



Business clusters in spatial planning

Three Danish Case-studies. Hernng - Randers - Naskov

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Business Clusters in Spatial Planning

Three Danish Case Studies

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Business Clusters in Spatial Planning
Three Danish Case-studies. Hernng - Randers - Nakskov

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Foreword

This report serves a double purpose. On the one hand, it is part of a study on the geography and planning needs of business clusters initiated by the Spatial Planning Department of the Danish Forest and Nature Agency. On the other hand the study is being part of a study on spatial planning and local strategies under the Interreg IIIB project Medium Sized Cities in dialogue around the Baltic Sea (MECIBS).

The report analyzes whether the business clusters which can be statistically identified in the Danish regions deserve special spatial planning measures. The report is based on three case studies from regions around the towns of Herning, Randers and Nakskov. Contact with these towns has been established during the MECIBS project. In Herning, the partner in the MECIBS project is the Herning-Ikast-Brande-Aaskov Business Council. In the two other towns, the partners are the two city councils. In each of the three towns studied, the researchers carried out interviews with politicians, officials, business organisations and municipal cooperation offices. In Randers, in cooperation with the Randers Business and Development Council, a questionnaire survey was administered among the firms in the three local business clusters in order to analyze whether they see themselves as part of one of these clusters, and whether the firms believe that there are cluster-determined needs which the local business and planning policy should address. We would like to thank all the many parties which have generously given of their time for the visits or answering of the questionnaires. The study has been conducted by senior researcher Niels Boje Groth and research assistant Søren Smidt-Jensen. Student assistant Jacob Grande has assisted in the processing of the questionnaires and the drawing of the digital maps. The statistical data on the clusters in and around the three towns has been made available by the Spatial Planning Department.

Introduction

Regional developmental potentials and developmental features vary from one region to another. Therefore, regional development policy and planning should also follow different pathways in the different regions and focus on local strengths and competencies. Such a notion has become mainstream thinking in business politics and is not foreign to spatial planning. Even though spatial planning builds upon a common set of general rules, the spatial planning tradition has been created through the solving of problems in their local contexts.

In business policies the interest for the regional dimension of has been feeded by the fact that manufacturing is to an increasing degree being carried out in networks of firms which sometimes (but not always) derive an advantage from being located in geographic proximity. In special cases, there can emerge regional complexes of supplier-, customer- and service enterprises. In cases where such complexes are linked to a special capacity and knowledge to produce and develop a certain type of production, e.g., furniture, information technology or food production, one can term this concentration a 'business cluster'. Such production capacity is related to formal knowledge and evident skills. But to an equally great degree, the special capacity lies in the functionality which consists of the local labour market adapting itself to the cluster's special needs, and to local development of a special network of service functions and subcontractors.

The development of production networks is linked partly to the international division of labour that arises with the outsourcing of production and back office functions to low-wage countries, the increasing importance of marketing, design, research and development in the old 'mother countries' and the general change of industrial society into a service-oriented and information society.

One might assume that with a geographic concentration of associated firms there arise special needs for the design of infrastructure, land-use regulation and design of business areas, and thereby a special need for spatial planning. Hence, the purpose of this project is to investigate how spatial planning can best integrate with business policy efforts of recent years to build regional development on the basis of the business competencies of the local areas, i.e. regional clusters.

This case study builds upon a statistical examination of production clusters in Denmark, carried out by the Spatial Planning Department, Danish Ministry of the Environment. In this study, the Spatial Planning Department has undertaken a mapping of the geographic placement of the business clusters. In statistical terms, a cluster was defined with the help of the resource areas statistics elaborated by Danmarks Statistik, Statistics Denmark, which defines a resource area as groupings of cooperating branches within selected production areas, such as manufacture of furniture, food products, garments or IT/communication or various groups of services. In their study, the Spatial Planning Department identifies a geographic business cluster when the employment within a resource area in a municipality or a connected group of municipalities is 25% above the national average and at the same time has an overrepresentation of at least 500 employed persons. Following these criteria, 149 business clusters have been identified in Denmark. They employ 26% of Denmark's total wage earners. About 100 of the business clusters, or two-thirds of them, are located in more than one municipality. An equally large proportion of business clusters have between

1000 and 5000 employees and are small by international standards. The largest cluster, IT/communication in the Greater Copenhagen area, contains a total of 78.400 employees.

In the present study the role of business clusters in spatial planning in three selected municipalities: Randers, Herning and Nakskov is examined. The purpose is to investigate whether the business cluster concept is applied in the municipalities' spatial planning. Here it will be elucidated whether the municipalities planning pays special attention to the development of the business clusters.

The key question for this study is thus: *Do business clusters play any role in the municipalities' spatial planning?*

The study is based on fieldwork in the municipalities of Herning, Randers and Nakskov and was conducted in the autumn of 2003. Conversations and interviews have taken their point of departure in the work of the municipal administration and the local business councils. The local businesses were also involved to varying degrees. In Randers, a small questionnaire survey was carried out among the firms in the three identified business clusters. The survey, carried out in cooperation with Randers Business and Development Council, sought to determine the extent to which business clusters play any role for the firms. The study also draws on a broad range of primary data collected as part of the international research project 'Medium-Sized Cities in Dialogue around the Baltic Sea'. This project, conducted with support from Interreg IIIB, evaluated the common experiences and strategies in smaller middle-sized towns under conditions of economic and functional restructuring (see www.mecibs.dk). A report has been written for each of the three towns studied here. The results are summarized in the first section. In order to describe the extent to which the cluster idea is utilised in local business policy, a special section in the appendix of this report reviews business policy in the three municipalities and the interaction between the local and regional business policy.

Summary

Business clusters have been identified by the Spatial Planning Department on the basis of Danmarks Statistik's cluster statistics. The results for Herning, Randers and Nakskov are shown in Table 1. In Herning, the textile sector contains two clusters: manufacture and service. With its 6100 employees, garment-manufacture constitutes the largest cluster. However, it is a cluster with declining employment. In contrast, there is another textile cluster, garments-service which is growing, reflecting the restructuring of the textile branch now taking place in the region. Other business clusters in Herning are furniture manufacture and manufacture within the construction and housing sector. Both these clusters have increasing employment.

In Randers, the largest cluster is that of medico-service. Most of the firms in this cluster are comprised by the local hospital and the physicians with family practice. The second largest business cluster are support businesses within foodstuffs. In this cluster one finds, for example, grain and feed firms, packaging producers, machinery sellers and machine workshops. The next clusters are made up of production firms within furniture and transport.

In Nakskov, only one cluster has been identified: medico-service. As in Randers, this cluster is made up of family physicians and public institutions within the health sector.

Table 1. Business Clusters in Nakskov, Randers and Herning

In the cells: Number of municipalities in the cluster Number of employees in the cluster Trends of employees in the cluster 1994-99	Nakskov	Randers	Herning
Food processing – Support industries		5 2000 increasing	
Furniture – Manufacturing		6 1100 -	10 4200 increasing
Garments – Manufacturing			13 6100 declining
Garments – Service			3 1400 increasing
Construction/housing – Manufacturing			8 5900 increasing
Transport – Manufacturing		3 1200 declining	
Medico – Service	2 1400 declining	1 4600 -	

Source: Spatial Planning Department, 2001

The municipal officials are generally familiar with these clusters. But this familiarity has not given impetus to concrete spatial planning initiatives. None of the three municipalities has

identified special spatial planning needs which can be directly linked related to the existence of these clusters.

Cluster planning

Even though business clusters have not given impetus to special planning initiatives, the municipalities nevertheless apply the concept of cluster in their planning and business policies. However, this occurs most often with a special focus on the formation of new clusters in the context of an idea or a concept regarding a specific type of firm though to have unique developmental potentials in the area. In Randers, efforts have been made to create such a new cluster of media firms in connection with the siting of the headquarters of the TV-2 East studio in the town. With the establishment of the Danish second channel (TV-2), the headquarters for TV-2 East studio was placed in Randers. The city council offered an attractive building by the harbour, a former grain storage facility now renovated. The idea was that the television station could contribute to the formation of a network of sub-contractors within the media branch, and that the environment around these enterprises could further stimulate the growth of a media cluster. However, the staff of TV-2 East never actually moved to Randers, and because many broadcasts were tied to political meetings in the county council and city council in Århus. Ultimately, the headquarters moved to its current location in Århus.

A second example from Randers is the local business council's attempt to cultivate a special competence within industrial assembly processes. The business council had observed that several firms work with assembly of components for finished products, such as the building of railroad cars at the 'Bombardier' plant. The business council has therefore promoted the establishment of a special 'knowledge centre' within the assembly sector and has formed a network of local firms whose production is based on assembly and montage. What characterizes these firms in such a cluster is that they apply the same type of technique and therefore have common problems in the production process. They are developing and seeking out the same type of technical competencies. This form for clusters distinguishes itself from the clusters which consist of firms within the manufacture of a certain type of product.

In order to distinguish the two types of clusters from each other, we will call the first a 'functional cluster' and the second a 'production cluster'. It is the production clusters which are the focus of this study. They are statistically defined 'from above' on the basis of an assumed production kinship between firms. The functional clusters thus distinguish themselves as being defined 'from below', by people with familiarity to the local firm environment and are therefore based on a kinship between firms using related types of labour processes and work functions.

Functional clusters can very well be formed between firms that belong to different production clusters. Such a relation between a production cluster and a functional cluster is found in the Herning area. As indicated above, Herning has four production clusters (furniture-manufacture, garments-manufacture, garments-service and construction/housing manufacture). Across these clusters, there is the experience that many firms are subcontractors. Regardless of their eventual affiliation to a specific production cluster, these subcontracting firms have special needs for further education in aspects such as, contracting, marketing and internationalisation. In order to meet this need and in order to develop a special subcontractor competence, a special knowledge centre for subcontractors

has been established. Like the assembly cluster in Randers, the subcontractor cluster is not linked to the product but to a functional feature of the firm.

Figure 1 illustrates how the functional clusters stand for a horizontal kinship between firms which crosscut the vertical kinship in the production clusters.

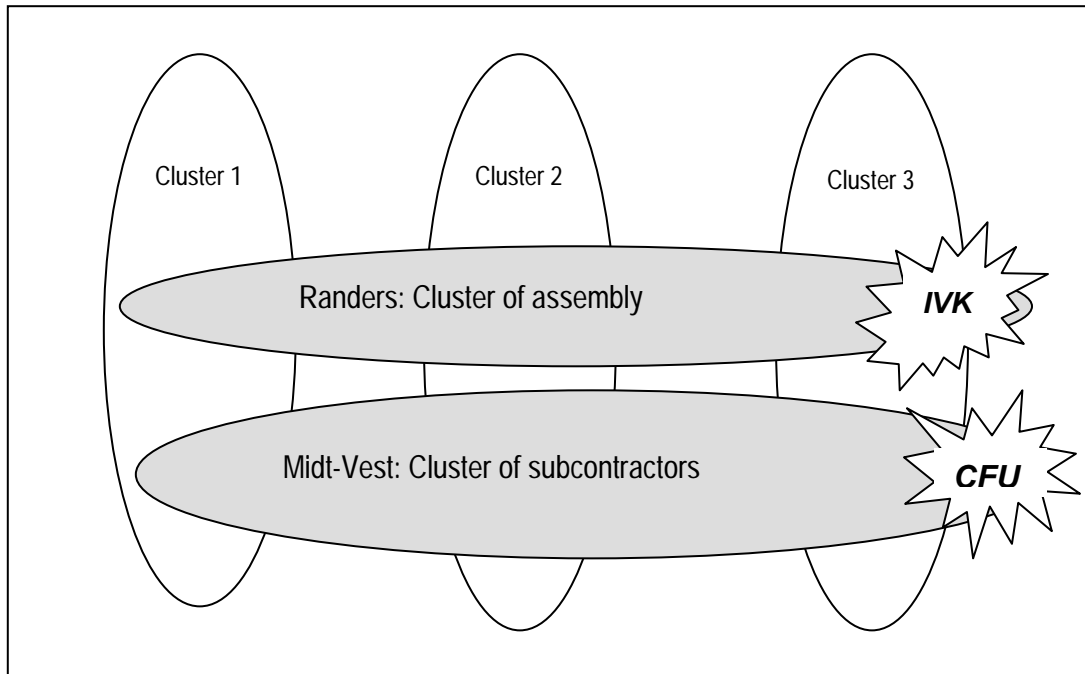


Figure 1. Vertical product clusters and horizontal functional clusters

IVK: Industrial Knowledge and Competence Centre sustaining the cluster of assembly in Randers. CFU: Centre for Subcontractors in Herning sustaining the Midt-Vest functional cluster of subcontractors. K1, K2, K3 illustrate three production clusters.

Herning also contains the Birk Centepark business and educational district, which has several organizations, educational institutions and firms, many of which are tied to textile manufacture, marketing and product development. Many of these institutions and firms are closely linked to the restructuring and further development of the textile industry that has taken place in connection with the very significant outsourcing of manual labour in textile production to Poland and Lithuania in the 1990s. The physical form of Birk Centrepark, with its very high degree of architectural quality and integration of art and architecture in the area, emphasizes that the physical form has not only aimed toward the functional procuring of space to the firms and the institutions. It also reflects an effort to create an area which unites function and quality into a concept of a 'learning environment', in which close cooperation is established between higher education, R & D, in-service training, business promotion actors and new innovative firms. The key concepts here are 'innovation', 'knowledge', 'education', 'business creation' and 'cooperation between public and private firms'. It is clear that it is not only functional cooperation or a functional transfer of knowledge that is emphasised. There is an effort to create frameworks which stimulate creative cooperation and knowledge transfer. Therefore, the educational institutions, youth dormitories, interest organisations and firms are functionally located close to each other and their framework of ideas binds them together into a concept which is emphasized by the urban and landscape framework and kinship in architecture and art.

Firms and functions which are bound together in this way we will call a 'concept cluster'. Unlike the production cluster, the conceptual cluster does not emerge via the market but via a political/organisational idea which can evolve into a production cluster or operate as support for the further development of a production cluster. The media cluster mentioned in Randers represents such a politically created idea for the formation of an enterprise cluster, i.e., it is a concept cluster.

The same idea can be seen in Nakskov's Industry and Environment Park. The idea for Nakskov Industry and Environment Park emerged in connection with the building of the Vestas windmill factory in the former shipbuilding area. Local leading politicians and professionals had concluded that Nakskov cannot wait for outside assistance to solve the economic crisis, which had come with the closing of Nakskov's historic shipbuilding industry. Rather, the municipality must rely on own actions. Thus, the municipality engaged itself intensely into cleaning up the giant shipbuilding area along the harbour and got the idea to create a business zone which could especially attract environmentally-oriented firms, calling it an Industry and Environment Park. An element in this concept is the municipality's decision to establish itself as a bridgehead for export of environment-friendly technology to Eastern Europe.

In Nakskov Industry and Environment Park, the municipality is pursuing the establishment of several mutually advantageous linkages between firms in the area, so that they can cooperate symbiotically. For example, when the Nakskov Sugar Factory was faced with environmental requirements to build its own purification facility, the municipality ensured that the facility would be sited in the Industry and Environment Park in proximity to the municipality's own purification facility in order to enable an operational cooperation between the two facilities. Shortly after the establishment of Vestas, two of its subcontractors, Skagen Sandblasting and Ship Service and Poul Ree A/S, located themselves next to the Vestas plant.

At the harbour area, a logistical zone has been constructed for local firms with facilities for loading and unloading. The municipality's heating and waste disposal plants have also been placed in the zone, and the municipality has initiated experiments with electrolyte and biological cleaning of harbour sludge residue with the goal of establishing such a facility in the area, possibly in cooperation with Vestas, which also has three experimental windmills there. In the zone immediately south of Nakskov Industry and Environment Park, the municipality, in cooperation with the neighbouring municipality, has reserved space for agroindustrial firms which will be able to exploit the surplus water from the sugar factory for the production of non-food products.

Discussions with the three municipalities in this study show that they apply the cluster concept in their business policy and spatial planning. In all the municipalities, there is a knowledge about and attention directed towards the local special features in the production. Even in Nakskov, where no statistically identifiable production cluster has been identified - beyond the cluster in the health sector - attention is paid to the unique workers' culture which arose during the era of the great landed estates and continued with the industrial era's new 'estate owners', the sugar factory and the wharf. The municipality is thus aware of the local specificities in production, but seldom applies the 'cluster' concept to those firms which create these local specificities. Similarly, the municipalities have not taken special planning initiatives directed toward the local production clusters. This is

probably due to the fact that the production clusters emerge 'by themselves' via the market and are not created via any genuine planning effort.

All three municipalities, however, plan for the creation of what we have termed 'functional clusters' and 'concept clusters'. The spatial planning can at times greatly contribute to the formation and design of the concept clusters, as is the case with the formation of Birk Centrepark and Nakskov Industry and Environmental Park and the Media House in Randers. In cases where the municipalities seek to establish a cluster via the creation of networks between firms, it is the network and cooperation which is the instrument, and not the spatial planning as such. This was the case with the creation of the assembly cluster in Randers and in the cooperation between subcontractors in Herning.

The question is whether institutions such as for example the HIIH wind knowledge centre, the Centre for Subcontractors in Herning and the Green Centre and Syd-Tek in Holeby near Nakskov are parts of the clusters which they aim to stimulate (windmill production, subcontractor competence and environmental technology). These institutions are not part of the production relations with the firms and are in this sense not part of the clusters. They are established as centres of innovation and can be seen as forming parts of the framework conditions for generating and sustaining the clusters.

The form of spatial planning used in the formation and design of the concept clusters has more the character of idea-based project design than of needs-based planning measures to suit the special features in an enterprise cluster's potential special needs for localization and lay-out of business zones.

Even though the three municipalities do not exhibit any examples of spatial planning specifically aimed at production clusters, the need for such planning must be investigated by closer examining of the production clusters' geography and by discussing some planning principles which might be applicable.

Cluster geography

In the geography of business clusters, some special features are significant for an eventual cluster-oriented spatial planning. Most business clusters straddle more than one municipality. This means that attention to the special considerations of the business cluster must occur within the frameworks of municipal cooperation rather than via the efforts of a single municipality. However, since the number of municipalities which contain one cluster can vary greatly from the number of municipalities in another cluster, a cluster-oriented planning cannot base itself on a single municipal cooperation network. The cooperation network must vary with the nature of the specific cluster.

The municipal business cooperation in which the three municipalities participate is therefore not based on desires to promote certain clusters. Rather, it has emerged as political communities attempting to stand together to stimulate the local business development generally.

In Herning, a planning and business strategy reaching beyond the municipal boundaries began shortly before 1970 with the land-use zoning of a business area, Birk, for façade-oriented firms in the neighbouring municipality of Gjellerup, east of Herning. After the

administrative reform in 1970, Gjellerup became part of the new Herning municipality. When, some years later, Birk expanded and the municipality needed more land for business development, a new industrial area was zoned in cooperation with the neighbouring Ikast municipality. The industrial area, the 'HI Park', is situated at the boundary between the two municipalities and with direct access to the new highway south of Ikast and Herning. The zoning of the HI Park marks a goal of physically joining the two towns into one linear city. Because of the restructuring of the textile industry in the region, many new firms have started up in the former textile factories, thus reducing the need for new commercial land in the HI Park. The HI Park has therefore not expanded at the envisioned pace. The development of the area's business sector, has instead been linked to Birk Centrepark, where the goal has been to contribute to a development and restructuring of the local business sector rather than simply allow more space for the expansion of the traditional industry.

Cooperation with neighbouring municipalities has continued with the establishment of the Mid-West regional cooperation. Under this cooperative arrangement, the consulting firm of Oxford Research has been asked to analyse planning needs for the firms in the area, including the need for spatial planning measures. Oxford Research takes its point of departure in an analysis of the area's business clusters. However, they have succeeded to only a limited extent in presenting concrete recommendations for spatial planning.

Cooperation with the neighbouring municipalities in business development can be found in all three towns. Besides the examples from Herning, it should be mentioned that Nakskov has been engaged in an intense business cooperation with the neighbouring municipality of Rudbjerg and is a partner in the Lolland Falster Growth Cooperation. Randers has been involved in a business policy cooperation with several neighbouring municipalities in the 'Crown Jutland' Business Council and in the Mid-Jutland Urban Cooperation. Another notable geographic feature of the production clusters is that clusters within manufacturing firms are localized both in urban areas and rural districts, whereas clusters within service are concentrated in the towns. The firms in the rural districts have often evolved from workshop-based one-man firms. They are often located next to the owner's home and do not exhibit any special localisation considerations beyond this. This dispersed localization indicates that a certain type of physical environment is not decisive.

With the establishment of new firms in the towns' business zones one might think that firms in the same cluster would seek to establish themselves in the same zones. However, in the three municipalities studied, we have not been able to observe any such localization behaviour. This is probably linked to the factor that the firms' localization in a single town is to a great extent determined by the presence of a suitable commercial property at the time of localisation.

In general, it is affirmed that the formation of production clusters occurs via a market where functional and economic relations between firms are more significant than the geographic factors.

Spatial planning

The three examples indicate that production clusters do not occupy any place in the municipalities' spatial planning. Nevertheless, one can imagine that spatial planning carried out on the basis of a logical or analytical idea has instruments with which it could interact

with special cluster needs. We will investigate this possibility by reviewing some key tools in spatial planning: land-use zoning, regulations for buildings and open areas, municipal public facilities and infrastructure and active land policies.

Land use zoning

Do product clusters need special areal zones? The service clusters, as we have seen in Herning, have a clear tendency to localize themselves in the city's centre. These areas are typically reserved for mixed residence and business. The primary motivation for this localization is presumably to achieve the accessibility benefits which service-oriented firms normally need. It would be difficult to imagine a need for area reservations, which in more detailed form would set special zones for textile services or foodstuff services.

It would probably be directly inappropriate to ensure grouped localization in special areas for other manufacturing-oriented clusters. Characteristic of a production cluster are the vertical and horizontal relations between firms at different levels in the production chain. Hence, production clusters tend to include firms of different size, function and environmental hazard. Locating these firms together would therefore for example entail that the headquarters, manufacture firms, craft workshops and service should be placed as neighbours in special cluster-fixed areas. It would presumably be directly inappropriate seen in relation to the considerations which one normally attempts to ensure through planning of special craft work areas (combination of residence and workshop), areas for special façade-oriented firms (outdoor storage) and special areas for firms with environmental or logistical requirements. Finally, determination of clusters on the basis of an area's utilisation would inhibit the firms' developmental dynamic. A firm's affiliation to a cluster will be difficult to define with meaningful application provisions. Even though it would be successful, fixing the application provisions for a firm would inhibit the change of production into new sectors.

Regulations for buildings and open areas.

As already mentioned, the firms in a production cluster will normally be of very different character. Therefore, the provisions which prescribe a common special external appearance of buildings and free areas will also directly conflict with the differentiation of firms in a production cluster.

Municipal utilities

As with regulations for buildings and open areas one can not envision special construction of streets or free zones for a production clusters. It is not feasible. Firms needing special municipal facilities and infrastructure have the same needs for traffic, e.g., with heavy transport loads, harbour or rail links. Such firms are functionally related rather than production related. Therefore, one cannot imagine that municipal facilities and infrastructure are cluster-determined.

Managing by deed stipulations and active land policy

It is also difficult to imagine a special need for the more wide-ranging regulatory management that municipalities could utilise via deed stipulations in connection with the sale of municipal properties. This is because the entire idea of gathering together cluster firms in special commercial zones does not seem relevant. In contrast, it is relevant according to conventional planning tradition to group, for example, façade-oriented firms into business parks or workshop-oriented firms into special workshop areas.

Conclusion

In sum, we cannot see that the spatial planning regulations and associated instruments, such as active land policy, are relevant for the promotion and development of production clusters. However, this should not exclude that special cases could arise whereby there is a need to apply spatial planning for the care and development of special production clusters. We can only conclude that there is some kind of general need for this. Just because firms occupying different positions in the production tend to be localized in certain areas or regions and thereby show that they benefit from geographic proximity, one cannot then conclude that the same firms would automatically benefit from further geographic concentration from the area or region to a specific industrial zone. What firms share at the regional level is a common labour market with the possibility to draw on the same type of educated workforce, just as there can be common forms of education and business services. While there can be agreement about such functions at the regional level, this does not mean that there can be more agreement at the level of the district. The movement from one level to the other is a qualitative jump. At the regional level, there can be a need for special support functions such as logistical functions. But normally, such functions will not be cluster-specific, in that the solution to a cluster's transport needs will often meet the transport needs of other clusters or firms.

Spatial governance

While it is difficult to show some association between the tradition-determined spatial planning and the care and development of production clusters, the situation is different as concerns the relation of concept clusters to spatial planning. Spatial planning here enters in as an integrated element in a comprehensive action, project or program; for example, the city council might invite several key agents to participate in the realization of an idea which is made visible in its physical form, such as the 'Media House' in Randers, the Industry and Environmental Park in Nakskov or Birk Centrepark in Herning. Here spatial planning is not used to regulate construction behaviour in an area. Form is not given to a development; rather, the form or concept is used to create and stimulate development. This type of spatial planning we will here call 'spatial governance', in order to emphasise the close connection between the spatial plan and organisation or network which can achieve the plan. With the concept of governance, we simultaneously wish to underscore the fact that the group behind the project is not a traditional entrepreneur, but a broader group of actors with different roles, each offering themselves as stakeholders in the concept. With spatial governance, we thus think of the realization of concepts such as an industrial park, urban renewal of a depressed area, the transformation of a dockyard district into centre- or residential purposes, or the realization of a business district where the physical plan and/or the architectonic project proposal takes on a key role in the realization of an idea or a concept. In the figure below, we have illustrated how the three concept clusters which will be discussed in this report, relate to the existing production clusters.

