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**The design of tourist maps.  
Creating spaces for travellers.**

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## List of abbreviations

- c.f. - compare (latin: conferatur)
- e.g. - for example (latin: exempli gratia)
- fig. - figure
- i.e. - that is (latin: id est)
- p. - page

## **Summary**

The present thesis deals with tourist maps. Although tourist maps are used by many people, there is a lack of research in this topic. There are no greater studies about existing tourist maps and there is also not much literature which claims how to design such maps. Present studies about tourist maps are always done from cartography's point of view. Studies dealing with tourist maps from tourism's point of view are missing.

Therefore, one main aim of this thesis is to evaluate the quality of existing tourist maps. For this evaluation, technical literature about cartography and also tourism will be analysed. With the help of technical literature, design norms for tourist maps can be determined.

After that, the design norms from literature are compared to existing tourist maps. Thus, it can be seen which cartographic rules are used in practice and which not. It will also be make clear which rules are maybe obsolete and which ones need to be followed in any case to make maps understandable.

The thesis also shows how tourist maps can support spatial planning or how they can be of use in cities and areas which are affected in a negative way by mass tourism.

The final aim of this thesis is to give design recommendations for tourist maps. These recommendations can be used for further production of tourist maps.

## 1. Introduction

Despite the fact that mapping applications for mobile devices and interactive web maps are enjoying increasing popularity, printed maps are still in use. Especially tourism is a field where non-digital maps are widespread. Nearly every city offers the tourists special city maps showing all attractions. Hikers prefer to have a printed map with them since not all areas where they walk might be covered with mobile network.

Besides the competition from the online maps, the printed maps face another problem: maps are often compiled and produced by laymen nowadays. The percentage of maps created by experts is decreasing. Map templates which can be found on the internet simplify mapping for everyone. Graphics software and other computer programs have speeded up all cartographic processes. But: one should not forget that the demands on maps are also constantly increasing. Particularly in the present time maps have to be constantly updated, they must be produced fast and, of course, cost-effectively. (DGfK 2019:94)

The facts that a decreasing number of maps are produced by professionals and that the maps have to be up-dated faster and faster may lead us to the assumption that the cartographic quality of the maps is declining.

But, what might be surprising is, the fading cartographic quality of especially tourist maps is no new phenomena! City maps have already been criticised in last centuries' sixties and seventies. They were called "disposable maps" (Pape 1979:228) and it was questioned whether they are a map at all or more a kind of graphic or replacement medium (Falk 1969:27).

At the same time, it was also stated that this field of cartography shows a lack of research (Hake 1977:130).

Today, little has changed and the lack of research still exists. Tourist maps do not get much attention in cartographic research although they are still used by many people and also the changing situation in cartography offers chances for research. Previous studies about the quality of tourist maps are older and not in great detail. And, what is more, these studies only concentrate on the cartographic point of view on tourist maps. Expertise knowledge about tourism is not taken into account.

To sum it up, we see a lot of open questions and research possibilities in the topic "tourist maps". This paper will try to fill up some research gaps.

One main aim of this thesis is to analyse and evaluate the quality of tourist maps that are distributed nowadays. As we have seen, cartography has to face, on the one hand, the challenge of more and more non-professionals taking part in mapping, but, on the other hand, especially tourist maps were already criticised before because of their lack of quality. Since we do not have any detailed studies about the quality of tourist maps today, here is some space for research.

But before we can start evaluation maps, we first need to know what a good tourist map looks like in theory. That leads us to the first leading question of this paper:

### **What are standards for tourist maps from literature's point of view?**

To answer this question, cartographic and tourism basic literature will be taken into account. As stated before, the tourism's point of view did not find much attention in previous studies about tourist maps and so it is an inevitable necessity to alleviate those deficiencies. Of course, this does not mean that we should neglect cartographic science. All cartographic basics required for map making will be explained, too.

Furthermore, we will have a look at communication theory. The idea of tourist maps of course is not to have just "any" map but a map which best fulfils all the needs of tourist and which is also easily understandable for this group of map users. So, combining theories about map design with theories about communication can tell us how to best speak to tourists by using maps.

After defining how a tourist map should look like in theory and how to make a map understandable for the chosen target group, a selection of tourist maps collected by the author will be evaluated according to these quality standards. This next step is necessary to get a picture of the present qualitative situation of mapping for tourists. Consequently, our second leading question is:

### **What is the quality of tourist maps today?**

It will be interesting to see whether the mentioned criticism that tourist maps are low-grade cartographic products is still justifiable or not. Furthermore, we will have a closer look at the question who the producers of such maps are and if we can identify differences in quality in the cases of maps made by professionals and those made by non-professionals.

The last step will be to critically compare the evaluation results and the standards for tourist maps taken from literature. How do tourist maps look like in reality and how large is the difference between theory and practice? How do the map makers try to communicate their information to the tourist? Are the analysed maps still understandable and usable despite maybe some defective qualities?

The last and most important questions in this context will be whether we need to rethink our standards. We may come to the conclusion that the evaluated maps are usable for the tourists even despite some deficits and that the mappers have maybe found a way to communicate with the tourists that does not match with the standards for making tourist maps we know from literature. Consequently, this would mean for us that we need to formulate some new rules for mapping for tourists and that we need to think about a new picture of the "perfect" map. Surely, on the other hand, the evaluation might also show that it is absolutely necessary to follow all cartographic rules to make maps understandable and that maps not adhering to those standards are useless.

So, our third and final leading question is:

**How does the perfect tourist map really look like?**

Here, we will combine the answers from the other research questions and therefore come to a conclusion about – maybe new – standards for tourist maps.

This research question is the most important one of all the questions presented here and answering it will be the final result of this doctoral thesis.

## 2. Historical background

To begin with, this paper will look at the history of tourism and the history of cartography. This history will show how tourism and cartography developed during the centuries and where the roots of both disciplines are. It might even already show some similarities between both disciplines. Understanding the history of tourism and cartography and the similarities will help getting a deeper understanding of both disciplines and might even already give some hints towards the question of what is important to design (high quality) tourist maps and what the requirements and needs of tourists during their holidays are and what their requirements for maps might be.

Tourism and cartography will first be considered individually and after that the similarities will be pointed out and analysed.

### 2.1. The history of tourism – From travellers in ancient Egypt to package tours and mass tourism

Travelling and being mobile were always important for human beings. Even in the New Stone Age people already were mobile although their reasons for travelling were different from today: travellers were mostly merchants transporting goods (Ludwig 1990:28). The first nation known as travelling for fun, pleasure and recreation are the ancient Egyptians (Ludwig 1990:29). It is commonly believed that travelling during this period was not only a privilege of the upper class but a popular and wide-spread phenomenon (Ludwig 1990:29-30). Popular destinations were mainly older pyramids and other cultural places of interest (Ludwig 1990:30). Ancient Greece was a nation of travellers as well. Here, other forms of travelling came into existence: sports tourists and the explorers (Ludwig 1990:30). The first Olympic Games took place in 770 B.C. and made people travel to participate in the games or just to watch them (Bieger 2004:47) because due to the lack of mass media, the only option for people interested in following the Olympic Games was being in the stadium (Ludwig 1990:30). Since the Greeks were always known as a maritime nation, it is no surprise that they conducted exploring expeditions to the countries bordering the Mediterranean Sea. But the Greeks also travelled for pleasure and recovery, comparable to the ancient Egyptians (Ludwig 1990:30).

Holidays at the seaside were favoured in the Roman Empire (Ludwig 1990:30). During the hot summer months the Roman upper class travelled to the seaside or to the mountains where it was cooler. In winter, visiting Egypt's antique cultural sights was seen as ultra-fashionable (Scherer 1995:9). Seaside resorts even at that time offered more than only the beach and the ocean: they had a good variety of restaurants, stylish hotels, souvenir shops, tour guides and casinos (Scherer 1995:9, Ludwig 1990:30-31). Group tours were organised, information was given by special tourist associations (Ludwig 1990:31). The road system and also the system of accommodations was fully developed at this time and made travelling easy (Scherer 1995:10).

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A road system comparable to that of the Roman Empire was not reached again until the 18<sup>th</sup> century. The Roman road system was of course not developed just for tourists. The main object for building such a road system was to facilitate the transport of troops and goods. Tourists were only beneficiaries (Ludwig 1990:31). The decline of the Roman Empire was also the end of tourism for many years (Ludwig 1990:31).

During the Middle Ages, the number of travellers was not very great because the roads were ruinous and travelling was dangerous (Bieger 2004:47). This was mainly the time of crusades, pilgrimages and travelling troops (Ludwig 1990:31, Scherer 1995:10). Exploring expeditions from Europe started in the 15<sup>th</sup> century (Ludwig 1990:32). Even the advent of the stagecoach in the 17<sup>th</sup> century did not lead to an emergence of tourism (Ludwig 1990:32). Until this time, travelling was in the first place purposeful and not for fun or recreation (Scherer 1995:10).

Travelling was revalued in the 18<sup>th</sup> century. Until this point, nature in general was judged dangerous (Scherer 1995:10). But authors, poets and philosophers like Rousseau, Goethe or Eichendorff ensured that nature was seen from a different angle now (Ludwig 1990:33, Scherer 1995:10). So Rousseau, in one of his novels, describes a walking-tour through the Alps and their undisturbed nature (Ludwig 1990:33). Rousseau's influence led to the beginning of Alpinism. In 1786, Mont Blanc was first climbed (Ludwig 1990:34). With industrial progress, travelling developed as a timeout and compensation for normal life. But – comparable to Roman times – travelling was only available for the nobility and the wealthy. The young male nobility started educational trips through Europe, called "Grand Tour" (Bleistein 1972:75). Destinations were antique places of interest in Italy and Greece but also new centres of attention such as London, Paris, Vienna, Prague or Munich (Ludwig 1990:33-34). Also, holidays at the seaside became popular at this time. Some members of the English Royal House travelled to the seaside to have a bath there in 1751 (Scherer 1995:11). The first seaside resort in Germany was Bad Doberan-Heiligendamm on the Baltic Sea in 1793 (Scherer 1995:11). The word "tourist" first came up in England around 1800 (Ludwig 1990:34). The 19<sup>th</sup> century, during which the steamships and the railway were developed, was a milestone in the history of tourism. These new means of mass transport made travelling easier and cheaper. People travelled to the seaside, to other cities or into the mountains (Steinecke 2011:144-145). The first railway line opened in England in 1825 (Scherer 1995:11) and in 1841 Thomas Cook organized the first package tour (Fraune 2016). During this package tour, several hundred people travelled to a non-drinker meeting. The tour included something to eat and to drink (of course non-alcoholic) (Fraune 2016). Thomas Cook finally founded the first travel agency in 1845. The first German travel agency opened 1863 in Breslau / Wroclaw. Its founder, Louis Stangen, at first offered tours to Breslau's surroundings, but he quickly went to destinations farther away and he even offered world tours since his main target group were especially financially strong people (Bleistein 1972:75, Ludwig 1990:35). Alpinism was still popular at that time and growing. The Alpine Associations were founded (cf. chapter 3.4.) and the number of Alpine huts for hikers was constantly rising (Ludwig 1990:34). Guidebooks that presented



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special attractions were also released in the 19<sup>th</sup> century. The first Baedeker was sold in 1827 (Bleistein 1972:75) and guided through the Rhineland (Ludwig 1990:35).

We see that the 19<sup>th</sup> century was the time where tourism as we know it today started: organised group tours and packaged tours, travel agencies, guidebooks, travelling to different kinds of landscapes like the seaside or the mountains and even world tours developed during this time. But it was still not possible for all people to participate in this development: the normal labourer did not have the money or the time to travel around since annual leave was a rare privilege in the 19<sup>th</sup> century (Ludwig 1990:36, Scherer 1995:12). Their only enjoyment were occasional day trips (Ludwig 1990:36). In Germany, this changed with the Strength through Joy – Organization [German: Kraft durch Freunde, short: Kdf] in the 1930s. They sold different packaged tours for affordable prices while the National Socialist regime granted annual vacations for the workers (Ludwig 1990:37, Scherer 1995:11). The Strength through Joy – Organization was, at that time, the biggest tour operator worldwide (Scherer 1995:11). Until the Second World War, 43 million trips were sold, but most of them still were only day trips (Ludwig 1990:37). During the Second World War, tourism came to a rest of course.

Tourists came back into the picture in the 1950s. Here, people travelled usually near their home and their main focus was on recreation. (Hammelehle 1995:11) But travels to Austria, Spain or Italy also slowly began to become popular (Scherer 1995:17). Finally, in 1963, the annual holidays were fixed in a law (Ludwig 1990:34). In this year Josef Neckermann started his business of packaged tours, too (Fraune 2016, Scherer 1995:17). He already offered package tours by plane. One destination was Majorca, for example (Fraune 2016). He focused mainly on mass tourism to keep the prices as low as possible (Ludwig 1990:38). As a consequence, Neckermann became a synonym for mass tourism (Scherer 1995:16) and in 1968 more Germans spent their holidays abroad than in Germany (Scherer 1995:17). But the demand for travelling was great and so the main focus of the tour operators was for many years just to satisfy this demand and not to create or develop any special travel offers (Scherer 1995:16).

This has changed today. Many people who can afford it are now trying to avoid the centres of mass tourism and are looking for more exclusive offers (Ludwig 1990:38). The consequence is a kind of dual-class society: the wealthier people looking for exclusive places and the not so wealthy people going to the places of mass tourism (Ludwig 1990:39). Although travelling is affordable for many more people today than in the past centuries, it does not mean that everyone can take part in the same way in tourism and travelling. The tourism industry is still growing and tourists are discovering more and more parts of the world. Even barren regions like Antarctica or the deserts are destinations now although travels to such areas are still expensive and so these holidays are not available to everyone (Steinecke 2006:211) and would be a good example for the previous statement that not everyone can participate in the same way in tourism. Beside the discovery of new destinations, the wish to be flexible during travel and to have exciting experiences is a trend nowadays in the tourism industry (Steinecke 2006:11). However, packaged tours are still popular and the countries visited by package

tourists are still the same: the countries around the Mediterranean Sea are favoured in this case (Fraune 2016).

## 2.2. The History of Mapping – A history of real places and mythological figures

One can expect that the oldest maps that were produced do not exist anymore today (Salitschew 1967:162, Hake 1994:523, Arnberger 1975:1). Their material was commonly not very durable (Arnberger 1975:1), they became the victim of fire or dampness (Salitschew 1967:162) or they simply got lost (Arnberger 1975:1). Some authors see the petroglyphs of the Stone Age men as very early cartographic products (Hake 1994:523, Pantenburg 1970:9). The Stone Age men showed especially striking geographic conditions to facilitate orientation (Pantenburg 1970:9).

The oldest map that was found until today and is commonly agreed to be a map is a clay tablet (Hake 1994:522, Arnberger 1975:2). It shows the northern parts of Mesopotamia, including the river Euphrates (Wilhelmy 1981:9). Another very old cartographic representation shows the fortification of the former city Lagaš which was also part of Mesopotamia. The map is dated 2400 B.C. (Arnberger 1975:2). The oldest city map (1500 B.C.) was also found here (Arnberger 1975:2). It shows the city Nippur which is in the contemporary Iraq and it is a clay tablet, just like the other Mesopotamian map showing the northern parts. It is commonly believed that this map also served as coordination for planning (Kohlstock 2014:14).

The ancient Egyptians also produced maps. A famous example is a map showing a goldmine in 1300 B.C.. In contrast to the Mesopotamian clay tablet maps this goldmine map is drawn on papyrus (Arnberger 1975:2, Hake 1994:523).

During this early days of mapping, the mappers did not have any knowledge about the sphericity of the earth and cartographic representations were carried out without a mathematical basis (Wilhelmy 1981:9). This changed in ancient Greece where mapping got a more and more scientific basis (Salitschew 1967:163, Arnberger 1975:4). The Greek already realized that the earth is a sphere and they developed a network of parallels and meridians and different map projections (Salitschew 1967:163, Hake 1994:524). The most popular Greek of that time is Ptolemy who wrote the famous "Geographia" (Hake 1994:524). "Geographia" was first published in 150 A.D. (Brotton 2015:10) and the book consisted of eight volumes (Pantenburg 1970:36). It was an instruction for making maps (Hake 1994:524) and also included many maps (Pantenburg 1970:36) and a list of 8000 places and their coordinates (Brotton 2015:10). Part of the book was also a world map. The "world" in this case goes from the Canary Islands in the West to Korea in the East. The north is bordered with Thule while the world ends in the South in the African Sahara desert. America was not known at that time and so it is not part of the World Map (Brotton 2015:24). This time is seen as a first time of prosperity of mapping (Wilhelmy 1981:9). But the downfall of ancient Greece blocked enhancements in mapping (Arnberger 1975:6). The Romans mainly used the cartographic knowledge of the

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Greek but they did not make any improvements or progress (Hake 1994:525, Arnberger 1975:6).

