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**The interaction of major components
of the defence infrastructure and
the possibility of their joint development**

the author's overview on his above PhD thesis

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1. Justification of the subject selection and the definition of the scientific problem

In my PhD thesis I intend to demonstrate the extremely complex and permanently changing internal relationships of the **national infrastructure** in terms of its extensions and content. In the course of this I first define the **defence infrastructure** and describe the major expectations concerning its requirements. In connection with these I highlight the protection of the national critical infrastructure. I separately examine the adequacy and the still existing shortcomings of the **transport infrastructure**, a major branch in the North Atlantic Treaty Organisation¹ and the European Union² in terms of defence requirements. I highlight the circumstances of the **military infrastructure** and its major development directions as they are represented in the resource plans. I describe the perspective role of the evolving **logistic supply centres**, which can be decisive elements in the development of the region later on, and can also, if need be, contribute to the execution of logistic functions required by national defence. I prove that there is a really strong system of connections between the **national and the defence infrastructure**, and I point out their coaction, **interaction**. Finally, based on the all this I identify the major possibilities of their **joint development**, which in turn will foster the growth of the national defence capabilities, the **security of the country**.

The **timeliness** of the research subject is indicated by the joint issue, in which the Alliance and the Union led international responsibilities and the national expectations coincide. Besides, historical timeliness is also a factor with facing the recent, the 21st. Century's threats and challenges as well as finding the answer to those. The real **novelty** of the subject is also highlighted by the examination of the defence infrastructure development in the security environment of the European Union, the analysis of the joint development directions of the national infrastructure and the defence infrastructure, complemented by the birth and role of the national logistic supply centres.

In order to identify the **scientific problem** first we have to define what is meant by defence infrastructure in the present day, and the scope of the **defence infrastructure**, which has not been made as yet. Then we have to find out to what extent the major elements of the defence infrastructure satisfy the requirements related to the country's defence capabilities, its defensive preparedness.

The next task is to identify how the **elements of the national and the defence infrastructures** affect each other, then through this **to justify their interaction**. As a result of this the **effects of the national infrastructure developments** on the defence capabilities of the country have to be seen. At the same time we also have to prove that the defence infrastructure investments **expedite the development of the national infrastructure**, thus satisfying civilian and civic demands too. Then from the present conditions of the **military infrastructure** and its shortcomings in terms of the international and national requirements the consequences can be drawn, as well as the medium and long term development directions, investments can be analysed and planned. These have to be integrated into the unified system of the national **integrated defence concept**. As a result we can see in what areas and how the development of the **national, defence, and military infrastructures** can influence, assist or complement one another.

¹ North Atlantic Treaty Organisation, NATO (hereinafter „Alliance”)

² European Union, EU (hereinafter „Union”)

2. Research objectives

The most important objective of my PhD thesis was to **analyse** the defence requirements of the infrastructure, to **examine** the situation of the transport sub-branches as an example and to **produce proposals** concerning their joint infrastructure developments. Certainly the requirements described in my thesis are not decrees, they will continuously change together with the daily political, security conditions. What we can surely declare as of today is that the requirements for the nationwide and overseas mobility of the defence forces will increase (e.g. contribution in Iraq and Afghanistan, military missions).

Objectives of my research:

- 1) **To examine** the elements of the national infrastructure important from the defence point of view, identifying its shortcomings and the capabilities missing in terms of defence.
- 2) **To define** the notion „defence infrastructure”.
- 3) **To analyse** the expectations and the complexity of the military infrastructure development.
- 4) **To answer** the existence and the nature of the interaction between the national and military infrastructure developments.
- 5) **To elaborate** proposals fostering the possibilities of joint and cost-effective infrastructure developments.
- 6) **To examine** in the security environment (alliance and union) the national infrastructure from the defence aspect.
- 7) **To contribute** with my own research in answering the major questions and fostering the birth of new scientific results by drawing the consequences.