Birk Centrepark in Herning has a close relation to two production clusters, textile manufacture and textile service. At the same time, however, the area is oriented toward more general needs for the clusters in the area, such as the special needs for subcontractors. The concept thus cross-cuts the clusters, addressing special needs in connection with export, organizational enterprise management, product development and design.

In Nakskov, the Industry and Environment Park comprises an initiative which is not built upon any existing cluster in the area. The concept is based on bringing together environmentally-oriented firms and building up a milieu of firms which can perhaps evolve into a cluster in the future.

The food 'Mecca' in Randers is the only example of a conceptual cluster which takes its point of departure in an existing production cluster. It is still at the idea stage. The basic idea is to establish a centre for the processing of high quality food products in cooperation with the two large local food processing firms, Danish Crown and Tulip, in the facilities of what was once a brewery. Linked to this would be an education program for food product technicians and food processing consulting services.

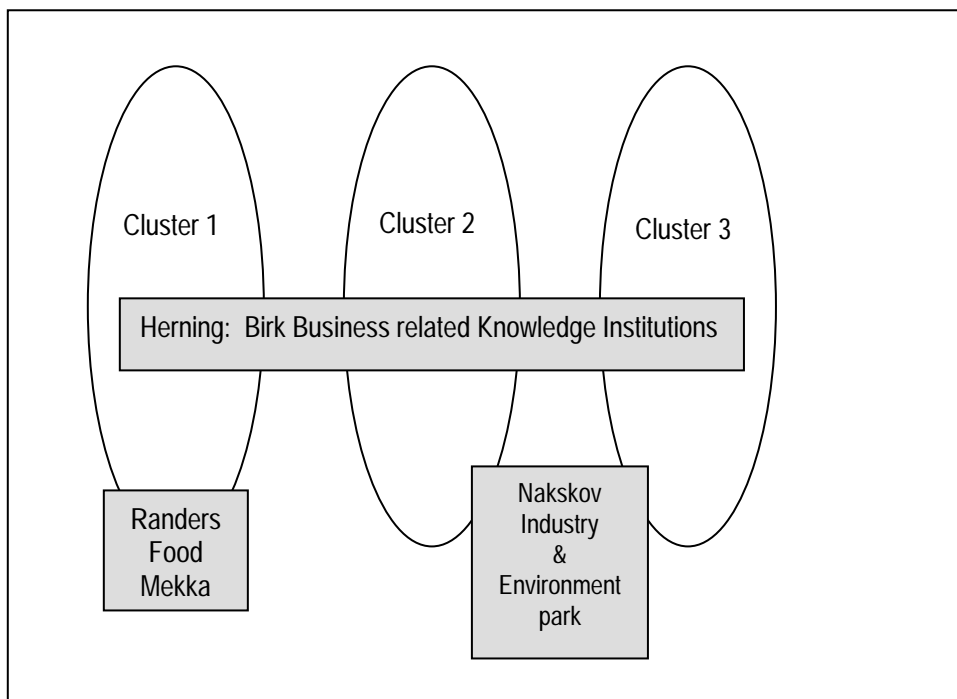


Figure 2. Conceptual Clusters in Herring, Randers and Nakskov

Nakskov: Environment and energy

Nakskov has only a medico cluster, consisting of the hospital and the municipality's general practitioners and dentists. The geographic location of this cluster appears on the map, figure 3. In addition, no production clusters have been statistically identified in the town. Nevertheless, it is interesting to examine the municipality from a cluster perspective more closely. This is because Nakskov Municipality very consciously seeks to create a business development based on firms within the environmental and energy sector. The municipality does not use the concept of cluster, and perhaps the municipality's business policy does not lead to an actual cluster formation, but rather, an industry-symbiotic complex. Nakskov's business policy is nevertheless interesting as an example of a policy which at the same time seeks to create an industrial economic foundation based on firms that are specialised within a given area, and which at the same time have the advantage of building up mutual relations based on geographic proximity to each other. In several cases, often by means of the municipality's active contribution, it has succeeded in establishing such relations which can consist in primary production relations (e.g. subcontractor relations) or secondary production relations (e.g. one firm's utilisation of another firm's waste or derivative production).

The example we shall examine more closely is Nakskov Municipality's Industry and Environment Park, Stensø, during the period from 1999 to the present.

Background

The background for the establishment of Nakskov Industry and Environment Park has at least two aspects, economic and political.

Economically speaking, Nakskov had entered a very serious crisis following the downsizing and eventual closing of its ship-building industry in 1986. Unemployment reached 35% for skilled and 40% for unskilled workers, and 10% of the municipality's inhabitants actually moved away in the period 1981-1998.

Politically, the administrative transformation that took place following the municipal elections in 1997 were of key importance for the municipality's ability to politically formulate a development strategy and to administratively follow it up. In the municipal elections, the sitting Social Democratic government, in power for many years, was upset by a majority backing mayor Flemming Bonne Hansen from the Socialist People's Party. At the same time, the municipality acquired a new chief executive officer and new director of the public utilities. Under this political-administrative leadership, the middle-manager level in the municipal administration was eliminated, and the municipally-owned companies and administration was reorganised into a kind of business enterprises with very high independent authority within the framework set in the business plans. One effect of this is that the municipality's administration can now enter into negotiations with a decision-making capacity which matches that of the private firms with which it deals. Behind the municipality stands a unified city council.

From a national political perspective, the Nakskov situation caused anxiety. In May 1997, the Socialist People's Party brought the situation in Lolland up for debate in Parliament. This led to a decision to allow a committee under the Government's Agency for Business

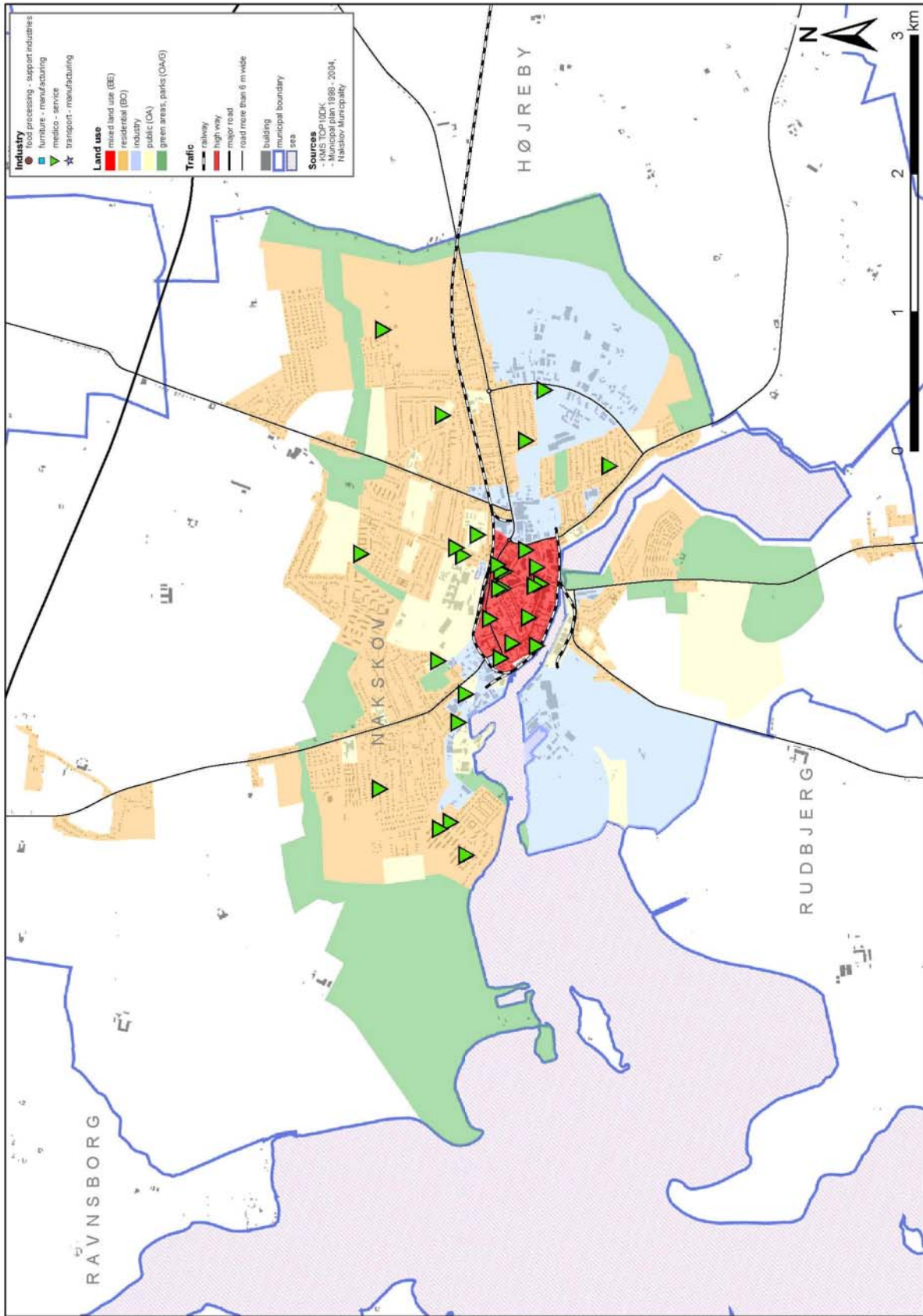


Figure 3. Medico-Service, Nakskov

Promotion to examine the situation more closely. The report, entitled 'Lolland: Marginal Area Undergoing Development' (Erhvervsfremmestyrelsen 1998), concludes that Lolland's business development potential should be sought primarily within four areas:

1. Manufacturing
2. Agricultural and processing industry
3. Tourism
4. Information technology

That same year, Nakskov municipality approved a business strategy which generally broke with the idea of simply waiting for the economy to turn around. Instead, the municipality itself would take the initiative and seek to initiate a development which builds upon its own competencies. Contributing to the idea of that the situation could be turned around only via outside initiatives was the municipality's location over many years in one of Denmark's economically depressed areas and the many-year support policy from the EU, whereby funds entered Lolland and Nakskov within the 'Objective 2' allocations under EU's structural fund for economically weaker regions. The negative aspect of this situation was that the support policy set the agenda for the municipality's own initiatives by steering them toward external funding possibilities.

In its content, the new business strategy took its point of departure in considerations about which business sectors contained the largest growth potentials. At this time, there were generally large expectations for growth potential in information technology (IT), followed by the energy and environmental sector. Expectations for growth within the environmental and energy sector were based especially on the EU's decision to commence negotiations about the entry of the East European countries into the EU and the Danish Government's high ambitions to provide foreign assistance to Eastern Europe in the field of environmental protection. With Nakskov's favourable geographic location for contact to Eastern Europe, the city council decided to concentrate on the environment and energy sector. At the same time, the city council decided that Nakskov should continue to base its growth on the harbour area and maintain the harbour's status as an industrial zone. Herein lay partly an acknowledgement that Nakskov had several planning advantages, with large zones close to the harbour which could be incorporated into a harbour-based development. There was also a recognition that the city, because of this location, did not have the possibility to establish any large growth base for commuters to the Copenhagen metropolitan region. The town should therefore be developed as a commercial town. This idea has since been further consolidated within the frameworks of the cooperation which Nakskov entered into with 13 municipalities on Lolland-Falster. Under this cooperation arrangement, Nykøbing-Falster should assume the role of general service town, while Nakskov should be developed as an industrial town.

The 1998 municipal plan does not yet reflect this prioritization of a development based on environmental and energy activity. The plan cites the following business policy priorities:

1. Enhanced processing of local agricultural products (e.g., ecological production)
2. Development of service for agriculture and industry and addition of larger service institutions
3. Tourist industry
4. Housing or improvement of conditions for long-distance commuters

Today the municipality has two business priorities aside from environment and energy: agro-industry and tourism. The priority on more than one area is a natural precaution against becoming too uniformly dependent and conjuncturely sensitive toward a single business sector. But the emphasis on the two other areas is also due to some natural preconditions for development of these sectors. Nakskov lies in an area with very good arable land and a good climate. The need for development of crops with greater yields is great. It is also the background that in Holeby, in 1988, there was established a Green Centre with support from the EU, Storstrøm County, eastern Lolland municipalities and the agricultural sector with the objective of managing several developmental tasks for agriculture and its derivative sectors. The ideas of Nakskov municipality for strengthening the agro-industry are concentrated on the possibilities for establishing, in immediate connection to the Nakskov Industry and Environment Park and in cooperation with the neighbouring municipality, areas for agro-industry with symbiotic relations to existing firms, including, for example, the exploitation of surplus water from sugar production.

For the development of the tourist sector, the municipality, in connection with other municipalities in the Southern Danish archipelago, is planning to create the conditions for the development of a family vacation concept. The municipality has an appropriately sited zone which could be utilized for this objective, and the municipality believes that it has something to offer for a large European market, which, following the construction of the Femern bridge, would be closer, placing Lolland-Falster at the entry point of a Scandinavian vacation market.

Nakskov Industry and Environment Park

Nakskov Industry and Environment Park contains two large industrial zones: Nakskov Industry and Environment Park 'East' and Nakskov Industry and Environment Park 'Stensø'. The 'East' zone demarcates the town's earlier city planned industrial area, while 'Stensø' is a new industrial zone developed by the transformation of the former Nakskov shipbuilding area, a municipal refuse zone and with the incorporation of a new agricultural land to the south. The two industrial zones appear in the municipal plan's general structure (Figure 4).

Firms, facilities and functions in the Industry and Environment Park

In Nakskov Industry and Environmental Park 'Stensø' is now situated:

Harbour area:

The harbour area contains 1.700 m commercial quay, a 32.000 m² loading area, of which 15.000 m² is coverable by a 100 ton crane, 2 mobile cranes, 9.700 m² of storage facilities and warehouses and railroad tracks

Industrial sector, wind energy

- The Vestas windmill co.'s section for production of windmill wings
- Subcontractors to Vestas:
 - Paul Ree A/S (windmill towers) (now closed following Vestas' merger with NEG Micon)
 - Skagen Sandblasters and Ship Service, South Dept. (painting of mill towers and surface treatment of windmill wings)

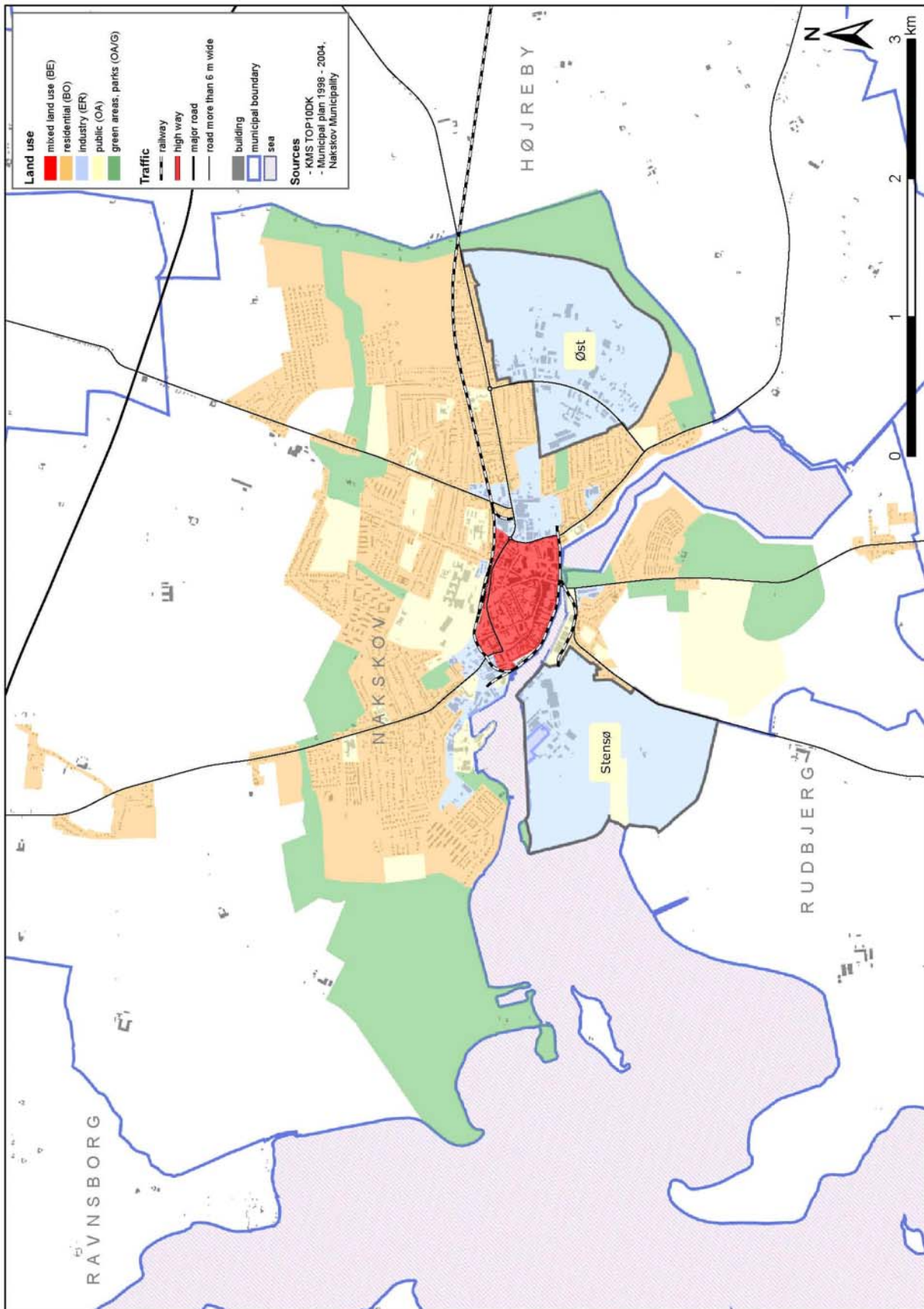


Figure 4. The municipal – general structure, Nakskov

Industrial sector, Agro-related firm:

- Wibolt Seeds

Public utilities:

- Municipal recycling station
- District heating plant
- Municipal waste-water treatment facility
- Sugar factory's waste water treatment facility

Other functions:

- Pilot project zone with willows for energy production
- The sugar factory's sludge basins
- Vestas' experimental park with sea-based windmills
- Shooting and riflery area

In connection with the Industry and Environment Park, located in the neighbouring municipality:

- Areas zoned to agro-industry

At the spatial plan of the area, figure 5, is shown the functions located in the area:

01	Sugar factory, active sludge basins
02	Biological production
03 - 04	Harbour area, dock 1 & dock 2
05	Pilot area for willow trees (purification and energy)
06	District heating plant
07	Reserved for future centre functions
08 – 09	Sugar factory, filled sludge basins
10	Municipal recycling station
11	Harbour area
12	Deposit of contaminated earth
13	Industrial area
14 - 16	Harbour area
17	Harbour area, logistic area with 15.000 m ² and 100 tons crane
18	Sugar factory waste water treatment (biogas)
19	Reserved for future sludge basins
20	Refa
21	Municipal waste water treatment plant
22	Shooting and riflery area
23	Municipal waste water sludge basin
24	Sludge treatment – reserved for expansion of the waste water plant
25 - 27	Vestas
28	Vestas pilot mills
29	Harbour area, with storage and production halls

Synergy between firms

A key essential idea behind the realization of Nakskov Industry and Environment Park is the establishment of synergy in the relations between the firms in the area and between private firms and public utilities as well.

Synergy between private production firms

Vestas established a simple synergy relation with its two suppliers, Poul Ree A/S and Skagen Sandblasting and Ship Service, and with the harbour's logistical centre; the relationship arises due to the physical proximity between the firms. Because of the size of the windmill tower elements and the wings, it is appropriate that production, surface treatment and outfitting can take place in the same area. Vestas' factory is newly constructed in the harbour zone, while the two other firms are located in halls used for shipbuilding. Skagen Sandblasting and Ship Service, however, has expanded with a factory occupying a 55,000 m² space immediately adjacent to the wharf area.

Synergy between private and public firms

In several projects, Nakskov municipality has sketched out several synergy relations between public firms and private firms. Some of these projects have been carried out, some are being tested, others await possibilities for realization, while yet others have shown themselves to be difficult to execute. All the projects are subprojects in what the municipality calls Nakskov Environmental Concept ('Miljøkoncept Nakskov').

Project 'Base Harbour'

The idea behind Base Harbour is for Nakskov Harbour to take on a function with physical development and testing of new projects undertaken during the earlier program for environmental and development assistance to Eastern and Central Europe. The idea here was to create practical possibility to bring together and develop environmental projects and thereby promote Danish industry's continued expertise in environmental tasks in Eastern Europe. Examples:

- Shipping of windmill 'wings' from Vestas.
- Deliveries of pyrolyte assembly from Organic Power
- Cleaning and Treatment of harbour sludge residue

Associated with the Base Harbour is an Environment Competence Centre.

The project was set on 'stand-by' in order to await developments in the Danish policy for support subsidies to firms exporting to Eastern Europe. Since the project idea emerged, Organic Power has gone bankrupt. The potential for export of solutions for the cleaning up of the harbour sludge and the polluted soil awaits the development of the concept with biological and electrolytic cleaning treatment. One of the possibilities for a revitalisation of the project lies in providing support to the construction of a bridge to Femern. The area offers a logistical zone for loading and unloading supplies and a labour force with the qualifications to participate in the work of bridge construction.

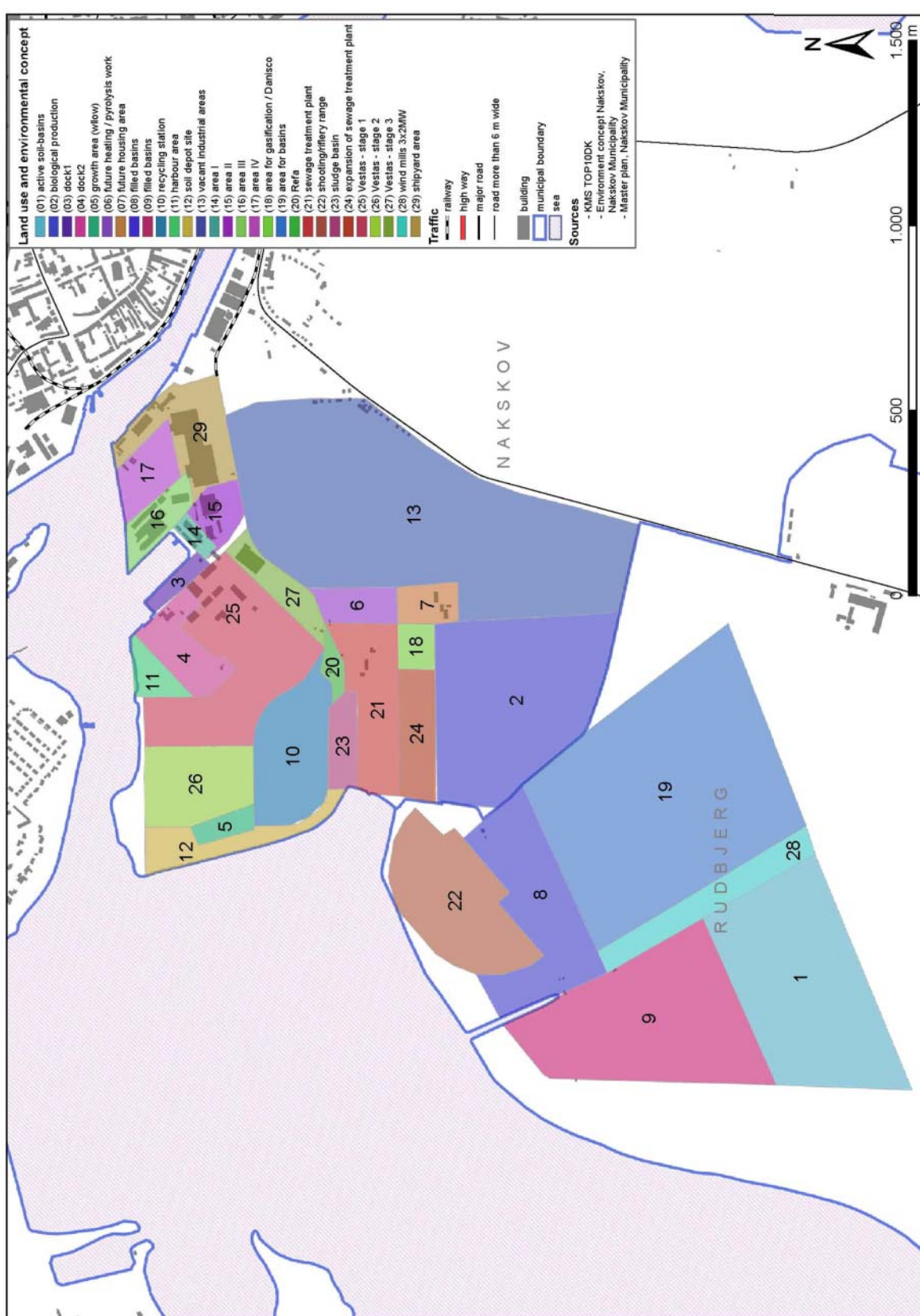


Figure 5. Nakskov Industry & Environment Park "Stensø"



Figure 6. Nakskov Industry and Environment Park 2003

Vestas' two subcontractors, Poul Ree A/S and Skagen Sandblasting and Ship Service, are immediately adjacent to Vestas. After the merger with NEG Micon, Vestas voided all supplier agreements, resulting in Poul Ree A/S going bankrupt. The district heating facility is today in operation. Danisco's waste treatment facility lies immediately adjacent to the municipality's treatment plant in order to enable a technical cooperation between the two. The waste recycling station with an open air stage was launched in the summer of 2004. Between Skagen Sandblasting and Paul Ree lies the Wisbolt seed company. In the upper right corner one can identify the crane in the logistical zone. With a very resolute effort on the part of the municipality, it has succeeded in creating a bridge-head of public and private firms with a high level of environmental know-how for the further development of the concept of an Industry and Environment Park.

