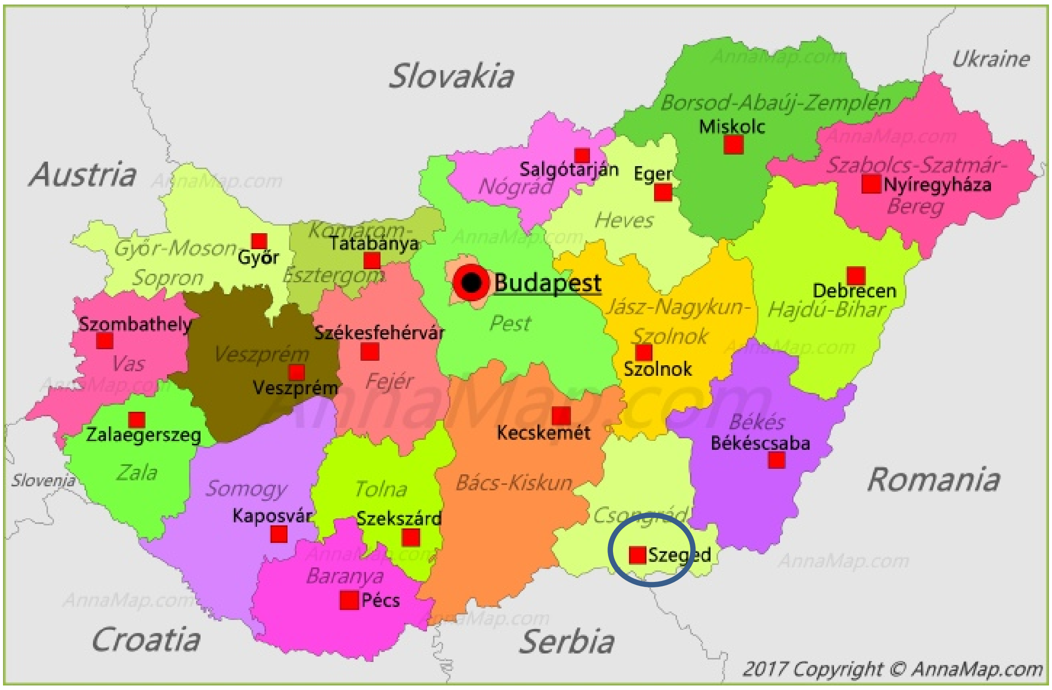
[2] Accepted by the Parliament by Act CXXVIII of 2003 on "The public interest and development of the Hungarian expressway-system" amended by Act XII of 2005

[3] "Transport Operational Programme" (TOP, approved by the Government resolution No 1004/2007 (I.30.); Government resolution No 1063/2007 (VIII.15.) on the action plan for 2007-2008 of TOP

1.1. PROJECT CONTEXT

The project is located in Csongrád (NUTS3) County, in the south-eastern part of Hungary.

Figure 1. Project location

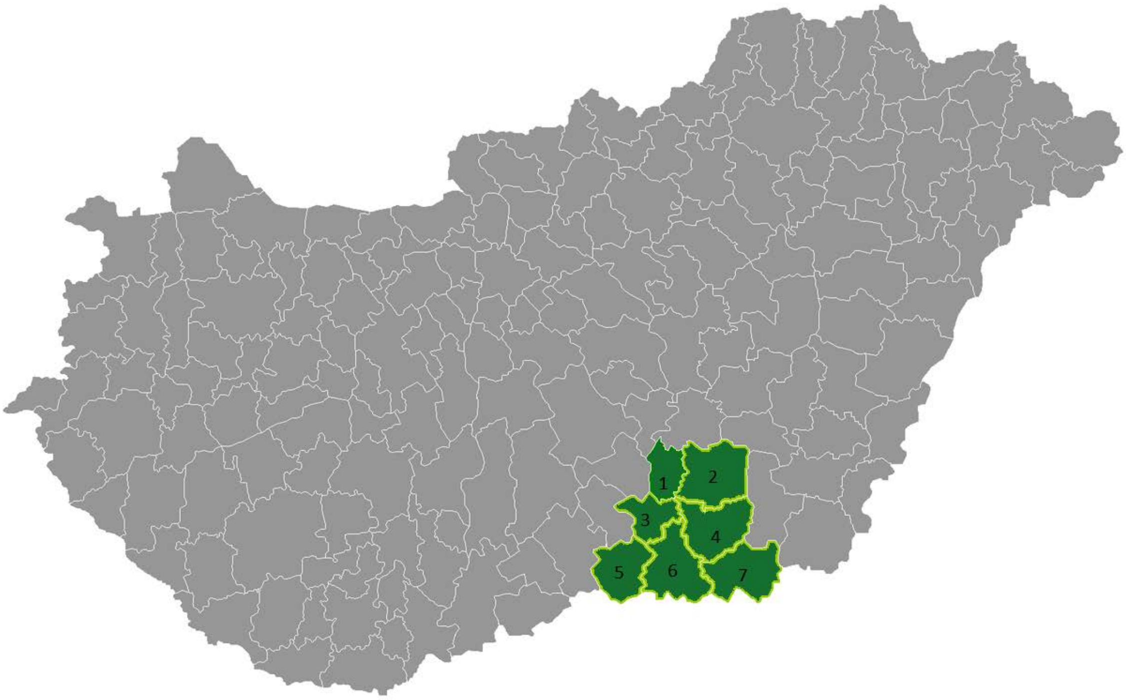


Source: www.AnneMap.com

Csongrád County is bordered by Arad and Timis Counties in Romania from the south-east and Vojvodina province (Serbia) from the south. Despite the external EU-border (Schengen border) with Serbia, many people commute to Szeged for work, study, healthcare and even shopping or leisure activities on a daily or weekly basis between Northern Backa area / Subotica (in Serbia) and Szeged. Towards Romania there is an intra-EU Schengen border with significant cross-border traffic. Contrary to the Serbian border, this traffic is mostly composed of long-distance travel. The share of regional cross-border business/shopping trips is also significant particularly between Szeged and Arad (in Romania) and also with a lesser extent to Timisoara.

Seven statistical micro regions (LAU1) are located in Csongrád county: Csongrád, Hódmezővásárhely, Kistelek, Makó, Mórahalom, Szeged and Szentes.

Figure 2.LAU1 micro-regions in Csongrád County in 2017



(1=Csongrád, 2=Szentes, 3=Kistelek, 4=Hódmezővásárhely, 5=Mórahalom, 6=Szeged, 7=Makó)

The topography of Csongrád County is diverse: its flat terrain is divided by the Tisza River and its blind channels, the Maros and Körös Rivers as well as many lakes and channels. The lowest-lying areas of Hungary are located here.

Also, the most significant crude oil and natural gas reserves of the country are concentrated here supplying more than half of the national production from the Algyő field.

The sandy soils of the western part of the county are suitable for cultivating fruits and vegetables, while the middle part is covered by flood deposits. In the East lies agricultural land of excellent quality.

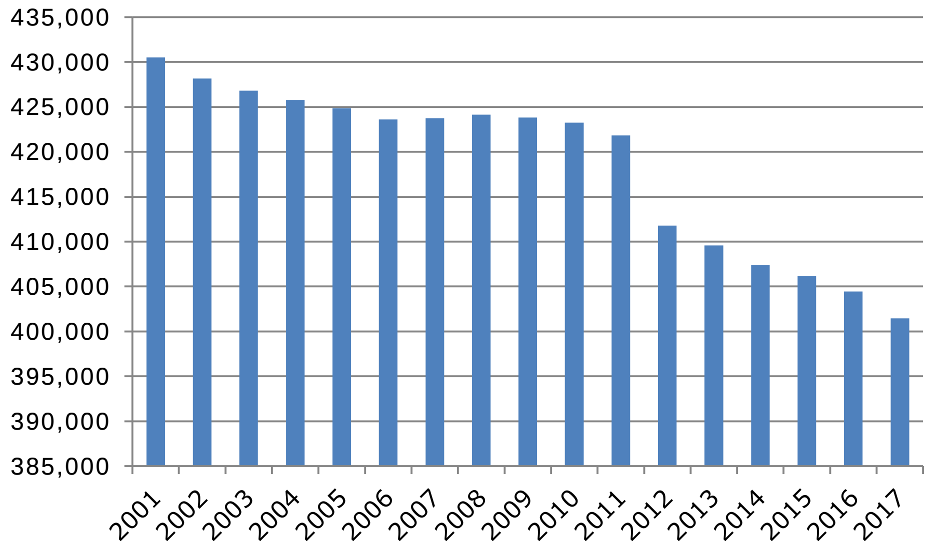
The area of the county is 4,263 km^2, the number of inhabitants in its 60 settlements reached 401.5 thousand people in 2017. It is the **second most urbanized county of Hungary** with 75.1% of the population living in one of the eight towns of the county. This rate was higher than the national average (70.5%) in 2017. The ongoing urbanization process makes the central settlements and their immediate catchment area stable while rural areas are rapidly losing population. The population density was 94 persons per sq. km in 2017, which is slightly lower than the national average of 105 persons per sq. km. In spite of these figures, Csongrád County is predominantly rural with a sparsely populated countryside.

Based on data from the Hungarian Central Statistical Office (KSH), in 2013 **57.3% of the population aged 15-64 was economically active:** their number exceeded 162 thousand people[4]. Due to the low birth rates and the growing share of elderly people only

[4] http://www.ksh.hu/interaktiv/terkepek/mo/lmunkaugy.html?mapid=QLF008

50.1% of the total population was active in 2017, which was slightly below the national average 50.3%.

Figure 3.Population in Csongrád County (2001-2017)



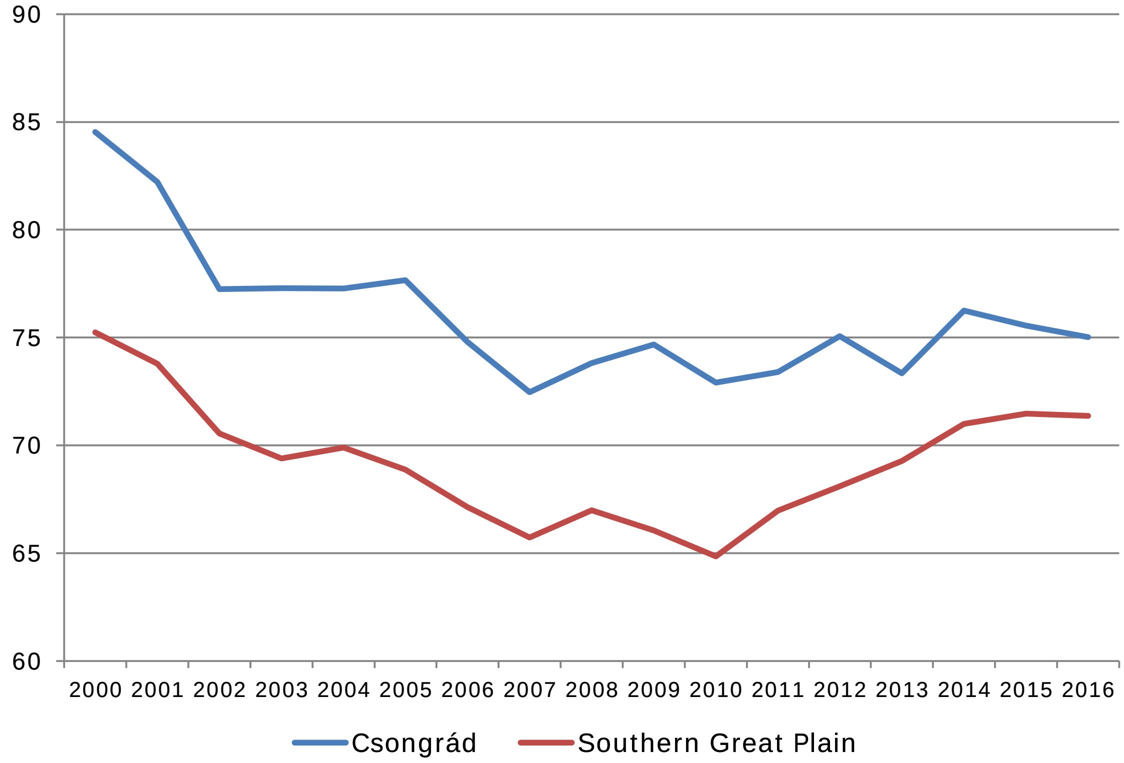
Source: KSH

Figure 3 shows a declining trend in population which is caused by birth rates and – since 2010 – **negative migration balance**. The trend is close to Hungary's average values (-4.7% per thousand inhabitants in 2017). The declining trend has accelerated since 2012 because of the lasting negative impact of the economic crisis on the birth rate and the migration balance. A considerable share of the youngest and economically active population migrated abroad for work. .

The unemployment rate increased from 9.6% to 12.3% between 2011 and 2013. Since then, following the national trend, unemployment has dropped to 2.5% as of Q3 2017. This value is lower than the national figure of 4.1% for the same period. The share of services in employment takes about 70% and the rate of active population is 50%, close to the country average.

The GDP per capita for Csongrád County was 2,708 thousand HUF (ca. 8,735 EUR) in 2016. Since year 2000 the relative GDP position of Csongrád County and its NUTS2 region (Southern Great Plain) has stabilized around 75% of the national average.

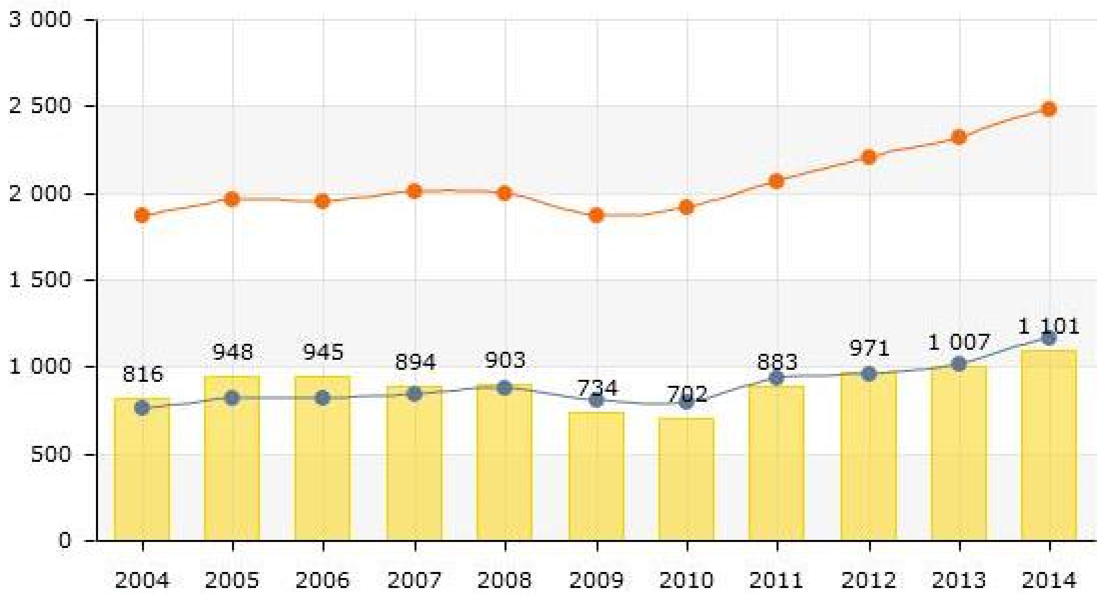
Figure 4.GDP per capita (expressed in percentage of Hungary's national average) between 2001 and 2016 in Csongrád NUTS3 County and Southern Great Plain NUTS2 Region



Source: KSH

Csongrád county's touristic potential is increasing largely due to spa tourism, which attracts guests from the neighbouring Serbia and Romania. The country is rich in thermal and medicinal water: one fifth of the national thermal water reserve is to be found here. Figure 5 shows the total guest nights per thousand inhabitants between 2004 and 2014 for Hungary (orange), for Csongrád county (yellow), and for the Southern Great Plain (NUTS 2) region (blue).

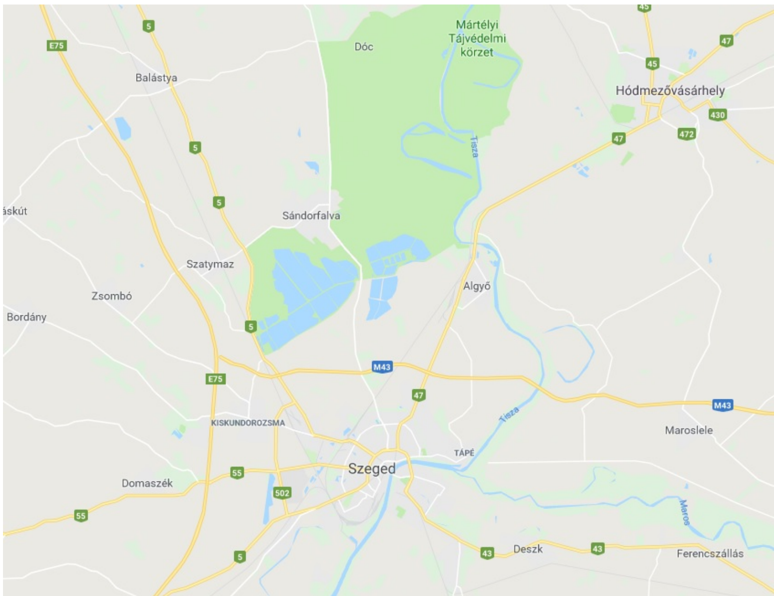
Figure 5. Guest nights per 1000 inhabitants (2004-2014) in Hungary (red), in NUTS3 Csongrád County (yellow) and in NUTS2 Southern Great Plain Region (blue)



Source: National Information System of Regional Development (TeIR)

Szeged is the centre of Csongrád. With around 162 thousand inhabitants it is one of the most important industrial, agricultural and cultural cities of Hungary and it is the south-eastern gate of the country. It is located at the intersection of transport and trade routes. The highways leading here are the M5 motorway and main road No 5 (E75) from the North from Budapest and Austria or Slovakia, main road No 43 (E68) from the East, main road No 55 from the West and main road No 47 from the North-East.

Figure 6. Main roads to Szeged



The Tisza River crosses the city of Szeged in the North-South direction while in the south-eastern part of Szeged the Maros River flows into the Tisza. **The highways and**

rivers turn the city an active player in foreign trade and transit traffic with the neighbouring countries.

Hódmezővásárhely, the town of Csongrád, Szentes and Makó are also significant settlements within the county, while Kistelek, Mórahalom and Mindszent are developing settlements that recently gained town rank.

1.2. PROJECT OBJECTIVES

The aim of constructing the M43 motorway **was to eliminate some of the bottlenecks of the transit traffic and to divert traffic from the urban sections of the existing roads**. Based on feasibility plan, the M43 motorway between Szeged and Makó was expected to offer a **coherent route, higher capacity and improved traffic speed and service levels for the international transit traffic** of the Pan-European Transport Corridor IV heading towards Romania and then to the Black Sea. A further key objective was to continue the building of the missing sections of the expressways toward the national borders, as well as to connect regions to the network by offering them international access, which is **expected to facilitate their catch up with the more developed regions.**

Before the investment had been realized, **the traffic crossed the town of Szeged and Makó on main road No 43 which caused unnecessary traffic jams**. Another objective of the investment was to decrease the concentration of traffic, especially transit traffic, in the city of Szeged and in the settlements along main road No 43. Furthermore, the construction of M43 was anticipated to divert the international transit traffic of heavy lorries from the existing trunk road that runs through settlements and eliminate unnecessary traffic from inner city areas and relieve the urban road network from the through traffic.

Yet another objective of the project was **to reduce the environmental impact on the residents of the settlements in the catchment area by lowering transit traffic and easing congestion.** Besides the environmental impact, the decrease in transit traffic was expected to generate less conflict between drivers and pedestrians/cyclists in the urban sections. For this reason, **the objective was also to minimize the risk of fatal accidents in the inhabited areas** by offering a safer traffic environment.

As a socio-economic objective, the feasibility plan defined **the contribution to the general growth of the economy of the Szeged – Arad region** through travel time saving and lower transport costs. It means that the faster and safer transit and easier access may turn the region more attractive and competitive in comparison with other European regions with similar potential in economy and labour.

Based on the ex-ante CBA results and qualitative data, the defined project objectives were mostly consistent with the development needs. The strategic objectives were realistic and fit to Hungarian strategic priorities such as the improving of the motorway network of the country and ensuring better accessibility to the peripheral regions.

Table 1. Summary of the project objectives

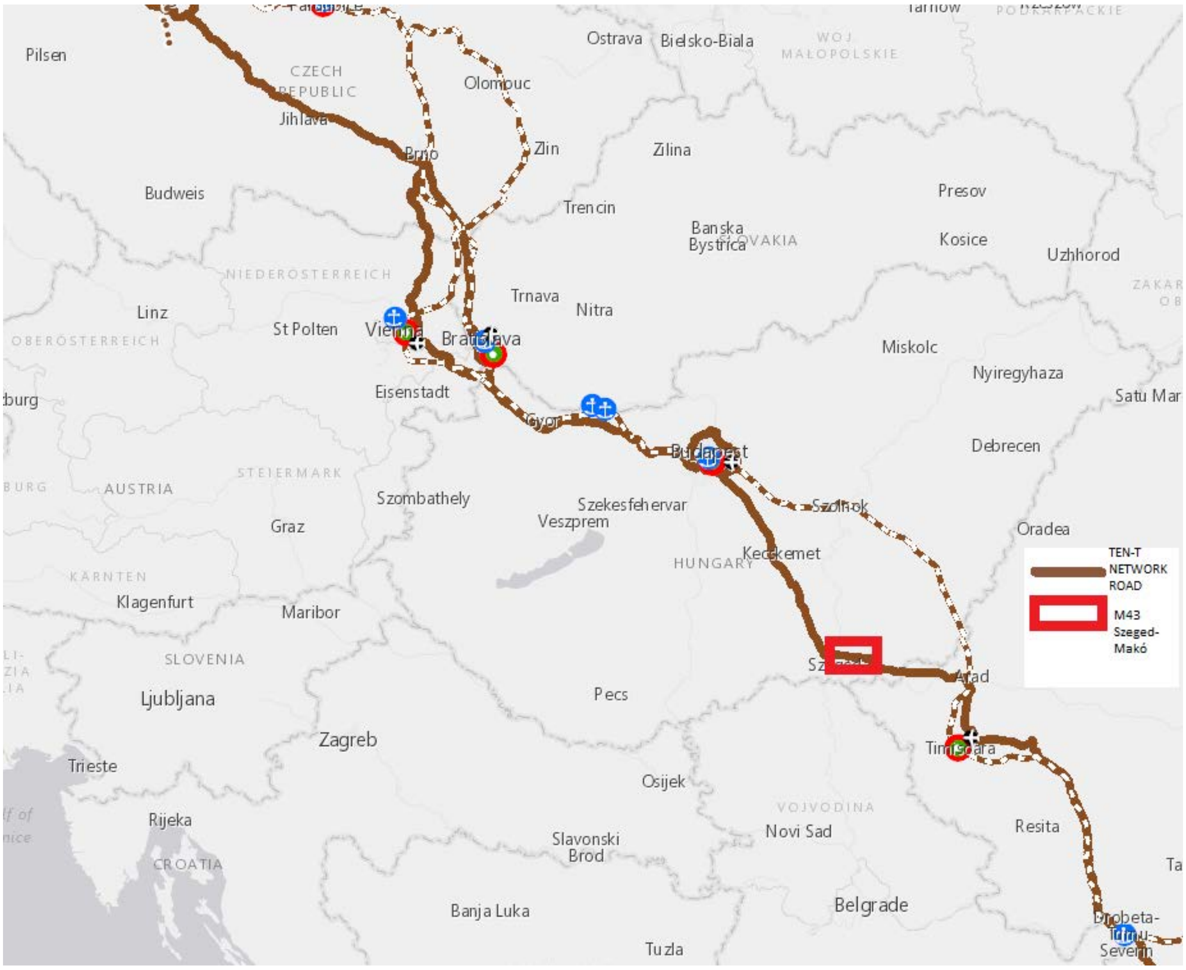
PROJECT OBJECTIVES		
Economic growth and distributional issues	**Quality of life and well-being**	**Environmental sustainability**
To facilitate the efficient movement of goods and people and thereby increase the competitiveness of Szeged - Arad cross-border region (to reduce travel times and improve accessibility of the settlements)	To reduce accident rates on the existing road network and lower their risk on a new, modern section with improved safety features	To protect residents in the settlements from noise pollution and emission
	To reduce vehicle / pedestrian / cyclist conflicts in the urban sections	
To reduce transport costs	To protect residents in the settlements from noise pollution and emission	
To ensure the socio-economic convergence of Csongrád County	To ensure standard road quality on the whole of this section of Pan-European corridor IV.	

Source: FS (2008)

The project objectives fit to the European strategic goals and principles as well. The European Council and the European Parliament accepted the TEN-T guideline for transportation in 1996. Its objective was to establish an **integrated surface, naval and aerial transport infrastructure network in the Community area**. The elements of the TEN-T on the territory of Hungary were defined by the maps attached to the Accession Treaty of Hungary and the EU, signed in 2003. The alignment of the M43 motorway constituted part of the Hungarian section of Pan-European Corridor IV.

Distinguishing the short from the long-term objectives would have been desirable but the feasibility plan did not include this aspect, which can be considered a deficiency.

