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Transport Axes and Corridors in Romania - Policy Issues and Opportunity for Territorial Development

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ABSTRACT

Without strong cities and efficient transport infrastructure, countries cannot benefit from developed regions and robust economies. The slow development of the road transport infrastructure (46 km/year) hampers the development of Romanian cities, especially those connecting peripheral areas, which are affected by population decline and stagnant growth. The purpose of this study was to determine the impact that transport axes/corridors policy and other relevant planning policies could have on the national territory in terms of stimulating regional growth and reducing spatial disparities. To achieve this, the research consisted in analysing a set of economic and social indicators for all 41 county capital cities in Romania and the capital city Bucharest, as well as traffic data for the national road network. Results showed that economic indicators such as entrepreneurial density and firm turnover have higher values in main urban centres, where infrastructure supports the location of businesses and attract investors that generate economic growth, whereas cities with low accessibility to high quality transport infrastructure have fewer opportunities to grow, evidence that the transport axes/corridors policy could be a relevant territorial planning instrument. Moreover, the findings of this research revealed the incipient stage of integration of development axes policy in Romania due to the fragmented administrative and planning capacity of governmental stakeholders. It is recommended to prioritize multi-level governance reforms to strengthen strategic planning and administrative capacity with a focus not only to connect major cities but also the secondary nodes and peripheral regions, thus promoting inclusive and sustainable development.

1. INTRODUCTION

Transport activity creates valuable links between cities in terms of economic activity, thus supporting regional development. While major European capitals and large regional cities are connected by important highway networks and high-speed railways, Romania sits at the bottom of the ranking regarding the density of high-speed roads (EUROSTAT, 2021), whilst the railway network, although with a higher density than the highway network, suffers from an accelerated quality decline.

The concept of development axes and/or corridors is not new and it has been evolving over time as transports have advanced technologically, once with the gradual construction of large-capacity infrastructures: highways, high-speed railways and airports (Priemus and Zonneveld, 2003); thus, transport technological progress has allowed for the connection of more and more cities, turning them into

real urban nodes. The concept of transport corridors/axes is relevant, their importance resulting from the "multidimensional and multi-scalar nature of current corridors" (Witte, 2014, p. 3), which are seen "not only as infrastructure axes, but as economic development and urbanization" (Priemus, 2001; Pain, 2011 in Witte, 2014, p. 3). In a broader sense, development corridors are characterised by a "complex interdependence between transport capacity, economic benefits and spatial structures" (Witte and Spit, 2016, p. 102).

Especially since the 1990s, the development of transport infrastructure was considered essential at the European Union level, not only from the perspective of building "the infrastructure itself, but also because of the role it plays later in economic development" (European Parliament, 2024, p. 1). The development axes model has been reflected in the conceptualization of the Trans-European Network policy since the beginning of the '90s (Albrecht and Coppens, 2003). Investments in transport represent the "cornerstone" of the cohesion policy and regional development (Crescenzi and Rodriguez-Pose, 2012), with important financial resources being granted to connect regions.

Pottier (1963) was one of the first authors to contribute to the evolution of the development axis concept (Geyer, 1987; Todd, 1974; Purboyo and Santoso, 2016). According to Pottier, starting from the initial phase, namely that of simple communication axis (transport), it can transform into a development axis (Pottier, 1963). The causes of this transformation are multiple and are related to the phenomenon of increase in the transport flow of goods and people, an increase that generates the location of more economic and commercial activities, which contributes to the development of urban settlements (Pottier, 1963). This is also called the *cumulative development process* (Lafeuille, 1983). From this perspective, Geyer explains this transformation, stating that, over time, due to its function (transport), a communication corridor will attract an increasing flow of transport and energy as the axis develops (Geyer, 1987).

Pottier used this concept to describe spatial alignments as an expression of growth in the sense that development takes place along arteries that connect different poles (Todd, 1974). According to this theory, the axis development will have a *spillover* effect on the hinterland (Purboyo and Santoso, 2016), provided that the peripheral centres are interconnected (Hilhorst, 1973).

In the field of geography and spatial planning, concepts such as *spatial development axes* or *corridors* (Todd, 1974; Brand et al., 2017), *economic development corridors* (Brunner, 2013) and the *planning of transport nodes* (Curtis, 2008) are often used as development instruments. Specialist literature reveals that there are many similarities between the concepts of the *development corridor* and *development axis* (Hillhorst, 1973; Marrian, 2001; Campbell and Meades, 2006); thus, in some specialized works, the two notions are interchangeable (Brand et al., 2017). Campbell and Meades (2006) define development corridor "as a narrow area along an important (transport) route that connects different poles" (Campbell and Meades, 2006, p. 191), with the poles diffusing development in the nearby area. Transport infrastructure influences social, economic, and cultural mobility (Surd et al., 2005) and stimulates socioeconomic development. However, the economic development has an important impact on the connectivity of the transport network, since a higher density of economic activities constitutes the premise for improving transport connectivity (Rodrigue et al., 2013). In spite of the common view that transport infrastructure investments generate economic growth, "the investment efficiency has been frequently questioned" (Li and Li, 2013, p. 43) and the economic output and population increases has been noticed in regional urban nodes at the expense of hinterland area (Baum-Snow et al., 2020). At the European level, the pan-European transport corridors were analysed in relation to their development and economic impact (Stancu et al., 2014). Much attention was also paid to the development of transport infrastructure in relation to the connectivity of the national territory to the Central and Western Europe (Popa and Schmidt, 2013; Man et al., 2015) and the overall economic impact (Fistung et al., 2014). Popa (1994) developed one of the first models of development axes in Romania. This model is based on the intensity of road and rail traffic, economic activity, and connections to international development trends (Popa, 1994). The model of development axes/corridors was then applied by other Romanian authors, for smaller territories, namely Iaşi County (Iurea and Braghină, 2012) and Suceava County (Pop et al., 2021). Recent literature on development axes/corridors highlights their role as strategic interventions to enhance economic growth (Aggarwal, 2020; Djais et al., 2024), regional connectivity (Jamali et al., 2023) and sustainable development (Bersaglio et al., 2021; Prus and Sikora, 2021; Kabashkin and Sansyzbayeva, 2024).