'Environment Competence Centre'

The objective of the environmental competence centre is to link together the technical projects into a common knowledge centre for

- Training of new staff
- In-service training of technicians from Denmark and abroad
- Dissemination of knowledge to the public
- Development of concrete commercial sustainable solutions on specific environmental problems in Denmark and abroad. The developmental work can be supplemented with full-scale testing of equipment and facilities prior to marketing.

The initiation of the project was conceived based on

- The pyrolyse project (no longer current)
- Water treatment
- Wind power
- Harbour sludge

From pyrolyse to wood chips

Nakskov has gone far with plans to establish a pyrolyse-based heating plant based on a long-term contract for the delivery of German railroad ties as fuel. The plans were elaborated together with the Norwegian firm Organic Power, which had decided that the forthcoming pyrolyse facility, which the firm expected to deliver to the Danish and German markets, should be produced in Nakskov. The plant was thus designed so that operations and trials could be combined in one of the ovens in order to create the possibility for continued optimisation and development in the vaporisation processes. However, Organic Power went bankrupt. Nakskov municipality then decided to construct a large wood chip-fired works. Around the plant, efforts are being made to establish several symbioses using the sheaths remaining from the local seed processing industry and the yard wastage collected and sorted at the recycling centre. The heating plant purchases the biomass from refuse collection on general commercial terms and thereby creates income for the municipality. As long as the ongoing trials, conducted by the Green Centre, with the biological treatment of harbour waste are successful, there will be created a full scale production of bio-willow trees, which would also be used as fuel for the plant. The largest amount of wood chips is purchased in the Baltic countries. In cooperation with the Nordic Environment Finance Corporation¹ (NEFCO) and Rindi Energi in Sweden it is being investigated whether there can be created a basis for the establishment of a genuine biomass production in a Baltic local area, possibly supported by the conversion of coal burning to wood chips-burning in the local area.

Waste water treatment

Because of environmental protection requirements, Danisco Sugar A/S in Nakskov had to establish its own treatment facility for processing the factory's waste water. The firm originally elaborated a project for the placement of the treatment facility on the factory's areas in the town of Nakskov. However, it was decided to place the treatment facility next to Nakskov municipality's own waste water treatment facility and the forthcoming district heating plant in the Industry and Environment Park. With this placement, biogas from the sugar factory's plant could be added into the new heating plant, and the cohabitation of the two treatment facilities could clear the way for the establishment of an operational technical cooperation between the two facilities, containing energy production and waste water treatment. The idea of guiding the biogas to the municipality's new wood-burning district heating plant was to avoid plant expenses for a pipe to return the biogas from the treatment facility in the Industry and Environment Park back to the sugar factory in the town. In this way, Danisco would be able to save capital expenses of about DKK 8.000.000. In return for the biogas, Nakskov would guide a corresponding amount of energy from the town's district heating network in the town out to the sugar factory. The tax authorities took the view, however, that Danisco, with its delivery of biogas to the municipality, should be considered as an energy-producing firm and should therefore pay a surcharge on the energy it delivered. The energy cooperation was therefore abandoned, and Danisco constructed a pipeline for the return of the biogas to the sugar factory. Danisco and the municipality, however, went further with the project of cooperation between the two treatment facilities, carrying out a project to recycle the treated process water into field watering of non-food products in the agro-industrial part of the Industry and Environment

¹ NEFCO was created in 1990 by the Nordic countries with the purpose of providing support for environmental projects in Eastern Europe.

Park. The water from the sugar factory is today piped out to the large sludge basins which already lie in the Industry and Environment Park.

Wind power

Vestas has constructed three experimental sea windmills in the new Industry and Environment Park, next to the sugar factory's sludge basins. The experimental mills are utilised for trials and tests of new wing types and hubs. The placement in the Western part of the Industry and Environment Park is ideal, being close to the factory and on a very flat area close to the harbour and with adequate wind gusts. The windmills are also placed close to the planned facility for electro-dialytic treatment of polluted harbour sludge. The electro-dialytical process is planned to be arranged such that it is only activated in periods with surplus electricity production. Such periods will typically occur when the heating plant has to produce much heat (winter) or when electricity production from windmills is very great (during strong winds).



Figure 7. Nakskov Industry and Environment Park toward the south

In the foreground, the logistical area with the crane. To the right is Vestas. Behind Vestas are experimental windmills, the sugar factory's sludge basins and the area to the south is zoned for agro-industry.

Harbour sludge

Nakskov municipality and the Technical University of Denmark are considering developing and establishing facilities for the reception and processing of polluted harbour sludge from Danish harbours. The sludge is often polluted with heavy metals, among them TBT, which was formerly used as an undercoat for seaweed of ships and small recreational boats. The project involves removing the heavy metals using phytoremediation and electrolysis. The harbour sludge is planned to be deposited onto large flat areas where willow trees are grown. The willow absorbs certain heavy metals, and the dangerous TBT is broken down by the effects of the sun. The heavy metal polluting willow trees are harvested and

incinerated in the wood chip-based district heating plant. The cultivation of the willow is closely managed in order to optimise the growth conditions, including with the addition of enriched waste water from the municipality's or sugar factory's treatment plant. The ashes from incineration will contain heavy metals, and these can be removed from the ashes using electro-dialysis. Electro-dialysis occurs by adding direct current to the ash, whereby the metals settle are then collected and disposed of. The energy for this process would come from the windmills. As long as the willow cultivation does not show itself to be effective, one can undertake an electro-dialytic treatment without willow cultivation in the untreated harbour sludge after watering and drying in the sludge basins. The basins are placed in proximity of the windmills. The dialytical process can take place in the periods when the mills are producing surplus electricity.

The dialysis treatment is carried out in cooperation with Denmark's Technical University (DTU). In Nakskov, an area of 10,000 m² is planted with willows for cleaning and energy production. In this area, the harbour sludge is deposited in an experiment being conducted by Syd-Tek and the Green Centre, in cooperation with DTU and Per Årsleff A/S.

Planning and construction of Nakskov Industry and Environmental Park 'Stensø'

The first project activities

During 1998, Nakskov Municipality had settled on the basic elements in the municipality's development strategy. The realisation of Nakskov Industry and Environment Park 'Stensø' was helped along when Vestas, in 1998, declared its interest in Nakskov as the location of its new production facility for fabricating mill wings. With a purchase option for the wharf, the municipality began negotiations with Vestas by which Vestas would rent a part of the wharf grounds with the intention of establishing a wing factory. Nakskov municipality would clean up the area and remove about 155,000 m² of polluted soil. As owner, the municipality would retain environmental responsibility for the grounds. During the negotiations with Vestas, Nakskov municipality placed emphasis on matching the firm's decision-making competence and demands for a rapid expedition of the case. A problem on who should pay the construction costs of about five million DKK for high voltage lines was resolved by the municipality's electric power company assuming the cost against a compensating connection surcharge. The agreement on the rental property was concluded in January 1999. Five months later, the construction began and in December the first wings rolled off the factory assembly line.

Nakskov municipality used the treated polluted soil as building material for a new construction consisting of a combined recycling station and open air stage and with the building of a protective embankment around the new zoned outdoor storage area for Vestas.

Skagen's Sandblasting and Ship Service established itself shortly afterwards in Nakskov Wharf's painting halls with a background in orders from Vestas for surface treatment of mill wings and mill towers. The firm has now expanded with its own buildings nearby.

In the summer of 1999, the municipality began work on a master plan, projections and economic estimates for the development of the area. The economic calculations showed an investment need of DKK 44-67 million. The plans were completed for political approval in the autumn of 2000 and formed the basis for the city council's decision, on December 19,

2000, to purchase the remaining part of Nakskov Wharf. The municipality took a loan of DKK 100 million for the execution of purchasing and construction.

The master plan contained the following proposals and preconditions:

- Cleaning of the wharf grounds and removal of refuse deposits;
- Conversion of parts of the area to a maritime logistical centre. The idea here was to establish a logistical area for the shipping of goods at a lower price for firms who might otherwise establish such facilities themselves. There would be established
 - a) 100 ton crane (renovation and certification of the existing crane)
 - b) 80,000 m² outdoor storage area
 - c) 750 m of new quay area;
- Purchase of further land for development, whereby the total area would reach 1,100,000 m².



Figure 8. Nakskov Wharf before 1986



Figure 9. Vestas began construction in July 1999

The agreement between Vestas and Nakskov regarding acquisition of the grounds was concluded in January. As owner of the land, Nakskov Municipality was in charge of clearing the land by demolition of buildings and removal of polluted soil.



Figure 10. Vestas and the northern part of Nakskov Industry and Environment Park 2001



Figure 11. 'Business as usual'

The windmill 'wings' which are not transported by sea are visible in the landscape when the trucks transport them through Nakskov town. The large windmill wings are a reminder that Nakskov continues to be an industrial town.

Spatial planning

It is the municipality's activities as investor, entrepreneurial contractor, supply firm and mediator and negotiator which are decisive for the development which was initiated by Nakskov Industry and Environment Park 'Stensø'. With spatial planning, the planned strategy is followed up with local planning and with a request to Storstrøms County to respect several wishes with reference to the land use in the forthcoming regional planning. These wishes have been formulated in the memorandum drafted together by Nakskov and Rudbjerg municipalities. On the background of this memorandum, the resulting local plan frameworks for the current as well as future situation are indicated on the map, figure 12. The areas 1-4 lie in Nakskov municipality. They will constitute the total 'industrial' part of Nakskov Industry and Environment Park 'Stensø'. Areas 5-7, the agro-industrial part, are located in Rudbjerg Municipality. It is especially the regulations of land-use purposes which have interest, including whether these are characterised by the idea of environmental and energy-related firms. However, it appears that the determination of objectives for areas 1-4 (the industrial firms) are broad and simply formulated without exclusive provisions. For the most southern areas in Rudbjerg municipality, however, it is specified that the not yet utilized areas should be used for agro-industrial purposes.

Utilisation provisions for areas 1-4, fig. 12:

- Area 1 (the former wharf) is zoned for 'Business purposes such as industry, storage and workshop activity, including public and private service';

- Area 2 (incl. the former refuse area) is zoned for harbour activities;
- Area 3 (water treatment facility) is zoned for ‘public purposes (water treatment, energy facility, research, development, Local Agenda 21 Centre and similar technical facilities)’;
- Areas 4-1 and 4-2 are zoned for ‘Business purposes such as industry, storage and workshop activities, including public and private service’.

Utilisation provisions for a area 5-7:

- Area 6 is zoned for ‘agro-industrial purposes’ by which is meant industries which demand extra space, have connections to agriculture and a high technological level’;
- Area 5 is zoned as a shooting and riflery area (corresponds to current use);
- Area 7 is the sugar factory’s sludge basins. Of this zone, a smaller area, 7-2, is zoned for three windmills (current usage).

On the basis of a comprehensive assessment, the land-use provisions are appropriate. Had Nakskov chosen to make exclusive determinations in the industrial area with the purpose of limiting the area’s use to environmental and energy-related activity, the municipality could be in the situation of having to reject the placement of firms which, for example, were harbour-related, but not environmental and energy-related. Considering how important it is for the municipality to generate workplaces, it would be questionable to formulate a prohibition against the localization of other forms of business. However, it seems correct to formulate the usage provisions for the agro-industrial areas in Rudbjerg municipality as exclusive provisions. First, technical groups would presumably speak against the placement of other types of firms together with agroindustrial firms. Second, other firms can be referred to Nakskov municipality’s zones.

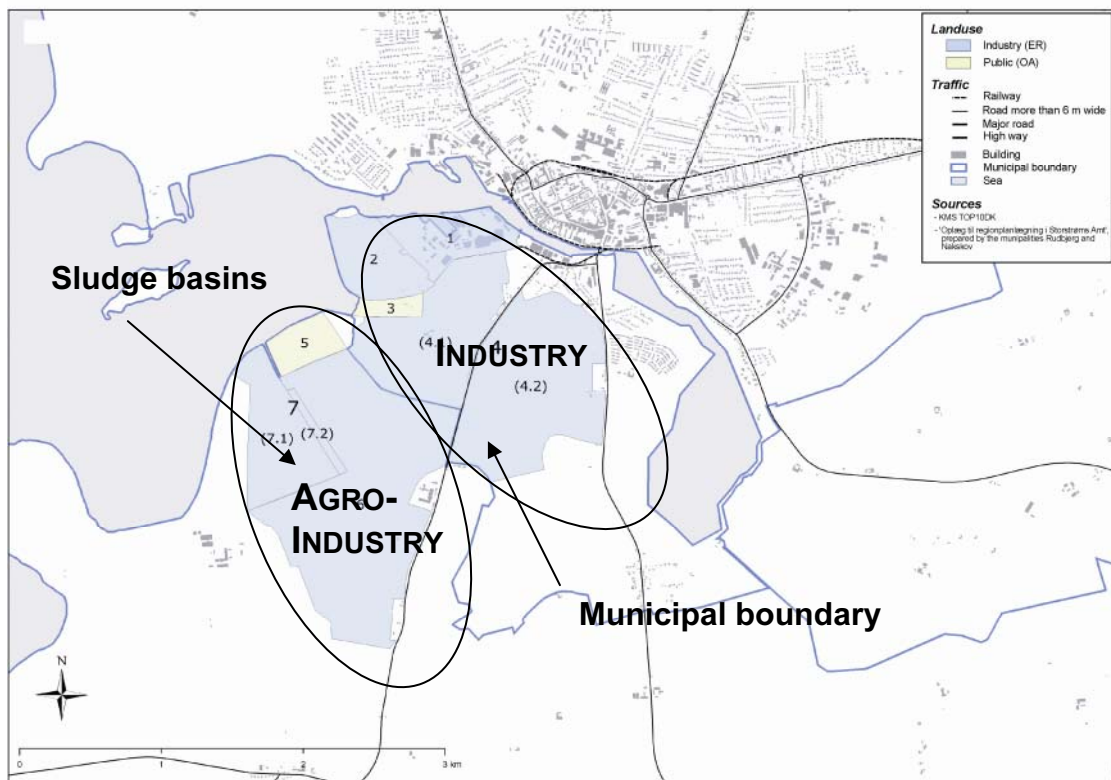


Figure 12. Framework areas of Nakskov Industry and Environment Park

Clusters in Nakskov

If one understand business clusters as a geographic collection of firms within the same type of production, which with associated service functions are able to develop a local labour market with special competencies, including the exchange of labour, it is difficult to speak of cluster formation in Nakskov. However, the efforts to collect firms within the environmental and energy sector with the purpose of establishing synergy relations between firms and with the intention of bringing together competence which can be utilized in export activities to Eastern Europe, will be able to create a special environmental product market and labour market with the character of a business cluster.

In discussions with several enterprise managers from Nakskov, there emerged one single proposal for a new cluster creation on Lolland centred on the production of composite plastic products. Besides Vestas, there is another plastic producer on the island, Jupiter Plast in Holeby. Two firms, however, are not sufficient to form a cluster. Furthermore, the two firms use different production methods, which complicates the formation of a cluster. Finally, there is a lack of several support functions, primarily in the education sector.

An assessment of the possibilities to create a cluster of agro-industrial firms falls outside the framework of this study. But the idea of creating an area in Nakskov Industry and Environment Park for the purpose seems interesting, just as one must observe that there are support functions in the area, such as the Green Centre in Holeby.

Randers: Media, assembly and food products

Background

Randers is a former commercial and industrial town now experiencing the general de-industrialisation and the increasing dominance of regional centres. As a centre in its own labour hinterland, the town is 'threatened' by Århus and by Aalborg, in that the labour hinterlands of these two towns take their share of Randers' own work force. About 20,000 inhabitants of Randers are commuters, of which 16,000 commute locally, and 4000 commute long-distances to Århus and Aalborg. Those commuting out of Randers have generally longer travel times than those coming in from other areas. The weakness of the local labour market is not only due to competition from the two regional centres, but also because of the city's loss of its own workplaces. This is not only an economic problem. It is also a problem of a symbolic character, because it is the large identity-rendering industries and workplaces that Randers has lost. Most recently, the Thor Brewery closed its doors in 2003. Thor was established in Randers in 1856 and is one of the town's oldest firms, having existed from the earliest days of industrialism. In the mid-1970s, the brewery merged with the Århus-based Ceres brewery. This was the beginning of several mergers, in what appeared to be an overcapacity, and the Randers brewery has now become a victim.

Firm structure

That Randers has derived its identity from some few large enterprises overshadows the fact that a large part of the town's commercial life is dominated by several middle-sized firms. Hence, Randers has about 100 firms averaging more than 100 employees each.

Among the firms in the town are several subsidiary units of international firms whose headquarters is in other towns or countries. An example is Dronningborg, now owned by General Electric. Recently, 400 employees were made redundant by the firm. Another example is Bombardier, which produces railroad wagons and is now Canadian-owned. Ten years ago, operating under the name Scandia, the factory employed 2000 persons. Today only 500-600 remain. These foreign-owned firms are managed to a very high degree according to earnings requirements and strategic considerations tied to international benchmarking and earning levels. People in Randers are critical toward this part of globalization and fear that local considerations have too small a place in the firms' decisions. Therefore, the chairman of Randers Business and Development Council, Per Nørret, can conclude with satisfaction that the town also houses large headquarters of Danish firms, such as those of the two meatpacking firms Tulip and Danish Crown and the windmill producer Vestas (formerly NEG Micon).

In the opinion of Business Council chairman Per Nørret, another important business type consists of newly started firms still owned and operated by the firm's founder. An example is Houmøller, producer of baking machines for petrol stations (Danish petrol stations also now sell a wide variety of products, including baked goods). This firm is expanding greatly on the world market. Another example is Innovation, which produces beds and sofas for a young market, and which has made an impact thanks to an aggressive marketing effort. Among the newly started firms are also some which have emerged out of larger, older

firms. When such established firms reduce or change their development strategy, it has in several cases given impetus to the formation of a new firm made up of workers from the old firm. When, for example, Dronningborg closed its development department, employees from this department started a new firm in the town. There exist several newly started small firms of this type. These firms will confront a shift of leadership and will be in need of special advisory service, e.g. by the business council.

Between reputation and actual conditions

It is difficult for Randers to shed its negative image caused by the closing of the large local firms. According to municipal director, Steffen Røntorp, the town's negative image as a city of unemployment conflicts with the actual conditions and is therefore undeserved. Randers' unemployment rate approaches the national average, and recently new jobs have been created in the hospital and at the Tulip meatpacking plants. Per Nørret is aware of the same distance between image and reality, in that he emphasizes that the total overview of the city's firms, shows that it is not just a case of the firm closings, reductions and moving of production abroad. There is also occurring an establishment and development of firms in a dynamic process which plays itself out in interaction with the business environment. However, it is a problem that the town is traditionally not used to dealing with the outside world, of which they are now an increasing part. In Per Nørret's view, Randers has for 45 years been pre-occupied by its own internal conditions. Petty scandals and disputes about ends and means have turned their view inwards and closed them off from the larger vision. Randers' qualities and potential have never come into focus because the town lacked the capacity and the aggressiveness to elevate itself in the national environment, as had been done by the Triangle area (a region of 8 municipalities the core of which is Vejle, Kolding and Fredericia). This is why only a very limited understanding of the industrial change process took place. According to Per Nørret, they were not clear that enterprise closings are not unique accidents, but the result of a general transformation of industrial production in Denmark, being affected by a continuing competition from low-wage countries and acquisitions by international firms which moves strategic enterprise decisions out of the local area to the headquarters in other countries. One must see this realistically and attempt to manoeuvre in this new reality. For example, for many local firms, it would be relevant to receive advice in how to outsource production as part of a strategy for growth and not just as a survival strategy. In the opinion of director Bjarne Haubo, Randers Business and Development Council, Randers is lagging behind in outsourcing. Therefore, he would like to see the business council assisting firms in this process. But outsourcing has been a taboo topic because of its connection to the loss of many local jobs. The business council, however, is trying to change people's attitudes. Hence, with a variety of initiatives, the council thus marks that it wishes to take part in the change processes rather than just shielding its members' interests against change. Expressed as a slogan, it could be said that the business council will evolve from 'interest organisation to competence organisation'. In accordance with this idea, six focus groups were organised to elaborate strategic plans for business and development topics; the participants represented competencies in the form of knowledge and influence and not because they are supposed to protect the interests of certain groups.

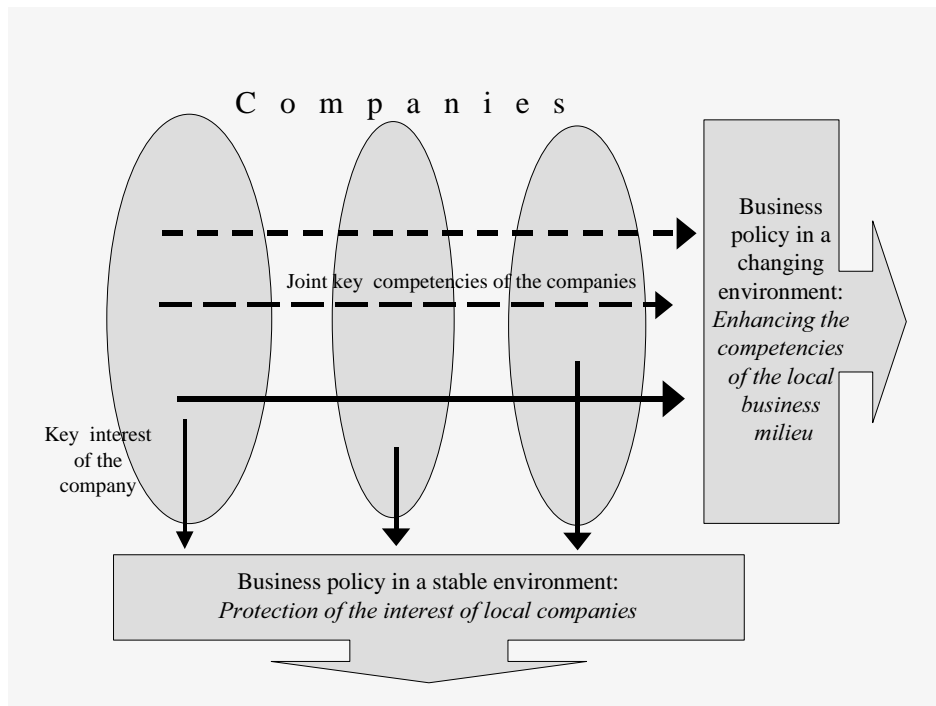


Figure 13. Change in business policy from interest to competence

Political initiatives

In 2001, a political-administrative transformation took place in Randers. The Social Democratic Party, which had held power for decades, lost its majority, with the position of mayor going to the Liberal Party. The results of the election had also been influenced by a scandal in the administration. The former chief executive had been fired and a new one hired.

The former city council had already begun to work more strategically with the town's development. A first result of this are the several policies approved in selected areas: business, tourism, education and housing. The strategic work takes place in close cooperation with the Randers Business and Development Council. Both in the business council and in the Randers City Council, the primary strategic area is housing. The view here is that the town's growth must be created primarily by attracting families to Randers, even though they might be employed in other towns, such as Århus and Aalborg. Randers would thus develop along two tracks, as a residential town and as a business centre. Of essential importance for this strategy is the fact that Randers is only 30 minutes' drive from Århus and that housing prices in Randers are significantly lower than in Århus. Therefore, it was thought that the town had good possibilities to attract people working in Århus. The policy orientation is to allow Randers to integrate into Århus' labour market. However, as a traditional working class town, Randers' existing housing stock is characterised by apartments and smaller dwellings. In order to attract higher-income families, Randers is focusing on building more attractive dwellings, among other things by building centrally located urban housing on empty zones close to the river Gudenåen and by developing exclusive detached housing lots in some of the suburbs.

In one sense, the housing-oriented policy is an indication that Randers is changing its identity from being a worker, industrial town into a residential and commercial town, in the

widest sense a suburb of Århus. In order for this strategy to succeed, it is important for Randers to shed its negative image of being afflicted by violence with many unemployed persons. Even though the statistics say something else, this image of the town is difficult to cast off. This is why the city council, in 2003, hired the design firm Eleven Danes to conduct a branding campaign for the town.