3. The character and the methods of research

My research involves **in general** the infrastructure related areas of the new Strategic Concept of NATO³, the Allied Defence Capabilities Initiatives, the NATO Prague Summit⁴ commitments and the Istanbul Summit⁵ decisions, the Allied and Union security policy, the security and defence policy principles of the Republic of Hungary⁶, the National Security Strategy⁷, the National Military Strategy⁸. Besides I analyse the development of the national military infrastructure based on the lessons learned during the defence review and the transition to a volunteer force.

³ 23-24. April 1999. Washington

⁴ 21-22. November 2002.

⁵ 28. June 2004.

⁶ 94/1998. (XII.29.) Parliament Resolution

⁷ 2073/2004. (IV.15.) Government Resolution

⁸ Prepared as a draft.

My research **does not involve** all the important elements of the defence infrastructure, like power supply, information technology, telecommunications, public utilities and environment protection. I could not undertake the detailed description, analysis of the whole spectrum of the complex infrastructure related to the defence infrastructure in my thesis – thus the evaluation of all areas of military infrastructure – due to its magnitude and the my lack of profound knowledge in the specific areas.

My research activity is basically **theoretical in nature**. In terms of its subject and goal it is aimed at a concrete, relatively well defined topic, which comprises the processing, the systematisation of documents related to the subject, produced in several ministries as well as of international literature and at finding the theoretical connections between them. The theoretical approaches are well illustrated by the ongoing civilian and military developments, on which the present study is based in terms of facts, figures and examples (e.g. investment data).

The thesis is based on theoretical and applied research terminated on 31st. August 2006.

Methods of research:

- research of national and international literature in order to identify and process the subject;
- using specialist literature in order to profoundly justify the analyses, consequences, proposals, and to show the connections;
- processing the knowledge acquired at national and international consultations, discussions;
- utilising the experiences acquired at foreign study tours;
- Systematisation, evaluation of my own experiences in the subject.

4. Major issues, working assumptions come up during the research and the structure of the thesis

Major issues come up during the research activity:

- 1) Does the national infrastructure meet the defence requirements?
- 2) What impact does the development of the national infrastructure have on the defence capabilities of the country?
- 3) How can the defence infrastructure be defined?
- 4) What are the directions of the necessary development of the military infrastructure and how do they impact on the defence capabilities of the national infrastructure?
- 5) In what areas and how can the development of the civilian and military infrastructure support each other?
- 6) How can the evolving logistic centres support the defence activities, how do they impact on the defence capabilities of the country's infrastructure network?

Working assumptions:

The following working assumptions motivated the formulation of the core scientific problem, the goals of my research, the findings of the research and the further definition of the research:

- 2) **Is it justifiable**, that in the changing security policy environment the national infrastructure has to be taken as an integrated system, bearing in mind its impact on the defence, security of the Alliance, the Union and the country in general?
- 3) Do the national and international security policy requirements expressly **necessitate** the need to develop the defence infrastructure?
- 4) **Is it justifiable**, that performing the recommendations, commitments as Host Nation Support in peacetime among others is represent in the increase of the country's defence capabilities, the successful completion of which can be ensured by the registration and development of the defence infrastructure?
- 5) **Is it verifiable**, that recent military activities are more and more based on civilian capabilities, which is built on closely harmonised, supporting activities of the national defence organisations and that this can be traced in the field of infrastructure?

In line with the research objectives and in consideration of the working assumptions my scientific study is divided into **five main structural sections**.

In the **first chapter** I explain the system of the **national** and within that the **defence infrastructure**. I think it is necessary to show the international security situation, the allied environment, and the major tasks of our forces so that the system of tasks of the defence infrastructure could be explained in general. For this purpose we need to look at the security and defence policy principles of the country, the responsibilities of the participants, and in advance we have to present the notion system of the national infrastructure and the defence infrastructure, and the effect that their development have on each other.