Considering the importance of transport in the economic development of settlements, our research aims to determine, from a strategic perspective, what is the impact of the policy of development axes and corridors and other spatial planning policies in Romania in terms of stimulating socioeconomic growth at the local and regional level, starting with the moment of Romania's accession to the EU.

For this purpose, the main objective of this research is to identify the direction and trends from the main strategic planning documents at European and national levels regarding transport axes/corridors policy. Secondly, this paper aims to evaluate the viability of the development axes and corridors, as well as the disparities in their proximity. In our research, we

started from the hypothesis that the integration of the development axes policy is at an incipient level in Romania, as there is no coherent framework for its implementation. Decision-makers pursued the development of transport infrastructure as a strategic priority and insisted on its correlation with the transport priorities of the European Union, but it was presumed the European interest took precedence over national interest. Eventually, the last hypothesis states that quality of infrastructure, accessibility, and different anthropogenic loads of the territory may induce local disparities that outline discontinuities in the spatial coherence of the development axes and corridors.

The current research focuses on covering gap in the existing literature, namely the lack of comprehensive spatial planning models at the national level targeting axes/corridors development model and synergies with other planning policies. This endeavour is useful for Romania, as spatial planning models and policies are not connected and often operate in isolation, which further leads to inefficiencies, such as fragmented regional development, underutilized infrastructure, and missed opportunities for integrating economic growth with environmental sustainability. This approach can build on insights from successful international examples, such as the Trans-European Transport Network (TEN-T), which integrates multimodal transport and economic hubs across the EU member states and regions. By adapting such models to Romania's specific challenges and opportunities, this research brings its contribution to a more strategic and interconnected national axes/corridors development policy.

Besides the Introduction, this paper consists of three main sections. The Theory and Methodology section briefly presents the main strategic documents on territorial planning and transport investments in Romania. In the Results and Discussion section, we specifically analysed how growth poles and development centres policy correlate with axes/corridors policy as well as some specific high-speed road projects that have been implemented in Romania since 2007 (a period that coincides with the accession to the EU), their corresponding cost and rate of construction, and also their impact on the territory. Another important part of this section consisted in examining a set of relevant socioeconomic statistical indicators to see if the development axes model provided by the SDTR (Strategia de Dezvoltare Teritorială a României: România policentrică 2035 – Romania's Territorial Development Strategy – Polycentric Romania 2035) and growth and development poles policy correlate with the designed urban poles and axes/corridors that concentrate the most important values in terms of population, entrepreneurial density and economic opportunities (registered turnover of companies). The most recent available data were used. The final section – Conclusions – encompasses the most important findings of this article while also exploring several further research paths.

2. THEORY AND METHODOLOGY

Considering the purpose and objectives of the research, with an emphasis on the evaluation of the axes in Romania from a methodological point of view, we selected the interregional development axes proposed in Romania's Territorial Development Strategy - Polycentric Romania 2035. These axes were selected because of their great development potential determined by the competitive advantage gained from a high level of accessibility compared to neighbouring areas (Romanian Ministry of Development, Public Works and Administration, 2015). The novelty of this process is the fact that the interregional axes were then integrated in ArcMap 10.3 spatial database and used to generate spatial planning models for the entire national territory. The development axes/corridors mentioned in the SDTR are some of the few viable development axes/corridors models designed at the national level.

In Romania's recent history, the growth poles and development centres policy has influenced the evolution of the country's socioeconomic performance. Considering that the SDTR places great emphasis on polycentric development, we selected all the cities that fall into one of the two categories of poles proposed in the Government's decision no. 998/2008 (Romanian Ministry of Justice, 2008). In terms of transport policy, we analysed Romania's Transport Master Plan (Master Planul de Transport al României – MPGT) (Romanian Ministry of Transport, 2016), as well as documents referring to the pan-European corridors (European Commission, 2002) and to the TEN-T axes (European Parliament, 2013). Both the MPGT and the TEN-T network of the European Union foresee a series of projects for rail, sea, and air transport, but only the projects and priorities related to the road transport mode were analysed. While the TEN-T policy sets out the main development transport trends in terms of investments for building/upgrading corridors in order to connect the EU regions, MPGT supports the TEN-T policy, at the same time considering the transport needs of the entire national territory, planning to enhance connectivity of all regions, as well as to boost connectivity in the cross-border areas.

Three relevant socioeconomic indicators were analysed for all 41 county seat municipalities and the capital city of Bucharest: *population evolution* (indicator from INS Tempo Online POP107A for 2011 and 2023), *entrepreneurial density* (data for firms were extracted from *Romanian Companies* online platform for 2022, the last available year; INS Tempo Online does not offer data at the local level), and *turnover*

generated by the business environment (economic data were extracted from *Romanian Companies* platform for 2022, the last available year). This process involved integrating data from INS Tempo Online to ArcMap 10.3 spatial database for all the 41 county seat municipalities and Bucharest. The data used for population was extracted from INS online platform (Institutul Naţional de Statistică – National Institute of Statistics) which is the most reliable data source in Romania. Data used for entrepreneurial density and turnover were extracted from Romanian Companies, which is one of the few platforms that offer data for the local level being both reliable and supplying additional information, not available on INS platform. Moreover, we analysed the evolution of road traffic on national roads related to the last two traffic censuses from 2015 and 2022. The data were downloaded from the website of the Road Technical Studies and Informatics Centre (Centrul de Studii Tehnice Rutiere şi Informatică – CESTRIN). All statistical data were integrated and processed in a spatial database using ArcMAP 10.3, a series of geospatial analyses and processing being carried out. The end result was a set of cartographic materials a support for the proposed investigation.

3. RESULTS AND DISCUSSION

3.1. Transport axes and spatial policy correlation

The growth and development poles policy can be correlated with the SDTR proposal of inter-regional axes because, as seen in Figure 1, all urban growth poles are part of the main development axes in Romania.

