

Urban structure in 17&18th century Scandinavia

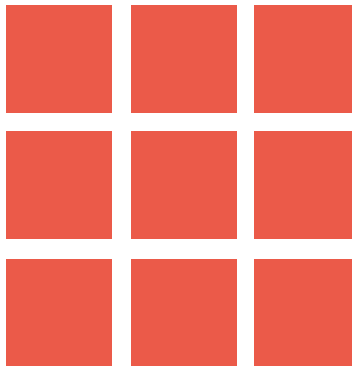
The emergence of grids in Stockholm, Oslo and Copenhagen

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Msc 2 *Architectural History thesis*

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Date 20.04.2023



Introduction

Aim, Questions and Methods

Scandinavia and Northern Europe as a whole have been personal interests of mine for a long time. When examining city plans in this region, a similar grid system keeps appearing, sparking a curiosity to find out why this might be. Initial inquiries into this do not supply an adequate answer and only offer some loose ends. The exact reasoning for the existence of grids is unclear, or at least, is not presented concisely as of yet. Only some research conducted by Thomas Hall (1997) appears to give some concisely presented answers into the topic. Therefore, further research into this topic would prove useful to gather, compile and compare the range of motivations that drove Scandinavian countries to implement this urban feature. This thesis aims to do just that, looking at all the different possible motivations, and comparing them to draw some main conclusions that have led to the emergence of grids in Scandinavia. Especially examining parallels between different countries/capitals can help give definitive answers and produce a clear presentation of the reasoning behind implementation of grids in Scandinavian cities.

During the 17th and early 18th centuries, cities in this region started to develop rapidly in line with other European powers. Hence this timeframe makes sense to research further. Three Scandinavian capitals were chosen in particular, for they are some of the larger cities in the area and have abundant documentation. Furthermore, they have an interesting history and structure, showing signs of grids. Especially Stockholm and Oslo show similarities, with Copenhagen being slightly different. Parallels or differences help explain the phenomenon in further detail. In addition, relevant cases of other cities within each individual capital's country could be included to solidify a particular stance.

The goal of this research is to investigate the main reasons why Scandinavian cities often appear with a distinct grid system, and how this came to be. This results in the main research question: *'Why do historic Scandinavian cities have characteristic gridded streets in urban layout?'*

This will be answered through literature and books from internet, archives, maps and pictures/drawings. Especially the use of maps could help understanding how and why the urban fabric changed. These maps are available through sites, such as the Swedish Riksarkivet and Lantmäteriet, and Norwegian Kartverket. General background information about countries in this region also aid the research, by allowing context and motivation to be formed. The three nations share a lot of common history, often competing with each other, especially during this era. This similarity, and most likely also distinct differences, are important to understand as a base of the research.

With many maps being old and slightly unclear while being of paramount importance to this research, *figure ground* images help to clarify these illustrations. They consist of simple urban plans showing the difference between built and unbuilt urban areas. Urban patterns become clear through the strong black/white contrast, making it easier to follow along and understand the contents of historical visual sources. Several times, areas are highlighted in red to illustrate a specific point, in relation to the text around the image(s).

Structure

The main research question is: *'Why do historic Scandinavian cities have characteristic grids in urban layout?'* In order to help answering this question, other sub-questions need answering, which will be done in their own chapters.

Chapter one will discuss the general background to this thesis. It investigates and answers the question: *'What is the situation in Scandinavia in the 17th and early 18th century?'* It illustrates the territorial boundaries of the age and covers wars and conflict between key players. The urge to explore and build empire, following Dutch and English example, as well as general influences and building practices are mentioned concisely.

The second chapter investigates the first capital city, Stockholm. *'Why does historic Stockholm have characteristic grids in urban layout?'* will be answered through an urban timeline of events that expose different motivations behind the implementation of grids in this context. The same is done with the two other cities, to gather information similarly which allows it to be compared. Chapter three covers the Norwegian capital of Oslo (or Krisitiania), while chapter four covers Copenhagen.

Hereafter, the three capitals will be compared in chapter five. Here, key reasoning for each city's grid implementation (or not) will be divulged in order to establish patterns, similarities or differences between each individual context. Specific other urban cases found in the region help to understand motivations, or illustrate a stronger example of successful implementation.

Finally, a short discussion and conclusion answer the sub-questions, and eventually the main research question of this paper. Shortcomings and possible hindrances during the research process are also discussed.

Scandinavia 1

1.1 General history

To approach the topic of this thesis in a complete fashion, it is important to understand the contextual background to which it plays out. The Scandinavian countries, being the Kingdoms of Denmark, Norway and Sweden, competed with one another for control over the area regularly through the ages. Ahead of the 17th and 18th centuries, the three kingdoms would be reigned by one monarch, during a union called the Kalmar Union (1397-1523), with the exception of some interruptions. However, Sweden would eventually rebel, led by Gustav Vasa, and become independent with Vasa being crowned the first King of Sweden.

During the centuries that followed medieval times (the Renaissance), many European nations took on endeavours for expansion. The Scandinavian nations also played a part in this, with Denmark and Sweden often posing as enemies as they sought expansion of their empires. Notably, Norway, Finland and Eastern European lands fell to their realms in European context. Scandinavian nations also explored and colonised other regions on the globe such as the Americas and Africa, with the ultimate goal to increase their global influence to exploit resources, extend territory and create new markets. Their successes were less compared to their southern and western European counterparts such as the United Kingdom, the Netherlands, France, Portugal and Spain. The first two of these would actually play a continuous role in the Scandinavian context, mainly through trade and military alliances. Several Dutch influences are still visible in the region.

During the 17th and early 18th century, the Scandinavian borders were established as is illustrated in the figure below. The map shows a Danish-Norwegian union by the end of the 18th century, as it remained since the fall of the Kalmar Union. Sweden is shown at its peak in 1658, having taken notable areas previously belonging to Denmark and Norway, while the latter was lost quite quickly thereafter. Sweden primarily focussed to the east, with large parts of Finland and the Baltics belonging to its empire. (The locations of the case cities in this thesis are highlighted).



Denmark-Norway 1780 *Unknown*



Swedish empire at peak 1658 *Unknown*

During this time, cities in the area began to prosper through colonialism and societal advances in the early modern era. The medieval cities had to be expanded, and new towns were founded throughout the region, often as a result of resource exploitation and authoritative control. Ahead of this, the northern parts of the European continent were only scarcely inhabited and urbanised.

1.2 17-18th century context

The centuries that this thesis focusses on, the 17th and 18th centuries, coincide with the Renaissance. This 're-birth' happened throughout Europe, and started in the 15th century in Italy, and steadily spread throughout the continent. By the beginning of the 17th century, Scandinavia was stepping out of the medieval ages, with new ideals beginning to be introduced in the region. Relevant is the Renaissance ideal of straight grid pattern streets in urban layouts. Geometric order was an important element, and fortifications were typically in place in urban projects containing star-shaped bastions after the invention of gunpowder. Therefore it is likely this will have played a role in the realisation of grids in Scandinavia, however the deeper reasoning behind this is just as important in this thesis.

Other important aspects to be aware of ahead of this thesis are traditional buildings practices. Generally speaking, the climate is similar throughout the nordics, with a dry climate, cold winter and warm summers. The traditional building practices were comprised mainly with the use of wood and a base material. The abundance of the material through the large forested areas in the region allowed it to be used quickly and cheaply. It also offered great insulation. Similar to other medieval urban areas in Europe, cities traditionally did not follow a plan, but were built rather spontaneously. Generally, medieval towns in Scandinavia were densely built, with street widths of 3-5m. Sadly, the combination of this and wood allowed many urban fires to take place during these medieval centuries, and even in the times that followed, forcing people to rethink their construction methods¹.

1.3 Conclusion

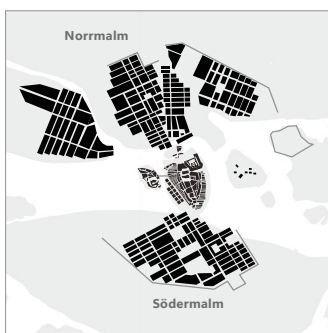
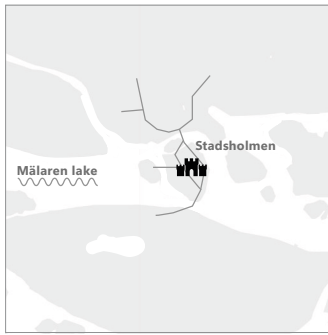
In conclusion, several things can be said of the 17th and 18th century context of Scandinavia. Rivalry in the region between nations was a motivator to engage in new activities, to impress, grow and defend. Furthermore, the Renaissance had just started which brought new influences and ideals to Scandinavia. Finally, the region had commonly continuously constructed unplanned cities, primarily from wood which regularly sparked fires.