Population, city and business life

‘A city has the citizens it has’. Therefore, there are also limits to how far a city can depart from its origins in the search for new development goals. This is briefly the idea which has been expressed by the head of the social and labour market department, Ole Andersen. Many ideas about development are created by a cultural elite which forms visions in its own image, and for whom it is difficult to empathize with the everyday life for the majority of the town’s citizens.

In the view of Ole Andersen, Randers will not be able to create a generally highly qualified workforce. ‘We do not have the social structures which enable people to take a higher education and also remain living in the town’. Therefore, it should be expected that Randers will continue to be a relatively low education area. Randers finds itself in a dilemma, because the alternatives available are not really solutions for the town. If the attempt is made to develop Randers as a residential municipality, it will be necessary to export part of its work force, e.g., that part which works within the service sector. People in this sector cannot find employment in the town, and there is a shortage of service workers in other places. If it chooses to attract development-oriented firms, it is doubtful whether they can succeed in getting the entire workforce employed within these branches. Even though there is a unilateral focus on education, it is doubtful whether it will be successful in upgrading the educational level because of the very slowly changing social structures, which means that people do not have the tradition of pursuing higher education.

Presumably, Randers will be required to accept that it cannot achieve the ideal situation, that people live and work in the town. On the one hand, a part of the labour force will become even more commuting-oriented, e.g., travelling to Århus to work in the social sector. On the other hand, some of the large production firms such as Danish Crown and NEG Micon (now Vestas) will hire employees who live outside Randers, and who do not intend to move to the city and reside there.

The social patterns are very stable in Randers. In this sense, the town is very conservative. It is characterised by families who remain resident in the town for several generations. They often have a fixed association to the same neighbourhood, street and school. ‘One cannot say that it is extreme, but many are localized and deeply rooted in the town. If, for example, you have a university education, you will not really find many of your own kind in Randers, while in Århus such people are everywhere. So you often have to take on a non-academic attitude, at my job for example, in order not to get left out’ (Ole Andersen).

The ideas about education promoted by the Randers Business and Development Council differ little from Ole Andersen’s view of the situation. According to business director Bjarne Haubo, Randers should not attempt to attract university satellites. The town should not be training academics, but rather attracting them from Århus and Aalborg. Randers

should instead concentrate on educating its unskilled workers and take its point of departure in the skilled workers' traditional occupational pride and offer them more training. The same view is held by Per Nørret. At his firm, Bombardier, they have oriented themselves toward attracting higher educated people from Århus and Aalborg. Hence, about half of the firm's 16 engineers live in either Århus or Aalborg.

In order to be able to orient the forthcoming educational activities toward the business sector, several municipalities in the region (Crown Jutland) have carried out a survey of how the current educational level matches the needs of the firms.

The observations presented here contain an acknowledgement that Randers has a very stable social core but that it is also starting to lose that core because the town is becoming a part of the regional housing and labour market. Randers' dual character, as something unique and as part of a region, makes it somewhat difficult to maintain the notion of a specifically local business sector. On the one hand, the town has a business sector whose developmental potential is linked to the stable social core of a relatively low-skilled workforce. On the other hand, several of the city's citizens in a future Randers will take part in the development of a regional commercial life which is not bound to the city of Randers. On the basis of such economic and social thinking, the concept of 'town' is eroding, and instead other centres of cohesion and identity are created, such as e.g. business clusters.

Clusters in and around Randers

In and around Randers several production clusters can be statistically identified: food products-support services, medico-services, transport-manufacture and furniture-manufacture.

Director Bjarne Haubo is familiar with the fact that the area has a certain concentration of firms. But the clusters do not enter as objects for business policy. In general, the business council's policy is not especially directed towards business clusters, aside from one case, where the business council has identified a new firm cluster with a special competence in assemblage of industrial products.

The concept of cluster has also been touched upon in a public meeting about future jobs in Randers, held in the summer of 2003 and arranged by the Randers Business and Development Council. One of the speakers was professor and national economic advisor J.R. Skaksen. He thoroughly discussed the concept of business clusters because it occupies a key role in many business policy considerations, where the central feature is often that one must concentrate on the firms which can be developed on the basis of local competencies and business traditions. In Skaksen's opinion, there is no empirical evidence that business clusters create regional development. Hence, if a municipality directs its business policy toward the development of a strong business cluster, it risks obtaining only the negative effects which are connected with creating a unilateral economic base, which is sensitive to competition and conjunctural swings of the cluster's market. Skaksen's advice was to concentrate on education, both higher education as well as, and especially, training of skilled workers. According to Skaksen, the skilled Danish labour force is one of the country's largest assets in international competition.