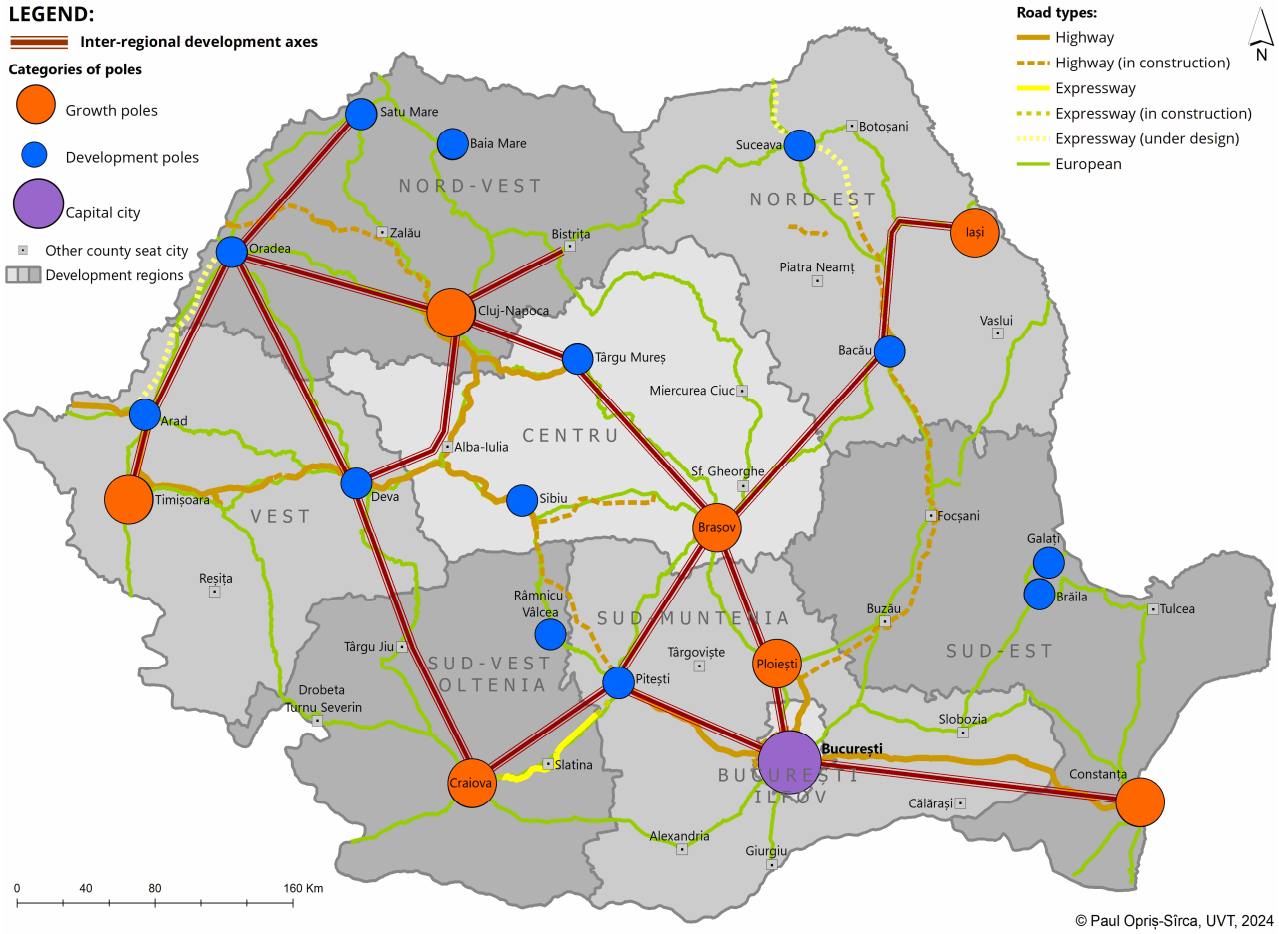

Fig. 1. The inter-regional development axes according to SDTR and the growth and development poles in Romania *(data source: Romanian Ministry of Development, Public Works and Administration; Romanian Ministry of Transport).*

In addition, the proposed axes include not only growth poles but also development poles, namely the cities of Arad, Oradea, Deva, Târgu-Mureș and Pitești. On the other hand, important urban centres of regional and local relevance, such as Baia Mare, Suceava, and the Galaţi-Brăila agglomeration are not connected to the main development axes, being located in peripheral areas, with less connectivity to the main development axes network.

A relevant aspect is the fact that SDTR did not include Sibiu as part of the network of development axes, this being a debatable issue, because the former European Capital of Culture in 2007 (European Parliament, 2007) is not only an important road node with connectivity to the highway network, but together with Braşov and Alba-Iulia, constitutes a veritable development axis not only for the Centre region, but also for the national territory. An additional argument

is the fact that, in 2023 (August-November), an additional approval was received from the Ministry of Transport and Infrastructure for the initiation of construction works on the trans-mountain segments of the A1 highway (Sibiu – Piteşti sector) and all contracts were signed for the design and execution of the four segments of Sibiu-Făgăraş Highway (Romanian Motorways and Expressways Info, 2023), which opens the perspective of connecting Sibiu with Braşov and, further on, with Bacău.

The General Master Plan for Transport (MPGT), approved in 2016, was elaborated considering the problems and needs of territorial development in Romania, representing a strategic planning tool, but also a reference resource for the analysis of territorial dynamics regarding the evolution and development potential of the axes across the territory. Until the approval of Romania's Transport Master Plan, directions for the development of transport network were stipulated in Law no. 363/2006 (Romanian Parliament, 2006).

Since the approval of the MPGT, authorities have not fully followed the provisions included in the strategic proposals and established projects included in this document, priorities that were agreed upon with the European Commission (Romanian Ministry of Transport, 2016). Some examples are as follows:

- *Siret Expressway (A3 – Siret)* which, today, is built as a highway up to the proximity of Paşcani city;

- *Trans Regio road of "Ţara Crişurilor" (Arad-Satu Mare)* which, today, is expected to be built as an expressway between Arad and Oradea;

- *Oltenia highway (Craiova-Piteşti Sud)* which was built and partially completed as an expressway.