Figure 7.TEN-T Network Corridor IV through Hungary



It is also important to mention the role of the **Hungarian Transport Policy**, which was adopted by the Parliament in 2004. The strategic document determined the main objectives and development priorities for the period 2003-2015. Expansion of the motorway network was one of the main goals of the strategy. Based on this strategic document, the development of the **road network should focus on sections of the Pan-European transport corridors stretching from the existing motorways**[5] **to the state borders, on eliminating the bottlenecks around Budapest**, and on the crossing of rivers. The primary objective of the Hungarian transport policy was also to facilitate the **integration of Hungary into the European Union through infrastructure developments.** Besides the plans on developing the European and Hungarian highway network, the alignment of the planned M43 motorway was also part of the structural development plans of the nearby settlements and the National Development Plan.

[5] Motorway network in Hungary in 2008: M1 motorway Budapest – Hegyeshalom (A border crossing); M2 motorway Budapest – Vác; M3 motorway Budapest – Nyíregyháza; M4 motorway Budapest – Üllő; M5 motorway Budapest – Röszke (SRB border crossing); M6 motorway Budapest – Dunaújváros; M7 motorway Budapest – Letenye (HR border crossing); M8 motorway Dunaújváros – Dunavecse (Danube bridge); M9 motorway Szekszárd – Dusnok (Danube bridge); M15 motorway Levél (M1) – Rajka (SK border crossing); M30 motorway Igrici (M3) – Miskolc; M35 Görbeháza (M3) – Debrecen; M70 Letenye (M7) – Tornyiszentmiklós (SLO border crossing).

A short and medium term development, operation and maintenance program on the national motorway network was also published in the Government Decree No 2044/2003 in March 2003 and after that in the 'Motorway Act' (Act CXXVIII of 2003), which was reviewed by the Parliament. The program defined the planned constructions for the period 2003-2015 in two phases. The M43 motorway section from Szeged to Makó was included in the short-term development program.

As the country being connected to the Pan-European Transport Corridor IV, the Romanian Ministry of Transport, Construction and Tourism also prepared their own Motorway Development Program defining the development priorities of the country. The program included the Nadlac (Hungarian border crossing) – Deva – Sibiu – Brasov – Bucharest Motorway (A1) in the Pan-European Transport Corridor IV.

In 2007 the Transport Operational Programme (TOP) (Government of Hungary, 2007) was accepted by the Hungarian Government.[6] The Operational Program **included the development plan of M43 motorway** complying with the transport strategy of Hungary (*Unified Transport Development Strategy 2008-2020* was accepted by the Government in 2008). The main goals of the strategy were the extension of the main road network so as to improve economic competitiveness and regional accessibility. These goals were consistent with the plan of the M43 motorway and because of this the project gained priority at the different decision-making bodies at the national and local level.

1.3.STRUCTURAL FEATURES

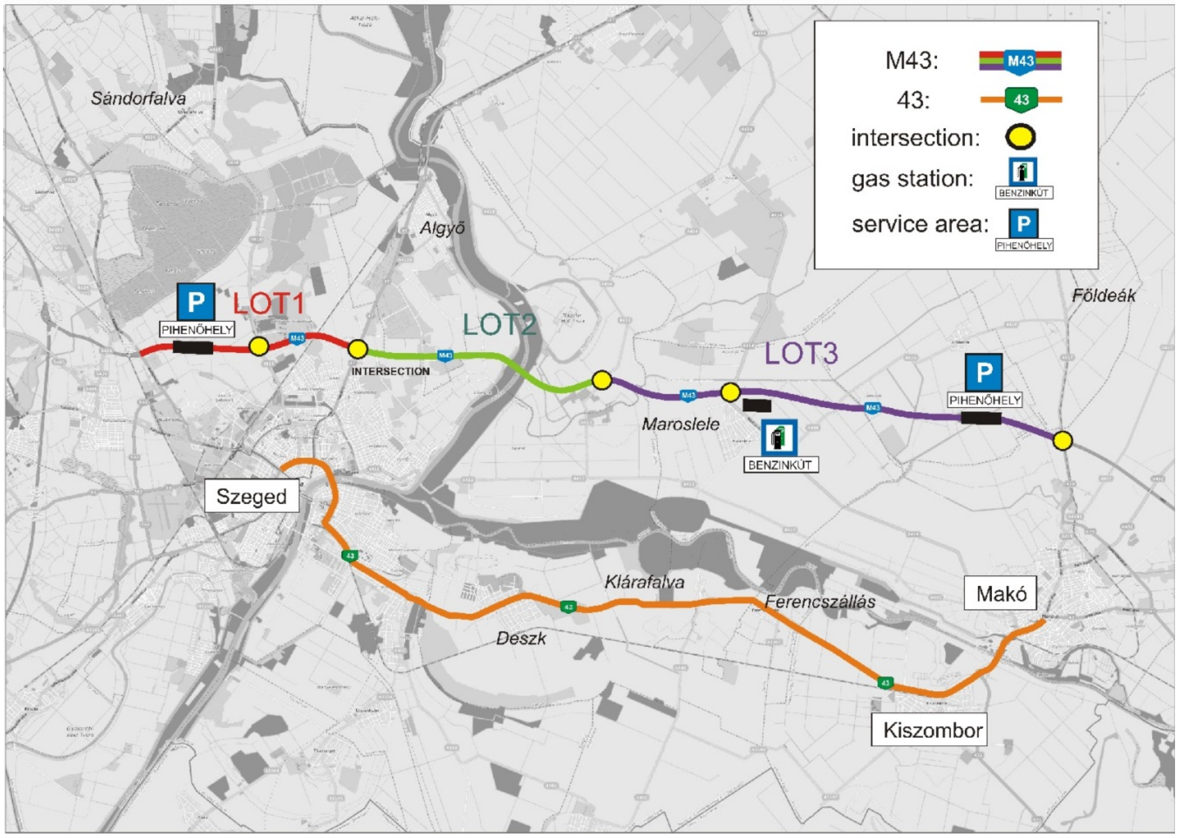
The project concerns the construction of **a 31.6 km** long dual carriageway section of M43 motorway **between Szeged and Makó**, together with emergency lanes. This section is composed of three sub-sections which coincide with the three construction lots. The M43 motorway runs parallel to main road No 43.

As we can see in Figure 8, the newly constructed M43 motorway starts from main road No 5 (Kms 3+000). Then M43 motorway bypasses Szeged and continues to the East. After crossing the Szeged – Hódmezővásárhely railway line and main road No 47 it crosses the oil- and natural gas field of the MOL oil company at Algyő**. LOT 1** of M43 motorway is between main road No 5 (Kms 3+000) and main road No 47 (Kms 9+700). Further, the road crosses the Tisza River (Móra Ferenc bridge, 661m) and runs on the eastern banks of the Tisza across agricultural lands towards road No 4413 (18+400 km) (**LOT 2**). From there the motorway runs on agricultural lands to the endpoint of the section at main road No 430 (**LOT 3**). The investment also included the **building of the Tisza bridge** and five grade separated intersections.[7]

[6] Government Resolution No 1004/2007 (I.30.) on indicative list of transport development projects planned to be implemented between 2007 and 2013

[7] Interchanges were constructed at main road No 5 (Kms 3+180), at road No 4519 (Sándorfalva, Kms 7+240), main road No 47 (Hódmezővásárhely, Kms 10+625), road No 4413 (Kms 19+200), road No 4414 (Maroslele, Kms 23+570) and at road No 4415/430 (Makó, Kms 34+600)

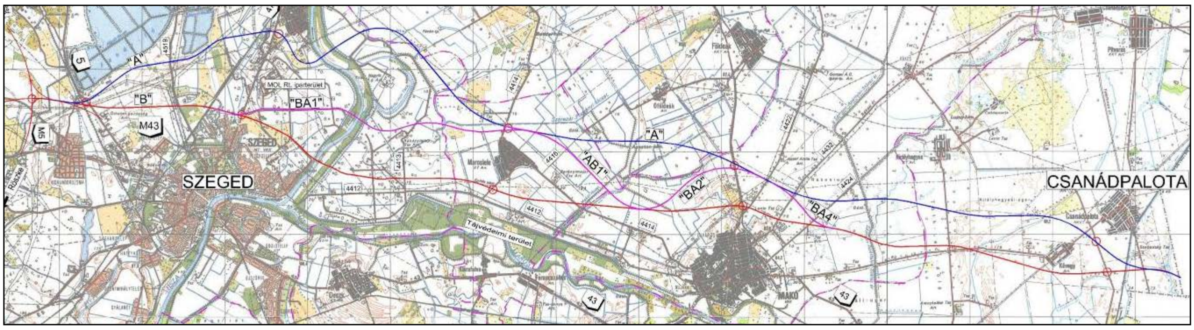
Figure 8. Structural features of M43



Source: Authors

In the feasibility study (2008) two main alternatives ("A" and "B") and four connection alternatives ("BA1" – "AB1" – "BA2" and "BA4") were investigated (see Figure 9 below). Both alternatives "A" and "B" joined the first, three km long section of the implemented M43 motorway of main road No 5.

Figure 9. Alternative variants of M43 motorway



Source: FS (2008)

Alternative "A" was the longest version and it crossed the region of Lake Fehér which was an environmentally protected area. Alternative "B" bore some advantages because of the railway line Hódmezővásárhely – Szeged, which could have been crossed with a shorter structure than in the case of alternative "A". However, the "B" option was overall less favourable, because of the section running parallel with road No 4412. There, along the Maros-river the road would have run on unfavourable terrain because of frequent inland water hazards and the vicinity of the embankments of Maros. However, from the perspective of hydraulics, neither option "A" nor "B" was favourable regarding the location of the crossing of the Tisza river: in this respect, alternative "BA1" offered the best circumstances for the Tisza-bridge. Nevertheless, all of these sections would have crossed the hydrocarbon-field of Algyő.

The evaluation framework for comparing the alternative options considered the following aspects:

- the total length of the alternatives,
- the extent to which they cross the hydrocarbon-field,
- hydraulics concerns in the case of the crossing over the Tisza river and environmental aspects (protection of the banks of Tisza)
- the anticipated impact on the flood control capacity of the embankments of the Maros river.

Based on the above comparisons and environmental aspects, **the most favourable option proved to be the so-called "northern alternative"**.[8]

Because of the structure of Corridor IV (running from Germany through the Czech Republic to Hungary) and the plans of the 2x2 lanes motorway on the Romanian side from the connecting point at Csanádpalota (RO border crossing), the M43 motorway was designed as a 2x2 lanes motorway until it reaches the region of Makó.

The planned speed limit on LOT 1 and 3 was 130 km per hour. According to the feasibility study, the planned speed limit on LOT 2 was 110 km per hour (given the restrictions due to the hydrocarbon-field of Algyő), but finally the speed limit was raised to 130 km per hour on the entire Section 2 except for the Tisza-bridge, where a 100 km per hour speed limit was set.

The feasibility study suggested the construction of two dual-use rest areas: in the area of Kms 17+000 on the eastern side of the Tisza-bridge and in the area of Kms 31+000, between Maroslele and Makó. While, the second dual-use rest area was built at the planned place, the location of the first one was shifted further to the east (as it is shown in Figure 8). It was designed to have enough space for a fuel station, but so far not a single petrol company showed interest in maintaining a petrol station there. There are two main reasons why it may not be worth opening a fuel station at Kms 31+000. First, Romania, where fuel is cheaper than in Hungary, is just 26 km far from there (taking the alternative route on M5 (E75) motorway it is 38 km); second, there is already an operating fuel station very close to the motorway at Maroslele settlement.

Table 2. Technical specifications of the motorway sections

Name of section	Road category	Speed limit (km per hour)	Width of sub grade (m)	Width of traffic lanes (m)	No of traffic lanes	Stopping possibility	Length (m)
LOT 1	K.I.B. Motorway	130	26.60	3.50	2x2	Paved emergency lane 3.25 m	6,700
LOT 2	K.I.C. Motorway	130 (except Tisza bridge: 100)	26.60	3.50	2x2		8,700
LOT 3	K.I.B. Motorway	130	26.60	3.50	2x2		16,200

Source: FS (2008)

[8] I.e. the AB+B+BA1+A+BA4+B alignments.

2. ORIGIN AND HISTORY

2.1.BACKGROUND

The preparation of the investment started in the early 1990s. The first study about the M43 motorway, which provided the basis for the alignment selection and for the further designs, was prepared in 1993 by Utiber Ltd. The study investigated the possibility of implementing an expressway eastward from main road No 53. In the following year, a study on environment protection was prepared. After these two studies, Plans for Approval and the final designs were prepared also by Utiber Ltd. and the environment protection permit was issued by the Hungarian authorities in 1995.

Between 1997 and 2008 the feasibility plan of M43 motorway was reconsidered several times due the modifications of the centre line. These modifications were based on new traffic models and tried to determine the optimal solution. This involved the re-drafting of the environment protection plans as well. Finally, the modifications were approved in 2004. **The M43 motorway project was integrated into the Transport Operational Programme (TOP) from 2006 onwards**.

After the preliminary studies preparing the road construction, in 2008 the Utiber Ltd. and COWI Ltd. prepared the final plan of M43 roadway between Szeged and Makó. This document defined the project objectives[9] and outlined how it complied with European and Hungarian development strategies and also analysed the feasibility of the technical implementation, the financial and legal background of the investment as well as its environmental impact.

Based on the interviews and analysis of media sources, the investment was prioritized by all the relevant stakeholders (especially local municipalities), including the policy makers and the inhabitants. **The national government committed to the project and the leaders of the involved settlements also supported the investment**. The need for the investment was illustrated by a public protest in 2007[10]. The participants demonstrated against the heavy transit traffic in Szeged and the speaker of the demonstration urged the construction of the M43 motorway. The commitment of the national government to M43 motorway was demonstrated by the inclusion of the project to the Transport Operational Programme (Government of Hungary, 2007). The local development plans of bigger settlements (such Szeged and Makó) also included the need to develop the motorway network.

The project was primarily supported by the mayor of Szeged[11] but the mayors of the involved settlements (Deszk, Klárafalva, Ferencszállás, and Makó) expressed similarly positive opinions. The main reason for the overwhelming support was that the project was expected to reduce transit traffic, which had a substantially negative effect on the quality of life and environmental sustainability. The other reason why mayors supported the project was that they anticipated positive effects on investments and economic growth.

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[9] The project objectives in the first preliminary study mainly reflected the improvement of the motorway network of Hungary to create better access to the South-East region. The increasing transit traffic from the Balkan region and the Pan-European Transit Corridor contributed to the incorporation of further objectives into the project plan (such as the connection to the Pan-European Network and impact on the quality of life).

[10] https://index.hu/belfold/hirek/323120/

[11] http://hir6.hu/cikk/8151/080410_ket_ev_mulva_atvagjak_az_m43_as_szalagjat

Table 3. The short history of the M43 motorway

YEAR	PROGRESS
1993	The first feasibility study about M43 Motorway between Szeged and Csanádpalota prepared by Utiber Ltd.
1994	The first environmental protection plan prepared by the Institute for Transport Sciences (KTI) Ltd.
1995	Update of the first feasibility study by Utiber Ltd.
1998	Utiber Ltd., Roden Ltd. and Pont-Terv Co. analyzed the feasibility of M43 crossing the Tisza river between main road No 47 and the left bank of the river.
1999	Kvantitás Consulting Ltd. prepared traffic simulations for the M43 limited access highway and the connecting road network as well as the intersections.
2000	Utiber Ltd. elaborated the Northern alternative of the trunk road to be developed into the M43 expressway bypassing Makó.
2001	Investigation of alignment alternatives to lead the traffic on the Makó –Csanádpalota (RO border crossing) section of the M43 expressway (prepared by Utiber Ltd.)
2002	Update of the first Environment Protection Plan by KTI.
2003	Utiber Ltd. elaborated the plan of the intersection of main road No 47 and expressway M43.
2004	National Inspectorate for Environment, Nature and Water prolonged the environment protection permit of the project to an unlimited period.
2005	Uvaterv Co. prepared the final design of LOT 1 of the expressway to be developed into motorway M43.
2008	Final feasibility study made by Utiber Ltd. and COWI Ltd.
2008	National Development Agency submitted application documents to the European Commission.
2009	In December 2009, the European Commission made a positive decision about the application and supported the implementation of the investment.

Source: FS (2008)

2.2.FINANCING DECISION AND PROJECT IMPLEMENTATION

After the preparation of the final study and the submission of the application for EU funding, the final decision took almost 15 months. From the side of Hungary, the National Development Agency (hereinafter NDA) and NIF National Infrastructure Developing Co. Ltd (hereinafter NIF) were the main actors, they were involved in the negotiation with Directorate-General for Regional Policy of the European Commission (hereinafter EC).

In September 2008, the NDA sent the final version of the Application Documents to JASPERS, which endorsed the decision of EC. A few days later JASPERS provided the Completion Note for NDA, which confirmed the completion of the project plan. On 18 December 2008, in its reply to the NDA, the EC assessed the application and made some remarks about the feasibility study.

The remarks of the EC related to the procedure of open tendering in Hungary and the economic and financial analysis of the feasibility study. After Hungary joined the EU, the M43 motorway project was the first major project which was supported by the Cohesion Fund. This is the reason why the EC did not have sufficient knowledge about the procedure of open tendering in Hungary. In the case of the economic analysis, the main critical remarks were that the average growth rate of traffic was set at 3.7 percent, which appeared rather high, and that the breakdown of traffic and breakdown of user benefits on a yearly basis were missing. Although the average growth rate of the traffic was rather high until 2016 (14.1% annual traffic growth between 2012 and 2016), due to the 2015 opening of the new section of M43 after Makó , now the traffic is estimated to grow only by 1.7% per year from 2016 to 2037.

Regarding the financial analysis, the most **relevant issue was the reimbursing of VAT** which is discussed in detail below (Box 1). The negotiations with the EC continued in 2009.

Box 1. The issue of VAT

Unlike stated in the Application Form, non-reimbursable VAT (at that time 54.1 million EUR, 20% of total net eligible cost) was not accepted by the EC as an eligible cost. The EC expressed that “value added tax charged to the beneficiary will be ‘recoverable’ through the value added tax paid on the fee collected by the management of the infrastructure built by the beneficiary”, because it is a revenue generating project.

The Hungarian government claimed that this was a “very wide interpretation of the concept of ‘recoverable value added tax’ used in Article 3(e) of Regulation N°1084/2006, which the wording of that provision does not support, and is, moreover, contrary to the legislation of the European Union on value added tax”. The Hungarian government turned the case to the European Court of Justice (24th February 2010), as the EC “refused the proposal of the Hungarian authorities to include payments of value added tax in the project concerned”. According to the decision of the ECJ announced on 20 September 2012 — Hungary v Commission (Case T-89/10), the court dismissed the action, thus the contested parts of the decision was not annulled.

A similar decision was made by the ECJ in another case (Case T-407/10), which affected a Hungarian railway project.

These court decisions created a precedent for (almost) all road and rail projects of the Transport Operational Programme in 2007-2013: the non-reimbursable VAT that initially was believed to be part of the eligible costs was not approved by the Commission as eligible cost. This has created a huge financial gap in the budget of the OP, which required further action from the government in order to replace non-eligible VAT with other eligible costs and to ensure the absorption of all the grants provided in the 7-year programming period. The court decisions, however, were not totally unexpected: they served as a decisive element in favour of implementing plan ‘B’ of the Transport OP as soon as possible.

In parallel with the above mentioned negotiations, **the environmental protection compensatory measures of the project required further consultations** among the actors. These talks lasted from March 2009 until October 2009.

In 2004, the National Inspectorate for Environment, Nature and Water decided to prolong the validity of the environment protection permit to an unlimited period. The EC indicated that the Hungarian Environmental Impact Assessment (EIA) procedure was not in compliance with the EIA Directive and the Natura 2000 guidelines were also not considered. This implied that the project failed to address these aspects when the decision was taken on the alignment of the motorway. In response, the Hungarian government explained that the environmental permit was issued based on the Government Decree No. 86/1993 (VI. 4.). The procedure and the documentation required by this regulation was already in line with the EU's EIA Directive. In the case of motorways, it required a two-step environmental study, public consultation, and a non-technical summary of the project. This decree was later replaced by Government Decree No. 152/1995 (XII. 12.) and Act LIII of 1995. These subsequent regulations described the procedures in more detail, but did not change the overall structure or the scope of the earlier rules. Regarding Natura 2000, the NDA referred to the declaration of the responsible authority (Lower-Tisza Region Environmental, Nature Conservation and Water Management Inspectorate) which stated that according to Art. 6(3) of Directive 92/43/EEC, the project would not have significant negative effects on a Natura 2000 site.

The result of the negotiation was the approval of the implementation of M43 motorway but the investors had to designate a compensatory area[12].

The EC made its decision about the project (No C(2009)10151) on 14 December 2009 (EC, 2009). According to EC (2009), the project was approved with a total budget of EUR 197.2 million, of which EUR 167.6 million (85%) was CF contribution. The annual breakdown of the financial contribution is portrayed in Table 4. The financial gap rate of the project was 72.9%, which means that the total eligible cost of the project reached EUR 270.6 million.

Table 4. Annual breakdown of the planned financial contribution of the Cohesion Fund (in EUR, at current prices)

	2008	2009	2010	2011	2012
Contribution of the Cohesion Fund (in EUR)	27,636,941	86,117,444	51,168,010	2,693,053	

Source: EC (2009)

The plan included the Makó bypass (7.66 km main road, of which 4.46 km new road) as a non-eligible part of the project, which was financed entirely from national sources during implementation (15,373,647 EUR + 20% VAT = 18,448,376 EUR) and was changed to ERDF retrospectively in 2013.

The M43 project was completed and put into operation on 20 April 2011. Almost seven years have passed since the opening of the new road. Some delay occurred (approx. 7 months) during the project implementation, which was caused by the exceptionally rainy weather (Ministry of National Development, 2017) and the **bankruptcy of one of the contractors (SZEVIÉP)**. The delay directly affected the construction of LOT 2 but also the interconnected LOT 3, which had been completed earlier, but was not possible to put into operation without LOT 2.

The main sections of project implementation are summarized in Table 5.

[12] The M43 motorway influenced the unity and coherence of the NATURA 2000 area in a negative way. To eliminate the negative effect, the investors designated a new area (14 hectare) close to the motorway to create a natural reserve.

Table 5. Constructing LOTs of M43 motorway

	LOT 1	LOT 2	LOT 3
Location	Between main road No 5 and No 47	Between main road No 47 and road No 4413 (including Tisza bridge)	Between road No 4413 and main road No 430
Building contractor	M43 Szeged-Makó Consortium (Swietelsky – KE-VÍZ 21)	TISZA M-43 Consortium (SADESA – Hídépítő – SZEVIÉP)	Maroslele 43 Consortium (EuroAszfalt – Magyar Aszfalt – Kelet-Út – KÖZGÉP)
Cost (HUF, net)	15.130.471.816	30.415.307.453	21.956.831.140
Engineer	UTIBER Ltd	METRÓBER - FŐBER Consortium	TRANSINVEST – KÖMI
Designer	UVATERV	UTIBER	UTIBER
In operation since	1st April 2010 (first 4 km as main road) 7th October 2010 (whole section as main road) 20th April 2011 (whole section as motorway)	20th April 2011	20th April 2011
Length (km)	6.7	8.7	16.2

Source: NIF National Infrastructure Developing Co. Ltd

There were several other infrastructure projects related to the M43 motorway that were not included in the current project:

- LOT 4: Main road No 430 Makó eastern bypass (4.5 km new road + 3.2 km rehabilitation) (completed on 03.11.2010), that was constructed simultaneously with the current project
- Construction of motorway engineering base in Makó at M43/430 motorway intersection (part of M43 Makó – RO border crossing project) (completed on 21.07.2013)
- Construction of the next phase (23.1 km) of M43 motorway between Makó (main road No 430) and Csanádpalota (RO border crossing) (34+600 – 57+723 km) (completed on 11.07.2015)

As mentioned above, the project has been implemented almost as planned but some problems occurred which hindered the smooth implementation of the project. These problems served as useful experiences in terms of institutional learning and for the implementation of future projects. **The interviewees revealed that the coordination of the high number of participants, including the building contractors, designers and public authorities posed a great challenge but the established coordination mechanism served as useful templates for further projects**. The representative of JASPERS argued that Hungary created a good institutional system with knowledgeable experts and this provided a solid base for continuing with the 2007-2013 and 2014-2020 programming periods. The specialist of JASPERS also emphasized that further coordination is still necessary with the neighbouring countries.

According to the final financial figures (Table 6), **the total investment was EUR 312.5 million** (3.8% less than planned), of which 45.4% (EUR 142.0 million) was co-financed by the Cohesion Fund. The remaining investment cost was covered from national sources (54.6%; EUR 170.5 million).

Table 6. Investment costs (EUR, at current prices)

PROJECT ITEM	PLANNED VALUES	FINAL VALUES	INDEX (%)
Transport Operational Programme (TOP) of which financed by	197,194,646	167,104,542	84.7
Cohesion Fund	**167,615,449**	**142,038,860**	**84.7**
National budget	29,579,197	25,065,682	84.7
Costs funded from future revenues	73,454,058	82,585,133	112.4
Total eligible cost in TOP	**270,648,704**	**249,689,675**	**92.3**
VAT (not reimbursable, non-eligible)	54,129,741	59,711,219	110.3
Other (non-eligible, gross)		3,140,265	
Total costs	**324,778,445**	**312,541,159**	**96.2**
of which financed from the national budget	*157,162,996*	*170,502,299*	*108.5*

Source: NDA (2008), Ministry of National Development (2017), Authors based on data of NDA

Contrary to the investment costs expressed in EUR, the total costs expressed in in Hungarian Forint (HUF) increased by 9.0%, of which the eligible costs increased by 4.5%, while the VAT by 24.9%. The reason for this is that the Hungarian forint substantially depreciated against the euro (to 280.8 HUF/EUR) relative to the original exchange rate of 248.0 HUF/EUR with which the initial plan calculated. Moreover, the normal rate of VAT changed from 20% to 25% (from 1 July 2009) and then further increased to 27% (since 1 January 2012). Both changes were caused by the global financial crisis.