¹: Larsen, Knut Einar (1987) Some Aspects of the Development of the Wooden Towns in the Nordic Countries Until the 20th-Century. In: Old cultures in new worlds. 8th ICOMOS General Assembly and International Symposium. Programme report - Compte rendu. US/ICOMOS, Washington, pp. 677-684.

Stockholm 2

2.1 An urban timeline

In order to understand the origins and motivations behind the implementation of a grid street system in the Swedish capital, it is important to understand how the city came to be in the first place. For, perhaps the existence of the grids go back to a much earlier time than the 17th and 18th centuries this thesis focusses on. Therefore, a concise urban development can be seen on this page. It attempts to illustrate how the fabric of the city changed throughout its initial settlement, up until the timeframe relevant in this document and acts as a guide through this chapter. (Based on: Lorenzi & Falk (2020), *Stockholms Byggnadsordning*, Stadsbyggnadskontoret, Stockholms stad)



800

The first settlements were established in the northern parts around the city. Väsby around current Hötorget and Ekeby around current Östermalm. These small villages would slowly move.

1000

1100

By the end of the 11th century, a permanent fortified town had formed where the new lake Mälaren and the sea met, the island of Stadsholmen.

1252

The city is regarded to have been founded in this year, and the first map of the messy medieval city had been drawn up. Small settlements were built around Stockholm, and the medieval centre was continuously altered in the coming centuries. Typically, långgatorna ('long streets' - narrow alleyways) running to the water, define the urban structure of the city. The island was expanded using logs, stone and sunken wrecks.

1625

A fire on the western side of Stadsholmen caused a large part of the city to be destroyed. A new plan was made, with the first implementation of a grid pattern.

1635

A decade later, the city grew exponentially and a massive extension plan for Norrmalm to the north, and eventually Södermalm to the south of Stadsholmen was made using a grid city pattern as basis.

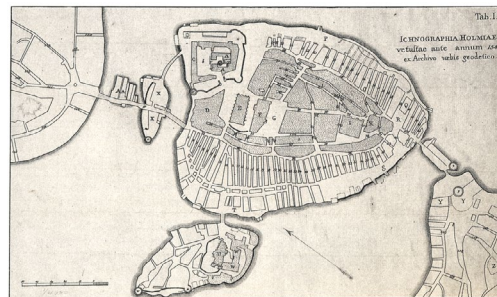
2.2 Historical urban structure

The timeline on the previous page offers a small overview of events that occurred in the urban development of the Swedish capital. It mentions the medieval city centre on Stadsholmen island, which does not contain a grid street pattern. This is an important notion, for it confirms the implementation of grids in the early 17th century. The map below shows the original historic urban structure of Stadsholmen. The approximation in the figure ground diagram next to it provides a clearer image.

'Figure Ground'
Stadsholmen 1625 *Own work*



Stadsholmen 1625 *Unknown*



Stadsholmen 1547 *Erico M. Fant*

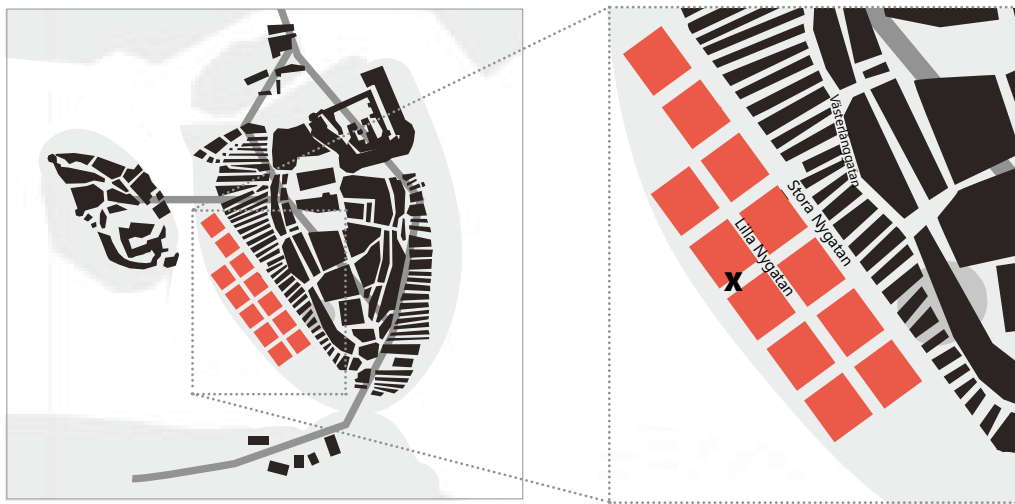
The oldest maps of the city indicate the absence of many straight lines in its urban fabric. Stadsholmen consisted of a densely built core with winding streets and a central square as well as a larger fortification on the northeastern edge. Towards the outer edges, long narrow alleyways protrude out towards the water, and become one of the most notable physical urban features (which are highlighted red in the figure ground map above). These alleyways, or långgatorna, were created because of the dependence on the water for the inhabitants of the city¹. Water was a source of trade and transport, as well as food and access in case of fires. The latter of these would later transform the city's urban fabric and in part lead to the topic of this thesis.

1: Lorenzi & Falk (2020), Stockholms Byggnadsordning, Stadsbyggnadskontoret, Stockholms stad

2.3 The first grids

Several centuries pass before grids start appearing in the urban fabric of Stockholm. On September 1st 1625, a fire in a brewery on the lower end of Kåkbrinken broke out (X in the image below). The flames were carried by the wind and destroyed most of the buildings on the southwestern part of the island. The fire left a sizeable gap in the city. Despite the absence of surviving documents, it is clear the city government wanted to renew the area and bring it up to the standards of the times. In the following year, King Gustavus Adolphus mentions plans ordered by himself, which resulted in the first regulation of the city west of Västerlånggatan. Two new broad streets were created being Stora Nygatan (*The Large New Street*) and Lilla Nygatan (*The Small New Street*). The medieval wall was replaced by grand palaces along the waterfront².

'Figure Ground' Stadsholmen 1625 after fire Own work



The two main broad new streets ran parallel to the water, as was the case in many cities at the time, continuing to offer good access³. This initial grid pattern would set a precedent for Stockholm, and would only a few years later be executed on much larger scales.

2.4 Grid expansion

In 1634 a new government was formed. This was followed with a large immigration of merchants, civilians, politicians, civil servants, soldiers and a growing intellectual elite to the city of Stockholm since the central government and kingdom regulations were seated here⁴. The medieval core had grown into a very dense urban structure, which led the city to expand out in the areas north and south of Stadsholmen. Settlements had already been made in these areas, and Norrmalm had its own governmental magistrate since 1605 making demolishment impossible. However, Norrmalm was reunified with Stockholm in 1635 which allowed the first planned expansion out of the city's central island, which showed the dependance of governmental interference in relation to urban development⁵.

2: Hall, Thomas (1999). Huvudstad i omvandling - Stockholms planering och utbyggnad under 700 år (in Swedish). Stockholm: Sveriges Radios forlag. ISBN 91-522-1810-4.

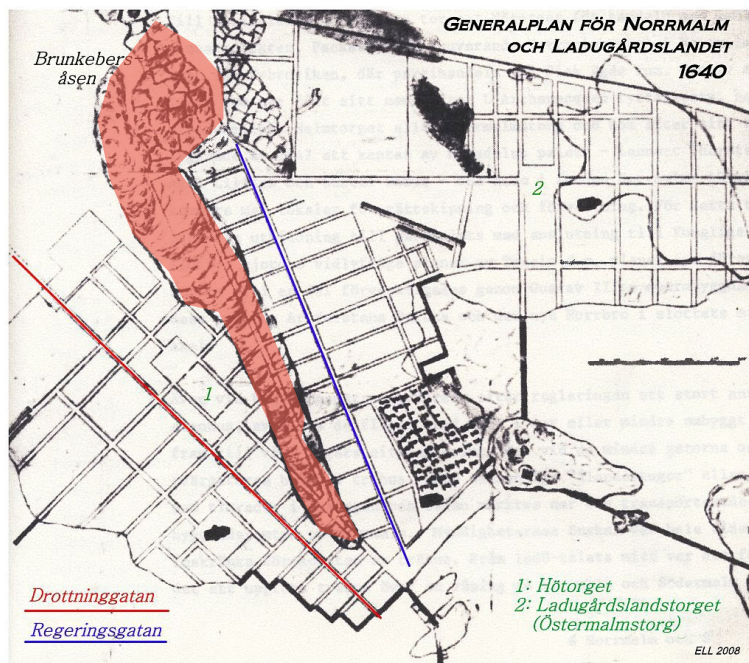
3: Stadsgrundningar och planförändringar : Svensk stadsplanering 1521–1721, avhandling vid Institutionen för landskapsplanering Ultuna och Konstvetenskapliga institutionen, Stockholms universitet 2005, p. 125