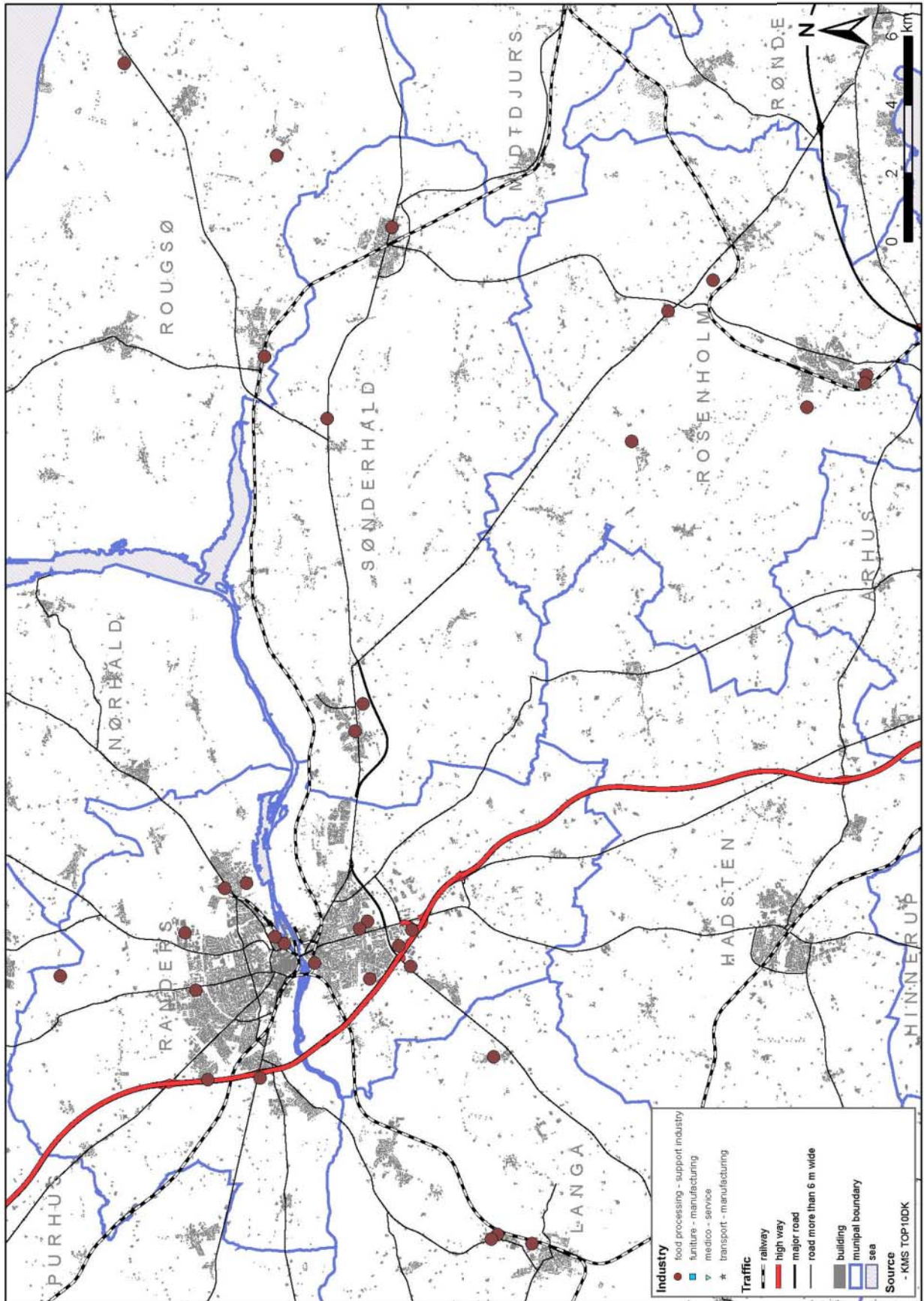


Figure 14. Food processing - support industries, Randers region

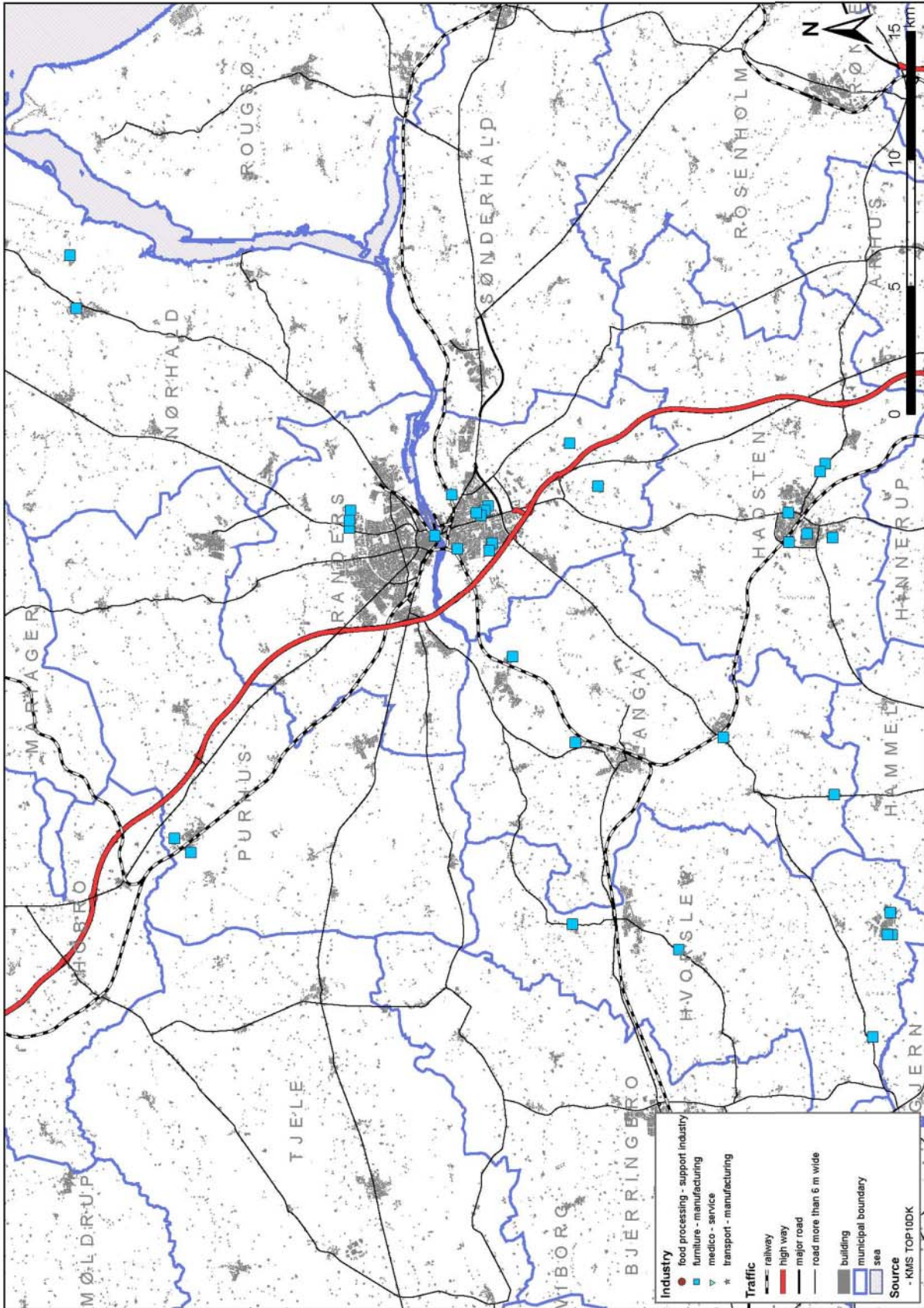


Figure 15. Furniture - manufacturing, Randers region

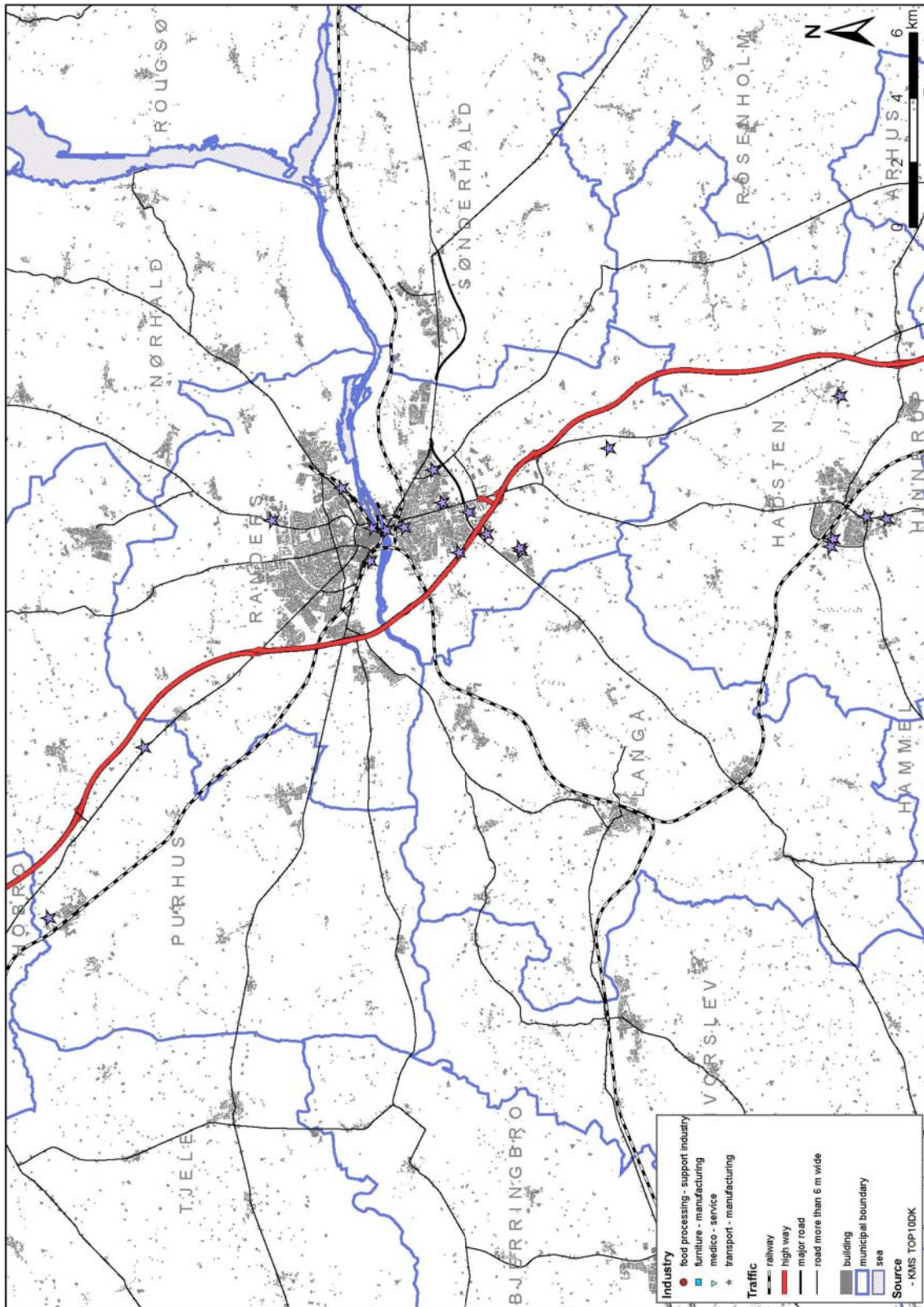


Figure 16. Transport - manufacturing, Randers region

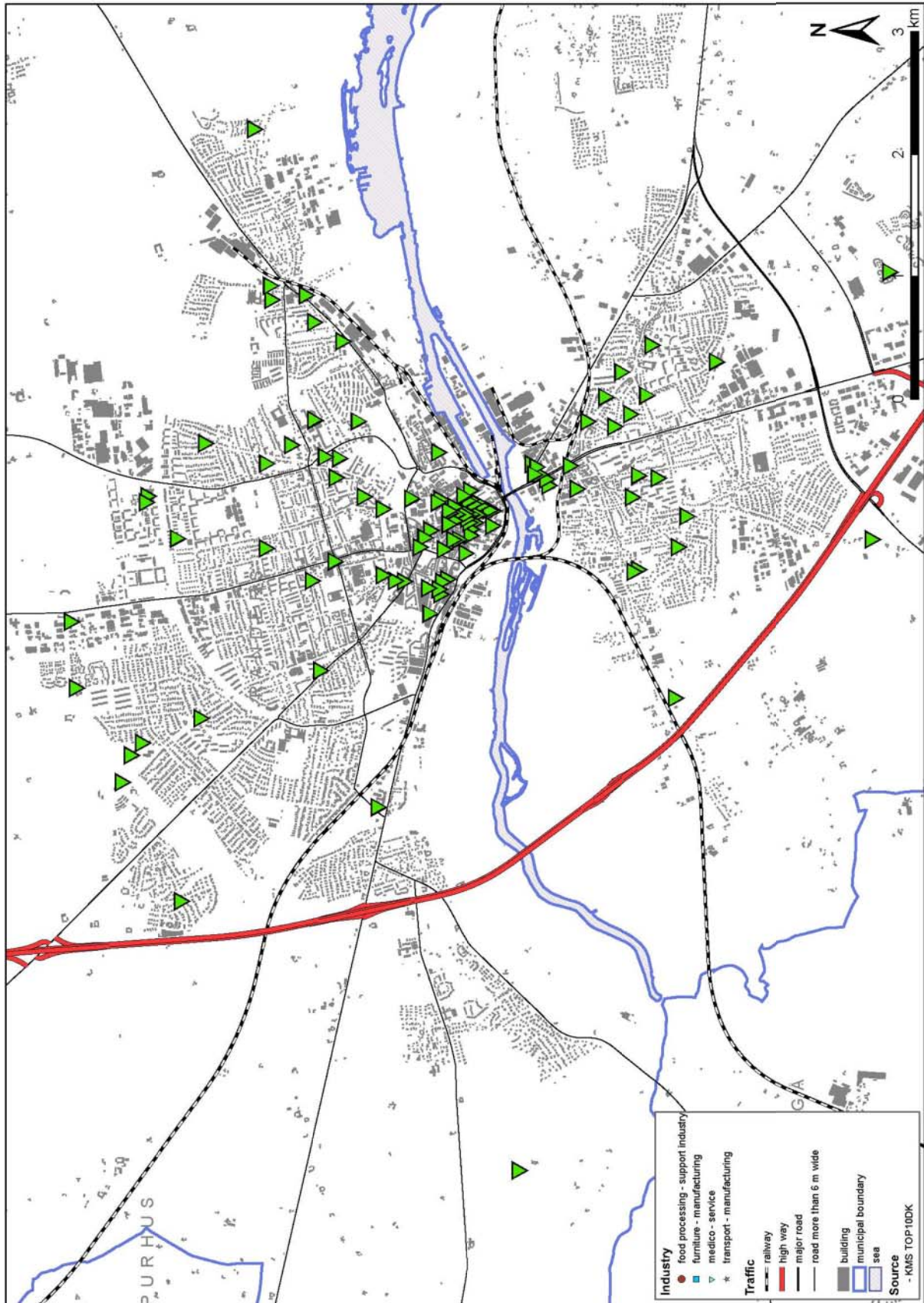


Figure 17. Medico - service, Randers region

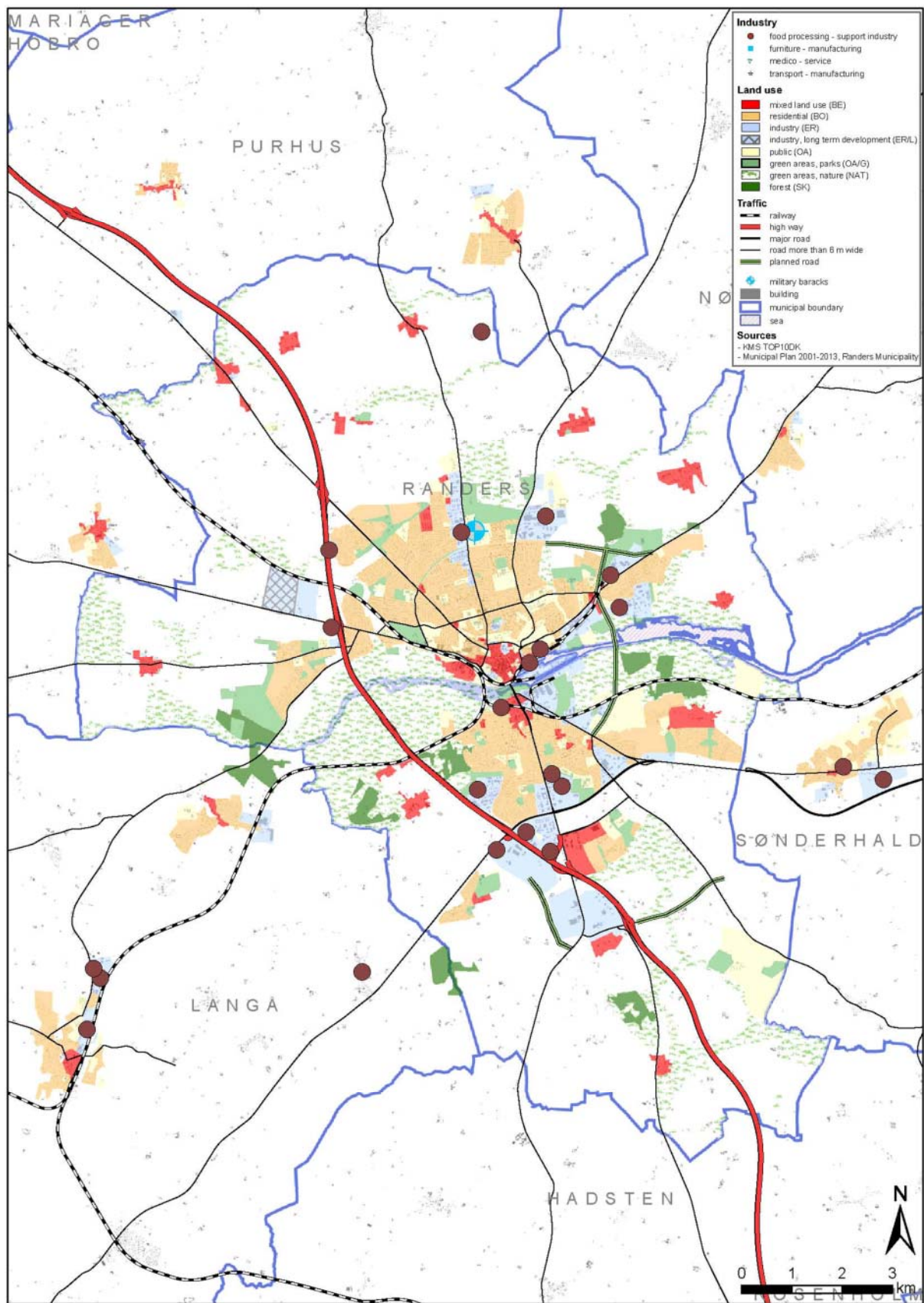


Figure 18. Food processing - support industries, Randers

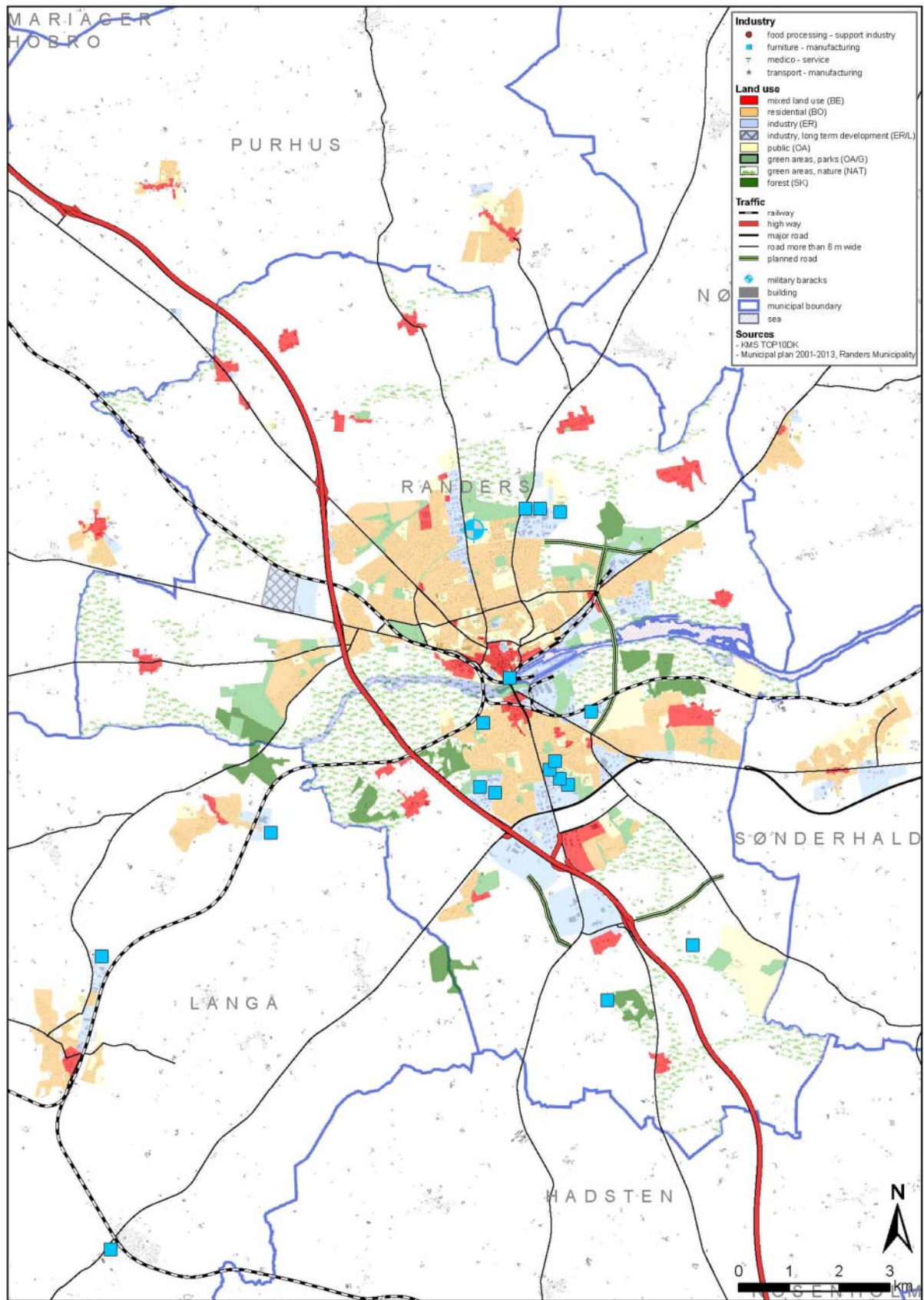


Figure 19. Furniture - manufacturing, Randers

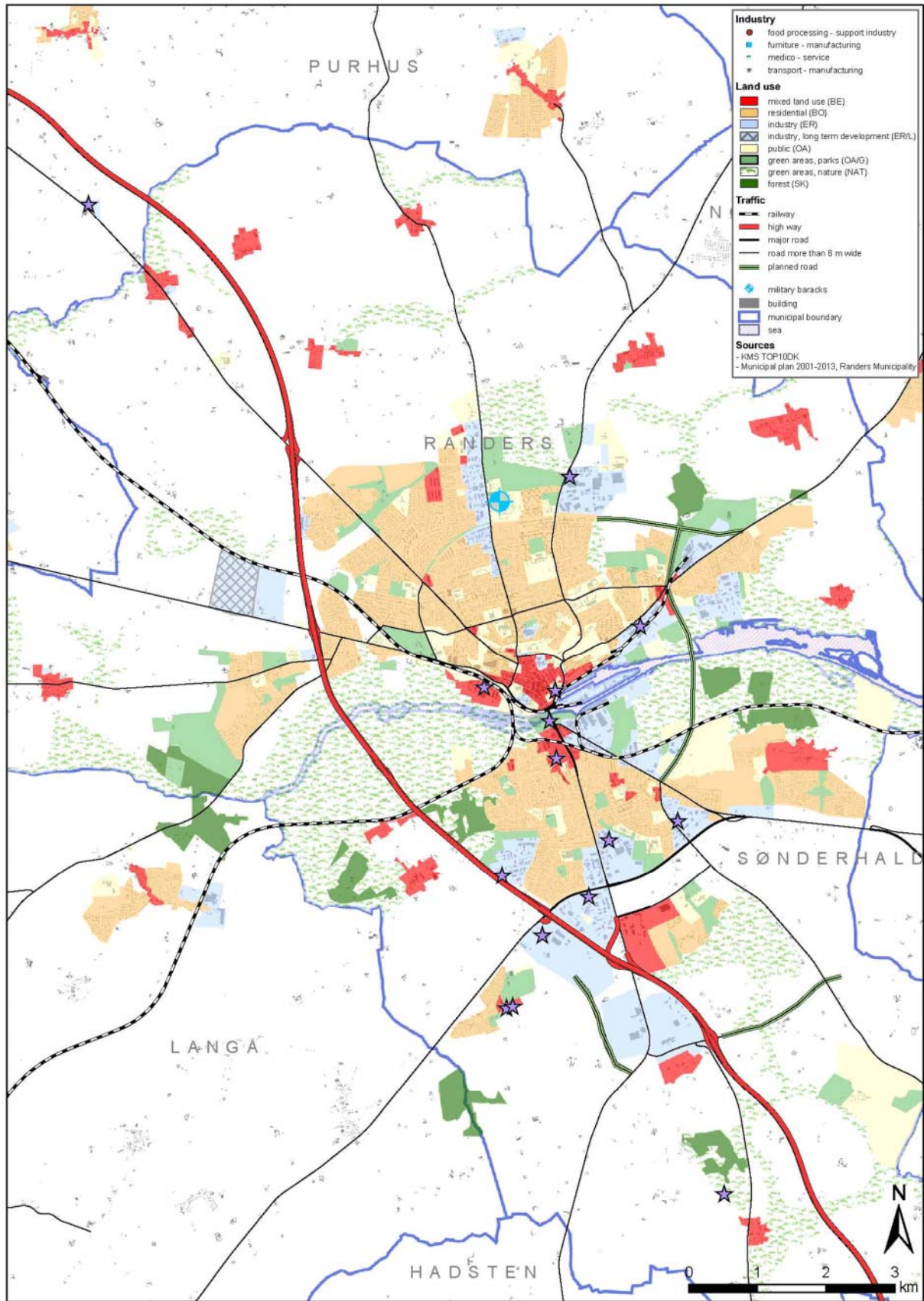


Figure 20. Transport - manufacturing, Randers

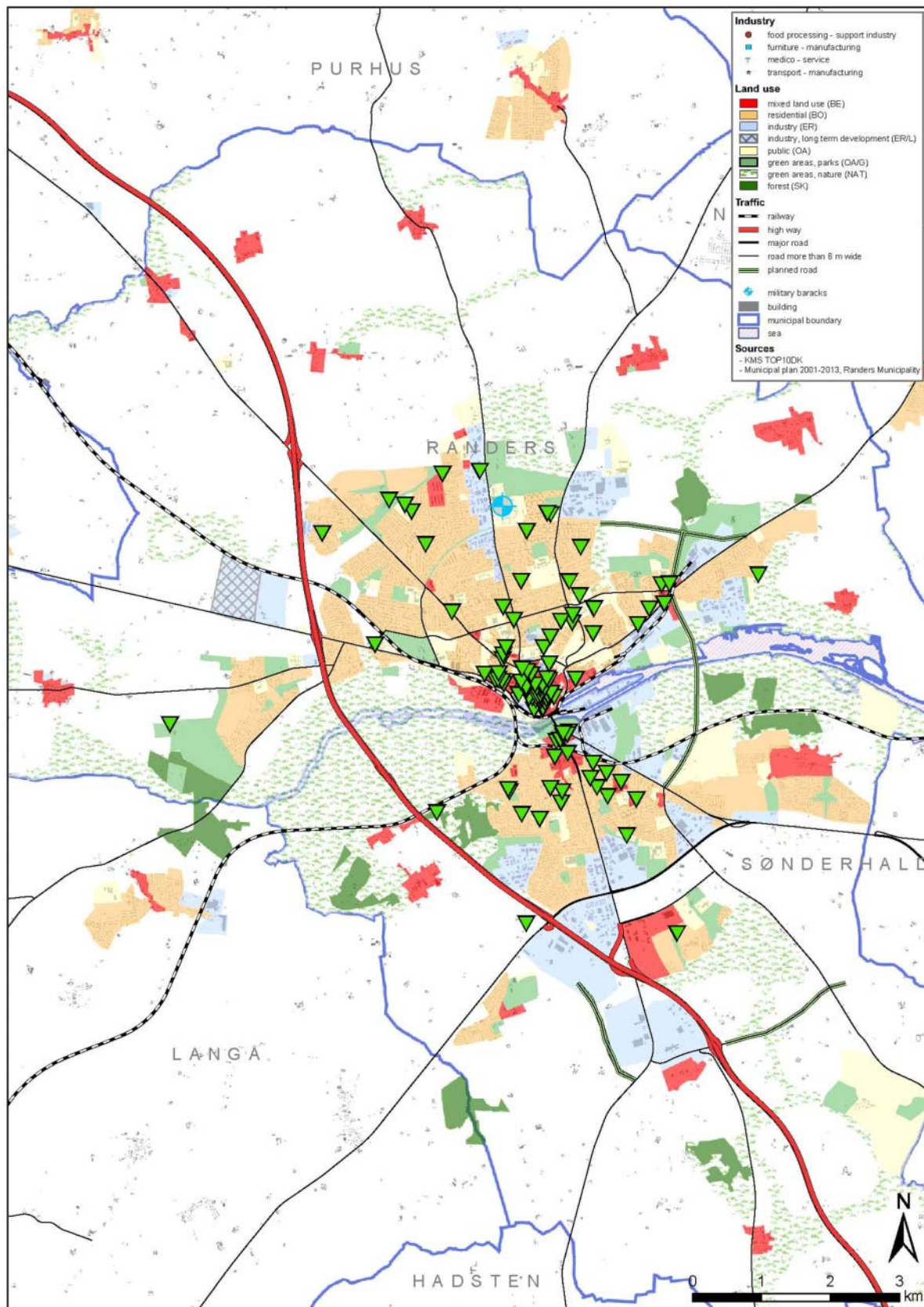


Figure 21. Medico - service, Randers

An assembly cluster

With a point of departure in the Bombardier railroad car factory, where he is the director, Per Nørret explains that the firm's development is closely linked to a continuing specialisation and enhancing efficiency of logistics and techniques in the assembly process of the many parts which comprise a railroad car, and not linked to an increase in the technological content of the car. Something similar is the case in other Randers firms, such as NEG Micon (now Vestas, windmills), Bosal (driver's cabins for tractors) and Dronningborg (agricultural machinery). These firms have begun to support each other in the development of principles and techniques for production control. Advanced final assembly of industrial products generates great demands, from logistics to robotic technology. A few years ago, the Knowledge and Competence Centre for Industry was created with the goal of supporting the creation of this cluster. It was somewhat successful, 'but we did not obtain the research and development with it as a part of the activity. We are trying to do this now, in that we are attempting to bring together five firms around a common focus on the establishment of research and development activities which can contribute to developing new means of assembling finished products. The entire idea is to disseminate the assemblage concept into the business sector and at the same time tell the firms that as long as they really desire a high quality of assembly of finished products with complicated machinery, they should go to Randers because here we do it in the most effective and competitive way in all of Western Europe. We have attempted to transfer some of these techniques at a low level from our firm to one of our colleagues, which resulted in a significant improvement of the firm's earnings. We are still only at a low level. But we hope to develop a high level of research and development activities in the coming year,' says Per Nørret.

Production clusters: food products, furniture and transport

The statistically identifiable production clusters in Randers - foodstuff-support services, furniture-manufacture, transport-manufacture and medico-service - are identified by firm name and post addresses in the appendix 'Production Clusters in Randers'. Geographically, the clusters are shown on two sets of map annexes: one set (figs. 14-17) shows the business clusters' regional location, and a second set (figs. 18-21) the location of the cluster firms within the town of Randers.

The firms' views of the clusters

It is one thing to identify a business cluster statistically. It is quite another as to whether the firms can identify themselves with these clusters. In order to investigate this question, we have cooperated with Randers Business and Development Council in sending out questionnaires to all the firms in the three business clusters located in Randers and the region Crown Jutland (i.e., the municipalities of Randers, Langå, Hvorslev, Rosenholm, Purhus, Rougsø, Sønderhald and Hadsten), i.e., food products-support services, furniture-manufacturing, and transport-manufacturing. The fourth cluster, medico-service, is not included because with its large content of doctors, dentists and public institutions, it is more the object of public regulation than municipal business policy.

Results of the questionnaire study

Eighty-nine questionnaires were sent out to the management of the relevant enterprises. The questions were divided into three categories, where the following was asked:

1) *the cluster's relevance*, including whether the firm was aware that in the area there is a special concentration of firms in the branch to which the firm belongs, and whether the firm draws any benefits from this concentration;

2) *the cluster's properties*, including whether there are special institutions and channels in the area which ensure access to knowledge within the cluster's area, or which provide services to the cluster's firms, and whether the firm exchanges employees with other firms within the cluster;

3) *strengthening of the cluster*, including whether a creation of a club of firms within the cluster with the objective of strengthening cooperation within the cluster would be of interest, and whether there is a need to establish special forms of education for developing the cluster.

In addition, the firms in the foodstuff cluster were asked whether they employ food technicians (bromatologists) and whether they see a need for a bromatologist education institution in Randers.

Eighteen questionnaires were received in completed form, while seven were filled out after a follow-up telephone call to all the firms who had not returned a completed questionnaire following the end of the submission deadline. The relatively low response rate (28%) should be recalled when reviewing the conclusions derived from the data.

The results of the completed questionnaires are summarized below.

Support services to food production: Most of the firms responding to the survey are not aware that there is a cluster in the sector, and the vast majority do not believe that they derive any advantage from a great concentration of related firms in the region. One respondent stated that he 'well knows that there are other foodstuff-related firms in the area, but we are not familiar with a cluster as such.' Generally speaking, it was answered that there is not much exchange of employees among the firms. One firm points out that an educational and information forum concerning 'the forthcoming enhanced food products' would be a good initiative. A majority of the firms would like to be invited to a meeting arranged by the Randers Business and Development Council concerning how the cluster can be strengthened

Table 2. Responses from the firms in the “food processing – support industries” cluster

No. of responses received as of 12 March 2004: 13 of 33 (39 %).

Is the cluster relevant?				
A	Is the firm aware that the area has a special concentration of firms within <i>support industries of food processing</i> ?	Yes	5	
		No	8	
b	Does the firm derive benefit that the area contains a concentration of <i>support industries of food processing</i> ?	Yes	2	
		No	11	
c	<i>Remarks</i> <i>I know there are other food-related firms in the area. But I am not familiar with a cluster as such.</i> <i>‘Don’t think that the company has any special relevance for this branch’</i> <i>‘It is a bit difficult to see the relevance for [our firm] in these questions.’</i> <i>‘Depending on the task, the experiences are shared across sectors in the local area, in Denmark and possibly internationally for a solution of a contracted project.’</i>			
Properties of the cluster		No	?	Yes
A	Are there special institutions and channels in the area which ensure access to knowledge within the cluster, or which provide service to the cluster’s firms?	5	7	1
b	Does the area have a special culture which makes it easier for the firms to cooperate within the cluster?	7	5	1
c	Are the firms generally aware of the existence of the cluster?	10	1	2
d	Does the area have a specially qualified labour force with qualifications which fit in with the firms in the cluster?	3	5	5
e	Does the firm exchange staff with other firms within the cluster?	8	3	2
f	<i>Remarks</i> <i>‘The customer’s needs determine the model for solution, and thereby also indirectly which sparring partners (firms, sectors) cooperate takes place.’</i>			
Strengthening of the cluster? The Business Council would like to promote the development of the firms in the cluster of <i>support services for food production</i> . Can you recommend the following proposals (mark X):				
a	Formation of a club of firms within the cluster with the goal of strengthening cooperation within the cluster. Would you like to be invited to a meeting on this issue?	Yes	7	
		No	6	
b	Does your firm employ food technicians (bromatologists)?	Yes	1	
		No	12	
c	Is there a need for a bromatology training institution in Randers?	Yes	0	
		?	11	
		No	2	
d	Is there a need to establish another form of education for the development of the clusters? If ‘Yes’, which?	Yes	1	
		?	9	
		No	3	
e	There are plans to establish a food centre on the site of the former Thors Brewery. Should the Business Council work further on this project?	Yes	4	
		?	7	
		No	2	
f	Do you have any proposals for other initiatives which can strengthen developments within the cluster? <i>‘Experience-sharing forum [Erfa-forum], where ideas and experiences can be shared between large and small firms.’</i> <i>We are attempting to make [company name] interested in placing a facility close to us. Perhaps we can produce fertilizer pellets of de-gassed fertilizer.</i> <i>‘It is very important that the authorities find the correct attitude to manage and help in the “development of clusters.”’</i> <i>‘Education and information forum concerning the forthcoming enriched foods would be a good initiative.’</i>			

Furniture manufacturing. Few firms are aware of the existence of the cluster, and furthermore, they believe that they cannot derive benefit from the presence of a large concentration of furniture production in the area. One respondent indicates that there are a number of joint ownerships among the region’s furniture manufacturing firms. Another respondent states that the survival of the furniture industry is linked primarily to general production

conditions in Denmark, among them the wage levels. Several firms are interested in meeting to discuss how the cluster can be strengthened, but it is also pointed out by one of the firms that ‘there had been established an experience-sharing group in the area earlier. As it happens with these kinds of groups, the cooperation always fades out and functions only as a “coffee club” during the time the group meets.’ Four out of seven respondents, however, are interested in being invited to a meeting about a possible creation of club of firms within the furniture manufacture sector.

Table 3. Responses from firms within the “furniture manufacturing” cluster

No. of responses as of 12 March 2004: 8 out of 35 (23 %).

Is the cluster relevant?				
A	Is the firm aware that there is a special concentration of <i>firms within furniture manufacturing</i> in the area?	Yes	4	
		No	4	
b	Does the firm derive benefit that the region contains a concentration of <i>firms in the furniture manufacturing sector</i> ?	Yes	3	
		No	5	
Properties of the cluster		No	?	Yes
a	Does the region contain special institutions and channels which ensure access to knowledge within the cluster’s area, or which provide service to the cluster’s firms?	2	5	1
b	Does the region have a special culture which makes it easier for the firms to cooperate within the cluster?	4	3	1
c	Are the firms generally aware of the existence of the cluster?	3	3	2
d	Does the area contain specially qualified work force within the area with qualifications which fits with the firms in the cluster?	5	2	1
e	Do the firm’s employees exchange with other firms within the cluster?	5	1	2
f	<i>Remarks</i> <i>‘There is some kind of common ownership among several of the region’s furniture factories’</i> <i>Regarding question b: ‘In potential cases we contact the individual firm directly.’</i>			
Strengthening of the cluster? The Business Council would like to promote development of firms in the cluster of furniture manufacturing firms. Can you recommend the following proposals (mark with an X)				
a	<i>Formation of a club of firms within the cluster with the goal of strengthening cooperation within the cluster. Would you like to be invited to a meeting about this issue?</i>	Yes	5	
		No	3	
b	Is there a need to establish special forms of education for developing the cluster? If Yes, which:	Yes	0	
		?	4	
		No	4	
e	<i>Is there a need for special support functions or service occupations for the cluster in the region? If yes, which?</i>	Yes	0	
		?	3	
		No	5	
f	Do you have proposals for other initiatives which can strengthen the development within the cluster? <i>‘Too late to do anything about developments within the furniture industry. The skilled level is on the way out and is being replaced by unskilled labour. Discount goods. The survival of the furniture industry is connected with a solid basis in the national economy: the wage level is too high – the production costs increase – competitiveness is worsening = production of furniture is on its way out in Denmark, or will fold up. Only niche production and discount goods can survive’</i> <i>‘I think it works best in the existing informal way.’</i> <i>Experience-sharing groups were previously established in the area. As it happens with this kind of thing, the cooperation fades out and functions only as a “coffee club” for the time that the group exists.’</i>			

Transport-manufacture: Three firms are not familiar with the existence of the cluster, while one firm is. One firm points out that it has worked together with a cluster of assembly firms across sectors in the area. The firms are interpreted in a meeting arranged by the Randers Business and Development Council about how the cluster can be strengthened.

Table 4. Responses from firms within the “transport manufacturing” cluster

No. of responses as of 12 March 2004: 4 of 21 (19 %).

Is the cluster relevant?				
A	Is the firm aware that there is a special concentration of firms within transport production in the area?	Yes	1	
		No	3	
B	Does the firm benefit from the concentration of firms within transport in this region?	Yes	1	
		No	3	
C	<i>Remarks</i> <i>We have worked with a cluster of assembly firms across sectors'</i>			
Properties of the cluster		No	?	Yes
a	Does the area contain special institutions and channels which ensure access to knowledge within the cluster's sector or which provide services to the cluster's firms?	0	3	1
b	Does the area contain a special culture which makes it easier for the firms to cooperate within the cluster?	0	2	2
c	Are the firms generally knowledgeable about the existence of the cluster?	2	0	2
d	Does the area contain a specially qualified work force with qualifications appropriate to the firms in the cluster?	0	2	2
e	Does the firm exchange workers with other firms within the cluster?	2	1	1
f	<i>Remarks</i> <i>"From question A: Under construction"</i>			
Strengthening of the cluster? The Business Council wants to promote the development of a cluster of manufacturing firms within the transport sector. Can you recommend the following proposals (mark with an X):				
a	Creation of a club of firms within the cluster with the objective of strengthening cooperation with the cluster. Would you attend such a meeting?	Yes	3	
		No	1	
b	Is there a need to establish special forms of education for the development of the cluster? If Yes, which?	Yes	2	
		?	2	
		No	0	
e	Is there a need for special support functions or service occupations for the cluster in this area? If Yes, which:	Yes	2	
		?	2	
		No	0	
f	Do you have proposals for other initiatives which can strengthen the development of the cluster? <i>Research and development'</i>			

On the background of these responses, it appears to be difficult to speak of the existence of business clusters within support occupations for, respectively, food production, furniture manufacture and transport production in Randers and the Crown Jutland region. Within the support occupations for food production and furniture production, many firms are not aware that there exists a regional concentration of firms within the branch to which they belong, and the largest number indicate that there are no immediate advantages to be derived from the relatively high concentration of related firms in the area. The fact that a respondent from the furniture cluster believes that the survival of the furniture industry is connected primarily with the general production conditions in Denmark, such as the wage levels, can be interpreted as signifying that the individual does not attribute any decisive importance to a local cluster for furniture production in the area. Among the firms in all three branches, however, there is considerable interest in being invited to meetings about possible establishment of branch clubs or ‘cluster clubs’.

Improved investigation

As mentioned above, the response rate in this mini-survey has been low (28%), which should naturally be taken into consideration in assessing the conclusions drawn from the

data. One factor behind the low response rate is probably that several firms have figured in the statistically identifiable cluster, while in reality they have had only a very peripheral connection to these cluster firms. Hence, a rope maker and a producer of wheelbarrows were on the list of firms in the support occupations for food production. The respondent from the wheelbarrow firm has pointed out that the firm, 'was perhaps not so relevant for this sector', but has nonetheless filled out the questionnaire.

There can have been several such cases, which can have reduced the response rate. Another explanation for the relatively low response rate is a lacking understanding of the concept of 'cluster'. In connection with the calls to the firms which had not initially returned the questionnaire, it could be concluded that there was often a need for an explanation of the concept of cluster. In connection with an eventual new questionnaire survey, consideration should be given to explaining the concept more fully.

The geography of clusters

The most geographically concentrated clusters are the medico-service firms. This group comprises, as previously mentioned, dentists and several public institutions, most of them concentrated in Randers town. As the cluster consists of service firms, a large number of them are located on a central street in the city centre, where they have preferred a customer-oriented location. However, many firms within the cluster are also located in residential areas, primarily the housing estates and neighbourhood centres. The firms in the transport-manufacture cluster are located predominantly in the towns of Randers and Hadsten, while those in the food production-support services sector and – to an even higher degree – furniture manufacture are significantly more dispersed, with many firms in smaller urban centres in the neighbouring municipalities.

For these three business clusters, the placement of the firms in Randers town is very uniform and characterised by a placement in the town's business districts. Only a few firms lie in mixed residential and commercial areas. The three industrial clusters are thus placed in accordance with good planning practice in areas especially reserved for production and industry. The firms show no concentration within specific areas in Randers. Hence, within the city's framework, there is no form of geographically determined cluster formation. This can be explained by the fact that the firms' placement has been determined primarily by where the municipality had reached in its planning and construction maturity of business properties at the point when the firm was established, or where there was suitable commercial property to take over, at the time when the firms started operations or made a choice about expansion. Hence, there arises a natural dispersion which reflects the town's historical development and the commercial districts generally.

Spatial planning and business clusters

We have discussed the role played by business clusters in the municipalities' physical planning with the municipality's planning director over many years, John Traasdahl Møller. Møller was familiar with the cluster concept and also expressed several opinions as to what was contained in the concept of business cluster.

Chains and clusters

John Traasdahl Møller believes that one must distinguish between firm *chains* and firm *clusters*. A firm chain consists of firms which are bound together by subcontractor/supplier relations around a given product, e.g., salvaging of cars. A former salvaging firm in the

town had specialised in supplying spare parts to high quality automobiles. When he wanted to sell the parts from the cars he had stripped, he transported them to Randers harbour. The salvager obtained benefit from Randers harbour being close by. They created a (small) chain, without this relation between them contributing to the construction of other relations which could impact the local environmental or labour market. This type of narrow relations can be called 'chain relations' in contrast to the 'cluster relations' which are broader and create a new kind of business environment.

