Port Development and Land Use through the Danish Planning System

University of Aalborg

Department of Development and Planning

4th Semester – Planning, Surveying and Land Management

Final Thesis

Group: L10LMAAL-06

13th June 2013

Title Page

Title of project:

Port development and land use through the Danish planning system.

Theme:

An analysis of the Danish planning framework with a particular focus on port development and land use.

Project duration:

1st of February – 13th of June, 2013

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Number of printed copies

3

Total page number

84

Finalised

13th of June, 2013

This project deals with development and land use in port areas with a particular emphasis on the physical and spatial planning of such. The aim of the project is to examine how development and use of lands can be managed and planned through a planning framework from National through regional and down to municipal and local level in order to investigate how and if the planning framework is in place to efficiently and sustainably support and protect the future development of ports. In order to examine this in more detail, an example of Denmark with particular attention on Aalborg's Port is chosen to give a working example of a planning framework. The research also investigates, through theory, how the relationship of the city and port has changed both physically and in terms of planning. The research gathers and discusses a number of different theories concerning the port industry and port planning with particular attention put on the national planning act, policies, reports and plans concerning port development at different levels of governance. An analytical framework is then designed to analyse the Danish planning system from the perspective of port planning with various reflections made on the theory concerning the subject.

Preface

This project has been produced by Daniel Michael Roche, student number: 20115990 on the final semester of the master degree in Planning, Surveying and Land Management at Aalborg University, Aalborg. The project concerns port development and land use through the Danish planning system and has taken place from the 1st of February to the 13th of June 2013.

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The project will use the Chicago-method (Fifteenth Edition) for referencing (author, year). A list of references on used sources will be available at the end of the project. Other additional sources have also been accessed for initial research such as websites and published reports.

The project is written in English and any translations from Danish have been carried out to the best of the Authors ability. A number of Danish documents have been examined during the research and a table of translated documents is attached in section 9 of the report.

Front Cover Image: Aalborg's East Port. Source: EIA Plan No.192

Acknowledgements

The Author would like to express his sincere gratitude and thanks to all people who have participated in this research. The author would especially like to thank project supervisor Line Træholt Hvingel for her time, advice and guidance during the research period.

The Author would also like to thank Anne Vibeke Skovmark, Surveyor at Aalborg Kommune and Jørgen Frandsen, Head of Development and Planning at Aalborg Havn A/S for the valuable information gained during the interview process.

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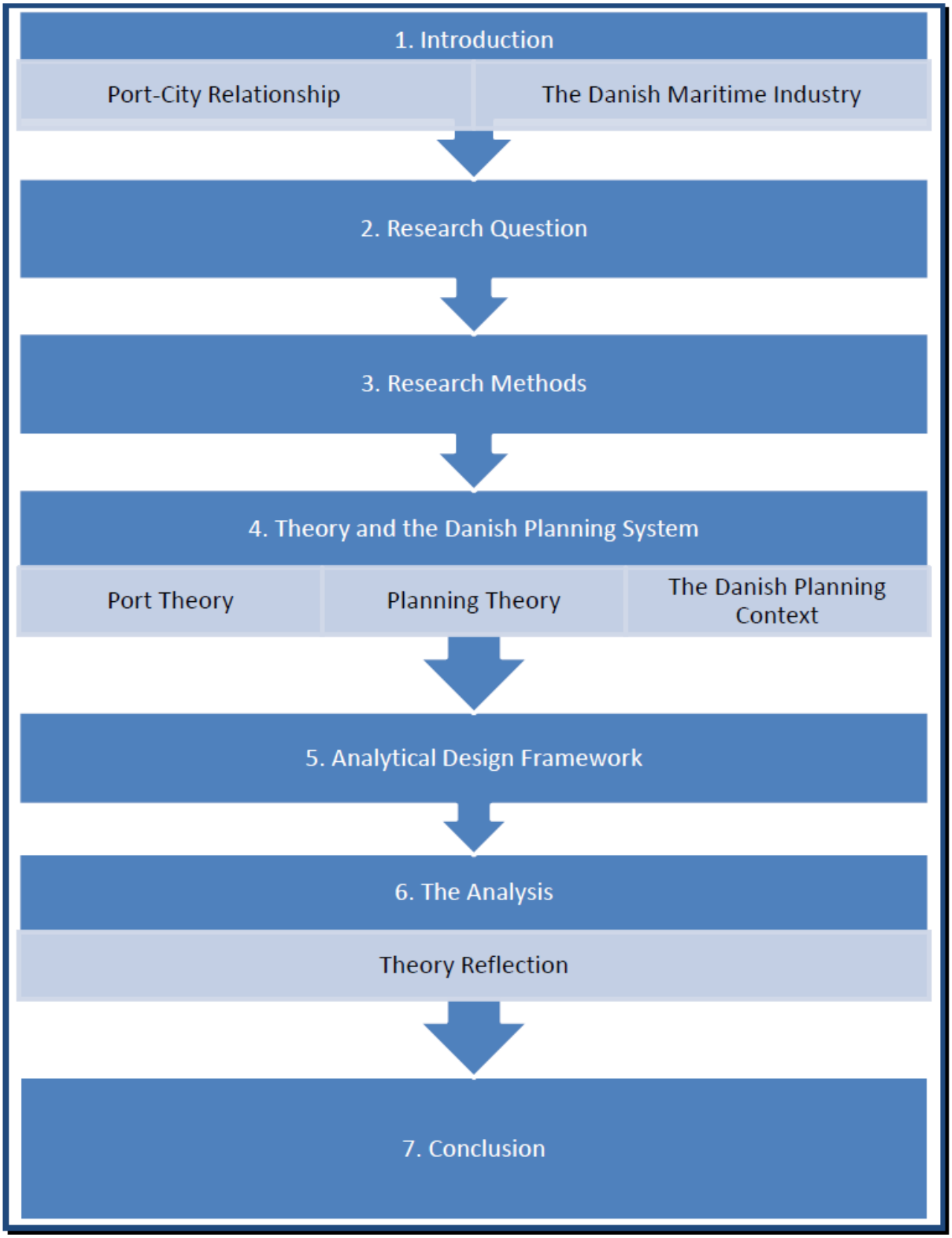


1Introduction

1.1 The Port City Relationship

One of the major and most important elements of planning is foreseeing what happens in the future and what is the best method for managing growth and change in a sustainable way.

The change and development in a city is sometimes most evident when we look at the physical relationship between an urban settlement and the port industry. Port and harbour related industry has been the basis for economic growth for centuries. Traditionally, ports and harbours created the foundations for most settlements and cities as we see them today by creating and enabling trade, industry, manufacturing as well as employment. The majority of cities around the world have grown up and centralised themselves around port areas for the above reasons. Large and well known cites such as Shanghai, Singapore, New York, Barcelona and Rotterdam have all grown from the port industry and continue to do so and both elements have mutually benefited form the relationship. Traditionally, according to (Hoyle, 1989), coastal cities generally owed their origin and development to the related port function and that the type of city that developed would be unique and vary form place to place over a period of time. At the same time (Hoyle, 1989) also refers to the distinction between the city and the port, although dependent on each other in terms of economy and employment had different factors that contributed to their individual development. The city and its hinterland relied on the port for the above reasons however, the maritime industry, was more fragile in terms of the factors that can influence trade such as interport competition and the modernisation of transport methods, demand and technology.

Traditionally according to (Hoyle, 1989),:

"*the prosperity of the city largely depended on the fortunes of the port: either the two developed together, or they declined together*"

This relationship has changed and this "dependence" according to Hoyle may no longer be the case in most circumstances. The port function has become physically disconnected from the city itself and spatially and economically, the city and port have grown apart. This research attempts to examine what has happened in the port and maritime industry in terms of its relationship with the

city and where this new connection or relationship has shifted. In terms of planning, (Hoyle & Hilling, 1984) point out in earlier research that the long lasting life of a port ensures that any mistakes now, from a planning perspective, with respect to technology, layout or location will have future implications for the geography of future development. This could according to (Hoyle & Hilling, 1984) be costly in financial and economic terms and could be counter productive in terms of development.

Although, traditionally cities have thrived on this type of economic and commercial industry, it has changed over time and will continue to do so through modernisation in technology, transport, infrastructure and consumer needs. According to (Hoyle, B; Pinder, D, 1980) difficulty arises with both port development and urban development and that in terms of planning, the mutual development of both have consequences. Locations that had been initially selected and developed when transport systems and urban centres operated on a strict scale are not always appropriate for modern needs and problems according to (Hoyle, B; Pinder, D, 1980) can be serious. This can be more problematic when a city is to take on a more national or regional role whereby physical congestion and social and economic dislocation require a lot of attention from planning authorities. The changes and evolution of the port and harbour related industry will also play an important role on how cities and settlements look and function in the future. The Port and Harbour industry cannot exist without appropriate planning and policy making. When the industry changes, in most cases the demand on or supply of land also changes and future demand is mostly supported and managed at local level.

As mentioned above, the changing face and function of port and harbour facilities within cities and towns are a result of a number of factors over time, the industry depends on a number of wide, varying and ever changing uses such as fishing, cargo, container, bulk goods, tourism, fuel and chemical, agricultural and the transport industry in general. Ports and harbours can cater for the above uses however, to what extent and how much depends on numerous factors that can allow ports to specialise in or concentrate on them such as its physical location not just nationally but regionally, its physical environment and its general competiveness. It was (Bird, Seaports and Seaport Terminals, 1971) that stated that:

"*not to the direct influence of any inherent qualities of land and water sites, but the way in which sites are assessed by its founder"*

referring to the fact that the location of the port or its accessibility from a maritime viewpoint is not the foundation or the reasoning behind the development of a port city, but it is the port function itself and how it is viewed and given importance by the city. This suggests that the success of the port function is how it is assessed and evaluated by the planning and port decision makers for now and into the future.

The majority of ports today can be categorised into what they specialise in and what their strengths are. Ports and harbours are continuously going through a changing process due to the factors mentioned above. This is more evident over the last 30 to 40 years with both positive and negative factors having an influence. From small scale to large scale, a change in the industry can have a direct affect on the surrounding areas. Take for example smaller type ports and harbours which have depended on the fishing industry for hundreds of years, due to recent regulation and quota's, the industry has suffered with the depletion of fleets and the number of vessels at sea coupled with cheaper and more efficient processing techniques offered by other countries resulting in disastrous consequences on settlements and communities around Europe. In some cases entire towns have suffered and have become run-down or remained at a stand still. In other cases, towns and settlements have had to adjust and develop other types of commercial pursuits such as tourism.

On a larger scale, the change of harbour and port related industry may not be as problematic or have such serious consequences. Modern cities and larger towns, although they have originated from the port industry and its benefits, have evolved to take on more commercial and economic means to support themselves. The city may not be as supportive of the industry as it once was. Over the last forty years there has been a significant change in port and harbour activities in large towns and cities due to changes in transport techniques and modernisation. This research will delve further into this current phenomenon in order to understand the type of change that is occurring. In most cases, the closure of some port related industry has created much needed and valuable land within the environs of a city.

The modern city demands a more mix of uses on its harbour front allowing for new higher end uses such as residential, commercial and recreational in old port industry lands. It has become a trend in most cities to re-develop old port areas into new vibrant and exciting harbour front areas. A demand for more appropriate city centre and harbour front development can put a stress on existing port uses, a number of port authorities have or are considering re-locating and moving the port industry to more user friendly locations outside the city to enable the port industry to develop in an

appropriate environment. The relocation of ports and related uses has a number of benefits; more land for development, more appropriate and efficient access to transport networks and a suitable environment to carry out and attract such activity.

This project aims to look at the port industry in terms of its new location outside the city and what needs to be planned for in terms of long term development through appropriate use of land and planning so that the future of the industry is not restricted and can develop in the most competitive and sustainable manner. One of the main arguments here is that, although in many cases the port has relocated from the city, it remains within the confines of municipal planning. In most cases when one talks about the port and city development, one automatically thinks of the harbour front and issues concerning waterfront redevelopment in derelict city centre port sites. The research will take a different view point and will examine the relationship between the existing and potential new port industry and how this is managed and protected from a planning perspective. Denmark will be taken as an example with particular attention to Aalborg's new eastern port with a view of assessing its position not only within the city, but on a regional and national perspective in terms of planning. Planning documents and policies within the different tiers of spatial planning will be examined in order to identify the planning relationship between the port and its physical, economic and commercial location. The research will be approached form a theoretical starting point and will start by assessing the new role a port plays and why things have changed, but first, the Danish scene must be introduced to get an overall perspective on what is planned for the port industry in Denmark.

1.2 Denmark and its maritime Importance

Denmark is a maritime nation with a strong tradition in shipping and sailing stretching back hundreds of years. It is for this reason that Denmark remains one of the major maritime players both directly or indirectly not only in Europe but around the rest of the world. It is estimated that the Danish Maritime cluster is employing over 80,000 people directly (Danish Ship Owners Association, 2012) with a production value of 287 Billion kroner which equates to 10% of national production and an export value of 200 billion kroner equating to 24% of total Danish exports (Danish Ship Owners Association, 2012). Denmark's national strategy is set to maintain the growth in this major economic and employment sector and ensure progress within a very competitive global setting. According to Danskehavne.dk, 80% of Danish foreign trade volumes are handled in Danish local ports and the port industry has embarked upon huge investments and expansion projects. By 2025, Danish ports will plan to have an additional 1,200 hectares of port related land. The maritime industry has proven to be a major contributor to the Danish economy and this contribution is expected to grow.

The industry itself includes a number of different sectors that make up the maritime cluster, including; shipping companies, ship brokers, ship building and ship yards, transport companies and research and manufacturing of equipment and components that have a direct link to the port itself. In a way, the port can be considered to be the major link in the maritime industry, an important link that ties the entire industry together. The Danish maritime industry through the "The Blue Denmark" has set out a number of goals and visions in order to develop and grow the service so as to remain a major player within the competitive global industry. Two of the main visions can be summarised as follow (Plan for Growth in the Blue Denmark, 2012):

- Denmark should be the maritime cluster of central Europe

- Growth in the maritime cluster should be supported by strong Danish competences

These visions can be achieved through marketing Denmark as the core of maritime industry within Europe and by making Denmark more attractive for maritime business. One recommendation from "The Blue Denmark" is to ensure ports have the best conditions for ensuring and supporting growth. Although, the port industry itself is mainly managed by the Ministry of Transport, a number of other ministries support and are involved in the Industry and play an active part in decision making

process. Such ancillary ministries or government departments involved in some way or another would include the Ministry for Business and Growth; Ministry for Food, Farming and Fisheries; International and EU ministerial departments including trade and investment and Nordic Cooperation; Ministry of science, innovation and higher education concerning research and development and most importantly for the purpose of this research, the Ministry of Environment from a planning point of view. A number of cross ministerial reports and external consultancy reports have been published over the last ten years. An important element of this research is identifying some of the issues raised in the reports concerning port development and land use in order to clarify if some of the issues identified are approached in planning documents and policies at local, regional and national level.

2 Research Question

This study attempts to understand the current relationship between modern port planning and city planning which have both undergone significant changes over the last 30 years. The central research question revolves around the current role of the port and how planning can continue to support growth in a sustainable manner. The question will be supported by taking the port industry and spatial planning in the context of Denmark. Denmark gives a good example as it has a high and traditional reliance on the port industry and is considered to be one of the countries at the forefront of spatial planning in Europe. In this case, the study will examine, through various planning documents and reports,

How is port development and related land use supported at various levels by the planning system?

In order to answer this main research question in more detail, the research must first take a look at the historical aspects of the Port-City relationship by taking the various factors and trends that have influenced the changes in the port industry itself. This will be looked at from a theoretical viewpoint supported by literature relating to development in ports in order to understand the port industry and why things have changed. Secondly, the study also investigates the planning system in Denmark addressing certain planning documents and regulations at national, regional and local level. Lastly, the study will try to identify if any problems or conflicts exist regarding the planning system in terms of supporting port growth in a sustainable manner with particular attention paid to local level planning.

To address the points raised above, ancillary sub-questions have been formulated:

- How has the city and port relationship changed over time and what are/were the influencing factors?

-In terms of planning, what documentation or policy documents exist at different tiers of governance in Denmark and how can we relate them to port development?

-What challenges or problems exist from a planning point of view in terms of future planning concerning land use and development of ports?

3 Research Methods

3.1 Methods

This section will introduce a number of research methods that will be used, including methods for analysing the data gathered. The research is based on qualitative semi-structured interviews along with policy, report and theory review coupled with an analysis that will form the basis for understanding and investigating the port industry through the planning framework. In order to approach the different theories and literature concerning the port industry and planning there is a need to understand the method for doing this. According to (Hart, 1998), literature can be considered to be "*the section of available documents both published and unpublished on a topic which contain information, ideas, data and evidence written from a particular standpoint*", the purpose of this, especially through the theory review, is to gain an initial understanding of the port industry and especially its perspective in terms of planning. The theory in terms of this project takes on two distinct subjects, firstly, the initial theory takes on the port industry itself and how it has evolved in terms of its relationship with the city, secondly, the theory review examines more relevant theory in terms of planning and policies. The initial theory section puts forward an understanding of what the actual topic is and what needs to be looked for as regards the subject. The description of the Danish planning system section takes on a different approach; it looks at the planning system as it stands without taking the port planning as a view point. It takes a neutral view of the law and policies that exist at different levels as it relates to overall planning. The process is designed to prepare documentation and literature for the main analysis section. The research will be taking on that of a rigorous nature which suggests that the information gathered is "*trustworthy and reliable"* (Kumar, 1996) while in terms of application, "*applied research"* (Kumar, 1996) would best suit this framework as it gathers and collects information to the particular issue of planning of port areas while allowing the Author to self educate on the research in question.