4: Hall, Thomas (1997), p. 70

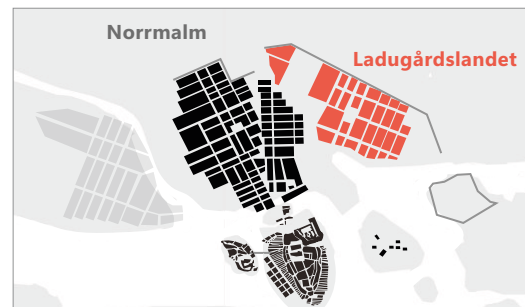
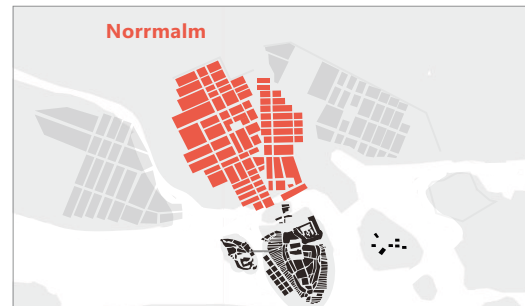
5: Hall, Thomas (1997), pp. 53–58

In 1636, Clas Larsson Fleming's regulation of Stockholm was created. Fleming was a politician who instructed his right hand man, quartermaster-general Olof Hansson Örnehufvud to create the following: "*en dessein på gatorna så på malmarna som här i staden, tagandes dem så breda som han någonsin kan*", or translated to "*as wide as possible streets for the capital itself and the areas of Norrmalm and Södermalm*"⁶. Planning commenced starting with the northern district of Norrmalm. In reality a close worker of Örnehufvud, Anders Torstensson, adapted the plans from a purely unimaginative technical urban plan into an architecturally shaped plan that still dictates the cityscape of Nedre (lower) Norrmalm to this day in March 1637^{7,8}.

Norrmalm & Ladugårdslandet 1640 Anders Tortsensson



'Figure Ground' Norrmalm 1637 Own work



'Figure Ground' Ladugårdslandet 1640 Own work

Torstensson preserved some urban features including Stoor Konungz gatan (Large King's Street, today's Drottninggatan) and Mönstre Platz (today's Hötorget) which can be seen in the map above.

A second destructive fire in 1640 on the eastern part of Norrmalm allowed planning for another district in that area, while simultaneously, the rural area east of Norrmalm (Ladugårdslandet, today's Östermalm) was donated to the city. Torstensson then presented a unified plan for all three northern extensions. However, a problem he failed to deal with before his death was the huge ridge *Brunkebergsåsen* separating the two parts of Norrmalm, resulting in irregularities between the streets on either side (see map)⁹.

6: Hall, Thomas (1997), p. 70

7: Hall, Thomas (1997), pp. 63–70

8: Hall, Thomas (1999). Huvudstad i omvandling - Stockholms planering och utbyggnad under 700 år (in Swedish). Stockholm: Sveriges Radios förlag. ISBN 91-522-1810-4.

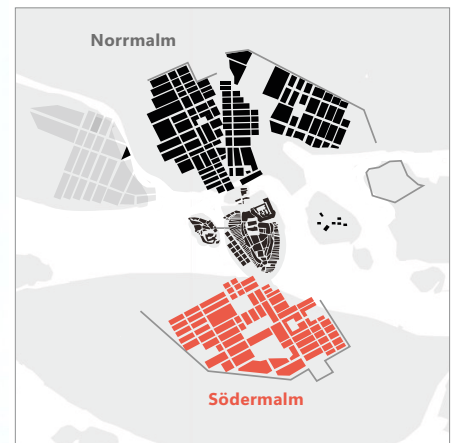
9: Hall, Thomas (1997), pp. 63–70

Eventually, the focus turns to the south which also had challenges. This part of the landscape had a steep shore at the north of Södermalm island. In the map below, the original street pattern of the medieval settlements can be seen, which is overlayed with the new grid pattern proposal. Today's Götgatan already existed, and is planned to be straightened on the map. An entirely new addition was a second artery street which ran perpendicular and west of the former. Blocks are placed parallel to these two broad streets, with spaces for two churches. However, in 1641, the Governor's Office ordered Södermalm's older buildings to be demolished. This resulted in the current absence of medieval structures on the island¹⁰.

Södermalm 1641 Anders Tortsensson, Lantmateriet

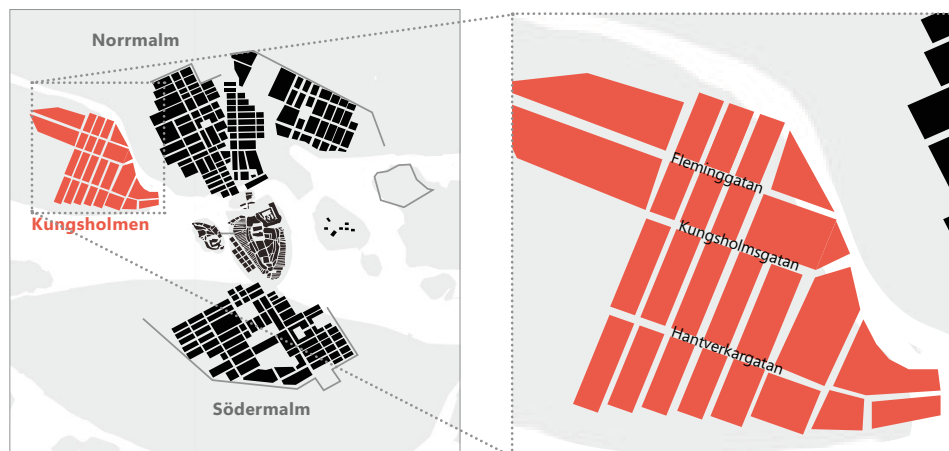


'Figure Ground' Södermalm 1641 Own work



Furthermore, Kungsholmen Island was also made part of the city by a donation in 1644, allowing similar plans to be created. Comperable to Södermalm, the varied terrain on Kungsholmen made the activity of implementing a grid pattern a challenge, but several of the present day artery streets date back to this time, including Fleminggatan, Kungsholmsgatan, and Hantverkargatan¹¹.

'Figure Ground' Kungsholmen 1644 Own work



10: Hall, Thomas (1997) pp. 70–74

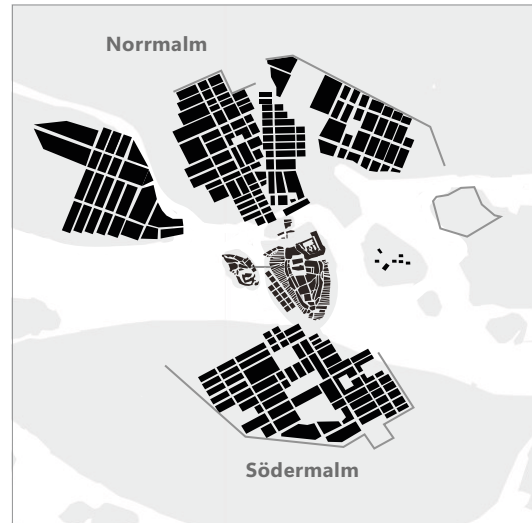
11: Hall, Thomas (1997) pp. 74–75

2.5 Final grids

As a result of the extensions, the city's population increased exponentially. It quite literally exploded, starting with a mere 9.000 in the year 1630 to 60.000 in 1680. The image below shows the final stage of the grid expansions in the Swedish capital in 1650. It shows the four separate areas, each with their distinct shapes, which is the result of the natural geographical conditions, as well as planning errors.



Stockholm 1650 (Capitale de Suède), unknown, city museum stockholm



'Figure Ground' Stockholm 1650 Own Work

2.6 Conclusions

To conclude this chapter and answering the question *'Why does historic Stockholm have characteristic grids in urban layout?'* several things can be said, having reviewed the emergence of urban grids after the medieval era in Stockholm.

The very first grids on Stadsholmen were the result of an urban fire that allowed the area to be redesigned, following Renaissance ideals of the time, a grid system was introduced on behalf of the king. A similar motivation can be found for the continuous implementation of this system for the further expansion of the city.