In the **second chapter** I first define the **defence infrastructure** and mention the major elements of the national infrastructure important from the defence point of view. A fundamental requirement related to these elements is that they serve as conditions of national defence location, operation, mobility, command, and that they have to be protected from internal and external effects which jeopardise security. Then, besides mentioning the critical infrastructure – focusing on a smaller area – I examine and analyse one by one the **sub-branches of the transport infrastructure** in Hungary in terms of their compliance (performance) with the defence requirements, so identifying their shortcomings. The particular analyses are aimed at finding out to what extent do the capabilities of the Hungarian transport infrastructure live up to the requirements arising from the Allied membership.

As a part of the contribution to the defence of the country I highlight – as a new thought – the defence infrastructure capabilities of the **Logistic Supply Centres**.

In the third chapter I write about the **demand formulation for the military infrastructure**. One of the major components of the requirement system is the demand for the armed defence of the country, as it is described in the security and defence policy of the country. This is organically complemented by the performance of the tasks arising from commitments as members of the Alliance and other international treaties. A part of this is to satisfy the requirements of **Host Nation Support**. In order to successfully meet the requirements of the military infrastructure it is a must to prepare the defence infrastructure in peacetime, to plan and carry out the defence related **investments and developments**. The military infrastructure developments only together with the national investments can satisfy requirements of the national defence capabilities. Besides we have to consider the permanent transformation of NATO and the EU and the ongoing force reform in Hungary. In this topic I illuminate the role of the military infrastructure within the defence infrastructure and how the military infrastructure can affect the national infrastructure.

The fourth chapter lists the necessary and possible alternatives, directions of military infrastructure development and highlights NATO's Security Investment Program. This chapter – in terms of logic – is divided into the following sub-sections. Within the first I present the **ongoing military infrastructure developments**. In its sub-section I deal with the tasks arising from the transition to a volunteer force. Then I mention the military capability increase in the country's defence as a result of the Gripen development program and the Vehicle procurement Program, a part of our NATO contribution. Later I analyse the Host Nation Support together with NATO's Force Goals. Finally I touch upon the reconstruction of the HDF Central Military Hospital, presenting the interaction of the military infrastructure and the defence infrastructure development. In the following section I shortly describe the principles of NATO's **Security Investment Program**, its major successes and the infrastructure development areas of it which match the national defence requirements. In the third section I outline **those infrastructure development plans still in the preparation phase**, which will have an effect on the national defence infrastructure. Finally I highlight the infrastructure significance of the **Logistic Supply Centres**.

The **fifth chapter** summarises the experiences, draws the conclusions, and gives proposals for joint developments and provides recommendations how to utilise the thesis (e.g. in developments, research, economy, science, education), as well as formulates the scientific results of the research.

5. Summarised conclusions

The many force reforms and the joining to the North Atlantic Treaty Organisation and the European Union after the change of the regime have established the conditions to create a vision for the Hungarian defence forces. The tasks arising from the preparation for national defence and our allied requirements come up in an integrated way. We define our national security in the security system of NATO and the EU, and identify our defence tasks in line with plans co-ordinated with the Alliance. The **extension of the notion defence** beyond military defence makes it possible to sum up the requirements related to infrastructure and to define the so-called „authoritative defence factors”.

In the present situation, the tasks of the organisations and forces of defence can well be defined, based on the system of tasks the defence related responsibilities of the national infrastructure **could be concluded**. It is obvious that **complex management of defence** can only be achieved through close co-operation of the ministries and organisations

involved. I think that these ministries and organisations are looking for the line that could ensure the perfect harmony. This has been proved by the recent endeavours. This is why I sought the possible solutions in the tasks and vindication of interests rather than in the existence of organisations.

In the system of **defence preparation** the planning, organisation and execution of tasks assigned to the civilian elements of the country's defence can only be achieved with the participation of the administrative and defence administrative organisations. Only the **central co-ordination** of the defence preparation can **ensure** the effective and successful execution of governmental tasks. The system of defence administration does not only serve as the **armed defence of the country** but also as the preparation for **disaster situations**, a shining example of which is the necessity to participate in the recent flood relief at the rivers Tisza and Duna. Similarly we have to manage the nuclear disaster relief issue, which has to be handled with special attention when increasing the defence capabilities.