According to the Trenecon (2014) study on costs of Hungarian road projects, the contract values per km (on indexed prices) of the M43 motorway was slightly below the long-term Hungarian average and below the average of some selected European motorway projects too.

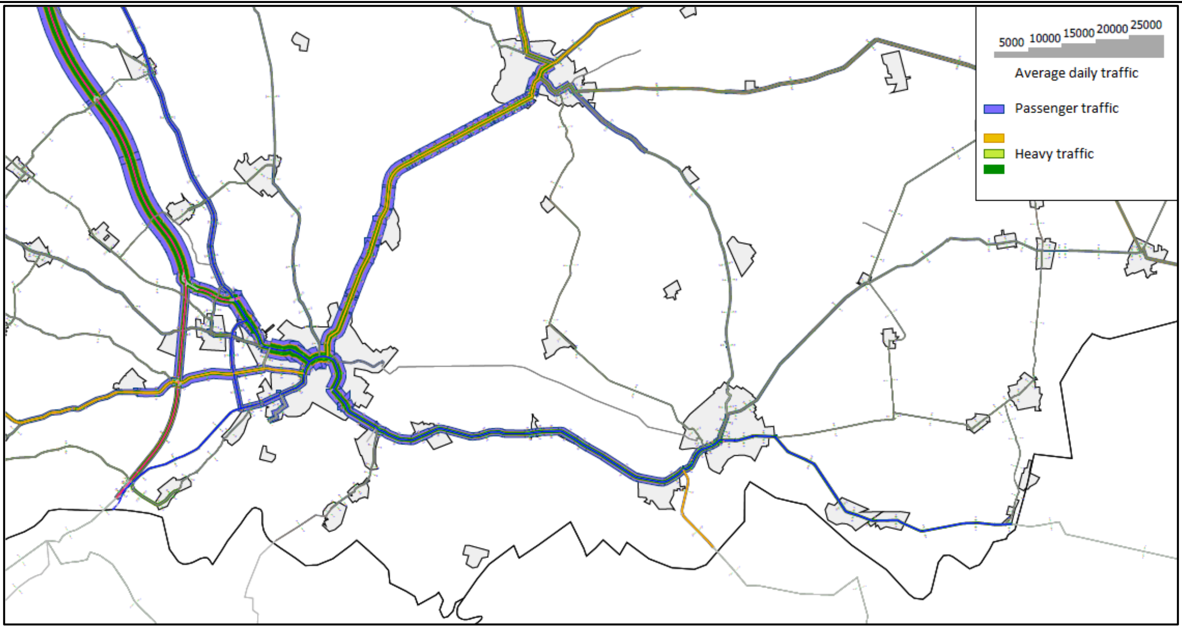
2.3.CURRENT PERFORMANCE AND OTHER INVESTMENT NEEDS

As a consequence of the opening of M43 motorway between Szeged and Makó, **the transit traffic has disappeared from the old main road No 43** and from those settlements that the road crosses. Heavy traffic in other parts of the county is still a problem, especially in Szeged, but this is not related to the M43 project.

Since the opening of the new motorway, a number of other elements of this road network have been completed and opened for traffic, including the next section of M43 motorway towards the Romanian border (2015) and the A1 motorway sections on the Romanian side (since 2011, the border crossing operates on the Romanian side since 2015). All these sections of the TEN-T Core Network Corridors of Orient/East – Mediterranean and Rhine – Danube are of high relevance for the south-eastern EU member states.

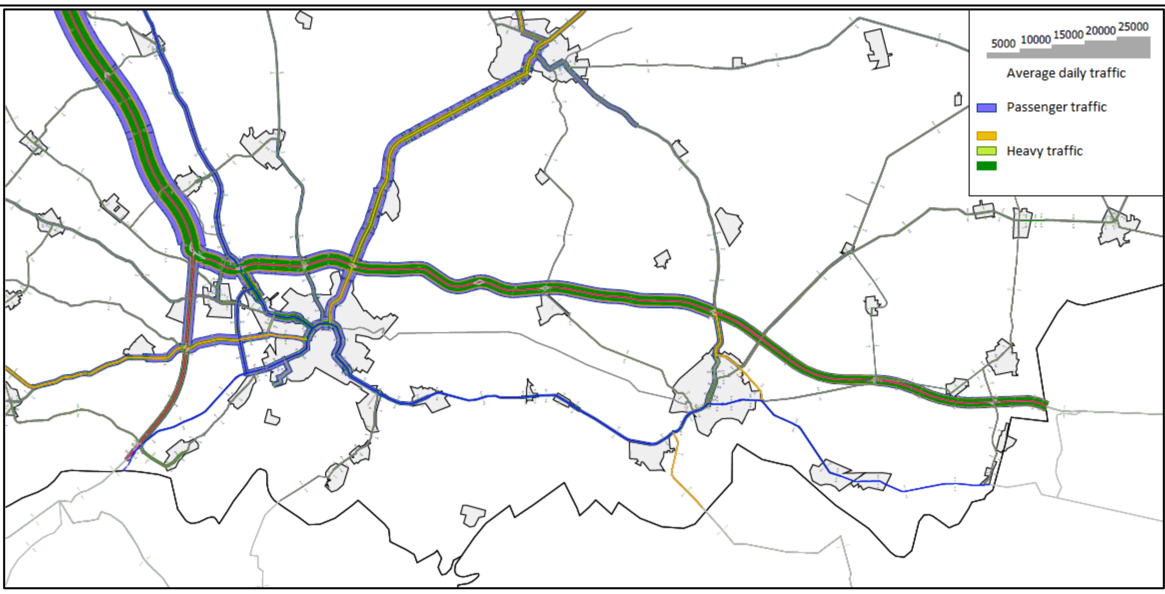
As Figure 10 and 11 (according to traffic modelling data for 2015) reveal, a significant part of the transit traffic would go through the towns of Szeged and Makó if there was no M43 motorway. **With the construction of M43 almost all of the heavy traffic avoids these settlements** and more than one third of passenger transport also uses the M43 motorway. Furthermore, the **traffic between Hungary and Romania has also increased with the opening of the motorway.**

Figure 10. Estimated volume of traffic for 2015 from traffic simulations without M43



Source: Authors

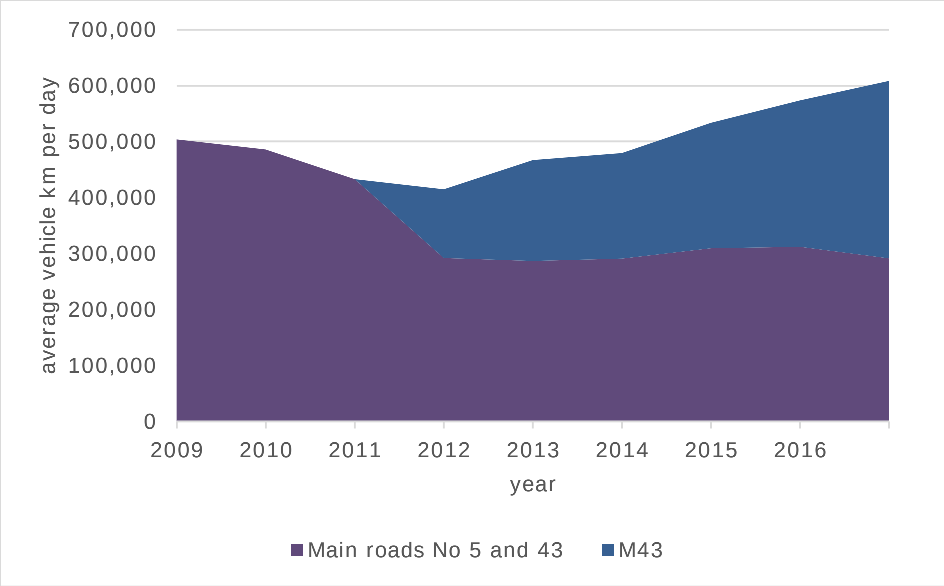
Figure 11. Estimated volume of traffic for 2015 from traffic simulations with M43



Source: Authors

The traffic of the main road No 43 has gradually declined during the construction of the M43 motorway and after its completion also fewer vehicles use the old road. At the same time, **a lot of passengers use the new motorway**, the sum of old road users and M43 users has increased by more than 20% from 2009 to 2017 (Figure 12). The expectation that the transit traffic of main road No 43 would avoid the villages and use the new highway instead has been reached, but there is evidence for newly generated traffic on M43 as well.

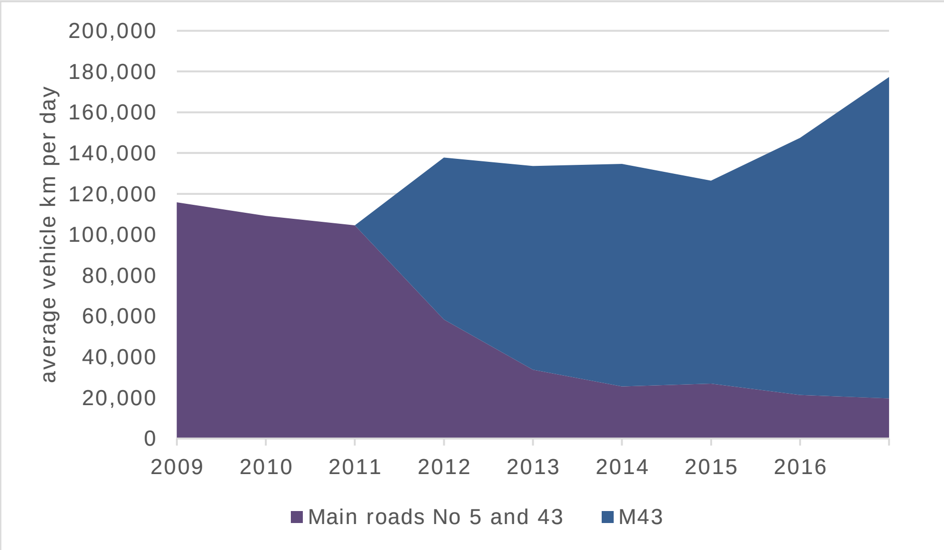
Figure 12. Passenger car traffic on main road No 5 and No 43 and on M43 motorway (2008-2016)



Source: Authors

In 2012, about half of the heavy traffic moved on the old roads and another half on the motorway (based on vehicle-unit kilometre). As soon as the motorway was completed and reached the Romanian border, a larger proportion of traffic appeared on the M43: the use of main road No 5 and No 43 reduced and only 11% of the former HGV traffic appeared there.

Figure 13. HGV traffic on main road No 5 and No 43 and on M43 motorway (2008-2016)



Source: Authors

In the ex-ante CBA a daily average flow of 10,417 passenger cars was calculated for 2016 (which contained only the traffic of M43). The **measured average daily passenger car traffic was 10,034 vehicles in 2016, which is quite close to the ex-ante estimation.** The ex-ante CBA calculated with a slight linear increase year by year: the average daily traffic of passenger cars is estimated to grow by 187 cars per year (from 2014 to 2038). In 2015, the real traffic flow was 8,277 cars, which means that the growth between 2015 and 2016 was 1,756 vehicles. In the transport model of ex-post CBA the estimated growth of daily passenger car traffic is not the same in every year: the annual average growth is 256 cars. This means that from 2017, the ex-post calculations show larger passenger traffic and the difference between the ex-post and the ex-ante numbers is increasing through the years.

In the case of heavy traffic the daily average flow was 6,705 vehicles (for 2016) in the ex-ante CBA. **The measured average daily heavy traffic was 4,988 vehicles in 2016, which is 74% of the estimated value**. The ex-ante CBA also calculated with a slight linear increase year by year: the average daily traffic of heavy vehicles was projected to grow by 184 vehicles per year (from 2014 to 2038). In the transport model of ex-post CBA the estimated increment of HGV traffic is not the same in every year, the average of is 55 heavy vehicles per year. This means that from 2017, the ex-post calculations show less HGV traffic and the difference between the ex-post and the ex-ante numbers is increasing through the years.

3. DESCRIPTION OF LONG-TERM EFFECTS

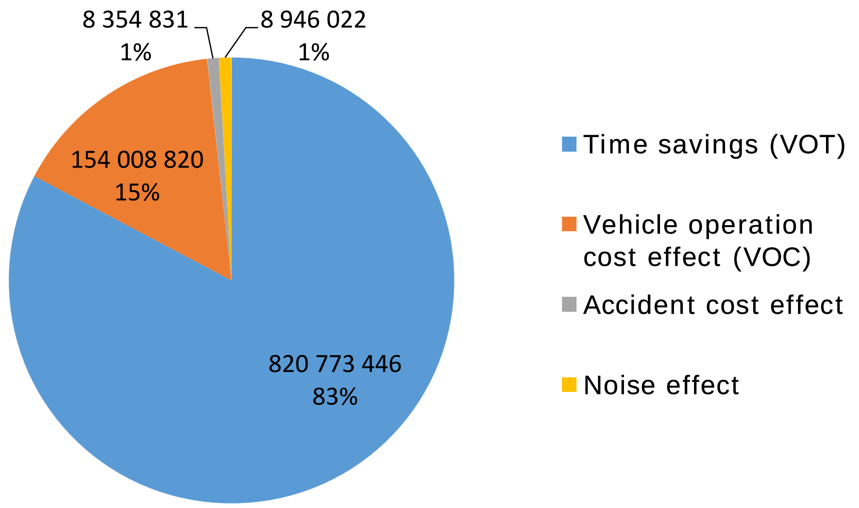
3.1. KEY FINDINGS

This section describes the **main long-term effects of the project**. It describes the changes in the long run as a result of the investment and how and when those effects materialised, including their evolution over time. The effects are classified into four groups: economic effects, quality of life and well-being, environmental sustainability and distributional issues.

The effects are related to monetary and non-monetary factors. The results of Cost-Benefit Analysis, as reported in Annex II include the effects in monetary terms (time savings, vehicle operating costs, income for the service provider, safety, noise, air pollution and climate change).

Most of the benefits are related to time savings and vehicle operation cost savings, while accident and noise costs are marginally affected.

Figure 14. Main socioeconomic benefits (Present Value, EUR)



Source: Authors

Benefits of air pollution and GHG savings are missing from Figure 14, because these values are negative, so they are considered among the economic costs of the project.

The other effects are described qualitatively but they have not been included in the calculations of the CBA.

Table 7 below summarises the nature and strengths of the project's effects and discuss their impact in territorial terms.

Table 7. Summary of the nature and strengths of the effects (the effects highlighted in green are those included in the ex-post CBA)

CATEGORY	EFFECT	STRENGTH	LEVEL
Economic growth	Travel time	+5	Local-Regional-Global
	Vehicle operating costs	+3	Local-Regional-Global
	Reliability of journey time	+4	Local-Regional-Global
	Income for the service provider	+3	National
	Wider economic impacts	+2	Regional-National
	Institutional learning	+4	Local-Regional-National
Quality of life and well-being	Safety	+1	Local
	Noise	+3	Local
	Service quality	+2	Local
	Crowding	N.R.	
	Security	N.R.	
	Aesthetic value	N.R.	
	Urban renewal	N.R.	
Environmental sustainability	Local air pollution	+2	Local-Regional-Global
	Climate change (GHG emission)	-3	
	Biodiversity	No data	
	Water pollution	N.R.	
Distributional issues	Social cohesion	+1	Regional
	Territorial Cohesion	0	Regional-National

Note:
**the strength score reflects the weight that each effect has with respect to the final judgement of the project. In particular:*
-5 = the effect is responsible for the negative performance of the project;
-4= the effect has provided a negative contribution to the overall performance of the project;
-3= the effect has contributed in a negative way to the performance but it was outweighed by other positive effects;
-2= the effect has a slightly negative contribution to the project performance;
-1= the effect is negative but almost negligible within the overall project performance;
0= the effect has no impact on the project performance;
+1=the effect is positive but almost negligible within the overall project performance;
+2= the effect has a slightly positive contribution to the project performance;
+3= the effect has contributed in a positive way to the performance but it was outweighed by other positive effects;
+4= the effect has provided a positive contribution to the overall performance of the project;
+5= the effect is responsible for the positive performance of the project;
The cells in green have direct influence on the benefit-calculation ENPV
N.R.= The effect is not relevant for the specific project;
No data: The effect is potentially relevant, but no evidence on impacts is available. This shall be used only for relatively low significant effects whose inclusion would in no case dramatically affect the overall assessment.

The following sections include some further details about the generated effects incorporated in the ex-post CBA and supported by qualitative evidence gained from media sources, official documents and interviews.

3.2.EFFECTS RELATED TO ECONOMIC GROWTH

Measurable effects

The reduction of travel time between Szeged (North) to Makó town centre is 21.5 minutes for light vehicles and 15 minutes for heavy vehicles. Vehicles travelling further on the motorway (since 2015) to the Romanian border crossing enjoy an additional 7-8 minutes advantage because they do not have to return to the main road No 43 to Makó (6.5 km). Moreover, there is a 9.0 km long shortcut (92.6-83.6 km) towards Pecica / Arad (West) that makes travel from Szeged (North) – Arad (West) another 10-11 minutes shorter. From this gain in travel time at least 4 minutes is the contribution of the M43 motorway if the proportional length of the whole motorway section is considered (31.6 km of the M43 section from the total distance of 83.6 km of total). **According to the ex-post CBA, the total economic benefit amounts to EUR 820.8 million, of which EUR 383.9 million belongs to light vehicles, EUR 436.9 million to heavy vehicles.**

The effect is similar for vehicle operating costs (VOC), but the benefit of faster, smoother traffic is almost annulled by the higher than optimal speed of the light vehicles on motorways (EUR 19.2 million benefit). The most important advantage for heavy vehicles is that they now avoid the inhabited areas (total of 19.8 km on the old route). The speed of the HGVs in the rural area is slightly closer to the optimal on motorways and is sufficient to gain a total advantage of 6-7 EUR for the whole distance. The shortcut effect for the cross border traffic (proportional to the length of the total distance) is 0.7 EUR for light vehicles and 3.4 EUR for heavy vehicles. **The total benefit for the heavy vehicles equals to EUR 134.7 million.**

It is important to highlight that VOC savings are not reduced by the toll paid to the service provider.

Non-measurable effects

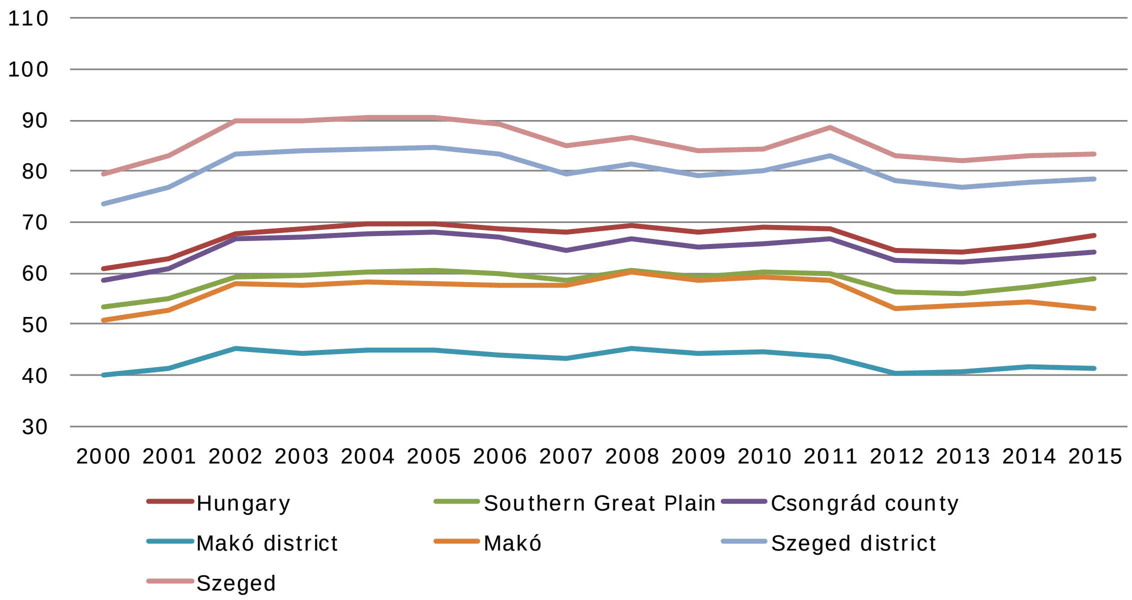
The benefit of reduction in travel time was mostly indicated by the passenger transport respondents, especially those ones who live in those settlements which have direct access to the M43 motorway (Szeged – Makó, Szeged – Maroslele, Szeged – Földeák, Óföldeák). It is important to note that the respondents emphasised the positive effect in the case of main road No 43 also. It means that **the reduction of heavy transit traffic caused better and faster transport mobility for the passenger cars on the main road No 43.** Based on the respondents' opinion, **the investment also affected the competitiveness of freight transport through the better connection to the expressway network.**

Reliability of travel time is also an important factor that is not covered by the CBA. **The capacity of the corridor is four times higher than before and the traffic does not harm the inhabited areas anymore, thus it is much more reliable to plan travel time** than before. However, Romania still cannot join the Schengen zone which makes travel time calculations of the TEN-T corridor rather unreliable (because of the border crossing). (In our traffic model, we expected that Romania would join the Schengen zone in 2022).

The impact of expressways on economic growth is indirect. Their stimulating effect on the economy is identifiable through the shorter access times and more secure traffic. The region already had great economic potentials even before the creation of the new road connections but **the lack of good accessibility was a barrier to further growth**. The construction of the **M43 motorway served not only the clustering of Makó and Szeged regions into economic growth centres, but the development of the cross-border region with Romania and neighbouring Balkan regions.**

Szeged and its surrounding area were well connected with other regions of Europe through the M5 motorway even prior to the M43 motorway construction, while in the case of Makó the lack of a motorway constituted an obstacle to faster economic growth.

Figure 15. Number of enterprises per thousand inhabitants (2000-2015)



Source: Authors

Szeged is distinguished from its closer and wider surrounding area in terms of its economic performance, the density of enterprises, and the unemployment rate. Although the city of Makó is in a better position than other municipalities within its surrounding district, but this latter area is lagging behind the indicators of Csongrád County, the Southern Great Plain and also behind the national average as well.

However, convergence is not observed in the region, even if the larger region or the entire country is considered as a benchmark. In the first few years after EU accession the number of operating enterprises per thousand inhabitants did not increase. In the early 2010s it kept declining but recently recovered and has reached the pre-crisis level observed in 2008.

Based on the official district-level economic statistics recorded since the first half of 2011 – which marks the opening of the M43 motorway between Szeged and Makó –, the wider economic impacts of the motorway are difficult to assess because of various methodological limitations. However, transport and economic experts commonly hold the view that in Hungary the companies – especially the foreign owned enterprises – primarily rely on road transport to reach their markets. For this reason, economic development can also be captured by observing the recent figures on *regional investment activities*, and on the *location proposals for foreign investors* in the district of Szeged, Makó and Hódmezővásárhely. Below, in the case of the foreign owned companies, the data was supplied by the state-owned Hungarian Investment Promotion Agency (HIPA), while in the case of the domestic small and medium sized firms (SME's), various local and national press materials were used. *(For methodological reasons we have to note that the microregion containing Szeged, Makó, Hódmezővásárhely and their surrounding areas, there are several industrial parks; while in the settlement of Maroslele a relatively small industrial zone were designated recently with the area of 10 hectares)*.

During the preparation, construction, and **opening to traffic of the examined section of the M43 motorway, the majority of the positive economic news and stories in the media were published in connection with the case of Makó**: first, the **Turkish *DunaDöner Ltd*.** and shortly after the Swiss flavours and fragrances manufacturer ***Givaudan* decided to create a greenfield investment in the recently established industrial park**. It has to be emphasized that Makó brought a 'brand new management approach' of that time creating an effective and investor friendly incentive package offered to the investors. The important precondition of the success was that the upgrading projects of the industrial zone were carried out parallel to the construction of the M43 motorway. In addition to the good transport connections and the development of the industrial park, other important factors contributed to the positive investor decisions: the qualified local workforce and labour supply; and the progressive, managerial approach of the Municipality of Makó. It is worth mentioning that the volume of **the investment project of Givaudan exceeded 135 million EUR** can be considered a significant investment project even on a European scale, which definitely raised the international visibility of the town as a business opportunity.
Besides the transport-intensive (imported input and exported output) manufacturing projects, the local small and medium-sized companies also set up their businesses in the industrial zone of Makó: the M43 Cleaning Ltd. (cleaning road containers); Dancsiker Ltd. (logistics) and Marostech Ltd. (metal- and wood working). These firms together with the already operating SME's in the zone – such as Valker Ltd. (fireplace manufacturing) and Ducor Ltd. (metal- and wood working) – constantly keep upgrading their capacity.

Table 8. Investment Projects in the Industrial Park of Makó (2011-2013)

Year	Company	Industry	Relation	Volume (million EUR)	Employee (capita)
2011	DunaDöner Ltd	Food	TR	2.7	100
2012	Givaudan	Flavours and Fragrance	CH	135.0	300
2013	M43 Cleaning Ltd	Industrial cleaning service	HU / local	N/A	30

Source: Municipality of Makó 2017; various press releases 2011-2013

The data of the HIPA on the projects managed by the agency shows that **since 2014 the volume of the regional investment projects has decreased to a smaller range** – considering the average project budgets managed by HIPA there has been a decline from 1.5 million EUR to 150 million EUR – and were concentrated in the bigger settlements of the examined region (Szeged, Makó). The upgrading projects of ContiTech Ltd. concerned capacity upgrading investments – the German automotive enterprise has been operating in Makó since the middle of the 1990's. The development projects in Szeged related to the less transport-intensive (info-communication technology, and shared service centre) industries of the service sector.