It is John Traasdahl Møllers' view that the geographic aspect in the formation of firm clusters means less and less. On the basis of declining transport costs, the structural content in a firm cluster means more than the cluster's physical form. This is the background for the phenomenon of business clusters not playing any greater role in the municipality's spatial planning. Nevertheless, there are exceptions.

Attempts with a media cluster

Such an exception has been attempted in the effort to build up a cluster of media firms in Randers. Some years ago, the town sought to develop a media cluster as part of the city's business development strategy and with a clear city planning idea. The attempt took place when Randers became the new home of the studios of the Danish TV-2 East. The establishment of the second national Danish television channel also entailed the establishment of several regional television stations. One of these was to be placed in the Århus region. When the mayor of Randers heard about this, only a minority of the board of TV-2 East actually resided in Århus. The mayor therefore acted quickly and resolutely in order to convince the board to place the new regional TV studio complex in Randers and not in Århus. He succeeded, and the new TV studio obtained a place in the Media House. However, not many years passed before the studio facilities were moved to Århus. There were two reasons for this: first, much of the regional news was linked to coverage of the political life in the County Council and in Århus City Council. This meant that the station's staff spent much of their time in Århus and not in Randers. Second, most of the employees lived in Århus, and none of them wanted to move to Randers. Finally, John Traasdahl Møller added, 'TV-2 was mentally speaking an "Århus firm" from the beginning.'

The Media House was placed in a former warehouse at the Hadsund Railroad junction. When the warehouse closed and stood empty, the municipality succeeded in convincing a local engineering firm to purchase the building and convert it into a media house. The concept had been developed by the municipality. The idea was that the building, besides housing the television studio facility, should also house several media related functions and firms. Randers municipality offered the engineering firm an option on the neighbouring area for several years, such that the building could be expanded if the media concept became a success. After the closure of the media house, John Traasdahl Møller realised that the municipality had 'seduced' TV2 into moving to Randers. 'We did not know enough of the relations which TV2 was starting to establish. Had we known, we would have perhaps concentrated on getting other media firms to locate in Randers, such as suppliers to TV2 and other media firms which were not so dependent on a localisation in Århus'.

The food production cluster

The recent closing of the Thor brewery has led to the idea of establishing a food product centre which would focus on quality in gourmet standard. The food centre would include restaurants, specialty food market, production of specialty foods, advice and training of

bromatologists or food technicians. The existence of the food centre would at the same time strengthen the existing food cluster.

The former Thor Brewery building cannot be used for residential purposes. Similarly, it is difficult to sell the brewery to a single firm. John Traadsdahl Møller is of the view that a food centre needs sponsors or investors, such as the meat processing firms of Tulip and Danish Crown. The ‘Mecca’ concept therefore lies with the business director to be further developed for presentation to the two firms.

Clusters and planning

Randers’ three industrial clusters - food products-support services, furniture-manufacture and transport-manufacture - have emerged without special spatial planning initiatives explicitly directed toward cluster formation. Nor have there been considerations as to special planning initiatives toward the creation of the new assembly-cluster, which some local firms, supported by Randers Business and Development Council, are working with. In sum, it seems that the cluster concept is linked significantly more to the local business policy than to the local spatial planning, and that the physical dimension is significantly less critical for cluster formation than the structural dimensions.

Nevertheless, one cannot conclude that creation of clusters is irrelevant to spatial planning. This is done insofar as the cluster idea can become part of a total concept, e.g., for the utilisation of an available area or building complex. In Randers, the attempt was made to convert a former warehouse into a media centre, and there are now plans to build a food centre in a former brewery. In both cases, the idea of synergy between related firms is combined with a concrete physical and city planning idea. Something similar was done by Nakskov Municipality, when it assisted in the conversion of the wharf area and adjoining commercial property into a cluster of public and private environmental and energy firms, which with a localisation in physical proximity to each other can construct symbiotic relations following the ‘Nakskov Environment Concept’.

We call such examples ‘concept clusters’ so as to indicate that it is a case of a specially delimited kind of clusters where the physical plays a more prominent role than normal, and where the transmissible effect or interaction with the local labour market and the local business environment can be limited. A conceptual cluster can exist as an island in the local business environment (media cluster), it can be sprout for an existing cluster (the food centre) or it can be a spearhead in an attempt to form a new, more broadly anchored cluster (‘Nakskov Environment Concept’).



Figure 22. Sparekassen Kronjylland's new headquarters on the banks of the Gudenå River. Deindustrialisation and outsourcing have hit Randers hard because the large firms that closed down were not only places of work but also identity-giving firms (Thors Brewery, Randers Rope, Randers Military Barracks). The closings leave wounds in the town when the empty buildings are not suited to other urban purposes. Here at the banks of Gudenåen, however, there has been success in transforming a former commercial zone into a combined city park and business park for firm headquarters.

Business development and spatial planning

While the formation of clusters plays only a small role in spatial planning, this is not the case with the remaining interaction between spatial planning and business development in Randers. Through the 1960s and 1970s, spatial planning has contributed to the formation of new business areas for relocation and expansion of local firms. One of these larger areas lies in the southern part of Randers, near Paderup. Here lie not only the headquarters of Tulip and Danish Crown, but also several other firms such as Randers Business Academy, the county academic high school (Amtsgymnasiet) and the Business School. With the many new firms, the Paderup area appears as a physical expression of growth. But it is not growth in new areas which otherwise characterises the interaction between physical planning and business development in Randers in recent years. The centre of this interaction is the urban renewal.

The land-use plan from 1970 had not foreseen that Randers would stop growing physically. Because of the many plant closings, numerous construction possibilities have appeared around the town's existing urban areas. As such, the planning department has found space for 1300 new housing units within existing urban areas. John Traasdahl views this as a great advantage in order to develop the town 'from within' rather than continued expansion into new areas, in that one can build upon the existing infrastructure. A disadvantage, however, is that the municipality has less influence on the sale of land, in that the developmental

possibilities are now created on private lands. John Traasdahl Møller calls this flexibility created within the city's framework 'porosity'.

By 31 examples on urban transformations since 1980 the planning department has illustrated how porosity occurs in the city. A summary is shown in table 5 revealing the new land use after finished, ongoing or planned conversions. The 31 examples represent the conversion of 90 ha urban territory. 14 - about half of the conversions - are from former industrial land uses. The new land uses are designated for either residential or city centre functions including services. Only 2 conversions are for business services.

The largest single territory is and older industrial area, Hvidemølle, on 21,3 ha situated at the waterfront of Randers Fjord. The city council has decided to initiate an urban transformation of the territory followed by the purchase of a closed industrial property in the area. The second largest territory is the former military barracks on 16,7 ha. Situated as it is on the northern part of the city urban transformation is difficult, since the property is situated far away of the educational milieu and the industrial districts in the southern part of the city. The barracks are now administered by the national real estate company, FREJA. Two other estates are Randers Rope (3,2 ha) and Thor Brewery (2,8 ha). The city council bought Randers Rope. The buildings are demolished and apartments are being constructed at the property. Thors Brewery is owned by Bryggerigruppen A/S. Currently, it is planned to convert the estate to city business and apartments.

Figur 23 shows the geographical position of the urban transformations. About 50% are situated in or close to the city centre. The other examples are spread all over a wider area. Thus, urban transformation is first and foremost influencing the central part of the city. From a functional point of view, the transitions mean that production is substituted by retail, culture, service and apartments. 14 of the 31 examples have to do with transformation following the closure of industrial production. Only in two examples, the transformations give rise to business services. 15 of the transformations result in the establishment of centre and service functions and 14 transformations give rise to housing. The overall picture of the transformations is that of a city transforming into a new role, i.e. from an industrial city into a commercial and residential city – keeping in mind, however, that the 31 examples represent only 3% of the urban zones of Randers.

Table 5 Land use conversions in Randers

31 examples of land use conversion since early 1980s		
New land use	Ha	Number of projects
City centre / service	34	15
Residential	51	14
Business service	5	2
Total conversion (planned and realised)	90	31
Conversion from former industrial land use	47	14

About 50% of the conversions are situated in or close to the city centre. And about 50% were due to the closure of industrial production. Only two conversions gave rise to business services, whereas 15 gave rise to centre and service and 14 to housing. The conversions indicate that Randers is transforming into a new role, i.e. from an industrial city into a commercial and residential city – keeping in mind, however, that the 31 examples represent only 3% of the total urban zones of Randers.

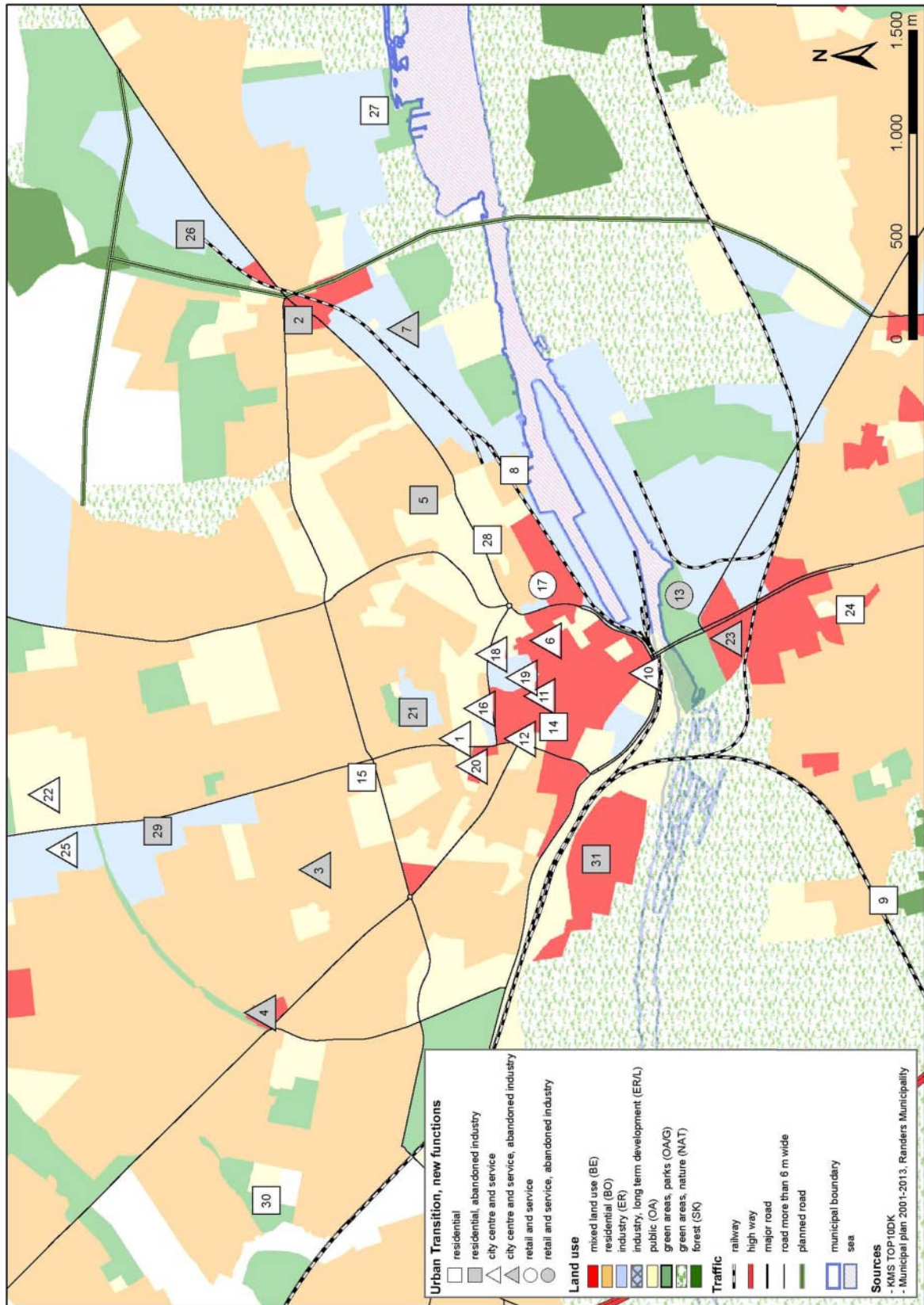


Figure 23. Land-use conversion in Randers, examples

Herning: smooth conversion

In the Herning area, four business clusters have been identified:

- Furniture-manufacture;
- Construction/housing-manufacture;
- Garments-manufacture;
- Garments-service.

It is well known that the garment and textile industry is strongly anchored in the Herning area. It is also well known that since the 1990s, precisely the textile and the industry have been subjected to a major wave of outsourcing of their manual production to countries such as Poland and Lithuania. Similarly, it is well known that Herning's textile and garment industry has succeeded in transforming itself via a concentrated emphasis on design, branding, sales and marketing. A calculation of specialization in selected regions shows Herning with a marked degree of specialisation in the garment sector, both in 1993 and 2000 (Det Økonomisk Råds Formandskab, 2003).

Table 6. Specialisation in selection Danish regions

Regions	1993		2000	
Copenhagen Metropolitan area	Life- and pension insurance	2.5	Air transport	2.3
Århus region	Vegetable, animal oils and fat products	6.5	Vegetable, animal oils and fat products	8.0
Odense region	Gardening, nurseries, etc.	6.9	Gardening, nurseries, etc.	7.4
Aalborg region	Cement, bricks, etc.	11.1	Cement, bricks, etc.	9.3
Esbjerg region	Crude oil and natural gas extraction	27.8	Crude oil and natural gas extracting	30.2
Herning region	Garments	17.6	Garments	18.1
Bornholm region	Shipping	9.5	Shipping	13.7

Remarks: Specialisation is given for the sector in which the region is most specialised. The figures indicate the sector's share of the region's employment as a proportion of the sector's share of employment at the national level. Source: Det Økonomiske Råds Formandskab, 2003.

A key institution in the conversion of the textile industry is TEKO. Under its former designation as Konfektions and Trikotageskolen (Garment-making and Knitwear School), TEKO helped train seamstresses and advised the textile industry during the mechanization process in the 1960s. In the 1990s, TEKO has played an important role in the restructuring of the textile and garment industry by changing focus from textile production to the pre-production and follow-up processes.

The Herning-Ikast-Brande-Aaskov Business Council is prepared for a new wave of outsourcing affecting one of the other business clusters, namely furniture production. Therefore, the business council is attempting to clarify which experiences with outsourcing from the textile sector can be transferred to the furniture branch. Nevertheless, the two types of production, textiles and furniture, are very different. Therefore, one cannot expect

that a restructuring of the local furniture industry can take place with the same measures as have been used within the textile sector.

Geography of clusters

Garments

Within the garment sector, there is both a manufacturing and service cluster. The two clusters show characteristic, but understandable differences. The manufacturing sector has a significant concentration in Herning-Ikast, but beyond that lies dispersed in small villages and individual properties in the open landscape (figure 24). The cluster of garment-service, in contrast, is to an even greater degree concentrated in the Herning-Ikast areas, with only a few firms in the open landscape (figure 25).

The dispersion of the production firms in the open land is presumably due to the historical anchoring of the textile industry in small, owner-operated firms and residentially-based manufacturing sewing workshops, whereas the garment industry's service functions naturally belong to the sector's business and service centres. The dispersion of the firms throughout the individual properties and smaller villages distinguishes it from the localization pattern for the two other manufacturing clusters, furniture and construction/housing. Outside the large towns, these firms are to a much greater extent located in smaller towns and with better access to roads and rail lines.

Within the Herning urban area, one finds nearly all the manufacturing firms lying in planned industrial zones. Only a few firms lie in residential or in the central business districts (figure 28). As concerns the garment service, the main part is located in the city centre, along the main thoroughfare. But several firms are also located in Herning's industrial zones. Ten to fifteen firms are located in residential districts. A survey of firms in the residential districts, however, shows that several have the character of production than of service.

Construction/housing-manufacturing

Construction/housing-manufacture shows concentrations in the large towns of Herning, Ikast, Skjern and Ringkøbing, but they are also represented in most villages and in several individual properties in the open countryside (figure 26).

Within the Herning urban area we find, with a few exceptions, all the firms in the town's industrial areas (figure 30). Nearly half the firms are to be found in the business zone of Herning-South, in the town's southwestern district. The firms lie so close to each other that they perhaps constitute a special production environment. It is beyond the scope of this project, however, to investigate this in more detail.

Furniture-manufacturing

Furniture manufacture is especially represented in Herning-Ikast, but also in Holstebro. The firms which lie outside the large towns are to a greater degree than for example garments-manufacturing localized in towns where there is better access to roads and rail lines (figure 27). Within the Herning urban area, furniture-manufacturing is localized in the business districts (figure 31).