Once with its accession to the European Union, Romania benefited from generous allocations for the construction of highways, mainly those directed toward the construction of the A1 highway, overlapping with the TEN-T axis Rhine - Danube (Fig. 3). Moreover, this axis has a similar route to Corridor IV, which crosses Romania from West to East. During 2009-2010, the Romanian state supported the construction of a 54 km segment of A3 (Transylvania Highway) from the national budget. Several other sections of A3 highway between Cluj-Napoca and Oradea are under construction or are in a tender process, as well as the A0, the perimeter highway of Bucharest. The A7 highway between Ploieşti (connection with the A3) and Paşcani is still partly under construction, although the works on most of it have just been completed at the end of 2024, and they are expected to end at the beginning of 2025. The A13 Sibiu – Făgăraş (Braşov) highway is currently in the process of design and execution. The express road between Craiova and Piteşti (total length 121.18 km) is also under construction, of which 72 km (Balş – Slatina - Coloneşti segment) are already in use. For the Arad-Oradea expressway (140 km) divided in 3 segments, construction will begin after the bidding companies have been established (in December 2024, only segment no. 3 had a winning company established) (Romanian Motorways and Expressways Info, 2024). Other road projects of interest and vital for the national economy, which are under various stages of preparation and mentioned in the MPGT as well as in the National Territorial Development Plan (Planul de Amenajare a Teritoriului Naţional –PATN), are as follows:

- *A6 Lugoj – Calafat,* which in MPGT is stipulated as the Danubius Expressway;

- *A8 Tg. Mureş-Ungheni,* also known as Union Highway (Autostrada Unirii), which appears under the name Montana Highway in MPGT.

Despite the ambitious plans for the construction of a vast network of highways and the frequent declarations of the decision-makers regarding the commitment to make the development of transport infrastructure a strategic priority, Romania, with the exception of Bulgaria and Slovakia, has the lowest number of kilometres of highway among the EU states from Eastern Europe (EUROSTAT, 2021). Between 2007-2022, an average of only 46 km of new highways or express roads were inaugurated per year in Romania (The National Institute of Statistics – Tempo Online, 2022; Romanian Motorways and Expressways Info, 2023). In comparison, in the same period, 63 km/year were built in Hungary and 71 km/year in Poland (Eurostat, 2022). In 2023, about 79.2 km of high-speed roads were built, of which 31.8 km were expressways, the difference of 47.4 km being represented by highways (Romanian Motorways and Expressways Info, 2023). Since 2007, the cost of building Romania's high-speed road network was more than 4.3 billion EUR (Romanian Motorways and Expressways Info, 2023). In 2024, projects totalling 535 km worth 10 billion euros were under different stages of implementation (National Company for Road Infrastructure Management, 2024). Frequent changes in road projects implementation, different than the ideas proposed in the strategic documents such as MPGT offer possible clues that there is a weak strategic administrative and planning capacity of the governmental stakeholders to follow the priorities set before. The Romanian strategic framework for transport follows the European TEN-T regulation and is coupled with funding and grants issued within the EU Community, funds being diverted towards sectors that mainly overlap the TEN-T corridors. However, TEN-T Policy is sufficiently broad as to allow the development of the national network provisioned by the Romanian transport strategies.

3.2. Statistical indicators and census data analysis

Road traffic data from censuses of 2015 and 2022 show an increasingly acute need for road network

development. The traffic on national roads increased by 45.7% between 2015 and 2022, indicating greater pressure on regions where traffic flows are concentrated predominantly on long segments of one-lane national roads (for example DN2 on the *Bucharest - Suceava* route), whereas the existing connections on either side of the Carpathian Mountains are insufficient for the optimal development of some traffic flows (Road Technical Studies and Informatics Centre, 2022). Insufficient links and low density of high-speed road infrastructure cannot support an optimal economic development of cities because transport infrastructure is vital in linking cities and regions, and further generate growth.

Regarding traffic evolution, when overlapping development axes with the traffic census data, it was observed that all axes converging in Bucharest, Romania's capital city (*Bucharest - Constanța*, *Bucharest - Pitești* and *Bucharest - Ploiești - Brașov*), recorded growth exceeding the national average. This dynamic is driven by significant traffic flows, particularly of commuters and goods, emphasising the capital's heightened potential to stimulate development in its surrounding areas. Increases above the national average (45,7%) were also recorded on the national road sections along *Oradea - Deva - Târgu Jiu – Craiova axis*, which connects the North-West region with South-West Oltenia region.

The development prospects of this axis are limited, considering that the main cities along it are connected by a one-lane national road, and no plans are foreseen to expand or build new and wider sections. Other increases in traffic values above the national average were also recorded on the road sections along *Timișoara - Arad - Oradea - Satu Mare axis*, but only partially; for instance, on the segment between Arad and Oradea the increase in traffic was below the national average (28%) (Fig. 2).

