Territorial lines of force within the Deva-Hunedoara conurbation

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Abstract: The paper aims to identify and correlate current territorial lines of force within the Deva-Hunedoara conurbation with present and future local territorial development of the settlement system. The paper is based on the territorial lines of force model described by Gustav Gusti for Romanian national territory and its application to regional, county and local level.

Key-Words: lines, force, conurbation, settlement system, transport

1. Introduction

A conurbation is an urban area consisting of a number of cities that by population growth and territorial expansion came together to form a continuous urban area. Most of the times the conurbation is an urban agglomeration with multiple centers which are connected by transportation networks[1].

The term conurbation was introduced by Patrick Geddes in his book “Cities in evolution”, where he suggested that the development of transportation networks and population growth makes some cities located at great distances to become united in solving common problems related to housing, utility networks or creating new industries.

Deva-Hunedoara conurbation is a complex form of spatial planning, located in the central-western part of Romania, occupying a central place in Hunedoara county and being situated in the middle sector of the river Mureș.

The complexity of geological substrate on which Deva-Hunedoara conurbation develops is given by the interaction between the Getic Domain, the Danube Domain and the post-orogenic magmatism, interaction that led to the formation of highly diverse morphological structures. The conurbation is located at the contact of four large geographical units: Metaliferi Mountains, Poiana Ruscă Mountains, Hațeg Depression and Orăștie Hills.

The settlement system of Deva-Hunedoara conurbation consists of two urban areas and nine rural areas, the two cores of the conurbation are the municipalities of Deva and Hunedoara.

Deva is located in the northern part of the conurbation, on the left bank of the river Mureș and is the capital of Hunedoara county. Deva has administrative, commercial, cultural, tourist and recreation functions in the conurbation. In 2002 the population consisted of 65,873 inhabitants.

Hunedoara is located in the southern part of the conurbation in the upper course of the river Cerna. Hunedoara has industrial, trade and education function in the conurbation. In 2002 the population consisted of 68,452 inhabitants.

2. Lines of force and their role in structuring the settlement network

The concept of territorial lines of force, the way it was formulated by Gustav Gusti in 1974, started from the idea that it is necessary to restructure the Romanian national settlement system in order to correct the identified malfunctions in the system’s function and layout. The author believes that a restructuring of the territory can not exist without meeting three major requirements: the study of the present settlement system, complex land zoning and subdivision of areas depending on the degree of urbanization of the territory.

Sensing that all three conditions refer to the same material phenomenon, systematic planning, the author proposes a unique cross-linked structure covering the whole national territory and whose purpose is to identify and promote the flow of matter, energy and information between major polarization centers, represented by settlements or settlement systems and in doing so helps the development of settlements located in favorable locations on the national grid.
The cardinal cross-linked structure that Gustav Gusti proposes for the national territory follows the very lines of force of a magnetic field grafted on the national territory. These territorial lines of force lines are grouped from north to south and from east to west respectively. The structure imagined by Gustav Gusti consists of nodes, band connections and mesh formed between bands. The nodes represent important urban concentrations with polarization role at local, county, regional or national level. Connection bands between nodes include highly urbanized areas, industrial and intensive agricultural areas and mesh retain less urbanized or natural areas or ecosystems.

Respecting the natural environment the author suggests six territorial lines of force linked with link up with the European lines of force. The six lines comply to the major flows of matter, energy and information at national level. At the intersection of the main lines of force the author proposes placing some settlements or settlement systems which have assigned population serving functions at regional and national level and are able to decrease the influence the capital has over the national territory.

Gustav Gusti attaches great importance not only to nodes but also to the bands that connect these nodes considering that in the future settlements within these bands will have the opportunity to create new nodes of polarization through the development of transport routes of matter, energy and information perpendicular to the existing transport bands.

Width of the band connecting the nodes in the cross linked structure results from the way the major flows are concentrated. Flows consist of roads, railway and waterways, transmission of electricity, natural gas and telecommunications.

The bandwidth must be structured so as to provide, if necessary, the possibility of extending the main material flows. Where the band width can not be increased it shall be taken in to account the creation of new transportation bands parallel or perpendicular to the existing ones. In the case of creation of new perpendicular transport bands the material flows enters in a organized way within the mesh[2].

I believe that by creating, in an organized manner, such perpendicular transport axes the creation of secondary settlement systems is stimulated in the mesh, which leads to maintaining optimum urban density in the main band. Settlement networks formed in this way can not have a higher rank in the national hierarchy than the settlement networks in the main band but they can be equal in rank.

In the formation of secondary settlements or settlement systems the transport band of matter consist a determining factor for network size and further development of settlement. By creating new perpendicular bands within the secondary network of settlements we can obtain a smaller size network. While creating a new network this process affects the structure of the mesh disrupting the ecological structure by changing local land use and creating extra pressure on the environment.