In ancient Rome maps were produced mainly for military or administrative purposes (Salitschew 1967:164). That means that they mostly showed land tenure or the road system (Hake 1994:525). One famous example of the Roman cartography of the road system is the Tabula Peutingeriana. The map was drawn on parchment and covers the whole Roman empire around the year 300 A.D.. It shows more than 100.000 km of the Roman road system and the distances between cities and other places are also given. Furthermore, it has rivers, temples, places for rest and forests in it. It is believed that this map was used mainly for the planning of travels and campaigns (Brotton 2015:28). Another special fact of the Tabula Peutingeriana is that it was made for the use on the road (Salitschew 1967:164). The map was separated in individual sheets showing different areas (Pantenburg 1970:32). One has to acknowledge that the distances that were given in the map are all very correct and the mapmakers did a good job (Pantenburg 1970:32). Another interesting part of Roman mapping is a city map of Rome with the scale 1:250 which was produced around 210 A.D. (Arnberger 1975:6). As one can expect such a map was really big: it was 13m high and 23m wide (Arnberger 1975:6).

The downfall of the Roman Empire led to a downfall of arts and science which also included mapping (Arnberger 1975:6). Mapping was under the influence of the church and maps were produced in monasteries (Hake 1994:525, Salitschew 1967:168). The aim of the maps was not anymore to give an exact picture of the world as it is, but to give a religious world picture (Wilhelmy 1981:10). This resulted in maps that were more pure fantasy than anything else and that did not have much practical use (Witt 1982:8). Especially regions about which no information existed were often drawn just out of fantasy. But one has to admit that such maps were often really artistic works (Pantenburg 1970:48). One of the most famous of such world maps is the "EbstoferWeltkarte" [Ebstofer World Map] which was drawn around 1235. In the middle of the map is Jerusalem. It shows cities, rivers, mountains and seas that really exist(ed) but also the paradise and biblical and mythological figures (Hake 1994:525).

The requirements of seafaring men led to a need of more accurate maps, especially marine charts (Wilhelmy 1981:11). This was the time of the so-called portolan maps. The portolan maps first came up in Italy around 1300 (Hake 1994:525). Portolan maps do not have a projection or meridians and parallels (Arnberger 1975:8). The main purpose of such maps was to enable safe seafaring. The maps were mostly undecorated and showed mainly the coastline (Brotton 2015:11). Since the 14<sup>th</sup> century, all portolan maps had the same appearance (Arnberger 1975:9). In the Mediterranean Area this type of map existed until the middle of the 16<sup>th</sup> century (Arnberger 1975:8).

In the 15<sup>th</sup> century, Ptolemy's "Geographia" was rediscovered (Arnberger 1975:9) and cartography became separated from religious conceptions. Furthermore printing was invented (Hake 1994:526). Printing made it possible to produce maps faster and more cost-efficient (Hake 1994:526). They did not have to be drawn manually anymore. And this time was the age

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of discoveries which had two effects on cartography: on the one hand the world view was enriched and enlarged and on the other hand the seafaring man of course needed a lot of different maps of a good quality (Brotton 2015:12, Wilhelmy 1981:11, Arnberger 1975:10). All in all, this led to a cartographic boom (Hake 1994:526). Maps received appreciation and were more and more widespread (Salistschew 1967:167).

Many world maps were produced now. A famous one is the world map by Fra Mauro from the year 1460. It was one of the most detailed world maps in the 15<sup>th</sup> century and corrected many of Ptolemy's mistakes. It is a south-up map (Arnberger 1975:11) and Jerusalem is not anymore in the centre of the map as it was in former times (as in Ebstorfer Weltkarte) (Brotton 2015:73). In 1492, Martin Behaim from Nuremberg produced the first globe (Iwanczak 2009:120). Behaim himself called his globe "apple" (Iwanczak 2009:121). Still, not everything had been discovered the earth and not everything was known about earth. Places that Behaim did not have any knowledge of were not shown in white but filled with paintings of mythical creatures and sovereigns or even with complete fairy tales (Pantenburg 1970:64).

Another big step in mapping was the development of the so-called "Mercator-Projection". At that time it was commonly accepted that the earth is a sphere. But that led to new problems in cartography: it raised the question how it might be possible to represent a spherical earth on a flat piece of paper (Pantenburg 1970:73). Gerard Mercator developed a projection that was mainly used for seafaring. The distinctive feature of his projection is an equal angle - that means that the angle between two lines on the globe is the same angle as the one between two lines on the flat map. The map was first published in 1569 and subsequently became a standard for travels with longer distances (Brotton 2015:110).

But not only world maps were drawn and developed. There was also a demand for maps with larger scales (Wilhelmy 1981:13). Around 1600 the plane table was invented (Hake 1994:529) and surveying technology made improvements (Wilhelmy 1981:13), which was important for making large scale maps.

Around 1700, the period of exact higher geodesy started (Wilhelmy 1981:15). First surveys were conducted (Wilhelmy 1981:15). France was the first nation that surveyed the whole country with all new methods (Brotton 2015:14). The methods were, for example, barometric hypsometry, trigonometrical survey or the introduction of the Greenwich meridian. For cartographic representation, contour lines and slope hachures were now used while hypsometric layers were now painted in colour (Wilhelmy 1981:15). Maps were exact and detailed like never before. Multi-coloured printing still was not possible. The colour had to be added manually after printing. This ended only in the 19<sup>th</sup> century when multicolour printing became possible (Hake 1994:539).

During this time most types of thematic maps came up. Indeed thematic maps have always been produced during the whole history of mapping but the diversity of topics was not always as big as it became now. The themes of former times were mostly land use or transportation (as in the case of the already mentioned Tabula Peutingeriana) (Hake 1994:533). Geological

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and other nature scientific maps came up now (Hake 1994:534) and the introduction of population census and other new statistical methods made a variety of socio-ecological and socio-economical maps possible (Brotton 2015:15). The production of geological maps is interesting insofar as now the earth was not only examined at its surface but now also the question what was under the surface became interesting and was explored (Brotton 2015:185).

The next big step for cartography was the introduction of aerial photography (Salistschew 1967:178, Kohlstock 2014:15). Until today, aerial photography has remained one of the most important techniques for surveying (Kohlstock 2014:15).

Both World Wars gave impulses for advancements in mapping. The First World War with its static warfare made very exact topographic maps of a large scale necessary (Salistschew 1967:177). Also, the Second World War caused a great need of maps. In this case, the entry of planes and tanks in the war made maps for this special case necessary. Another fact was that there were so many people participating in the war like never before in history and so there was also a need for a very large amount of maps (Salistschew 1967:178).

Between the two World Wars especially road maps gained in importance. Maps that showed the different types of roads were needed now (Salistschew 1967:181-182). Furthermore, the production of maps for advertising reasons emerged at this time. Thus, oil companies started to produce maps and distributed them for free in petrol stations (Salistschew 1967:183).

The invention of offset-printing in the 20<sup>th</sup> century (Kohlstock 2014:16) was another important advancement in printing technology that made printing faster and cheaper and in this way of course also supported the distribution of maps.

During the 1960s, the first so-called Geographic Information Systems were invented and used (Brotton 2015:17, Tyner 2014:14). Such computer programmes could create maps from digital data (Tyner 2014:14) and made mapping easier and faster for everyone. Not only mappers but also other scientist and even ordinary people can produce maps now (Brotton 2015:17). With the help of satellites, a number of high-resolution images is available today (Tyner 2014:14). In general, one can say that never before in history has as much geographical data as today been available (Brotton 2015:17). And maps are now available for everyone – and at every time. With the help of computers and smartphones everyone who needs them has the possibility to get up-to-date maps whenever he or she wants (Brotton 2015:17). This also shows that maps are still important and still needed. Maps have always been important for humanity and people have always been eager to develop new kinds of maps and to improve mapping technologies – and this is the case even today.

### 2.3. Bringing tourism and mapping together: How the history of mapping and the history of tourism influence each other

History shows that tourism and mapping always have been connected and have always influenced each other.

The best example is definitely the history of hiking and mountaineering in the Alps: tourists started to discover the Alps and so they were in need of good maps of the mountains. There were no good maps of the Alps until that time and official cartography did not show much interest in developing and producing high quality mountain maps even in the following years. That is when the Alpine Associations came into focus: first, they were only responsible for tourism in the Alps in the way that they cared for the alpine huts and the hiking trails but now they also started to produce mountain maps that could support the tourist during his travel through the Alps. The Alpine Associations always cared for the needs of the hikers and mountain climbers and were always eager to improve new maps and invent new techniques of mountain cartography that would better support tourists during their activities. The Alpine Association still exists today and still produces maps so tourism and mapping are still connected in this Association. In this case, tourism and mapping have influenced each other in a great amount. The merging alpine tourism gave the impulses for developing and improving a type of map that did not find much attention in the past and so it influenced the history of mapping in a very positive way.

Another example is the grand tour, the educational trips of the young male nobility that started in the 16<sup>th</sup> century. The noble youth was also in need of good maps to plan their tour and to execute it but they had the same problem as the alpine tourists later: good maps did not exist at this time. Maps were not of a high quality and had many mistakes which is understandable since higher geodesy started developing first in the 17<sup>th</sup> century. Furthermore, it was difficult to buy maps at all since they were not as widespread and as easily available as today at that time. The only collection of maps that had some quality and was used often was the "Il portafoglio necessario a tutti quelli che fanno il giro d'Italia". It was first published in London in 1774 and – according to its own claim – is necessary for everyone who goes on a tour through Italy. It contains 26 maps and describes cities, rivers, sightseeing spots and much more (Dury 1774). So we can also see this book as a kind of first guidebook which very much resembles present-day guidebooks with their descriptions of interesting sightseeing spots and maps. The tourism of the grand tour did not influence the developing and improvement of mapping as much as Alpine tourism. It only showed the lack of maps at that time. But one can say that it at least led to the development of one of the first tourist guide books, the "Il portafoglio necessario a tutti quelli che fanno il giro d'Italia".

The Tabula Peutingeriana can also be seen as one of the first maps that was useful for tourists. It was not created for touristic use at first but for troop movements and commercial travellers. But since touristic travels were already popular in Roman times, one can expect that the map

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was also useful for tourists since it contained roads, places for rest or temples and gave the distances between different cities.

So history shows that maps were always important for tourists. They needed them for their journeys and they also needed maps that were of a high quality and supported them during their travels. In some cases growing tourism also led the map makers to improve their maps and develop new techniques. So, as a first result of this paper, one can see that tourism and mapping have a long common history.

### 3. Maps and tourists

#### 3.1. What is a map?

##### 3.1.1. The history of the term “map”

Before moving to the concrete explanation what a map is, we should have a look at the history of the term “map”. The German word for map is “Karte” which can be traced to the Greek word *chartes* (χάρτης) and the Latin word *charta* (Arnberger 1966:51). But it has to be said that these words had another meaning then: *charta* and *chartes* meant letter or document. The map was called *pinax* in Greek and *tabula* in Latin (Arnberger 1966:51, Paschinger 1967:9).

During the 14<sup>th</sup> and 15<sup>th</sup> century the words “*charta*” or “*carta*” became common as title for maps. The word “*carta*” or “*charte*” respectively was also used in Spain, Portugal and France (Arnberger 1966:51). All through the Middle Ages maps were usually named “*mappa mundi*”, “*orbispictus*” or “*figura*” (Arnberger 1966:51, Paschinger 1967:9). Also common was the name “*Land-Tafel*” in Germany which came from the Latin *tabula* (Arnberger 1966:51, Paschinger 1967:9). “*Land-Tafel*” was finally replaced by “*Land-Charte*” during the 17<sup>th</sup> century while in the English language the term “*map*” is in use (Arnberger 1966:51). But it is important to say that “*map*” is not used for nautical matters. In this case the term “*charts*” is common (Paschinger 1967:9).

##### 3.1.2. The map – an image of the earth’s surface

Like the term “*map*” itself, the definition of the map has also changed the time and the definition can still vary from person to person and from culture to culture (Tyner 2014:6). This thesis will follow the definition of Peter Kohlstock who says that a map is “a reduced, simplified and levelled image of the earth’s surface” (Kohlstock 2014:17). This definition is taken from his latest book about cartography which was released in 2014. Older definitions, for example Wilhelmy 1981 (Wilhelmy 1981:39) and Arnberger 1977 (Arnberger 1977:15), leave out the aspect that the image of the earth’s surface should be simplified to be called a map. Instead they point out that the image has to be commented to be a map. Although this thesis will generally follow Kohlstock’s definition, the idea of the commented image presented by Wilhelmy and Arnberger should also be kept in mind during the following discussion.

These definitions bring us to the fact that not every image of the earth’s surface is a map. Different forms of cartographic representations exist and the map is only one of many. Furthermore, we have many images which show the earth (or parts of it) but which are no cartographic representations at all. One example for an image of the earth’s surface which is no map would be the aerial photograph. An aerial photograph shows the earth but it is not simplified. Following Wilhelmy 1981 and Arnberger 1977, we can also say that an aerial photograph is not a map because it is not commented. Furthermore, some graphic



representations of the earth or parts of it like a profile are not a map because they are usually not levelled. A soil profile, for example, shows the different soil horizons in vertical view, starting with the topsoil and finishing with the parent material which is of course under the earth's surface.

In case of cartographic representations, we can distinguish two-dimensional and three-dimensional cartographic representations. Three-dimensional cartographic representations are globes and reliefs. Naturally, these cartographic representations are reduced and maybe also simplified and commented but they are not levelled. So they cannot be a map. Two-dimensional cartographic representations are maps and map-related representations. Map-related representations are, for example, a diagrammatic map or a sketch map. Technical literature sees a sketch map only as a pre-stage of a map where the details are worked out later (Koch 2001a). A cartogram on the other hand shows statistic data which are related to a special region on a map. Today it is being discussed whether the cartogram is really just a way of representing statistical data or if it is a special form of a map (Stams 2001a).

### 3.1.3. What is cartography?

Another important term that has to be specified is cartography.

Kohlstock gives us a very short definition of cartography which only says that it is the discipline which deals with map making (Kohlstock 2014:17). Tyner's definition is more widespread. In her explanation of cartography, she follows the International Cartographic Association which says that cartography is "the art, science and technology of making maps, together with their study as scientific documents and works of art" (Tyner 2014:3, Tyner 2014:234). This definition, on the one hand, compromises map making but also, on the other hand, the study of maps. It goes with Leser's definition where he also emphasizes the making of topographic and thematic maps and at the same time the study of maps and the research of how to communicate with maps (Leser 2005:418). According to Salitschew, cartography's areas of interest are not only maps showing the earth's surface but also maps of the moon and the starry sky (Salitschew 1967:25).

Two other facts should be kept in mind: first, the meaning of the term cartography has changed in the last decades (Kraak 1997:42), and second, some English-speaking authors distinguish between cartography and mapping (e.g. Dent 1999:4).

The changing meaning of the term cartography is described by Kraak (Kraak 1997:42). According to him, cartography was first just seen as manufacturing maps. But today, it also part of the field of communication science. (Kraak 1997:42) These observations fit to the definitions of cartography given by Tyner and Leser. They can be also seen in the context of Dent's distinction between cartography and mapping. Dent suggests to call the map making process "mapping" while cartography compromises a field which is broader than only the

production of maps. Here, also aspects of studying theoretical bases of mapping will come into focus. (Dent 1999:4)

In this paper, both terms will be used.

The reader who is interested in additional definitions of cartography will find them in Witt's "Thematische Kartographie" where he presents the definitions best known at the time (Witt 1970:19-22).

### 3.1.4. Thematic vs. topographic maps

Maps are usually divided in two groups: topographic and thematic maps. Both groups can certainly be subdivided in more concrete groups but we will concentrate now on these two main groups and their characteristics.

The main function of topographic maps is to show the earth's surface (Kohlstock 2014:123, Kraak 1997:44) and therefore provide orientation. Examples for phenomena of the earth's surface that can be part of a topographic map are: stretch of water, terrain profile, vegetation, settlements and traffic routes. Also administrative boundaries can be included (Witt 1970:25, Kohlstock 2014:123). Furthermore, the names of the mapped objects are usually registered on the map (Kraak 1997:44).

The thematic map, though, presents one or more specific topics (Kohlstock 2014:123), such as, for instance, the climate or subjects of spatial planning (Hake 1994:17). Hence, thematic maps are used in many sciences (Wilhelmy 1981:195).