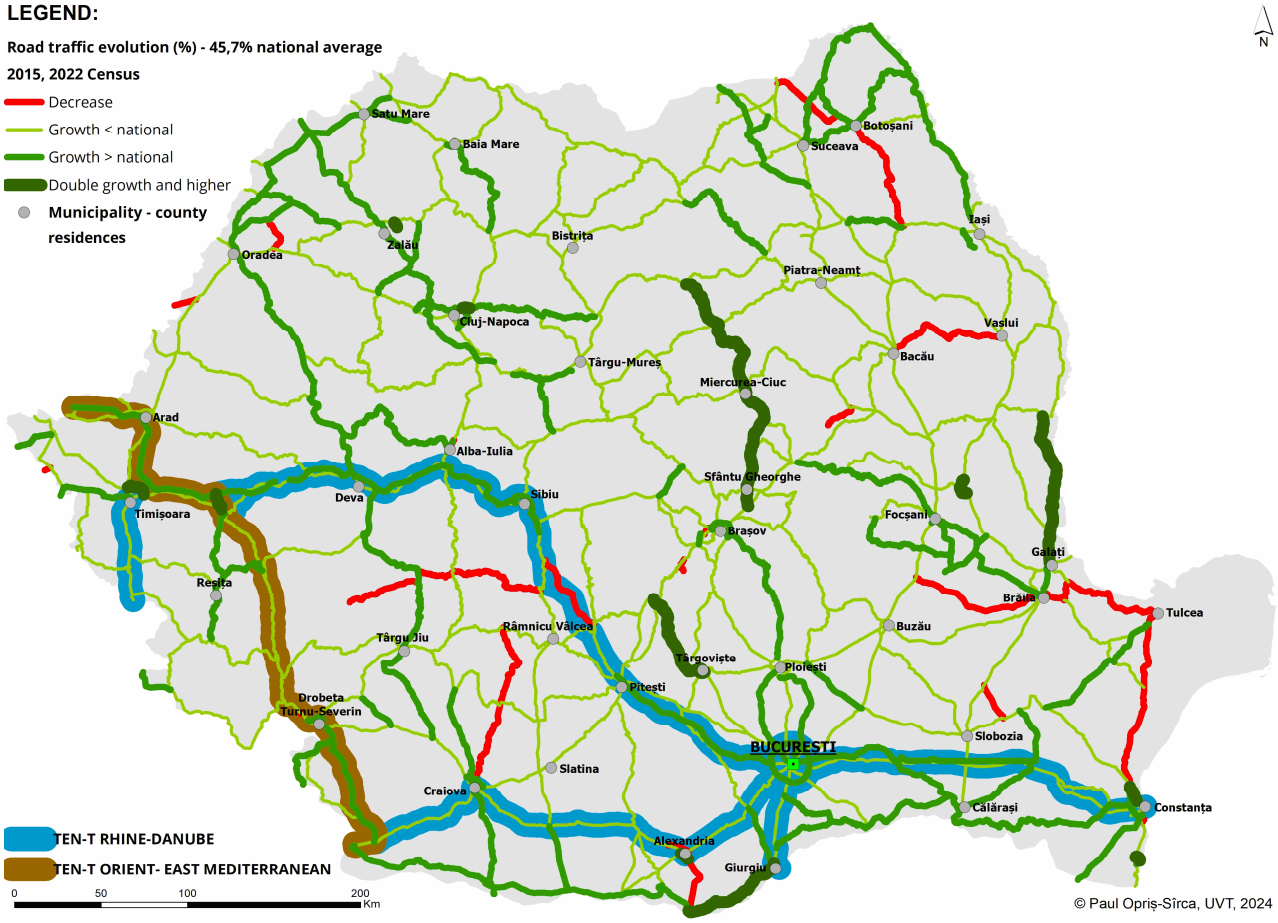

Fig. 2. Map of the evolution of road traffic in Romania, on national roads and highways (2015-2022) *(data source: Road Technical Studies and Informatics Centre, 2022).*

Considering the evolution of road traffic, for the *Brașov – Bacău – Iași axis* as well as *Oradea – Cluj-Napoca – Târgu Mureș – Brașov axis*, the results show only an increase below the national average, with few exceptions (e.g. the A3 segment between Turda and Florești).

The completion of the highway route between Cluj-Napoca and Târgu-Mureș, as well as the anticipated completion of the Oradea – Cluj-Napoca highway in the coming years, offer valid prospects for the consolidation and development of this axis. It is not clear, however, if the entire axis towards Brașov will be strengthened, since there are no concrete steps to complete the old project of the A3 highway on the Târgu-Mureș – Brașov connection, or rather that the construction of the A8 towards Iași will outline a new

direction of development, forming an East-West corridor. Specifically, the highest traffic values are recorded on the bypass belts (Bucharest Ring Road - 28,419 vehicles/day, Brașov Ring Road - 26,895 vehicles/day, Oradea Ring Road - 20,499 vehicles/day, Cluj-Napoca North-East Ring Road - 16,745 vehicles/day) and on some highway segments (A1 – 23,240 vehicles/day, A2 – 18,332 vehicles/day, A3 – 17,102 vehicles/day), and national roads (DN5 Bucharest – Giurgiu – 19,450 vehicles/day) (Road Technical Studies and Informatics Centre, 2022).

Where present, highways have recorded high traffic flows, taking over a large share of traffic from the national roads (for example A1 between Nădlac and Sibiu, Pitești – Bucharest, or A10, between Cluj-Napoca and Alba-Iulia) (see Fig. 2). Traffic evolution on major road transport infrastructure is influenced by both the concentration and density of population and the economic development. Urban polarization of the territory is a significant diagnostic indicator. Thus, *the development axes provided by the SDTR include urban poles that record the highest population values* (Fig. 3).

Nonetheless, this indicator does not include the peri-urban areas around the big cities, which have a much more pronounced positive dynamic than the urban centre, relevant examples being the localities around Bucharest (Chiajna, Bragadiru, Popeşti-Leordeni), Iaşi (Valea Lupului, Miroslava), Timişoara (Giroc, Dumbrăviţa, Moşniţa Nouă) or Cluj-Napoca (Floreşti), which recorded population increases of over 250% (Muntele, 2023). Among the county seat municipalities, only six of them registered an increase in population: Suceava, Iași, Vaslui, Bistrița-Năsăud, Cluj-Napoca and Alba-Iulia (Fig. 3).