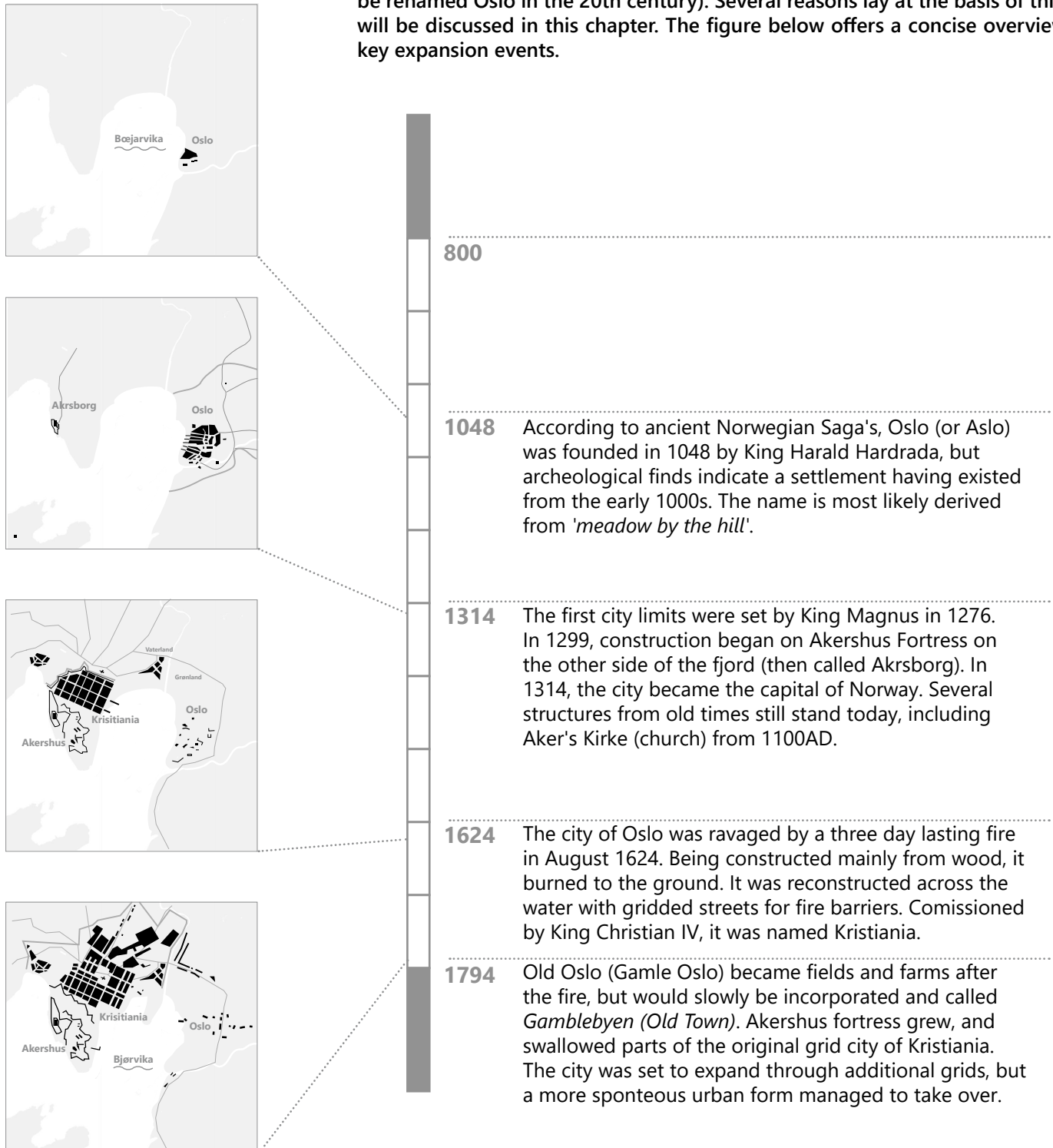
Therefore, it can be said that these grids were introduced for three main purposes. Initially, fire caused city planners to rethink how to safely and efficiently build dense areas, and created an open space to do so. Secondly, the ideals of the renaissance mirrored straight lines in urban layout, making grids *'fashionable'*. While finally, the (royal) authorities wanted to show their influence by using this style as their *'signature'* on the city.

However, the grids are not perfect because of geography and human error, for Stockholm's history and landscape were not completely suitable. Better examples of grid cities exist, since the Swedes expanded the use of this method throughout their empire as it grew. The final chapter briefly covers Uusikaupunki (Nystad) in Swedish Finland and allows a clearer insight in the Swedish reasoning behind its implementation in terms of efficiency.

Oslo (Kristiania) 3

3.1 An urban timeline

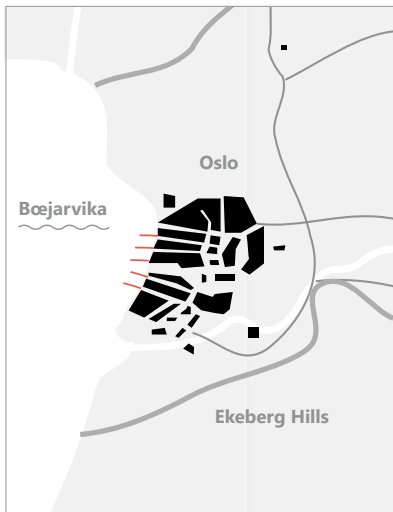
Similar to the previous chapter about Stockholm, Oslo's origins and development form the foundation. The urban fabric of current day Oslo has a rather different history compared to its Swedish counterpart. The city of Oslo was relocated and renamed Krisitiania during the time relevant to this thesis. The former location of the city, and originally called Oslo, will be referred to as Old Oslo, whereas the newly founded area across the fjord will be referred to as Kristiania (which would be renamed Oslo in the 20th century). Several reasons lay at the basis of this, as will be discussed in this chapter. The figure below offers a concise overview of key expansion events.



3.2 Historical urban structure

As is made apparent in the previous historical urban overview, the city of Oslo has known a turbulent past. Sadly, far less cartographic and factual information is available in relation to the Norwegian capital. The initial city was founded on the eastern banks of Bjørvika, a northern part of the fjord that is situated centrally in the landscape. The old city was founded in 1048, and continued to grow in the centuries that followed. The urban layout had a rather spontaneous system, with access to the water being an important element. This is reflected by the presence of several piers along the waterfront, as well as longer streets pertruding into the urban fabric towards the east. The old city of Oslo shows no signs of a grid plan having been introduced (see image below, with piers in red).

'Figure Ground' Oslo 1300s Own Work



Reconstruction Oslo 1300s from Ekeberg Hills Karl-Fredrik Keller



During the 1300s, the city had approximately 3,000 residents. King Håkon V (1299-1319) was the first king to reside in Oslo, and commenced the construction of Akershus Fortress across the water, for the city was often attacked by enemies. The medieval town had six churches and three convents, and thus contained some important stone structures¹.

3.3 The fire of 1624

The city's gradual and modest expansion throughout the centuries was abruptly halted when disaster struck in August 1624. After many fires tormented the city in the centuries before, a three day lasting fire tore through the town, leaving it in ruins. Only stone structures such as the churches and monasteries survived. At the time, Norway was in a union with Denmark, and ruled by King Christian IV. The city would soon be rebuilt following his order, but not in its original location. This was done to efficiently rebuild the city following a fireproof plan, as well as the ability to better defend the city in the new location. A new plan was drawn up to construct a new town just outside the ruins of the old, across the water of Bjørvika and next to Akerhus fortress².

1: Nedkvitne, Arnved (2000). Middelalderbyen ved Bjørvika. Cappelen. ISBN 8202191009.

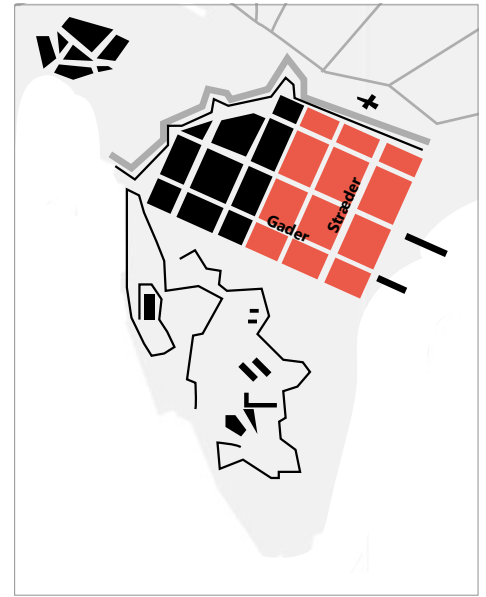
2: Daae, Ludvig: 1891, Det gamle Christiania 1624-1814

3.4 Kristiania

King Christian IV himself went to Norway to execute his plan, with the city being founded and named Kristiania after the king on the 17th of September 1624. An integral element of this new town was the emphasis on better fire protection, to prevent disaster going forward. A grid street pattern was introduced in the plan, with streets being wider than before: 24el (around 15m). That way fire could not spread easily from one side to the other. It followed Renaissance ideals of geometric order. Simultaneously, 'Murtvangen' (Wall Compulsion) was introduced, which forced all buildings to be constructed using bricks instead of wood. However, since this foreign way of construction broke traditional and cheaper methods, some broke this order. After the fire of 1708 however, only brick structures would be built in and around the city. Murtvangen remained a unique concept to Kristiania for two centuries in Norwegian context. Only in the 19th century, other cities followed³.