But: the distinction between topographic and thematic maps is not always that easy to be drawn (Hake 1994:17, Kohlstock 2014:123). On the one hand, topographic maps can also contain information of thematic character, like administrative boundaries (Kohlstock 2014:123). On the other hand, a topographic map can function as a base map for a thematic map and be only complemented with some additional thematic information. A great example for a map which appears as a topographic one at first is the hiking map. The map offers mostly topographic information, though the topic "hiking" is put forward by giving convenient information which makes this type of map a thematic one. (Kohlstock 2014:123, Kraak 1997:44)

Finally, it should be mentioned that the number of thematic maps which exist today is uncountable and there are more thematic maps than topographic ones (Kohlstock 2014:123). In his book "Handbuch der thematischen Kartographie", Erik Arnberger describes the history of the different types of thematic maps. He distinguishes more than 30 types of thematic maps and describes their history (Arnberger 1966:81-179) but one can expect that these are not all the types of thematic maps that exist. The tourist maps which are in focus of this paper are not mentioned by Arnberger at all. Tourist maps on the other hand can also be divided in different types of tourist maps, depending on the question which audience each map has. This will be

explained further in chapter 3.3. where we will focus especially on tourist maps and the different types.

## 3.2. The tourists

### 3.2.1. The tourist – Only someone travelling for fun?

In literature, the meaning differs in the question which people are tourists and which are not. But literature agrees on one point: a tourist is someone who leaves his usual environment and returns to it after a certain time. This idea can already be found in the word "tourism" itself.

The origin of the word "tourism" lies in the Greek word "tornos" and in the Latin word "tornare". "Tornos" stands for a circle while "tornare" means "rounding" (Mundt 2001:1). If we take this origin of the word, we see that the word "tourism" has the idea of making a round in it – so "tourism" always means coming back to the place of departure (Mundt 2001:2). This definition already excludes, for example, people moving houses from tourism – because they are, of course, not planning to return to their place of departure. But the definition is still very vague and leaves many open questions: Is everyone a tourist, no matter what the reason for travelling is? Is someone travelling for business affairs a tourist as well as someone travelling only for fun? How long does one need to leave home to be called a tourist? Does tourism mean leaving home for a longer time or can someone on a day trip be already called a tourist? How far away does one have to go to be participating in tourism?

To figure out what tourism and being a tourist means, three different categories come into focus: the motive, the duration and the distance of the travel. The **motive** is the factor that is discussed most controversially. Some authors say that every traveller is a tourist – no matter what his motive might be. The justification for that idea is that the reason for travelling is irrelevant for hotels, restaurants and airlines (Mundt 2001:8) - they have clients who need their services and who pay for it. Beyond that, Freyer and Steinbach argue that the motives for travelling can be mixed (Freyer 2001:2, Freyer 2004:4, Steinbach 2003:10). The main reason for a journey might be business affairs, but this does not mean that this travel does not include any leisure activities (Freyer 2001:3, Steinbach 2003:10). Following this idea, tourism also includes visiting relatives and acquaintances, treatments at a health resort, pilgrimages and so on (Freyer 2004:4). On the other hand, the drive to one's workplace, resettlements or long-term study visits are not part of tourism (Freyer 2001:3).

The **duration** of travel is also taken into account to define who can be called a tourist and who cannot. Authors agree that the maximum duration of a tourist's travel is one year (Mundt 2001:6, Freyer 2004:4). Everyone who does not return to the place of departure within one year is no longer a tourist (Mundt 2001:6). So permanent movements are not a part of touristic research. The minimum stay of a person to classify him or her as a tourist is 24 hours (Mundt

2001:4, Freyer 2004:4). Furthermore, the trip should include at least one overnight stay (Mundt 2001:5). People who do not stay overnight are called day-trippers (Mundt 2001:5).

An indicator for travel is the leaving of one's usual domicile (Freyer 2004:3). So movement is a characteristic of tourism. But literature does not give a hint about the **distance** that has to lie between home and the traveller's destination to make him or her a tourist. This question remains still unanswered (Freyer 2004:4).

Thus, it can be summed up that a tourist is someone who travels for at least 24 hours, including an obligatory overnight stay, but not for longer than one year. The motives for travelling are vary. Since business travels might also contain leisure activities, they are also part of tourism. The distance between the traveller's home and his destination is not important for the definition of the term "tourist".

### 3.2.2. Motives for travelling

The chapter (cf. chapter 3.2.1.) which talks about the definition of the term "tourist" already announces that travelling happens for different reasons. The reasons or motives for travelling are of high relevance for the following research because they can tell us what tourists expect to find or to do during their holidays and, as a consequence, which information should be added to maps to fulfil those expectations.

Literature presents different motives for travelling and sorts those motives in different categories. This thesis will not follow any given list of travelling motives. Based on the literature about this topic, I developed my own list of reasons why people travel, including categories compiled by me<sup>1</sup>. The results can be seen in fig. 1, p.18.

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<sup>1</sup> Since this compilation of motives for travelling does not exist in this way in any of the literature used for this thesis, this chapter does not have concrete bibliographical references. However, the reader who is interested in more information about this topic or other compilations of motives for travelling, will find them in, e.g., Mundt 2001:4, Freyer 2001:59, Steinbach 2003:81, Kosma 2009:12-13, Steinecke 2011:49, Althof 1996:46 which were also used for the research for this chapter.

## Motives for travelling

### Recreational motives

- Relaxation
- Distance from every-day life
- No stress
- Being free
- Gathering energy
- Time for oneself
- Resting
- Sunbathing
- Enjoying some comfort
- Being pampered

### Social motives

- Common experiences
- Getting to know new people
- Meeting locals

### Family oriented motives

- Having time for each other
- Time for the family
- Time for the partner
- Visiting relatives

### Cultural motives

- Pilgrims
- Sightseeing
- Trying food typical for that country
- Broadening one's horizon
- Educational tourism
- City tourism

### Economical motives

- Business tourism
- Congress tourism
- Exhibition tourism

### Sportive motives

- Light physical activities
- Hiking
- Doing sports in general
- Winter sports

### Motives of wellness and healthcare

- Medical care
- Staying at a health resort
- Wellness tourism
- Beauty treatments

### Interest in natural environment

- Healthy climate
- Experiencing nature
- Enjoying beautiful landscape
- Doing something for one's health
- Going for a walk
- Sunbathing

### Experience oriented motives

- Having fun
- Getting new impressions
- Nightlife
- Shopping
- Going on a trip
- Having parties
- Sex tourism

## Holidays in man-made freetime worlds

In large parts, the reasons for travelling can be summed up in the main category of the recreational motives. Recreational motives are such as the desire for relaxation and rest, getting away from everyday life, having time for oneself and enjoying some comfort. In contrast to recreational reasons for travelling, we do also have people who travel for sportive motives, such as the ambition to go hiking or to do winter sports like skiing or snowboarding. Causes for going on holiday can also be experience-oriented, meaning the tourist is looking for some fun, getting some new experiences and entertainment. This category also covers partying, shopping and sex tourism. Furthermore, travels can be motivated by interest in the environment. Here, we can find people wishing for a healthy climate or a beautiful landscape. Going for a walk is a favoured activity during such holidays. Enjoying the sun and warmth can also be part of this motive. Going on holidays can also be based on social reasons. Some tourists want to use their days away from home to get to know new people or to meet the natives of a certain region. A sub-category of these social motives are family-oriented reasons for travelling. This means people visit family members, friends or acquaintances living further away from them or they leave their usual surroundings to enjoy some quality time with their partner or their immediate family. Tourism can also be triggered by a wide range of culturally oriented motives. Such motives can be education, sightseeing, pilgrimage, tasting regional cuisine and more. Another category the wellness- and healthcare -holidays, medical treatments, staying at health resorts, spas and beauty treatments. As already mentioned before, travels can also happen because of business affairs. Business tourism, congress tourism or trade show tourism can be summed up in the category of economy tourism.

### 3.3. Types of tourist maps and types of tourists

After discussing maps and tourists in general, we now should have a look at the maps that are in the focus of this thesis: the tourist maps.

Cartographic technical literature gives some definitions of tourist maps: Thus it is said in *Lexikon der Kartographie und Geomatik* (Dictionary of Mapping and Geomatics) that the most important function of tourist maps is to support the planning and realization of touristic activities (Wilfert 2001a). According to Hake, places of interest are one important element of such maps (Hake 1994:409). Tourist maps have been produced since the 1920s. First, tourist maps were mostly topographic maps including information that was seen as useful for tourists. Especially maps for cyclists enjoyed great popularity. Increasing car traffic led to the development of road maps. Since the second half of the 20<sup>th</sup> century, we have a wide range of different types of tourist maps: hiking maps, maps for mountain climbers, maps for cyclists, winter sport maps... (Wilfert 2001a)

But, of course, there is not only one general type of tourist maps which all tourists should use, no matter what their motive for travelling is. As we already have seen in chapter 3.2.2., different

reasons for travelling exist and since those reasons can be very varying, many different maps are needed. So, our next question, is which types of tourist maps do in fact exist.

The Lexikon der Kartographie und Geomatik (Dictionary of Cartography and Geomatics) is very helpful in this case. It gives definitions and describes different types of tourist maps. It describes city maps, maps for cyclists, maps for mountaineers, maps for touring on waterways, hiking maps and winter sports maps. It also knows roadmaps and maps for high mountains which can also be useful for different kinds of tourists. So we see that many fields which can be interesting for different touristic groups are already covered.

Another way, besides the analysis of literature, to approach the question which types of tourist maps exist, would be to find out which different types of tourist groups we have in general. The touristic literature uses different methods of grouping tourists. One idea would be to group tourists with regard to the main activity or the main objective they have during their holidays. This main activity may be doing some sightseeing or some sports.

Furthermore, it might be possible to group tourists with regard to the possible target group they belong to. Target groups can be families, singles, elderly people... - as one can imagine all those people have different expectations and needs during their holidays. People with young children will be favouring other holiday activities than teenager or elderly people. But it can be problematic to use this form of grouping for our question which different kinds of touristic maps exist since even the group "families" is not one homogeneous group and different families might be interested in different kinds of activities during their holidays. For example, one family can be looking for some special attractions which are suitable for children to visit like zoos or theme parks while other families like to go cycling or hiking. So these families would need varying maps, according to their preferred activities. One family alone might also be in need of diverse maps if they are planning to pursue different activities during their holidays. In this case, one "family map" would not be of much help since not all information for so many varying activities can be included in just one map without making it overloaded.

Another idea might be to group tourists according to the form of vacation they prefer. As we all know, there are many forms of organized holidays like cruises, bus trips etc. Club vacations as well are a special form of organized holidays because they usually offer sports programmes or entertainment through animation. Farm holidays or camping are also special forms of vacation since they are not attractive for every holidaymaker. They usually approach only a particular target group. According to Althof, more than half of farm tourists are families (Althof 1996:128). At first sight, one can draw the conclusion that someone doing a cruise or a club vacation does not need maps at all since everything is well-organized, carefully planned and offer tourists many free time activities already so they do not need to leave the club hotel etc. if they do not want to. But it still might be possible that the tourist leaves the club hotel, the farm, the cruise ship etc. to visit another city, explore nature and so on and in this case the tourist would be in need of a map to not get lost, to find out which are the best spots to visit

etc. This leads us directly to another problem with this group which is the same like the problem with the group before: these tourists grouped with regard to their preferred form of vacation are also not one homogeneous group and might be interested in different kinds of activities and so they would again be in need of more than one map.

Table 1 sums up the different possibilities of dividing tourists into groups:

<b>Grouping tourists</b>		
<b>Activities</b>	<b>Target group</b>	<b>(special) form of vacation</b>
Culture/sightseeing	Families	Farm Holidays
→ City tour	Singles	Camping
→ Round trip (visiting different cities/spots)	Teenager	Club vacation
	Elderly People	Bus trip
Recreation	Disabled People	Cruise
→ Health care	Businessmen	...
→ Wellness	show/conference/congress	
→ Relaxing	pilgrims	
Sports/being active	...	
→ Hiking		
→ Skiing		
→ Cycling		
→ Touring on waterways		
→ "Adventure Holidays"		
...		

**Table 1:** Grouping tourists (Preuß 2019)

So we can come to the conclusion that for our question which kinds of touristic maps exist it is the best idea to divide the groups by the tourists' activities.

This group now needs to be split even more according to the different types of possible holiday activities. The first group of activities is the one regarding culture and sightseeing. This aim is normally achieved by visiting a city and looking out for historical buildings, interesting museums etc. Of course the tourist does not need to visit just one city during his holidays. In the course of a round trip, different cities or other culturally interesting spots can be visited. This round trip can be self-organized or organized by others as it is usually the case with a bus trip, for example. A tourist who is interested in culture and sightseeing often looks out for special spots that are described in guidebooks. (Freyer 2001:74)

Another group of tourists looks for recreation. At first there are the health care tourists who normally travel to spa towns. They are not always travelling voluntarily. Often the health care is ordered by a doctor (Freyer 2004:30). Wellness holidays on the other hand usually mean travelling voluntarily. These holidays are not bound to spa towns; they can be offered everywhere and in every hotel (Althof 1996:125). "Wellness" can mean medicinal baths,



massages, yoga, thalasso therapy, manicure... (Althof 1996:126). So we see that the term "wellness" is very wide-ranging. The people who only want to relax can also be counted to recreation-tourists. Such tourists are just looking for rest and are not very interested in discovering something new during their holidays. They can be often found at (sunny) beaches. (Freyer 2001:74)

The third group of holiday activities is the sports group. People who can be attributed to this group are not only interested in relaxing but want to be active during their holidays and do some sports. Such sports can be hiking, skiing, cycling, touring on waterways or looking for very special, unique experiences which can be bungee-jumping, parachuting, climbing in very high mountains...

This listing of touristic activities may not be complete just like the other listed groups may not represent all possible target groups or all special forms of vacations. There might also exist other ways of grouping tourists. The given table (Table 1) was developed from the study of varying textbooks about tourism, written by Freyer or Althof, for example, and presents three common ways of grouping tourists. And, the most important point, the way of grouping tourists according to their main holiday activities gives a possibility to answer the question which kind of tourist maps might exist. As the previous statements show, only the group of the different activities tell us which maps might be needed since a target group or a tourist who pursues special forms of vacation can be in need of different maps, based on their particular activity – and that conclusion also reminds us that looking at the activities is the best way to answer the question which touristic maps exist and have to be analysed during this doctoral research.

The first example for a map needed by tourists is a city map. As explained before, sightseeing and looking for special cultural spots can be done in one or in different cities within the frame of a round trip. So the tourists need a city map, showing all interesting spots for each city they visit. If they are on a (self-organized) roundtrip, it may be useful to have a general map of the whole region they visit so that they can decide which cities are interesting for visiting at all, since one can imagine that not all cities have so many interesting cultural or historical spots that they are worth visiting.

Active tourists who are interested in sports of course need maps that support their sportive activities and the special requirements that might result from those activities the best. As one can imagine, one map fulfilling all the requirements that might exist would be too overloaded and so we need one map for each activity.

The recreation group is a bit problematic in our case since such tourists do not really need a map for their recreational activities. Wellness and health care are usually offered indoors, in a hotel or in a health clinic, and so they do not produce the need of a map. If the tourist decides to leave the hotel or the health clinic to do some other activities beside wellness and health care, he will be in need of one of the other maps that are described above, depending on the activity he is planning – so he might be in need of a city map to explore the surroundings of

the hotel or maybe a cycling map if he is more interested in sports. Since it is said in the technical literature that the typical relaxing tourist is not interested very much in discovering the area around his relaxing spot or in doing some sports, this kind of tourist might not need a map at all. Only if he decided to leave his relaxing spot at the beach to do at least some sightseeing or whatsoever, would he be in need of a map. Which map he needs again depends – as we see it with the wellness or the health care tourist – on the question which activity he wants to practice.

As stated before, the Lexikon der Kartographie und Geomatik knows some maps that can be counted to tourist maps and which fit to our analysis of the different touristic groups and which the maps they might need. Coinciding maps would be: the city map, cycling maps and maps for touring waterways. Furthermore, we have the winter sports maps in the Lexikon der Kartographie und Geomatik of which skiing can be a part. But since skiing is not the only winter sport, these maps cannot be put on the same level and should stand for themselves. Moreover, some maps are mentioned in literature that have not found attention yet in the analysis of the different touristic groups: maps for mountaineers, maps for high mountains and road maps. Maps for mountaineers and maps for very high mountains should be mentioned, too, since one can imagine that some hikers might be interested in hiking in high mountains or mountaineering, too. Road maps need to receive attention either, since they are maps nearly every tourist might be in need of. A tourist needs knowledge of the road system to get to a certain place – no matter whether this place is his holiday destination, some interesting sightseeing spot, a special city he wants to visit during his holidays in another city, etc.

All in all, we now have identified some touristic maps that may be worth analysing. Of course this list is not complete. As the motives for travelling which were explained in chapter 3.2.2. show, there are still some motives for travelling which have not been treated yet in our list of activities, like, for example, pilgrimage. However, the list covers the most common activities and therefore gives a good overview of which maps are useful for tourists.