One of the key issues of the defence preparation of the country is the planning of tasks, to execute the approved decisions to plan, an important element of which is the analysis of the defence infrastructure, the registry and development of its capabilities.

In the present order based on the governmental decisions the ministries and the defence administration organs – appropriately – autonomously conduct their dedicated responsibilities. At the same time I conclude that in reality the **required harmony is missing** from these organisations, which could ensure the Defence Planning System working in a unified way. The National Defence Planning System should ensure among others the professional foundation of decisions related to the NATO commitments of the Republic of Hungary, as well as the governmental unity of the tasks to be performed by the defence administration organisations.

So far the **centralised defence co-ordination system based non interministerial co-operation** has not been established (e.g. in the Prime Minister's Office), which should perform the **staff control the governmental operation**. Arising from these we can conclude the requirements and the defence tasks for every ministry, the solution of which is the responsibility of the ministers.

In my thesis I summed up those important principles, theoretical considerations upon which my analyses and examinations are based. As an example I **examined** from defence aspect the **existing capabilities** of the national transport and military infrastructure. By comparing the requirement to the existing capabilities – analysing one of the major branches – I have **identified the missing capabilities** of transport sub-branches from defence aspect. I have identified severe shortcomings, problems in the area of road, rail, air and inland water transport. For each transport sub-branch I have **defined the important elements of developments in terms of defence necessity** and have presented **particular project proposals** without the intention to be exhaustive.

Earlier studies dealing with the transport situation of the Central Training range and the Táborfalva **military shooting and manoeuvre ranges** can be fully integrated in my scientific research, and I have **presented my development proposals** for road and rail transport based on these research findings. These two areas play an important role not only in war time but are also significant venues of training and allied exercises, firing exercises, as well as they are vital for the civilian counterparts and the disaster relief organisations.

The proposed developments at the same time would assist the development of the national infrastructure as well.

In the analyses of great assistance were the tasks related to recent international commitments and those international military actions in which Hungary was the transit country. Since we became a NATO member several exercises have been held in Hungary the transport experiences of which I could take into account.

Despite the complex understanding of defence I have taken as a basis the military defence with the most movements, assuming that the tasks of greater defence would require less mobility than the armed defence of the country, for which allied augmentation forces are also needed. **The road infrastructure**, which is the mostly used considering the probable, most important routes of the defending forces have been analysed by considering the transit capabilities of the roads, their technical parameters, the load-bearing of the bridges, width of the road surface, their load-bearing capabilities and the obstacles overhead. I have analysed the **rail network**, highly important in defence transports mainly in terms of major transit routes. At the analysis of the **air transports** performance, besides the appropriateness of the air traffic control and the many airport facilities, I have **identified** the extremely weak infrastructure capabilities of our airfields and have illuminated the most important development requirements. Although **water transport** is not important in Hungary, I have defined its special defence connections, the possible capacities and made my proposals, which consider the **logistic bases** deployed next to the large cargo ports, too.

In my thesis I summarised the most important development goals of the transport infrastructure, and the major milestones of the preparation, approval and realisation of the **development goals required for defence**. I divided the goals into two parts, the first being the regulatory and legal, the second being technical and economic, which are listed among the proposals (PhD thesis 5.2.1).

In the case of the transport development areas, which require so-called complementary investments, or autonomous defence projects due to the defence preparation, **I have analysed the funding possibilities** as well. On the resource side **I have presented four different possible processes**. **I have proved** that the most remarkable option is where within the NATO Security Investment Program the **common funds of the Alliance** can be the target.