In terms of the interviews, as the research will inevitably deal with two major stakeholders, the Municipality and the Port Authority have been selected in order to gain further knowledge of what goes on at local level. The interviews were semi structured with broad questions sent to both parties prior to the interview date. The purpose of this was to give both representatives an idea of the research topic. The interviews took place at a late stage during the research period so that the author was fully aware of stakeholder's respective roles within the port and city planning relationship.

3.2 Limitations

The topic is quit broad and certain boundaries or limitations were set in terms of the scope and reach of the research. As the research primarily deals with two main subjects; the port industry and planning, it was important to set boundaries. The scope of the research from the port industries perspective was to research the topic as an important service sector. The research covers a number of topics concerning the port and how it has changed as an industry over time. The port industry is strongly tied into the main topic of supply chain and distribution and this was addressed as an ancillary topic to gain an understanding of the ports role. National reports were used in terms of the port industry to provide an overview or general picture of what is expected of the industry in terms of growth and development on a national basis. The research does not take into account the Danish Transport Network, major transport plans or EU laws pertaining to emissions and environmental concerns as the topic is too broad and takes form the overall research subject in question. In terms of planning, the author is aware that a number of acts exist that can directly relate to the port area such as the Building and Harbour Acts, Environmental Protection Act and Natura 2000 etc. In this case, the research took the most recent planning act and the planning framework set out by the act in order to set a research boundary.

4 Theory

As mentioned in the introduction, the modern day port has come a long way from its original physical and economic connection with the city. This section intends to introduce a number of theories and literature on the changes in the relationship between the city and the port with a focus on planning. In order to look at this, the research will also take into account theory and concepts in order to understand the changing face of the port industry itself. The section will conclude with an introduction into the planning system in Denmark. The description of the Danish planning system is centred around the planning act with a focus on planning documents and strategies at national, regional and local level.

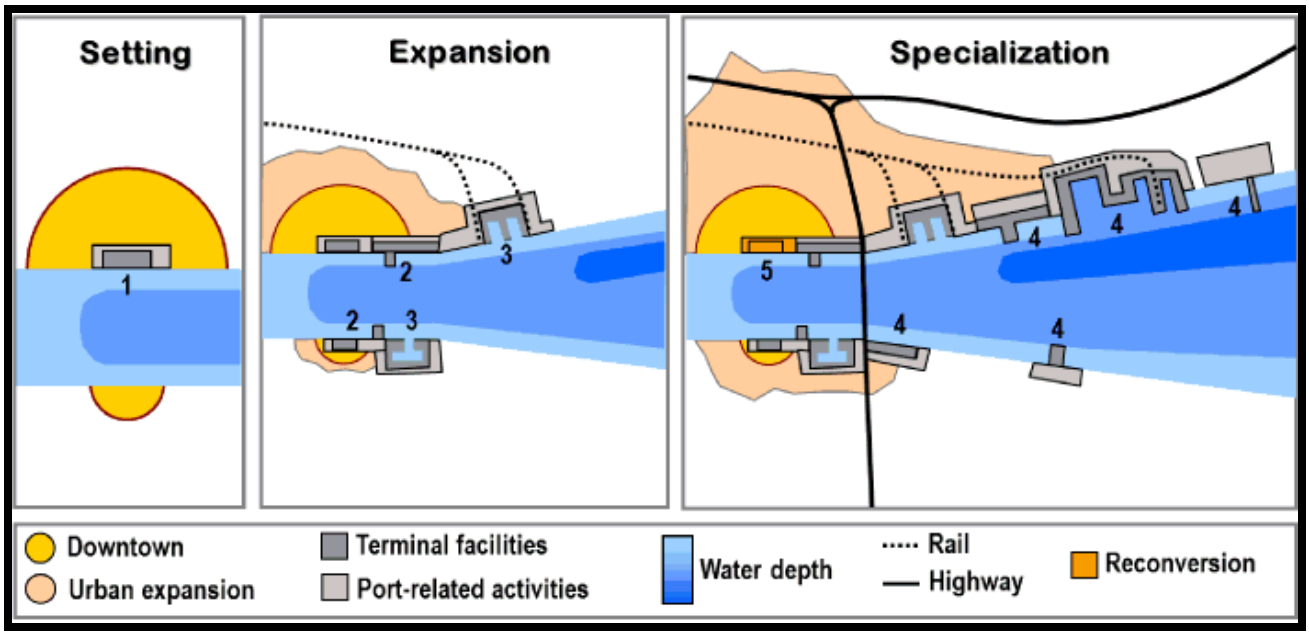
4.1 The Evolution of the Port-City relationship

The essence of this research is taking a global phenomenon such as the maritime industry and assessing it to see if the appropriate measures, polices and actions through planning are in place to ensure growth. In order to explain what is happening in the relationship between the city and port, this section will take a look at a number of theories that tend to explain what is actually happening from a planner's point of view. The "Port-City interface" is defined as the "*waterfront zones in which the geography of the port and its city meet each other*" by (Daamen & Vires, 2013), this concept has existed for many years and when we look at the underlying relationship of the two we see that the linkages are very complex and varied. According to (Hoyle, 1998), these underlying linkages lie with social, economic, political and technological factors that can be viewed from a spatial or temporal context. (Hoyle, 1998) mentions that for modern day practical purposes, the planner most recognise these fundamental aspects. The way in which a port and a city interact over time in terms of land use and infrastructure, and in terms of their purpose in the spatial environment, can give rise to problems at all levels.

4.2 The Anyport Model

A number of different models have been put together to explain what is happening in terms of port development. The models and theories include Bird's (1973) "Anyport model" which categorises port and city development over time; Taafe's (1963) "Main Street" model which focuses on nodes connected along priority transport corridors and Rimmer's (1967) who combines the Anyport model with a number of additional stages. For this research the Author has chosen to take Birds "Anyport Model" and modernised variations and Brian Hoyle's advancement of the model to delve into the port city relationship in greater detail. Bird in "Of Central places, cities and seaports, 1973" focuses on central place theory and centrality with an emphasis on how infrastructure evolves over time and space. Bird's mentions that the purpose of the original seaport was merely as a function of the city centre which in most cases occupied the cities waterfront. The initial stage of port development is that they tended to locate in a semi circular shape rather than occupy a full circle due to the physical barrier of the sea or waterway in front of a city. As time progresses, this centralised port location within an urban environment tends to draw or pull other central functions towards the waterfront just as a normal example of central place theory would operate on an inland urban example. This original phenomenon, according to (Bird, 1973) is the starting point for problems within the port city interface. As development progressed over time, as the waterfront mainly consisted of port related uses, the Central Business District or non port related commercial industry grew gradually away form waterfront areas. Bird uses a number of port city examples in North America and more evidently uses London as a prime example of how the original location of the port has a long term effect on the layout and location of other service functions within the city. For ports in urban coastal areas, a tendency occurred over time for port activities to move downstream from the urban areas. The means for this, are not only due to technological and modernisation in the port industry but other factors directly related to physical relationship and possible conflicts between the port and the city. The final stage in Birds Anyport Model is the movement of the port downstream to more favourable locations due to increased specialisation in cargo handling, modernisation in shipping, and the increasing demand for space. As a result, port sites commonly located in the traditionally waterfront city centre location were abandoned leaving opportunities for redevelopment of city centre sites for alternative uses such as waterfront parks, housing and new commercial developments. (Bird, 1973) also notes that this model is broad and not all ports can be connected to

such a model, however he does explain that this model can be used to form the basis for port evolution. Bird's Anyport model can be broken down into three distinct stages as illustrated below.



Birds Anyport Model including setting, expansion and specialization Source: (Bird, 1973)

Stage 1 – Setting

The setting of the port according to Bird is very much dependent on geographical consideration. The above example sets out a location which is on an inlet or river at the furthest point form the sea at which a ship can travel. This stage was the initial phase of location and the primary uses of port industry was mainly in fishing, ship building and straight forward import and export of goods which included basic quays and wharfs. This remained quite static up until the industrial revolution. The related industry around the port mainly focused on wholesaling and warehousing. The terminal facilities were considered adequate for their needs.

Stage 2 – Expansion

The Industrial revolution in the mid 18th century saw more demand from the port and maritime industry. The Industrial revolution initiated a number of changes that had a great impact on the size of quays and wharfs to cater for larger ships containing increased amounts of cargo and passenger ferries. The resulting increase of activity also triggered an increase in ancillary port related industry such as shipbuilding and larger warehousing. The industrial Revolution also opened up and expanded the rail network which, in turn, opened up access to inland urban settlements and cross

national distribution. The increase in port activity ran hand in hand with manufacturing and production which was also located within close proximity. More land was required and this mainly happened downstream.

Stage 3 - Specialisation

The final stage according to Birds "Anyport model" involved the significant increase in the construction of purpose built piers and jetty's to handle freight such as containers and bulk material such as ores, grains, petroleum and fuel. Ship size yet again increased and specialisation resulted in a further migration form the city centre downstream towards deeper waters. This in turn left original port facilities almost abandoned and unused.

4.3 The Port City Relationship.

As bird addressed above, most ports have almost disconnected themselves from the urban centre. Bird addresses how the port has evolved during this period, however Brian Hoyle in "Cities and Ports: Concepts and Issues" addresses in greater detail what happens to the urban element at the waterfront and what happens when the port industry leaves its original location. Similar to Birds model, (Hoyle, 1998) puts together similar stages in the port city relationship and they can be summarised below.

STAGE	SYMBOL ○ City ● Port	PERIOD	CHARACTERISTICS
I Primitive port/city		Ancient/medieval to 19th century	Close spatial and functional association between city and port.
II Expanding port/city		19th - early 20th century	Rapid commercial/industrial growth forces port to develop beyond city confines, with linear quays and break-bulk industries.
III Modern industrial port/city		mid - 20th century	Industrial growth (especially oil refining) and introduction of containers/ro-ro require separation/space.
IV Retreat from the waterfront		1960 s - 1980 s	Changes in maritime technology induce growth of separate maritime industrial development areas.
V Redevelopment of waterfront		1970 s - 1990 s	Large-scale modern port consumes large areas of land/water space; urban renewal of original core.
VI Renewal of port/city links		1980 s - 2000+	Globalization and intermodalism transform port roles; port-city associations renewed; urban redevelopment enhances port-city integration.

A spatially developed model. Stages in the evolution of the port-city relationship. Source : (Hoyle B. , 1998)

Stages 1 to 3 are similar to that of Birds Anyport Model, which address the direct and gradual disconnection of the urban and port function in terms of land use. Stages 4 and 5 in Hoyles model identifies the physical gap in terms of land use that existed in many port cities during the 1960's to 1980's. Stage 5 refers to the redevelopment of this area and this is clearly evident in most cities around the world. This research will not examine the problems that lie within the exact confines of what (Hoyle, 1998) describes as the physical area left by the port industry relocating but will take a turn towards what the new relationship is between the city and the actual port industry from a planning point of view. The point of Hoyle and Birds models is to give an understanding of why the

port has relocated from the city centre. From a planning perspective, the next section will look at the importance of the port industry for the city or region although they may no longer be physically co-located. Before we take a look at the new port industry and its contributions towards the city and urban surrounding it is important to address the benefits of the relocation for the port.

4.4 Port Relocation and its benefits

The port-city relationship has changed and in most cases, stage 5 in Hoyle's model is still underway and the infill or redevelopment of old port areas will continue for the foreseeable future, especially in developing cities where the recent economic crises has slowed such redevelopment. With the city expanding on its own right into old port areas, the port authorities themselves according to (Merckx, Notteboom, & Winkelmans, 2004) are driven by changes in maritime industry. Port Authorities are seeking new land to meet the expectations of a competitive industry and the shift from the "conventional transport system" to that of a "modern transport system" can provide the new benefits that are required form ship-owners, terminal operators and customers. (Merckx, Notteboom, & Winkelmans, 2004) have formulated a number of benefits that the relocation can offer.

	Conventional Transport System	Modern Transport System
1.	Cargo = exogenous Weight = dominant Shippers are cargo-minded	Endogenous Numbers and volumes Functional minded => logistic (chain) approach
2.	'man-load' concept	Bulk-load = unit load
3.	Direct transhipment Small terminal area	Indirect transhipment Extensive terminals
4.	Berths: - mechanisation - improvisation - labour intensive (gangs) - mainly discontinuous cargo handling - polyvalent	Terminals: - automatisation - planning and organisation - capital intensive - more continuous cargo handling - specialisation
5.	Distinction: general cargo/bulk cargo	Distinction as a function of goods appearances
6.	Link-to-link solutions	Terminal operations = systems approach

Conventional versus Modern Transport systems, relocation of port facilities can facilitate the modern transport system. Source (Merckx, Notteboom, & Winkelmans, 2004)

The new relocation or down stream migration can offer the space and land that is needed for the "modern transport system" to function in its full capacity. The "Conventional Transport System"

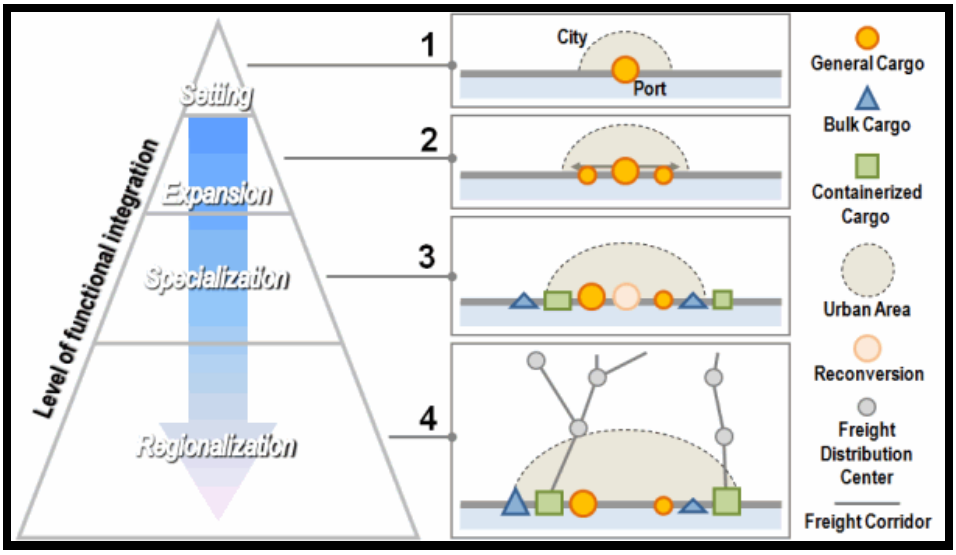
would mostly be associated with ports which remain within the urban centre and are restricted in terms of land required. This is an important point to note as the new port systems and the benefits of relocation opened up new potential for the ports and its modern day function.

4.5 Port Regionalization

This section takes a deeper look at the Port in terms of its main function within the maritime and transport sector without particular reference to the urban centre. It takes Birds Anyport theory somewhat further in terms of what specialisation can account for at different levels. According to (Notteboom & Rodrique, 2005), structural changes in logistics and transport have created changes in freight methods that have an affect on how maritime ports perform. Containerisation is at the forefront of this change and customers and freight carriers are extremely sensitive to cost, time and efficiency. The majority of containerization stems from inland sources or nodal points. This development of the global supply chain according to (Notteboom & Rodrique, 2005) is putting pressure on the maritime industry, port operations and inland freight distribution. The result of this means that accessibility of the port to its hinterland or region has become a major part of a port's competitiveness. In other words, the ports success depends on its direct access to the remainder of the region. (Notteboom & Rodrique, 2005) refers again to Birds Anyport Theory and how it does create the basis for port development and that the three phases of setting, expansion and specialisation are relevant. However, the model has weaknesses in terms of the more modern logistics industry of today. Birds Anyport Model according to (Notteboom & Rodrique, 2005) does not address new types of port or freight locations such as offshore Hubs or transhipment locations which are a more recent form of "mid" ports for cargo/freight distribution. These primarily exist on the east-west shipping lanes and are a midway point for inter-continental transport. The offshore hubs have no real relevance in terms of Birds "Central place theory" based on the Anyport model.

More importantly, in terms of this research, (Notteboom & Rodrique, 2005) identifies a weakness in Birds Anyport model in terms of the inland element as influencing port development. (Notteboom & Rodrique, 2005) add an additional stage of "Regionalization" to the Anyport model that strengthens the theory by linking a ports specialisation with its hinterland and intermediary ports.

(Notteboom & Rodrique, 2005) also note that regionalisation and the inclusion of Hinterland and intermediary ports are not usually combined in the model as most ports due to their geographical location, production and consumption in the surrounding area are specialising in one or the other.



An adapted version of Anyport model including stage 4 – Regionalisation Source: (Notteboom & Rodrique, 2005)

Stage 4 or regionalisation according to (Notteboom & Rodrique, 2005), is made up of two concepts. The first concept refers to “Inland waterway ports” which involves ports that are situated more inland from the original gateway port. Inland smaller vessels or barges connect to midway ports or hubs which act as feeder stations to the remainder of the region or vice versa. The second concept is “Inland Ports”(dry), this is a more recent and favoured concept that takes advantage of the existing or upgraded road or rail networks. The concept revolves around inland distribution centres that provide full logistical services and preparation of cargo before final transport to the gateway port or vice versa. This is favoured according to (Notteboom & Rodrique, 2005) as it eliminates problems associated with congested coastal ports. It is important to note that regionalisation is mainly concerned with larger land areas such as central Europe and North America. Regionalisation is difficult to implement or evident on a small scale with areas or countries with short travel distances from port to destination.