Kristiania 1648 Geelkerck



'Figure Ground' Kristiania 1648 Own work

The grid system of the city was based on streets going East to West, and North to South. The North-South orientated streets would contain the name *Stræder*, while the East-West streets would be named *Gader*⁴. This happened in the medieval city as well, but gradually was abandoned after its implementation in Kristiania. Several streets were given different names throughout the centuries. The image above reveals the grid plan for Kristiania.

The areas to the east along the waterfront were intended for the richer inhabitants (red in map), while the remaining smaller blocks to the west were intended for poorer people.

3: Rognerød, Dag-Ivar og Havran, Jiri. Christiania : Kvadraturen i Oslo. ARFO, 1998. ISBN 82-91399-08-5

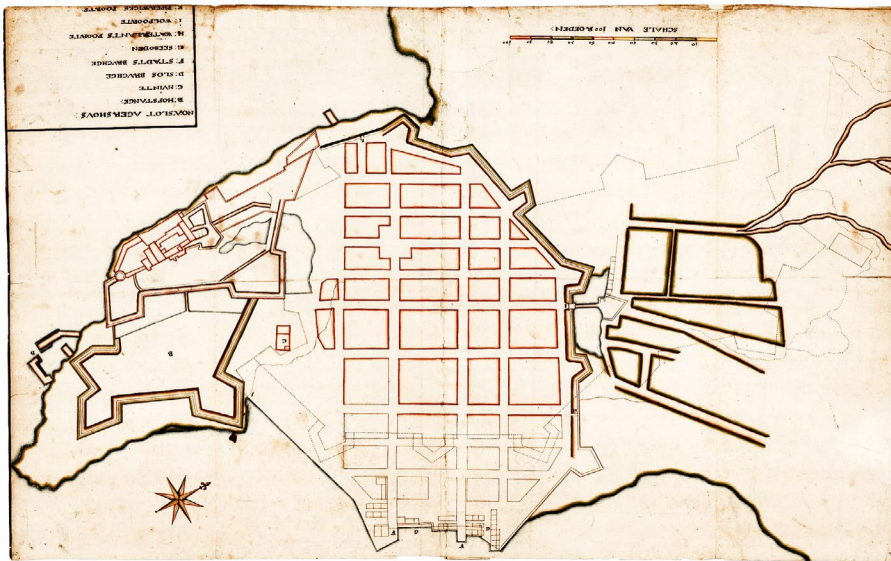
4: Rognerød, Dag-Ivar og Havran, Jiri. Christiania : Kvadraturen i Oslo. ARFO, 1998. ISBN 82-91399-08-5

3.3 Kvadraturen

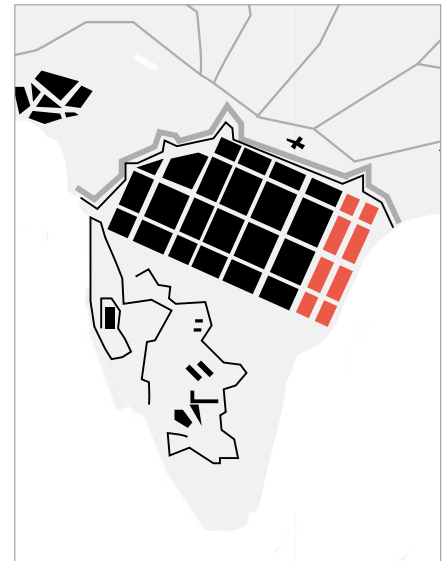
Essentially, the streets were supposed to act as fire breaks in the urban fabric. This area would be named Kvadraturen, translating in 'the quadrature', based on the distinct straight streets dividing the city in 'quarters'. Today, this area still possesses the name, and contains some of the oldest surviving buildings of the city of Oslo. Furthermore, Kvadraturen has become a Norwegian term used to identify similar grid patterns found in other Norwegian cities that were founded or reconstructed at the time including Kristiansand and Trondheim. Most notable is the addition of fortifications along the northern edges of the city.

Akershus fortress became the citadel of the town, as it became an increasingly important centre for politics, trade and prosperity for the region and the Kingdom of Denmark-Norway. The neighbourhoods inside the fortifications would be completed around the year 1650.

3.4 Extensions 1657 & 1704



Kristiania 1657 Willem Coucheron



'Figure Ground' Kristiania 1657 Own work

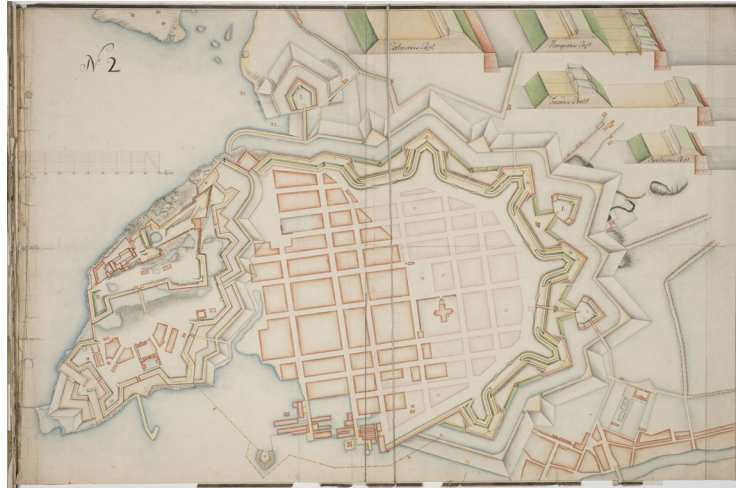
Because of the growing need to increase housing, the city was extended towards the waterfront in 1657. Governor Niels Trolle allowed people to create new land in Bjørvika to facilitate new neighbourhoods that complied with the urban layout of the existing grid (see red in figure ground). This was done in exchange for payment to stabilise the soil afterwards by the authorities. This new area would focus on the interaction with the sea, and became the city's new harbour area. This new extension would be completed before 1680. The outer neighbourhoods were partially built when fire destroyed the area in 1708³.

1: Nedkvitne, Arnved (2000). Middelalderbyen ved Bjørvika. Cappelen. ISBN 8202191009.

2: Daae, Ludvig: 1891, Det gamle Christiania 1624-1814

3: Roede, Lars (2016). Historisk atlas over Oslo p. 30-33

In 1704, the map below was created showing a huge expansion of the grid system towards the north. However, due to money and geographical challenges, these changes were never executed.



Kristiania 1704 Scheel, C. S. Schøller

3.5 Conclusion

To conclude this chapter and answering the question '*Why does historic Oslo have characteristic grids in urban layout?*' several things can be said.

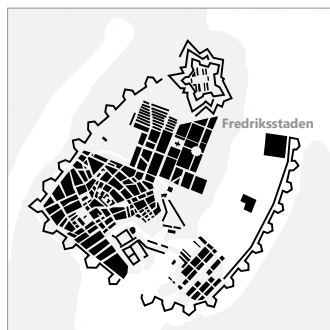
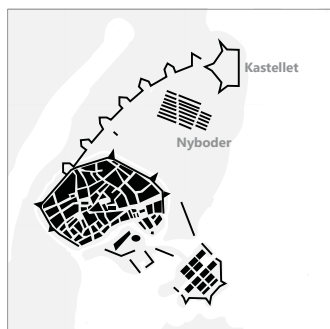
The implementation of grids in Oslo can directly be traced back to the fire that destroyed the first town. The new gridded street system would help prevent fires from spreading on a big scale again. Furthermore, it was also a quick and efficient way to rehouse people after the first fire destroyed their homes.

However, another reason for the grids in Norway's capital is the influence of the Danish king Christian IV. By means of the usage of a grid, he put his signature on the city, showing his regional significance which was certainly convenient in the 'foreign' part of his kingdom, Norway. In this, the ideals of the Renaissance are reflected through urban order and fortifications.