In theory this process of creating perpendicular axes within the mesh can be repetead untill the point were it creates new rural centers. In conclusion the band of transport thus created become lines of force of the territory, their importance ranging from regional force lines to local force lines and rural force lines. Depending on their location these lines of force create settlements or settlements systems and help develop a coherent and balanced national territory.

3. The structure of Deva-Hunedoara conurbation based on lines of force

At national level Deva-Hunedoara conurbation as a settlement system is integrated in the band of the main territorial force line Arad–Timişoara–Braşov-Constanţa which crosses nationwide from west to east. Transport infrastructure associated with the IV-th Pan-European corridor is grafted on this main line of force. The transport infrastructure is composed of european roads E68, E81 and E60 and the M200, M300 and M800 main railways.

Do to the ever growing importance of this force line, the band infrastructure covering it is ever changing. The construction of the new motorway system for the IV-th transport corridor is a prime exemple of the importance of this band and it will surely rise the importance of settlements and settlement systems located in the band.

At regional level Deva-Hunedoara conurbation acts like a regional node at the intersection of the main force line Arad-Timişoara-Braşov-Constanţa with the Oradea-Drobeta Turnu Severin force line. The Oradea-Drobeta Turnu Severin is a regional force line crossing Nationwide from north to south and supports the transport infrastructure composado of the E79 european road. Oradea-Drobeta Turnu Severin force line enhances the role of Oradea and Drobeta Turnu Severin as regional polarizing centers in territory and also boosts centers located in favorable positions such as Deva-Hunedoara conurbation and Târgu Jiu.
At county level Deva-Hunedoara conurbation obtains the status of polarizing node mainly because of its position at the intersection of two main territorial lines of force. The polarizing node status of Deva-Hunedoara conurbation shows its influence on the organization of county geographic space by encouraging the development of new local lines of force and new nodes on the main west-east and north-south lines.

The nodes encouraged to develop are Brad and Petroșani located on north-South force line respectively Orăștie-Geoagiu system located on the east-west main line (see Figure 1). At this level of spatial organization the main structure of the conurbation can be highlighted, a dual core structure with Deva located at the intersection of the two the main force lines and connected to Hunedoara by a local force line.

The main force line Arad-Constanța ensures the connection of Deva-Hunedoara conurbation to the national system of settlements. Seen from the main line Deva-Hunedoara conurbation is a perpendicular branched structure, the root is Deva, the trunk consists of several rural settlements located within the local force line and the crown consists of Hunedoara and several rural settlements.

On this line of force the transport infrastructure associated with the IV-th Pan-European Corridor is located. It is composed of the river Mureș, the E68 european road, the double electrified railway M200, the electricity transmission networks of 20, 35, 110 and 400 kv, the Simeria-Mintia 300mm natural gas pipeline, pipeline for district heating and in the near future the Arad-Sibiu motorway. The Arad-Sibiu motorway construction is part of the resizing of this transport band, a necessary resize given that this band is transited daily by 30,000 vehicles.

The internal structure of Deva-Hunedoara conurbation is based, like in all conurbations, on communication between the urban cores. In this case the communication takes place along a local line of force of the territory.

The force line of the territory that connects Deva and Hunedoara provides the transport of energy, matter and information from south of the conurbation to north where it intersects the main territorial line of force.

The transport belt which folds on this local line of force includes the upper course of the river Cerna, the electrified railway M207, the Sântuhalma-Hunedoara express road DJ687, the Simeria-Hunedoara 300mm gas pipeline and the electricity transmission networks of 35, 110 and 400 kv.

Resizing this band of transport is a work in progress, a process related to the increasing number of inhabitants of the two cores of the conurbation as shown in table 1.

The process began after the 1850’s by upgrading the road with asphalt pavement and then later by the construction and upgrading the railways and putting in place of the electricity transmission lines, the last resizing was in the year 2000 when the county road was upgraded to accommodate more intense traffic.

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Table 1. Population evolution between 1850 and 2002 in Deva-Hunedoara conurbation

The band between Deva and Hunedoara also focuses an important part of the industry of the two cores, the location of industries being made here in order to harm as little as possible the human population in the conurbation while still being located so as to provide adequate access to labor.

As mentioned before the settlement system of Deva-Hunedoara conurbation consists of two urban settlements and nine rural settlements. Out of the nine two are located on the main line of force, four are located on the local line of force and the last three are located in the south.

The position of the rural settlements in the internal structure of the conurbation is very
important because as the settlement system develops the rural settlement’s role will change, some will be absorbed by the urban cores, some will be included in the transport band and act like urban spirals for the urban core and some will gain favorable positions on some transport bands and become nodes from which new axes will appear.