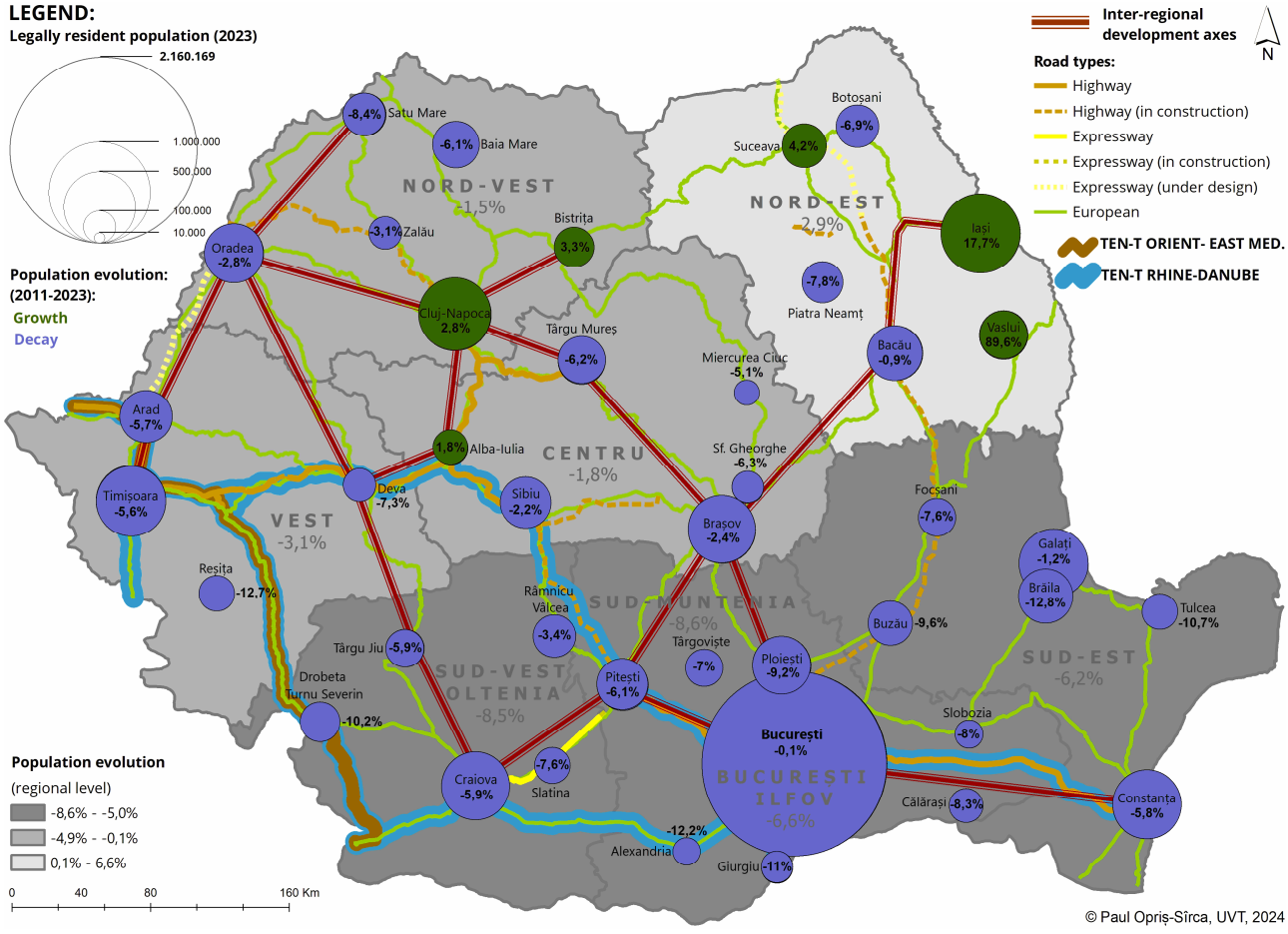

Fig. 3. Number of population in the county seat municipalities, in 2023, and its evolution compared to 2011 *(data source: Romanian National Institute of Statistics-TEMPO ONLINE POP107A).*

Of these, Iași and Cluj-Napoca are important university centres, whilst Suceava and Vaslui are part of a region with a traditionally higher natural increase than the rest of Romania, and which, in recent years, have benefited statistically from immigration from the Republic of Moldova.

The most important decreases in the number of population during the intercensal period 2011-2021 were recorded by the cities located on the periphery of the national territory, near border areas, such as Drobeta Turnu-Severin (10.2%), Tulcea (10.2%) and Satu Mare (8.4%), cities located outside development axes and with limited access to the main road network, such as Reșita (12.7%), Piatra Neamț (7.8%) and Baia Mare (6.1%), as well as the cities that gravitate around the capital city of Bucharest. An interesting fact is that traffic decreased in these areas (Tulcea) or registered a growth below national average (Piatra Neamț and

Drobeta Turnu-Severin). In the medium and long term, the effects of the decrease in the number of population will be increasingly felt socially and economically, not only due to the negative dynamics of the birth rate, but also to the migration of the population to areas with more work and housing opportunities.

Economic performance was measured using the entrepreneurial density indicator expressed as the number of firms (companies) per 1,000 inhabitants. Urban centres with special performance in terms of entrepreneurial density are listed in Table 1. Figure 3 shows the data for all 41 county seat municipalities and for the capital city, Bucharest.

Table 1. The main 10 cities in Romania, according to entrepreneurial density (2022).

No.	City	No. of companies/ 1000 inhabitants	No.	City	No. of companies/ 1000 inhabitants
1	Cluj-Napoca	89.5	6	Sibiu	53.1
2	Bucharest	64.8	7	Constanța	52.5
3	Oradea	59.2	8	Alba-Iulia	50.8
4	Timișoara	56.6	9	Târgu-Mureș	50.3
5	Brașov	54.2	10	Arad	50.2

Source: own elaboration based on data from Romanian Companies (2022).