4.6 Containerization, Modern Supply Chain, Competitiveness and the impact on Ports

The increase of global trade and geographical dispersion of production has led to significant changes in the maritime industry. This has been most evident in the strong growth and change in the way freight and cargo has been handled over the last 30 years. The organization of this service has changed dramatically and has become more competitive. The change in the industry has left the port industry with a number of challenges. According to the OECD report on Port Competition and hinterland connections (2009), the port authorities power has reduced over time. This is a direct result of modernization of the industry which in turn has included an increased number of agents and actors that are involved in the global and international supply chain. In other words, the involvement of larger and more powerful actors and agents outside the port authorities control are in fact having a larger influence on the industry than in previous decades. One concern is that local authorities could face problems in the relationship and communication between the local municipal representatives, local politicians and citizens on one side, with the port in the middle and external influencing actors and agents on the other. In other words, the port authorities' decisions and actions have a direct impact on both the maritime actors and agents with solely commercial and economic pursuits against the publics urban environments sustainable growth requirements and interests. The ports in a way, in order to strengthen their position in terms of competitiveness, have a mixture of public and private concerns.

The (OECD, 2009) report highlights that the major change in the port industry is primarily a result of containerization. Containerization revolutionized the way the maritime industry transported goods and freight which resulted in a standardization of port services which in effect opened up more competitiveness in the port sector. The (OECD, 2009) report findings suggests that, due to containerization, ports are now in competition with other locations or other shipping routes in the same region or state and that specialization is no longer the "safe bet" in terms of the future of an individual port. The (OECD, 2009) report also suggests that containerization brought about two other changes that can have an effect on a ports growth. Firstly, containerization resulted in the introduction of larger vessels requiring larger docking areas but in turn meant less "port of calls". This means that shippers have less dependence on particular port locations resulting in greater competition among the remaining ports. Secondly, as also discussed above by (Notteboom &

Rodrique, 2005) under regionalization, the growth in intermodal rail and inland waterways has extended the gateway ports regional service reach. This in turn has lead to greater competition amongst regional port locations to capture the main port gateway for the region.

Containerization also goes hand in hand with global supply chains, the (OECD, 2009) report highlights that supply chains link geographically separated production and sourcing sites to demand in centrally located consumption regions. When we take the shippers point of view, the only things that matter in terms of connecting the two locations are *price, service quality and reliability* - (OECD, 2009). The shipper's commercial pursuits in a competitive market are extremely volatile. In order to reduce costs, shippers try to structure a vertical and horizontal approach to the supply chain, and with the correct control and business model, shippers are able to increase market share and almost monopolize shipping routes and certain supply chains. This in turn, can put pressure on ports to provide what the shippers need. In terms of the commercial pursuits of a port, a port could be held to ransom in terms of what a shipper needs against what the port can provide. In some cases, what is required by the shippers goes against the goals and objectives of public interests surrounding the port area such as pollution, noise, congestion and port related use of lands.

4.7 Land Use and Planning

According to (Hoyle, B; Pinder, D, 1980), "*the problems created by inadequate port layouts and port land reserves can seriously affect regional and sometimes national economies*" emphasising that port lands not only play an important part for the local port and city economy but that the management of this land plays a larger role within the economy of not only a region but on a national scale. (Takel, 1981) agrees with this statement and adds that there is an increased demand for harmonisation of the interests between port authorities and public planners in terms of what a port needs and what a city can provide and vice versa.

In terms of port expansion, "Greenfield sites" are the preferred option for both the Municipality and the Port Authority. However, due to the close relationship and physical location of both the port and the city, this is not always possible. City-port relationships are almost different in every case, some cities are at more advanced stages of city and port separation while some cites are still very much intertwined and dependent on the port and city mix. As we have seen previously in this theory

section, the tendency for most port related activity over time is to move downstream, in other cases, this is not possible. The benefits of moving downstream as mentioned above in (Merckx, Notteboom, & Winkelmans, 2004) is that modern transport systems thrive best in these circumstances. (Takel, 1981) also points out that downstream or peripheral port development has its own restraints, the continuous development raises other issues such as environmental, ecological and noise pollution which is not in the interest of the general public. This, as we are aware, is one of the main reasons for planning and conflict avoidance. (Hall & Hesse, 2013) highlight a major finding in terms of local development, and state that the new modern urban centres that are most successful in terms of port development are the ones that embrace the problems and challenges imposed by the external impacts and factors of freight logistics and place the service industry at the forefront of their local and economic objectives. This also goes in line with what was discussed earlier in the previous section by Bird stating that the ports success is not down to "*the direct influence of any inherent qualities of land and water sites, but the way in which sites are assessed by its founder*" (Bird, Seaports and Seaport Terminals, 1971). It is important to note here, that according to (Hall & Hesse, 2013), communities that have strategically set out to work with and put the ports objectives in a spatial and strategic perspective tend to plan for such an important activity get to reap the rewards under successful management and planning. This is in contrast to traditional types of planning and policy practice that would "*restrict and regulate*" this essential industry. (Hall & Hesse, 2013) also point out that some communities have no choice but to do this as the circumstances around the choice may be the only option. The preferred scenario for a community or urban environment would be to have this logistics or maritime path not because it is the primary function but that it is one of many goals and objectives that a multifunctional city can focus on.

As we look at the Danish scene, or any port-city environment, the complexity of the maritime, port and logistics industry makes it a place where policy has long been in existence. As discussed earlier, many multi-level including local, regional, national and global policies and multi sectorial policies in port service industry such as labour, infrastructure development, business and growth and planning are at play. In most cases according to (Hall & Hesse, 2013), global polices are mostly trade related and can extend beyond the environs of the EU. Labour, research and development and infrastructure development along with economic plans lie with policies at regional or state level but in terms of local or municipal, it is here where all these polices interact and the effects of such can be seen in an almost physical form. It is also at local level where we see the implementation and management and vital use of the land. (Hall & Hesse, 2013) describe this as a vital point at which

retention of power and control over land use planning is the vital element in the overall function of the industry.

In terms of land use and the amount of land required around ports depends on the type of port and its direct function as a port. Under specialisation, ports have taken on different separate functions. Many functions exist within the overall maritime and logistics sector. These could include according to (Rodrique, 2013);

-Passenger Ferry Service

- Cruise shipping and general transport of passengers

-Bulk Carrier

- Liquid bulk including fuel, fertiliser, chemical etc.
- Dry bulk including coals, ore and agri-products, forestry etc.

-Non Bulk Carrier (container) (lift on-lift off)

- Container shipping of various sizes, large equipment

-Roll on/ Roll Off (propelled and non self propelled)

- Truck with trailer, car, bus, live stock etc.

- Fishing

- Fishing fleets and support vessels

- Off shore support and Ship Building

- Support and supply vessels for oil and gas platforms and wind turbines
- Ship building and ship yards

In some cases the modern port can facilitate all of the above, in one location or within close proximity. However, the most productive ports generally specialize in one sector. The type of facilities that are required in a port to service the above sub sectors varies widely. **Passenger ferries** as stated above can consist of cruise vessels which do not generally use the port in the traditional sense, specialised docking systems are usually in place within port cities to accommodate this type

of tourist industry and the amount of land required is not of great importance. The location of which are generally in new waterfront sites within close proximity to city amenities. Passenger ferry terminals for general passenger transport are straight forward and this type of industry has remained static with limited competition from airports and other modern methods of passenger transport.

The **bulk carrier** sector according to (Rodrique, 2013) comprises the most traffic in international seas. The bulk carrier sector is predominantly a "one origin to one destination" route with large bulk vessels transporting goods between two locations. Such locations require large unloading and loading facilities. The amount of land required is an issue, however, the majority according to (Rodrique, 2013) is within private ownership and has taken a tendency to locate away from urban centres to avoid obvious environmental and visual issues.

Non-Bulk or container sector is becoming a fast growing industry according to (Rodrique, 2013). This sector revolves around containerization and the transport of unitized and packed cargo. The requirements for land is in high demand and the infrastructure surrounding it play a major role. Due to competition in the sector as mentioned above, shippers require modern facilities and operation areas for fast loading and unloading. In some cases, containers, especially in hub and gateway ports stay in the direct environment awaiting further transportation requiring large amounts of land. Storage facilities and warehousing are sometimes required within the immediate location.

Roll on – Roll Off concerns cargo that is nether bulk or non bulk and comes in the form of self propelled or non self propelled units. (Rodrique, 2013) mentions that the cargo has the potential to be self loaded such as trucks and cars that can move without the use of cranes or heavy loading equipment. The majority of the car manufacturing industry can be transported around the world in this manner. Roll on-Roll off also includes the truck with trailer category which is important for short term crossing and is most evident around the Mediterranean and between mainland Europe and the UK. Land requirements are short term, however facilities and infrastructure need to be in place to allow quick and easy movement of vehicles and goods.

Fishing sector is probably the oldest of all the categories. The majority of self sufficient urban centres owe their existence to this type of port industry. Traditionally, a fishing port required additional land for manufacturing and processing however, due to regulation and quota's the industry has seen a decline in land requirements as factory ships, modernisation and large scale fleet fishing has taken over.

Off shore support and Ship Building while not necessarily part of place to place shipping, off shore support ports play an important part in supporting the oil and gas and wind energy sectors. Most rural ports have converted to this type of sector with the decline in the fishing industry and this will be especially evident in Northern Jutland. Land requirements are limited and future demand are not posing an issue at present. On the other hand, ship building has a large requirement for land as the sector requires the use of dry port facilities in close proximity to the sea. The majority of shipbuilding which equates to 85% according to (MLIT, 2012), is located in East Asia and the demand for land for ship building in Europe will continue to drop as a consequence of outsourcing.

The above sectors have a direct and immediate demand for land within the port area. However, the above sectors also have the benefit of attracting ancillary industry to the immediate vicinity. (Hoyle, B; Pinder, D, 1980) point out that ancillary port related industry are attracted to the vicinity for economic purposes. An industry that requires the use of shipping and sea transport will inevitably locate within close proximity. In most cases, downstream migration of the main port opens up ancillary land that can be used to attract further industry that can capitalise on its proximity to the port and reduce short distance transport costs. (Hoyle, B; Pinder, D, 1980) also point out that ancillary industries dependant on the port should not be located too close to the main port facilities as future demands for direct port related land use can become restricted.

4.8 Polices and Planning

(Hall & Hesse, 2013) mention that land use is the area where local communities and municipalities have the greatest influence and power over freight flow and logistics through different policies and strategies including development, taxation, land zoning and redevelopment plans. (Hesse, 2004) also agrees with this point and highlights that land development is a blend of public planning, economic development and private sector interests and that developing such port and industrial activity is in their own interest. This is an issue according to (Hall & Hesse, 2013) as commercial pursuits and commercial development has its own consequences. Internal tension arises when development of commercial interests go against the public good from an urban planning perspective. Spatial planning primarily revolves around mixed use developments, job creation, appropriate retail and office development and sustainability. One problem within the current scope of most planning authorities is the appropriate inclusion of a sustainable transport network and the blend of logistics and freight industry into this does not fit in many cases. When one talks about transport, the general public primarily view this as general transport within and through cites for improved liveability and healthy community goals (Hall & Hesse, 2013). However, the overall transport network serves a much larger spectrum of logistics and connections. The local planner can adapt quickly for immediate changes in infrastructure concerning citizens of a city, however, the process may become more complex when dealing with port logistics and access to appropriate land use in port areas. (Hall & Hesse, 2013) recognises that in most cases within the local planning process, planners have a tendency to "restrict and regulate" as opposed to "understand and accommodate" and this can have implications for the long term development of ports. The problem is more complicated, as mentioned previously, the actors and factors involved in the supply chain and port activity are consistently evolving and changing and so is the industry. (Hall & Hesse, 2013) mention that this is a continuously evolving industry which causes problems for planners in an urban planning context as the tools and methods for managing such change are not evolving at the same rate. This problem is further expanded, according to (Hall & Hesse, 2013), as local planners have little or no power or influence or in some cases, an understanding of global supply chains.

(Hall & Hesse, 2013) also address polices at higher levels of governance and planning. Planning for logistics and port activity at National or Regional level seems to have higher influence on the industry, although this is sometimes managed through strategic and spatial planning through the

implementation and identification of gateways and corridors, it is more of an economic strategy rather than a spatial planning one dealing directly with land use. It is according to (Hall & Hesse, 2013) at local level concerning land use and the separation of planners from freight decision making that the problems lie. (Hall & Hesse, 2013) suggest that local policies do not directly deal with the changing face of spatial change in the logistics and port industry. There is a trend appearing in efforts to engage and educate local planners, municipal representatives and decision makers in port and logistics activity as well as land use guidelines and urban-port relations (Hall & Hesse, 2013). This is however, according to (Hall & Hesse, 2013) more related to improving the negative and environmental impacts of port development as opposed to the positive impacts of economic growth and job creation.

The above section sets out a number of theories and literature from professionals in the research fields of ports, logistics and planning. It is important to outline and understand what the port industry is and how the demand for port and related land use is and where we see this today. The above section addressed a number of changes in the port industry and how the physical relationship has changed and evolved between the port and the city through downstream migration, modernisation and containerization.

As mentioned by (Hall & Hesse, 2013), few policies in terms of land use planning concerning ports exist directly. This will be an interesting point to note and the analysis section will try to identify this problem at national, regional and especially in terms of local and municipal planning.

4.9 The Danish Planning System

This section will endeavour to summarise and investigate the Danish planning system in order to identify the documents, guidelines and polices regarding the use of land and planning. The Danish planning system will be looked at from a broad angle in order to identify and locate where certain rules regarding the spatial development, growth and future planning of port areas are located. As discussed in the last section, it may not be clear where these regulations and guidelines are actually in force. The purpose of this investigation is to identify at what level and where the responsibilities are concerning port development and land use surrounding port areas.

The Danish planning system is described as being a "mature planning system" by (Galland & Enemark, 2013) through an (CEC, 1997) report recognising that Denmark has a comprehensive integrated approach with a "*systematic and formal hierarchy of plans from national to local level, which coordinate public sector activity across different sectors but focus more specifically on spatial co-ordination than economic development"* and this has its origins with a traditional Scandinavian goal of managing a horizontal and vertical mix of policies across sectors and different levels of planning through a hierarchy of plans at different administrative levels. The current planning system can owe its structure and organization to this early foundation.

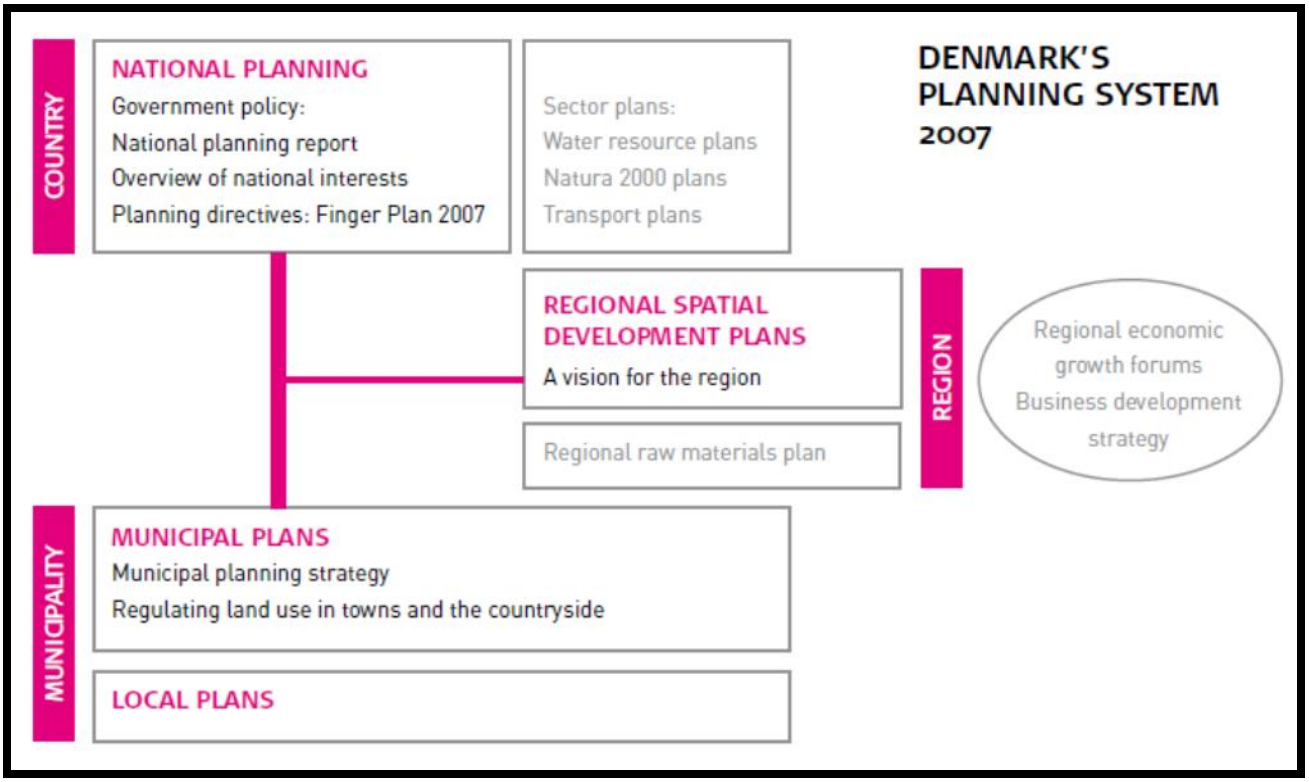
4.9.1 National Level Planning

The current system in Denmark is considered to be "*a simple and clear planning system with a strong decentralized division of tasks*" (Spatial Planning in Denmark, 2007). The rules and regulations concerning all levels of planning in the modern system were first introduced in January 1992 and has had a number of amendments under different policies focusing on the broad spectrum of planning. Such amendments would include the "Regulation of Rural Zones 2002", "Planning for retail Trade, 1997,2002 and 2007", "Planning in Coastal Areas 1994" and more recently and importantly the "Local Reform Act of 2007". The local reform act is one of the most recent amendments which significantly strengthened the Danish planning system and has created the structure and hierarchical system that exists today. The reform was put into action to create "*a*

public sector organized to meet the needs of citizens" according to (Ostergaard, 2006). The planning act according to (Spatial Planning in Denmark, 2007) ensures that planning involves the best interests of society in relation to use and safeguards the national interests from a nature and environment aspect in respect of societies needs under sustainable development. The act is focused around creating appropriate planning conditions and aims towards a number of focus areas (Spatial Planning in Denmark, 2007):

- Appropriate development in the entire country with individual administrative regions and municipalities based on inclusive planning and economic consideration.
- Creating and conserving valuable buildings, settlements, urban environments and landscapes.
- Protection of coasts as a natural and landscape resource.
- Environmental management of pollution such as water, air and noise.
- Inclusion of the public in the planning process.