Table 9. Investment Projects managed by HIPA in the districts of Szeged, Makó and Hódmezővásárhely (2014-2016)

Year	Company	Industry	Relation	Volume (m EUR)	Employee (capita)	City
2014	Contitech Fluid	Automotive (Tyres)	D	14.38	123	Vác, **Makó**
2015	ContiTech Fluid ContiTech Hungary	Automotive (Tyres)	D	16.21	681 (of which 365 in Makó)	Nyíregyháza, **Makó**
	ContiTech Fluid ContiTech Hungary	Automotive (Tyres)	D	15.79	216 (of which 200 in Makó)	**Makó**, Nyíregyháza
	IT Services Hungary Ltd	SSC	D	N/A	400	Pécs, **Szeged**, Debrecen, Budapest
	EPAM Szeged	ICT	US	N/A	365 (of which 285 in Szeged)	**Szeged**, Debrecen
2016	BP Business Service Centre Ltd	SSC	UK	N/A	500	**Szeged**
	IT Services Hungary Ltd	SSC	D	N/A	360 (of which 140 in Szeged)	Debrecen, Pécs, **Szeged**

Source: HIPA (2017)

One of the main services of HIPA offered to the potential foreign clients is location search and evaluation. During this process, the agency, based on the preferences of the foreign partners, searches for and evaluates both potential sites suitable for greenfield investments, and office buildings and industrial halls. According to the location proposals made by HIPA in the districts of Szeged, Makó and Hódmezővásárhely, the total number of those proposals has multiplied since 2011. The number of the proposals significantly increased in 2015, when the M43 was already operating along its full length reaching the Romanian border. The strongest promotional activity, however, were registered in 2016 in the case of Hódmezővásárhely. It has to be noted that a location proposal does not necessarily involve a positive investment decision, but the growing number of the negotiations show that the region gained a much more attractive investment potential thanks to the M43 motorway.

Table 10. Number of location proposals made by HIPA in the districts of Szeged, Makó and Hódmezővásárhely (Office, Hall, Greenfield Project)

Year	Hódmezővásárhely	Makó	Röszke	Szeged	Szeged-Algyő	Total
2011			1	4		5
2012	2	3		5		10
2013	1	2	3	5	1	12
2014		2		7	4	13
2015		3		14	5	22
2016	1	11		4	6	22
2017	19	11		19		49
Total	**23**	**32**	**4**	**58**	**16**	**133**

Source: HIPA (2017)

During the semi-structured interviews, many respondents evaluated only the economic situation of their own settlements, and only few respondents tried to give a more comprehensive, broader picture about the economic effects of the investments. Most of the respondents told that the **M43 motorway had major effects in the case of larger cities that have a direct connection to the motorway. In the case of smaller settlements, the effects are mostly indirect** and related to the major economic investments of the cities (such Makó and Szeged).

The respondents marked **the industrial area of Makó as the most developing area in this region**. In this industrial area the biggest companies of the region are operating such as DancsiKer, Givaudan (food manufacturer), ContiCar (automotive company) and some other medium-sized companies (Valker, Duocor).

Some respondents expressed a critical point of view and emphasized that in spite of the infrastructural investment, several settlements have been unable to realize the benefits of the M43 motorway. They also told that **infrastructural development is a necessary but not sufficient condition for growth**. The respondents from the central state administration also mentioned that the real winner of the M43 motorway was Makó.

The interviewees also clearly stated that the M43 motorway had a positive impact on the competitiveness of local and regional companies. The motorway offers a faster and safer connection to Szeged and Makó as well as to the TEN-T Corridor No IV.

Several respondents also mentioned **some negative effects** of the M43 motorway. They particularly mentioned **the dramatic decline of small service providers along the main road No 43**, which is the consequence of the much lower heavy transit traffic. The other identified negative factor was the lack of new investments in these smaller settlements.

Overall, th**e M43 motorway had a positive influence on the economic growth of the region**, mainly through its indirect developmental effect of bringing new investors into the industrial area of Makó and Szeged (for example IT Services Hungary Ltd, EPAM Szeged etc.). It is also important to note that the lack of new investments in the smaller settlements and the limited socio-economic convergence of the region can be attributed to external factors.

All things considered, the M43 motorway has opened new economic perspectives for the region. Thanks to the investment, several significant investors (such *Givaudan)* entered the region which influenced its socio-economic development in a positive way. The beneficial effect of the new motorway is also reflected in the HIPA's proposals which are heavily influenced by a well-developed infrastructure. In fact, the effect of the motorway on economic growth is indirect as a well-developed infrastructure is a necessary but not a sufficient condition for that. The case of **Makó shows that a good economic policy of the municipality and the infrastructure development could jointly affect economic growth.**

Institutional learning refers to wider spillover effects that any investment project may bring to the different levels (national or regional) of public administration and other institutions. As we mentioned in the section about project implementation, the investment contributed to the learning process in many different ways. Based on evidence from the interviews, **the major lessons to draw are related to the project management structure, the process of land expropriation, the planning of environment protection and the resolution of liquidity problems experienced by the building contractors.**

In the case of **Szeged**, institutional learning was not so relevant because the city's local government **had already gained important experiences from the construction of the M5 motorway**. However, the interviewed representative of **Makó reported that the project was a very useful process** for them as the municipality obtained relevant knowledge about the processes of land expropriation, project management and decision-making about development plans. The respondents from the National Development Agency (NDA) and NIF National Infrastructure Developing Co. Ltd (NIF) also emphasized **the role of institutional learning in the case of the M43 motorway**. The M43 project between Szeged and Makó contributed to the better preparation of other major EU-financed projects (especially the preparation of the M43 investment between Makó and Csanádpalota/RO border crossing). The other **main experience was how to handle the bankruptcy** of one of the contractors (SZEVIÉP). This case resulted in a **stricter regulation** of subcontractor agreements. The bankruptcy of SZEVIÉP was the biggest challenge during the phase of project implementation but the other members of the TISZA M-43 Consortium took responsibility for the implementation and fulfilled their obligations stipulated in the construction contract. The respondents representing the NIF also highlighted the significance of the offer price during the public procurement procedure. The main conclusion drawn from the bankruptcy of SZEVIÉP was that the realistic offer price of building contractors is a pre-condition for the successful implementation of any infrastructure projects. **The underestimated offer price may seem favourable for the client but it threatens the project implementation in the long-term** and may cause liquidity problems for the contractor.

During the interviews, the respondents from the NIF also mentioned that the coordination among the various actors was one of the main challenges during project implementation. The lessons of the investment led to a stricter and more consistent regulation in the field of subcontracting and generated a more efficient coordination structure.

3.3.EFFECTS ON QUALITY OF LIFE AND WELL-BEING

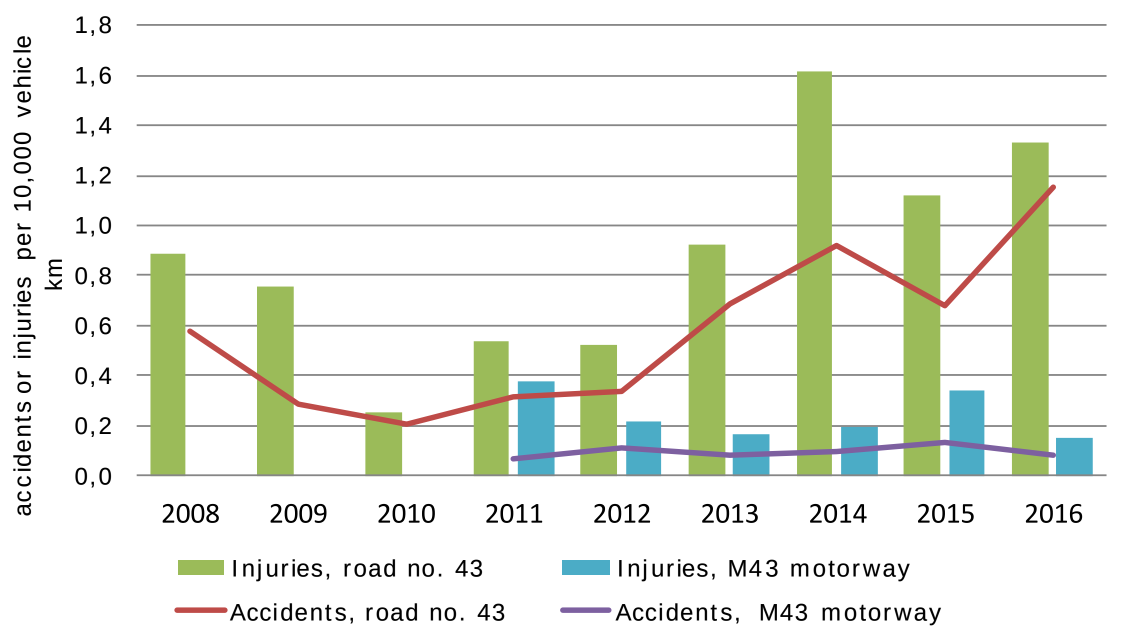
Measurable effects

The quality of life and well-being can be measured by the reduction of the number and severity of accidents since the opening of the M43 motorway.

The completed section of the **M43 motorway** between Szeged and Makó **significantly reduced the risk of accidents both within the settlements and on the roads connecting them.** 22 major accidents, including 3 fatal accidents occurred on the route throughout the year before the start of the investment, while the number of accidents with less serious injuries was 29. A year after the project was completed the number of major accidents decreased to 8, although the number of fatal accidents stayed the same. However, the number of accidents involving less serious injuries also decreased significantly to 11.

There was a major accident on the new motorway half a year after it was put into operation. On 30th October 2011 a truck, which transported 20 tonnes of wood from Romania to Germany, broke the barrier separating the two sides of the motorway (near Km 17), turned on its side and crashed into a Romanian minibus causing the death of 14 people. The truck driver might have fallen asleep before the crash because of the side effects of his medicines and was not following his lane anymore.

Figure 16. Accidents and injured persons per 10,000 vehicle kilometres on main road No 43 and M43 motorway



Source: Hungarian Public Road Pte Ltd Co.

However, the declining figures of accidents did not become a long lasting trend (see Figure 16). Since the early 2010s the number of accidents and the number of injuries in accidents started to rise again (especially on main road No 43, which crosses villages). This is because the post-crisis economic recovery involved rapidly increasing road traffic as well. In spite of this, the overall net present value of savings due to the temporary decline in accidents is estimated at EUR 8.3 million.

The M43 motorway also improved the overall quality of life because much of the traffic now does not pass through the settlements but goes outside the populated areas. Therefore the residents and properties have been released from significant noise and vibration, **which represents a total saving of EUR 17.2 million**. However, there is a new source of noise on the motorway in the rural area (EUR 8.3 million of estimated cost) since the opening of the motorway. In the ex-post CBA the overall **net present value of noise savings is EUR 8.9 million.**

Non-measurable effects

Most of the respondents highlighted **the immediate significant decrease of congestions after the opening of the M43 motorway** sections. Several interviewees confirmed the significant improvement in road safety and many respondents experienced a slight decrease in heavy traffic after the opening of the M43 motorway. Most of the respondents told that the investment involved lower exposure to traffic noise, which was a very relevant problem before the opening of the motorway. Based on the opinions of the respondents these factors influenced the quality of life in a very positive way.

In Szeged and Makó, **the intensity of passenger car traffic has been rising since the opening of the M43 motorway**. The development of spa and wellness tourism might be the most important reason for this growth.

The mayors of smaller settlements (Klárafalva and Deszk) also indicated that despite the positive change in transit traffic, at times they still experience heavy transit traffic on the main road No 43.

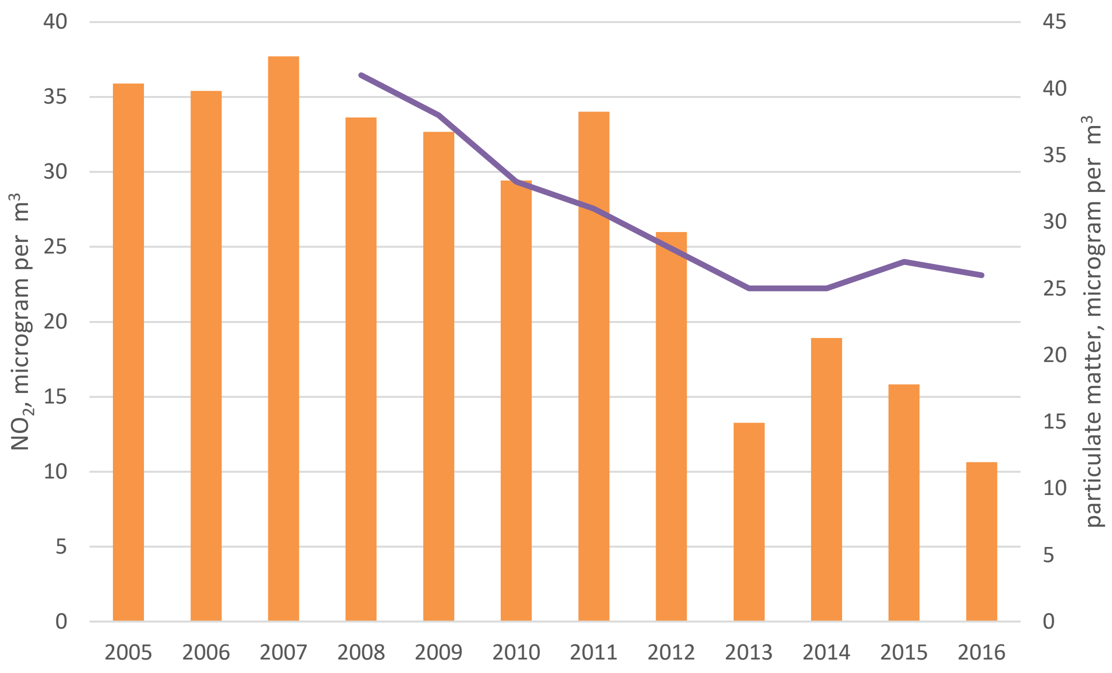
3.4.EFFECTS ON ENVIRONMENTAL SUSTAINABILITY

Measurable effects

In terms of sustainable environment, the construction of the M43 motorway has involved both positive and negative measurable impacts. Some of these effects are included in the CBA as well.

Overall, **the rate of emission in the project catchment area has increased due to the changes in traffic volumes and the increased average speed of the vehicles**, which is detrimental to the environment. However, the increasing emission affects entirely the rural areas along the motorway, thus it has lower direct negative effect on the population's health status as it was the case before the implementation of the project. Concerning emissions, the most characteristic changes affected the concentration of NO_2 and particulate matter (PM). The OMSZ (Hungarian Meteorological Service) has continuously monitored both contaminating elements in Szeged using automatic measuring stations. The changes in the data (see Figure 17) clearly reflected that the traffic partly shifted to the new route of the M43 motorway.

Figure 17. NO_2 emission and air contamination by particulate matter in Szeged (2005-2016)



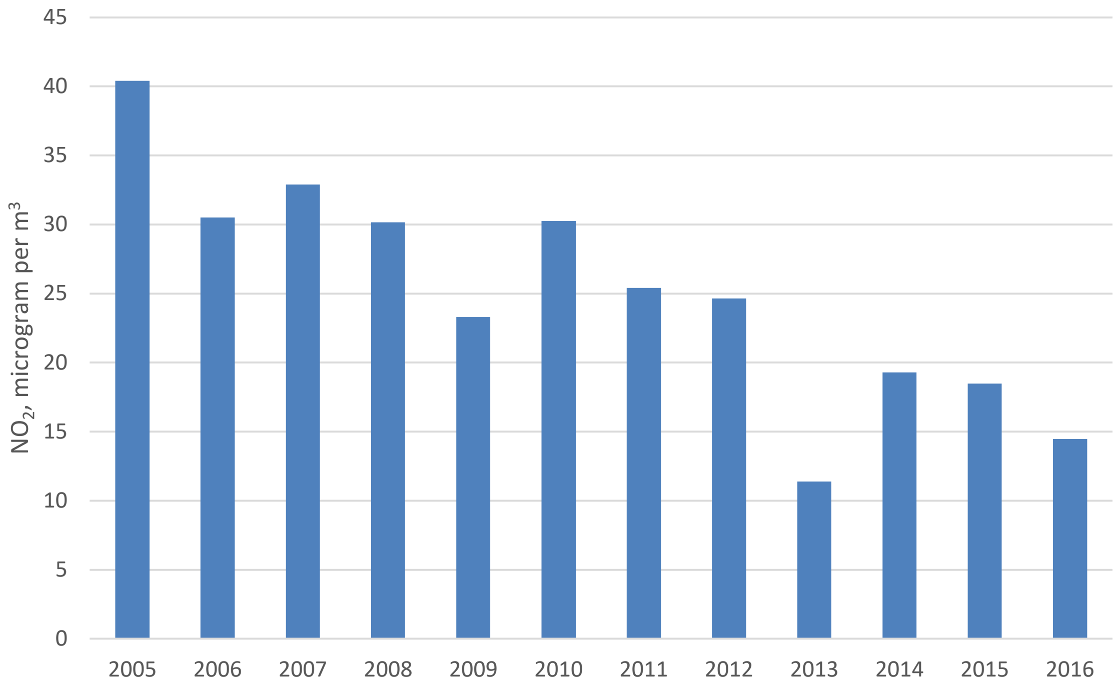
Source: Hungarian Air Quality Network

The information on air quality in Makó is manually recorded. Therefore, only the results of measurements of the concentration of **NO_2** are available (see Figure 18). But, of course**, the positive effect of the new M43 motorway can be very clearly identified** in those figures, too.

The increase in the amount of emitted greenhouse gases is just as harmful if it occurs in a residential area or in remote areas. However, the decreasing amounts of airborne dust or emitted volumes of non-greenhouse but otherwise harmful gases in the populated areas, in exchange for the increasing amount of greenhouse gases in uninhabited territories is a positive change.

These two effects together, that is **the decreasing air pollution in residential areas** (EUR 186.0 million benefit along the old main road) and **the growing emission on external areas** (EUR 291.9 million cost along the motorway) **represent EUR 105.9 million net expense, which definitely should be contrasted with the positive 'returns' of other impacts.**

Figure 18. NO_2 emission in Makó (2005-2016)



Source: Hungarian Air Quality Network

Non-measurable effects

In terms of sustainable environment, every building represents an environmental burden as it occupies natural habitats, thereby affecting the living conditions of both natural vegetation and wildlife. It destroys green areas or interferes with the paths of wild animals, nesting sites, and food sources etc. The M43 motorway is not an exception to this rule either: the road occupies about 1.7 million square meters of natural habitat of vegetation and wild animals. Apart from road crossings, there are five game crossings (ecoducts) passing through the motorway. **Based on the EIA the motorway does not affect significantly Natura2000 areas.**

3.5.EFFECTS RELATED TO DISTRIBUTIONAL ISSUES

Non-measurable effects

Many respondents told that the **time savings and the better accessibility to the motorways (M5 and M43) positively influenced territorial cohesion**. The faster and safer transport mobility infrastructure contributed to better and faster accessibility to social and economic goods and opportunities (e.g. **job opportunities**).

Based on the respondents' opinion, migration from smaller settlements to cities was one of the biggest challenges faced by small settlements. The M43 motorway influenced this phenomenon in a positive way but the negative process still exists (especially in the smallest settlements such as Kübekháza).

The respondents from the central state administration indicated that the investment had a positive effect on the cooperation among the larger cities in the region. Instead of conflict and rivalry, **cooperation between the settlements played an important role in territorial development.**

Overall, the respondents had big expectations toward the investment of M43 motorway but these expectations have only been partially met. Almost all respondents admitted that the motorway was necessary for the future development of the region but it did not represent a not sufficient condition for territorial and social convergence.

3.6. TIME SCALE AND NATURE OF THE EFFECTS

The M43 motorway between Szeged and Makó was opened for traffic in 2011 and most of the effects from this investment materialised within a short timeframe. In the short run, the opening of the M43 motorway between Makó and Csanádpalota (RO border crossing) influenced the effects of the project under assessment, i.e. the first section of the M43 motorway between Szeged and Makó. In the long run, the development of the motorway infrastructure in Romania will influence the performance of M43 motorway between Szeged and Makó.

Table 11. Temporal dynamics of the effects

CATEGORY OF EFFECTS	SHORT RUN (1-5 YEARS)	LONG RUN (6-10 YEARS)	FUTURE YEARS	COMMENT
Economic growth	+	+	++	Substantial time savings, reduced congestion, better accessibility
Quality of life and well-being	++	++	++	Increased safety, reduced noise in inhabited areas, higher service quality
Environmental sustainability	+/-	+/-	+/-	main road No 43: + M43: -
Distributional issues	+/-	+	++	Improved territorial cohesion

Note: += slight positive, ++=positive, +++=strongly positive, +/-=mixed effect.

As mentioned above, the project objectives did not discuss the expected impact on time. In spite of this, some effects **on economic growth such as time savings and reduced transport costs have been realized already in the short run** and these effects will continue to exert a positive influence on the local economy in the future, too. Other effects such as **better accessibility have had a positive effect on the competitiveness of the region but these outcomes will be realized mostly in the long run**. It also holds for distributional issues. In the short run, the project has a mixed effect because of the combination of new investments and disappearing of local services along main road No. 43. **In the long run**, however, **the project will improve the territorial and social cohesion of the region**. At the same time, the effects on **quality of life and well-being have become visible already in the short run**. The reduction in congestion and the positive change in terms of air pollution in the inhabited areas affected the project outcomes in a positive way. In the case of environmental sustainability, the effects are ambivalent. The decrease in air pollution in the inhabited area and the increasing of GHG emission due to the motorway involves a mixed effect. This may not change either in the short or the long run. However, it is important to emphasize that every new motorway, which stimulates new traffic flows, has a negative impact on environmental sustainability because of the increasing GHG emission.

4. MECHANISMS AND DETERMINANTS OF THE OBSERVED PERFORMANCE

The key mechanisms and determinants of the long-term effects discussed in the previous chapter are illustrated and discussed in this section. Finally, the importance of each determinant for the project's final performance, the interplay between them, and the observed outcomes are discussed. Table 12 below summarizes the analysis of determinants.

Table 12. Determinants of the project outcomes

DETERMINANT	STRENGTH
Relation with the context	+3
Selection process	+2
Project design	+3
Forecasting capacity	-2
Project governance	+4
Managerial capacity	+4

Note:
-5 = the determinant is responsible for the negative performance of the project;
-4= the determinant has provided a negative contribution to the overall performance of the project;
-3= the determinant has contributed in a negative way to the performance but it was outweighed by other positive effects;
-2= the determinant has a slightly negative contribution to the project performance;
-1= the determinant is negative but almost negligible within the overall project performance;
0= the determinant has no impact on the project performance;
+1=the determinant is positive but almost negligible within the overall project performance;
+2= the determinant has a slightly positive contribution to the project performance;
+3= the determinant has contributed in a positive way to the performance but it was outweighed by other positive effects;
+4= the determinant has provided a positive contribution to the overall performance of the project;
+5= the determinant is responsible for the positive performance of the project.

4.1.RELATION WITH THE CONTEXT

The history of M43 motorway strongly influenced the performance and project design of the current status of the development. In 1990 the motorway and expressway infrastructure were in an underdeveloped state in the country which was a relevant drawback for the economic development. The early plans of M43 motorway correlated with the development demands which targeted the infrastructure development of Hungary. For this reason, the **development plans of the M43 motorway had strongly a transport perspective.**

The relevance of the M43 motorway strengthened with the designation of the elements of TEN-T Network and the economic development of Romania affected also the necessity of the project. **The Csongrád County**, where the project was implemented, **became a transit zone for the transport from the Balkan region and Romania to the direction of West-Europe**. **Without a motorway infrastructure the transit caused significant externalities** (i.e., congestion, lack of reliability of the travel time, noise, pollution etc.) **in the region** and the passengers also. On the other hand the development of M43 motorway played an important role from the aspect of Hungarian economic development due to the connection between peripheral and well-developed areas.

The project impact on the economic growth is overall positive. Due to significant traffic, the direct economic impact (time saving and the reliability of the journey time) of the project has been met but the result of the wider economic impacts are still ambivalent. It means that the **project made a region more competitive** through better accessibility, reduced transport costs and relevant time saving but the economic growth of the region was not realized in a short run. However, relevant investments arrived to the region since the implementation of the M43 motorway which shows that economic growth could materialize in long run.

As we above mentioned, the project objectives reflected to the development needs in local, national and European level also and concentrated to the major problems of the region. It means that the **project was appropriate to the context**. **The positive effects of the motorway on quality of life and well-being of the inhabitants** show the relevance of the project. The improving of Pan-European Corridor was also a significant aspect which contributed the implementation of Trans-European Transport Network in the long run.

In summary, the relation with socio-economic context is rather positive in light of the relevant traffic volume which caused a positive result on the field of direct economic effects. Furthermore, the positive changes of quality of life had contributed to the positive opinion about the project. The results of the project and **the project itself will remain relevant over the years because the generated effects will persist in the long run.**

4.2.SELECTION PROCESS

The selection of M43 motorway between Szeged and Makó **based on the development need of a motorway network** in Hungary. From this standpoint, in the preliminary studies the development focused primarily on the transport perspective. The history of the investment shows that the **project was in the focus from the early 1990s** but other elements of the national motorway infrastructure network were favoured by the decision-makers until 2006. The development of the motorway network started from the capital and went on towards peripheral areas. It was in 2006 when the development of the missing network elements in peripheral areas became current.

This means that the **development needs for the Pan-European Transport Corridor IV coincided with the Hungarian motorway network development needs**, which altogether led to the selection of the M43 motorway. Nevertheless, the transport perspective has been completed with the aim of economic growth and the better life quality.