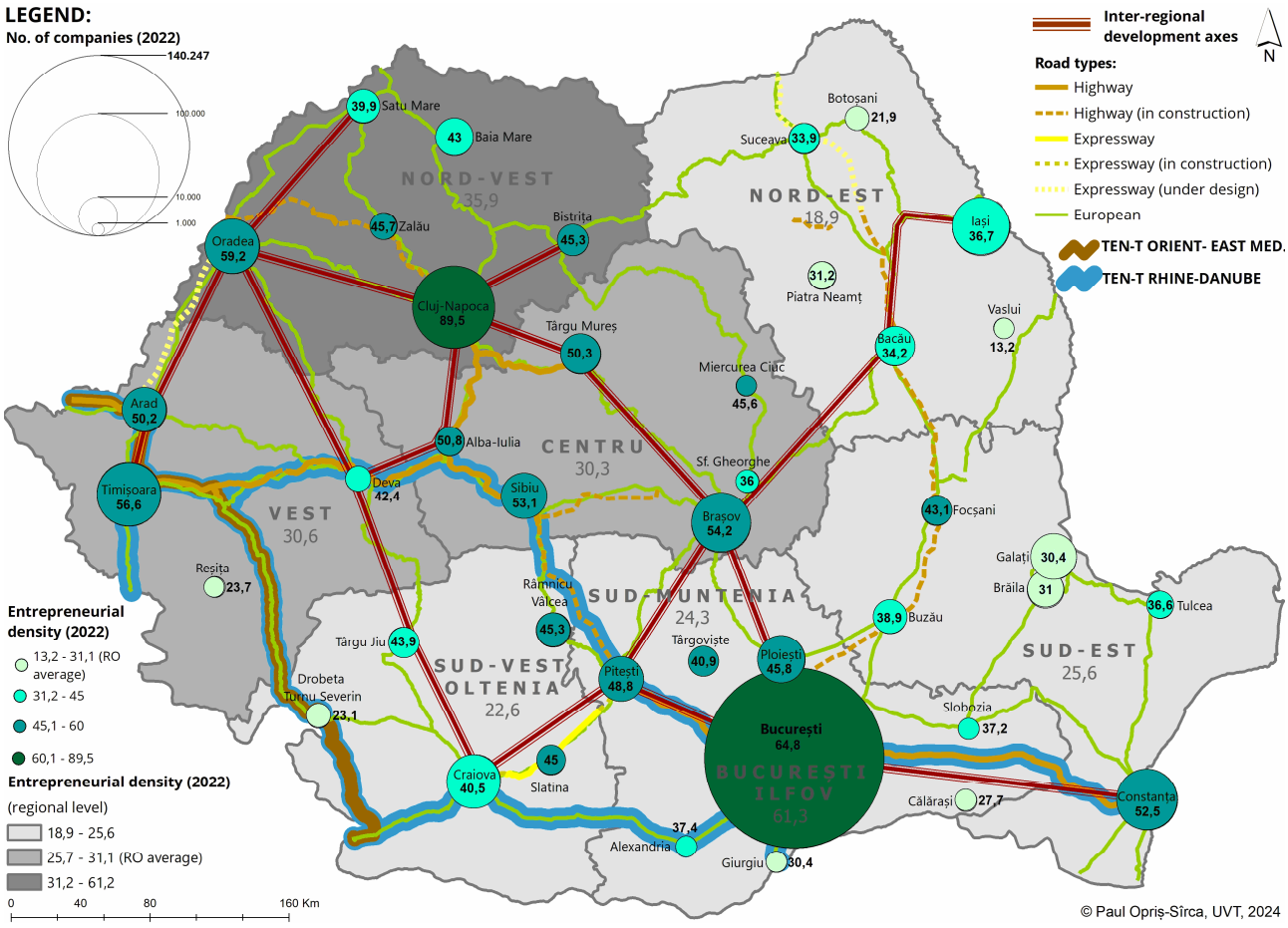

Fig. 4. The number of companies and entrepreneurial density in the county seat municipalities, in 2022 *(data source: Romanian National Institute of Statistics-TEMPO ONLINE POP107A and Romanian Companies, 2022).*

Spatially, Figure 4 reflects important densities of companies along development axes, individualizing corridors such as Brașov – Târgu-Mureș – Cluj-Napoca – Oradea, Timișoara – Arad – Oradea and Bucharest – Brașov. At the regional level, the lowest dynamics of the business environment can be observed in the North-East region (18.9 companies/1,000 inhabitants) and South-West Oltenia region (22.6 companies/1,000 inhabitants) where high-speed road infrastructure is at an early stage of development. Figure 4 shows that regions with higher access to transport infrastructure recorded higher densities of average entrepreneurial density. The construction of the A7 highway, which connects the capital city and the region of Moldova, will have a significant socioeconomic impact. In addition, the construction of the A8 highway on the Târgu-Mureș

– Iaşi – Ungheni link will stimulate not only the localities along it but also the economic exchanges with the Republic of Moldova, boosting cross-border relations on both sides of the border between the two states.

The *turnover of companies* is an indicator that also reflects relevant aspects, such as the dynamics of competitiveness and the level of investments. Unlike entrepreneurial density, the analysis of this indicator reflects the major discrepancies between the capital city of the country, Bucharest, whose companies generated EUR 171.2 billion in 2022 (Fig. 5), and the other county seat municipalities, which together generated only EUR 136.4 billion in the same year. On the second place, far from the capital city, we find Cluj-Napoca (14.5 billion EUR), followed by Timișoara (11.6 billion EUR).