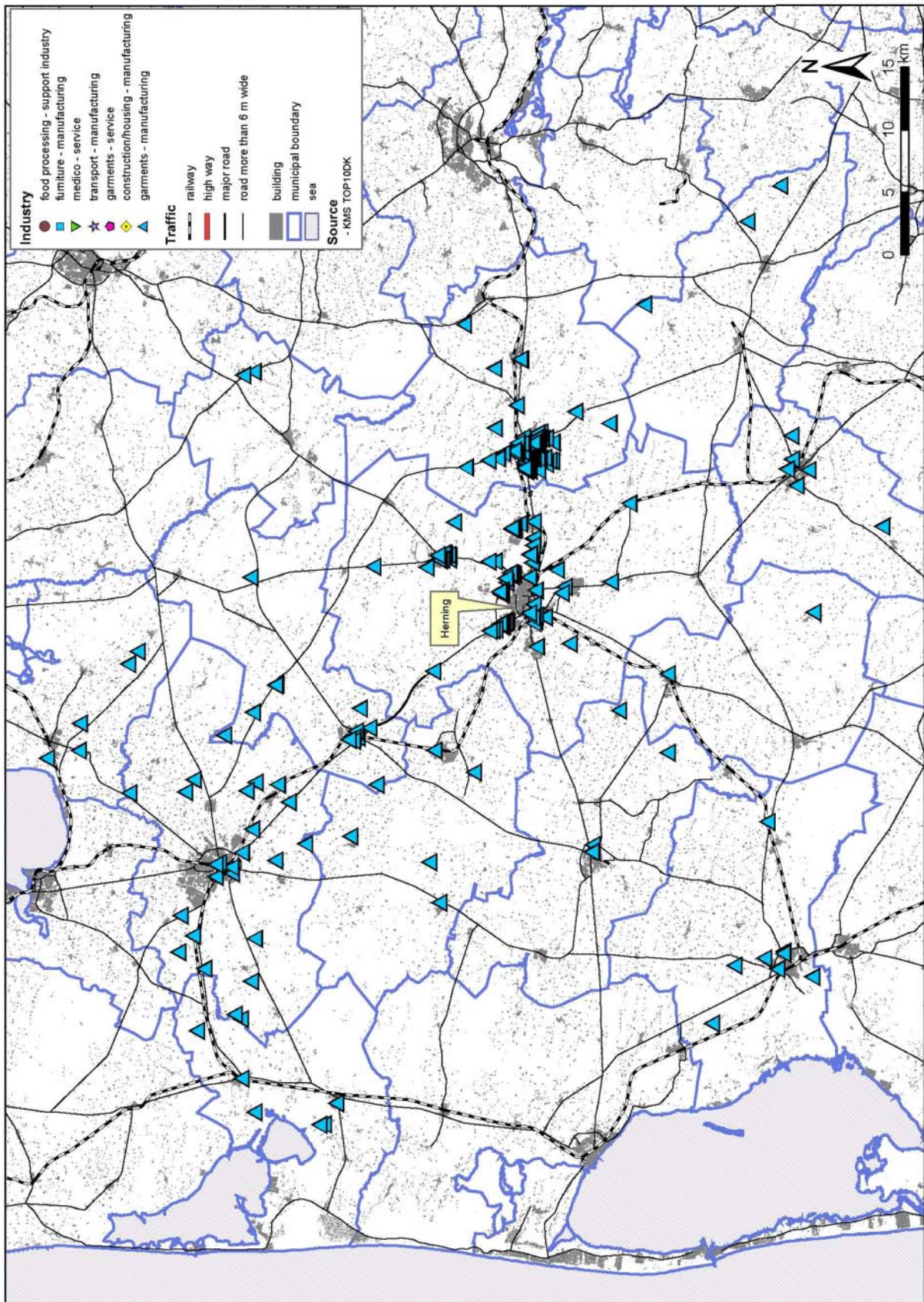


Figure 24. Garments – manufacturing, Hering region

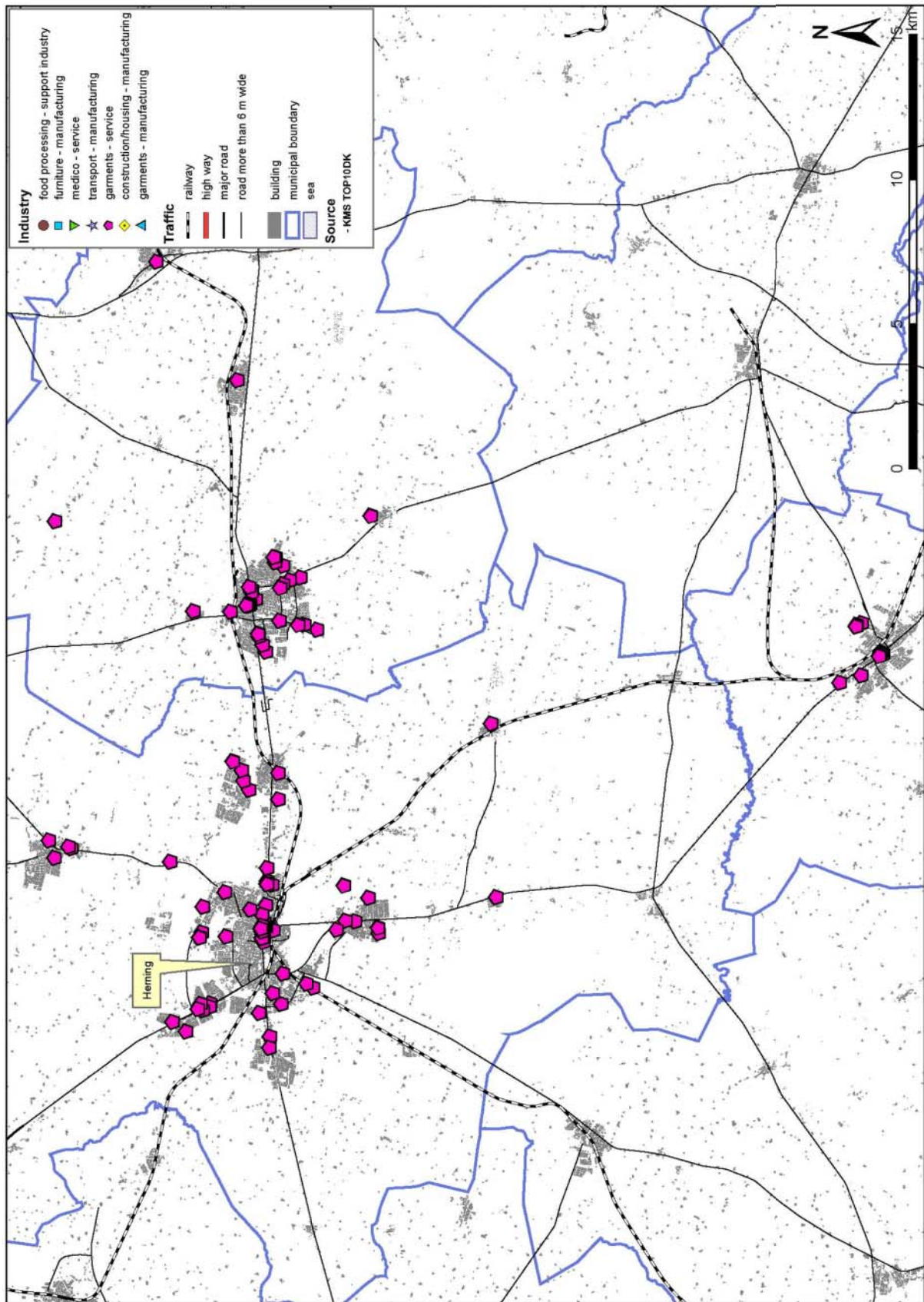


Figure 25. Garments – service, Hering region

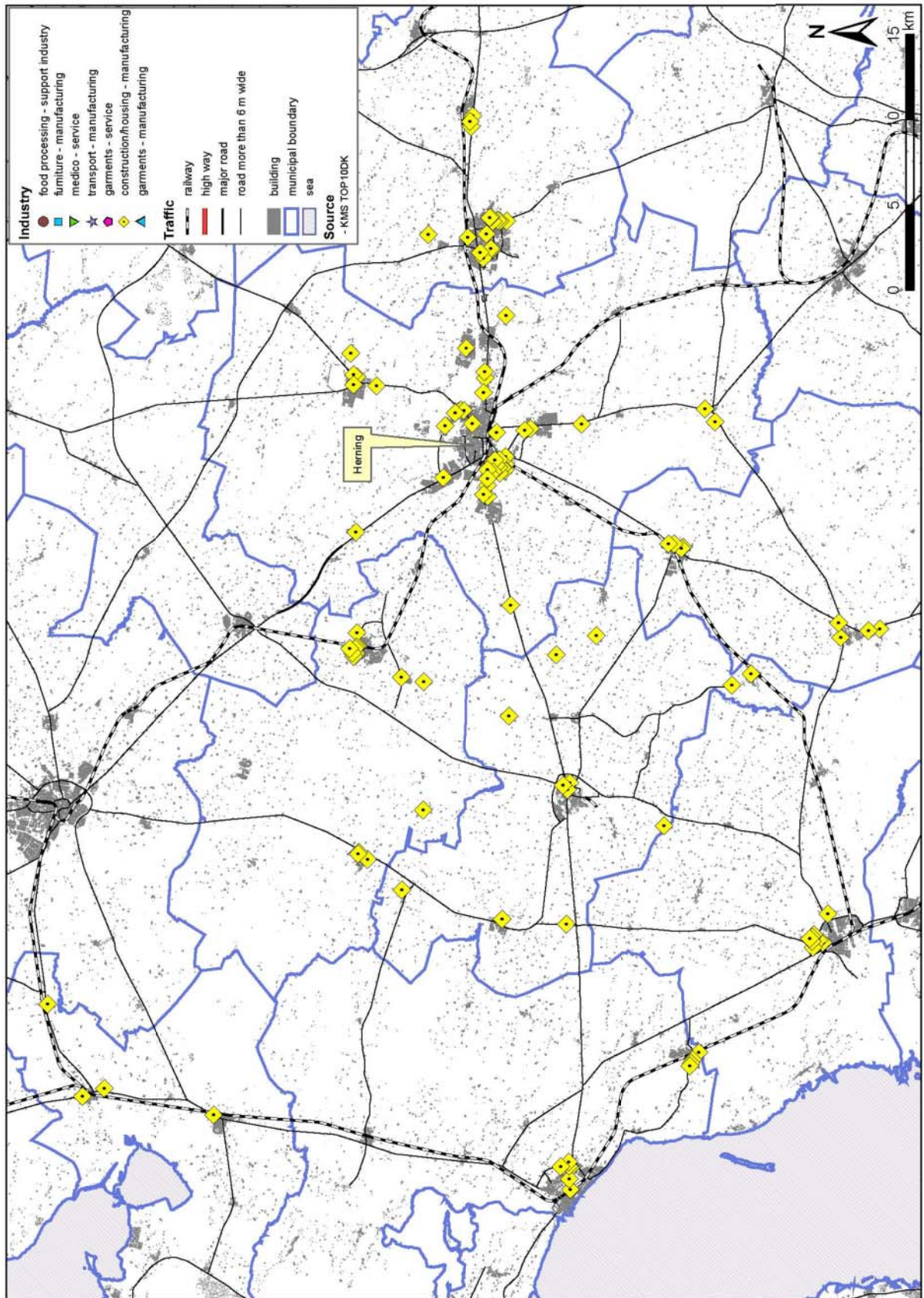


Figure 26. Construction/housing - manufacturing, Herring

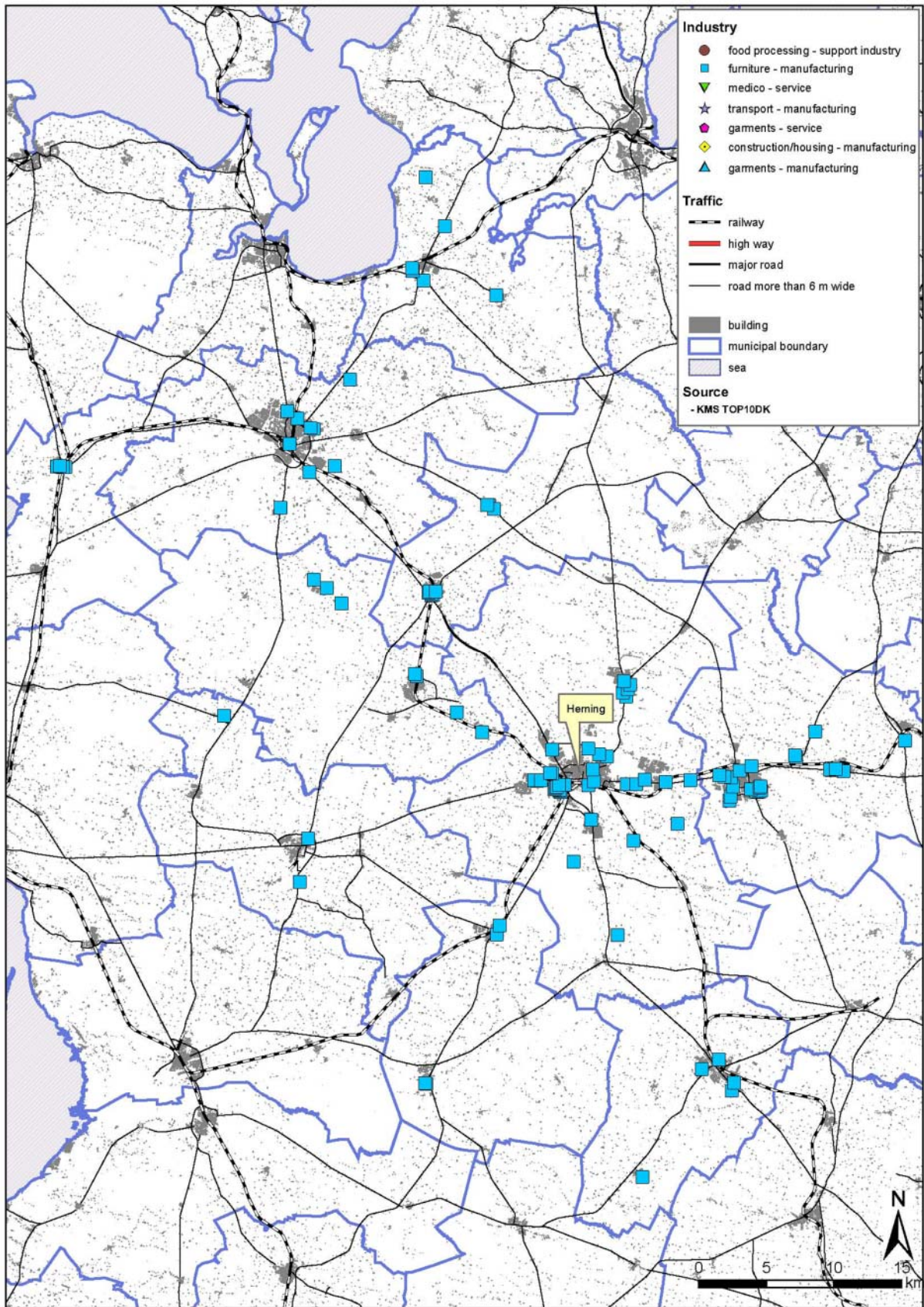


Figure 27. Furniture - manufacturing, Herning region

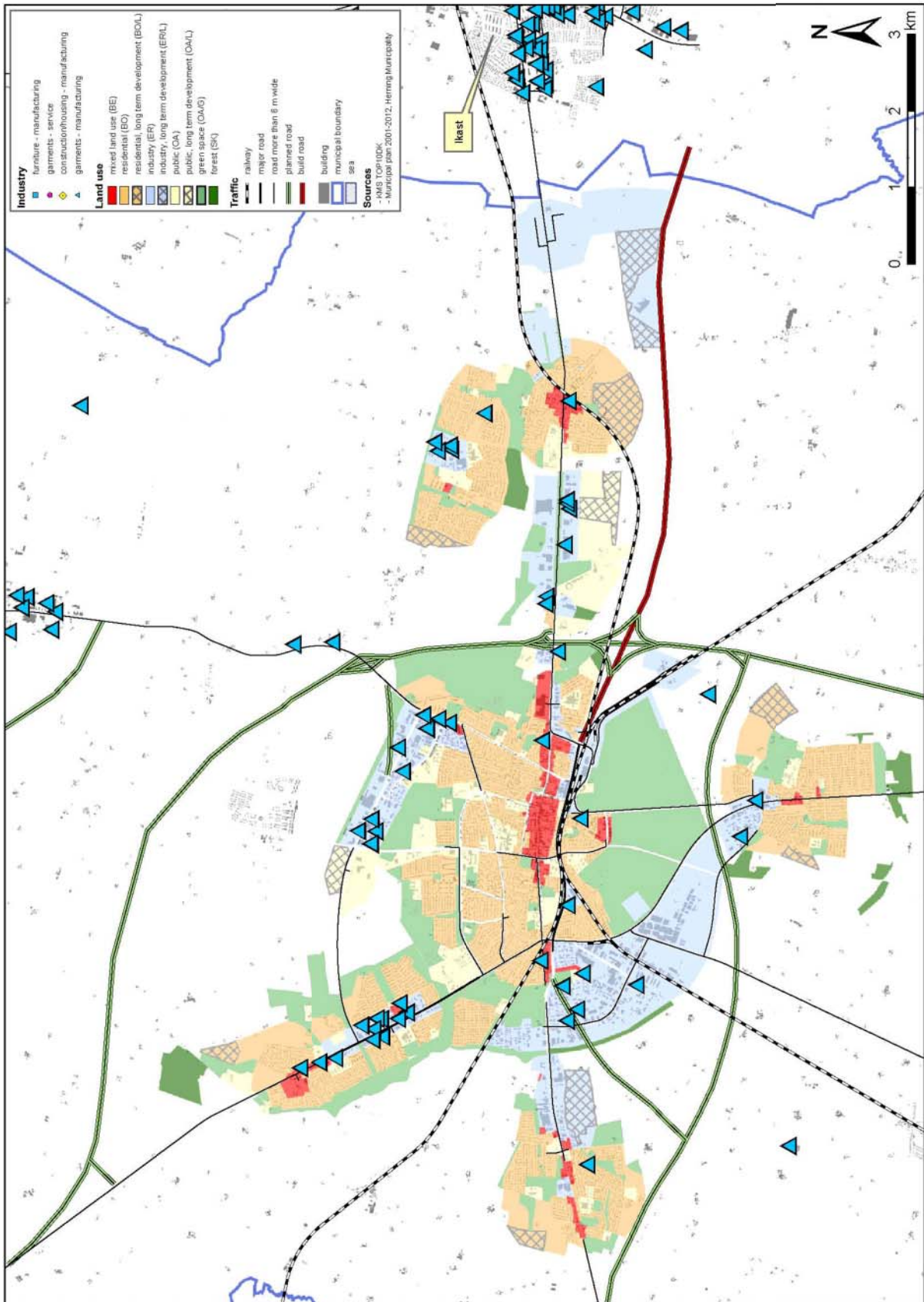


Figure 28. Garments – manufacturing, Herring

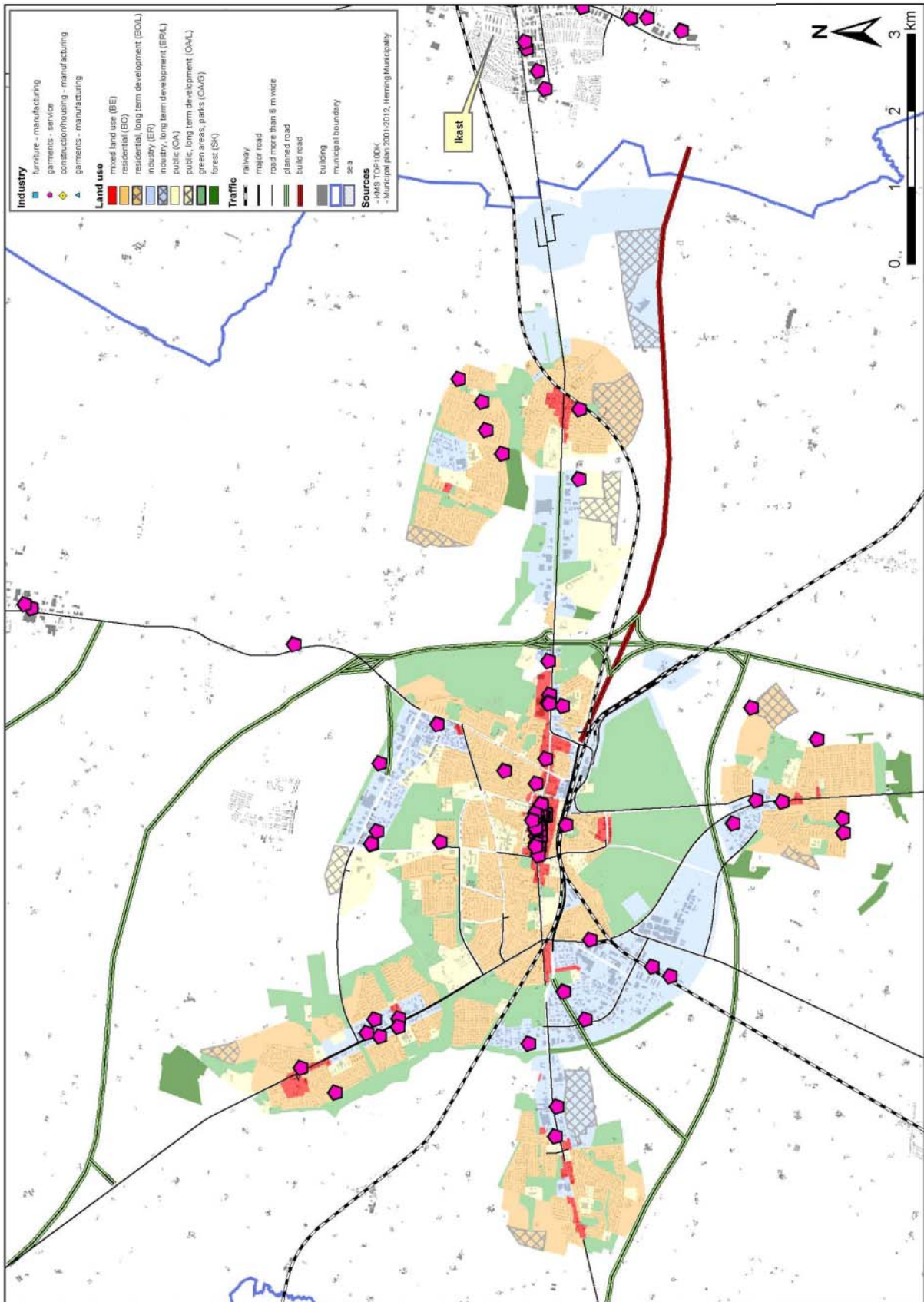


Figure 29. Garments – service, Herring

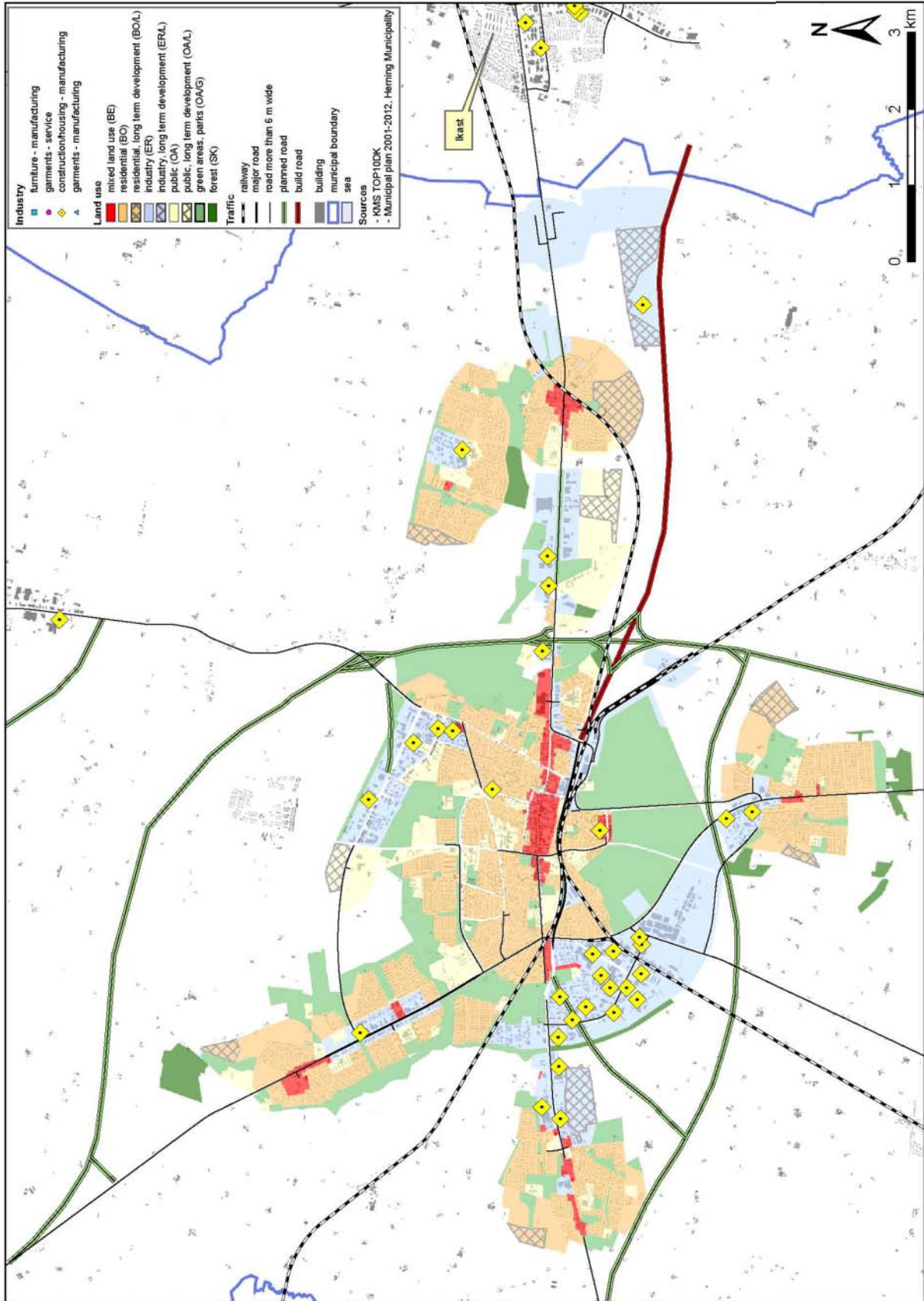


Figure 30. Construction/housing manufacturing, Herring

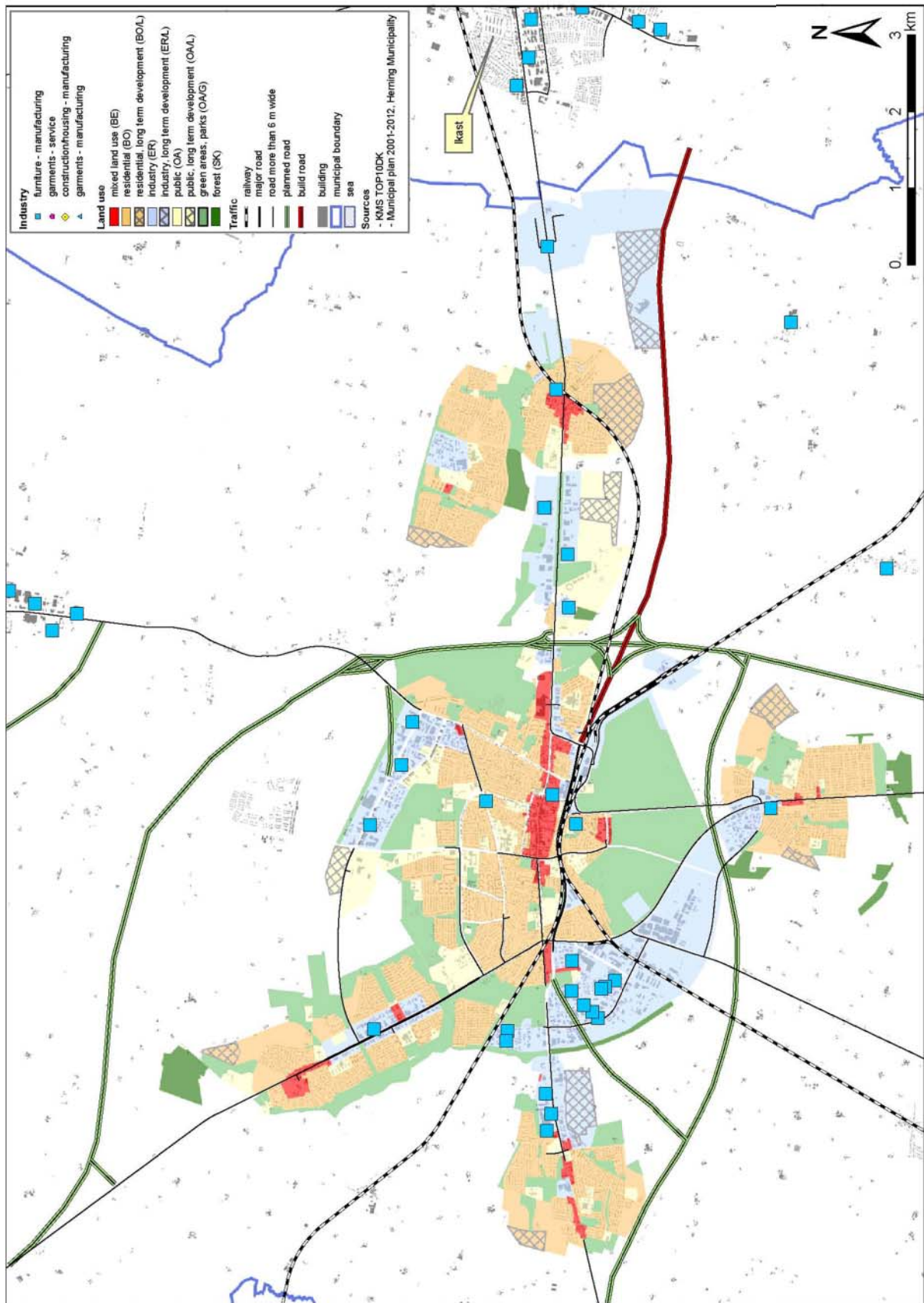


Figure 31. Furniture - manufacturing, Herring

Changes in the town's economy in the 1990s

In the opinion of planning director Jørgen Vædele Hansen, restructuring of industrial society has not caused a crisis in Herning. Herning is dependent on manufacturing firms and will continue to be so for many years to come. Therefore, the restructuring of the local economy from industry to service takes place in a less conflictual way in Herning than in many other towns.

The most remarkable change of the industrial structure in the 1990s was the marked decline in employment within the textile sector. The loss of workplaces within textile production, however, was nearly entirely compensated by a growth within retail sales and business services, especially in the years 1997 to 2002. In the years 1993-2002, the number of workplaces within textiles and garments fell by about 2500. The growth of workplaces within commerce and business services during the same period was about 2300 (Herning municipality 2003, p. 13f).

The spatial structure of the textile industry

The textile firms in Herning have grown up around many small firms, and for many years the branch has been marked by this feature. Many of the small firms were established before the development of special industrial areas using modern city planning techniques. The firms were therefore located throughout the town. A contributing factor to the dispersed placement of the firms was that most of the textile firms were set up in the owners' own homes and would later evolve into the expansion of the house or construction of an annex on the lot. In this way, there developed a unique tradition of craft worker housing lots combining both residential and work functions. Early on, there also developed a tradition for the larger textile firms to hire seamstresses who worked out of their homes. The entire production process (delivery of materials, retrieving the finished garment and training, etc.) was organised by the firm. This form of production further underscored the integral connection between dwelling and production.

In this environment of smaller firms supplemented with home-working seamstresses, production evolved to the 1960s, when some of the firms began to grow and establish themselves on larger lots in planned business zones. In the late 1950s, Herning municipality constructed two commercial areas, one in the town's northern zone ('Vesterhomsvej district') and another in the town's southwestern zone ('Herning South'). Immediately east of the town, the Gjellerup parish municipality had constructed an extended business area in Birk between Herning and Hammerum, on both sides of the highway toward Silkeborg, these being called 'Birk North' and 'Birk South'. With the construction of Birk North and Birk South, the first step was taken in the development strategy which Herning metropolitan municipality established in connection with the municipal planning in 1993, to cease further business development toward the north and instead concentrate on the business development toward the east. The idea here was to work toward an actual physical consolidation with Ikast, so that the area would become a single linear urban connection between the two cities. In the western section of Birk South, closest to Herning, the factory owner Aage Damgaard constructed in 1964-65 a new production building for his Angli shirt factory. A nearly circular a-shaped building was decorated in the inner circle by Carl-Henning Pedersen's ceramic work 'Game of Fantasy on the Wheel of Life' (1966-68). Birk South and Birk North are today fully built-up, so that Herning and Hammerum are physically linked together. It is preferably middle-sized façade-oriented firms which lie out

along the highway. Birk South has expanded southwards, among others with the new Birk Centrepark, which lies in the area's western part with entrance marked by the former Angli shirt factory. What was once a factory is now Herning Art Museum and parts of the Danish Textile and Garment-making School (TEKO).

The ideas of developing the Herning-Ikast agglomeration were concretized in 1993 with the construction of a new business district, the Herning-Ikast Business District ('HI-Park') east of Hammerum, bordering Ikast Municipality. The district is served by a new highway south of Herning-Ikast. The area has not developed at the pace it was planned. This is due partly to the many unutilized business areas in the existing building space. One of the first firms to establish itself in the area is the new freight terminal, a consolidation of the freight depots in the two town. The former freight depot in Herning lay in the city centre and is now converted to the Dreissler supermarket.