The selection process was led by the National Development Agency (NDA) which was a government body between 2006 and 2014. NDA was under the authority of the national government and was responsible for the planning and the coordination of major development investments.

The task of the NDA was to evolve the project list of the Transport Operational Programme (TOP). As mentioned above, the 2007-2008 period of Transport Operational Programme (TOP) was approved by the Government. The project list of TOP was based on the negotiation between NDA and the Ministry of Transport, Telecommunication and Energy.

After the selection of M43 motorway project, **NIF National Infrastructure Developing Co. Ltd (NIF) signed a contract with Consortium of Utiber Ltd. and COWI Ltd. for**

making a feasibility study. It is important to mention that the NIF is a state-owned company and it is responsible for the technical implementation of the mayor projects.

As mentioned in the section of project background, **the feasibility study has been negotiated between NIF and JASPERS**, which supports promoters in preparing projects in areas benefiting from EU funds. JASPERS transferred knowledge to the NIF about environmental issues (environmental impact assessment) and other EU legislations which referred to the major projects in the EU. It means that the role of JASPERS was to ensure that the project objectives and design of **M43 motorway meet all the EU necessary standards.** JASPERS also supported the forecasting of the expected effects and benefits of the M43 motorway.

4.3.PROJECT DESIGN

The need for a high service level motorway between Szeged and Arad (Romania) was clear early on. The feasible alternatives were investigated deeply in the feasibility study and the chosen combination of the southern and the northern route united the advantages of each option.

The first part of the M43 motorway (3 kilometres) was finished in 2005 as it was built together with the section of Kiskunfélegyháza – Szeged (M5 motorway). This section was not part of the M43 project which also means that this section is not part of the ex-post analysis.

According to the feasibility study (2008) **the project originally included 31 km motorway** with 2x2 lanes, a 680 m bridge over the Tisza-river and the construction of 7.66 km trunk road with 2x1 lanes and road sections that connect the end of the motorway to the existing main road No 43 creating a bypass road around Makó. Unfortunately the environmental impact assessment of Makó-bypass had not been finalized till the critical time, so JASPERS suggested leaving that section out of the major project. The suggestion was accepted, **Makó bypass road was constructed from national resources**, which was changed to ERDF retrospectively in 2013.

In the feasibility study two main route alternatives (northern and southern) and four connection alternatives were investigated. Both alternatives joined the first three km section of the implemented M43 motorway at the connection of main road No 5. After a discussion a combined **route was accepted and this decision was questioned neither during the construction nor after the implementation. The selected route has optimal length that also optimized the costs as well.** The crossing of the Algyő hydrocarbon-field was inevitable and the implementation was well designed to minimize the risk factors for crossing pipes and power lines. The crossing of Tisza river was a challenge and finally the safest version was supported from the aspect of hydraulics, furthermore the shore protection of Tisza was also taken into account. And finally the main negative points of the south route alternative, which would have been the impacts on the flood control dike of Maros river, were also avoided by the combined version.

The motorway with 2x2 lanes and the Tisza-bridge were built without any significant modification just like the five grade separated interchanges and the maintenance centre. Two dual-use rest areas were constructed; one of them was designed to have enough space for a fuel station, which has not been built yet.

Overall, **the project design contributed positively to the outcome of the project due to the effective and efficient construction**. However, the positive picture is distorted by the 7 months delay, but if the bankruptcy of one building contractor is taken into account this delay is not as significant.

4.4.FORECASTING CAPACITY

The forecasting regards the possibility and capacity to predict future trends and forecast the demand level and estimate the technical challenges of the project.

The forecasting for traffic demand on the project section has been overestimated at ex-ante analysis. The next phases of Szeged – Arad TEN-T link were not included in the traffic model, which became real in July 2015 already. Estimates for light traffic could be reached though in 2015, when the new phases of Szeged – Arad link with new border crossing were inaugurated. Traffic forecasts for the future are quite similar in ex-ante and ex-post analysis (ex-post: 98-108% of ex-ante forecast).

Regarding the heavy traffic, it was only 50-59% of ex-ante predicted values till new phases in 2015, since then it is about 74%, and it expected to be declining back to 58% of ex-ante predicted traffic with a smaller growth of traffic demand till 2037.

The lower volume of heavy traffic is one of the main reasons, why there is much less economic benefit of the project (EUR 7.9 billion) in the ex-post than calculated in the ex-ante CBA. There are various reasons of having lower volume of heavy traffic than estimated. It can be explained with the global financial crises till 2012 and also with the delay of Schengen accession of Romania and Bulgaria, which is forecasted now for 2022 instead of 2010-2012. Apart from M43 it seems there will be more options to connect Romania to Pan-European TEN-T expressway network for the next decades than expected several years ago.

As far as we experienced the ex-ante traffic model was elaborated with nearly the same average speed for all vehicle categories; e.g. on M43 88-93 km per hour for light vehicles, 89-92 for heavy vehicles (allowed speed for HGV: 80 km per hour), while on other motorways 78-85 km per hour for all vehicle categories. Such difference, was very economically beneficial from an environmental point of view, because that is an optimal speed for emission of light vehicles, but good for the travel time benefit too, because unit values of heavy vehicles are much higher, which compensated the less value of time calculated for cars. From an ex-post perspective, such assumptions are unreliable.

There are other reasons of having such a difference in economic benefits, which can be derived to different assumptions adopted in the ex-ante and ex-post CBA. In the ex-post analysis Section 1 (nearby Szeged), which is economically the most attractive section because of higher traffic demand, is also part of the ‘without the project scenario’, hence there is a lower benefit that can be gained with the other essential sections (Section 2 & 3). On the other hand Makó bypass – that was not supported by CF as planned – was included in ex-ante, its loss in ex-post was not beneficial in the ex-post results between 2011 and 2015.

Overall **the forecasting capacity contributed to the project performance in a slightly negative way**, while the forecast was inaccurate and benefits were overestimated.

4.5. PROJECT GOVERNANCE

As we mentioned before, **the main actor in the project governance structure was the National Development Agency (NDA)**, who was responsible for the planning and plan-approval procedures. Beside NDA the NIF National Infrastructure Developing Co. Ltd (NIF) was the other main actor who coordinated the implementation of project design and kept a contact with the different actors (building contractors, engineers, other authorities etc.).

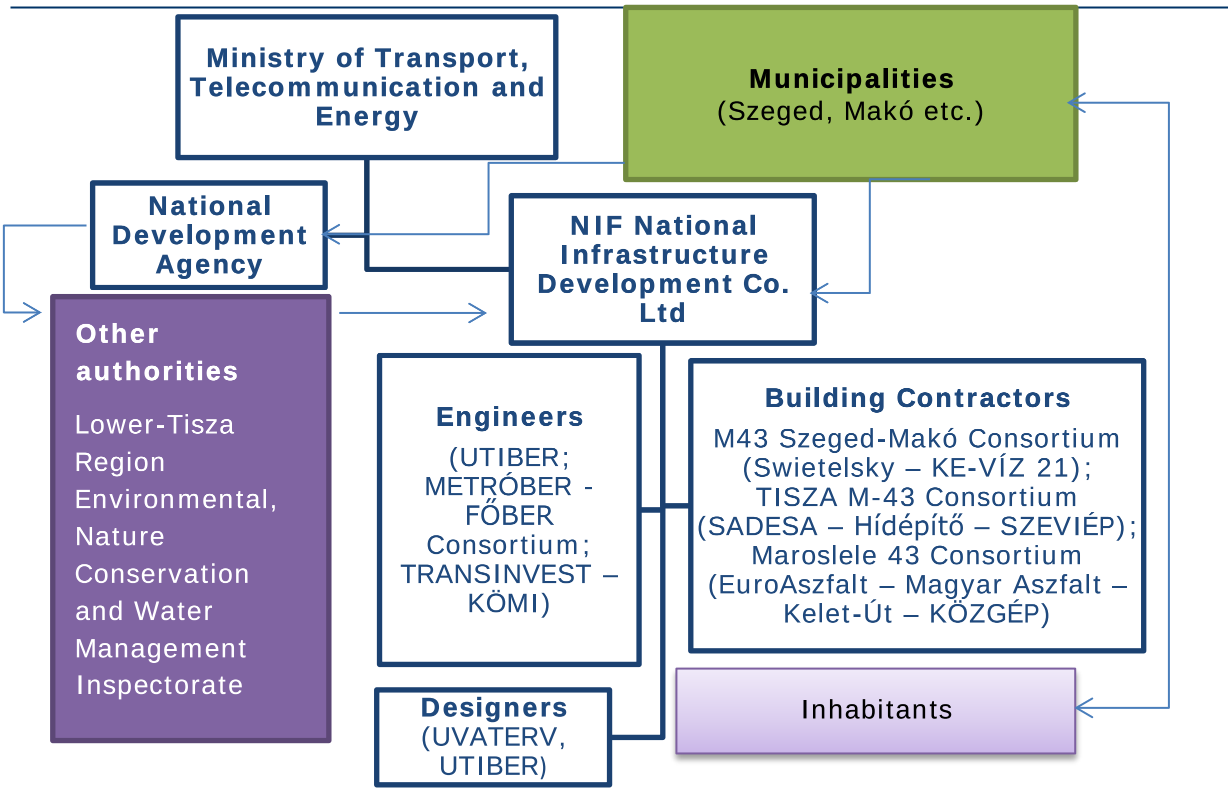
The project of M43 motorway was one of the first major projects, which were supported by the EU. It resulted that the process of **project preparation and managing was a learning process** for each actors. The project governance followed the standard Hungarian and EU procedures even so the implementation of M43 motorway between Szeged and Makó resulted in some important lessons which have been utilized for other major projects.

The **main lessons** refer to the **project managing structure, the process of expropriation, the environmental planning and the prevention of liquidity problems by the building contractors**. The relevance of the offer price during the open tendering procedure has become obvious. The main conclusion was that the realistic offer price of building contractors is a pre-condition of the successful implementation of the projects because **the underestimated offer price may seem favourable for the client but it threatens the project implementation in long-term and causes liquidity problems for the contractor**. **The liquidity problems** of the contractor **led to stricter regulation on the field of sub-contracting** to protect the interests and financial background of sub-contractors.

As we can see in Figure 19 the total number of stakeholders (municipalities, building contractors, designer, engineers, managing authorities and other authorities) was relatively high, which was a significant challenge to project management. **The effective communication and the clear responsibilities** contributed significantly to the efficient project implementation. As we mentioned, the main coordinator was the NIF in the management structure. The responsibilities of the company were the gathering of the information, contact keeping with the municipalities, engineers, building contractors, designers and the continuous coordination of the implementation. The NIF was also responsible for the representation of the project towards the NDA and national Government (Ministry of Transport, Telecommunication and Energy). The company held contact with other authorities too. The tasks of the municipalities (with cooperation of NIF) were the contact keeping with inhabitants and the administrative contribution to expropriations.

The well-structured project governance system was the one of the most relevant pre-condition of a successful implementation of the project. The established structure was supported by the EU through mentoring and the legal harmonization.

Figure 19. Structure of the project management



Based on the opinion of Jaspers, the Hungarian governance structure was capable for the project implementation and it was able to integrate the main lessons into managing structure.

In the project management system, the NIF and the NDA were the main actors. The Agency ensured project planning and management process, kept contact with other authorities (such as Lower-Tisza Region Environmental, Nature Conservation and Water Management Inspectorate) and negotiated with the EC and JASPERS. The NDA was also responsible for the ensuring the financial sustainability of the project implementation which also meant the monitoring and controlling of financial resources. The NIF was the responsible actor for contact keeping with engineers, designers and building contractors and the state-owned company also controlled the implementation of project design. The municipalities cooperated with the NIF and the Agency and played an important role in the process of expropriation. The Municipalities also kept the contact with the inhabitants.

After the implementation of the project, **the operation and maintenance of M43 motorway is managed by public sector**. From 2011 till 2013, the State Motorway Management Company Ltd. was the responsible actor for the operation and maintenance of M43 motorway between Szeged and Makó. According to Government Decree No 1600/2013. (IX. 3.), based on Act CLXVI of 2013 on the transfer of public road management tasks, the Hungarian Public Road Pte Ltd Co. (MK) took over the public road management activities of the State Motorway Management Company Ltd. (SMMC). As a result of the sector handover, the name and scope of activities of the SMMC have changed from 1 November 2013. The Hungarian Public Road Pte Ltd Co. handed over the all employees and assets of SMMC and maintained all activities of SMMC. Based on interviews, the transformation had not influenced the operation and maintenance of M43 motorway in a negative way.

4.6. MANAGERIAL CAPACITY

The managerial capacity was already relevant during the application process. As we mentioned above, **the feasibility plan was modified for the request of the EU Commission but a disagreement over VAT caused difficulties**. The issue of environmental impact assessment was also a subject of the negotiation. Solving the issue of environmental permission required effective cooperation between the different Hungarian authorities. This was the first test for the project management of M43 motorway which ensured the base of efficient cooperation between the different actors.

As mentioned before, **the project has been delayed 7 months** due to the bankruptcy of one of the building contractors, whereas other factors such as archaeological excavations and the environmental legislation **did not hinder the implementation.**

The bankruptcy of SZEVIÉP Ltd. (contractor in the LOT 2) happened in the June 2010, which caused a difficult situation for the project management. Many subcontractors of SZEVIÉP were in a hard position due to unpaid costs so they organized several demonstrations against the company.

In this situation, the project management had to react quickly to solve the problem. The negotiations started already in June 2010 between the NIF and the remaining members of M43 Tisza Consortium. The agreement was reached in July 2010 which made possible to continue the project. Based on the arrangement[13], the indemnity was provided by the remaining members of the Consortium.

The problem solving ability is a one of the most important indicator of the managerial capacity. Despite the presence of problems, **the project management responded well to the challenges and ensured the implementation of the project within the budget.**

Overall, the **managerial capacity was one of the strengths of the project** and contributed the successful implementation of the project.

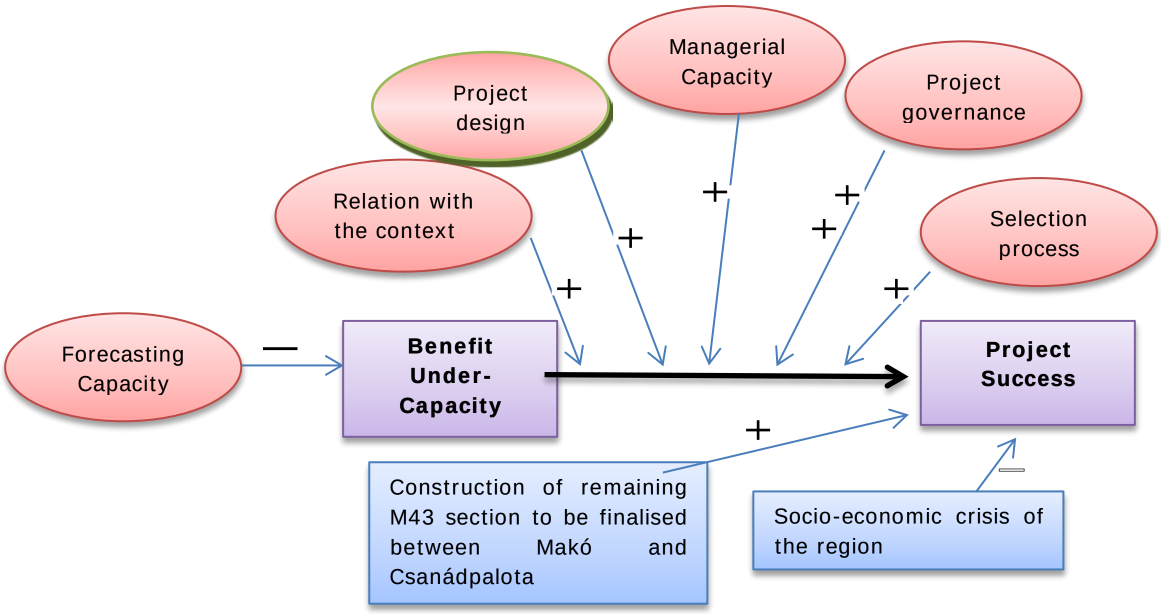
4.7. PROJECT BEHAVIORAL PATTERN

After the identification of the typical determinants of the project performance and the main projects outcomes, the next step is to describe the chain of interlinked causes and effects which determined the project over time.

The following figure introduces the behavioural pattern of the project. The rectangular boxes indicate the project's determinants in a positive or negative way. The report also distinguishes the intensity of influence. The hexagonal boxes refer to the observed events which also influenced a project performance and main outcomes.

[13] The details of the agreement are classified as business secrets.

Figure 20. Behavioural pattern



Source: Authors

(++)= the determinant is responsible of the positive performance of the project;
(+)= the determinant has provided a positive contribution to the overall performance of the project;
(-)= the determinant has provided a positive contribution to the overall performance of the project;
(--)= the determinant is responsible of the negative performance of the project.

The relation with the context gives a sligthly positive picture. The project objectives focused on the development needs in local, national and European level and reflected the major problems of the region. **The project will remain relevant over the years** because the generated effects will persist in future years. Although preliminary studies focused mostly on the transport perspective, the project objectives were complemented later with the aspect of quality of life and well-being. At European level, the contribution to the implementation of TEN-T Network is also a relevant determinant. Despite the preparation of the investment started in the early 1990s, the selection process ended only in 2009. During the whole selection process, the content and the objectives of the motorway were not modified significantly. From 2006, the selection process was accelerated due to Transport Operational Programme of Hungary 2007-2013 and the selection was finished in a relatively short time.

The contribution of the project governance and managerial capacity to the project success is significant. Especially, **the project management played an important role** and ensured the successful implementation of the project. Despite some delay, the project governance almost kept the deadlines and the investment was realized according to the budget. Nevertheless, the high number of stakeholders was a relevant challenge for the project management but the well-structured governance system and the clear responsibilities provided a good institutional background of the project. **The main negative event was the bankruptcy of one of the building contractors**, which threatened the successful implementation. The efficient solution of this problem gives a positive picture about the managerial capacity of project governance.

As mentioned above, among the possible options for project design, **the implemented centre line was the most optimal possibility**. It means that the project design has provided a positive contribution to the overall performance of the project.

The evaluation of **the forecasting capacity of the project is ambivalent**. As we introduced before, the forecasting was too optimistic and made several technical mistakes during the planning. It caused that **the planned results did not fit in the observed reality**. It means that observed **project performance is positive but below the expectations.**

The project success was influenced by **two exogenous events**. **The finalisation of construction of remaining M43 section** between Makó and Csanádpalota (RO border crossing) is responsible for a positive performance of the project (reduced travel time, lower transport costs). On the other hand, **the socio-economic crisis of the region** has provided a negative contribution to the overall performance of the project in a short term.

Overall, the pattern of the project is labelled **"Little star"** because it is not characterized by weak appropriateness to the context and weak technical capacity to design the infrastructure. But it could not be argued that the project pattern is a "Bright star" because the forecasting capacity was not so accurate on the demand side. So, the project performance is positive but far below the expectations because demand side predictions in the ex-ante analysis were overestimated.

5. FINAL ASSESSMENT

Based on the different findings produced by the project analysis both in terms of effects generated and measured through Cost-Benefit Analysis or qualitative tools discussed as well as of factors affecting the generation of those effects, the final assessment of the project performance is described along a set of evaluation criteria.

5.1. PROJECT RELEVANCE AND COHERENCE

The objectives of the project correspond to the development needs and the priorities established at the local, national and EU level. **The project** facilitated the efficient movement of goods and people and thus ensured and **increased the competitiveness of Szeged – Arad cross-border region**. Most notably, **time savings have been realized** and **transport costs decreased significantly** due to the investment. The project also **positively influences the quality of life and well-being** in that it protects residents in the surrounding settlements from noise pollution and emissions because the heavy transit traffic, which was a grave problem in the project area, now avoids those settlements. In the absence of the project, it would have resulted in the overloading of existing infrastructure, which would have deteriorated the quality of life in the affected settlements and congestion would have increased.

As we mentioned above, the socio-economic objectives have only been partially fulfilled but it does not mean that the project is irrelevant in this respect. The socio-economic convergence of the region is an important objective but in the short run the M43 motorway had limited contribution to reaching this goal.

The objectives of the project fit to the national development priorities. The main goal of the Hungarian transport strategy[14] on the development of transportation infrastructure is the extension of the main network structure to improve economic competitiveness and regional accessibility. The strategic objectives of the project also reflect the local development plans of which primary goals are to improve the accessibility of the region.

From a European perspective, **the project improves the Pan-European Transport Network** as the M43 motorway constitutes part of the Hungarian section of the TEN-T Network (**The Orient/East-Med Corridor**).

5.2. PROJECT EFFECTIVENESS

The project provides a coherent route, higher capacity and improved traffic speed and service levels for the international transit traffic of the Pan-European transport corridor IV heading towards Romania and then to the Black Sea.

The traffic of main road No 5 and No 43 has decreased significantly after the opening of M43 motorway: 33% of the passenger cars and 81% of the heavy traffic has disappeared from these roads.

As the travel time (and the length of the journey) decreased between Szeged and Makó, vehicle operating costs (VOC) decreased also, but the benefit of faster traffic is almost annulled by the higher than optimal speed of the light vehicles on motorways. The largest benefit is that the heavy vehicles now avoid the inhabited areas

[14] *Unified Transportation Development Strategy 2008-2020* (Ministry of Transport, Telecommunication and Energy, 2008)

(this affects almost 20 kilometres of road leading through inhabited zones). This represents a win-win situation in that the quality of life of the inhabitants has improved and there are better speed conditions for the HGV drivers on the motorway (as their speed can be closer to the optimal). **The total estimated benefit of heavy traffic is around 134.7 million euros.**

M43 motorway between Szeged and Makó significantly **reduced the risk of accidents in the settlements and also on the roads connecting them**. 22 major accidents (3 fatal ones) occurred on the route throughout the year before the start of the investment, and the number of accidents with less serious injuries was 29. A year after the project was completed the number of major accidents decreased to 8, while the number of accidents with less serious injuries decreased to 11. The M43 achieved the objective of improving quality of life as traffic now does not pass through the settlements, but outside of the populated areas. Consequently, the inhabited areas are now less exposed to air pollution, noise and vibration.

There are numerous factors contributing to the economic growth of the region and the motorway construction is certainly one of them, although the exact contribution of M43 is difficult to estimate. Economic growth in the region can be measured mainly by the location proposals of HIPA. In the districts of Szeged, Makó and Hódmezővásárhely, the total number has multiplied to 2017 since 2011. The numbers of the proposals boosted significantly in 2015, when the M43 was operating along its full length reaching the Romanian border. The growing numbers of the negotiations show that the region gained a more attractive investment potential mostly because of the M43 motorway. Another economic indicator to consider is the unemployment rate which has decreased significantly since 2011.

The evolution of the traffic flow and the economic, environmental and social impacts of the M43 motorway suggest that the project significantly contributed to the improvement in the quality of life.

5.3. PROJECT EFFICIENCY

The ex-ante CBA included a total investment cost of EUR 324.8 million. 72.9% of this (EUR 236.6 million) was planned to be financed by the Transport Operational Programme 2007-2013, of which 85% (EUR 201.1 million) would have been Community assistance.

According to the project decision (14 December 2009) the budget was approved with a total funding of EUR 197.2 million, of which EUR 167.6 million (85%) represented the contribution from the Cohesion Fund. In these costs VAT was not included, which was finally covered by the state budget.

The total costs of M43 project exceeded the initially planned budget by 9.0% (by HUF 7.2 billion), while **in euro the budget was less by 3.8%** (by EUR 12.2 million). This additional sum was allocated for the project by the Hungarian Government.

The construction of the **M43 motorway** between Szeged and Makó was completed and the road **was open in April 2011**. Almost seven years have passed since then. Previously, August 2010 was scheduled as the deadline for the completion of the project but a 7-month delay occurred in its implementation because of the exceptionally rainy weather (Ministry of National Development, 2017) and the bankruptcy of one of the contractors (SZEVIÉP). The delay directly affected the construction of LOT 2 but also the interconnected LOT 3, which had been completed earlier, but was not possible to put into operation without LOT 2.

The ex-ante CBA, which was affected by some deficiencies in the demand analysis as well as some unrealistic and some different assumptions (see Section 4.4. Forecasting Capacity), presented a cost-benefit ratio of 18.66, which is substantially higher than the B/C ratio calculated in the ex-post evaluation (1.54). Although the difference is large, a cost-benefit ratio above 1 suggests that the project was nevertheless cost effective.

5.4. EU ADDED VALUE

According to the funding decision the budget was approved with total funding amounting to EUR 197.2 million, of which EUR 167.6 million (85%) represents CF contribution.

Based on the qualitative evidence collected via interviews, **EU-funding was crucial for the project.** Formerly, the project had been identified as a top priority but probably the motorway would not have been built without the availability of EU funding. Besides the funding, the role of EU was also important during the planning and the implementation of the project. The institutional background serving the project was established with EU support and the cooperation between the project management and JASPERS contributed to the successful implementation of the project. However, the EU added value is not limited to project implementation: the National Development Agency gained relevant experiences about the project application procedure. Becoming familiar with EU standards and the relevant legal background proved useful in connection with other major infrastructure projects that were later supported by the Cohesion Fund. As our interviewees revealed, the insights gained through the planning and implementation of the M43 motorway contributed to the easier and more efficient implementation of the other section of M43 motorway between Makó and Csanádpalota (RO border crossing), and also played an important role in other major Hungarian projects.

The European Council and the European Parliament accepted the TEN-T guideline for transportation in 1996. Its objective was to establish an **integrated surface, naval and aerial transport infrastructure network in the Community area**. Today, **the M43 motorway** between Szeged and Makó **is an important part of the Orient/East-Med Corridor**. First and foremost, the M43 motorway ensures fast and safe connection between two EU member states, Hungary and Romania. Second, this connection also contributes to the competiveness of the cross-border region which, in turn, positively affects the socio-economic development of the macro region.