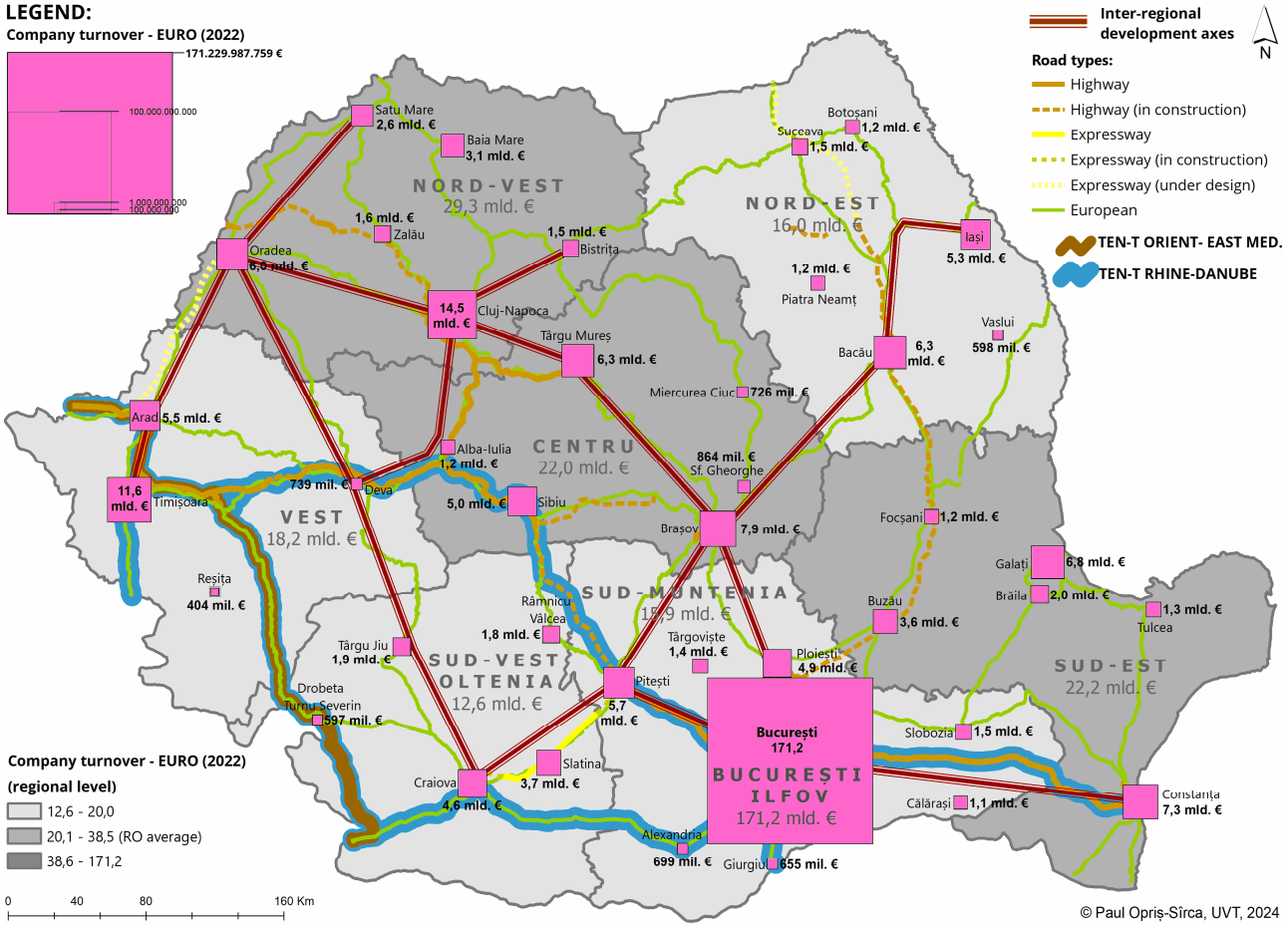

Fig. 5. The turnover of companies in the county seat municipalities of Romania, in 2022 *(data source: Romanian Companies, 2022)*.

With reference to entrepreneurial density, the situation is relatively balanced, with a concentration observed in the main urban centres that are part of the axes of development. In terms of business volume, the capital Bucharest generated more than half of the turnover, whereas Cluj-Napoca (ranked second, as an economic force in terms of turnover at the national level) failed to generate even 10% of the capital city's economic output. From this perspective, the policy of development axes can have a greater role in strategic planning by developing several cities (arranged on polarization alignments, well equipped from an infrastructural point of view) that should be able to compete with Bucharest.

4. CONCLUSIONS

This research showed a positive correlation between the growth and development poles policy and the interregional axes from the SDTR, meaning that interregional axes include all growth poles and most of the development poles. The interregional axes also incorporate the highest concentration of population and economic activities measured by the entrepreneurial density and firm turnover, evidence that the transport axes/corridors policy could be a relevant planning instrument for the national territory.

The findings of this study substantiate the incipient nature of the integration of development axes policies in Romania, revealing significant gaps in strategic coherence and implementation. The analysis underlines the fragmented administrative and planning capacity of governmental stakeholders, evidenced by deviations from the established priorities of national strategic documents such as the Romania's Transport Master Plan. These gaps highlight the prioritization of EU-aligned transport corridors, often at the expense of addressing national needs, thereby confirming the

hypothesis that the European interests have frequently taken precedence over the national imperatives.

The gap created between Romania's regions is caused, to a good extent, by the clustering of economic activities in certain geographical areas, in cities that benefit from better accessibility to transport infrastructure. The accessibility to a more developed transport network has allowed these urban centres to become more attractive for investments and human capital (workforce). It is therefore no wonder that the weakest regions in terms of economic performance (North-East and South-East) lack viable connections to high-speed infrastructure. These findings align with the statement that transport infrastructure is a critical determinant of urban and regional economic development, with spatial discontinuities along development axes undermining the broader coherence of the policy framework.

The analysed data showed that most of the cities outside the main transport axes have a higher degree of population loss, but additional research should be made to further establish if transport connectivity plays a significant role in demographic dynamics.

To address these challenges and capitalize on the potential of transport axes and corridors as tools for territorial development, this study recommends prioritizing multi-level governance reforms to strengthen strategic planning and administrative capacity. This includes fostering collaboration between national and regional authorities to ensure alignment between EU and national priorities while tailoring investments to address local development needs. Moreover, unlocking investments in high-speed infrastructure will require innovative funding mechanisms, including public-private partnerships (PPPs) and greater utilization of EU funding instruments. Ensuring transparency and efficiency in project implementation through enhanced monitoring frameworks can further attract investor confidence.

Eventually, the integration of transport policy with broader spatial and economic planning objectives is critical. Investments should focus not only on connecting major cities but also on strengthening secondary nodes and peripheral regions, promoting inclusive and sustainable regional development. A concerted focus on these recommendations will ensure that Romania's policy of transport axes and corridors transforms from an aspirational framework into a robust driver of socioeconomic and territorial growth.

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