One of the main results of the local reform act was the restructuring and decentralisation of responsibilities in order to give more power and administration at municipal level while strengthening the state. The responsibility for planning in Denmark became divided amongst 98 municipalities, 5 regions and the state. Previously, the structure of Denmark was formed by many more municipalities and counties with administration and planning power spread at local, regional and state levels. The end of the previous county setup and the merging of the municipalities was the most significant change during the reform. The regions in a way have steered away form physical planning and is more focused on visions for business and development strategies. The new structure of the Danish planning system can be seen below.



Denmark's Planning System Source: (Spatial Planning in Denmark, 2007)

The national planning system in Denmark is built of a combination of binding instructions and regulations, planning reports, guidelines and statutory directives with special national interests. Sector plans are also involved at national level and concentrate on individual themes and cross sectorial plans such as transport and environment including EU directives such as Natura 2000.

National planning reports are issued after each state election and the new parliament must submit a national planning report, the report is of a critical nature and is submitted as a proposal with alternatives to current issues and problems in the field of national planning. The report also focuses on regional and municipal aspects of planning by setting guidelines. The report includes visions and goals followed up by agreed action plans between municipalities, regions and the private sector. (Spatial Planning in Denmark, 2007).

In every four years of terms, the minister for the environment must publish a report based on **National Interests in Municipal planning.** The report focuses on interests and considerations arising from politically adopted decisions in the form of legislation, action plans, national planning decisions and agreements between public authorities (Spatial Planning in Denmark, 2007). The

National Interests in Municipal planning report also includes consultation with other relevant ministerial departments that can directly affect planning decisions. The minister of the environment can also veto certain projects that interfere or go against national interests.

The national planning level is also responsible for implementing national **Planning directives**, which are legal binding rules concerning specific issues or projects that have a national interest. The directives are legally binding for Regional and Municipal Authorities. The directive can focus on specialized topics such development in the greater Copenhagen area, coastal protection and location of gas and energy testing stations (Galland & Enemark, 2013).

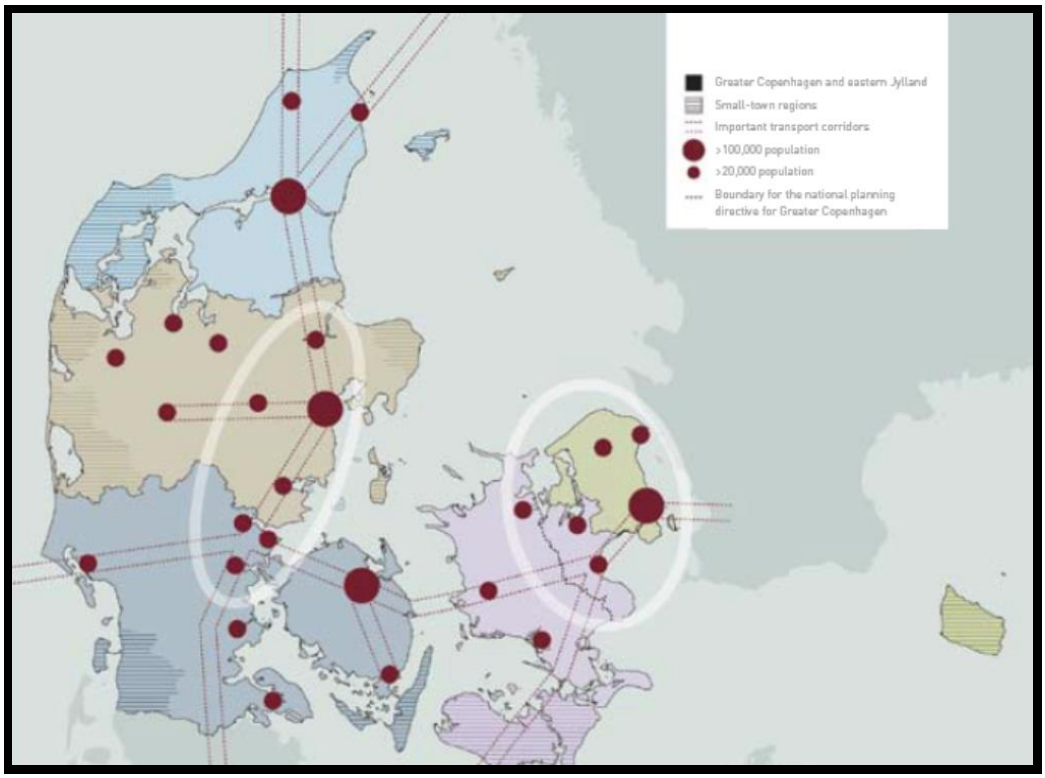
4.9.2 Regional Level Planning

As mentioned previously, regional planning has taken on a different role to that of the National and Municipal planning. The new regional role is less about regulating and more about inspiring the municipalities on sustainable development at lower levels. The regional levels main responsibility is concentrated on **Regional Spatial Development Plans**. The plans focus on future spatial development for each region's cities, towns and rural areas. The plans focus more on developing and inspiring sectors such as business, employment, education and training and environmental themes (Spatial Planning in Denmark, 2007). According to (Galland & Enemark, 2013), the plans are generated from local level up and involve dialogue and inspiration form numerous stakeholders and actors in various sectors. The plan is drawn up every four years in close collaboration with Municipal plans and strategies The regional development plan should include three main elements:

- The relationship between future spatial development and state and municipal for infrastructure
- The context for cooperation between the region and neighbouring public authorities in neighbouring countries
- The response and actions the regional council will carry out to follow up the plan.

Regional Economic Growth Forums are also present at regional level and concentrate on regional business strategy that is included in the regional spatial development plan. The strategy focuses on the strengths of business in the region in order to encourage, facilitate and initiate further growth.

The strategy is based on the 4 key drivers for growth; innovation, entrepreneurship, education and new technology. The councils which are a mix of professionals from the above sectors also prepare and are responsible for recommending funding for regional development projects from the state and EU reserves (Galland & Enemark, 2013).



The new map of Denmark showing the newly formed regions of North Jutland, Mid Jutland, Southern Denmark, Zealand and Greater Copenhagen. Source: (Spatial Planning in Denmark, 2007)

4.9.3 Municipal Level Planning

The Local Reform Act of 2007 as mentioned above also lessened the number of municipalities from 275 to its current number of 98. At municipality level, two main plans exist; the municipal development plan and the strategy for municipal planning. The two documents are published concurrently every four years and the strategy for planning must be published within first two years of the election process (Spatial Planning in Denmark, 2007).

The municipality should include the political strategy for the area along with planning that has occurred since the last municipal plan. The **strategy for municipal planning** should also decide on recommendations for revising the upcoming municipal plan. The purpose of the strategy is to revitalise municipal planning (Spatial Planning in Denmark, 2007). The strategy should also focus on the current problems and opportunities in the municipality. The strategy can also be linked to other areas such as business growth, culture and conditions for improved living.

The **municipal development plan** summarises and confirms the overall objectives for the development of the municipality. The plan should link national planning with local area plans in terms of land use and regulation. The main elements of the municipal plan include (Spatial Planning in Denmark, 2007);

- A structure with overall objectives for development and land use in the area
- Guidelines for land use
- A suitable framework for local area plans

According to (Galland & Enemark, 2013), the municipal plan includes the basic function of land use to regulate and control a framework for development. The municipal plan in many municipalities also includes business elements and targets for growth. The plan may also take a more strategic approach to planning in order to facilitate redevelopment projects, growth areas, improving living conditions and education.

The guidelines for the municipal plan are directly linked to the planning act and it is in this manner that the municipality can designate types of land for special habitat or special growth zones. (Spatial Planning in Denmark, 2007). More importantly, for the purpose of this research, the municipal plan decides on which areas of peripheral land can be converted to urban type use. The municipal plan

undergoes a public consultation process for at least 8 weeks so that public and stakeholders can have their say on certain projects.

4.9.4 Local Plans

A direct link is made from municipal level to local level and this linkage forms the framework for planning on ground level. The framework describes what a local plan can and should provide for given the municipalities' social, physical and economic objectives. The local plans in a way form the foundations of the spatial planning system in Denmark (Spatial Planning in Denmark, 2007). The most important element of the local plan is flexibility. Local areas differ and need to be regulated in a manner that relates to matters that are most suited and sustainable for that particular area. The local area plan gives municipal authorities a binding and enabling power to implement detailed, specific and regulated plans for all areas within a municipality. The flexibility of the plan may regulate endless factors relating to use, size, design, density and purpose of buildings; infrastructure; parks and recreation; social amenities; specialised retail, industrial and redevelopment planning projects. The local plan is in accordance the legal rights of individuals and allows for the security of property owners rights in relation to development and use of areas and buildings. With that said, the municipal authorities can expropriate or exercise compulsory purchase over private property when implementing a plan. (Spatial Planning in Denmark, 2007).

An important part of local planning is public participation. The municipal council provides a timeframe of at least 8 weeks to enable a public consultation process to take place before a local plan is implemented (Spatial Planning in Denmark, 2007). The local authority plan can also be challenged or vetoed from higher governing bodies if the plan goes against national interests.

An important factor for local plans is that it regulates and sets out rules concerning future developments in an area. In simple terms a local plan sets out for what is allowed or what is not allowed. A summary of the planning tools and policies can be seen below.

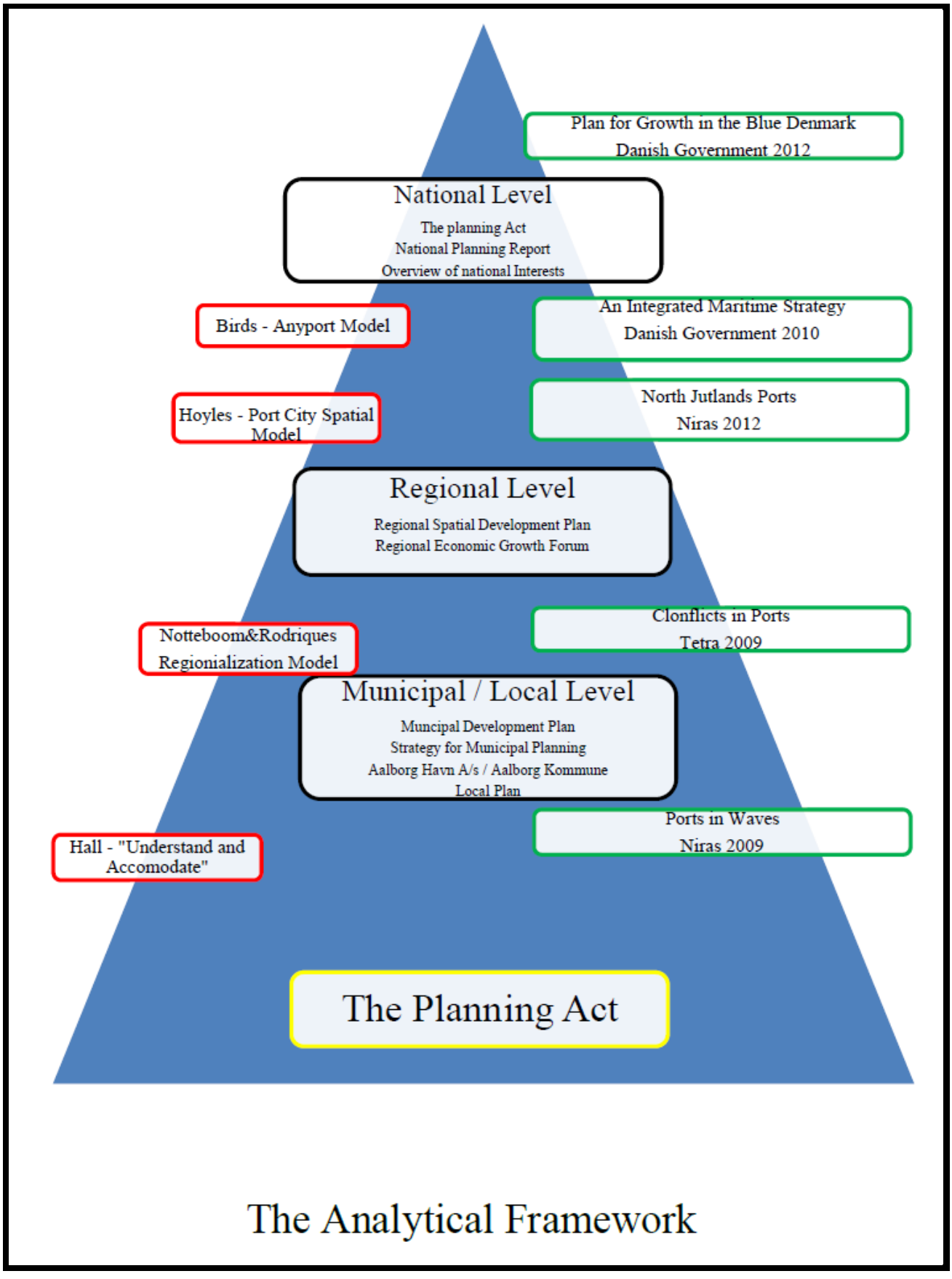
4.10 Planning levels and instruments

Level	Documents / Policy /Report /Instruments	Latest	Current Impact and power over port planning
National	The Planning Act	2013	Great (Direct)
	National Planning Report	2010	Great (Direct)
	National Interest in Municipal Planning	2013	Great (Direct)
	National Planning Directives	Various	Medium (Direct)
Regional (North Jutland Region)	Regional Spatial Development Plans	2012	Medium (Indirect)
	Regional Economic Growth Forums	continues	Weak (Indirect)
	Business Development Strategies	2010	Weak (Indirect)
Municipal / Local (Aalborg Municipality)	Municipal Development Plan	2009 2013 (Draft)	Strong (Direct)
	Strategy for Municipal Planning	2011	Medium (Indirect)
	Local Plans	Various	Strong (Direct)

5 Analytical Framework

The previous section delved into a number of theories relating to the changes in port industry and reasons for change from an economic, planning and spatial perspective, along with relevant theories and literature relating to land use and policies. The section also concluded with an overall view of the Danish planning process and its power and planning instruments at different levels. To further the research into an analyses section, it is important to readdress the main research questions in order to construct a model using the gained information. The visual working model below will give a visual understanding of what information will be used and at what level. The framework will be centred on the main research question with assistance form the ancillary research questions and will involve the analysis of policy documents and related reports on the port industry and its related land use in terms of planning.

How is port development and related land use supported at various levels by the planning system?



The Analytical Framework

6 Analysis

6.1 Introduction

The last section presented the designed analytical framework in order to facilitate a better understanding of what needs to be investigated in terms of land use and planning coupled with sustainable port development in and around port areas. The framework is constructed on a 3 tier level on a top down basis combining National, Regional and Municipal/Local level. The planning and port theory chapter and selected port models such as Anyport and Regionalisation gives a better understanding of what may be needed in order to examine the Danish Planning System in more detail in terms understanding the use of port lands and development. The ancillary document section comes from a more critical view point and relates directly to the port industry itself. Some of the documents and reports may vary in terms of what is the exact topic under review. The documents also vary as they are carried out by either cross sectorial departments or by private consultancy forms. The analysis below will explore the Danish planning system at different levels and port and planning theory will be applied during a reflection process towards the end of the analysis. The main and ancillary problem questions will be approached at different stages with a conclusion summarising the main finding at each tier of the planning system.

6.2 National Level

6.2.1 The Planning Act

As mentioned in the Danish planning description, the Danish Planning act is the main tool for governing spatial planning and land use and brings with it the legal means of regulation. The Planning Act covers all levels of planning and is the legal binding document that ties national to local level interests. The planning act will be investigated in order to highlight rules and regulations regarding land use and planning in ports areas. As mentioned previously, the planning act covers a broad spectrum of land use and spatial planning, however, in this case, extracts will be investigated with which have a semi-direct link to planning or land use in port areas. Some of the more interesting elements of the planning act concerning port developments are the laws and regulations concerning land use in the coastal areas. Section 1 of part 1 of the planning act makes it clear that one of the main purposes of the act is to ensure that (Planning Act, 2013): *"that the open coasts shall continue to comprise an important natural and landscape resource".*

Already, the planning act is putting the coast and coastal protection as a high priority. It is obvious in most cases that ports and its associated industries are located in coastal areas, in some cases, the location are in close proximity to wetlands and natural habits. Although ports may only occupy a small physical proportion of the coast line in Denmark, their environmental impacts can become a major issue and conflicts may occur between adjoining uses of land. The Danish planning act puts coastal protection as a high concern; however, there are certain sections of the act which help to set some rules concerning such land use problems. Part 2a of the planning act directly relates to land use in coastal areas and moreover section 5a clearly states that the coast is to be kept as free as possible form development that does not require a location in the area (Planning Act, 2013): "*The country's coastal areas shall be kept as free as possible of development and installations that do not need to be located near the coast*". The term "*as free as possible*" gives the assurance that efforts will be done to prevent any such development. However, section 5b of part 2a dealing with coastal planning, a number of exemptions can be made (Planning Act, 2013);

1) It is prohibited to transfer land to an urban zone or to conduct planning for development in a rural zone unless there is a specific planning-related or functional justification for location near the coast.