The transformation of the settlement system is already under way as the both Deva and Hunedoara approach the closest rural settlements and fundamentally transform them by giving them functions like residential or small commerce. This is clear as in the last five years the five kilometres gap between Deva and Sântuhelm located to the east is almost close, the space along the band being filled with housing, small businesses and storage and with hotels and restaurants. In the same way the four kilometres gap between Hunedoara and Hăşdat is being filled with individual housing.

Of the four rural settlements located in the local band between Deva and Hunedoara two of them, Cristur and Peştişu Mare, become more industrialized and in the near future they will become nodes on the local line of force and they will start new lines of force and help develop the settlement network at a rural scale. Bârcea Mică which is very close to Cristur will eventually form a micro settlement system and Răcăştia which is close to Hunedoara will be given a residential function in the near future.

In the southern part of conurbation, to the south of Hunedoara we can identify the beginning of a force line on which on east-west direction the last three rural areas Groş, Boş and Hăşdat are located. In the west this rural line of force can intersect the regional line Oradea-Drobeta Turnu Severin and in doing so can provide the conurbation with a new connection to the national settlement system. The arguments for this line are the Nădăştia and Zlaşti streams, DJ687 and DJ687I county roads and electricity transmission networks of 10 and 20 kv.

Given all the above we can conclude that the entire settlement network of Deva-Hunedoara conurbation folds to the lines of force of the territory, so Deva and the villages Archia and Sântuhelm are distributed on the west-east main line Arad-Constanta, Hunedoara and the villages Cristur, Bârcea Mică, Peştişu Mare and Răcăştia are distributed north-south along the Deva-Hunedoara local force line and the villages Boş, Groş and Hăşdat are distributed on the west-east direction in the southern of the conurbation(see Figure 2.)

At the level of Deva-Hunedoara conurbation the intersection of various lines of force of the territory forms two mesh structures were human intervention is minimal and so the ecological environment is preserved. The first mesh is defined by all lines of force described above and is located in the eastern part of the local line of force Deva-Hunedoara. The land included within this mesh is used mainly in agriculture and animal breeding but there also is a small cluster of forest located here.

The second eye is only partially defined by lines of force from the conurbation, being situated in the west of Deva-Hunedoara local line and has a better preserved ecological system. Small scale agriculture is practiced in this territory covered by vast expanses forest. The better environmental conservation is due primarily to specific high hill zones and to the lack of access roads structured on territorial lines of force. In the future as the conurbation evolves this western mesh will lose some of its ecological value as new lines of force will evolve and split up the territory. At this time in the western mesh there are fourteen rural settlements belonging to two rural administrative units, these fourteen settlements had a total population of 2,088 people in 2002, the largest of these, the village of Mânerău, had a population of just 303 people.

With an average population of just 150 people these settlements do very little harm to the environment. The hard terrain and low population means that for the moment these settlements, although connected by local roads, are of very little interest and no lines of force linking them to the conurbation can be indentified.

![Figure 2. Present model of Deva-Hunedoara conurbation](image-url)
4. Future form of Deva-Hunedoara conurbation

In the future the conurbation and its settlement system will change due to the continuous urbanization process. This process will not only change both the conurbations cores but also some of the the rural areas of today. Figure 3 shows an optimistic scenario of how the conurbation will look ten years from now.

Deva will develop along the west-east main force line and will close the gap that separates it from the village of Sântuhalm and in doing so creates a continuous stretch of more than ten kilometers of urban space. It is very likely that both Sântuhalm and Archia villages lose their administrative status and be a part of Deva.

Hunedoara, just like Deva will evolve and try to close the gap in the north and south by turning Râcâştie and Hâşdat in urban areas.

On the local line of force between Deva and Hunedoara Cristur and Bârcea Mică villages will form a system with urban like characteristics.

From this system, depending on the evolution of rural settlements in the western mesh, a new rural line of force will be created.

With the exception of creating the new line in the western mesh all the force lines within Deva-Hunedoara will remain the same or gain importance at local, county and even regional level.

In the case of a good evolution at county level it is possible that Deva-Hunedoara conurbation grow and add the small towns of Simeria and Călan to its structure. Simeria is located twelve kilometers to the east of Deva on the same force line as Deva and in 20002 had a population of 10,928 people and is an important railway node in the national rail system.

Călan is located on the regional line of force Oradea-Drobeta Turnu Severin at nine kilometres to the east of Hunedoara and is a former industrial town that after 1989 suffered continuous population drops, the population in 2002 was 9,359 inhabitants.

4. Conclusion

The location and function of Deva-Hunedoara conurbation follows the lines of force of the national territory as suggested by Gustav. Gusti and transposes these force line structures in its internal structure. In the future the structure of Deva-Hunedoara conurbation can be changed by resizing the existing transport bands and creating new lines of force to penetrate the mesh and thus amplifying the current urbanization process and strengthening the regional and national position of the conurbation.

References:

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