5.5. FINAL ASSESSMENT

The project of the **M43 motorway** represents an example of a road infrastructure project which, in spite of the overestimated assumptions regarding the demand side in the planning phase, **contributes positively to the competiveness of the region and the quality of life of the inhabitants.**

Thanks to the unchanged strategic objectives, **the project was and over the years has remained fully in line with the local and regional development needs and the priorities established at various territorial levels.**

Nevertheless, the benefits do not completely fulfil the ex-ante expectations because of the overestimated traffic forecast and other technical mistakes. Nevertheless, the **performance of the project still remains strongly positive**.

The role of the EU was very significant from two important aspects: first, it covered a huge share of the investment costs; second, the EU facilitated institutional learning as well.

Table 13. Evaluation matrix

CRITERION	EQ	ASSESSMENT	SCORE (*)
Relevance	To what extent the original objectives of the examined major project matched: • the existing development needs, • the priorities established at the programme, national, and/or EU level.	The project was and over the years remained fully in line with the local and regional development needs and the priorities established at various territorial levels	5
Coherence	• Are the project components in line with the stated project objectives? • To what extent the examined the project was consistent with other national and/or EU interventions carried out in the same field and in the same area?	Almost fully consistent	4
Effectiveness	• Has the examined major project achieved the objectives stated in the applications for Cohesion policy support? • Was the actual implementation in line with the foreseen time schedule? • What factors, including the availability and the form of finance and to what extent influenced the implementation time and the achievement observed? • What has changed in the long run as a result of the project (for example, is there evidence showing contribution of the project to the private sector investments)? • Were these changes expected (already planned at the project design stage, e.g., in terms of pre-defined objectives) or unexpected (emerged, for instance, as a result of changes in the socio-economic environment)? • How have these changes matched the objectives set and addressed the existing development needs, the priorities established at the programme, national and/or EU level? • Did the selected project turn out to be the best option among all feasible alternatives?	The project has achieved the expected objectives with some delay with respect to the original time schedule. It turned out to be the best option among all feasible alternatives.	3
Efficiency	• Are there any significant differences between the costs and benefits in the original cost-benefit analysis (CBA) and what can be observed once the project has been finalised? • To what extent have the interventions been cost effective?	Negligible negative differences	3
EU added value	• What is the EU added value resulting from the examined major project (in particular, could any of the major projects examined, due to its risk profile, complexity or scope, have not been carried out if not for the EU support)? • Did the examined major projects achieve EU-wide effects (e.g. for preserving the environment, building trans-European transport networks, broadband coverage etc.)? • To what extent do the issues addressed by the examined interventions continue to require action at EU level?	High EU added value, i.e. the project achieved positive effects which would have been unlikely to achieve without EU support	4

*Note: * scores range from 1 to 5. Source: Authors*

6. CONCLUSION

The ex-post assessment of this project suggests an overall positive result of the infrastructure project concerning the construction of the M43 motorway in southern Hungary.

The history of M43 motorway dates back to the early 1990s. The initial plans focused especially on the development needs of the Hungarian motorway network but later the final feasibility study incorporated aspects of quality of life and well-being.

The project concerns the construction of a section of 31.6 km of the M43 motorway in Hungary bypassing the cities of Szeged, Makó and several small settlements between these two cities.

The objective of this investment was to fulfil the objectives of the Hungarian Transport Operational Programme (2007-2013), namely to improve the international accessibility of the country as well as to construct the missing section of the expressway network towards the national borders. **The project also forms an important part of the TENT-T Orient/East-Med Corridor.**

The performance of the project is lower than initially expected but the results of the ex-post CBA still remain positive. This also confirms that the project represents added value at the EU level as well.

Several lessons can be learned from the ex-post assessment of this major project:

- **Complying with the development needs is one of the most important factors during the planning phase. It ensures that the project objectives will not change during the implementation and the project will remain coherent. It is also important to define which strategic objectives to fulfil in the short and the long run.** The objectives of the M43 motorway consistent with the overall development needs and the priorities established at the local, national and EU level.
- **The role of the project management is crucial for the successful implementation of the project. Good project management rests on clear responsibilities and efficient internal communication which serves effective and fast problem solving.** Apart from the 7 months delay in implementation, the M43 project demonstrates that good project management can generate a positive outcome even if external factors influence the implementation in a negative way. The bankruptcy of one of the building contractors represented the biggest challenge but the project management handled this problem quickly and efficiently and ensured the continuation of the project implementation.
- **Investigating feasible alternatives and clarifying the advantages and disadvantages of each possible version are crucial for finding the optimal solution. If the decision-making process is transparent, then there is no barrier for the stakeholders to commit to the selected alternative.** In the case of the M43 motorway the feasibility study investigated the potential centre lines. As a result of the clear classification of the pros and cons, an optimal solution was selected that combines most of the advantages of the alternative options and reduces the disadvantages to the minimum. This was the main reason why the chosen version was not questioned by the stakeholders during the planning process.

- **It is essential to examine the demands for related services of the project to avoid the situation in which the project creates conditions for a profitable investment but the market participants do not take advantage of the opportunity.** Although petrol stations had been planned along the M43 motorway and the spaces for them were constructed, none of the petrol companies showed interest in the public procurement for building and maintaining a fuel station. The reason for this is that drivers may not need any additional fuel stations at this 60 kilometre long section as there are plenty of stations close to the border in Romania, along the M5 motorway or in the nearby settlements (e.g. Maroslele). The fact that the public procurement proved unsuccessful gives a slightly negative tone to the project.
- **B/C ratio calculated in the frame of this ex-post evaluation (1.54) shows that the project was economically effective.** This figure is significantly lower than the one calculated (18.66) in the ex-ante CBA, which was affected by some deficiencies in the demand analysis as well as some unrealistic and some different assumptions (see Section 4.4. Forecasting Capacity). B/C ratio is also lower than it was (4.78) at the first ex-post CBA (Szeged-Makó Consortium, 2013). The largest share of the quantifiable total benefit is time savings with an estimated EUR 820.8 million (net present value), which is 82.7% of the total estimated benefit (EUR 992.1 million). Vehicle operating costs savings contributed to the total benefit with 154.0 million (15.5%), while the role of accident savings (EUR 8.3 million) and noise savings (EUR 8.9 million) remain rather marginal. At the same time, the effects of the project on climate change and air pollution are negative.

ANNEX I. Methodology of evaluation

This Annex summarises the methodological approach undertaken for carrying out the project case studies and presented in the First Intermediate Report of this evaluation study.

This Annex summarises the methodological approach undertaken for carrying out the project case studies and presented in the First Intermediate Report of this evaluation study. The main objective is to provide the reader a concise account of the evaluation framework in order to better understand the value and reach of the results of the analysis as well as to enable him/her, if interested, to replicate this methodology.[15]

The Annex is divided into four parts, following the four building blocks of the methodological approach (mapping of effects; measuring the effects; understanding effects; synthesis and conclusions) laid down in the First Intermediate Report. Three evaluation questions, included in the ToR, guided the methodological design. They are:

- **What kind of long term contribution** can be identified for different types of investment in the transport field?
- **How is this long term contribution generated** for different types of investments, i.e., what is the causal chain between certain short term and log-term socio-economic returns from investments?
- **What is the minimum and average time** needed for a given long term contribution to materialise and stabilise? What are these time spans for different types of investments in the transport field?

A I.1 Mapping the effects

The Team developed a classification of long-term effects, with the aim of identifying all the possible impacts of transport investments on social welfare. Under four broad categories, a taxonomy of more specific long-term development effects of investment projects has been developed. The definition of each type of effect is provided in the Table below.

Far from being exhaustive, this list is intended to guide the evaluators in identifying, in a consistent and comparable way, the most relevant effects that are expected to be identified and included in the analysis. Additional effects could possibly be relevant in specific cases and, if this is the case, they can be added in the analysis.

In researching all the possible long-term effects of project investments, it is acknowledged that there could be a risk of duplication. In addition, the allocation of some effects under different categories is to some extent arbitrary and thus it may happen that categories overlap. That said caution will be paid in order to avoid double counting when performing the ex-post CBA.

[15] Specific recommendations which may enable application of the same evaluation methodology to future projects are discussed in the Final Report of this evaluation study.

Table 14. Taxonomy of effects

	DIRECT EFFECTS	**DESCRIPTION**
EFFECTS ON ECONOMIC GROWTH	Travel time	Reduction in travel time for business travellers, shippers and carriers (including the hours gained because of a reduction of congestion) is a typical positive outcome of transport project, except those that specifically aim at environmental or safety benefits.
	Vehicle operating cost	Vehicle operating cost savings for the travellers (fuel costs, fares) and for transporters of goods (this refers to the distance-dependent transport costs) are relevant if the project aims at reducing congestion and/or the journey distances.
	Reliability of journey time	It means reduced variation in journey times. Reliability benefits are potentially important for many projects, unless journey times are already quite reliable. However, often forecasting models or other information for the impacts on and through reliability are missing (de Jong and Bliemer, 2015)
	Income for the service provider	It includes the revenues (e.g. rail ticket income increase) accrued by the producer (i.e. owner and operators together) as well as the operational cost savings. To some extent it can reflect the previous aspects (i.e. the service fare is increased to reflect a better service allowing for significant time saving for the users) so double counting shall be avoided. This aspect might be particularly relevant for public transport projects or toll road projects, especially if the project is expected to feature significant traffic (generated or induced) or a substantial change in fares.
	ADDITIONAL EFFECTS	**DESCRIPTION**
	Wider economic impacts	It refers to the agglomeration effect on productivity (the productivity of the economy is increased because the project leads to a clustering of economic activities together in a core city which makes these sectors produce more or better goods and services together than before). Agglomeration effects are unlikely to occur for small projects and even for large projects there are specific pre-conditions (see for instance Chen and Vickerman, 2017). Wider economic impacts (agglomeration effects) depend on whether the project makes a potential economic cluster location substantially more accessible. This is only possible if the infrastructure network before the project had important missing links which the project effectively removes.
	Institutional learning	It refers to wider spillover effects that any investment project may bring to the Public Administration and other institutions at national or regional levels in terms of expertise gained by working on large scale projects. Learning may lead to productivity gains by stimulating the improvement of existing technical know-how, improved policy-making, competitive tendering and divert resources towards the most growth enhancing projects.

EFFECTS RELATED TO QUALITY OF LIFE AND WELL-BEING	**DIRECT EFFECT**	**DESCRIPTION**
	Travel time	Leisure time saving relates to projects that provide a reduction in travel time for non-business travellers.
	Safety (accident savings)	It relates to the amount of fatalities, serious and slight injuries, damage-only accidents. Safety impacts should possibly be included in all project evaluation.
	Security	Safety of travellers in the vehicle and at stations, platforms and stops, safety of the goods transported (often damaged or stolen). Security impacts are often neglected in project evaluation, but for public transport projects (both urban and intercity) they can be of considerable importance.
	Noise	It refers to the exposure of population to noise measured in dB
	ADDITIONAL EFFECT	**DESCRIPTION**
	Crowding	A reduction of crowding in public transport is mainly relevant for projects that provide significant additional capacity in public transport.
	Service quality (other than crowding)	It refers mainly to the availability of specific service features increasing the journey comfort e.g. smoother movement of the vehicles, more comfortable seats, provision of electricity, Wi-Fi, catering.
	Aesthetic value	This relates to projects that provide infrastructure with positive visual effects (e.g. a beautifully constructed bridge) or when public transport provide a better image in the eye of the public. Also, it refers to projects that lead to a less attractively looking landscape (e.g. constructing high walls).
	Urban renewal	It refers to the spillover effects of urban transport projects on residents (not necessarily users of the project) due to an improved local context and possibly reflected in an increase in real estate values.
EFFECTS ON THE ENVIRONMENT	**DIRECT EFFECT**	**DESCRIPTION**
	Local air pollution	Local air pollutants are typically small particles, NO_x, VOCs and SO_2. The increased/decreased volume of local air emissions is a typical effect of transport projects.
	Climate change	Climate change refers to the volume of greenhouse gases (GHG) emitted by transport infrastructure. The increased/decreased volume of GHG emissions is a typical effect of transport projects.
	ADDITIONAL EFFECTS	**DESCRIPTION**
	Biodiversity	This refers to the reduction of biodiversity through the extinction of species in a specific area. It is not a common effect but it can be relevant in selected cases.
	Water pollution	Emissions of substances, e.g. from the road, into watercourses, that are harmful for people (as drinking water) or for life in the water
EFFECTS RELATED TO DISTRIBUTIONAL ISSUES	**ADDITIONAL EFFECTS**	**DESCRIPTION**
	Social cohesion	It encompasses the allocation of the main benefits over income and social groups
	Territorial cohesion	It encompasses the allocation of the main benefits over central (core) and peripheral areas

Source: Authors

A I.2 Measuring of effects

Because of the variety of effects to be accounted for, a **methodological approach firmly rooted on CBA (complemented by qualitative analysis** when necessary) is adopted in order to grasp the overall long-term contribution of each project.

In terms of their measurement level, the effects can be distinguished into:

A. **Effects that by their nature are already in monetary units** (e.g. transport costs savings). These can therefore be easily included in a cost-benefit analysis (CBA).
B. **Effects that are quantitative, but not in money units, and that can be converted into money units in a reasonably reliable way** (e.g. transport time savings, accidents, air pollution)[16]. These effects can also be included in the CBA.
C. **Effects that are quantitative, but not in money units, for which there are no reasonably reliable conversion factors to money**. We propose not to try to include such effects in the CBA, but to discuss them in a qualitative way together with the overall outcome of the CBA.
D. **Effects that are difficult to measure in quantitative (cardinal) terms, but do lend themselves for ordinal measurement** (a ranking of the impact of different projects on such a criterion can be provided, such as very good, good, neutral, bad, very bad). We propose to discuss these effects in qualitative terms.
E. **Effects that might occur but that are subject to a high degree of uncertainty:** these will be treated as part of the risks/scenario analysis that will be included in the CBA.
F. **Effects that might occur but that we cannot even express in an ordinal (ranking) manner:** they are residual effects that can be mentioned in qualitative description in case study report.

In short, all the projects' effects in A and B are evaluated by doing an ex-post cost-benefit analysis (CBA)[17]. Reasonably, these represent the most significant share of long-term effects. Then the outcome of the CBA (e.g. the net present value or benefit-costs ratio) is complemented by evidence from C and D, while E and F are used for descriptive purposes. Moreover, qualitative techniques are used to determine why certain effects are generated, along what dimensions, and underlying causes and courses of action of the delivery process (see below).

Section 3 of each case study includes a standardised table in which scores are assigned to each type of long-term effect. Scores ranging from -5 to +5 (5 = very strong negative effect; 0 = no effect; 5 = very strong positive effect) are given in order to intuitively highlight which are the most important effects generated for each case study.

A I.3 Understanding the effects

Once the project effects have been identified and measured, and the causal chain linking different categories of short-term and long-term effects has been investigated, the third

[16] Methods to establish such conversion factors include: stated preference surveys (asking respondents about hypothetical choice alternatives), hedonic pricing or equating the external cost with the cost of repair, avoidance or prevention or with the costs to achieve pre-determined targets.

[17] More details on the approach adopted to carry out the ex-post CBA exercise and, in particular, indications on project identification, time horizon, conversion factors and other features are extensively described in the First Intermediate Report of this evaluation study.

building block of the methodological approach entails reasoning on the elements, both external and internal to the project, which have determined the observed causal chain of effects to take place and influenced the observed project performance.

Taking inspiration from the literature on the success and failure of projects, and particularly on costs overruns and demand shortfalls, and on the basis of the empirical evidence which develops from EC (2012) six stylised determinants of projects' outcomes and their development over time have been identified (see table below).

The interplay of such determinants may reinforce or dilute one effect over the other. Moreover, each determinant may contribute, either positively or negatively to the generation/speed up/slow-down of certain short-term or long-term effects. For this reason it is important not only to understand the role that each determinants has on the observed project outcome, but also their interplay in a dynamic perspective.

In doing this, it is useful to refer to stylised, typical "paths" of project behaviours outlined in the following table. Such patterns capture common stories and reveal recurring patterns of performance, as well as typical problems that may arise and influence the chronicle of events. Case studies test the validity of such archetypes and are used to specify in better nuances or suggest possible variations or additions.

Section 4 of each case study includes standardised tables in which scores are assigned to each determinant. Scores ranging from -5 to +5 are given in order to intuitively highlight which are the most relevant determinants explaining the project outcomes (5 = very strong negative effect; 0 = no effect; 5 = very strong positive effect). Moreover, section 4 of each case study includes a graph describing the project's behavioural pattern, i.e. describing the chain of interlinked causes and effect determining the project performance over time.

Table 15. Stylised determinants of projects' outcomes

DETERMINANT	DESCRIPTION
Relation with the context	It includes the considerations of institutional, cultural, social and economic environment into which the project is inserted, was the project appropriate to this context?; is there a problem that the project can solve?; does the project remain relevant over the years?
Selection process	It refers to the institutional and legislative framework that determines how public investment decisions (and especially those co-financed by ESIF) are taken, i.e. which is the process in place and the tools used to select among alternative projects. The selection process is influenced by incentive systems that can lead politicians and public institutions to either take transparent decisions or strategically misrepresent costs and/or benefits at the ex-ante stage.
Project design	It refers to the technical capacity (including engineering and financial expertise) to properly design the infrastructure project. Under a general standpoint, we can distinguish: the technical capacity to identify the most appropriate conceptual design, which best suits the need of a specific context. Even when a region really is in need of the project, it usually requires a well-designed project to solve the observed problems. This, in turn, involves that different alternatives are considered and the best option in terms of technical features and strategical considerations is identified; the technical capacity to develop the more detailed level of design (preliminary and detailed), thus identifying most effective and efficient detailed infrastructure solutions and construction techniques, thus avoiding common pitfalls in the construction stage (such as introducing variants that are not consistent with the original conceptual design) and the risk of cost overruns during the construction phase by choosing inappropriate technical solutions.
Forecasting capacity	It regards the possibility and capacity to predict future trends and forecast the demand level and estimate the technical challenges, thus estimating correctly the required resources (e.g. looking at the dangers of over-predicting demand and under-predicting construction costs). In particular, technical forecasting capacity is related to the quality of data used and forecasting/planning techniques adopted. At the same time, forecasting capacity includes the ability of the project promoter and technical experts not to incur in the planning fallacy (the tendency to underestimate the time or cost needed to complete certain tasks) and optimism bias (the systematic tendency to be overly optimistic about the outcomes of actions).
Project governance	It concerns the number and type of stakeholders involved during the project cycle and how responsibilities are attributed and shared. This is influenced by the incentive mechanisms. If bad incentives exist, this can lead different actors involved in the project management to provide benefits for their members, thus diverting the funds away from their optimal use, or forcing them to delegate responsibilities according to a non-transparent procedure.
Managerial capacity	It refers to the: professional ability to react to changes in the context/needs as well as to unforeseen; professional capability to manage the project ensuring the expected level of service in the operational phase. To ensure a project success, it is not enough that it is well planned and designed, but also that the organizations in charge of the management and operations provide a good service to the end users (e.g. ensuring a good maintenance of the infrastructure).

Source: Authors

Table 16. Behavioural patterns archetypes. Behavioural patterns are illustrated by use of diagrams linking determinants and project outcomes in a dynamic way

TYPE	DESCRIPTION
Bright star	This pattern is typical of projects where the good predictions made ex-ante (both on the cost side and demand side) turn out to be accurate. Proper incentive systems are in place so that the project actually delivers value for money and success. Even in the event of exogenous negative events, the managerial capacity ensures that proper corrective actions are taken and a positive situation is restored.
Rising sun	This pattern is typical of projects which, soon after their implementation, are affected by under capacity issues because of a combination of low demand forecasting capacity, weak appropriateness to the context, and weak technical capacity to design the infrastructure. However, due to changed circumstances or thanks to responsible management and good governance the project turns around to reap new benefits.
Supernova	This pattern is typical of projects for which the good predictions made ex-ante (both on the cost and demand side) turn out to be accurate. However, due to changed circumstances or because of weak management capacity and/or governance the project eventually turns out to be unsuccessful.
Shooting star	This pattern is typical of projects starting from an intermediate situation and resulting in a failure. This outcome can be explained by a low forecasting capacity affected by optimism bias which yields a cost overrun. Then during project implementation, because of low managerial capacity and/or poor governance (also due to distorted incentives) corrective actions are not implemented, this leading to project failure. The situation is exacerbated if unexpected negative events materialise during the project implementation.
Black-hole	This pattern is typical of projects that since the beginning of their life fail to deliver net benefits. This is a result of a combination of ex-ante bad factors (i.e. low technical capacity for demand forecasting, optimism bias, inappropriateness to the local context and bad incentives affecting both the selection process and the project governance) and careless management during the project implementation or bad project governance (e.g. unclear division of responsibilities, bad incentive schemes).

Source: Authors

A I.4 Syntesis and conclusions

Qualitative and quantitative findings are integrated in a narrative way, in order to develop ten project 'histories' and to isolate and depict the main aspects behind the project's long-term performance. A final judgment on each project is then conveyed in the case studies with an assessment structured along a set of evaluation criteria, as suggested in the ToRs. Evaluation criteria are the following:

- Relevance (were the project objectives in line with the existing development needs and the priorities at the programme, national and/or EU level?);
- Coherence (with other national and/or EU interventions in the same sector or region);
- Effectiveness (were the stated objectives achieved, and in time? Did other effects materialise? Were other possible options considered?);
- Efficiency (costs and benefits relative to each other and to their ex-ante values);
- EU added value (was EU support necessary, EU-wide effects, further EU action required?).

ANNEX II. Ex-post cost-benefit analysis report

This Annex illustrates the ex-post CBA of the project under consideration, undertaken to quantitatively assess the performance of the project. The methodology applied is in line with the guidelines provided in the First Interim Report (EC, 2017) and, more generally with the CBA Guide (EC, 2015). This annex aims to present in more detail the assumptions, results of the CBA and the scenario analysis for the project under consideration.

A II.1 Methodology, assumption and data gathering

In what follows, the main assumptions and the procedure of data gathering are described in detail.

Project identification

The unit of analysis of this CBA is the M43 motorway project between Szeged (main road No 5) and Makó (main road No 430), which was completed on 20.04.2011. The project was included in the Unified Transport Development Strategy of Hungary 2008-2020 (Ministry of Transport, Telecommunication and Energy, 2008) and Priority 1 TEN-T Expressway development of Transport Operational Programme 2007-2013 (Government of Hungary, 2007).

The project was implemented from 2008 to 2011 as discussed below.

The project under assessment consists of the construction of a 31.6 km long new motorway in three construction lots:

- LOT 1: Szeged (main road No 5 – main road No 47): 3+000 – 9+700 km (6.7 km)
- LOT 2: Szeged – Maroslele (main road No 47 – road No 4413): 9+700 – 18+400 km incl. 661 m bridge over Tisza River (9.7 km)
- LOT 3: Maroslele – Makó (road No 4413 – main road No 430): 18+400 – 34+600 km (16.2 km)

Table 17. Synthesis of the interventions

ACTIVITY	IMPLEMENTATION PERIOD
Preparatory phase (design, documentation, FS, AF)	2005-2008
Land acquisition	2007-2008
Construction Works	2008-2011

Source: Ministry of National Development (2017)

Time horizon

In line with the First Interim Report (EC, 2017), the time horizon for the CBA of the project is set at 30 years (incl. 3 years of construction until the opening of the road). Accordingly, the timeframe for the project's evaluation runs from 2008, when the constructors were chosen in public procurement, to 2037. A mix of historical data from 2008 to 2016 (covering 9 years) and forecasts from 2017 to 2037 (covering 21 years) is applied.

Constant prices and discount rates

The CBA model was performed using constant prices of the year 2008 as it was the base year of the Feasibility Study too. In line with the guidelines (EC, 2017) all the figures were converted to 2017 EUR prices and values (using 25.14% cumulative HUF inflation rate 2017/2008; 3.9% backward social discount rate; 309.21 HUF/EUR 2017 average exchange rate) for the report.

In line with the guidelines (EC, 2017) the CBA was performed using constant prices. As for data from 2017 onwards, prices have been estimated in real terms (no inflation is considered).

Consistent with the choice of using constant prices, financial and social discount rates have been adopted in real terms. Specifically, inflows and outflows of financial analysis - for both the backward and forward periods of analysis – have been discounted and capitalised using a 4% real rate, as suggested in the EU CBA Guide (EC, 2015). With regard to the economic analysis, a real backward social discount rate of 3.9% and a real forward social discount rate of 3.9%, specifically calculated for Hungary (see the First Interim Report for the calculation), have been adopted (EC, 2017).

Without the project scenario

The reference scenario for the CBA (Without the project scenario) is a “Business as usual” scenario, which means that no action is implemented in order to improve infrastructure significantly. The only exceptions are LOT 1 and Makó bypass (LOT 4) sections of the construction project, which are implemented even without the major project in 2019 because of traffic reasons. LOT1 is not an essential part of the major project, while LOT4 is a connecting project.

At the same time, there are two motorway sections, which are missing from the traffic models of ‘without the project scenario’, while they are part of the ‘with the project’ scenario:

- Next phase of M43 motorway from Makó to RO border crossing (23.1 km)
- Romanian A1 motorway from the border crossing to Arad (38.9 km) that connects M43 from Romania (both have been finished on 11.07.2015)

Had the current major project been eliminated, these phases would not have been implemented either. This means that either all phases of the motorway between Szeged and Arad would be implemented, or none of them until 2037.