Copenhagen 4

4.1 An urban timeline

The Danish capital city of Copenhagen appears to be the odd one out in the relation to the other two discussed previously. The city was quite well established early on, and developed during medieval times. During the centuries thereafter, the 17th and 18th centuries, the city was expanded but in rather different fashion. The shallow water allowed new land to be reclaimed from the sea. The urban timeline below explains the key events in urban development and its relation to implementation of grids in the city.



800

First traces of inhabitation date back to 700-800. In 1043 is the first mention of the city as 'Havn'. A turbulent time follows marked by wars and uprising. The city gets its first defensive structures in the 12th century. The city was destroyed by the Hansiatic League in 1368, and it took a while before the city was rebuilt. The city is re-established and had winding streets. Defenses are expanded and improved. It marks the beginning of a new age for the city.

1500

Christianshavn is constructed towards the east on artificial land, by means of grids. The first in the urban fabric.

1618

1626

1647

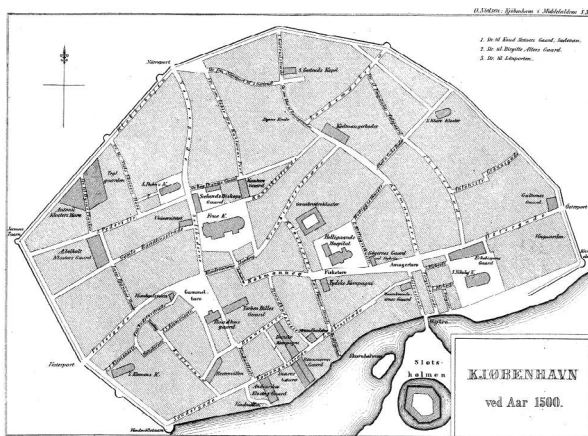
In 1626 the city is expanded northwards with defences and Kastellet fort. In 1647, nyborg neighbourhood with grids is constructed.

1728

A major fire destroys a big part of the medieval centre, sparking some alterations. Christianshavn is extended and Fredriksstaden is made in 1756.

4.2 Medieval development

The first signs of people living in the area stems from remains of bridges and buildings found dating back as far as the year 700. Gradually, the population in the area would grow into the middle ages. In 1043, the city is mentioned as 'Havn'. Because of its position and many rivals, the city begins building fortifications in the 12th century, under possession of Bishop Absalon¹. The old medieval city's outer edge follows the current streets of Radhuspladsen (located at the waterfront at the time), Vester voldgade, Nørre voldgade, Gothersgade, Holmens Kanal and Niels Juelesgade, where it meets the water again² (see image below). It would roughly be contained in this area until the 17th century. In 1254 it would receive its city charter. The harbour and fishing possibilities made it an important trading centre. The old parts of the city of Copenhagen are characterised by winding streets in irregular patterns. This is very much visible in the older maps of the city, like the reconstruction of the city in the 1500s below. Notable features are some larger buildings, modest fortifications and a castle on an island next to the city. The city would continue to focus on having proper fortifications.



Reconstruction Copenhagen 1500 Oluf Nielsen



'Figure ground' Copenhagen 1500 Own work

Similar to the other cities that were discussed previously, the old city centre does not show any signs of grids in urban layout. The gradual unplanned expansion allowed streets to form the way they did. In 1443 the city would become the official royal residence, in the fortress on Slotsholmen island (red in figure ground). At the end of the middle ages, the city had a population estimated to be around 5000³.

4.3 King Christian IV

An important figure in the history of Copenhagen, and Scandinavia as a whole, was the Danish-Norwegian king Christian IV (1577-1648). The longest reigning monarch in Scandinavia, he was known for his large urban developments and left his mark on many cities and buildings in the region. As mentioned in the previous chapter, it was his order that relocated Oslo across the water, and introduced a grid pattern in its layout. Similarly, he altered the city of his royal residence. Christianshavn began construction in 1618, built on a new island in shallow water, marking the first significant urban changes for 450 years. In 1626, he would order a northern fortification to be built, Kastellet. Not long thereafter, in 1646, the city would be expanded north by means of grids. The following texts focus on these new developments under his command.

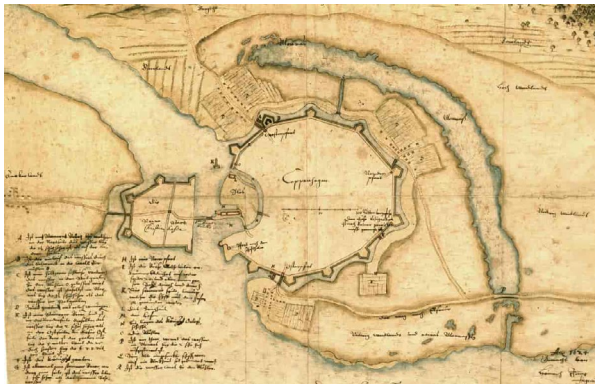
1: Kristiansen, Mette Svane (1999). "Den middelalderlige bybefæstning på Kongens Nytorv". In Gautier, E.; Skaarup, B.; Gabrielsen, K.; Kristiansen, M.; Ejlersen, T. (eds.). Historiske Meddelelser om København 1999 (in Danish). Copenhagen: Copenhagen Municipality. ISBN 87-89457-13-7.

2: slks.dk, (2022) Om Københavns volde

3: Om København i Vikingetid og middelalder; byhistorie.inet-designer.dk (2018)

4.4 Christianshavn 1618

Named after himself, vaunting his authority and significance, Christianshavn marks a new age for the city of Copenhagen⁴. The city was quite well protected along the land borders, but was vulnerable from the water. The creation of this new area, built on an artificial island, would help protect the city from this direction. Furthermore, it offered a place for Dutch immigrants, but would later be used mainly as a trading centre. The water between the two parts of the city would become a better protected harbour.



Copenhagen with Christianshavn 1624 *Unknown*

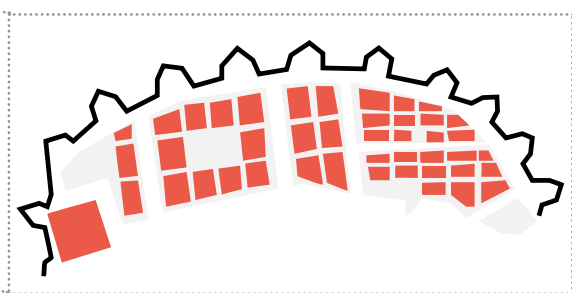


'Figure ground' Copenhagen 1624 *Own work*

Initially on a small island, Christianshavn is created as can be seen in the map above. The plans for the new area are ambitious and drawn up with a chequer board, or grid pattern, in mind. This is the first time grids become visible in the urban fabric of the city. The emphasis on this new area is put on sightlines and fortifications, as well as canals following Dutch examples from Amsterdam. Access to the water in this new area is important for its intended function⁵. The following map shows the intended plans for Christianshavn.



Copenhagen 1674 *Unknown*



Christianshavn grid plans *Unknown*

4: www.chararkiv.dk Om Christianshavns 400 års jubilæum i 2018 (2023)

5: Jan Møller: Borger i Christian 4.'s København, Sesam, Viborg 1988, ISBN 87-7324-641-7

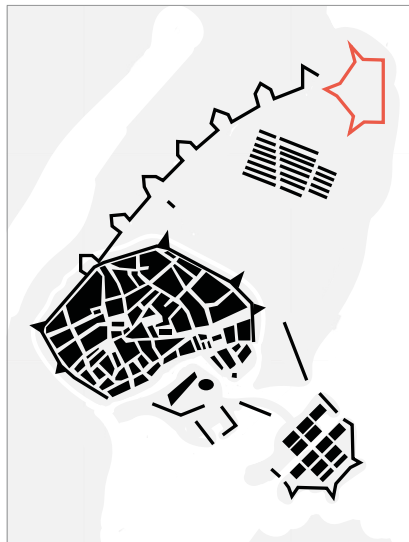
The maps shows a large amount of land being added across the water with a grid pattern. However, in reality, it would take far longer for the development to take place, with only a small portion of Christianshavn being completed in its intended fashion. Here, the grid system is still very much visible, yet only one main canal has been realised.