Some different types of tourist maps should be explained now in detail. In addition to the maps for special activities, we will also have a closer look at the map type “road map” and “general map of a certain region”. Both map types are helpful at the stage of preparation of the travel, since they can tell the tourists how to get to their destination or give them information about the destination’s surroundings and which other spots might be worth to visit.

### **General map of a certain region**

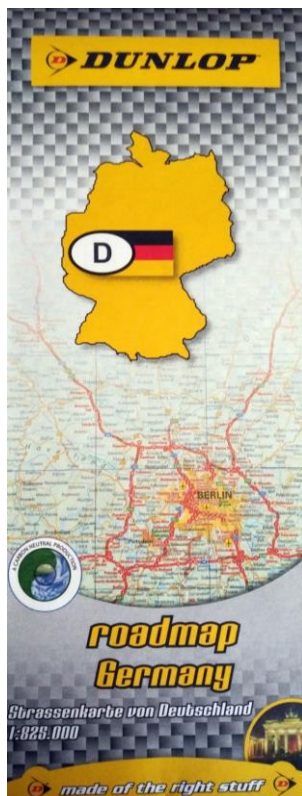
The general map gives an overall picture of an area or a region. General maps are, in the traditional sense, topographic maps but today the term is used for different kinds of thematic maps, too. (Stams 2001c)

### **Roadmaps**

Road maps have a long tradition and belong to early cartographic representations (Arnberger 1966:127). The main function of a today’s road map is the planning of drives and orientation

with cars (Koch 2001b). To reach this aim, the focus of such maps is on the road system, showing the different types of roads (motorway, main roads, side roads etc.) (Koch 2001b). Furthermore, it can also be useful to mention petrol stations, motorway service areas or points of interests in such maps. For a good orientation, it is of course essential to have a good labelling of the roads, the cities on the way etc. and everything being up-to-date (Koch 2001b).

As an example, we have a roadmap of Switzerland, released by the publishing company MairDumont and the oil company Shell (fig. 3), and a roadmap of Germany, published by Dunlop, who produces care tyres (fig. 2). These two examples show something that is also mentioned in literature: oil companies, car companies etc. play a big role in publishing such maps (Koch 2001b). The maps given show the different types of roads and also some sightseeing spots like castles or viewpoints. Petrol stations are also registered in the roadmap of Germany while such data is missing in the roadmap of Switzerland. Both maps do not have a date specification so it is not possible to know how up-to-date the map is. But all roads are labelled and important cities on the route are mentioned so that orientation with the help of this map is possible.



2 Cover picture of a roadmap of Germany (Germany no date)



3 The cover picture of this road map shows the logo of an oil company. (Switzerland 1996)

## City Maps

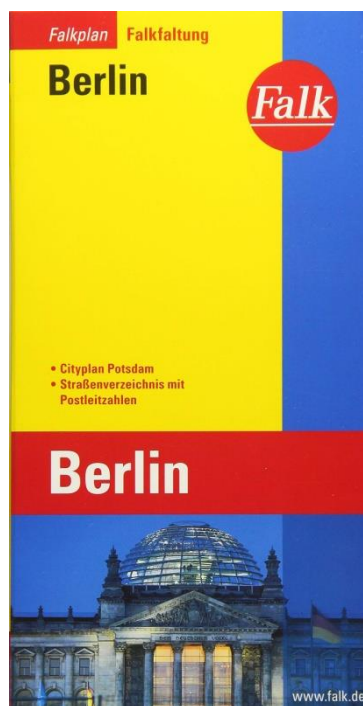
According to the Lexikon der Kartographie und Geomatik, a city map primarily serves the orientation in an urban area (Großer 2001c). The typical scale of such a map is between 1:5.000 and 1:50.000 (Großer 2001c, Leser 2005:881). Paper size can reach as far as 1,2 x 0,85 meters,

## Maps and tourists

which is consistent with German A0 paper size. As we can see, city maps can have a large paper size. To handle this problem, city maps are usually sold folded in pocket size. Furthermore, the paper is usually printed on both sides. (Großer 2001c)

The information which can be found in city maps is normally the complete road system with the names of roads, public buildings, historic sites, hotels and restaurants, recreational facilities and public transportation stops (Großer 2001c). To make it easier for the map user to find the information he needs, it is wise to add a search grid and a register to the map (Leser 2005:881). The main map is often complemented by an auxiliary map. Such an auxiliary map can show, for instance, the public transportation network, a scheme of approach roads and thoroughfares or the city centre, pictured in a larger scale than the main map (Großer 2001c). Some city maps also offer short texts about the town history or sightseeing spots, including appropriate photos (Großer 2001c).

Typical examples for city maps are the Falk maps released by the publishing company MairDumont (fig. 4). As mentioned before, the map shows the complete road system and all roads are labelled. Furthermore it is possible to get information about the public transportation systems, historic sites (or other sites that could be interesting for tourists) and public buildings. But we do not find hotels and restaurants on this map.



4 The photo shows the cover picture of a typical Falk city map.  
(Berlin 2019)

## Hiking map

A hiking map shows hiking trails and normally the relief with geodetic points and contour lines (Wilfert 2001b). Other useful information can be viewpoints or Alpine huts (Hake 1994:409).

## Maps and tourists

Hake mentions that hiking maps can have an aerial image as base and that some hiking maps also offer historic, geologic or botanic information (Hake 1994:409). To guarantee a good orientation, the hiking map's scale must not be smaller than 1:50.000. Handiness is also of high importance for this type of map. Wilfert recommends that map size should not exceed a paper size of 80 x 60cm. (Wilfert 2001b)

An example for such a hiking map with an aerial image as base is the hiking map of a hiking area in South Tyrol (fig. 5). It also contains height points and information about Alpine huts and restaurants. The focus is of course on the hiking trails in the area.



5 The picture above shows a part of the map of the hiking area around the Seiser Alm. We can see signatures for car parks and places to get food and drinks and of course hiking trails. (Seiser Alm 2018)

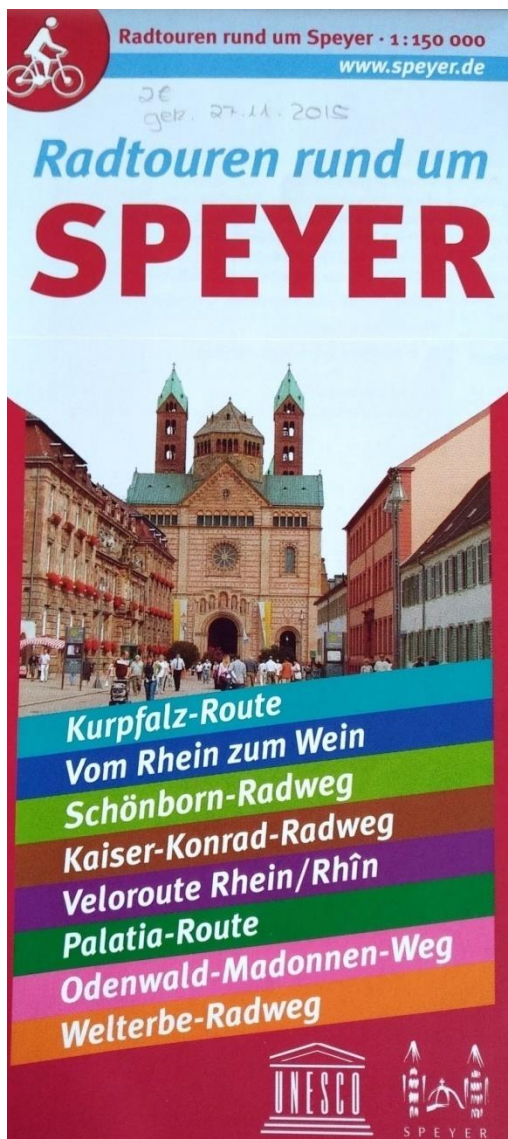
## Maps for mountain climbers

Mountain climbing is also an activity which is favoured by some people during their holidays and so special maps for mountain climbing do exist. In general, such maps show very detailed contour lines and fixed rope routes. Such maps are published by the Alpine Association or can be found in special climbing guides. (Wilfert 2001c)

## Maps for Cyclists

The most important elements of such maps are, as one can imagine, the cycle routes with their quality and inclination (Wilfert 2001d). Also interesting may be the information whether the cycle route is near to a street or in the woods (Wilfert 2001d). The base map for cycle maps can be a city map or a topographic map (Hake 1994:410).

The maps available for cycling around Speyer (fig. 6) or Lake Constance (fig. 7) do not give information about the quality of the routes or their inclination. But they propose different cycle routes of different lengths or give information about points of interest or hotels near the route. The cover pictures of the maps can be seen below.



6 The cover picture of this cycle map promises tourists to show different cycle tours. (Speyer 2006)



7 The cycle map of the area around lake constance includes information about hotels as well. (Lake Constance 2015)

## Maps for touring on waterways

The map for touring on waterways is a special map for touring on stagnant or running water by non motor-driven boats (Wilfert 2001f). This means they are in general especially for canoes or kayaks. The topic that is in the focus of such maps is of course the waterway (Wilfert 2001f).

An example for such maps would be the “Wassersport-Wanderkarten” (maps for touring on waterways) released by Jübermann – Kartographie u. Verlag (fig. 8), a publishing company which is specialised in producing maps for touring on waterways for different areas in Germany. These maps focus on the waterways and give information that might be interesting for canoeists etc. like water gates, traffic ability of the rivers at different times of the year and so on. Moreover, the map has a special waterproof foil so that it can be taken on the canoe trip without any problems (Wilfert 2001f).



8 The picture shows the cover picture of a map usable for touring on waterways. It includes information for cyclers as well. (Germany-West 2015)

## Wintersportmaps

The winter sport map normally shows mountainous regions (Wilfert 2001e). In this, they can be compared to hiking maps but the particular characteristic of winter sport maps is the representation of the wintry conditions of the area and the special winter sports that can be done there (Wilfert 2001e). (cf. fig. 9, p. 29)



9 Here, we can see a winter sport map of Winterberg. It includes information about ski runs, places to get food and drinks and car parks. (Winterberg 2016)

### The focus of this thesis

As we can see, we do have many different maps for different types of tourists. Since it is not possible to discuss all these maps in detail, the paper will focus on two types of maps: **city maps** and **hiking maps**.

The idea behind choosing these two types of maps is that they are, on the one hand, examples for maps used by a great number of tourists and not very special map types like the ones for touring on waterways which will only be needed by a smaller group of people. On the other hand, city maps and hiking maps form an interesting contrast to each other. Designing a city map or a hiking map means completely different demands on the cartographer. Mapping for hiking usually means mapping mountainous areas which is regarded as one of the most complicated problems in cartography, as we will see later (cf. chapter 5.8.). This does not mean that mapping a city is an easier task. Especially the question of how to show larger cities on one map is not to be answered quickly (cf. chapter 6.1.2.). And both types of maps should of course try to fulfil all possible requirements regarding information tourists might have. So the next steps will be to have a closer look at how to design these map types.

### 3.4. Alpine Association

The Alpine Associations were already mentioned in many different chapters during this paper: they played a big role in the history of tourism, especially in the history of Alpinism, since they supported tourism in the Alps by building alpine huts and extending hiking trails (Ludwig



1990:34). But they are also important for the history of mapping since they have always been making efforts to improve mapping and to develop new techniques, especially in case of the cartography of mountains. And not to forget: the Alpine Associations are still relevant today as they still release maps, especially Alpine maps of course. Since hiking maps are a focus of this paper, we will have a short look at their history and how they contributed to mapping.

The first Alpine Association was founded in England in 1875 (Ludwig 1990:34). It may be surprising that the first Alpine Association was not founded in a country neighbouring the Alps. But the English aristocrats were the first who, influenced by Rousseau (see chapter 2.1.), started to discover the Alps (Ludwig 1990:34). Six years later, Alpine Associations were also founded in Switzerland and in Austria (Ludwig 1990:34). They were founded by mountain climbers and scientists (Arnberger 1966:133). Again a few years later, the German Alpine Associations came into life. In 1873, the German and the Austrian Alpine Association united. (Ludwig 1990:34) The main job of these Alpine Associations was at first, as mentioned before, the building of alpine huts and the improvement of hiking trails. But soon another problem came into focus: no acceptable topographic maps of the Alps existed for Alpinists and for the mountains tourists (Stams 2001d). So the members of the Alpine Associations started to develop high mountains maps (Stams 2001d). They made an effort for mainly two types of maps: large scale maps of the high mountains for mountain climbers and hiking maps especially for tourists (Arnberger 1966:33). The making of the high mountains maps particularly was in the responsibility of Switzerland and Austria (Arnberger 1966:34).

But the Alpine Associations did not only map the Alps; they also passed their attention to other high mountains around the whole world (Stams 2001d, Arnberger 1966:34). With their work, they contributed essentially to topographic cartography (Arnberger 1966:34). At that time, official cartography was not able to satisfy the wishes and the requirements of climbers (Arnberger 1975:419).

Furthermore, maps should not only be a help for climbers and for hikers. Another requirement was that the maps should also be useful for other scientific work, like, for example, cartometric evaluation or geographic analysis. (Arnberger 1975:422) Another important factor that leads to the high quality of the Alpine Associations maps is the fact that the maps are not worked on with a fixed method: the methods are always changed, depending on the use of new techniques or new cartographic findings (Arnberger 1975:423). Besides, they have always made an effort to have their own geodetic surveys (Wilhelmy 1981:173). And it has to be noted that the Alpine Associations work in a field where the maps always have to be as up-to-date as possible: the maps cover an area which has some danger spots in it and so it is important that these are always marked correctly in the map since some danger spots like, for example, glaciers can change their appearance or their extent. Furthermore, one can imagine that out-dated maps are not useful for scientific purposes either (Arnberger 1966:138).

Because of the fact that cartographic methods have always changed, five major circles of Alpine Association Cartography can be distinguished (Stams 2001d, Arnberger 1975:424):

## Maps and tourists

1. 1862 – 1891: Early days of Alpine Association Cartography, maps are influenced by the slope hachure method; copperplate print and multiple colour maps lithographed
2. 1892 – 1900: Relief maps, obliquely illuminated maps
3. 1900 – 1936: Time of Classical Alpine Association Cartography, multicolour lithography, plastic rock drawings stressing the petrographic-tectonic features
4. 1937 – 1974: contour lines on the rock, hair-stroke rock drawing recedes
5. since 1969: three-dimensional effect of landform representation produced where contours merge or nearly merge on steep slopes, edge drawing, texture drawing (Stams 2001d, Arnberger 1975:424, Arnberger 1966:149).

Alpine Associations still exist today and their maps are still of a distinguished quality. Individual map editing and the selection of different scales, sections and size of the map are still able to satisfy the requirements of climbers, hikers or scientists in the best possible way (Arnberger 1975:422-423). Of course the Alpine Associations' job is not only to make maps: they, for example, still build alpine huts (and take care of them), give lessons in climbing or follow the needs of nature protection (Deutscher Alpenverein no date).

## 4. A theory: How to communicate with tourists

Since the principal task of cartography is to communicate environmental information (Robinson 1995:17), maps can also be seen as means of communication and therefore as an important part of communication theory.

Althof (Althof 1996:319) presents the base questions of communication:

Who (communicator, source, sender)

Says what (message)

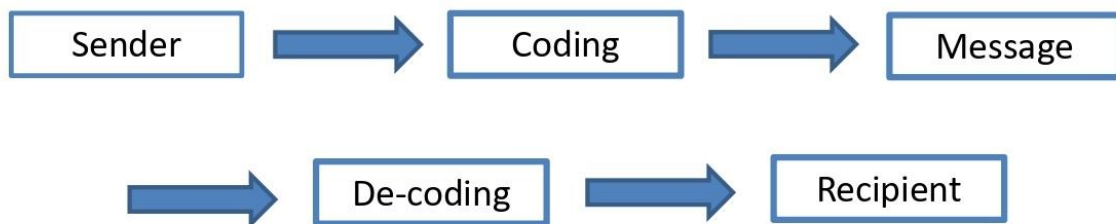
In which situation (communication situation)

To whom (communicant, recipient)

By using which channels (channel of communication)

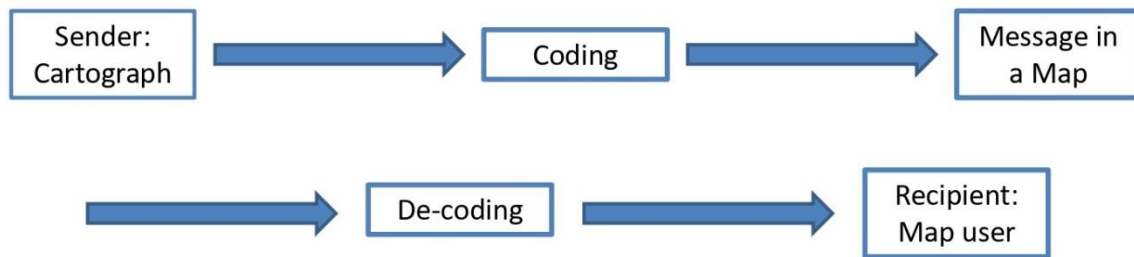
With what aim (communication goal) and

With what effects (communication success)?