2) Except for harbour facilities used for transport and other very important infrastructural installations, development projects on land that require the reclamation of areas in the territorial waters or special coastal protection may only be planned in very special circumstances.

Port and related activity can be taken into consideration when the above exemptions are taken into account. Strict laws are in place concerning the development of lands in rural zones, however, port and port related industry may be accepted or allowed for by naturally possessing a "functional justification".

In the case of Denmark, port development and port land use may be exempt as the majority of ports are located in the urban zone. Denmark's entire country is divided into 3 types of zoning; urban zones, summer cottage zones and rural zones and the above provision only refers to rural and summer house cottages in the coastal area making most ports areas exempt from this rule. Port areas can be considered to be allocated for urban development under urban development plans, building by-laws, town planning by-laws and local plans. Under part 4 (11f) of the Planning act covering municipal planning, certain laws concerning coastal areas in the urban zone must also be upheld. The municipality must asses the future development conditions to ensure that development takes into consideration the following (Planning Act, 2013):

- *that new development fits in with the coastal landscape as a whole;*
- *that conservation-worthy units of the urban structure and interests in protecting nature in the surrounding land areas are considered;*
- *that the necessary infrastructural installations, including harbours, are considered*
- *public access to the coast is considered*

The above provision allows for and recognises that infrastructure and harbours are to be taken into consideration in terms of development in the coastal areas of the urban zone. The level of consideration in this case is unclear according to the provision. As mentioned previously in this section, some port areas can be located along side or in close proximity to sensitive or

environmentally protected areas on the periphery of the urban zone. Part 4 and part 5 of the planning act under Municipal and Local planning states that the municipal plan and local plans need to take into consideration and must not contradict certain environmental regulations such as Natura 2000, water resource plans, nature and forestry protection plans which have higher national agendas at interest. In terms of land use, especially around ports in coastal areas, this may be one of the major concerns facing port authorities and port development.

The Planning act 2013 concerns the entire nations planning system at all levels, however the above extracts and provisions concerning port areas, whether inside the urban zone or in coastal areas is clearly stated. The planning act makes a clear distinction between normal development activity and port related development and clearly states that exemptions can be made for development in the coastal zone or coastal areas in the urban zone especially when it concerns the port or harbour itself or any activity that has a functional justification of being in such a location. The important element to note here is that port related activity and future planning and growth is allowed for, however, certain environmental by-laws and state directives must not be contradicted especially in the coastal areas.

6.2.2 National Planning Report

As mentioned in the Danish planning Description section, the Danish planning act states that a National Planning Report should be published every four years. This section will take a look at the most recent National Planning Report of 2010 with a view of assessing it in terms of port planning and development. As mentioned previously, the National Planning report sets out the political direction for physical planning in the form of principles and priorities. The purpose of the report is to highlight the "*main issues that the government is looking into in terms of physical planning in the coming years*" (National Planning Report, 2010), this report in brief should highlight any main concerns that can affect physical planning over the coming years. The report also includes the initiatives and topics relating to planning that the government will undertake by cooperating with regions and municipalities. One of the major points from the report is the outlook for municipal planning. The report suggests that municipalities should "*ensure that brownfield sites developed for new, modern neighbourhoods in new areas should be included into the city* (National Planning Report, 2010)" which in terms of port use could address old port facilities that are no longer in use.

The outlook for municipalities is to ensure that such sites are developed for the cities benefit with more modern type housing and commercial development.

The report also addresses the port area and industry itself recommending that "*There is still a need for ports and there is still a need for sea transport, and some of the companies that need to be at the port can not be integrated with housing developments"* (National Planning Report, 2010). Here the report is highlighting the fact that port and port industry is still an important service sector and that sea transport will remain a major part of the Danish Infrastructural system. The report also suggests that port development is not to be to become a part of housing or non port related activity. In line with this the report also advises that "*all ports must not be converted to such ancillary use*" (National Planning Report, 2010).

The National Planning Report refers to continued growth in the port along with ancillary related industry and this should be strengthened and supported by the municipality that are to ensure that "*efficient connections to and from the ports can help to strengthen the basis for growth in freight transport by sea*." This is suggesting that it is the municipalities responsibility for ensuring growth within the local port area by ensuring better opportunities for freight and easier access to ports. A number of roads and rail linkages to ports will also support this development.

Although the report is quiet broad, it does state a clear goal in the sense that the port and port industry should be supported at local level, firstly, by means of supporting it through access and infrastructure and highlighting the need for additional land to support the sector and secondly, it is important when planning ports that for the purposes of future development, the port area and housing and other non-port development should be kept separate so as to avoid conflicts. The report also mentions the (Land Use in Danish Ports, 2010) report which was jointly published by the Department of the Environment and the Department of Transport which contains recommendations for the safeguarding of national interests in Danish ports. This report appears to be a vital document in terms of this research into planning in port areas. It will be examined in greater detail later in the analysis.

6.2.3 Overview of National Interests in Planning

As mentioned previously, the Overview of National Interests regarding municipal plans report is issued every 4 years. The report determines the considerations from discussions in the form of legislation, national planning decisions, action plans and agreements between public bodies. The document is compiled with cooperation from other concerned departments with a view on different and broad topics in terms of planning. The consideration include topics such as transport, energy and nature protection providing the core current state interests that municipalities should consider in order to avoid a "veto" from state level. In short, the municipality cannot put a municipal plan into action unless all state interests are met.

The latest report which was issued in 2013 recommends that the municipalities should take the following initiatives into consideration when drafting and discussing new municipal development plans (Overview of National Planning Interests, 2013):

• Green Growth

• Green Transportation

• Room for more wind turbines

• Denmark in balance in a global world

• National Planning Report 2010

The above initiatives are considered to be tools that national bodies and municipalities should consider in pre-municipal planning through discussion and dialogue (Overview of National Planning Interests, 2013). For the purposes of planning concerning port areas, almost all of the above can be considered and taken into consideration. In terms of planning in the port area, the main national goal according to the report is "*to ensure the best possible conditions for the continued development of ports, which are effective transport hubs and commercial areas for active competitive companies and in interaction with development of the city in general"* (Overview of National Planning Interests, 2013). Yet again, this is in line with the (National Planning Report, 2010) and similar suggestions and guidelines are in place. The report puts an emphasis on the continued growth within the port industry sector and that the national interest is to insure that the port and all its ancillary and supporting industry "*are placed appropriately in relation to the rest of*

the infrastructure" (Overview of National Planning Interests, 2013). The report also highlights a goal that " *the municipal planning should prevent environmental conflicts for example. zoning and similar actions and municipal planning should cater for the future development needs of the port operation and port companies"* referring to the municipalities responsibility of ensuring that appropriate planning and zoning should minimise conflicts between parties all local level. Yet again, the (Overview of National Planning Interests, 2013) report supports the National Planning Report by pointing out that nature interests must be given a high priority when considering or adapting new lands for port use and that the appropriate integration of the two is vital. The report also supports the planning act by reiterating that port development is acceptable as long as a "functional justification" exists for doing so.

The (Overview of National Planning Interests, 2013) report gives us a broad but clear understanding of what is required by the municipalities in terms of port development. The Overview, essentially reinforces what the Planning act and the national planning report are outlining in terms of regulations and goals. The report itself can be considered a tool for a municipality's better understanding of what is required at local level in terms of port planning.

6.2.4 Maritime Documents

The Danish government has recently published a number of documents concerning the port and maritime industry. In terms of this research, two documents have been selected in order to view the port industry without the physical planning element in mind. Both the (An Integrated Maritime Strategy, 2010) and (Plan for Growth in the Blue Denmark, 2012) put forward a number of visions, objectives and goals to encourage growth within the sector. The (Plan for Growth in the Blue Denmark, 2012) is mainly focused on employment in the industry either by direct or indirect means. The focus of the report is on the growth and marketing of the industry not just within Europe but on a world wide scale. As mentioned previously in the introduction, the main visions for the growth plan are (Plan for Growth in the Blue Denmark, 2012) :

• Denmark should be the maritime centre of Europe

• Green solutions are the future for the Blue Denmark

• Growth in the maritime cluster should be supported by strong Danish competences

The above visions according to the plan are supported by a number of objectives including making Denmark an attractive place for doing business; increasing the strengths of an already successful shipping fleet; through research and innovation and through intelligent green solutions. Although the above objectives are not directly related to planning, it is at ground level that planning of land and infrastructure is to provide the basis for such visions. The plan mainly focuses on economic, educational and environmental consideration which may not take a major role in terms of this research, however, the plan does suggest that growth in the industry is high on the agenda.

The (An Integrated Maritime Strategy, 2010) report on the other hand takes on more direct overview on polices that concern issues in the maritime industry in Denmark. The strategy does suggest that no new measures are needed at present (An Integrated Maritime Strategy, 2010), however, the strategy should be used to enhance the existing and future initiatives. The strategy is possible suggesting here that no major change is needed meaning that initiatives currently in place are working at present.

The initiatives currently in process focus on creating and enhancing industrial development, however, consideration must be given to reducing Co2 emissions, air pollution along with protection of the marine environment and coastal protection. In terms of the port and supporting infrastructure, the (An Integrated Maritime Strategy, 2010) focuses on

- Strengthening the framework conditions for and growth potential of the ports.
- Ensure an effective infrastructure and to strengthen the interaction between the various modes of transport, including sea-based and shore based transport modes.
- Ensure continued favourable framework conditions for the ferry services in the country.

The first two points could include a physical or spatial planning element as the planning sector should be involved in the framework for growth. The above framework includes a broad number of actors that include economic, transport, environment and planning. Infrastructure plays an important part and the correct planning and implementation of support networks are essential. The important point to note here is that this strategy is one of integration. It is an effort to highlight or put together the main issues surrounding the maritime industry. The above reports are broad in context and in terms of physical planning do not give any direct guidelines or objectives, however, growth in any part of the sector will have an effect on planning in terms of additional requirements for land and structural development. In terms of integration, one important fact in terms of this research is that there is a thin line between spatial planning and planning for infrastructure within that environment. The next sub-section will take a closer look at reports or guidelines that involve both transport and planning.

6.2.5 Cross Ministerial Reports

This part of the analyse brings into scope a number of documents, both within cross ministerial departments between the Department of Transport and the Department of the Environment along with neutral consultancy firms specialising in the field of port planning that have been instructed to carry out the reports. The reports primarily deal with the use of land around port areas, waterfront redevelopment, conflicts and collaboration between municipalities, port authorities and stakeholders or private stakeholders involved in the industry. The importance of these reports for this research is that it allows for the inclusion of views, findings and recommendations not just within the planning framework but within the port and its associated industries.

The joint report by the Department of Transport and Department of Environment was published in May 2009 and is titled "Land use in Danish Ports". The purpose of the report is focused on issues concerning port development today and possible issues for the future, the report also highlights a number of initiatives that are designed to "*ensure that the port's role as a transportation and commercial hub that can be maintained and developed with sensible interaction with the surrounding city development*" (Land Use in Danish Ports, 2010) . The (Land Use in Danish Ports, 2010) report takes a number of findings from commissioned reports on planning in port areas compiled by both Niras Consultancy (Ports in Waves, 2009) and Tetra Plan Consultancy (Conflicts in Ports, 2009). The main report supports what is understood by the National Planning Report by stating that the port industry is due to grow in the coming years and that the state should support this development for two main reasons. Firstly, that port development and an increase in shipping is a major contributor to decreasing Co2 emissions and this can be allowed for by transferring road freight to sea based freight and secondly, that the pressure on land based infrastructure must be reduced (Land Use in Danish Ports, 2010). These main goals all point towards supporting the port industry as an environmentally friendly and sustainably way of transporting cargo and that backing of the industry is of the utmost importance.

The report poses a number of questions concerning the current use and future use of ports and more importantly for this research addresses a number of issues concerning the planning framework and conflicts that exist on municipal and local level. The report divides the planning of ports into three main categories:

- Transport centre

- Activity
- Other Urban Functions (Land Use in Danish Ports, 2010)

It suggests that physical planning for the above takes on different perspectives and will have to have a different approach for each. **Transport Centre** relates to the actual port itself and how it should be supported as such. In other words, it should be supported by planning to ensure that's its role is understood and that restrictions on such development is not encroached upon for future potential growth. Planning for **Activity** takes on another approach and that planning should support all the ancillary related industry that locates near the port and this type of planning should take into consideration sensitive environmental issues such as noise and emissions and recommends the separation of such industry from housing and other urban uses within the locality. The report also address's planning concerning **Other Urban Functions**, which include change of use to more appropriate means such as housing or commercial development. As mentioned in the introduction of this research "other urban functions" will not be addressed or investigated in this research as it primarily deals with old or brownfield sites in the city centre. However, the affects of such redevelopment in an urban area can have consequences for existing and successful port industry that are still located in the urban centre.

According to the (Land Use in Danish Ports, 2010) report, plans and announcements by the municipality, which describes a major transformation of the port area into another urban function can generate uncertainty among particular port companies where there has not been a prior dialogue that clarifies the municipality ambitions and plans for existing use. This, although it may benefit the city as an urban settlement through appropriate new mixed use developments can have adverse affects on existing port industry by causing uncertainty amongst port users as to the future of their current location. This from an investment perspective, may cause a port industry or business to discontinue its growth plans in its current location. This according to the (Land Use in Danish Ports, 2010) report can be avoided by the municipality giving clear and long term plans for an area. Early dialogue is suggested by the report as being the major tool to avoid future conflict and avoid the closure of industry and municipalities need to "*priorities commercial port development, and that plans are transparent, so companies can make long-term investment*" (Land Use in Danish Ports, 2010).

Both the (Conflicts in Ports, 2009) and the (Ports in Waves, 2009) agree with the above by suggesting that dialogue and early consultation is key to avoiding the risk of uncertainty for port

users: "*uncertainties develop into conflicts....when planning is not an on-going dialogue process between the port, the port users and the municipality of new ideas and plans for port development*" (Ports in Waves, 2009).

The message is clear from the report that port development should be supported as a vital industry for the nation and that the success of ports as a main functions has many long term benefits:

"It is essential to ensure the conditions for the functioning of ports as efficient transportation hubs for increasing freight and cargo transport and modern commercial areas with good development for companies that rely on to be on a driver for improving competitiveness and employment" (Land Use in Danish Ports, 2010)

The report concludes with a number of findings that both the Tetra plan and Niras reports have suggested that a large percentage of ports are seeking land for growth on their own initiative as a business and as important service sector "*ports are planning for their own demand for increases in land for port-related business in the coming years*" (Land Use in Danish Ports, 2010) and that this in itself will ensure on a local basis that the national supply of land is warranted. The report also states that "*It remains the Government's view that local authorities are best placed to carry out the weigh-in of the various interests in land use on each port"* (Land Use in Danish Ports, 2010) suggesting that the development process can be managed locally and that possible conflicts in land development as a rule, can be resolved by the parties within the current framework and rules without government interference is sufficient without changing legislation. However, the report recommends that the understanding of the port industry at local level by planners is essential in order to avoid future conflicts. The report suggests that information should be made available to municipalities which could make it possible for planners to gain a further understanding of the general terms of transportation, supply and business of a particular ports own specialised service.

"*If municipal planning must support the overall traffic and business interests over a longer time horizon, it is appropriate that knowledge about the key challenges and trends that apply to Danish commercial ports across municipal borders, is accessible by municipalities* (Land Use in Danish Ports, 2010)"

The report concludes with an interesting point suggesting that finding the correct solutions to some issues concerning port related planning is down to good practice planning and understanding local conditions. The uniqueness of this situation is that planning for port related activity differs form

municipality to municipality and that "*no rule book exists*" (Land Use in Danish Ports, 2010) for such practice in relation to use of lands around port areas.

6.2.6 National Conclusion

The entire national planning system is founded through the planning act ensuring that overall planning puts together the interests of peoples needs with respect to land use and forms the foundations for protecting the states nature and environmental interests so that sustainable development can take place. The act allows for securing of certain interests ensuring that appropriate development takes place taking into consideration the; economic and planning elements, the conservation and creation of settlements and that rural environmental requirements are met. In terms of planning, the port is associated with the large majority of laws and regulation and is not exempt in any way from other such development. The act does provide some easements in terms of port development in coastal areas which have a "functional justification". The act sets out the regulations as a clear simple framework as a functional national planning system with its hierarchy of levels. The latest national planning report puts an emphasis on the continued need for port growth as it is "*vital for the economy*" (National Planning Report, 2010) and recognises that the port should be supported at local level and the port and its associated industry should be kept separate from other uses such as residential and other sensitive zoning or development. The report in a way, sets a framework for municipalities and regions to abide by. The national planning report does not go into great detail concerning the actual physical port planning; however, the report does highlight the jointly published report from the departments of transport and planning "Port in Waves" and that this report investigates the essential elements that concern the safeguarding of national interests in Danish Ports. The (Overview of National Planning Interests, 2013), report highlights that conflicts are the major concern at municipal level at present and that environmental conflicts should be avoided and it is the municipality responsibility the best manage this process.