The national level system of tasks related to **Host Nation Support** requiring governmental responsibility necessitates efforts not just from the ministry of national defence but from all other ministries as well in peace and war time alike. That is why I consider it of outstanding import that the identification, decision and co-operation capability of the interministerial level contacts should be number one priority. For the Host Nation Support tasks the personnel is prepared and committed, while the **co-ordinating organisational component** (e.g. in the Prime Minister's Office) to centrally manage the interministerial activity is not in place.

The prerequisite of the realisation of the **described action program** is to integrate defence into the system of transport policy and transport development and to bring the **defence requirements** to light. Another important requirement is ensure that the **transport**

module of the information system supporting Host Nation Support should be **credible and up-to-date**.

According to my proposal the preparation, planning of most important investment, development tasks important from defence aspect has to be started immediately. After the technical-economic preparation based on the magnitude of the problem different level proposals have to be taken in order to expedite the decision making. Especially elaborate preparation is required (technical-economic, diplomatic) in the case of our infrastructure development related proposals, which are aimed at the **NATO Security Investment Program**.

As for me the present thesis fully identifies the defence connection principles of transport and transport development, but certainly in terms of technology, economy and law more detailed analyses are required than before, which are beyond the scope of this study.

I am convinced, that based on the system of requirements arising from our allied commitments and the mission of the defence forces the analysis of the national transport infrastructure capabilities is of paramount import recently.

I am convinced, that even the partial realisation of my proposals in this thesis, and the proposed action program can significantly increase the transport branch's contribution to the defence infrastructure development. At the same time it assists the increase of the technical quality and capacity of the national transport network as well as the development of the peace time civilian transport conditions. The proposals concerning the transport branch are good examples for the **possibilities of the mutual effects of particular areas within the defence infrastructure and their joint development**.

6. New scientific results

In my PhD thesis based on my scientific research I can report the following scientific results:

- 1, **I have defined** the notion of defence infrastructure in connection with the notion system of national infrastructure, military infrastructure and critical infrastructure.
- 2, **I have identified** within the defence infrastructure the most important actions, areas of development from the aspect of the transport network compliance to the defence requirements, which harmonise with the directions of military infrastructure.
- 3, I have analysed the required and possible directions of the defence and the military infrastructure developments, on the basis of which **I have made proposals** for their major areas. Furthermore I have justified that the **developments have effect on one another**, their mechanism, connections.
- 4, **I have justified** that the large Logistic Supply Centres are important elements of the country's defence infrastructure and **I have identified** the possibility of their dual role and their function in defence.

7. Proposals and recommendations

7.1. Proposals

In the interest of the military infrastructure development I propose to establish the **appropriate organisational structure**, and within that to put back the **control of the military infrastructure on defence ministry level** (national development tasks, infrastructures for missions, control of joint NATO development tasks).

Based on the new structure of the defence forces and the allied missions I propose to work out a **medium term infrastructure concept** and its consistent execution free from political influence.

Furthermore I propose to establish a closer professional co-operation between the organisational elements of **the Ministry of Economy and Transport (GKM) and the Ministry of Defence**, which would require more effective co-operation in the course of investments, developments related to my thesis subject.

I deem it necessary and propose to assess in detail the areas of defence infrastructure, to maintain them in a **capability catalogue** and **to prepare plans** aimed at the improvement of defence capabilities. Considering that most of the critical infrastructure facilities in Hungary are elements of the defence infrastructure I propose the **accurate assessment of these critical infrastructure elements** and to prepare and schedule the required **measures increasing defence capabilities**, as well as investments.

From the **professional branch defence tasks** detailed in my thesis it can be felt the required and proposed transport infrastructure development tasks are more or less the same as the civilian modernisation demands, but from time to time they also include more. The answer to the identified defence requirements will basically dictate the ministry's contribution to the defence capabilities. So it is extremely important how the Ministry of economy and transport will react to the proposed topics and what **action plan** they prepare and execute.