10 Basic principles of communication (Freyer 2004:529, changed)

The basic idea of communication theory is that communication always means the communication of information (Hake 1994:24, Bollmann 1977:12). Each communication process consists of a sender who sends a message and a recipient who receives this message. The channel of communication links both sender and recipient. (Bollmann 1977:12) During this process, the message is coded by the sender and de-coded by the recipient, as it is also shown in fig. 10. One way to communicate such information is the use of maps. How the basic principles of communication would look by using maps can be seen in fig. 11, p.33.



11 Basic cartographic communication (Preuß 2019)

The communication goals of cartographic communication are getting geographical insights about certain regions and the control of behaviour and acts in areas (Tainz 2001).

Hake divides communication theory in two categories: first, information theory, and second, semiotics (Hake 1994:24-25).

Information theory is not interested in the content of the message but cares only for the process of information transfer. As already stated by Althof, every communication process needs a sender and a recipient of information. This information is usually coded by the sender in symbols and reach the recipient by a channel of communication. Then, the recipient needs to decode the information. (Hake 1994:24)

So, we can state that information is always transported in a coded form as a chain of symbols. Such symbols can be, for example, letters. But: to make the communication process work, sender as well as recipient need a common repertoire of symbols. Only in this case will the recipient be able to decode the message and to gain all the information. (Hake 1994:25)

Semiotics, on the other hand, is interested in the symbols which represent the information (Hake 1994:25). The main aim of semiotics is to look for basic rules for the understanding of symbols (Dickmann 2018:139).

Semiotics distinguishes three different dimension of symbols: the syntactic, the semantic and the pragmatic dimension. (Hake 1994:25-26)

The syntactic dimension is interested only in the creation of symbols and their relationship to each other. This means, a map is already correct from the syntactic point of view if all symbols can be recognized without a problem. Symbols are well perceptible, for example, if their size is big enough and the contrast to the base map is sufficient. (Hake 1994:25)

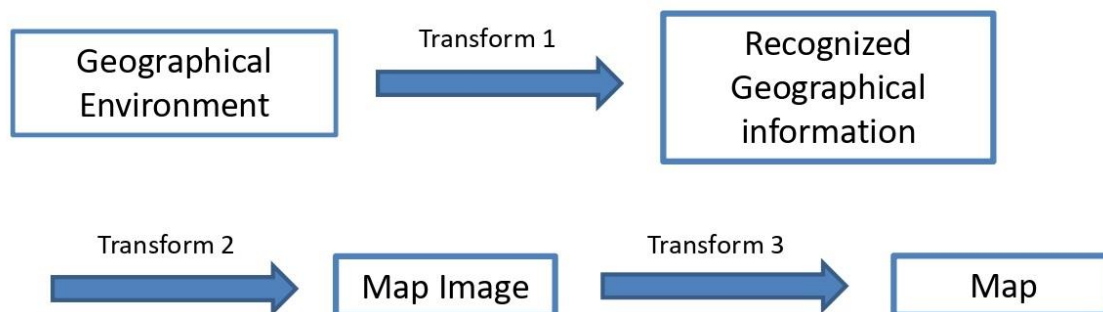
The semantic dimension cares about the relationship of the symbols and the objects represented by them. As one can imagine, it is surely of high importance that the message the recipient receives is as close as possible or in the best case identical to the original message produced by the sender. (Hake 1994:26)

But, in the case of maps, map makers cannot be sure that they and the map users have the same understanding of the symbols used in the map. To handle that problem, the legend can help. In the legend, the meaning of symbols can be clearly defined. (Dickmann 2018:140)

The last dimension is the pragmatic one. Here, we talk about the relationship to the recipients and how the message can influence their behaviours. So, for example, if hikers recognize a symbol as a sign for a hiking trail, they can be brought to use that trail for their hiking tour. (Hake 1994.:26)

The theory of cartographic communication already gives us some hints regarding what to think about when maps are being made. But: this theory has not always been in the interest of map makers. In the earlier days, cartographers did not think much about the map user and how to best transport the map's message or whether the map user would understand the map at all (Tyner 2014:15). Today we know that the task of a map maker is always to "enhance the map user's ability to retrieve information" (Robinson 1995:17).

What should also be mentioned here is that the mapping process consists of a series of information transformations (Robinson 1995:18). This means, when we are talking about cartographic communication and transporting information, we should keep in mind that the process of the communication of information with the help of maps is not the only process where information might get lost by inadequate handling.



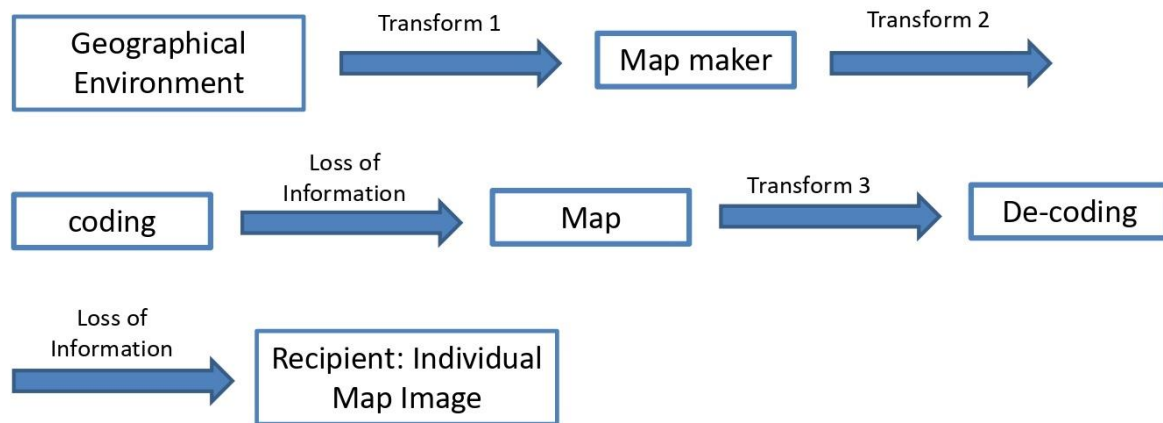
12 Transformation process – from geographical environment to the map image (Robinson 1995:18, changed)

The first process of information transformation already happens when the data for mapping is collected and selected. Since not every single detail about the geographical environment can be noted, a selection will take place. The data noted in this first process is the "recognized geographical information". When map makers plan their map, they will maybe realize that even this selection of information about the geographical environment is still too much to represent in the map. So, again, we have a process of selection and information transformation. The result of this transformation process is the map (fig. 12).

A theory: How to communicate with tourists

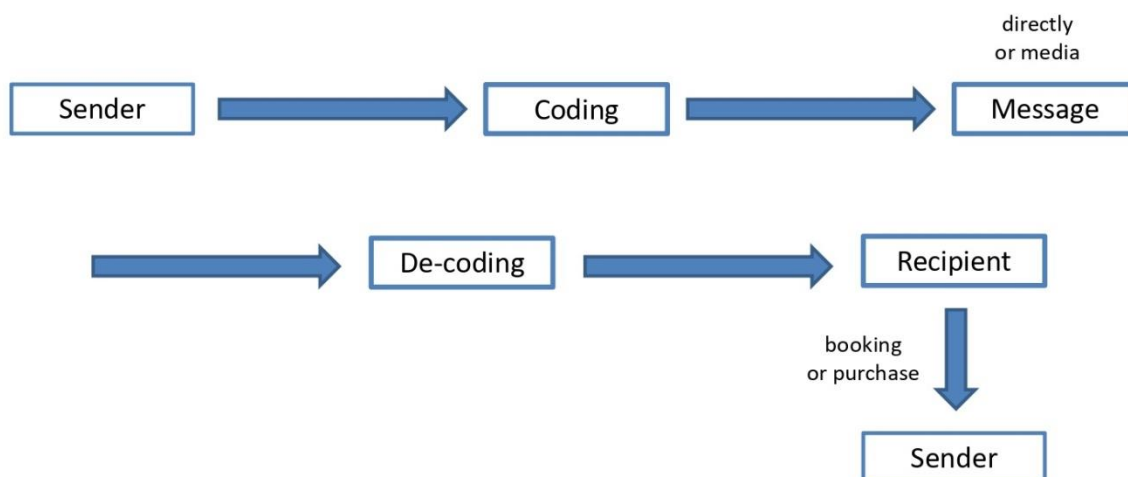
The last transformation process happens when the map users read the map and try to understand and interpret it. Therefore, each map user will gain his or her own personal map image, depending on their background knowledge about the region shown in the map and their previous experiences of working with maps. (Robinson 1995:18)

The following fig. 13 shows the combination of the transformation process and basic cartographic communication.



13 Transformation and communication (Preuß 2019)

Communication theory of course does not only work with maps. Freyer (Freyer 2004:529) also presents us with a scheme for communication in tourism (fig. 14).



14 Communication in tourism (Freyer 2004:529, changed)

The senders in the case of communication in tourism are, for example, tour operators, accommodation providers, travel agencies or tourist centres. Their information about the

destination are coded and can be transferred to the (potential) tourists in different ways: the senders can talk to the recipients directly or they can reach them by different media like, for instance, leaflets or magazines. Tourists process the information and in some cases, we might even get a feedback to the sender of information: tourists might react to the information they receive by booking holidays from the initial senders. The main aims of this communication process are, beside making tourists book a journey, getting the tourists' attention and sparking interest or simply some information. (Freyer 2004:529)

So, what does this mean now for our paper? It means that we should always keep the communication goals in mind when we plan or produce our maps (Bollmann 1977:66). The following chapter will concentrate on the rules for map making and therefore on how to best communicate cartographic information with map users.

## 5. How to make a map – trying to communicate

### 5.1. What has to be on the map?

After defining the term “map” and identifying what a map is and which representations are only map-related, a look now has to be taken at the question which elements have to be included on every map to make it understandable and usable: These elements are a title which fits the content of the map, a legend that explains all the signs that are used on the map and a scale. Furthermore, a north arrow and a source statement have to be added.

#### **Title**

Every map needs a title. The map title contains the main topic of the map in a short but concise way. If the topic is very complex and it is not possible to include everything that has to be said in a short title, it is also possible to use a subheading (Hake 1994:451).

#### **Legend**

The legend is one of the most important map elements (Großer 2001a). It explains all the symbols that are used on the map. Some symbols may be easily understandable even without a legend because they are very pictorial (Wilhelmy 1981:245) but other symbols may be very abstract. However, every symbol has to be explained in the legend, no matter if they are more pictorial or really abstract (Großer 2001a). Besides, Judith Tyner points out that it is necessary that every symbol that is explained in the legend must look exactly like the symbol on the map because otherwise (e.g. if the symbol is miniaturized) it might cause the reader confusion (Tyner 2014:33). To guarantee that the map user is able to interpret the legend quickly and easily, the legend has to be clear (Wilhelmy 1981:245). To achieve a clear legend it can be useful to have a hierarchical order of the symbols in the legend or/and to divide the symbols into groups (Großer 2001a).

#### **Scale**

The scale indicates the ratio of the reduction between the distance in reality and the distance on the map (Kohlstock 2014:17, Ormeling 2014:3). The scale is defined as:

$$s'/s = 1/M \text{ (Stams 2001b)}$$

$s'$ : the length on the map

$s$ : length in reality

According to Judith Tyner, the scale can be expressed on the map graphically, as a bar or as a linear scale, or it can be written down as a verbal statement or as a fraction (Tyner 2014:34). Salitschew notes that it will be easier to work with maps if the scale is given as graphic scale, as a verbal statement and fraction at the same time (Salitschew 1967:40).



Maps can be grouped according to their scale: a map which has a scale of 1:10.000 or more is a large scale map, a map with a scale of 1:500.000 or less is a small scale map. Every scale between these numbers is called medium scale (Kohlstock 2014:18).

The scale is always just an aid to the reader and should not be the focus of the map.

### **North arrow**

The north arrow shows the map's direction. Although it is customary nowadays that the north is at the top of the map, it is still advised to use an indication for the map's direction (Tyner 2014:35). This indication does not always have to be the north arrow. It is also possible to use lines of longitude and latitude (Tyner 2014:35). If these lines are used, a north arrow is redundant (Tyner 2014:36). However, the north arrow is still a good way for an easy and quick indication of the direction (Tyner 2014:35). Like the scale, the north arrow is just an aid for the map user and should not dominate the map (Tyner 2014:36).

### **Source statement**

The source statement must include at least the name of the author and the map designer, the source of the data and, of course, the year of production. It is very important to give the map user the source of the data so that the authenticity of the data can be verified (Tyner 2014:39). It also gives the user the possibility to maybe get more precise information from the original data for further researches. The year of production is significant to know how up-to-date the map is.

If necessary or reasonable, other information like the name of the publishing company, edition, copyright, etc. can be included (Großer 2001b). In the case of world maps, the name of the projection should be indicated (Tyner 2014:39).

## **5.2. Signatures**

One of the most important factors for a good map design are carefully chosen signatures. The fact that technical literature about mapping includes many pages, even whole chapters, concerned only with signatures also shows the importance of this topic.

Literature knows many types of signatures – Erik Arnberger actually differentiates between 14 different types of shapes for expressing qualitative and quantitative objects and their characteristics (Arnberger 1966:222). He mentions quite obvious elements of design like line signatures or area signatures but he also counts diagrams, letters, numerics and other things as signatures. This brings us to the question which signatures are really necessary for the type of map we are analysing.

Tourist maps are thematic maps showing a special city or region. The map always expresses the state of the city or region at the time of map production. It is not an aim of tourist maps to

show previous or future sights of the city because tourists of course need a map of the current state for orientation and they want to know which interesting things there are now in the city to visit. Beyond that, tourist maps do not give information about statistical data or things like that. They basically show the position of streets, buildings, tourist attractions etc. This leads us to the fact that signatures that show statistical data like diagrams are not necessarily suitable for our purposes. The important point here is that tourist maps are maps with qualitative, not quantitative data. So the map designer needs signatures that can be mainly used for qualitative data.

The next question is what the exact contents of tourist maps that need to be represented in such maps are. The maps that will be analysed during this paper are city maps and hiking maps. These maps have different contents and so they need to be considered individually also in the case of signature use and design.

The basic signature forms are point, line and area. They are geometric means of representation (Kohlstock 2014:78). The idea behind this classification is the fact that every geographic or spatial phenomenon can be sorted in one of these groups – some geographic phenomena exist at points, while others might be thought of as lines or might extent in a certain area (Tyner 2014:134). Tyner even adds volume phenomena to this list (Tyner 2014:134).

Point phenomena exist at discrete and clearly defined points (Tyner 2014:134, Kohlstock 2014:131). Examples for point features could be the position of power stations, hospitals or in our case museums, tourist informations etc. It is important to note that the fact whether a geographic phenomenon is a point feature or maybe an area feature also depends on the scale of the map: on a small-scale map, a city can be marked as a point signature while on a large-scale map the same city is an area phenomenon (Tyner 2014:134).

Linear objects can be roads, rivers, railway lines etc. (Tyner 2014:131, Kohlstock 2014:134). The most significant dimension of such objects the length (Tyner 2014:131). One interesting fact in this case is that some of these objects , like rivers or roads, can be seen on the earth's surface, while other line features like political boundaries would be only marked in the map (Tyner 2014:131). Some objects that are often marked with linear signatures in maps are in motion – like, e.g., commuter, the heading of birds etc. (Kohlstock 2014:134). But these examples are normally not of interest for tourist maps –here, we will focus on the linear graphic representation of roads, rivers and similar items.