Birk South and Birk North now contain many of the new middle-sized textile firms which established themselves in the new buildings in the 1960s. For many years, production in the smaller firms coexisted with the larger firms in the Birk South and Birk North areas, such that the town contained a significant variation of textile firms.

Effects of restructuring in the textile industry on urban planning

When employment in textile production fell because of outsourcing of the manual labour, largely to Poland and Lithuania, several industrial properties became available for other uses. Despite the commercial space that became available during the 10 years where restructuring took place, no industrial buildings remained empty for prolonged periods. Many of the small textile firms were changed to residential use. They often lay in mixed residential and business zones and often already have a dwelling on the property. They could thus be converted to residential use relatively easily. The properties which have not been converted into dwellings have been changed to other business purposes. This is especially the case, naturally, with the larger firms.

Table 6. Effects of the transformation of the textile industry on urban planning

City centre, Vestergade:

1. Herning Clothing Factory ⇒ Herning Textile Museum

City centre, Silkeborgvej

2. EGE carpets ⇒ VM data (IT firm) - moves to Birk North

City centre, Ringkøbingvej South

3. Herning freight depot ⇒ Dreissler Supermarket – moves to HI-Park in connection with consolidation with Ikast freight depot – now Danske Fragtmænd

City centre, between Dronningens Boulevard and Grøndalsvej

4. Elas textile rubber products ⇒ grocery and private hospital (Dalgas) – moves to Birk North
5. Iron smelting plant ⇒ housing units
6. Lind Machine factory ⇒ advertising agency – moves to HI-park
7. Neila (textile firm) ⇒ 100 youth dormitory units

Vesterholmsvej area

8. JBS (under garments)

Birk Nord

9. Elas (moved from city centre, Thrigesvej)
10. Ege Carpets (moved from city centre, Silkeborgvej)

Birk South

11. Angli Shirt factory ⇒ Herning Art Museum
12. Femilet (women's undergarments) ⇒ office use and storage warehouse
13. Skovhus Strik (knitwear) ⇒ Storage depot for Red Cross
14. Zachø Strik (knitwear) ⇒ furniture factory for Idé Møbler (furniture co.)

Hammerum (at the rail station)

15. Hammer Thor (undergarments) ⇒ 29 apartment units

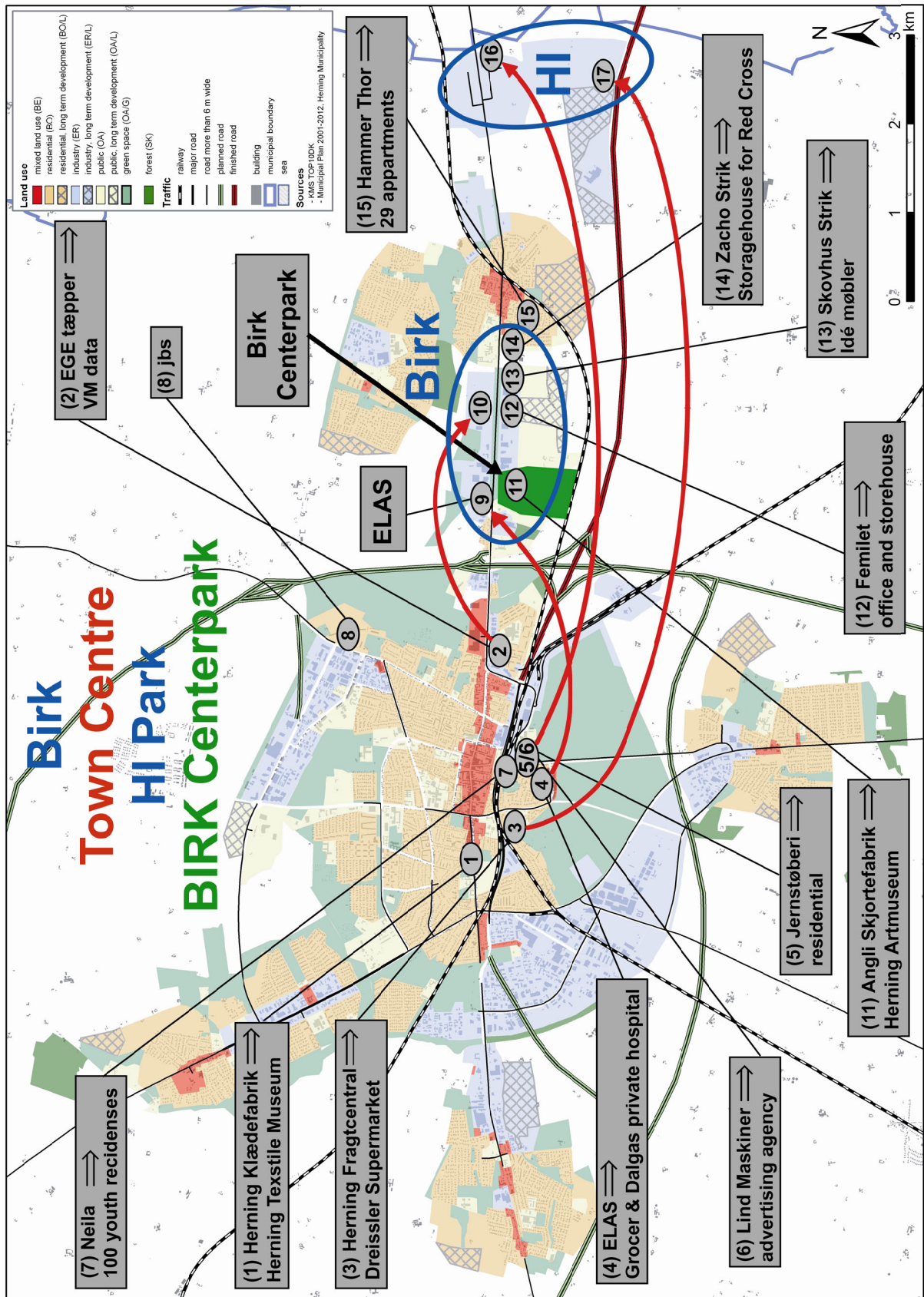


Figure 32. Herring adjusts to the outsourcing textile industry. Herring has continuously been able to adjust to the changes of the textile industry. During the growth period, the textile industry moved from the center of Herring to the new industrial area, Birk. Later, when textile manufacturing moved abroad, the manufacturing premises were closed down but without leaving open scars. Most of the buildings of the textile manufacturing – from the small work shops in private houses to the large workrooms – were suitable for other purposes and new industries and productions moved into the vacant premises.



*Figure 33. From textile to dwelling
Hammer Thor in Hammerum is remodelled into apartment units.*



*Figure 34. From textile to hospital
Buildings from the former ELAS rubber products firm are remodelled into the Dalgas private hospital.*

Planned restructuring of business districts

In general, the restructuring in connection with the closing of the textile firms took place via the operation of the normal housing and property market. Hence, there has thus not been a need for larger municipal planning efforts. In recent years, the municipality has focused its efforts on areas which in general have been worn down or environmentally degraded. In the municipality's Planning and Budget Strategy (Herning Municipality, 2003, p. 22-23), five areas have been selected where an urban planning effort is to take place.

One of these is a smaller older commercial zone at Thrigesvej. Here the restructuring began some years ago. The area had been greatly affected by environmental problems from an iron smelting plant and from other firms. With the municipal plan from 1993, the City Council decided to restructure the area. A larger section of it was re-zoned as residential area and the rest into mixed residential and business. This became the start of several changes. On the former industrial lots in the northern part of the area, apartment dwellings have been constructed. The Lind machine factory has moved out into the new HI Park, its buildings now taken over by an advertising agency. The Elas plant, which produces elastic for textiles, has moved to Birk North and the former plant now houses a supermarket and the Dalgas Privathospital. The current plan is to initiate urban renewal in the other four selected areas. Besides Thrigesvej and Tingvej, these areas are Energigruppen's area south of Dalgas Allé, the golf course and Holtbjerg (area between the highway and Silkeborgvej).

The new business service

As mentioned in the preceding section, the decline in the number of industrial workplaces within the textile sector has been offset by an increase in the number of workplaces within trade and business services. The major part of these workplaces is established within the framework of the existing Herning city in the form of conversion of former industrial buildings, by urban densification and by new construction on obsolete properties.

An example is the construction which took place around the city hall complex. A few years ago, when the town hall has been renovated, a twin building was constructed just opposite. This building was rented out to a local law firm with 50 employees. Shortly thereafter, however, the firm moved again in connection with its merger with another law firm. The move was to an area just outside the city centre, bordering Birk North. On the north side of Dronningens Boulevard now lie a large headquarters building of the Rambøll engineering company and the Hausch furniture store. Despite the expansion of business services, there has also taken place conversion of office properties. This was the case with the city's highest building, Codan House. The property lies in the city centre and was constructed as a multi-story office building in 1987. The house was probably constructed too early to benefit from the demand for office space, or it could not compete with cheaper, converted industrial properties. Codan House has now been converted into apartment houses, aside from the ground floor.

Planning for 'the new economy'

Responsive municipal planning

The Herning area is periodically cited as the home of one of the most prominent business clusters in the country, the textile cluster. If the cluster concept has had significance for spatial planning, Herning should have provided examples. Nevertheless, we have no such clear examples. The creation of clusters has not left its mark on planning in the form of the

kind of urban planning which has explicitly sought to meet special needs related to the textile sector. Still, one must imagine that in its daily planning and building administration, Herning Municipality has been receptive to the many projects for extending single family homes and expediting the building of sewing workshops in garages and annexes, which has certainly been occurring over many years. It lies outside the framework of this study to elucidate this question. When the textile firms began to grow and require more room, there was a need for general industrial areas without special siting requirements. It is probable, however, that the new middle-sized textile firms have understood the importance of good façade placement and image projection and that Gjellerup parish municipality's construction of Birk South and Birk North near the highway to Silkeborg has attracted the firms because they have been able to obtain land and the possibility to display themselves. Several of the firms have thus made an architectonic impression on this site, from the special building of the EGE Carpet company, to the Angli shirt factory to the other factories along the highway.

Rather than being an offensive instrument for creation and expansion of the textile cluster, urban planning in Herning has responded to agendas which have emerged as a natural consequence of cluster formation. One can assume, for example, that the idea of consolidating Herning and Ikast arose as an acknowledgement that the two towns lie in the same labour markets within textile, wood and furniture production, and that they therefore have a common interest in relation to the common environment. The HI Park is a child of this idea, and has been followed up with the placement of the new common Herning-Ikast Freight Terminal in the HI Park, along the new highway and with a location between the two towns.

Vision-born planning

With the construction of Birk Centre Park, a more active planning initiative has been taken which combines urban planning and an aggressive business policy to strengthen a competence-based business development via the construction of an educational and developmental environment in close cooperation with the local business community. Birk Centrepark thus brings together several institutions and firms which have mutual benefit of being placed together and which can act as a dynamic force for restructuring and modernization of the business sector in the Herning area. The core of the Birk Centrepark is comprised by the textile-related educational and developmental institution TEKO and by the management- and export-oriented Engineering and Business College (HIH). Around these institutions lie a number of larger and smaller business-oriented and business-related institutions. The placement of a student dormitory next to the Centrepark gives it a campus-like ambiance, and the area's identity is strengthened by good architecture and by buildings which integrate with each other. The architects behind the buildings and free areas include among others C.F. Møller architects, C. Th. Sorensen, Jørgen Utzon and Henning Larsen architects. At the entry to the area lies Angligården, with Carl-Henning Pedersen's large ceramic decoration, and the area is rounded off by Ingvar Cronhamner's monumental sculpture, 'Elia'.

One can view Birk Centrepark as a response to the developmental needs which have emerged among the local business community as a consequence of globalization and an increase of the knowledge content in the production, and as a consequence of the fact that the comprehensive outsourcing of industrial workplaces has created a need for the development of new competencies. With the outsourcing of manual labour in industrial

production, the firms had to move their attention from the production process itself to the elements in the value chain which lie both before and after production: design, logistics and marketing. But with the conscious gathering of associated institutions and firms in a common environment, Birk Centrepark also seems to be more than just a functional response to the needs of the business sector. Through the addition of image- and symbolic values, there is also created a vision-bearing ‘conceptual cluster’ which must be at the forefront of a competence-driven development of the local business life.

In a combination of business policy, urban and landscape planning and an art policy effort, a convincing result has been created, which was acknowledged by awarding Herning Municipality the Annual Urban Planning Prize 2002.

Table 7. Firms and institutions in Birk Centrepark

TEKO Institute of design and business	Training and development within design, process and marketing in the textile and garment sector
Dansk Tekstil og Beklædning (Danish Textile and Garment Association)	Interest organisation for garment producers
HIH Handels- og Ingeniørhøjskolen (Herning Engineering and Business College)	Education within business, electronics, production, management, marketing, communication and multimedia, etc.
Technological Institute	Dissemination and processing of research and/or technology based knowledge for Danish business
Den Danske Eksportskole (Danish Export School)	Trained export specialists
Herning-Ikast-Brande-Aaskov Business Council	Local business policy, marketing, lobbyism, firm development
Empa	Development of jobs for vulnerable groups (reduced work capacity, disabled, etc.)
MTC (Mid-Jutland Technology Centre)	Organisational change processes in firms within quality, environment and work environment management and competence development
EU Centre	Business advice concerning EU subsidies, legislation, public contracting and international cooperation
Green City Denmark & European Institute of Environmental Energy	To establish an international exhibition window for Danish environmental technology and know-how Diffusion of knowledge about energy and environmental questions within the international energy sector
HIH Vind (competence centre for wind energy)	Knowledge and competence centre for wind energy sector. Educational cooperation between engineering schools and the wind energy sector
ineo designlab	Design firm. Development of web-sites, visual identities and printed communication
Design Business Group	Optimisation of internal and external resources within design, communication and innovation
Centre for Subcontractors (CFU)	Cooperation between subcontractors in international trade
Centre for Applied Management Studies (CAMS)	Applied management research in cooperation with the regional business community. Part of the Copenhagen Business College
Randstad	Firm supplying temporary employees
Træets Kompetenceformidling (Wood industry's competence communication)	Training agreements within the wood processing sector to recruit young people for the wood industry

Designwerk	Design solutions
Innohow!	Raise innovation and creativity in firms' production

Despite the clear qualities of the Birk Centrepark complex, the question has been raised whether Herning has lost urban planning qualities in the central city by placing urban functions in Birk Centrepark rather than in the city centre. Oxford Research (2001, p. 39) thus poses the question of whether locating the Engineering and Business College and the adjacent dormitory in Herning's city centre instead of Birk Centrepark could have helped create more life in the urban centre and thereby also given a subsidy to the commercial life and the business services which consciously seeking toward the central urban neighbourhoods because of the more lively environment found there.

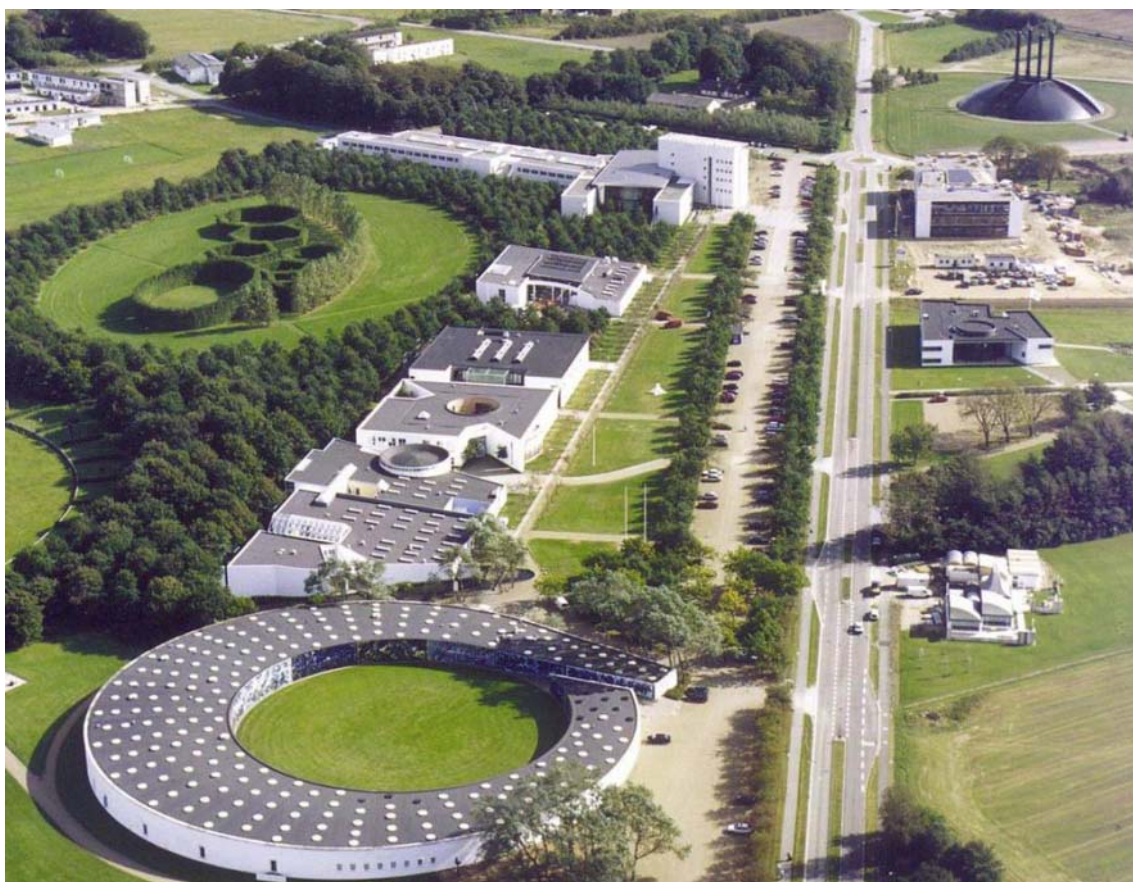


Figure 35. Birk Centerpark, Herning

A concentration of knowledge and business institutions in the Herning area physically framed in art and modern architecture.

Midt-Vest: Clusters and spatial planning

Herning is one of the four towns in the new Midt-Vest regional centre (Herning-Ikast-Holstebro-Struer). Under this municipality cooperation, work began a few years ago to develop a common business policy and planning strategy for the municipalities in the western part of central Jutland. In this effort, the attempt is made to elaborate a strategy for urban development which can promote the development of business clusters in this region.

Ideas about clusters

The secretariat of the Midt-Vest centre is familiar with the sector- and product-oriented clusters in the area: food products, garments, wood and furniture, and information-communications technology/electronics. But just as Randers Business Council had the view of a work-functional cross-cutting cluster of firms, which have developed special competencies in industrial assembly, the Midt-Vest secretariat also has the view that the region's firms have a special feature which cuts across the branch- and product-oriented clusters: the special feature is that in recent years, many firms in the area have evolved into subcontractors a result of the continuing globalization of industrial production.

Across product specialties and branches, special common conditions and common competencies are linked to the position of subcontractor. It is this factor which enables the Midt-Vest secretariat to speak of the subcontractors as a special competence cluster.

'We can compare the development with what has taken place at B&O [Bang and Olufsen, consumer electronics] in Struer. B&O's newest design television unit does not contain a single B&O produced component. B&O only assembles the television unit from 5-6 different subcontractors. Here in Struer we put the entire thing together. B&O has a few Danish subcontractors left. But this is mostly for historical reasons, and because B&O can almost not bear the idea of letting them go. More and more of the subcontractors participate in product development and decide precisely how the component they deliver should look. It is a picture which is changing very rapidly. Therefore, we must build up the old competence clusters in a new way. For example, there must be a "subcontractor cluster" instead of a textile cluster, a metals cluster, a food product cluster. It will be completely mixed across types. The development department for a given component is not placed in the mother company, but with a subcontractor. The technical expertise is delegated to the subcontractor. The subcontractor must therefore add as much competence to the mother company so that it becomes difficult to replace with another' (Interview with managing director Peter Møller, Midt-Vest).

When it became clear that the firms in central Jutland had generally evolved into subcontractors, the regional centre took the initiative for the creation of a competence centre for subcontractors. It is now called the Centre for Subcontractors (CFU), and is located in Birk Centrepark. According to the secretariat, the same idea lies behind the creation of the other knowledge centres in the area:

- NOVEM, a knowledge centre established by seven northwest Jutland municipalities with the purpose of strengthening cooperation between private firms, teaching environments and public companies focusing on development of new service offerings and products within a broad field of energy, environment and health. NOVEM is located in Holstebro.
- VIFO, Knowledge Centre for Food Product Development. VIFO is housed in the NOVEM complex and has the objective of supporting food processing firms in the Holstebro-Struer region.
- The Centre for Wind Energy, Birk Centrepark, initiated by Ringkøbing County with support from the fund of the Ministry of Research for 'regional growth environments'; the Centre's goal is to support the Danish windmill industry, which has a strong presence in Ringkøbing County.

The creation of these knowledge centres should also be seen in light of the locally diffused understanding that the region will never obtain its own university. Combined with the

widespread view that business development must be created through the development of knowledge and competences, intense efforts are being made to establish knowledge institutions which can facilitate communication between the local business community on the one hand and the universities and students on the other.

Business policy and planning strategy

As part of the preparatory work for the common planning strategy for Midt-Vest, Oxford Research was asked to carry out an analysis of the interaction between business and urban development. This work will be briefly summarized, for it attempts to clarify the way in which spatial planning could stimulate business development.

The planning strategy takes its point of departure in the observed local competence clusters and it should seek to show how within the business sectors especially good physical frameworks can be created for the further development of these competence clusters and the new firms generally.

An 'analytical contribution'

Oxford research points to the following factors of significance for the spatial planning:

The business sector

The new knowledge-based production poses demands on the creation of image-oriented business areas. It is argued that firms which previously worked with traditional industrial production now work more holistically, combining service, marketing and design. Along with their product, they sell an experience and a lifestyle, and they want their business property and buildings to reflect their image.

Urban development

The same firms also place emphasis on more general urban qualities which can attract and maintain the new knowledge workers, engineers, technicians and skilled workers, upon whom many firms have become increasingly dependent. The development of a stimulating and attractive urban environment is viewed as more critically important than the simple land-use zoning of industrial areas and the expanded construction of infrastructure. In order to stimulate the urban environment, Oxford Research recommends that emphasis be placed on functional integration and construction of attractive housing units in the urban centres, including both student/youth dormitories and housing units for the elderly. It is further proposed to create a common vision for a comprehensive urban development in the four towns of Midt-Vest (Herning-Ikast-Struer-Holstebro), a vision of the four towns becoming four districts or sub-centres, each with their own specialities in a total [polycentric] 'city'.

None of Oxford Research's recommendations regarding spatial planning direct themselves specifically to any of the four clusters (food products, garment, wood and furniture and information-communications technology). The recommendations are more general, focusing on how to meet the developmental demands that knowledge-orientation poses for business development across sectors and clusters. It is remarked, however, that the food and furniture sectors, tradition-bound as they are, have not developed the same needs for urban quality and image-oriented business landscaping as have the other businesses. Even though the point of departure for the analysis is the development of four local clusters, no actual cluster-specific recommendations are developed. The leitmotif in the

recommendations is rather to meet the demands posed by the development from traditional to knowledge-based industry, across clusters and branches.

Even though Oxford Research had attempted to present proposals for cluster-specific recommendations to the physical planning, it is doubtful whether it would have been successful for them, in that the firms' urban planning demands are normally determined by their size, environmental factors and traffic, rather than by their production and production relations to other firms. Therefore, it can also be interesting to see the results of the consultants Dybbroe and Haastrup, who, in elaborating proposals for a planning strategy for Midt-Vest, will investigate 'how especially good physical frameworks for competence clusters and firms can be created in the business zones'.

Concluding remarks

The urban planning principles for business and urban development are not cluster-oriented. Rather, urban planning follows the general developmental features in the restructuring of industrial societies into service and knowledge-based societies.

Urban planning and building administration nevertheless respond, as a locally integrated political instrument, to the special needs required by the firms, from permissions to construct sewing workshops in residential lots to the local business sector's ideas about new, more spectacular initiatives for planning new kinds of business districts, such as Birk North and South and Birk Centrepark.

Urban planning takes an active part in the designing of the conceptual clusters. But such clusters must be regarded as having a more limited effect on the development of actual business clusters with product-determined special features having economic significance for the town, the area or region as a whole.

Planning of concept clusters is not without risk, as shown by Randers' experiences with the Media House. Such planning is also difficult, in that it demands a major and long-term commitment of the town, as in Nakskov, in order to readjust and change the concept so that it stays in step with the changes which occur for the firms involved in the concept. The Birk Centrepark concept in Herning has the strength of being more general and more broadly oriented towards a 'competence-driven' development than toward a certain kind of enterprise cluster. Based on the urban planning idea, however, one could ask whether or not the many institutions and student dormitories could have provided a more significant contribution to Herning's development through more urban planning integration with the town. The question, however, is posed incorrectly, if it is such that the Birk Centrepark concept could only have evolved by precisely isolating it from the town and thereby making it distinctly visible and creating its own independent attraction value.

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