The particular **defence requirements have to be compared** to the ongoing transport developments and wherever possible corrections have to be made. Having clarified the magnitude of the tasks derived from the defence requirements a proposal has to be submitted to the minister of economy and transport on the problems and the rectification tasks. After the theoretical decision study drafts, or **feasibility studies have to be prepared** concerning the first priority projects.

On the preparation and funding of the defence related developments continuous **co-ordination** is required with all the other ministries directly involved in defence. An appropriate **forum** of this can be an interministerial **Security Investment Committee** at state secretary level.

Having the feasibility studies at hand the developments have to be categorised in terms of **affordable funding** as follows:

- general network development projects funded by the GKM,

- developments, area developments, projects on regional development, infrastructure developments etc. with EU support,
- transport developments funded jointly with the defence ministry,
- developments funded within the NATO Security Investment Program budget.

The projects planned within the **NATO Security Investment Program** have to be prepared, and the topic has to be presented at different NATO fora (Infrastructure Committee, Senior Resource Board), and documents have to be prepared in advance for the extension of capability packages (e.g.: „Minor Works” definition).

After the technical-economic preparation **a decision is needed** on the realisation of particular projects, and then the **defence development schedules** have to be prepared. Based on the tasks and decisions feasibility or tender plans have to be prepared then in possession of the licences the execution has to be started as well as the continuous realisation of projects.

In my judgement the realisation of the proposed action plan can immensely increase the contribution of the transport branch to defence as well as technical quality of the national transport network **without significantly more funds**. This is a shining example for the for the **interaction** of the defence infrastructure elements and that **their development** could serve multiple purposes.

As the first step of the process, as the result of the research **I propose to prepare a priority list of the tasks** and the development areas described in the present PhD thesis. The priority list has to be prepared in terms of **affordability** and **it has to be co-ordinated with the involved ministries**.

7.2. Recommendations

- the thesis provides a **system aspect basis** concerning the connections of the national, the defence and the military infrastructure,
- **it contributes** to the identification of required development areas by revealing the shortcomings in the defence infrastructure, and to the preparation of the priority list based on it,
- **it serves as a basis** for the repeated review and evaluation of the governmental task,
- **it creates a basis** to utilise the possibilities of joint infrastructure developments,
- **it provides a theoretical basis** for the possibility to create a double function for the Logistic Supply Centres,
- **it provides a theoretical basis** for the instructions in schools teaching infrastructure,
- **it enriches** the library of the Zrínyi Miklós National Defence University, and assists the work of the researcher as a source document.

In my judgement the content of the PhD thesis can be **utilised in practice** in the activities of the following organisations:

- Ministry of Defence and its organisations
- Ministry of Economy and Transport
- Ministry of Local Governments and Regional Development

- Ministry of Finance
- Higher education.

8. List of publications

- 1, NATO Security Investment Program, its operations, and major development areas concerning Hungary (Technical Military Journal, 2002./3-4.)
- 2, NATO Security Investment Program, analysis of its major realisation areas in Hungary (Technical Military Journal , 2003./1-4.)
- 3, The preparation of the designated military airfields in Hungary in line with NATO requirements (Bolyai Review, 2002. Special Edition III.)
- 4, Unified control principle of the Air Command and Control System in NATO countries (Bolyai Review, 2004. Special Edition)
- 5, The History of The Development and Improvement of Hungarian Airfields (Academic and Applied Research in Military Science, Volume 3. Issue 5. 2004.)
- 6, Elements of NATO Security Investment Program (New Defence Review, LVIII. 2004./10.)
- 7, Comparing the past and to the present in the history of the Kecskemét and Pápa military airfields (New Defence Review, LIX. 2005/8.)
- 8, Underground defence capabilities (New Defence Review, LIX. 2005/5.)
- 9, Madarska in Natov program investicij na področju varnosti – Journal of the Slovenian Defence Ministry (Slovenska Vojska, 29. April 2005. Leto XIII./8.)
- 10, Interpretation of the defence infrastructure in the present day (Bolyai Review, 2005. Special Edition)

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