The next type of geographic phenomena are the areal ones. Such phenomena are distributed over a previously defined area (Tyner 2014:134). Similar to line phenomena, some of them can also be seen in the real world (like vegetation types or land-use patterns) while others are only conceptual (living preferences) (Tyner 2014:131). A further characteristic of areal phenomena is that they are not always clearly definable and are mutable (Kohlstock 2014:135). Examples in this case can be temperature or the amount of rainfall (Kohlstock 2014:137). In the case of tourist maps, changing or not clearly definable areal phenomena should not be a problem –

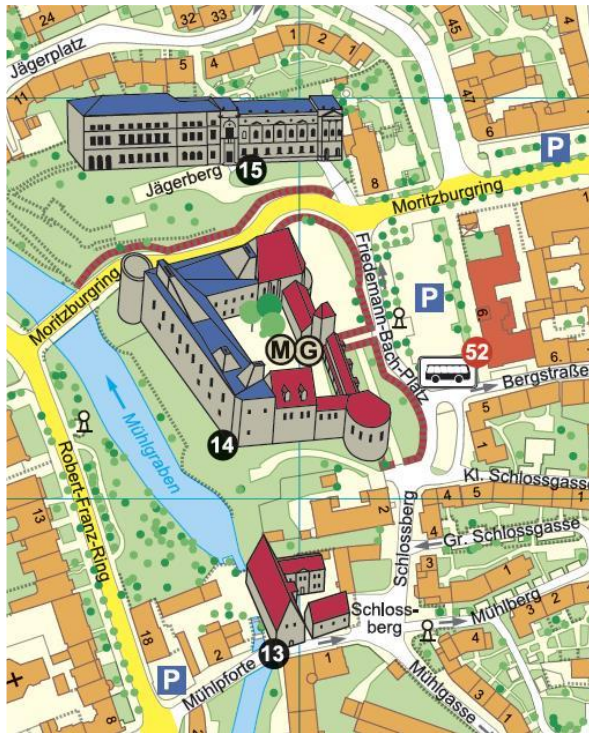
the areal objects that are normally mapped here could be parks, lakes etc. which normally do not change their extent much.

As already mentioned before, Judith Tyner has a fourth category for geographic phenomena: volume phenomena (Tyner 2014:134). For her, volume phenomena are areal objects which have a third dimension, meaning for example the elevation of the land (Tyner 2014:134).

However, this chapter will focus the point signatures since this type of signatures has a lot of different variations. The chapter about how to use colours in maps (chapter 5.4.) will focus on area signatures as well. Objects which have a “third dimension” will be in focus in chapter 5.8.. Representing, for example, the elevation of the land is of special interest for this paper since it concentrates mainly on hiking maps (besides the city maps, of course) and so it is reasonable to dedicate one chapter to the specific requirements for designing maps of mountainous regions.

Point phenomena can be represented with geometric or pictorial signatures or only with letters and numbers (Hake 1994:99-100).

**Geometric signatures** are triangles, circles or squares. They can be varied in form, size, colour or also texture. Variations in form or colour are used to represent qualitative data while variations in size normally stand for quantitative data. (Tyner 2014:137). However, geometric signatures have a big disadvantage: the map user will always have to consult the legend to understand what these signatures stand for. The signature and the represented object have no real connection with one another. We face the same problem with **numbers** and **letters**. Of course, it is possible to use different numbers or different letters to indicate different objects but no one will get the meaning of such a signature at first glance. So, we will have to look for a type of signatures which is easier and faster to understand. And when we have a look at some maps, we will see that in most maps we usually find not only geometric signatures, but, in the case of point phenomena, really complex and often creative signatures.



15 Part of the map of Halle, including pictorial signatures and numbers (Halle 2014)



16 This map includes pictorial signatures for car parks or playgrounds but also letters (Rothenburg ob der Tauber 2014a)

The given examples show excerpts of two city maps: Halle (fig. 15) and Rothenburg ob der Tauber (fig. 16). In Figure 15, we find symbols for parking lots and buses and we can also see complex representations of buildings. Furthermore, we of course have the point, line and areal signatures described above. Some objects are also marked with numbers and with letters. The second example (fig. 16) goes without sketches of buildings but has some additional symbols like the parking lots symbol. Some of them are easily understandable and in common use (like the symbol for the parking lots) while others will need further explanations in the legend.

Those signatures are not inventions of the map makers of these given examples but they are also known and described in technical literature.



17 Vertical plan of a church in Halle (Saale) (Halle 2014)

Fig. 17 shows the example of a church in Halle which is represented in a **vertical plan**. The dictionary of cartography and geomatics calls this type of signature "profile symbol". They are usually seen as part of the pictorial signatures which have already been mentioned before and will be explained in more detail later. The idea behind such vertical plans is that man is used to seeing bigger objects as front elevation and so they are easily recognizable (Arnberger 1966:222, Arnberger 1977:50) and comparable to the real world (Witt 1970:89). According to Witt, such vertical plans are often used in popular maps like city maps (Witt 1970:89). Since city maps are the focus of this thesis,

the following analysis will show how often vertical plans are really used in city maps. Vertical

plans were very popular in old (topographic) maps (Arnberger 1966:223, Witt 1970:89) and also led to the development of many currently conventional signatures (Witt 1970:89). Of course the signatures do not show every detail of the pictured objects: only the essential and characteristic parts should be represented (Arnberger 1966:233). Vertical plans are usually used for representing point or areal objects. The representation of line objects is difficult. (Arnberger 1977:51) Another disadvantage of such signatures is the fact that they take up much space on maps (Witt 1970:89). There is even the possibility that they hide other objects – this actually happens in the example of the church in Halle given above. The vertical plan of the building is so big that some of the other buildings in the north of the church cannot be seen anymore. Another problem with vertical plans might arise when too many of these signatures are used on one map: the map might get confusing and overloaded. Therefore, individual figure pictures should be used with caution in maps.

As already mentioned, vertical plans are part of **pictorial signatures** (Hake 1994:99, Arnberger 1977:50). In general, pictorial signatures always have a concrete reference to the represented object (Arnberger 1977:50). A common example for such a pictorial signature that is not a vertical plan is a plane, standing for an airport (Arnberger 1977:50). Other names for pictorial signatures of this kind are: representational, replicative or mimetic signatures (Tyner 2014:138). In contrast to the vertical plan, this kind of pictorial signature shows the plan view or the contour of an object (Arnberger 1977:50). Instead of giving the contour of an object as representing signature, it would also be possible to use a typical allegory for an object to mark it (Hake 1994:100). An example for such a variation of a pictorial symbol is a pick and shovel to represent a mine (Tyner 2014:138).

So, if we think back to chapter 4, we will already see some differences in the way we can communicate with signatures. Some signatures like the pictorial ones will be easier and faster to understand while letters or numbers always need a legend with them.

### 5.3. Generalisation

The definition of the map by Peter Kohlstock that has been given in chapter 3.1. claims that a map is a “reduced, simplified and levelled image of the earth’s surface” (Kohlstock 2014:17). The important fact here is that the earth’s representation we see in the map mirrors the reality only to a certain degree: a map always reduces and simplifies information, depending on the scale used for the map. A map cannot show every single information on the earth’s surface – it cannot give information about every single tree, every tombstone on a graveyard or the accurate footprint of a building. If the scale of the map is reduced more and more, there is also less space to give information. The map user will not find information about every single building on regional general maps, maps of whole countries even do not show every city or town of a particular country.

The process that leads to this reduction on simplification of information is known as generalisation. The generalisation process also has some specific rules and should not be done carelessly.

The term “generalisation” comes from the French word “généralisation” which means “simplification”. The French word on the other hand has its origin in Latin: here, the word “generalis” is the base which stands for “general”, “common”, “mostly”. (Salistschew 1967:19). Judith Tyner defines generalisation as the “selection, simplification, and even symbolization of detail according to the purpose and scale of the map” (Tyner 2014:82). Taking the definition of Salistschew, it can be added that it is essential to show the typical characteristics of reality in the map (Salistschew 1967:19).

Technical literature distinguishes between two types of generalisation: object generalisation and cartographic generalisation. Object generalisation is normally the first process of these two because it means the survey of objects in the real world and their transfer onto a map (Hake 1994:110, Kohlstock 2014:79). Here, the cartographer already has to decide which objects should be shown in the resulting map, which are not important enough to express them in the map or which objects should be mapped in a simplified form (Hake 1994:110-111, Kohlstock 2014:79-80). The result of this object generalisation is a base map (Kohlstock 2014:80).

Cartographic generalisation can be seen as the second process that follows object generalisation: a derivative map is deduced from the base map that was the result of the first step (Hake 1994:111, Kohlstock 2014:80). Derivative maps always have a smaller scale than base maps (Hake 1994:111, Kohlstock 2014:80). As we have already determined before, a smaller scale means less space for information on the map. So the cartographer’s task here is, again, to decide which objects and which information should be part of the resulting map and which should not.

For both kinds of generalisation, the cartographer needs knowledge about several operations of generalisation (Tyner 2014:83, Kohlstock 2014:81, Hake 1994:112, Dickmann 2018:157) which can be divided into two groups of generalisation procedures: the graphical and the conceptual generalisation procedure (Dickmann 2018:157, Kraak 1997:95-96). The procedures will be explained briefly in the following section:

## **Graphical generalisation**

### **Simplification**

The process of simplification means leaving out certain details. The consequence would be, for example, that not every river bend is shown in the map (Kohlstock 2014:81). The question how many details have to be left out, depends – again – on the scale of the map. Large-scale maps can show more detail than small-scale maps. (Tyner 2014:85)

### **Smoothing**

Smoothing is a part of simplification (Tyner 2014:85, Dickmann 2018:157). It means reducing the complexity of map features (Kraak 1997:94). For instance, roads which have a lot of switchbacks are smoothed (Tyner 2014:85).

### **Enlargement**

Enlargement mostly refers to linear objects (Kohlstock 2014:81) which are widened or enlarged. Especially in small-scale maps some features might be too small and, as a consequence, not legible. To keep them legible, they need to be enlarged. (Kraak 1997:94)

### **Displacement**

Displacement is often a result of enlargement (Kohlstock 2014:81): objects which are now wider require more space and consequently, they are moved farther apart for better differentiation (Tyner 2014:86).

### **Conceptual generalisation**

#### **Aggregation/Merging/Grouping**

This procedure has different denominations in literature but they all refer to the same process which is grouping several single objects of the same kind into one. Such instances would be single houses that are shown as a colony in the map or individual trees grouped into a forest. (Tyner 2014:84, Kohlstock 2014:81, Kraak 1997:94)

#### **Selection**

Selection means choosing which objects will be shown in the map (Tyner 2014:83). This means, for instance, that in case of similar objects the less important ones are left out (Kohlstock 2014:81). It can also mean that some kind of object categories are not shown at all because they do not fit the main topic of the map (Tyner 2014:83).

#### **Classification**

Classification signifies categorising data and forming groups (Tyner 2014:88). Hence, features which are not typical for a special area may be even left out (Kohlstock 2014:81).

#### **Symbolization**

Symbolisation can also be seen as a part of classification (Dickmann 2018:157). Here, the cartographer chooses a symbol that represents a category which was created before (Tyner 2014:87).

#### **Exaggeration/Enhancement**

Exaggeration is also sometimes called enhancement in literature (e.g. Kraak 1997:95-96). Here, the map maker has to decide which objects are more important than others and thus have to be highlighted (Kohlstock 2014:81, Kraak 1997:95).

## 5.4. How to use colours in maps

Today, nearly all maps are coloured. This is quite comprehensible since colourful maps are more attractive and more interesting to look at than maps which are only black and white (Großer & Schoppmeyer 2001). Moreover, using colours in maps makes them easier and faster to understand (Kohlstock 2014:79). By applying different colours, diverse categories of objects can be elaborated (Dickmann 2018:140). Black and white maps offer a more limited amount of possibilities to represent different objects (Arnberger 1966:280) and a lower flexibility in design in general (Tyner 2014:57).

But the map maker is not completely free in his choice of colours during the mapping process. To achieve the best results in colouring maps, some rules have to be kept in mind.

The first step is to decide whether the given data which should be represented in the map is of qualitative or quantitative character. Qualitative data means that species are depicted while quantifiable properties are displayed when we speak of quantitative data (International Ormeling 2014:3). Thus, we can say that data can be ordered by different measurements or in categories (Spiess 2017:7). Examples for maps displaying qualitative data could be language maps or maps showing the land use of a specific area (Ormeling 2014:3, Spiess 2017:7). A population density map, however, is a map which contains quantitative data (Ormeling 2014:3).

The character of the data determines whether the map maker has to work with a sequential colour scheme or whether qualitative areal colouring is the right choice (Salistschew 1967:52). Qualitative areal colouring uses differences in hue (Dickmann 2018:142) while the sequential colour scheme usually involves only the use of a single hue or a very limited number of hues (Ormeling 2014:5) which differentiate in lightness (Tyner 2014:67). City maps will normally contain information of qualitative character. Here, the map maker will need to show various areas like residential areas, green areas, pedestrian zones etc. Therefore, the following discussion will focus on colours used in a qualitative manner in maps.

Before deciding which colours to apply to the map, it has to be checked if colour conventions for the topic which is to be displayed exist (Witt 1970:123-124). Colour conventions are agreements upon the standardised use of special colours and colour scales for maps with the same subject (Großer 2001d). A prominent example for the standardised use of colours are geological maps. The colours which should be used for this type of map have already been fixed at the end of the 19<sup>th</sup> century (Großer 2001d).

Road atlases often present the motorway in blue or red. Since this use of colours is seen so often, one might come to the conclusion that a standardisation exists. But actually, we do not have an official standardisation here but rather a repetitive use of the same colours by publishing houses.



If no colour conventions have to be followed, the map maker is, at first glance, free to select colours for his maps. However, it is useful to take account of the connotation of colour. Established connotations of colours are, for example, nature colours. Here, colours which are close to reality and the appearance of natural phenomena are applied to the map (Großer 2001e).

Typical examples are:

Cropland	-	brown
Meadow, steppe	-	greenish yellow
Deciduous forest	-	green
Coniferous forest	-	green, blackish
Sand, desert	-	yellowish, orange
Rock	-	grey
Waters	-	blue
Snow/glacier	-	white
Settlement areas	-	dark grey, red

(by: Großer 2001e)

Although such a colouration seems to be pretty intelligent, the map maker cannot be sure that all map users will definitely link the used colour to the information it should represent. Therefore all colours have to be explained in the legend. (Großer 2001f).

Beside the connotations of colours, there are also some other rules which have to be kept in mind when planning the map's colours. First, it can be established that nearly all authors agree upon the fact that broad areas are best illustrated in bright colours (Wilhelmy 1981:235). On the other hand, bright colours are not appropriate for small areas (Dickmann 2018:145). Here, dark colours are advised (Wilhelmy 1981:235, Großer & Schoppmeyer). Furthermore, it must be taken into account that the map does not only show objects on an area-wide basis. Some objects will need to be represented with line signatures or point signatures. These line and point signatures have to contrast with the area signatures to be well identifiable (Großer & Schoppmeyer 2001). To achieve this, it is recommended to brighten the base map which is usually formed by the combination of the different areal colours (Dickmann 2018:146, Großer & Schoppmeyer 2001). In contrast to the bright base map, line and point signatures can be shown in darker colours. If it is unavoidable to use dark colours in the base map, it would also be possible to use halos which means extending the outline of point signatures in white to make them stand out (Großer & Schoppmeyer 2001, Tyner 2014:49). This method can also be used for black lettering which is placed in dark coloured areas.

Also, it must be mentioned that colours are always affected by each other. That is, a bright colour appears to be even brighter if it is placed near to a dark colour and the opposite. (Arnberger 1977:63)

To sum this up, we can define four steps which have to be followed when planning the map's colour scheme:

1. Define, whether the data is of qualitative or quantitative character – in the case of tourist maps the data will have a qualitative character.
2. Find out if colour conventions exist for the given topic – in our case the answer will most likely be "no".
3. Check which colour connotations can be used for the intended mapping project.
4. Respect the general rules for colouring areas, such as no dark colours for broad areas, preserve the readability of other overlaying signatures etc. .

These explanations about the use of colour on maps can be seen as guidelines but not as strict rules which have to be followed in all cases. The choice of colours for map making is always a compromise: on the one hand, colour associations must be taken into account, but on the other hand, the colours should be clearly distinguishable from each other and other signatures like point and line signatures must be well identifiable. Moreover, one should not forget that the fact which colours are considered beautiful or suitable for a given topic is normally influenced by cultural imprint or subjective perception (Dickmann 2018:143). Every mapper will find his or her own solution for this problem. This is way, commercial maps like city maps or road maps, for example, try to please as many people as possible by the use of vivid and high-contrasted colours (Witt 1970:137).

## 5.5. Lettering – How to place texts on maps

Maps usually do not only consist of colours and signatures but they also contain texts. Maps which do not have lettering in it are called "silent maps" (Wilhelmy 1981:128). Such maps can be used, for example, to test the geographical knowledge of pupils but they are definitely not useful for orientation in an unknown area. Primarily, lettering functions as a help to identify the objects which are presented in the map. Besides, map type cannot only serve object identification but can also offer additional explanatory information to the map's content (Wilhelmy 1981:128). Lettering can be placed beside the signature that should be labelled or explained further but it can even replace the entire signature (Paschinger 1967:27, Wilhelmy 1981:128).

Beyond doubt, lettering is an indispensable part of maps. But here as well - as we can imagine after reading the previous chapters about other map design elements like colours and signatures - the map maker is not completely free in his decisions according to the map type's character.