Arad (population about 160 thousand) will have a motorway link from Timisoara (since 2012) and Oradea in the long run. If the Szeged expressway link (M43) had been dismissed, Arad would still have another expressway link to Budapest through Békéscsaba (M44) in the long run. (The most important phase of M44 expressway – 62 km – is under construction and will be finished by 2019). In sum, in the ‘without the project scenario’ both Szeged and Arad would be part of the Pan-European motorway network, but without the M43 motorway connecting them.

All the other past, current and future developments are the same in both scenarios.

Difference of with and without the project scenarios where counted in all figures (incremental approach). This is the reason why some outflows are indicated with negative sign (part of investment at ‘without the project scenario’) while others not in the financial tables.

Data sources

The analysis relied on data provided by the Hungarian Public Road Pte Ltd Co. from 2008 to 2016. The first difference between the two scenarios is appears in 2011, when the motorway was opened.

Origin-Destination (O/D) national interurban surveys of Hungary prepared by KTI Institute for Transport Sciences in 2008 and in 2016 were used to set up a new traffic forecast till 2038.

Technical features

Total length of the motorway is 31.6 km

Section 1 of M43 motorway starts from main road No 5 (Kms 3+000), then bypasses Szeged from the North and continues to the East. After crossing the Szeged – Békéscsaba railway line it ends before main road No 47 (Kms 9+700).

Section 2 begins there crossing the main road No 47, then runs above the oil- and natural gas field of the MOL oil company near Algyő**.** The road then continues to the Tisza River where it crosses it (Móra Ferenc bridge) at 16+200 km and runs further on the eastern side of the Tisza across agricultural lands towards road No 4413 (18+400 km). The bridge consists of three structures with a total length of 661 m. There are two flood bridges and one main river span (180 m) arching above the main river bed, which is a suspension bridge of skewed cables.

Section 3 of the motorway runs on agricultural lands to the endpoint of the project at main road No 430 (34+600 Kms).

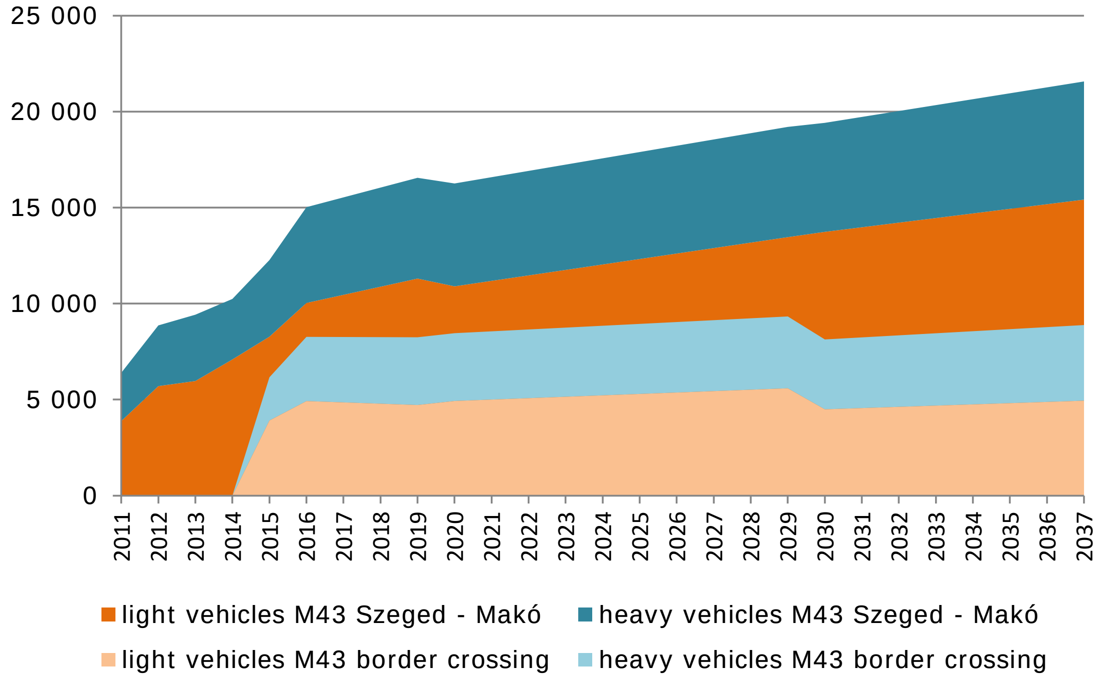
The motorway crosses five national roads with grade separated interchanges and there are five game crossings, too.

A II.2 Future scenario

Demand

The historical and future trend of M43 motorway traffic for the ‘with the project’ and ‘without the project’ scenarios is shown in Figure 21 below. Border crossing traffic of the motorway is shown in the figure to display international traffic of the motorway (it is also relevant for VOT calculations).

Figure 21. Demand – historical data (2011-2016) and forecasts (2017-2037) in AADT.



Source: Hungarian Public Road Pte Ltd Co. (2017) and Authors

Table 18. Demand split by vehicles and sections of M43 motorway (AADT)

	LIGHT VEHICLES					HEAVY VEHICLES				
YEAR	Szeged – Makó				Border	Szeged – Makó				Border
	Sect.1	Sect.2	Sect.3	Avg	crossing	Sect.1	Sect.2	Sect.3	Avg	crossing
2011	5 393	3 861	3 277	3 887		2 885	2 562	2 334	2 514	
2012	7 915	5 666	4 809	5 703		3 614	3 221	2 942	3 162	
2013	8 280	5 930	5 033	5 968		3 943	3 522	3 216	3 454	
2014	9 842	7 047	5 981	7 093		3 605	3 231	2 919	3 150	
2015	11 488	8 223	6 979	8 277	3 912	4 548	4 093	3 705	3 991	2 251
2016	13 670	9 833	8 638	10 034	4 924	5 567	5 050	4 716	4 988	3 344
2017	14 865	10 085	8 834	10 457	4 856	5 660	5 139	4 799	5 075	3 406
2018	16 060	10 338	9 030	10 880	4 787	5 753	5 228	4 881	5 161	3 467
2019	17 254	10 590	9 225	11 304	4 719	5 847	5 316	4 964	5 248	3 528
2020	18 737	9 613	8 350	10 900	4 929	5 936	5 432	5 075	5 356	3 530
2021	19 318	9 837	8 544	11 185	5 002	5 988	5 475	5 115	5 399	3 554
2025	21 643	10 735	9 321	12 323	5 296	6 194	5 644	5 272	5 570	3 648
2030	24 211	13 187	9 700	13 736	4 495	6 337	5 880	5 295	5 677	3 639
2035	25 488	14 563	10 773	14 936	4 816	6 712	6 234	5 613	6 017	3 853
2037	25 998	15 113	11 202	15 416	4 944	6 863	6 376	5 740	6 153	3 939

Source: Hungarian Public Road Pte Ltd Co. (2017) and Authors

A II.3 Financial Analysis

Investment costs

Table 19 summarizes the breakdown of the investment according to the main cost categories.

Table 19. Breakdown of investment costs by project component (EUR)

PROJECT ITEM	NOMINAL VALUE	PRESENT VALUE (€ 2017)
Preparatory phase (design, documentation, expertise, FS)	4,068,125	5,997,149
Land acquisition	4,223,624	6,192,883
Construction works	186,665,799	267,253,748
Supply	0	0
Supervision and authors supervision	1,717,812	2,472,526
Project management	42,078	54,224
Promotion	67,917	87,523
Other costs	0	0
Total	**196,785,356**	**282,058,054**

Source: Authors

Residual value

Residual value was calculated with an annual linear amortization rate of 3% and an annual 1% during construction time. By the end of 2037, the incremental residual value is estimate to reach EUR 77.2 million, which corresponds to EUR 35.2 million in 2017 present value.

Operating & Maintenance costs

The following operation and maintenance costs were applied for each year (Ministry of National Development, 2016). Maintenance cost appears only in the year of the planned maintenance (every tenth year).

Table 20. Operating & Maintenance unit costs (€ 2017 per km per year)

ROAD CATEGORY	OPERATION COST	MAINTENANCE COST*	TOLL OPERATION
Motorway 2x3 lanes	115.75	1 121.93	14.03
Motorway 2x2 lanes	88.10	856.21	14.03
2x2-lane motor road that can be upgraded into a motorway, dual carriageway, junctions on different levels, without paved parking lanes	85.29	829.03	14.03
2x2-lane motor road, dual carriageway, junctions on different levels, without paved parking lanes	74.98	720.77	14.03
motor road that can be upgraded into a motorway, 2x1 lanes, junctions on different levels (20% takeover sections)	67.02	666.41	14.03
2x1-lane motor road that can be upgraded into a 2x2-lane motor road, junctions on different levels (20% takeover sections)	61.39	612.05	14.03
Main road, 2x2 lanes, level junction, dual carriageway, physically separated	35.15	598.46	14.03
Main road, 2x1 lanes, level junction without separation	29.99	502.85	14.03
Main road, 2x1 lanes, level junction	14.53	251.66	14.03
Secondary road	6.09	95.13	0.00
2-lane river bridge (with respect to the length of the superstructure)	1,359.53	22,432.95	14.03
2-lane (half-lane) tunnel	543.62	8,837.18	14.03

Source: Authors based on Ministry of National Development (2016)

** only in the year of occurrence (every tenth year)*

Operating revenues

There is a time-based vignette system for cars and buses to raise revenues, while since 1 July 2013 heavy good vehicles are subject to an electronic toll collection system proportional to the distance. In the case of the time-based vignette, revenue (which arises from the fees for using the whole Hungarian expressway network for a certain time period) generated per vehicle km were used (€ct per vehicle km) to count the revenue of the project under assessment. However, these generated per vehicle km unit revenues are quite rough estimates.

Distance-based unit rates of heavy good vehicles are applied to EURO-3 environmental category, which enables trucks to use the best available unit rates. More than 95% of toll road users have already reached that category.

Table 21. Unit revenues (€ct 2017 per vehicle km, net rates)

VEHICLE CATEGORIES		EXPRESS-WAYS	MAIN ROADS
motorcycles / passenger cars for up to 7 persons with a maximum authorized mass of 3.5 tons and their trailers	D1	3.4	0.0
bus	B2	3.4	0.0
cargo vehicles with a maximum permissible gross weight exceeding 3.5 tons, 2 axles	J2	11.3	4.8
cargo vehicles with a maximum permissible gross weight exceeding 3.5 tons, 3 axles	J3	15.9	8.4
cargo vehicles with a maximum permissible gross weight exceeding 3.5 tons, 4 or more axles	J4	23.2	14.5

Source: Authors based on toll rates of National Toll Payment Services Plc

Toll revenue is already higher and it is expected to be higher than it was initially planned. The main reason for the difference between the planned and realized toll revenue is the introduction of the distance-proportional electronic tolling imposed on heavy good vehicles since 1 July 2013. This system has raised approximately four times higher revenue than the vignette system produced before. Also, the toll rate is much higher than before, but it is still not worth avoiding the motorway as it is beneficial for both the HGV traffic and from the perspective of financial sustainability. Discounted net revenues of the motorway amounts to EUR 264.3 million, which is 93.7% of the investment and 75.7% of the total costs.

Project's Financial Performance

On a financial basis, the profitability of the project is negative. The Financial Net Present Value (NPV) on investment (FNPV(C)) is equal to EUR -68.7 million (at a discount rate of 4.0%, real), with an internal rate of return (FRR(C)) of 2.5%. These values confirm that the project was in need of EU funding since no private investor would have been motivated to implement it without an appropriate financial incentive.

On the other hand Financial Net Present Value on national capital (FNPV(K)) is positive with the level of EUR 91.8 million, while the internal rate of return for capital (FRR(K)) is 7.6%, which means that with the European funding FNPV is positive thus it was not only economically, but also financially reasonable decision to implement the project for the national owner. The results of the project's financial performance are presented in Table 22.

Table 22. Financial performance indicators of the project

INDICATOR	VALUE
FNPV(C)	-68,677,536 EUR
FRR(C)	2.5%
FNPV(K)	91,774,420 EUR
FRR(K)	7.6%

Source: Authors

Table 23. Financial return on investment (EUR)

It.	Project financial effectiveness	Present value	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	**Operational income**	**264,322,058**	**0**	**0**	**0**	**2,814,422**	**3,827,181**	**5,808,012**	**6,898,765**	**11,330,448**	**14,524,452**	**14,626,614**	**14,667,411**	**15,022,440**	**13,373,904**	**13,521,330**	**13,668,520**
1.1	Income from users (vignette: cars, bus)	49,038,123	0	0	0	1,058,523	1,621,754	1,690,074	2,031,302	2,347,698	2,899,087	3,028,503	3,157,919	3,287,335	1,926,918	1,965,724	2,004,529
1.2	Income from users (toll: heavy vehicles)	215,283,935	0	0	0	1,755,899	2,205,428	4,117,938	4,867,463	8,982,750	11,625,365	11,598,111	11,509,492	11,735,105	11,446,986	11,555,606	11,663,991
2	**CAPEX**	**282,058,054**	**0**	**103,510,775**	**95,668,983**	**38,598,304**	**7,066,849**	**15,598,648**	**0**	**0**	**0**	**-24,193,956**	**-23,456,757**	**-9,832,877**	**-1,902,888**	**-4,271,726**	**0**
2.1	preparatory phase (design, documentation, expertise, FS)	5,997,149	0	5,082,494	8,983	41,711	49,726	136,968	0	0	0	-1,187,950	-2,203	-10,626	-13,390	-37,588	0
2.2	land acquisition	6,192,883	0	4,921,851	175,713	54,907	55,989	327,359	0	0	0	-1,150,402	-43,082	-13,988	-15,076	-89,646	0
2.3	construction works	267,253,748	0	92,540,451	94,547,242	38,285,462	6,939,701	14,854,060	0	0	0	-21,629,822	-23,181,721	-9,753,180	-1,868,651	-4,067,743	0
2.4	supply	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	supervision and authors supervision	2,472,526	0	965,980	937,045	216,223	21,433	128,785	0	0	0	-225,782	-229,751	-55,083	-5,771	-35,268	0
2.6	project management	54,224	0	0	0	0	0	57,946	0	0	0	0	0	0	0	-15,868	0
2.7	promotion	87,523	0	0	0	0	0	93,531	0	0	0	0	0	0	0	-25,613	0
2.8	other costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	**OPEX**	**86,191,180**	**0**	**0**	**0**	**1,798,378**	**2,569,111**	**2,726,238**	**2,883,366**	**2,883,366**	**2,883,366**	**2,883,366**	**2,883,366**	**2,883,366**	**2,398,351**	**26,406,874**	**2,398,351**
3.1	Operation cost	54,343,818	0	0	0	1,798,378	2,569,111	2,726,238	2,883,366	2,883,366	2,883,366	2,883,366	2,883,366	2,883,366	2,398,351	2,398,351	2,398,351
3.2	Maintenance cost	31,847,362	0	0	0	0	0	0	0	0	0	0	0	0	0	24,008,523	0
4	**Residual value**	**35,249,585**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5	**Total (1-2-3+4)**	**-68,677,591**	**0**	**-103,510,775**	**-95,668,983**	**-37,582,259**	**-5,808,779**	**-12,516,875**	**4,015,399**	**8,447,082**	**11,641,086**	**35,937,204**	**35,240,802**	**21,971,951**	**12,878,440**	**-8,613,818**	**11,270,169**

It.	Project financial effectiveness	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
1	**Operational income**	**13,815,476**	**13,962,197**	**14,108,684**	**14,254,937**	**14,400,959**	**14,546,749**	**14,692,309**	**15,132,950**	**15,352,797**	**15,572,533**	**15,792,154**	**16,011,656**	**16,231,035**	**16,450,290**	**16,669,417**
1.1	Income from users (vignette: cars, bus)	2,043,335	2,082,140	2,120,946	2,159,751	2,198,557	2,237,363	2,276,168	2,484,721	2,534,567	2,584,412	2,634,258	2,684,103	2,733,949	2,783,794	2,833,640
1.2	Income from users (toll: heavy vehicles)	11,772,141	11,880,056	11,987,738	12,095,186	12,202,402	12,309,386	12,416,140	12,648,229	12,818,231	12,988,121	13,157,896	13,327,552	13,497,087	13,666,496	13,835,777
2	**CAPEX**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2.1	preparatory phase (design, documentation, expertise, FS)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	land acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.3	construction works	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4	supply	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	supervision and authors supervision	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.6	project management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.7	promotion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.8	other costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	**OPEX**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**-1,667,546**	**2,398,351**	**26,406,874**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**
3.1	Operation cost	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351
3.2	Maintenance cost	0	0	0	0	0	0	-4,065,897	0	24,008,523	0	0	0	0	0	0
4	**Residual value**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**77,236,181**
5	**Total (1-2-3+4)**	**11,417,124**	**11,563,845**	**11,710,332**	**11,856,586**	**12,002,608**	**12,148,398**	**16,359,854**	**12,734,598**	**-11,054,077**	**13,174,182**	**13,393,803**	**13,613,304**	**13,832,684**	**14,051,939**	**91,507,247**

Source: Authors

Table 24. Financial return on national capital (EUR)

Lp.		Present value	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	**Inflow**	**299,571,643**	**0**	**0**	**0**	**2,814,422**	**3,827,181**	**5,808,012**	**6,898,765**	**11,330,448**	**14,524,452**	**14,626,614**	**14,667,411**	**15,022,440**	**13,373,904**	**13,521,330**	**13,668,520**
1.1	Inflow from vignettes (cars, buses)	49,038,123	0	0	0	1,058,523	1,621,754	1,690,074	2,031,302	2,347,698	2,899,087	3,028,503	3,157,919	3,287,335	1,926,918	1,965,724	2,004,529
1.2	Inflow from e-toll (heavy vehicles)	215,283,935	0	0	0	1,755,899	2,205,428	4,117,938	4,867,463	8,982,750	11,625,365	11,598,111	11,509,492	11,735,105	11,446,986	11,555,606	11,663,991
1.3	Residual value	35,249,585	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	**Outflow**	**207,797,223**	**0**	**44,627,473**	**41,246,575**	**18,439,590**	**5,615,901**	**9,451,358**	**2,883,366**	**2,883,366**	**2,883,366**	**-7,547,579**	**-7,229,744**	**-1,355,965**	**1,577,943**	**24,565,219**	**2,398,351**
2.1	National contribution	121,606,043	0	44,627,473	41,246,575	16,641,212	3,046,790	6,725,120	0	0	0	-10,430,944	-10,113,109	-4,239,331	-820,408	-1,841,655	0
2.2	OPEX	86,191,080	0	0	0	1,798,378	2,569,111	2,726,238	2,883,366	2,883,366	2,883,366	2,883,366	2,883,366	2,883,366	2,398,351	26,406,874	2,398,351
3	**TOTAL (1-2)**	**91,774,420**	**0**	**-44,627,473**	**-41,246,575**	**-15,625,168**	**-1,788,720**	**-3,643,346**	**4,015,399**	**8,447,082**	**11,641,086**	**22,174,192**	**21,897,154**	**16,378,405**	**11,795,961**	**-11,043,889**	**11,270,169**

Lp.		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
1	**Inflow**	**13,815,476**	**13,962,197**	**14,108,684**	**14,254,937**	**14,400,959**	**14,546,749**	**14,692,309**	**15,132,950**	**15,352,797**	**15,572,533**	**15,792,154**	**16,011,656**	**16,231,035**	**16,450,290**	**93,905,598**
1.1	Inflow from vignettes (cars, buses)	2,043,335	2,082,140	2,120,946	2,159,751	2,198,557	2,237,363	2,276,168	2,484,721	2,534,567	2,584,412	2,634,258	2,684,103	2,733,949	2,783,794	2,833,640
1.2	Inflow from e-toll (heavy vehicles)	11,772,141	11,880,056	11,987,738	12,095,186	12,202,402	12,309,386	12,416,140	12,648,229	12,818,231	12,988,121	13,157,896	13,327,552	13,497,087	13,666,496	13,835,777
1.3	Residual value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77,236,181
2	**Outflow**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**-1,667,546**	**2,398,351**	**26,406,874**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**	**2,398,351**
2.1	National contribution	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	OPEX	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	-1,667,546	2,398,351	26,406,874	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351	2,398,351
2.3	Capital repayment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4	Interest repayment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	**TOTAL (1-2)**	**11,417,124**	**11,563,845**	**11,710,332**	**11,856,586**	**12,002,608**	**12,148,398**	**16,359,854**	**12,734,598**	**-11,054,077**	**13,174,182**	**13,393,803**	**13,613,304**	**13,832,684**	**14,051,939**	**91,507,247**

Source: Authors

Financial Sustainability

The project was put into operation on 20 April 2011 but there were some additional investment costs until the summer of 2013. Since then all operation and maintenance costs can be easily covered from the toll revenue raised by the project, thus the project is financially sustainable.

Annual revenues are about 5-6 times higher than the operating costs, and about two years of revenues can cover the maintenance (replacement) costs that arise every tenth year.

Table 25. Financial sustainability of the project (EUR)

Project sustainability in EURO	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Sources of financing	0	103,510,775	95,668,983	38,598,304	7,066,849	15,598,516				-24 193 956	-23 456 757	-9 832 877	-1 902 888	-4 271 610	
Total revenues	0	0	0	2,814,422	3,827,181	5,808,012	6 898 765	11 330 448	14 524 452	14 626 614	14 667 411	15 022 440	13 373 904	13 521 330	13 668 520
Compensation payment															
Total inflows	**0**	**103,510,775**	**95,668,983**	**41,412,726**	**10,894,030**	**21,406,527**	**6 898 765**	**11 330 448**	**14 524 452**	**-9 567 342**	**-8 789 347**	**5 189 563**	**11 471 016**	**9 249 720**	**13 668 520**
Initial investments	0	103,510,775	95,668,983	38,598,304	7,066,849	15,598,516				-24 193 956	-23 456 757	-9 832 877	-1 902 888	-4 271 610	
Replacement costs	0	0	0	0	0	0	0	0	0	0	0	0	0	24 008 523	0
Loan repayment (incl. interest)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total operating costs	0	0	0	1,798,378	2,569,111	2,726,238	2 883 366	2 883 366	2 883 366	2 883 366	2 883 366	2 883 366	2 398 351	2 398 351	2 398 351
Taxes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total outflows	**0**	**103,510,775**	**95,668,983**	**40,396,682**	**9,635,960**	**18,324,754**	**2 883 366**	**2 883 366**	**2 883 366**	**-21 310 590**	**-20 573 391**	**-6 949 511**	**495 463**	**22 135 264**	**2 398 351**
Net cash flow	**0**	**0**	**0**	**1,016,045**	**1,258,070**	**3,081,773**	**4 015 399**	**8 447 082**	**11 641 086**	**11 743 248**	**11 784 045**	**12 139 074**	**10 975 553**	**-12 885 544**	**11 270 169**
Cumulated net cash flow	**0**	**0**	**0**	**1,016,045**	**2,274,115**	**5,355,888**	**9 371 288**	**17 818 370**	**29 459 456**	**41 202 705**	**52 986 749**	**65 125 824**	**76 101 376**	**63 215 832**	**74 486 001**

Project sustainability in EURO	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Sources of financing															
Total revenues	13 815 476	13 962 197	14 108 684	14 254 937	14 400 959	14 546 749	14 692 309	15 132 950	15 352 797	15 572 533	15 792 154	16 011 656	16 231 035	16 450 290	16 669 417
Compensation payment															
Total inflows	**13 815 476**	**13 962 197**	**14 108 684**	**14 254 937**	**14 400 959**	**14 546 749**	**14 692 309**	**15 132 950**	**15 352 797**	**15 572 533**	**15 792 154**	**16 011 656**	**16 231 035**	**16 450 290**	**16 669 417**
Initial investments															
Replacement costs	0	0	0	0	0	0	-4 065 897	0	24 008 523	0	0	0	0	0	0
Loan repayment (incl. interest)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total operating costs	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351	2 398 351
Taxes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total outflows	**2 398 351**	**2 398 351**	**2 398 351**	**2 398 351**	**2 398 351**	**2 398 351**	**-1 667 546**	**2 398 351**	**26 406 874**	**2 398 351**	**2 398 351**	**2 398 351**	**2 398 351**	**2 398 351**	**2 398 351**
Net cash flow	**11 417 124**	**11 563 845**	**11 710 332**	**11 856 586**	**12 002 608**	**12 148 398**	**16 359 854**	**12 734 598**	**-11 054 077**	**13 174 182**	**13 393 803**	**13 613 304**	**13 832 684**	**14 051 939**	**14 271 066**
Cumulated net cash flow	**85 903 125**	**97 466 971**	**109 177 303**	**121 033 890**	**133 036 497**	**145 184 895**	**161 544 749**	**174 279 348**	**163 225 271**	**176 399 453**	**189 793 256**	**203 406 560**	**217 239 244**	**231 291 183**	**245 562 249**

Source: Authors

A II.4 Economic Analysis

From market to accounting prices

In line with the CBA Guide (2014), the social opportunity cost of the project's inputs and outputs has been considered in the economic analysis. For this purpose, market prices have been converted into accounting prices by using appropriate conversion factors. As for labour, it is worth noting that the shadow wage estimated by *Del Bo et al. (2011)* for Dél-Alföld (Southern Great Plain, HU-33) Region (0.79) has been adopted to correct for past values, and 0.48 has been used to correct for future values. Table 26 below summarises the conversion factors applied for each cost item.