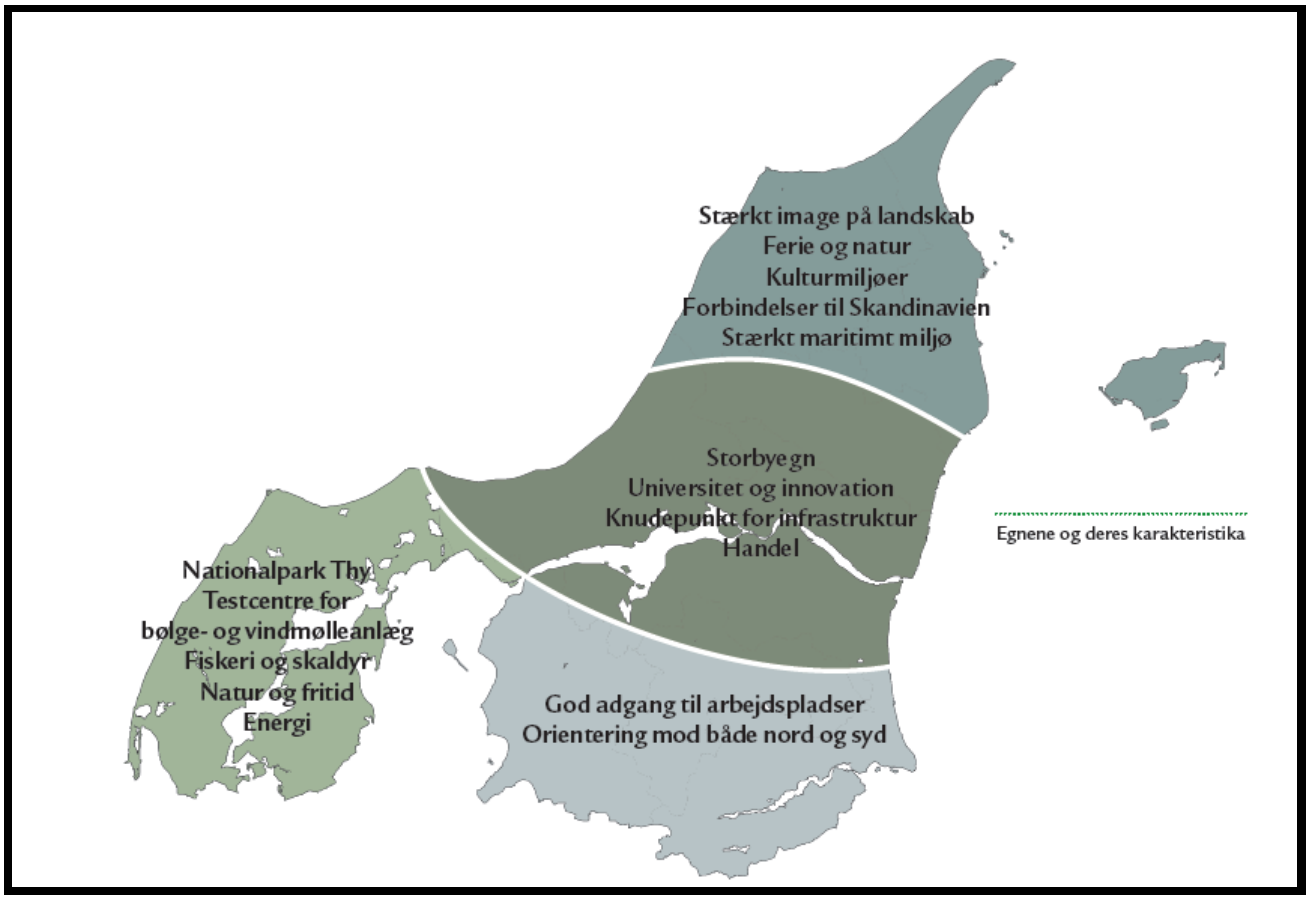
The "Integrated Maritime Strategy" and "Growth in the Blue Denmark" although, not necessarily concern planning, do give some important indicators that the overall framework conditions for growth and potential of ports needs to be strengthened to be effective coupled with an effective transport sector that is connected by land and sea.

The commissioned “Land Use in Danish Ports” report gives a good investigation into what’s going on at port areas in terms of land use and planning at different levels. The report has possibly been produced from recommendations of a previous planning report prior to 2010 with state interests in mind. The main conclusions are that local authorities are in the best position to manage port development and conflicts are best avoided by prior dialogue and understanding of the ports needs. It is also suggested that appropriate information is available to municipalities in order to understand the needs of the port.

6.3 Regional Level

6.3.1 Regional Spatial Developments Plans

As described earlier in the Danish planning section, the regional level is primarily made of regional spatial development plans. Since 2007, the regional planning level has taken on a somewhat different role from previous regional plans and its main purpose is concentrated around economic growth and sustainable development within the 5 regions. The plan is concerned about the vision for the overall future spatial development of an administrative region and its area. The current plan was published in 2012 and contains the visions for North Jutland based on a number of principles that will encourage growth through cooperation, cohesiveness and coordination and how the visions for the future of this growth can be achieved. The ideas and visions are gathered from a number of large stakeholders, not just the municipalities but businesses, educational institutions, tourism and related interest groups (Regional Spatial Development Plan, 2012). Although industry plays an important part in these visions, it is according to the (Regional Spatial Development Plan, 2012) the responsibility of the Growth Forum of North Jutland through the (Regional Business Strategy, 2010) that sets out the premier actions and visions for business. This report will be approached later in the section. The Regional Spatial Development plan does focus however on the importance of port areas for the development of North Jutland.



The region of North Jutland outlining the area of Aalborg for the Hub of Infrastructure and Centre for Trade (Aalborg area in dark Green). Source: (Regional Spatial Development Plan, 2012).

For the purposes of the port industry, the above regional spatial map illustrates a number of concentration points for development with the "Hub for Infrastructure and Trade" concentrated in the Aalborg area, fishing in western north Jutland and connections to Scandinavia along with a strong maritime environment concentrated on the northern tip. In terms of the port industry in Northern Jutland, the report highlights the importance of ports for the region not just as a service but as a way of creating and generating employment and attracting more income for the region. "*Port development is central to North Jutland business development as well as for the spin-off jobs and tax base. Particularly in the region's peripheral areas - in terms of distance to Aalborg - ports play a vital role in the local economy and job creation".* (Regional Spatial Development Plan, 2012).

The continued growth in ports and harbours is vital for sustaining business and towns that have a high dependence of the port industry such as Hirtshals, Frederikshavn, and Skagen. This growth also supports a large number of companies that are dependant on the ports services such as off shore oil companies and wind energy companies who rely on ports for the convenience of transportation. The report also suggests that a potential exists for an increase in activity in the sector through cooperation with Aalborg University by delivering innovation in transport modes and technology. The report concludes with an important point that collaboration is vital for growth in the industry "*knowledge sharing is an integral part of the port's work and established a number of collaborations for Greenland activities, wind and local businesses"* (Regional Spatial Development Plan, 2012). Although the plan does not deal with physical or land based planning issues, it does set out a growth picture for the region for the years to come. This essentially is the main aim of the regional Development Plan.

6.3.2 Growth Forum

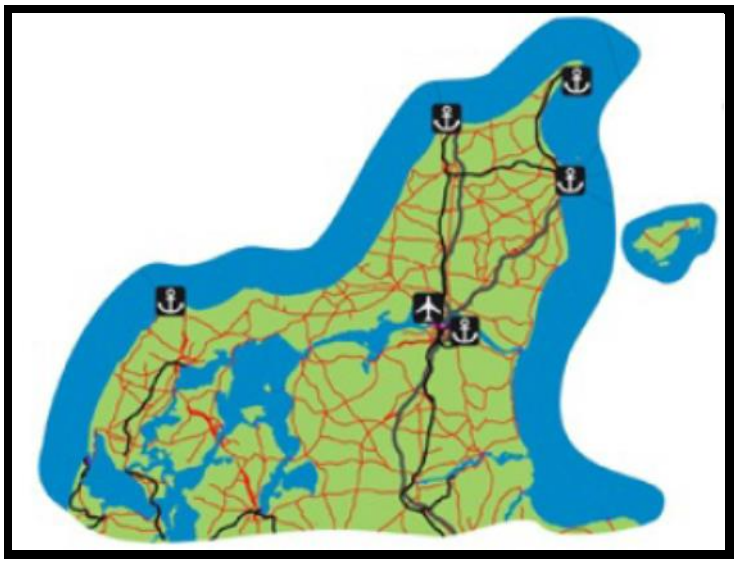
One of Growth Forum's main tasks is to develop a long term strategy for business development in the region through the (Regional Business Strategy, 2010). The strategy is based on North Jutland's strengths and weaknesses and what strategies can be used to further development. Published in 2010 the Regional Business Strategy is focused on 3 main characteristics which include growth, balance and innovation throughout the region with input from all relevant stakeholders. The strategy is concentrated on these 3 characteristics to increase growth in business, production, enterprise, knowledge and that collaboration is the key. "*We must know how to exploit by collaborating openly and actively both in public and in private across companies and sectors"* (Regional Business Strategy, 2010).

The strategy does point out a number of strengths concerning the region and more importantly in terms of ports, noting that North Jutland has a high productivity growth and the that business clusters seem to be working well with regional focus (Regional Business Strategy, 2010). This may include the port industry and the clusters involved in transport and logistics. However, the report does point out some weaknesses in the region such as a "*limited international orientation of companies*" (Regional Business Strategy, 2010) which could have a long term affect in ports and

some threats such as the "*traditional industries are under increasing pressure*" (Regional Business Strategy, 2010) which could suggest the fishing industry. In terms of the port industry, the strategy suggests a number of tasks which could support the sector on a regional scale. Some recommendations include the continued operation of the "*Maritime Partners*" group which involves collaboration between maritime authorities in southern Norway and western Sweden along with the establishment of a nation wide "Maritime Centre for Optimization and Operating" in Frederikshavn along with increased collaboration between ports in North Jutland (Regional Business Strategy, 2010). The strategy, yet again does not really take on a physical planning view on development in ports but it does acknowledge that cooperation is vital for the port industry to grow and that this can be encouraged through the Regional Growth forum and strengthened through the strategy.

6.3.3 The Ports of North Jutland

The above regional development plan and the business strategy were produced at the same time that Niras produced their report concerning the potential of ports in North Jutland. The report (Ports of North Jutland, 2012) focus is on the potential of North Jutland's Ports in terms of development and employment creation. Initiated at regional level, the emphasis is on where and how the major commercial ports in North Jutland; Frederikshavn, Hanstholm, Hirtshals, Skagen and Aalborg can contribute to increased regional growth in North Jutland.



North Jutland with its 5 main ports of Aalborg, Hanstholm, Skagen, Hirtshals and Frederikshavn. Source: (Aalborg Munciapl Plan (Draft), 2013)

A particular aim of the report was to convey the role of ports and development opportunities for a wider audience "*including and especially politicians and other decision makers*" in other words, the report may not be for port users or port related business but a means of conveying an understanding of the industry to stakeholders, decision makers and possibly planners that do not take everyday participation in port activity. This research will primarily examine the port of Aalborg in terms of its situation and future potential however it will be interesting to compare Aalborg in terms of its regional counterparts. The (Ports of North Jutland, 2012) also highlight the importance of the major ports as contributor to the region which have a direct combined income of 5% for the region with an indirect influence on other ancillary related industry creating even more. The ports in other words are a "*breeding ground*" (Ports of North Jutland, 2012) for enterprise and employment. With that said, Aalborg port contributes approximately 7.5% to the Aalborg Municipality as opposed to the

other four ports which contribute between 14% and 20% to there respective municipalities (Ports of North Jutland, 2012). This is not saying that Aalborg Port is under performing rather that Aalborg Municipality itself has a greater income from other industry, business and enterprise.

The report indicates that the ports of North Jutland have adopted well to changes in the industry, especially over the last 15 years, by specialisation and concentration on the type of port activity carried out at each individual port. The report also suggests that national investment in the industry "*is not required*" (Ports of North Jutland, 2012) as the ports are in a comfortable position in their respective core areas.

In terms of Aalborg, the report recognises that Aalborg is by far the largest in the region with the highest turnover and employment figures. Aalborg Port A/S combined with Portland and Vattenfall have a turnover that equals the total from the remaining 4 major ports in North Jutland. Aalborg Port has a broad range of facilities and support systems to cater for all types of maritime industry however the main focus at present is on cargo shipment to Greenland, Wind turbine transportation and feeder cargo routes for the north Scandinavian region. The current success of Aalborg Port according to the report is down to the port having a strong and intelligent support system with Aalborg port inheriting the name of "*Denmark's Intelligent Port*". This coupled with strong partnership agreements in the Artic Business Network, HUB North and Business Network 9220 sets Aalborg Port up as a string competitor. The potential of further business with Greenland according to the report also makes further growth possible.

6.3.4 Regional Conclusion

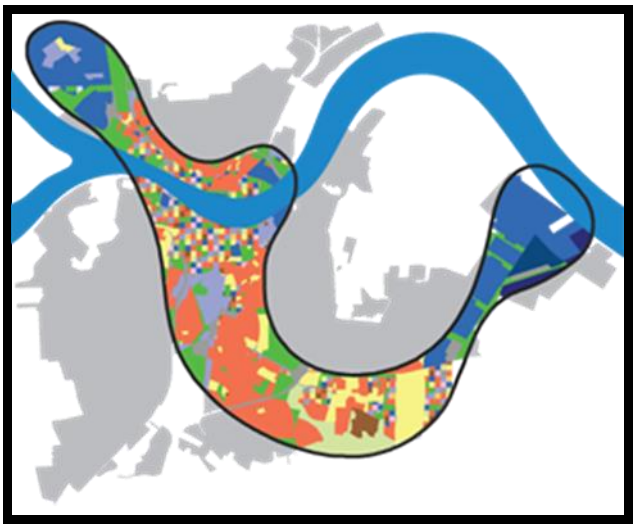
Due to the reform in 2007, regional physical planning has been reduced in terms of its control over land use and zoning which is now coming under the responsibility of the municipality. With that said, regional level plans, reports and strategies seem to give a good overview of what is expected in terms of development of the port industry itself. It is difficult to asses at this stage if the port industry is best supported by the business and growth plans for the region under the new planning system or if the old regional system, although more physical in terms of planning, could have had a greater impact. In summary, the ports and port industry seem to be supported well through the regional development plan and the business development strategies and the importance of the industry is well highlighted through the regional visions and objectives.

6.5 Municipal and Local Level

The municipal and local analyses will take the official planning documentation along with recent local area plans for the Port area. The analysis will also be backed up by comments and remarks made by Anne Vibeke Skovmark, Surveyor at Aalborg Kommune and Jørgen Frandsen, Head of Development and Planning at Aalborg Havn A/S from interviews conducted during the research period.

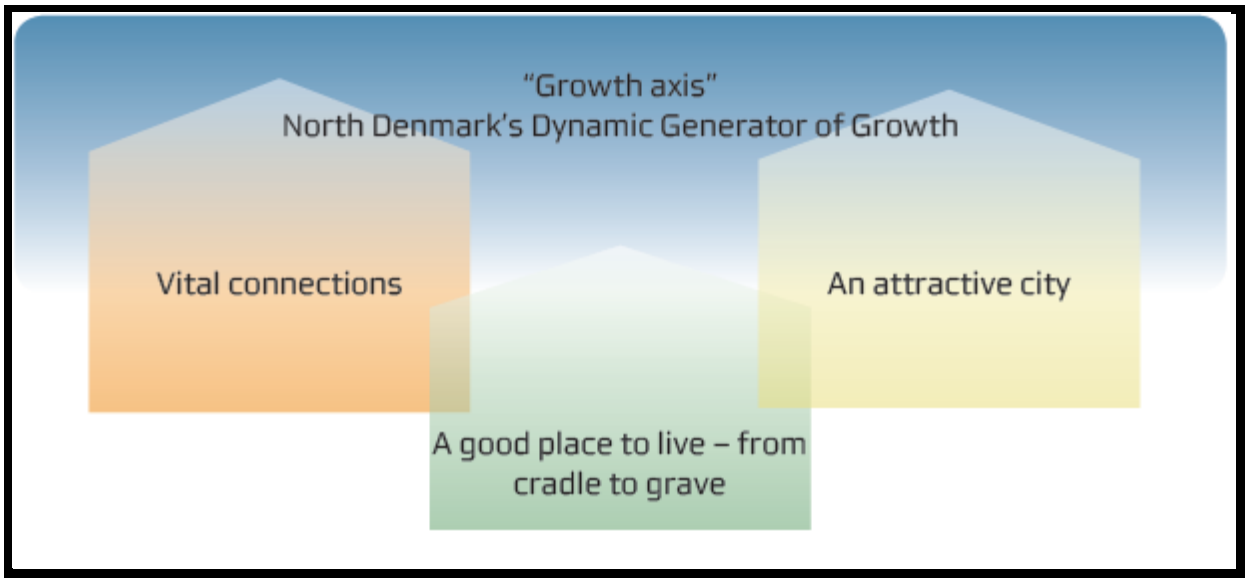
6.5.1 Strategy for Municipal Planning

As mentioned earlier, two main planning documents exist at municipal level, The Municipal Development Plan and The Strategy for Municipal Planning. In the case of Aalborg the most recent strategy was launched in 2011 and entitled the Strategy for Municipal Planning 2011- North Denmark's Dynamic Generator of Growth (Strategy for Municipal Planning, 2011). As per the planning act, the strategy is issued within the first two years of the local elections. The strategy in a sense sets out the foundations for the upcoming municipal plan of 2013. The strategy puts a spotlight on development and growth in a particular geographical zone which is emphasised by Aalborg's "growth axis". The axis is a geographical zone that extends form the Airport in the North West to Aalborg's port in the east, the growth axis puts an outline on areas where development projects either exist or are up and coming. It is estimated by the (Strategy for Municipal Planning, 2011) that one third of jobs are currently located within the axis, and half of Aalborg employments is concentrated within 500 metres of the Axis (Strategy for Municipal Planning, 2011). The growth axis creates the foundations for future development and "*makes up the backbone of future development*" (Strategy for Municipal Planning, 2011) for the city.