The first decision the cartographer has to take is which map objects should be labelled and which not. In this context, it has to be mentioned that some authors refer only to the text within

the map's frame when they describe their rules for lettering on maps (e.g., Großer 2001g, Kraak 1997:128). But of course, letters can also be found in the map's title, the legend etc. Explanations for designing such text elements can be found in Judith Tyner's "Principles of Map Design", for example (Tyner 2014:43-46). So, before giving a brief summary of lettering for the texts in the map's margin, the focus will be on the text within the map's frame since in this case more rules have to be considered than in the case of margin texts.

The lettering that is mostly to be found in maps are names. So the mapper will have to decide which of the objects presented in the map should be labelled. The most important names which should be mentioned in a map are, e.g., cities, villages, rivers, lakes, islands and mountains. Depending on the scale, countries or continents could also be named. If we have a large-scale map, individual objects like castles, churches, roads, public institutions etc. can be labelled. One can say that the decision which labels to put in the map and which not arise also a kind of generalisation, depending on the scale and the general topic of the map. (Wilhelmy 1981:128). Besides, it is not always necessary to have the object's complete name on the map. It would also be possible to work with abbreviations, provided that the abbreviation which is used is generally known and one can expect that most map users will understand it (Kohlstock 2014:102, Hake 1994:103). A common example in the case is the abbreviation "Mt" which stands for mount and can be often found in English maps. In German maps, one can often see the abbreviation "Bf", indicating that a station (in German: Bahnhof) is located here (Kohlstock 2014:102).

In addition to entire names and abbreviations, maps can also contain numbers. Numbers can be, e.g., contour line numbers and geodetic points. (Kohlstock 2014:102). By the way: numbers were established on maps only in 1850 (Paschinger 1967:28).

Another important step for high-quality map lettering is the label placement. As one can imagine, it is wise to place the lettering next to the object which is to be labelled to achieve an explicit attribution of the object and its name (Hake 1994:105). On the other hand, the lettering should not hide too much of the other map information (Hake 1994:105, Paschinger 1967:27).

The exact placement of the labels depends on the question which type of signatures should be supplemented by a name. For point signatures, Großer recommends to place the lettering to the right of the signature (Großer 2001e). Wilhelmy adds that the name of point signatures must be in a horizontal position (Wilhelmy 1981:128). In the case of line signatures, the labelling text should be parallel to and close to the line or even following their bends (Kraak 1997:128, Hake 1994:105). The labels of area signatures have to be placed in the centre of the area which is to be named. If the area is rather small, the letters can exceed the area's borders. (Großer 2001e) Then again, if the area is a large one, letters can be enlarged (Großer 2001g) or spread out to cover the extent of the area (Tyner 2014:46-47).

At this point, it is necessary to discuss the design of the map lettering. As one can image, it is not wise to use only one font or one font colour. Firstly, we can assert that the font size can be

used to differentiate between the varying significance of objects (Paschinger 1967:26, Salitschew 1967:69) or, in general, to give quantitative information (Witt 1970:139). So, e.g., different font sizes could show different sizes of cities. Information which is of qualitative character can be pointed out by working with different fonts or font colours (Salitschew 1967:69, Witt 1970:140). Naturally, the fact that the applied font colour and the background colour contrast with each other must be taken into account. If the lettering's colour and the base map's colour are too much alike, it will be very hard to read the lettering (Salitschew 1967:68). As a consequence, Großer recommends to use mainly black as a font colour since black contrasts with a high number of colours (Großer 2001h). Witt adds that a dark grey font colour also would be appropriate in such cases (Witt 1970:138). If the background is kept mostly in darker colours, it would of course be possible to use white as a font colour (Großer 2001h). Furthermore, it should be mentioned that especially tourist maps have a wider range of possibilities to work with different colours (Großer 2001h).

Regarding the fonts used, it is claimed in literature that today mainly sans serif fonts are used (Großer 2001i). Serifs are "small finishing strokes protruding from the edges of most letter forms" (Peterson 2012:46). A sans serif font, on the other hand, does not have these finishing strokes (Peterson 2012:46). Peterson recommends to combine serif and sans serif fonts in a map (Peterson 2012:46).

Besides using different font colours and alternating between serif and sans serif fonts, we do have some other possibilities to diversify the lettering's appearance. When talking about labelling wider areas, it has already been mentioned that letters can be spread out. The process of enlarging the space between the letters of one word is called "spacing" (Großer 2001j) or "tracking" (Peterson 2012:46). Spacing can also be used to emphasize names in maps (Großer 2001j). Another possibility to make written information in maps stand out is to use only capital letters in one word (Großer 2001k). But: capital letters are hard to read in the case of longer words or texts, so it is advised to use them only for some labels (Großer 2001k). Furthermore, the font weight, i.e., the stroke width of the single letters, can be varied. It can be varied in roman, book, semi bold (or heavy) and bold. Likewise, the grade of the letters is of interest. It can be regular (normal) or italic. (Großer 2001l) An italic font, e.g., can be a good choice for labelling stretches of water (Großer 2001h, Wilhelmy 1981:128).

The previous explanations present a brief introduction to the most important rules for lettering in maps. But, as already mentioned before, a map does also have lettering outside the map's frame like the title, the legend etc. So we should also take a brief look to the question how to work best with lettering in these cases. Großer suggests to use spacing for the map's title or other titles (e.g., the legend's title) (Großer 2001j). It would also be possible to use capital letters (Großer 2001k). Since the title is normally the most important intellectual feature and should therefore catch the map user's attention, it is advised to provide it with the largest type size of all type sizes used in the whole map (Dent 1999:280-281). According to this, subtitles should have smaller type sizes while the source statement commonly has the smallest type size (Dent

1999:281). But: in the case of the title and the legend not only the lettering's appearance is important. Here, it is also necessary that the texts themselves offer appropriate information. More details about the content of title and legend can be found in chapter 5.1..

Similar the use of colours in maps, the choice of how to present and design the map's lettering is always a compromise of between an adequate amount of names which enables orientation but does not hide too many other map information and the basic rules of lettering and its readability. When deciding all these points, it should always be kept in mind that the lettering has a "significant impact on the usability of the final product" (Peterson 2012:45). An inappropriate choice of fonts or a bad placement of labels might even lead to a map which is unusable (Arnberger 1966:22).

## 5.6. Planning the map's layout

After having talked about how to design the map itself, we need to discuss the other map elements which need to be placed on the map sheet and how to arrange them best. This means we need to plan the map layout. When we talk about map elements, we refer to the elements mentioned in chapter 5.1. which have to be on every map. Beside these general map elements, we also have some other objects which need to be considered when thinking about the map layout. Such objects could be, e.g., diagrams, description fields, street directories or inset maps (Salitschew 1967:42). They do not have to be on a map but it is an option to use such elements if it is necessary for the map's topic. How to work with inset maps especially or in which situations they might be of use, is described in chapter 5.7..

The first consideration when planning the map layout is whether the map is a standalone one or whether it is part of a map series. If the map is part of a map series, the map maker will face some restrictions when arranging the map layout since the map's overall design should of course fit in with the other maps which are part of the map series. (Großer 2001m)

Beside the question whether the map is part of a map series or not, the options for the map layout are also dependent on some other factors. One relevant factor is the map's orientation: is it portrait or landscape? Another question would be: how do the map face's boundaries look like? On the one hand, the map face can be limited by the borders of administrative units. The result is a map face which shows irregular borders. (Großer 2001n) On the other hand, the map face can be limited by a rectangular frame. Putting the map in a frame usually means cutting of parts of the map face, so the map extract that should be shown has to be chosen carefully. (Großer 2001o)

When planning the map layout, the map's future folding has also to be taken into account (Hake 1994:394). A well-thought-out folding contributes to an easy handling. In turn, the manageability of a map is essential for its usefulness, especially when being used in open

country (Hake 1994:394). Also of importance is the question whether the backside of the map is also printed on or not (Hake 1994:394).

According to various authors, these are all things that have to be considered when thinking about how to arrange all map elements on a map sheet. But: literature does not talk much about what a good map layout really looks like. Most technical books only take a brief look at map layout. The authors agree that the map layout's main aim is having a well-balanced distribution of all map elements (e.g. Großer 2001m, Hake 1994:244, Salistschew 1967:43). Still, we do not get much information about how to reach this balance. However, we do get some hints which should be of course summarised here.

As already mentioned before (chapter 5.5.), the map's title should catch the map user's attention at first sight. To get this eye-catching effect, the title's font size must be sufficiently large and the title should be placed in the upper section of the map sheet (Buziek 2001). Großer agrees with him to best position the title on top of the other map elements and adds that it should be at the top and on the left (Großer 2001m). Subheadings should be found in a smaller font size directly underneath the main heading (Witt 1970:250-251, Hake 1994:451).

The legend can be positioned in the lower parts of the map sheet (if we have a landscape format) or on the right side, if the map sheet is in portrait format (Großer 2001m). Witt consents to this proposal. He appends that it is not wise to have the legend to the left of the map face. (Witt 1970:251)

The lower parts of the map sheet are seen as the best space for the scale (which should be given as a scale bar and as numeric scale) and the source statement (Buziek 2001, Witt 1970:251, Großer 2001m). The map's back side can be used for a street directory or touristic information (Hake 1994:394).

Another aspect that has to be taken into account when thinking about how to place the map elements on the map sheet is visual hierarchy. Visual hierarchy is defined as "the intellectual plan for the map and the eventual graphic solution that satisfied the plan" (Dent 1999:266). Since not all map elements or all map information are of equal importance, the visual hierarchy has to work out these differences in importance (Dickmann 2018:24) and to lead the map user's eye (Tyner 2014:28). This can happen, e.g., by using striking colours or enlargements (Tyner 2014:28, Dickmann 2018:24). So the less important information should have an inconspicuous design while, consequently, the more important map information has to catch the map user's eye (Dickmann 2018:25).

## 5.7. Inset maps

In some cases it might be necessary to have more than one map on the map sheet. Such a map which is smaller than the main map is called “inset map” (Tyner 2014:38) or “auxiliary map” (Stams 2010e).

The main purpose of inset maps is to supplement the main map’s content (Stams 2010e). Hence, the inset map can show a section of the entire territory which is of special interest at a larger scale to have the possibility to add more detail (Salitschew 1967:42, Tyner 2014:38). Or the inset map can be at a smaller scale to show surrounding areas (Tyner 2014:238). The use of auxiliary maps is also an option for representing areas outside the borders of the main map (Tyner 2014:238, Salitschew 1967:42). Furthermore, inset maps can show additional characteristics of the area displayed in the main map (Salitschew 1967:42).

Of course it is also possible to have more than one auxiliary map. But that does not mean that the integration of inset maps is obligatory. Judith Tyner cautions against the overuse of auxiliary maps (Tyner 2014:38). Likewise, Werner Stams notes that inset maps can give the map sheet a messy appearance. But auxiliary maps can also help to fill the map sheet. It should also be remarked that several maps of the same size and/or the same topic which are placed on one map sheet are not seen as main map and inset map. They can be called “part maps”. (Stams 2010e)

If the inset map and main map are at different scales, which happens in most cases, the particular scale needs to be added on both maps (Tyner 2014:38).

## 5.8. Specific cartographic requirements of hiking maps

Since hiking usually takes place in mountainous areas, we will have a closer look at the question how to best express mountains in a flat map. Incidentally, the representation of terrain is seen as one of the most complicated problems in cartography (Arnberger 1975:259). As one can imagine, it is not an easy to solve problem to represent three-dimensional information in a two-dimensional map (Wilhelmy 1981:106). What is more, there are different requirements towards the representation of the terrain which should all be respected in one map. First, the relief should be expressed in the map in a geometrically correct way. This means that it has to be possible for the map user to get exact information about heights and to be able to determine altitude differences. Secondly, the map user needs to be informed about inclines and wishes to have a vivid illustration of the surface forms. (Wilhelmy 1981:106-107, Paschinger 1967:29, Arnberger 1975:260, Hake 1994:380) So we will have a closer look now at the question how these requirements can be converted into the map.

Over the years, different ways of representing terrain have been developed. Today, contour lines, hill shading, height points and the coloured hypsometric layer are the techniques

commonly used for showing the ground (also in combination). The idea behind these techniques and their advantages and disadvantages will be explained briefly. We will also have a look at the question which method is suitable for which map scale and how to combine them the best.

First, we will focus on **contour lines**. Contour lines are lines which connect ground points of the same height above sea level (Arnberger 1975:267). These lines are fictitious and do not exist in nature (Wilhelmy 1981:120, Kohlstock 2014:92). Index contours are lines which are provided with height points (Paschinger 1967:29). The distance between two contour lines is called "contour interval" (Wilhelmy 1981:121).

Contour lines have one big advantage: using them is the only method of mapping the relief which gives geometrically correct information (Wilhelmy 1981:121). But: being able to read them requires some practice (Paschinger 1967:31) and many map users believe them to be abstract (Wilhelmy 1981:123). However, contour lines are usually the favoured way of showing the relief in large scale maps (Kohlstock 2014:95).

Another possibility of mapping the relief which can be seen very often in maps is **hill shading**. Here, the idea is to express the terrain by shades (Kohlstock 2014:96). We differentiate between two forms of hill shading: slope shading and oblique light shading.

The method of slope shading uses dark colours for steep slopes and bright colours for the gentle ones (Wilhelmy 1981:115). Oblique light shading, on the other hand, assumes an oblique lighting of the ground (Kohlstock 2014:98). As a consequence, lighted slopes are given bright colours while the slopes which are in the shade have dark colours (Paschinger 1967:35). Talking about colours it has to be mentioned that both methods of hill shading use variations of grey and no other colours.

Working with hill shading means having a very demonstrative representation of the relief (Paschinger 1967:35). Also, it does not interfere with the readability of the further map content (Wilhelmy 1981:118, Hake 1994:385). But: hill shading is useless in respect of geometrical aspects (Wilhelmy 1981:118, Hake 1994:385). So it is often recommended to combine hill shading with contour lines (Paschinger 1967:35, Wilhelmy 1981:118). In this case, hill shading will support the vividness of the representation while contour lines will give mathematically correct information about the terrain.

Besides grey hill shading, we do also have a method which uses colours to represent the terrain: the **coloured hypsometric layer**. Coloured hypsometric layers are commonly used in atlases (Kohlstock 2014:98). Often, contour lines are used to divide the terrain into different hypsometric layers. Then, hypsometric layers are created from the contour intervals. (Wilhelmy 1981:128) After that, the individual hypsometric layers are coloured following the principle: the higher the mountains, the darker the colours. This method gives the map user information about the vertical structure of the terrain but it is not suitable for detailed measurements. (Kohlstock 2014:98)



A possibility to obtain exact information about heights in maps is to work with **height points**. Good places for adding height points to a map would be: mountaintops, depressions, mountain saddles, road junctions or bridges. The concentration of height points in the map face depends on the map scale. (Kohlstock 2014:100)

Some authors also mention **hachuring** as a way of showing terrain in maps. Hachuring can still be found in older maps, but is not commonly used anymore these days. Today, the representation of terrain is dominated by methods of contour lines, hill shading, coloured hypsometric layers and height points explained above. Hachuring can be divided in two forms, similar to hill shading: slope hachures and shadow hachures. (Wilhelmy 1981:110;113, Kohlstock 2014:90)

Important characteristics of slope hachures are lines which are drawn in the direction of the steepest gradient. In contrast, shadow hachures show the lighted and unexposed slopes. The lighted slopes have thinner hachures, while the unexposed slopes, consequently, are the ones with thicker hachures. (Wilhelmy 1981:110-111, Kohlstock 2014:90)

However, hachuring is normally not used anymore because of some great disadvantages. First of all, hachures darken the map face and therefore the map's readability is being interfered with (Kohlstock 2014:90). Furthermore, it does not give information about exact heights or is in any ways geometrically correct. Besides, it is not possible to compare gradients because of the method's inaccuracy. (Wilhelmy 1981:113)

After presenting the methods of terrain representation which are commonly used today, we will have a closer look at the question which method best suits which scale and how the methods can be combined with each other in an appropriate way.