4.5 Northern expansion 1626-1647

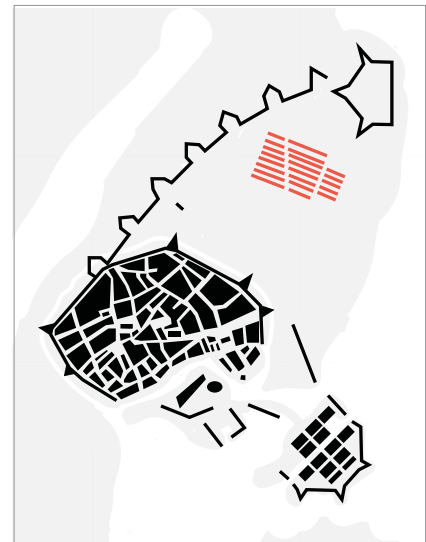
In the same map from 1674, the city has grown in northern direction too. Two notable features are the large fortress and gridded streets between the this and the medieval city. King Christian IV is responsible for these extensions as well. In 1628 he orders the construction of Kastellet, the fortress to the north (called st. Annæ Skanse at the time)⁶. The outer city fortifications were continued up from the medieval city to this new fortress and modernised. The area it created in between would be filled up with a grid system in 1647, and would be called New Copenhagen. Nyboder is among the more notable elements in this. This high density neighbourhood was intended to house sailors, which were important for the city and kingdom. Rosenborg Castle was also built, offering a new royal residence in the city. More iconic buildings were commissioned by Christian IV, such as Børsen (stock exchange) and Rundetårn (Round tower)⁷. The new grids are visible in the images below.



Copenhagen 1685 *Unknown*



Kastellet *Own work*



Nyboder *Own work*

After the Swedish siege of 1658-1660, the population had grown because of the extensions. By this time, it is estimated to be around 25.000 inhabitants, of which many are military and government officials⁸.

6: www.forsvaret.dk, Om Kastellet's historie (2023)

7: www.garderforeningerne.dk, Om udvidelsen af København (2023)

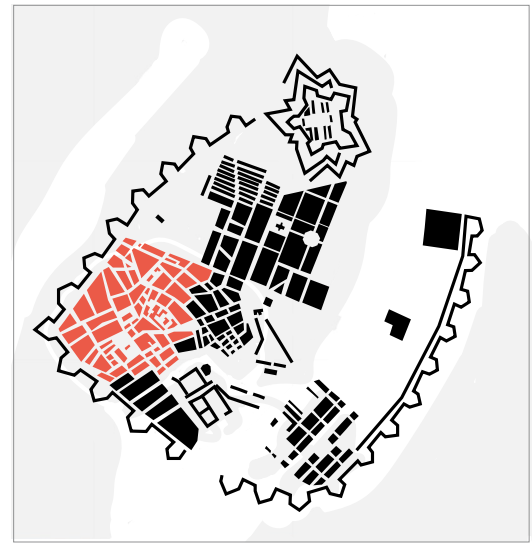
8: www.indenforvoldene.dk Om indbyggere i København (2023)

4.6 Fire of 1728

An important event that changed urban layout in the city was the fire of 1728. A large part of the medieval city centre was reduced to ashes as a result of this four day lasting fire⁹. The map from 1728 below shows the affected area in yellow (as well as the notably small successfully created part of Christianshavn at this time).

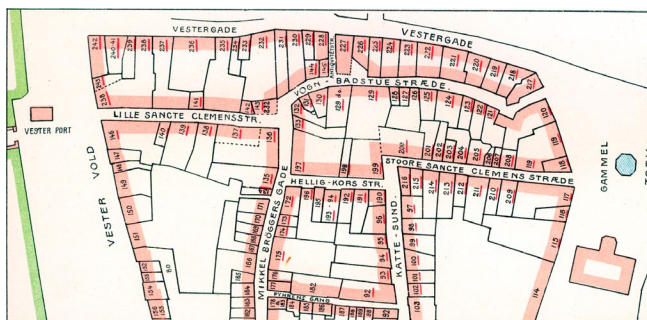


Copenhagen fire 1728 Unknown

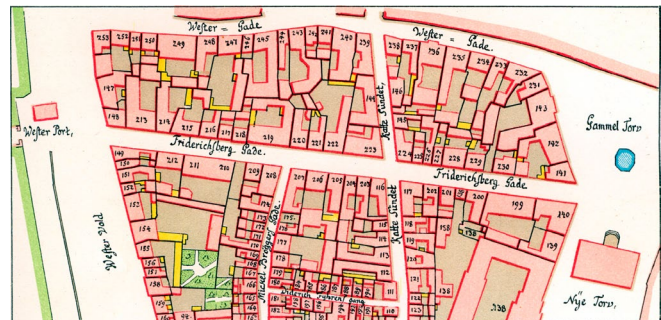


Affected area Own work

In response, the authorities intended to redesign the medieval area, and make it more fire resistant. A regulations commission was created, and hastily suggested to construct main streets of 12 to 15 metres wide, and side streets with a width of 10m. The population disagreed with King Christian the VI's intentions, as the plans violated the right of property. In many cases, streets did not end up becoming wider as a result¹⁰. After many years of struggle over costly fireproof building materials, reconstruction got underway in 1731. The homes would be rebuilt using as much brick as possible, but allowed cheaper materials to be used as well. The images below show the before- and after situation as a result of these events. Two major straight lines were added to the urban fabric, reflecting a basic grid system. The east-west running street would later become the famous *strøget* street. Another major fire in the area in 1795 did not result in physical alterations.



Before fire Unknown



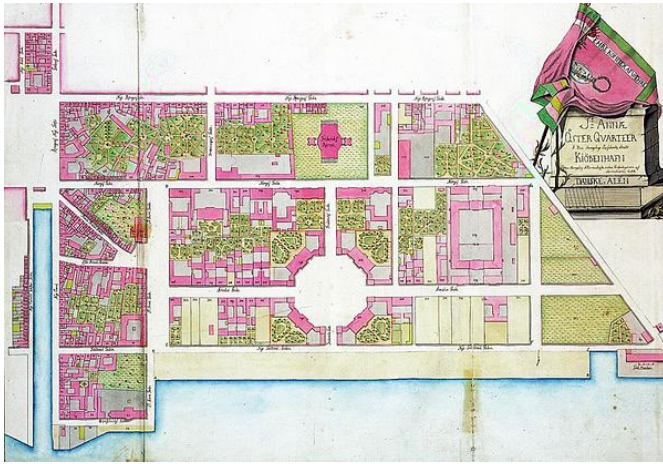
After fire Unknown

9: Byen brænder. Den store brand i København 1728 af Kåre Lauring, Gyldendals Boghandel 2003. ISBN 87-02-01895-0

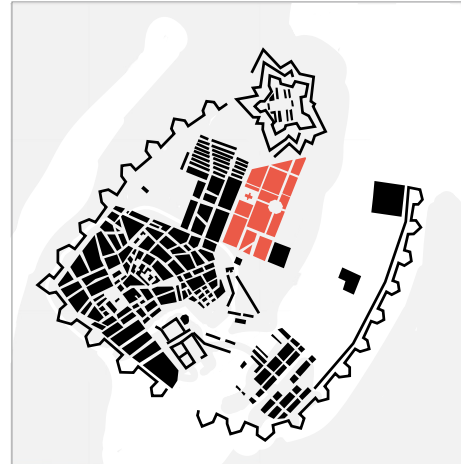
10: Københavns Historie. Bind 3 – Storhandelens by. 1728-1830 af Sv. Cedergreen Bech mfl. Gyldendalske Boghandel 1981. ISBN 87-01-52571-9

4.7 Fredriksstaden 1748

Another king decades later, King Christian VI, no longer wanted to live in the old castle on Slotsholmen and commissioned the creation of Christiansborg castle on the same location in 1731¹¹. It marked the beginning of some new alterations to the city fabric. A new neighbourhood, containing royal palaces would be created in the northern extensions of the city. Fredriksstaden would have numerous gridded streets and sightlines, following European (renaissance) ideals¹². However, this was partly the result of the 1728 fire, with the plan being reviewed. Risky businesses such as bakeries and breweries would not be allowed in the new neighbourhood. The city grows to a population of 80.000 in 1769, and 100.000 around 1800.



Fredriksstaden (Sankt Annæ Øster Kvarter) 1757 Christian Gedde



'Figure Ground' Fredriksstaden Own work

4.8 Conclusions

To conclude this chapter and answering the question 'Why does historic Copenhagen have characteristic grids in urban layout?' several things can be said.

The first is in relation to Christian IV, who's influence marked many of the gridded interventions in the city. It can be concluded this was done because of several reasons. The first being a way to show the influence of the monarchy over the city. An orderly organised city by means of grids shows order from the royal powers. Another reason is the need for effective protection against invading armies. Straight lines in urban fabric helped move goods and people efficiently during such times. Furthermore it can be stated that the grids allowed for an organised planned expansion of the city, making the overall growth of the city possible, something that the relatively flat terrain of the area offered. These reasons can all be connected to some ideals of the Renaissance, but also work in their own right. Another reason why grids were chosen was simply because they were fashionable at the time.