Aalborg's Growth Axis – Identifying the growth areas of the city with Aalborg Airport to the North West and Aalborg Port and Ancillary Industry (highlighted in blue) located to the East. Source: aalorgkommune.dk

The growth axis is also supported by three main focus areas within the municipality in a physical form with goals of achieving future growth by concentrating on the main elements of vital connections, an attractive city and a good place to live (Strategy for Municipal Planning, 2011). As this research is port specific, the emphasis will be on the vital connections and infrastructure elements in the strategy that concern the port area. However, it is the collaboration of and connection of the three elements that jointly work in creating growth within the city that support the growth axis.



Aalborg's Growth Axis supported by the three focus areas of Vital Connections, An Attractive City and a Good Place to Live: Source: aalborgkommune.dk

In terms of vital connections, Aalborg puts a high priority on ensuring efficient infrastructure. Not only Aalborg but the entire region is dependent on good connections to the rest of the country. Aalborg Port along with the airport are considered to be the municipality's best points of access to trading partners and businesses (Strategy for Municipal Planning, 2011). The strategy suggests that the airport and port are ideally located along important motorway and rail routes. The port itself is considered to be the "*nerve centre*" for North Denmark's freight and cargo movement. The vision for the Port according to the strategy is to become Denmark's intelligent port that combines infrastructure knowledge with physical infrastructure. Similar, to what the document suggest at regional level- "*this will take place in collaboration with entities such as the centre for logistics at Aalborg University, Artic Business Network and Hub North*". The strategy also highlights the importance of the port not only as an infrastructure service but as a major business within the municipality by attracting employment and ancillary industry to the area. The interview with the Municipality also confirmed "*the ports inclusion in the growth axis is vital for the overall growth and economic plans for the city of Aalborg*" (Interview with Aalborg Kommune, June 2013).

The strategy is of a spatial nature and is designed in such away that clear goals and ambitions are put forward in a simple manner. The target group of the strategy is on professionals, politicians and

business people within the municipality giving them a clear visions of "*what they can count on for the years to come*" (Strategy for Municipal Planning, 2011).

6.5.2 Municipal and Local Development Plan

Aalborg's municipal plan is the overall strategic and comprehensive physical plan that directly relates to the city, its environs and each local area. The plan is in the process of changing, the current municipal plan came into operation in 2009 and also contains an overall assessment of development in the municipality. The plan contains a general structure that puts together the objectives for development and land use in the area. The plan must also not contradict the regional spatial development plans and regulations concerning national interests at higher level. The (Aalborg Municipal Plan, 2009) sets out the framework for the content of the local plans for the specific parts of the area. The main structure of the plan is the overall and strategic part concerning 14 different topics dealing with municipal issues. The port area in east Aalborg has its own dedicated section under the main structure which expresses its importance. The main structure is to ensure the physical framework of the business plan can be realized. This means identifying areas where the port area can be located in harmony between needs and environmental protection. The port according to the main structure of the (Aalborg Municipal Plan, 2009) is designed as an important and special focus area "*As far as the port-related industries, the goal is to expand Aalborg East industrial area of East Harbour and group related industries here*" meaning that the port is recognised has having a possibly greater effect not just as a service but for attracting ancillary industries to the area. In terms of Infrastructure, the plan suggests that the location is well serviced by roads networks however some improvements must be made at certain junctions and access roads (Aalborg Municipal Plan, 2009).

The main structure of the report also sets out the main goals concerning planning for the port area; the goals are summarised below;

- *Port of Aalborg must remain the hub for cargo handling in North Jutland*
- *Port of Aalborg must ensures good development including seeking synergies with industrial companies in close proximity to the harbour*
- *Port of Aalborg must develop its potential to provide industry with special transportation needs of large units by sea or land sideways*

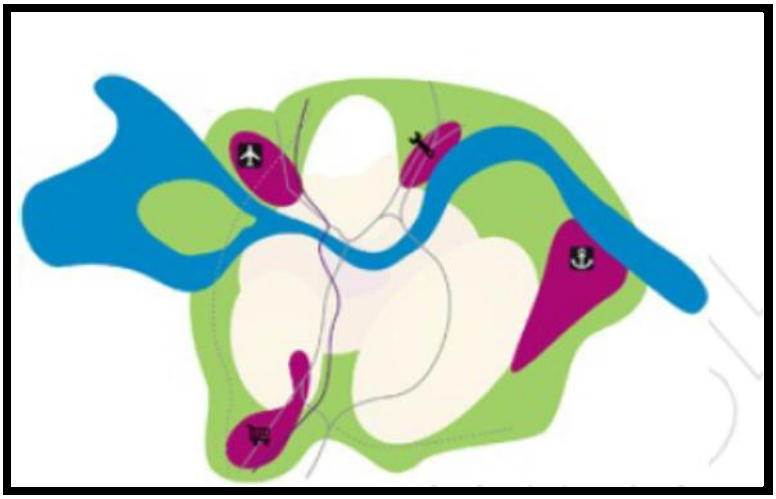
- *Port of Aalborg ensures good transport corridors by land and by sea* (Aalborg Municipal Plan, 2009).

The plan clearly sets out the above goals to stress the importance of development in the port under the four main objectives, hub for North Jutland, synergies with local industry, develop potential in the supply chain and providing an important corroder for the land and sea transport.

The main structure addresses a number of other points concerning the industry in the east port and that future growth in the area needs to take place to the east of the current site and any such plans needs to be contained when local plans are being revised. The plan also stipulates that the area is designated as a location for business with particular needs and requirements of the port and that this area should be protected for this reason " *a 500m impact zone is there to protect existing and future industry and sensitive land use is not to be allowed*" (Aalborg Municipal Plan, 2009) suggesting that the area is to be protected as an industrial zone and not dictated by avoiding future development with ancillary uses with environmental concerns that might arise.

At the time of this research, the (Aalborg Municipal Plan, 2009) is under review. This gave the research an added opportunity to investigate the current changes that are taking place between the 2009 plan and the 2013 plan. The plan is currently in the public domain for 8 weeks for consultation.

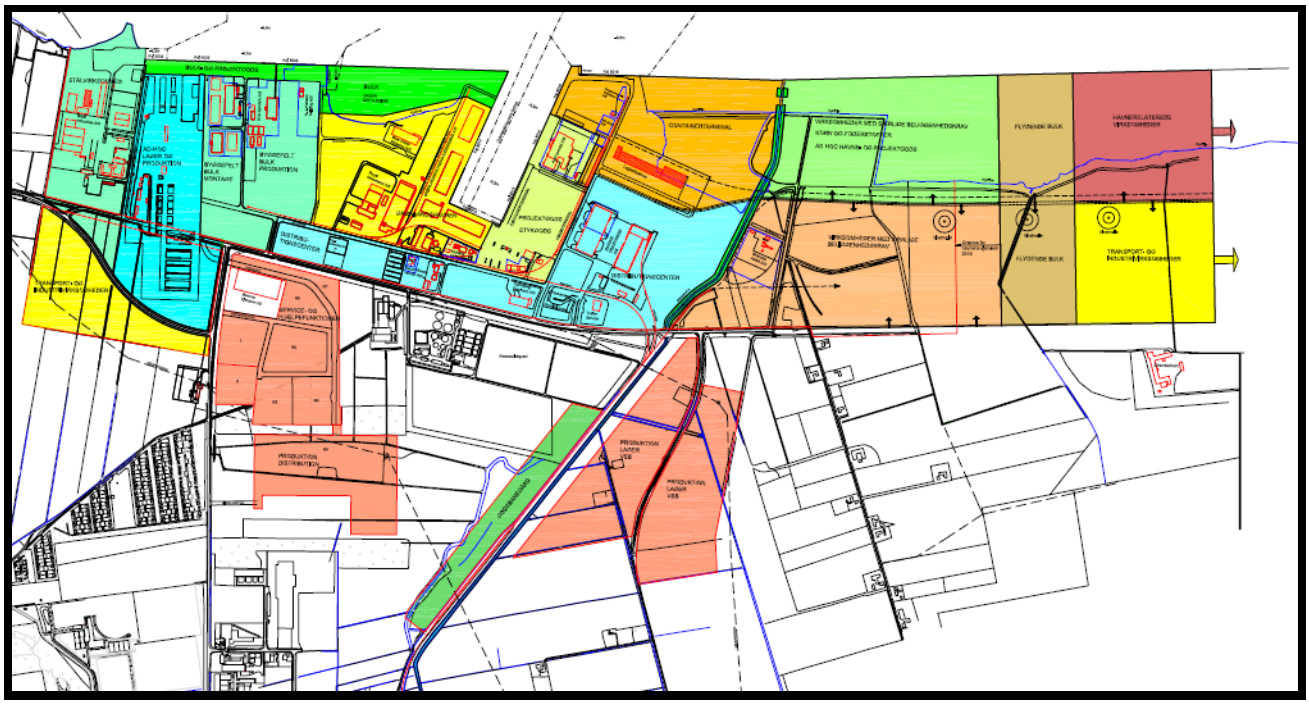
The new (Aalborg Munciapl Plan (Draft), 2013) will come into effect according to the Municipality by 2014 with all amendments. "*The head structure is up and running now and the concrete guidelines and framework should be in force in January 2014*" (Interview with Aalborg Kommune, June 2013). The current or proposed plan is broad and only sets out the main structure and goals for the area. The plan under the main structure suggests that the commercial port at East Aalborg is a result of a "*targeted relocation*" of port business form the city centre to the suburbs due to demands for land and environmental concerns. The draft plan suggests a number of overall development prospects and directions for the area so that the commercial port " *does not end up in the same situation as the city centre in the 1970's*" (Aalborg Munciapl Plan (Draft), 2013).



Industrial Areas of Aalborg, The Port is located to the East with adjoining ancillary industries. Source: (Aalborg Munciapl Plan (Draft), 2013)

The draft report does however highlight a number of special interests that the new plan will focus on in order to protect business in the area along with developing the port as an attractive service industry with optimal connections to the outside world. Some of the special interests included a focus on nature and land interests, involvement in the growth axis, windmills in the area and existing industry in the area amongst others. This according to the Kommune interview "*are briefly described issues, no immediate guidelines are fixed, it will take time to deal with these issues over the coming years*" (Interview with Aalborg Kommune, June 2013) suggesting that the special interests could be a problem in the future and it will be in focus during future planning projects. The concrete focus points are brief at present under the draft plan and run in line with the 3 main focus points laid out in the Strategy for Municipal planning 2011. As discussed during an interview with the municipality, Aalborg Port A/S are yet to make any suggestions or comments regarding the proposed amendments under the 2013 plan "*so it is difficult for them to comment*" (Interview with Aalborg Kommune, June 2013).

Part of the Municipal plan for expansion in the East Port of Aalborg including arrows signifying future growth direction to the East and West of the site. Source: (Aalborg Munciapl Plan (Draft), 2013).



Aalborg Ports Development Plan, designated uses and zones for specific ports related activity such as cargo, bulk, liquid bulk, storage and specialised goods. Source: Aalborg Port A/S 2010.

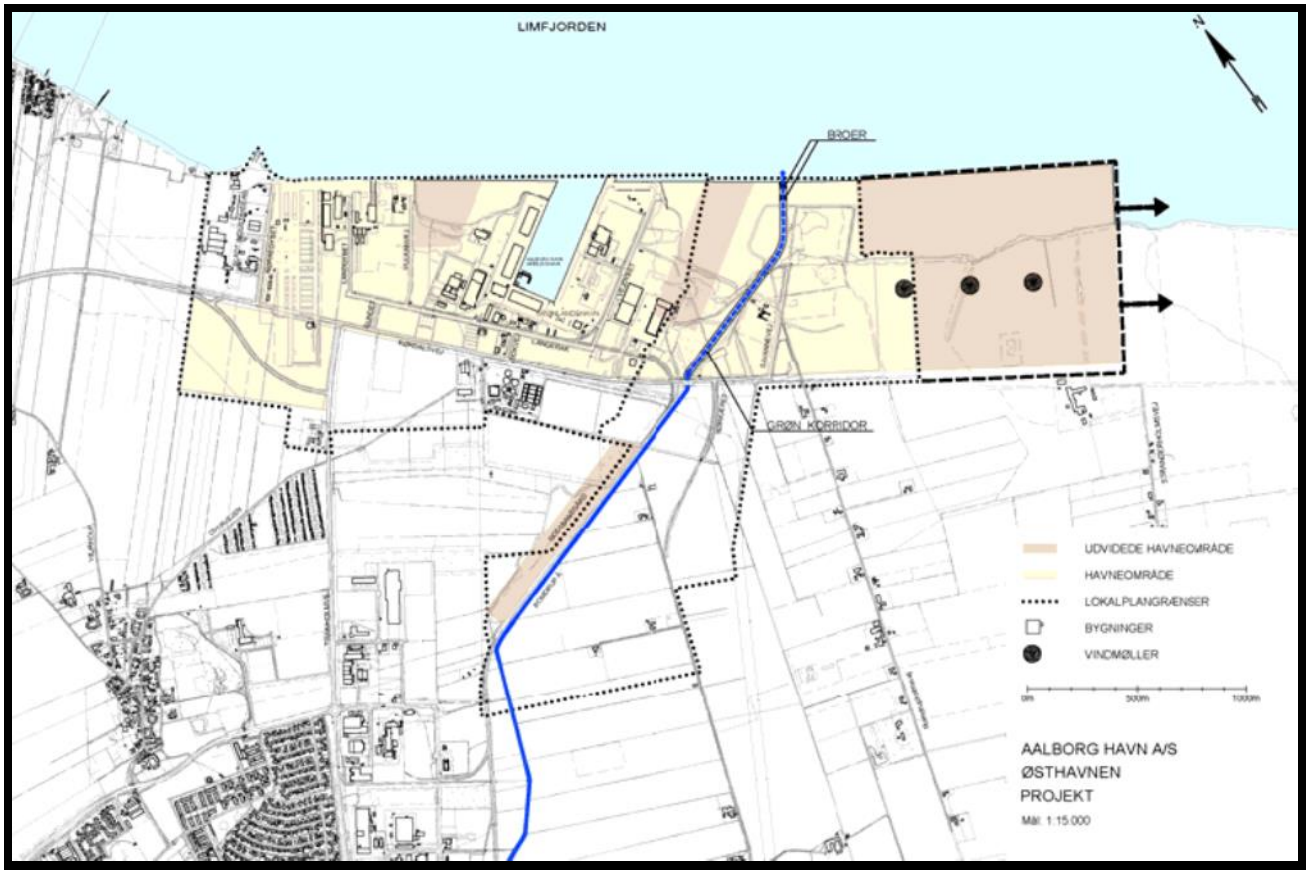
During the interview with Aalborg Port A/S, the port authority seems to be relatively happy with the proposed changes as the new municipal plan supports their master plan and agreed local plan for the area for the near future. Aalborg Port Authority will be putting in some comments concerning the new plan by the end of June 2013. According to Aalborg Havn A/S, the comments are nothing serious and concern primarily the infrastructure and environmental issues "*we will suggest an additional 1 million sq.m of land both to the East and West of current site"* (Interview with Aalborg Havn A/S, June 2013) suggesting that it is a good time now for the Municipality to recognise further extension of the port. Some of the other concerns for the port included the extension of the proposed light rail system from the new hospital location further south in the Aalborg east area. The remainder of the comments concerned some minor environmental issues and infrastructure improvements. The comments would be more "*additions rather than objections*" (Interview with Aalborg Havn A/S, June 2013). The port authority is also in discussions with a number of other partners or stakeholders in the area in order to put their comments in as a combined group "*we have formed a group with additional companies in the area in order to put forward our remarks*" (Interview with Aalborg Havn A/S, June 2013) suggesting that companies in the area are working together and collaborating on planning issues concerning the location.

When asked about the cooperation and prior consultation between the Port and the Kommune about the Municipal plan, it was not an issue concerning their immediate local area, however, recent other plans for the area did prove to be a concern. New plans adjoining the current port site are set to contain a number of new windmills which could according to the port, " *have serious consequences for the port*" (Interview with Aalborg Havn A/S, June 2013) and that the continued effort of the Kommune to place them in the area is concerning "*we were surprised when the current windmill plans for the area came through, it encroaches on our area and we told them on numerous occasions that our land should not be included*" (Interview with Aalborg Havn A/S, June 2013). The windmill project is part of an adjoining area which is part of Portland's local plan but the Kommune did not consult with Aalborg Port in relation to the project. According to the Kommune, the project is at an early stage and that "*we need to find out exactly what we can do in the area*" (Interview with Aalborg Kommune, June 2013) and indicted that they do expect a strong counter proposal form the port authority.

Part of the Municipalities plans for a new windmill site, encroaching on the Aalborg Port Site. Source: Aalborg Kommune.