Table 26. Conversion factors for input

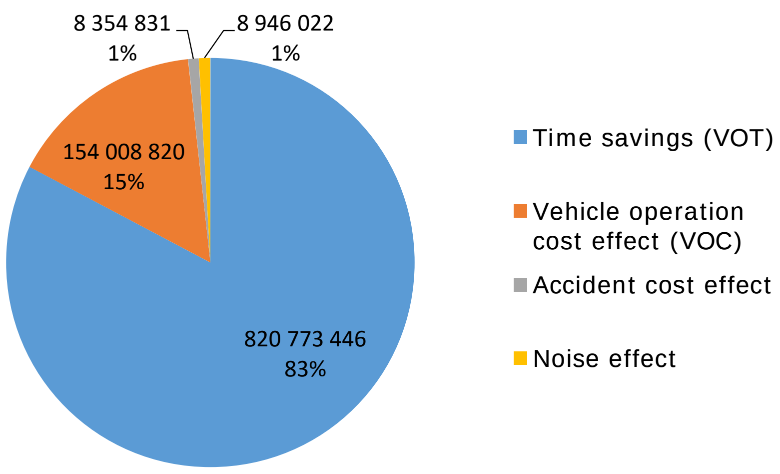
ITEM	CONVERSION FACTOR	SOURCE
Labour cost under investment costs and operating costs	0.79 backwards 0.48 forwards	Conversion factors reported in the First Interim Report, Volume I
Investment costs (other than labour)	1.00	Conversion factors reported in the First Interim Report, Volume I
O&M costs (other than labour)	1.00	Conversion factors reported in the First Interim Report, Volume I
Residual value	1.00	Conversion factors reported in the First Interim Report, Volume I

Source: Authors based on EC (2017)

Project's effects

Most of the benefits are coming from time savings and vehicle operation cost savings, while accident and noise costs will change very little.

Figure 22. Main socioeconomic benefits (Present Value, EUR)



Source: Authors

Benefits of air pollution and GHG savings are missing, because these values are negative, so they are listed among the economic costs of the project. In what follows is a description of each effect's estimation.

Time savings

Time savings arise from the fact that the parallel old main road No 43 has a normal speed limit of 90 km per hour (light vehicles) and 70 km per hour (heavy vehicles), and about half of its length is an inhabited area with a speed limit of 50 km per hour. The motorway has a normal speed limit of 130 km per hour (80 km per hour for heavy vehicles) and there is 100 km per hour speed limit on the bridge.

Reduction of travel time between Szeged (North) to Makó centre is 21.5 minutes for light vehicles and 15 minutes for heavy vehicles. Those vehicles that travel further on the motorway (since 2015) to the Romanian border crossing, can gain an additional 7-8 minutes of advantage because they do not have to return to the main road No 43 to Makó (6.5 km). Moreover, there is a 9.0 km long shortcut (92.6-83.6 km) until (Pecica / Arad (West) that makes the Szeged (North – Arad (West) travel time another 10-11 minutes shorter, of which at least 4 minutes is the contribution of the M43 motorway Szeged – Arad motorway (proportional to the length of the whole motorway section compared to the total distance; 31.6 km / 83.6 km).

Table 27. Units of time savings (€ 2017 per vehicle hour)

VEHICLE CATEGORIES		RATE
Passenger cars up to 3.5 tons	D1	26.3
Buses	B2	240.6
Heavy vehicles, 2 axles	J2	49.0
Heavy vehicles, 3 axles and more	J3-J4	77.1

Source: Authors based on NDA (2011)

The flow of traffic on the old main road will be a bit faster and smoother (EUR 72.5 million benefit). Time savings of the motorway users, who formerly used the old main road, amounts to EUR 500.5 million benefit, of which EUR 261.5 million belongs to light vehicles, EUR 239.0 million to heavy vehicles. In the case of diverted and generated traffic, ‘rule of half’ was applied for counting their benefit, which resulted in a net benefit of EUR 247.8 million. Net present value of overall time savings is EUR 820.8 million, which is 82.7% of the total benefit (EUR 992.1 million).

Travel cost savings

The effect on vehicle operational costs (VOC) is quite similar to the time savings above, but the benefit of the light vehicles is annulled by the higher than optimal speed on motorways. The most important advantage for heavy vehicles is that they avoid the inhabited areas (total of 19.8 km) – this is beneficial also for the people living there –, while the speed in rural areas is just slightly closer to the optimal one on motorways. Nevertheless, this is still enough to gain a total advantage of 6-7 EUR for the whole distance. The shortcut effect for the cross border traffic (proportional to the length of the total distance) is 0.7 EUR for light vehicles and 3.4 EUR for heavy vehicles. Unit costs used for the calculation are listed below in Table 28.

Table 28. Units of vehicle operation costs (€ct 2017 per vehicle km, approx.)

ROAD CATEGORIES	LIGHT VEHICLES	HEAVY VEHICLES
Main road*	18	83
Motorway	21	82

* Inhabited area coefficient: 1.25 *Source: Authors based on Ministry of National Development (2016)*

The travel cost benefit of vehicles remaining on the old main road is EUR 10.7 million due to the faster and smoother traffic. The travel cost savings of the motorway users, who formerly used the old main road amounts to EUR 99.9 million, of which EUR 9.7 million belongs to light vehicles, EUR 90.2 million to heavy vehicles. In case of diverted and generated traffic 'rule of half' was used for counting their benefit, thus the net benefit of this traffic amounts to EUR 86.8 million. Net present value of overall travel cost savings is EUR 154.0 million, which is 15.5% of the total benefit.

Air pollution savings

Air pollution effect of the project is slightly negative. On the one hand, there is the new motorway, and most of the traffic came from the parallel main road , some of this is diverted other is generated (291.9 million euro cost). It avoids inhabited areas (so the unit costs are 0.3 times lower due to the rural area coefficient), but corridor traffic is higher than before and the speed of cars are much higher than optimal and pollute the air more than before. On the other hand there is a much lower volume of traffic on the old main road (186.0 million euro benefit). The overall effect is slightly negative (EUR 105.9 million cost), which represents 15.6% of the total economic costs. Unit costs used for calculation are the following.

Table 29. Units of air pollution (€ 2017 per thousand vehicle km)*

VEHICLE CATEGORY	UNIT RATE
Light vehicles	91.4
Heavy vehicles	675.0

* Rural area coefficient: 0.3 *Source: Authors based on NDA (2011)*

GHG emission savings

There is the same context at GHG effect as at air pollution experienced (high speed on motorway cause more emission than optimal), but the overall result is worse because the GHG emission saved from the inhabited area does not have an added value to rural areas (coefficient is 1.0). Net present value of GHG emission cost of the motorway is EUR 351.7 million, while the GHG emission saved along the old main road is EUR 113.2 million, the net effect is EUR 238.5 million cost, which represents 35.2% of the total economic costs. Unit costs used for calculation are the following.

Table 30. Units of GHG emission (€ 2017 per thousand vehicle km)

VEHICLE CATEGORY	UNIT RATE
Light vehicles	55.8
Heavy vehicles	204.8

(Rural area coefficient: 1.0) *Source: Authors based on NDA (2011)*

Reduction of collisions and accidents

Unit costs used for calculation are the following.

Table 31. Social accident costs (€ 2017 per injuries)

TYPE OF INJURY	VALUE
Fatality	1,342,945
Severe injury	180,229
Slight injury	13,046

Source: EC (2017)

Occurrences of injuries per vehicle km driven are estimated based on the data of CBA Guide, Hungary (2016).

Table 32. Relative injury index (persons injured per 10 million vehicle km)

ROAD CATEGORY	DEATHS	SEVER	SLIGHT	TOTAL
Motorway	0.041	0.214	0.549	0.804
Main road, rural sections	0.204	0.880	2.133	3.217
Main road, inhabited sections	0.119	1.258	3.841	5.218
Main road, average	0.171	0.888	2.254	3.313

Source: Ministry of National Development (2016)

Accident effect of the project is slightly positive (EUR 8.4 million, 8.4% of total benefit) though the 2011-2016 fact data used that are negative (EUR 7.2 million cost) due to a huge accident (14 deaths) half a year after opening the motorway in 2011.

Reduction of traffic noise

Noise effect of the project is slightly positive. The context of traffic noise is very similar to the context of air pollution and GHG emission, but in case of noise effect the benefit of the inhabited areas counts more, while the inhabited to rural unit ratio is higher (10.0). Net benefit is EUR 8.9 million (0.9% of total benefit), resulting from EUR 8.3 million cost from the motorway and EUR 17.2 million benefit from the old main road. Unit costs used for calculation are the following.

Table 33. Units of noise (€ 2017 per thousand vehicle km)*

VEHICLE CATEGORY	UNIT RATE
Light vehicles	20.0
Heavy vehicles	36.8

* Rural area coefficient: 0.1 *Source: Authors based on NDA (2011)*

Project's Economic Performance

Based on the economic costs and benefit described above the economic performance indicators are the following values.

Table 34. Economic performance indicators of the project

INDICATOR	VALUE
ENPV	349,809,813 EUR
B/C	1.54
EIRR	11.6%

Source: Authors

The economic net present value (ENPV) is clearly positive due to huge time savings and significant vehicle operational costs savings and so B/C ratio and EIRR indicators are above the threshold values (B/C>1; EIRR>SDR=3.9%) that proves the net positive effect of the project. However there are some negative benefit factor at cost side (greenhouse gases, air pollution), while other net positive benefits are not significant compared to the size of the project (noise, accident).

The results of the economic analysis are presented in Table 35 below.

Table 35. Economic return of the project (EUR)

It.		Present value	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	**CAPEX**	**266,411,251**	**0**	**97,424,341**	**90,043,647**	**36,328,724**	**6,651,318**	**14,681,448**	**0**	**0**	**0**	**-22,771,351**	**-20,041,453**	**-8,401,210**	**-1,625,827**	**-3,649,763**	**0**
1.1	Labour costs		0	22,896,583	21,161,979	8,537,945	1,563,187	3,450,421	0	0	0	-5,351,703	-3,152,588	-1,321,539	-255,748	-574,120	0
1.2	Non-labour costs		0	74,527,758	68,881,668	27,790,779	5,088,131	11,231,027	0	0	0	-17,419,648	-16,888,865	-7,079,671	-1,370,079	-3,075,643	0
2	**OPEX**	**411,865,649**	**0**	**0**	**0**	**1,922,076**	**1,242,275**	**762,832**	**645,684**	**11,886,183**	**16,646,265**	**17,624,724**	**18,194,825**	**19,183,905**	**20,908,275**	**39,212,264**	**21,998,301**
2.1	O&M costs (labour)		0	0	0	710,359	1,014,799	1,076,864	1,138,929	1,138,929	1,138,929	1,138,929	692,008	692,008	575,604	6,337,650	575,604
2.2	O&M costs (non-labour)		0	0	0	899,189	1,284,555	1,363,119	1,441,683	1,441,683	1,441,683	1,441,683	1,441,683	1,441,683	1,199,176	13,203,437	1,199,176
2.3	Air pollution effects		0	0	0	-1,635,456	-3,490,605	-4,241,426	-4,712,767	1,904,962	3,887,315	4,153,476	4,429,979	4,698,494	7,458,549	7,629,742	7,804,673
2.4	GHG effects		0	0	0	1,947,984	2,433,526	2,564,275	2,777,839	7,400,609	10,178,338	10,890,636	11,631,155	12,351,720	11,674,946	12,041,435	12,418,849
3	**Residual value**	**36,003,595**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4	**Socio-economic benefits**	**992,083,119**	**0**	**0**	**0**	**8,907,432**	**35,930,696**	**36,692,297**	**29,482,567**	**39,739,116**	**52,609,935**	**52,682,658**	**54,692,886**	**56,638,613**	**42,261,273**	**43,305,203**	**44,369,212**
4.1	vehicles operating costs savings	154,008,820	0	0	0	3,355,914	4,553,218	5,234,219	5,176,530	5,687,888	8,760,130	8,906,180	9,052,230	9,198,280	7,304,020	7,370,029	7,436,039
4.2	travel time savings	820,773,446	0	0	0	20,357,080	26,379,541	27,656,121	27,916,775	29,642,342	40,260,346	42,056,470	43,855,032	45,593,559	34,408,597	35,306,680	36,221,839
4.3	accidents savings	8,354,831	0	0	0	-15,240,340	4,403,620	3,171,626	-4,229,102	4,023,777	3,187,821	1,292,567	1,331,435	1,366,771	394,409	454,523	516,721
4.4	noise savings	8,946,022	0	0	0	434,779	594,316	630,332	618,364	385,108	401,637	427,441	454,188	480,003	154,247	173,970	194,613
5	**Total (4-(1+2-3))**	**349,809,813**	**0**	**-97,424,341**	**-90,043,647**	**-29,343,368**	**28,037,103**	**21,248,017**	**28,836,883**	**27,852,933**	**35,963,670**	**57,829,286**	**56,539,514**	**45,855,918**	**22,978,826**	**7,742,702**	**22,370,910**

It.		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
1	**CAPEX**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1.1	Labour costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.2	Non-labour costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	**OPEX**	**22,565,696**	**23,148,539**	**23,747,237**	**24,362,210**	**24,993,885**	**25,642,704**	**23,300,352**	**26,474,242**	**44,921,724**	**27,851,110**	**28,561,593**	**29,287,144**	**30,028,045**	**30,784,586**	**31,557,058**
2.1	O&M costs (labour)	575,604	575,604	575,604	575,604	575,604	575,604	-400,211	575,604	6,337,650	575,604	575,604	575,604	575,604	575,604	575,604
2.2	O&M costs (non-labour)	1,199,176	1,199,176	1,199,176	1,199,176	1,199,176	1,199,176	-833,773	1,199,176	13,203,437	1,199,176	1,199,176	1,199,176	1,199,176	1,199,176	1,199,176
2.3	Air pollution effects	7,983,416	8,166,049	8,352,646	8,543,286	8,738,048	8,937,012	9,140,260	8,913,697	9,142,231	9,375,398	9,613,279	9,855,957	10,103,517	10,356,044	10,613,628
2.4	GHG effects	12,807,500	13,207,710	13,619,811	14,044,144	14,481,058	14,930,912	15,394,076	15,785,766	16,238,406	16,700,932	17,173,534	17,656,407	18,149,749	18,653,762	19,168,650
3	**Residual value**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**77,236,181**
4	**Socio-economic benefits**	**45,453,678**	**46,558,988**	**47,685,534**	**48,833,716**	**50,003,943**	**51,196,631**	**52,412,202**	**54,889,696**	**56,087,798**	**57,300,441**	**58,527,791**	**59,770,017**	**61,027,289**	**62,299,779**	**63,587,662**
4.1	vehicles operating costs savings	7,502,048	7,568,058	7,634,067	7,700,077	7,766,086	7,832,096	7,898,105	7,586,600	7,675,190	7,763,780	7,852,369	7,940,959	8,029,549	8,118,139	8,206,728
4.2	travel time savings	37,154,360	38,104,535	39,072,659	40,059,032	41,063,959	42,087,750	43,130,719	45,438,810	46,483,818	47,541,945	48,613,329	49,698,110	50,796,427	51,908,425	53,034,244
4.3	accidents savings	581,059	647,597	716,395	787,514	861,017	936,970	1,015,439	1,400,734	1,447,960	1,496,151	1,545,327	1,595,505	1,646,703	1,698,940	1,752,236
4.4	noise savings	216,210	238,798	262,413	287,094	312,881	339,815	367,938	463,551	480,831	498,565	516,766	535,444	554,610	574,276	594,454
5	**Total (4-(1+2-3))**	**22,887,982**	**23,410,449**	**23,938,297**	**24,471,507**	**25,010,058**	**25,553,927**	**29,111,850**	**28,415,454**	**11,166,074**	**29,449,331**	**29,966,198**	**30,482,873**	**30,999,243**	**31,515,193**	**109,266,786**

Source: Authors

A II.5 Sensitivity analysis

Since the analysis relies on a series of assumptions underpinning the estimates of current (when actual data were not available) and future values, a sensitivity and risk analyses are necessary to measure the degree of performance indicators.

A sensitivity analysis has been carried out on the key variables in order to determine whether they are critical or not. The procedure requires to make them vary one at a time by a +/-1%, and then to assess the corresponding change in the Economic NVP and IRR. A variable is referred to as "critical" if the corresponding variation in the economic output is greater than 1% in absolute value.

The Authors tested the sensitivity of a long list of different variables. As a result of the sensitivity test 3 critical variables have been identified, as shown in Table 36.

Table 36. Results of the sensitivity analysis

INDEPENDENT VARIABLE	VARIATION (in %) of the economic NPV due to a ± 1% variation	CRITICALITY JUDGEMENT *
Operation & Maintenance cost	-0.19%	Not critical
Time saving (h)	0.21%	Not critical
Travel speed on new motorway	1.56%	Critical
Traffic on new motorway	0.09%	Not critical
Value of time	2.35%	Critical
Unit cost of VOC	0.44%	Not critical
Number of accidents	0.21%	Not critical
Unit cost of accidents	0.02%	Not critical
Unit cost of noise	0.03%	Not critical
Unit cost of air pollution	-0.30%	Not critical
Unit cost of GHG	-0.68%	Not critical

Very critical: ΔNPV > +5%; Critical: ΔNPV > +1%; Not critical: ΔNPV/IRR < +1%.

A II.6 Risk assessment

The risk assessment has been conducted on the critical variables as a result of the sensitivity analysis: *value of time, travel speed on new motorway*

For the sake of simplicity, it was assumed that the probability distribution of each of these variables is triangular, with the value with the highest probability being the reference one – that is, the "base value" adopted for carrying out the CBA – and the lower and upper bounds being the "pessimistic" and "optimistic" values defined in the scenario analysis.

The analyses have been elaborated using the Monte Carlo simulation technique with 10,000 random repetitions. In brief, at each iteration it is randomly extracted a value from the distribution of each of the independent variables. The extracted values are then adopted for computing the ENVP and IRR. Finally, the 10,000 estimated values of ENPV and IRR are used to approximate the probability distribution of the two indicators.

The risk assessment shows that the expected value of the ENPV is equal to EUR 348,347,738 (slightly lower than the reference case), and that the expected value of the ERR is 11.58% (against a reference case of 11.64%). The probability that the ENPV will become negative and that the ERR will be lower that the SDR adopted in the analysis is almost nil. However, there is a 51% probability that the two indicators assume a lower value than in the reference case. Hence, the CBA outputs appear to be robust to future possible variations in the key variables. Overall, the risk analysis shows that under the project has a negligible risk level.

Figure 23. Results of the risk analysis for ENPV (left-hand side) and ERR (right-hand side)

CBA Reference value

ENPV	ERR
349 810	11,64%

Estimated parameters of the distribution

	ENPV	ERR
Mean	348 348	11,58%
Median	347 322	11,59%
Standard deviation	70 062	1,27%
Minimum	145 313	7,56%
Maximum	549 058	14,98%

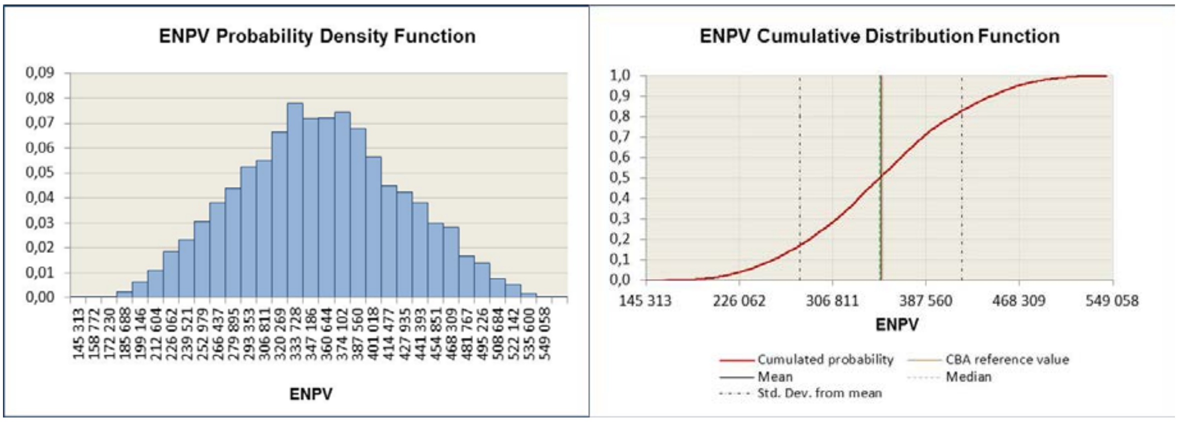
Estimated probabilities

Pr. ENPV ≤ base value	0,513
Pr. ENPV ≤ 0	0,000

Pr. ERR ≤ base value	0,514
Pr. ERR ≤ Social discount rate	0,000

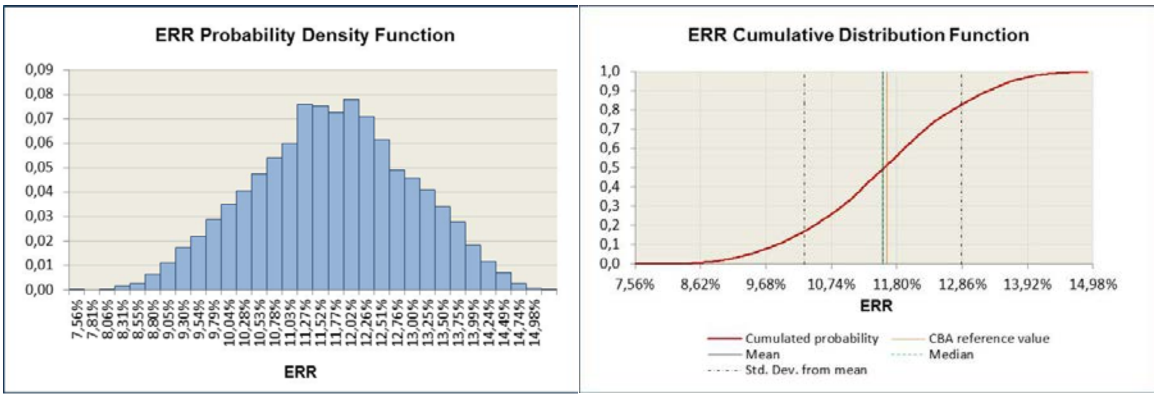
Source: Authors

Figure 24. Probabilistic distribution of the Economic Net Present Value (EUR)



Source: Authors

Figure 25. Probabilistic distribution of the Economic Internal Rate of Return



Source: Authors

ANNEX III. List of interviewees

NAME	POSITION	AFFILIATION	DATE
Dr Bálint Ákos	Secretary of Territorial Office of Csongrád County (KTE) Engineering Office of Szeged, Directorate of Csongrád County (MK)	Hungarian Scientific Association For Transport (KTE) Hungarian Public Road Pte Ltd Co. (MK)	04.12.2017
Berente István	Head of Office, Office for Transport Organisation Southern Great Plain	KTI Institute for Transport Sciences Non Profit Ltd	06.12.2017
Csicsely Gábor	Project leader	NIF National Infrastructure Developing Co. Ltd. (NIF)	12.01.2018
Erdős-Békefi Edina	Head of Dept., Department for Road Projects, Deputy State-Secretariat of Transport Operational Programmes	Ministry of National Development (NFM)	15.12.2017
Fekete József	Mayor (since 1990)	Municipality of Klárafalva	12.12.2017
Dr Gál József	Deputy Dean (passenger transport and logistics practitioner background)	University of Szeged	01.12.2017
Horváth Beatrix	Head of Dept., Department of Connecting Europe Facility (CEF), Deputy State-Secretariat of Transport Operational Programmes	Ministry of National Development (NFM)	15.12.2017
Jani János	Mayor (since 2010)	Municipality of Ferencszállás	04.12.2017
Juhász Zoltán	Deputy Director for Road Development	NIF National Infrastructure Developing Co. Ltd. (NIF)	12.01.2018
Király László	Mayor	Municipality of Deszk	12.12.2017
Kovács András	Journalist	Delmagyar.hu ('Southern Hungarian') (County Newspaper)	08.12.2017
dr. Kovács Beáta	Vice President (responsible for coordination)	Municipality of Szeged	11.12.2017
Kovács Roland	Head of Dept., Makó Motorway Engineering Base, Directorate of Csongrád County	Hungarian Public Road Pte Ltd Co. (MK)	14.12.2017
Dr Mader Balázs	Head of Dept., Department of Environment and Nature Preserve	Government Office of Csongrád County	06.12.2017
Dr Martonosi György	Mayor (since 2006)	Municipality of Maroslele	04.12.2017
Márta János	Head of Dept. (since 2012), Department of Roads	Government Office of Csongrád County	11.12.2017
Ménesi Imre	Representative of Rókus district, Head of Committee for City Managing and Urban Development	Municipality of Szeged	05.12.2017
Nagy Sándor	Representative (1994-2002; 2010-2014), Vice Mayor responsible for transport between 2002-2010	Municipality of Szeged	05.12.2017
Nemesi Pál	Representatives/associations	Chamber of Commerce and Industry Csongrád County	30.11.2017
Dr Rigó Mihály	retired chief engineer (MK) after serving 37 years	Hungarian Scientific Association For Transport (KTE); Hungarian Public Road Pte Ltd Co. (MK)	01.12.2017

NAME	POSITION	AFFILIATION	DATE
Szegvári Ernőné	Mayor since 2002	Municipality of Kiszombor	04.12.2017
Tasi Marianna	project manager, Department for Rail Projects, Deputy State-Secretariat of Transport Operational Programmes (worked on M43 project and for Dept. for Road Project, when M43 was constructed)	Ministry of National Development (NFM)	15.12.2017
Thoroczkay Zsolt	Head of Dept., Dept. of Development of Road Infrastructure, Deputy State-Secretariat of Transport	Ministry of National Development (NFM)	14.12.2017
Varga Péter	Tender manager (since 2011)	Municipality of Makó	05.12.2017
Vincze Attila	Dep. Head of Dept., Department of Transport (since 2012)	Government Office of Csongrád County	08.12.2017
Zeller, Lothar	Transport Sector Specialist of CEE Region	JASPERS Office Vienna, European Investment Bank	28.12.2017

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