Finally, the notable interventions as result of the urban fire in 1728 are another reason why gridded streets were implemented. Attempts to prevent such disaster again could be a motivator, but proved difficult to be achieved successfully in previously established urban landscapes.

11: www.hovedstadshistorie.dk/slotsholmen/christiansborg-slot, Om bygningen af Christiansborg slot (2023)

12: John Erichsen, Frederiksstaden : grundlæggelsen af en københavnsk bydel 1749-1760, Historisk Institut ved Københavns Universitet. Lokalhistorisk Afdeling, 1972.

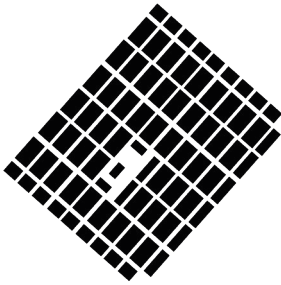
Comparisons 5

5.1 Introduction

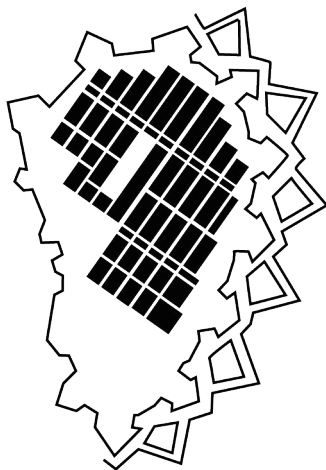
This chapter covers the main comparisons between the reasonings behind implementation of grid patterned streets in the Scandinavian capitals. Following the information gathered in the previous chapters, several main categories have become apparent. The cities will be compared in regards to each of these to establish an answer to the main research question of this thesis. For some motivations of implementation other examples of various cities in the region that illustrate a better executed example will be included.

5.2 Grids and renaissance

This thesis established that the emergence of grids happens after the middle ages in Scandinavia, which coincides with the Renaissance. This era of new ideals and influences from the continent appears to be a primary motivator for the emergence of grids in Scandinavian capital cities. The grids form an integral part of the popular urban style at the time. However, multiple other reasonings can be attached to this main driver.



Kristianssand 1801 *Own work*



Gothenburg 1705 *Own work*

The royal influence, as well as military efficiency both share a direct connection to the renaissance's ideals. The royal powers at the time used this new style as a way to display their influence on the physical urban fabric of the land they ruled. It shows they were aware of international trends, and thus used this to impress other (rival) nations with their knowledge and culture. In all three cases, the royal powers had influence over the emergence of grids. In Stockholm, grids were chosen by King Gustav to show the royal influence over the city, and reflect authority. Similarly, Christian IV, king of Denmark-Norway, personally initiated urban projects consisting of gridded plans. This is true in case of Oslo/Kristiania as well as Copenhagen with Christianshavn and Nyboder. Several decades later, Christian VI would also play a role in the emergence of Fredriksstaden. In the cases of the capitals examined in this thesis, none truly managed to convey complete urban order through this reasoning because of previous urban patterns or geographical challenges. Perhaps one of the clearest examples of urban order through grids and royal influence is the Norwegian city of Kristianssand (again named after the Danish-Norwegian ruler Christian IV) which follows a near perfect and extensive grid pattern as can be seen in the figure ground on the side. It is important to mention, many cities have continued to grow following the grid pattern in the centuries after the 17th and 18th century.

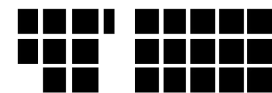
Furthermore, in the cases of Oslo and Copenhagen, the grids are tied to fortifications. This is partly because of the renaissance ideal, but also because of the very real threat of invasions of (swedish) armies. The gridded city behind the fortifications offered a logic layout, which would allow the swift the movement of supplies and people in the event of war. Numerous star-shaped fortress town followed the ideals of the renaissance in Europe at the time, and mirror those found in these cities. Again, another, perhaps better, example of such a city is the western Swedish city of Gothenburg, which shows clear defensive works along its edge, and an organised grid within these fortifications, illustrated on the left.

5.3 Grids and fire

Apart from these connections to the renaissance, fire appears to be directly linked to the implementation of grids in Scandinavian cities. Stockholm first introduced grids after a fire destroyed a large part of Stadsholmen island. Oslo was relocated entirely in response to the fire that destroyed the old city. Through this relocation, a gridded street pattern could be introduced. In the case of Copenhagen, the 1728 fire caused slight alterations in urban fabric with two wide straight streets. This last case also shows that grids were only really implemented in relation to fire when the fire was sizeable in scale or resulted in relocation, in combination with other factors. In a sense, fires created the conditions for grids to be implemented. Without them, the implementation of grids could have developed differently in the region.

5.4 Grids and efficiency

Furthermore, in all three cases, the implementation of grids was paired with a rapid increase of population, or the need to quickly construct new neighbourhoods. Grids posed a great way to plan a new area relatively quickly because of repetition, resulting in an efficient process to house a growing population. In the cases of the capitals this is true, but it is especially true for smaller newly founded towns throughout the kingdoms of Scandinavia. One of these examples is the Finnish town of Uusikaupunki (Nystad), which is shown on the right. Back in the 17th century, this area was part of Sweden and was yet to be developed.



Uusikaupunki (Nystad) 1750
Own work

5.4 Grids and geography

Finally, the geography also affected the (successful) implementation of grids in Scandinavian cities. In Stockholm, a relatively hilly terrain caused the grids to follow certain lines and caused some irregularities in the actual built result. One could state the implementation of grids was not suitable in this location. Better examples exist in a Swedish context: Gothenburg, but also Karlstad were much flatter and could more easily offer a gridded street pattern. In Oslo, the flat area around Akershus was great for the implementation of a grid, but as the city expanded northwards, the terrain became hillier, hindering successful implementation of grids here. Finally, Copenhagen was very flat and allowed several small scale grid systems to appear. In this city, a large part was created on reclaimed land: Christianshavn. The building of grids on reclaimed land also happened in Oslo and Stockholm, since this new land was flat and open.

Conclusion 6

This thesis aimed to better understand and compile reasoning behind the implementation of grids in Scandinavian cities, through the cases of Stockholm, Oslo and Copenhagen. This short final chapter covers the answer to the main research question: 'Why do historic Scandinavian cities have characteristic grids in urban layout?' First answering the sub-questions offers a general foundation.

6.1 Sub-questions

In line with the first research question '*What is the situation in Scandinavia in the 17th and early 18th century?*' it can be said that the Renaissance had just started which brought new influences and ideals. Furthermore, rivalry in the region between nations was a motivator to engage in new activities. Commonly, the region had continuously constructed unplanned cities, primarily from wood which regularly sparked fires. The second research question '*Why does historic Stockholm have characteristic grids in urban layout?*' can be motivated with the rebuilding after fire, using the ideals of the Renaissance and as a means to show the king's authority. The third research question '*Why does historic Oslo have characteristic grids in urban layout?*' has a different motivation. The whole city was relocated after fire, and introduced grids based on Renaissance ideals of order and (military) efficiency, and to prevent other fires from spreading. It was also means of King Christian IV to show his influence over the region. Finally, '*Why does historic Copenhagen have characteristic grids in urban layout?*' is reasoned by the display of royal influence, and relative ease because of flat terrain. Furthermore, this offered an efficient way to quickly construct new parts of a quickly growing city.

6.2 Conclusion

The final conclusion to this thesis can be based on the final chapter. This comparison brought to light that many parallels exist between the cases, especially in relevance to the ideals of the Renaissance. In some ways, it was almost a standard decision to implement grids and follow these ideals of urban order. However, it is generally clear royal influence and (military) efficiency were large motivators as well. This was especially true after fires struck older parts of the urban fabric, and called for reconstruction of large areas. Often, grids were then used to regulate the probability of fire spreading throughout the city. Interestingly, geography often threw a spanner in the works, and caused the successful implementation of grids to not go as planned.

6.3 Closing words

Through this method of dissecting the urban history of the three Scandinavian capitals, it has become clearer what moved people in the 17th and 18th centuries to build their cities in gridded street patterns. A possible weakness in this research is the reliability of old maps, and the subsequent unclarities behind its makers and the following accuracy of the final product. Despite this, the maps have been recovered through official archives of Scandinavian countries. Therefore, a fair conclusion can still be reached. The use of maps has proven to be a very helpful tool to illustrate this phenomenon, and figure grounds make the information universally comparable.

Based on this thesis, grids have played a fundamental part in the urban history of Scandinavia, and carry the identity of a foregone time. Some cities used the system more than others, and for varying reasons. In general, the conclusion of this thesis illustrates a succesful attainment of its main aim of gathering, compiling and comparing information and offering an overview behind these motivations of the implementation of grids in Scandinavian cities.