In terms of the local plan, the most recent amendments concerning the area are included in the 2006 local plan for the port. The plan came into force in November 2006 after a successful EIA report was conducted. The purpose of the plan was to "*piece together two older separated local plans*"

(Interview with Aalborg Kommune, June 2013) from 1984 and 1987 into a local plan that fitted the ports master plan for the area. The new local plan also provides for better development with cohesion in the area so that plans are clear and in order "*The local plan must allow that the port can develop more harmonious than the previous local plans allowed"* (Aalborg East Port's Local Plan 08-066, 2006).



The plan for expansion at Aalborg Port. Source: Regional Plan No.192, 2005

The local plan sets out the local rules on how land, new buildings, vegetation, roads, trails, etc. should be located and designed in a particular area. In addition the plan also focuses on environmental conditions on how the local plan relates to other planning issues and implementing the land use plan with regulations concerning permits or exemptions from other authorities. The report also includes land use plans, boundary lines and cadastral maps. The local plan also holds the regulations and comments concerning all other relevant local issues such as business use, noise from industry, traffic limitations and parking and bus recommendations.

Aalborg ports local plan, as it was implemented in 2006, came under the old system of planning before the reform. Essentially, the EIA was initiated at regional level and the corresponding local plan had to abide by such regional conditions and regulations for land use.

The objective of the current plan is to ensure that "*the current and future businesses in the area get the best possible conditions for the establishment and development and to create the best conditions for more companies to be placed in the area as a port location"* (Aalborg East Port's Local Plan 08-066, 2006). Another objective of the plan was to accommodate and cater for industry that needs to relocate form the city centre "*a flexible response and conditions if larger companies wishing to expand or establish themselves. East Port can also accommodate the port-related companies that may wish to move out from the city centre*" (Aalborg East Port's Local Plan 08-066, 2006). In terms of restrictions, the local plan addresses a number of land uses, building use and visual conditions that perhaps support the industry rather than restrict what essentially the port is about. Such restrictions concerning use classification under different environmental classifications and building height restrictions are wide ranging and can enable a number of unique industries into the area under the current local plan. "*In terms of the local plan, the port is allowed to build up to a maximum of 100metres in some areas which suits the type of industry that needs to locate on the port site*" and "*we are happy with the current plan*" (Interview with Aalborg Havn A/S, June 2013) suggesting that the local plan under Aalborg Municipality is enabling almost all types of port related industry into the site.

6.5.3 Municipal and Local Conclusion

The current local plan seems to be working quite well with the overall development plan of the port itself. The local plan and the EIA report only contain future plans to the east of the current site; however, both the new municipal plan and the port are suggesting the port will expand on both sides in the future. The proposal that may be put forward by the port authority concerning requested additional land to the east and west will more than likely require a new EIS report and a possible new local area plan. Continues points seem to be made through the municipal plan and the strategy for municipal planning that the port remains as a major function and should be supported in terms of growth and development through physical planning. This is continued right through to local level with certain easements made in terms of the use and regulations for such heavy industry within the area. In terms of cooperation, the municipality seems to be getting more involved with planning in the port over recent years "*a lot if things are going to happen in the port area, the municipality and planners are taking more of an interest in the area*" (Interview with Aalborg Kommune, June 2013). This is also backed up by comments made by Aalborg port suggesting that the inclusion of the port into the growth axis made a big difference for the port from an external point of view "*it was good to become part of the growth axis, it enables us to be visualised as part of the city again*" and in terms of planners involvement and communication Aalborg port commented that "*its getting better and better, we feel we were quit invisible and some planning and political decision makers were not aware of our full operation out here*". The inclusion of the port under the growth axis also set up a physical presence in the city that may have been lost when the port relocated "*it is good for our understanding and of course for the understanding of the Municipality not just for the port as having a service but having physical function and purpose for the entire city*". In terms of communication, the Port and Kommune meet on a regular basis, the head of the Aalborg Port meets with the head of planning in the Municipality, the technical team meet opposite members in the Municipality and in terms of planning, if a problem does arise, the Port Authority can discuss issues almost immediately "*the door is always open with the Kommune on various different points regarding planning*". Both the Municipality and the Port are heavily involved in partnerships outside the standard port or planning field, representatives from both sides are present and contribute to various network groups "*Hub North and Business Network 9220 provide a platform where ideas can be discussed and exchanged and member from the Kommune will sit at these meetings and the port usually has a representative*" (Interview with Aalborg Kommune, June 2013)

suggesting that the dialogue that goes on in the background can eliminate future conflicts by sharing knowledge and intentions.

6.6 Theory Reflection

As a conclusion from this analysis section, an effort will be made to relate the findings and conclusions from the above analysis and relate them back to the selected theory concerning planning and port development. Birds "Anyport model" gives a simple but clear model for how ports have developed in relation to the city. Aalborg's Port Industry and particular its evolution over the last 40 years is a very good example of this evolution. At the time of Birds research, the Port of Aalborg was going through the phase of specialization as mentioned in Birds model. The most notable change of this time was the foundation of the Greenland Harbour in Aalborg East. The interview with Aalborg port suggested that this foundation was the first start of the Port relocating out form the city centre "*it all started in the 1970's with the identification of a location for the new Greenland harbour with further industries following over the coming years, it was the benefit of additional land and space that allowed this to happen"* (Interview with Aalborg Havn A/S, June 2013) suggesting that downstream migration did and is still occurring. The particular specialization was concentrated on cargo and freight of a certain type and that "*80% of shipping concerns the artic trade and transport with the remaining 20% focused on a feeder route for Rotterdam*" (Interview with Aalborg Havn A/S, June 2013). The development of Siemens also added to the area with a specialization in the transport of Windmills and associated machinery. Although the ports main income is concentrated on the two types of transport mentioned above, the existing local plan and ports master plan can also cater for additional types of port business such as the transportation of bulk and specialized goods. In terms of regionalization and (Notteboom & Rodrique, 2005) modified version of the Anyport model to include regionalization is possibly not that evident when we look at Aalborg. However, the recent addition of the Nordic Transport Centre (NTC) to the location of the port provides an efficient service in redistributing cargo and freight throughout the region. The majority of users of the port make use of this facility for the easy management, efficiency and connectivity to the road network. As we see from the regional plan, Aalborg Port takes on a larger role than just a port at a coastal location, it is a major contributor to the region and has the designation under the regional plans as the "*Hub for infrastructure and trade*" (Regional Spatial Development Plan, 2012)". As mentioned in the theory section, Regionalization may possibly be more evident on a larger scale within North America and Central Europe, due to Aalborg and North Jutland's location, may play more of a place as a "stage in a line" rather than a direct hub for the numerous feeder routes, the lack of evidence of regionalization may be primarily

down to economies of scale rather than other factors. In terms of containerization, the port seems to have adopted well to modern supply chain process, this is considered to be one of the major incomes of Aalborg Havn A/S and the port as business seems to be positioned in the most profitable type of port industry, but in terms of expansion, it is an extremely competitive industry, increasing market share, especially as a feeder port is proving difficult and this is backed up from the interview with Aalborg Port stating that "*we may probably never see the likes of Maersk here, they have their own setup and facilities"* and also stating that short term facilities and turn around are essential for the ports cargo business "*in terms of the feeder routes, its all about timing and providing the right service at the right time*" (Interview with Aalborg Havn A/S, June 2013). In terms of land use and expansion and (Merckx, Notteboom, & Winkelmans, 2004), it is the mutual understanding from both the Port Authority and Municipality that greenfield sites outside the city are the best option for relocation. This is also recognized in Aalborg Ports most recent local area plan indicating that the new location gives better opportunities for development of the port and its associated industry "*the current and future businesses in the area get the best possible conditions for the establishment and development and to create the best conditions for more companies to be placed in the area as a port location"* (Aalborg East Port's Local Plan 08-066, 2006) however, the new location can according to (Takel, 1981) have its own restraints and new environmental issues arise in terms of noise pollution and environmental conflicts, but it is how these conflicts are managed is the key to successful planning. As we can see from Aalborg's local plans in the area and information gathered from the interviews, some issues may possibly arise concerning the area, in particular, the local new windmill project which is in close proximity to the current site. As stated in the local plan, the area should get "*the best conditions*" for growth. The new windmill project seems to be encroaching on the port area and the development of such a windmill farm may have consequences for future expansion plans. This could possibly provide a very good example of how an area that was initially designated for such use can possibly be threatened by such a project, it may not be a case of poor planning but a case of early and good planning. The system and framework is set up to allow this project to be made evident and the public consultation process that follows this initial project may prove to be a perfect example of collaboration and negotiation so that conflicts are recognized at an early stage. The interview with the Municipality also confirmed this "*this is why we have mentioned this in the new municipal plan as a focus area*" (Interview with Aalborg Kommune, June 2013) suggesting that the planning system in place allows for these problems to be sorted out and that this is the purpose and benefit of the Danish planning system.

In terms of the policies in place, the Danish system seems to have a good framework setup, foundations of such are secured through the planning act and the recommendations that the National Planning report and the Overview of National Interests in Municipal planning both play an important role at national level. It is evident in the reports that development, especially in relation to ports is taken as a unique issue and that ports are "*vital for the economy*" (National Planning Report, 2010) and this should be best supported at local level. It is important to note a recent commissioned report concentrated on the issue in "Land Use in Danish ports" in an effort to address any issues pertaining to planning of ports and land use. Yet again, the system allows for such a report to take place, the recommendations of such a report highlighted the need for more information to be provided for local level planners in order for them to understand and accommodate the needs of the port as a part of urban planning. The report also recommends the availability of further information concerning the port industry and this could quite possibly be the 2012 report commissioned at regional level concerning the 5 largest ports of North Jutland. When we relate this back to theory, it is inline with what (Hall & Hesse, 2013) describes a trend in efforts to engage and educate planners and municipal representatives around the port industry. (Hall & Hesse, 2013) also state that the regional level sometimes has more of an economic or strategic viewpoint on port development rather than a physical one, this is very evident in the case of Denmark, it is clear at a regional planning level, that the regional spatial development plan and the growth forums take on a more strategic and economic role and can be considered to be facilitators in the overall growth plans of the port industry from an economic perspective. The main conclusions of the theory is focused on planners at local level having the best knowledge to best plan for development concerning ports and this also goes in line with the report on "Land use in Danish Ports" suggesting that this is also the case.

7 Conclusion

This research inevitably set out to understand not just the port industry, but how it is managed and planned within a planning system that is structured at different levels from national, through regional down to municipal and local levels. The main results of the research conclude that the framework is in place to support such development and in a sustainable manner. The planning act sets out the foundations for a network with clear regulations and laws concerning what the port is and how it should be protected. The planning act and associated national reports highlight the importance of the industry, not just as part of the infrastructure network, but as a major contributor and facilitator for economic growth and employment creation within the municipality, the region and also the state. The theory concerning the evolution of the port city relationship gives a good understanding of how things have changed in the physical relationship over the last 40 years. It is clear that Birds "Anyport Model" is relevant when we look at the case of Aalborg and that downstream migration is and has occurred with the relocation of the port to Aalborg East. The result of this has already seen its benefits with further growth and expansion due in the coming years. It is at local or municipal level where we see the benefits of such transitions.

Although this research has proved that the planning system supports development especially in the case of Aalborg, the picture may not be so similar in other situations in Denmark. Aalborg may have had the foresight to relocate the port in order to reap the benefits of a new location. The case however, may be different in other examples as geographically and functionally, a relocation of the port industry form the city centre may not be possible.

Essentially, the successful planning of port areas lies at the local level. At this level appropriate cooperation and dialogue is the essence of good planning and an understanding of each others needs will lead to success and future growth. The critical point is that conflicts are something that need to be avoided and it is in pre - dialogue that conflicts and differences are normally resolved. It is the continuation of this cooperation that is vital for the continued success.

This report concludes that planning for the port area, especially in the example of Aalborg, has possibly changed from the traditional attitude of "*restrict and regulate*" to a more proactive role of "understand and accommodate" from a planning perspective and the success of Aalborg port is not down to the port itself but how the new and successful municipality of Aalborg has learned to

embrace the problems and challenges of port development by being a facilitator in the process through promoting and securing the development by placing it at the forefront of its local and economic objectives.

8 Bibliography

Aalborg East Port's Local Plan 08-066. (2006). *Local Plan 08-066.* Aalborg Komunne.

Aalborg Munciapl Plan (Draft). (2013). *Aalborg Munciapl Draft (Draft);Aalborg Kommune.*

Aalborg Municipal Plan. (2009). *Aalborg's Municipal Plan 2009; Aalborg Kommune.*

An Integrated Maritime Strategy. (2010). *Danish Government.*

Bird, J. (1971). Seaports and Seaport Terminals., (p. 24).

Bird, J. (1973). Of Central Places, Cities and Seaports. *Geographical Association*, pp. 105 - 111.

CEC. (1997). *The EU compendium of Spatial Planning Systems and Policies.*

Conflicts in Ports. (2009). *Trends and Needs of Ports as Transports Hubs; Tetra Plan.*

Danish Ship Owners Association. (2012). Danish Shipping and the EU Agenda. *Danish Shipping and the EU Agenda 2012.*

Daamen, T., & Vires, I. (2013). Governing the European port-city interface: institutional impacts on spatial projects between city and port. *Journal of Transport Geography*, pp. 4-13.

Galland, D., & Enemark, S. (2013). Fluctuating Capacities of Planning Policies and Institutions: The tRansformation of the Danish national Planning Framework. In *Planning for Stats and Nation/Stats - A Transatlantic Exploration (unpublished).*

Hall, P., & Hesse, M. (2013). Cities, Regions and Flows.

Hart, C. (1998). *Doing a Literature Review; Releasing the Social Science Resaerch.*

Hesse, M. (2004). Land for Logistics: Locational Dynamics, Real Estate markets abd Political Regulation of Regional Distribution Complexes.

Hoyle, B. (1998). Cities and Ports: Concepts and issues. *Vegueta No. 3*, pp. 263 - 278.

Hoyle, B. S. (1989, June). The Port City Interface. *Trends, Problems and Examples*, pp. 429 - 436.

Hoyle, B., & Hilling, D. (1984). *Seaport Systems and Spatial Change.*

Hoyle, B; Pinder, D. (1980). Cityport Industrialization and Regional Development Spatial Analysis and Planning Strategies.

Interview with Aalborg Havn A/S. (June 2013). *Jorgen Frandsen; Head of Development and Planning; Aalborg Havn.*

Interview with Aalborg Kommune. (June 2013). *Anne Vibeke Skovmark; Surveyor; Technical and Plannning Department; Aalborg Kommune.*

Kumar, R. (1996). *Reasearch Methodology.*

Land Use in Danish Ports. (2010). *Department of Transport and The Department of the Envirnoment.*

Merckx, F., Notteboom, T., & Winkelmans, W. (2004). *Spatial models of waterfront redevelopment: the tension between city and port revisited.*

MLIT. (2012). Current Status of Ship Building. *Ministry of Land, Infrstucture and Tranport Japan.* Japan.

National Planning Report. (2010). *National Planning Report; Department of Environment.*

Notteboom, T., & Rodrique, T. (2005). Port Regionalization: Towards a new phase in Port Development. *Maritime Policy and Managment*, 297 - 313.

OECD. (2009). *Port Competition and Hinterland Connections.* Tranposrt Reserach Centre.

Ostergaard, N. (2006). *Reform of the Planning Act.*

Overview of National Planning Interests. (2013). *Overview of National Planning Interests regarding Municpal Plans.* Department of the Environment.

Plan for Growth in the Blue Denmark. (2012). *Danish Government.*

Planning Act. (2013). *The Danish Planning Act.* Ministry of Environment.

Ports in Waves. (2009). *Ports in Waves; Recomendations for safeguarding of national Interests; Niras Consultancy.*

Ports of North Jutland. (2012). *Ports of North Jutland; Their Importance and Potential.* Niras Consultancy.

Regional Business Strategy. (2010). *Regionall Business Strategy; North Jutland Region Growth Forum.*

Regional Spatial Development Plan. (2012). *Regional Spatial Development Plan, Region North Jutland.*

Rodrique, J. (2013). The Geography of Transport Systems.

Spatial Planning in Denmark. (2007). *The Danish Ministry of the Environment.* Ministry of the Envirnment, Denmark.

Strategy for Municipal Planning. (2011). *Strategy for Munciapl Planning; North Denmark's Generator of Growth.* Aalborg Municipality.

Takel, R. (1981). The Spatial Demands of Ports and Related Industry and Their relationship with the community. In B. Hoyle, & D. Pinder, *City Port Industrialization and Regional Development.*

9 Translation of Danish Document Table

English Translation	Danish Translation	Year
National Level		
The Planning Act	Planloven	2013
National Planning Report	Landsplanredegørelse	2010 (Due 2013)
Overview of National Interests in Municipal Planning	Oversigt over statslige interesser i kommuneplanlægningen	2013
Land use in Danish Ports	Redegørelse om "Arealanvendelsen på danske havne"	2010
Ports in Waves	Havne i bølgegang	2009
Conflicts in ports	Undersøgelse af konflikter i relation til havnens transportcenterrolle i 12 havne	2009
Regional Level		
Regional Spatial Development Plans	Regional udviklingsplan (Region Nordjylland)	2012
Business Development Strategies	Regional Erhvervsudviklingsstrategi og Handlingsplan for Nordjylland 2010-2014	2010
Ports of North Jutland	Nordjyllands Havne – Deres betydning og potentiale	2012
Municipal / Local (Aalborg Municipality)		
Municipal Development Plan	Kommuneplan	2009 2013 (Draft)
Strategy for Municipal Planning	Strategi for kommuneplanlægning	2011
Local Area Plan 08-066	Lokalplan 08-066	2006
EIA Plan No.192	Udvidelse af Aalborg Østhavn – Regionplantillæg nr. 192 med VVM-redegørelse	2005