The geometrically correct representation of the terrain is the most important factor in the case of large scale maps. So the map should primarily contain contour lines and height points. (Hake 1994:379)

For middle scale maps, the vividness of the representation is also of interest. Thus, it is recommended to add hill shading to the map face. Hill shading can be combined easily with contour lines so that the map still contains the geometrically necessary information. (Hake 1994:379, Arnberger 1975:322)

It is not possible to show each form of the terrain in a geometrically correct way in small scale maps. But: it is also not essential to have every single detail of the earth's surface in those maps. Here, the idea is to have an overview of large surface forms and their connections. Hence, hill shading in combination with coloured hypsometric layers will achieve the best results. It would also be possible to add some height points to the map. Contour lines are usually not used for small scale maps. (Hake 1994:379)

Regardless of the scale, it would of course also be possible to combine contour lines with coloured hypsometric layers. But this combination is not to be found very often in practice. If

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one still wants to work with hachuring, it works well together with contour lines or coloured hypsometric layers. It does not make much sense to put hachuring and hill shading together in one map. (Wilhelmy 1981:127-128)

## 6. Content of tourist maps – what is the message?

We already know who a tourist is and which cartographic rules have to be followed for designing a good map in general, including maps of mountainous areas. But our focus is not on maps in general but on hiking and city maps. So the next logical question would be how to design hiking and city maps in particular. The main focus in this case is on map content. The map's aim is to support the tourist in his travel activities and so the map has to include all information which might be required by the tourist. Thus, we need to know this information.

To answer that question, we will have a look at both cartographic and touristic technical literature.

### 6.1. What cartography says

#### 6.1.1. Hiking maps

Hiking maps have found attention in a few cartographic textbooks and also some professional journals. In this literature, practical details that affect the map's usability are taken into account in literature and the authors also describe the possible content of hiking maps.

One factor which has an effect on the usability of a map is the paper size. Here, we get different specifications in literature about the best paper size. Wilfert says that the format should not be larger than 80 cm x 60 cm (Wilfert 2001b) while Drey suggests 67 cm x 105 cm as a format (Drey 1988:148). In folded condition, the map can have a format of 10,5 cm x 17 cm which would be pocket size (Drey 1988:148). The paper's quality is of high importance. Since hiking is an outdoor activity, the paper might get wet because of a sudden rain shower. Consequently, it has to be weatherproof and also tear-resistant (Schulz 1984:128, Schulz 1984:134). Thus, the map will also survive frequent folding and unfolding. The paper's durability can be achieved by giving it a coating with plastic film or by spraying it with clear varnish (Linke 2017:27).

Authors do not agree about the best scale for a hiking map either. Kost claims that hikers prefer a scale of 1:50.000 (Kost 1970:184) while Wilfert tells us that the best scale is 1:25.000 (Wilfert 2001b). But she also adds that it is possible to use a smaller scale. However, the scale should not be smaller than 1:50.000. Furthermore, she advises to have the map in landscape (Wilfert 2001b). Linke, on the other hand, argues that 1:25.000 is best suitable for short hikes while a scale of 1:50.000 is usually used for long distance hikes. The Alpine Associations usually also use 1:25.000 as a scale for their maps. (Linke 2017:25)

It has been proposed by Kost to have the map face only on the paper's front page while the reverse side can be used for additional information (Kost 1970:184). The nature of this additional information will be explained in detail later on.

Drey suggests providing the map with a short and precise title like “Hiking and Freetime” (Drey 1988:147). Thus, the map user will immediately be able to see the map’s topic.

The base map for a hiking map is usually a topographic map (Kost 1970:182-183, Wilfert 2001b) or a map which at least contains a certain amount of topographic information in a satisfying quality (Schulz 1984:128, Schulz 1984:134, Wilfert 2001b). In this context, it should be mentioned again that hiking usually takes place in the mountains. So, it is not only necessary to get topographic information in general but also to have very detailed information about the terrain like the inclination or mountain heights. How to show the terrain in maps in general has already been explained in chapter 5.8.. But: not all the methods which were presented in this section of the paper are recommended for use in hiking maps. In this case, contour lines and height points are the most important ways of giving information about the terrain (Drey 1988:148). They can be complemented by hill shading (Wilfert 2001b).

Beside basic topographic information, the hiking map will also need some other details that are necessary for a hiking trip, such as mountain huts, viewpoints or overnight accommodation (Kost 1970:183). Descriptions about the quality of individual hiking trails are also useful. Trails which are in a bad condition or which have danger spots should be mentioned in the map (Mertins 1984:99). Those sections of hiking trails which are very scenic can also be highlighted in the map (Mertins 1984:99). Furthermore, it is recommended to suggest some themed tours to the hiker like, e.g., nature study paths or circular walks (Kost 1970:181, Drey 1988:148). At best, the given tours are provided with distance markers (Mertins 1984:96). By proposing themed tours, a map shows the hiker the variety the hiking area offers (Kost 1970:181).

For reaching the hiking area, it is useful to have information about approach roads, car parks or public transport (Kost 1970:184).

As already mentioned before, the map’s back side can be used for some additional information which could be, e.g., texts about proposed hiking tours (Drey 1988:148) or texts about the hiking area in general. Notes about flora, fauna or the history of the area shown in the map can also be of interest to the hiker (Kost 1970:184). By including photos or sketches, the texts are made less monotonous (Kost 1970:184). The map’s back side could also be used for an auxiliary map which shows a small part of the hiking area that is especially scenic or interesting at a larger scale (Kost 1970:183).

If the hiking area is often visited by foreign tourists, it is advisable to consider offering the information texts mentioned above in more than one language (Kost 1970:180). This applies to the legend as well (Kost 1970:184, Wilfert 2001b).

While planning the map’s design, it should be kept in mind that many map users are not skilled in using maps (Schulz 1984:134). And, what is even more important, the map users naturally expect the content of the map they have purchased to be always correct. Thus, it is essential that all given information, no matter whether it is in the map face or additional texts on the map’s back side, is absolutely correct. (Mertins 1984:102)

### 6.1.2. City maps

After having summarised what is said in literature about hiking maps and their possible content and design, we will have a closer look at city maps and how they are seen in literature. In the case of the city maps also, cartographic literature gives us some hints about the best outward appearance of such maps and what information might be of real use to city tourists. But - similar to the maps for hikers - authors do not agree on all points about the design norms for city maps.

Let us take the scale as a first example for this. Here, Pape recommends using a scale between 1:10.000 and 1:20.000 (Pape 1979:249). But he also says that even the scale of 1:20.000 might be too small for the city centre in detail. Here, much information needs to be fit into limited space. If the scale is not big enough, the map user will have some difficulties reading the map. One solution to handle this problem is to add an auxiliary map on the map sheet which shows only the city centre in a large scale (here a scale between 1:5.000-1:10.000 is recommended). (Pape 1979:249) Stams, on the other hand, proposes to use a scale between 1:10.000 and 1:40.000 for city maps (Stams 1965:180). Taking into account that a scale of 1:20.000 is already seen as too small for presenting all the necessary details of a city in the map face (especially all the uncountable details of the city centre), the suggestion to use even smaller scales up until 1:40.000 does not appear very practicable. But when we talk about scales, we face another problem: today's cities are getting larger and larger and therefore it is getting harder and harder to put the complete city zone on one map sheet. To be precise, this is not really a problem which has arisen in the past few years. Some authors already pointed out in the 1960s that it is becoming problematic to picture bigger cities like London or New York on one map sheet in a readable way (e.g. Falk 1969:29, Pape 1964:196).

So, what might be a solution to this problem? One possible solution has already been presented before: the city centre can be shown in an auxiliary map which offers a larger scale than the rest of the map (which therefore will remain in a small scale). Another possibility is to refrain from representing the whole city zone in the map. We should not forget the main aim of the city maps we are talking about: not to have a map which pictures the complete city but a map which shows everything that is relevant for a city tourist. And the spots which are normally interesting for tourists like the sightseeing attractions are usually in the city centre or in its vicinity. So in our case it might be a good idea to limit the parts of the city pictured in the map and to have only the relevant parts (mostly meaning the city centre) in it. (Stams 1965:181-182)

The publishing house Falk offers another solution to the problem concerning the best scale to use. For their maps, they use hyperboloid projections. The idea behind this projection is that the scale is not the same for the whole map - it changes. The city centre is shown at a big scale while the other parts of the city are represented in smaller scales - the further away an area is from the city centre, the smaller the scale. (Pape 1979:250)

In this context, paper size is also of interest. The scale problems result primarily from the fact that paper size is limited. Handiness is an important factor for city maps. To have a handy map, it should not be bigger than DIN A2 when unfolded. The folded map should, similarly to the hiking map, have pocket size. (Nebe 1985:214-215)

Cartographic literature also talks about the information which can be useful for city tourists and therefore should be added to the map. Firstly, the map needs all places of interest like historic buildings, monuments and cultural institutions such as museums and theatres. Hotels and restaurants can also be of interest. (Stams 1965:180) Other useful information relates to public transport and car parks (Nebe 1985:208, Stams 1965:185-186). Town halls, post offices, police stations and other public buildings can also be added to the map (Nebe 1985:209, Stams 1965:186). Furthermore, it is useful to know where hospitals and leisure facilities are (Verbraucherzentrale NRW 1976:114).

To facilitate good on-site orientation, Nebe recommends labelling all streets in the inner city zone (Nebe 1985:212-213). In this context, it should also be mentioned that a street directory is very helpful for city maps (Pape 1964:198). A search grid can help locating the streets faster in the map (Nebe 1985:213). If the map shows streets which lead to places outside of the map face, lettering besides the street can tell the map user where the street leads to (e.g. the next larger city) (Stams 1965:168). Having the map in north-orientation will also contribute to a good orientation (Pape 1979:230, Nebe 1985:212).

Similar to the hiking map, the city map can also include some texts about the city. The text could contain general facts about the city like size, population, history, industry and commerce (Pape 1964:198), but of course also information about the sightseeing spots and all the interesting buildings.

Another point where literature does not agree is which kind of signatures are the best to use for touristic city maps. Stams argues that it is a good idea to apply only letters and numbers to the map face because they do not need much space and therefore the map face will be very clear (Stams 1965:186). Nebe, on the other hand, recommends using pictorial signatures and front views of buildings because they are easy and fast to understand, even for foreigners (Nebe 1985:209, 214). Nebe also advises the use of different fonts and type sizes in the map. Thus, important information can be shown in a larger type size or in an eye-catching font colour. (Nebe 1985:211, 214) Furthermore, he reminds the map maker to add a scale, a scale bar and an easily understandable and complete legend to the map (Nebe 1985:213) and to work with colour associations (Nebe 1985:211).

At the end of this chapter, we should briefly focus on to the main aim of tourist city maps which is to discover an unknown place as quickly and as eventfully as possible (Nebe 1985:207). Thus, the map should show all streets and other connection like public transport and of course all the sightseeing spots and other places to visit (Pape 1964:198). Furthermore, when designing the map, we should always keep in mind that the map is usually used by laymen (Pape

1964:198). Therefore, the city map must try to be easily understandable for everyone (Falk 1969:27).

### **Insertion:** Maps of the main-trough roads

Some authors see maps of the main-trough roads as an appropriate addition to city maps. Such small auxiliary maps show the main roads which lead to the city as a help to get to the city and the biggest and most important roads in the urban area to enable fast movement by car (Stams 1965:179). The information can be given just in sketches which show the main-through roads only schematically or in overview plans of the city which are not to scale and where the important roads are pointed out (Stams 1965:179-180). Useful information which can be added to such an auxiliary map and which will help to plan the routes in the city are car parks, sightseeing spots and also one-way streets (Pape 1964:196). Roads which lead away from the city should be labelled with the next larger city (Stams 1965:186). Of course this should only happen if the labelling of the exit roads has not already taken place in the main map.

### 6.1.3. Criticism on tourist maps

It has already been mentioned in the introductory chapter that especially tourist city maps have already been criticized in the sixties and seventies. In 1964, Pape states that the field of city maps is remarkable for the fact that we have, on the one hand, many good examples but, on the other hand, an uncountable number of bad examples. According to him, there is no other field in cartography where this contrast is so distinctive. And in addition, this map type is used by a huge number of users, no matter whether the quality is good or bad. (Pape 1964:196) Pape also invented the term "disposable map for tourists" (Pape 1979:228) which does not have a very positive connotation, either.

Falk even denies that tourist city maps are maps at all. He claims that they are more a kind of replacement medium and should be better called a sketch but not a map. (Falk 1969:27) In the case of this particular critic, it must be remarked that the person who is cited here is a map publisher himself. As the founder of the Falk publishing house he might have not been very happy about the competition in the form of maps which are mostly distributed for free.

In the seventies, the North Rhine-Westphalian consumer advice centre examined a selection of city maps available at that time. In this study, it has been discovered that these maps are full of flaws. For instance, it was criticised that the maps often did not have an adjustment date so it was not possible for the map user to know how up-to-date the given information was. And, what is even worse, the maps actually contained incorrect or incomplete facts. (Verbraucherzentrale NRW 1976:114)

Hake sees the reasons why such maps have great sales figures in the map users themselves. According to him, map users do not know much about criteria for good maps. (Hake 1977:121)

Thus, they accept even badly designed maps. And, as already mentioned before, the map users presume that the facts given in the map are always correct (Mertins 1984:102) and do not expect them to contain false information. What is more, Hake also criticises the handling of maps by the map user. He points out that the use of maps is usually very hasty and the map user does not take much time to read the map. Therefore, the map user will gather only information from the map if the map design or the map elements are extremely eye-catching. That means the map maker has to work with strong colours, thick lines, colour contrast and titles that are a kind of advertisement headline to catch the map user's attention. (Hake 1977:123) But Hake does not only criticise the map user. He also sees a lack of research about "disposable maps". According to him, academic cartography considers these maps not to be of much value and, hence, not worth paying any attention to. Hake himself prefers to call such maps "short time maps" rather than "disposable maps". He expects them to have chances for the future and advises cartography to take more notice of them. (Hake 1977:130)

In the eighties, Nebe determined that cartography was still not very much interested in maps which are widespread and used by a great number of people (Nebe 1985:207). So the lack of research which Hake highlighted some years before Nebe is still present. Nebe himself did a study about tourist city maps where he rated 26 city maps under the aspects of information content, colour management, readability and handiness (Nebe 1985:208-215). In his research, he found some positive examples of tourist city maps but he also detected a lot of deficits in his selection of maps. The detailed results of his study can be found in the 6th edition of the *Cartographic Journals* in 1985 (Nebe 1985:208-215).

To sum this up, it can be said that, we see that tourist city maps did come in for a lot of criticism in previous years. Yet, there has neither been much research or study in these types of maps nor any real academic discourse at all. And, what is more, it has to be stated that Hake was right back in the seventies when he predicted that short time maps would have chances in the future. Tourist city maps are still being distributed in every city visited by tourists and are used by the visitors of the city.

So, this again shows us the value of this paper. Here, a wide-spread type of map will be studied and therefore fill the lack of research. Even more, the paper wants to contribute to the academic discourse about tourist maps or even open up a new discussion about this type of maps.



#### 6.1.4. Studies about hiking maps

In contrast to city maps, hiking maps did not receive that much criticism and not that much attention in studies either. One study that should be mentioned here has already been quoted in this paper: It is the one by Kost where he analyses how nature parks and national parks are represented in maps (Kost 1970). Since nature parks and national parks are usually good places for hiking, this study is interesting for our paper, too. He describes a selection of nature park maps in detail, analyses their design quality and after that gives recommendations for the design and the content of such maps. These recommendations were also helpful during the research for this analysis.

In the eighties, cycle maps came into the focus of scientists. This was due to the oil crisis of the seventies and also the up-coming keep-fit trend which led to an increased use of the bicycle and therefore to the need for more maps specialised in cycling (Mertins 1984:97). Two studies of the eighties which analysed and evaluated the cycle maps available at that time should be named here: one by Mertins ("Radfahrerkarten aus heutiger Sicht") and another one by Schulz ("Gestaltungsmerkmale bedeutender Radwanderkartenwerke"). They both evaluated a couple of cycle maps, named their deficits and also explained how to best design maps of this type. (Mertins 1984, Schulz 1984) These studies are of interest for this paper, too, since many design norms of cycle maps can also be taken into account when thinking about a hiking map's design. The information from the studies which is useful in our case have already been cited in chapter 6.1.3..

The final study which should be mentioned here is, a fairly new one. It is the study "Digitalisierung am Berg - Ersetzen digitale Angebote die traditionelle Wanderkarte?" by Moritz, Novak and Schwand. The researchers were interested in traditional hiking maps and also digital maps and which are preferred by hikers today. They arrived at the conclusion that printed maps are still the central source of information for hikers. Digital maps are also used by hikers but they are usually combined with the traditional paper map. (Moritz 2018:137) This shows us that printed hiking maps are still of importance and therefore should be investigated in more detail.

## 6.2. What tourism says

### 6.2.1. Tourist maps in touristic literature

As stated already in the introduction, one main aim of this paper is to rectify the mistake of previous studies which looked at tourist maps only from the cartographic point of view. So, as a consequence, we need to gain some knowledge of tourist maps also from tourist literature. First, we will therefore briefly summarise what touristic literature says about tourist maps. But: this point of research is a bit disappointing because all in all, touristic literature does not pay much attention to tourist maps. Most books and articles try to explain what tourism means and

who tourists are. They focus on the questions why tourists want to travel somewhere, how they decide which destination they want to visit and which expectations they have from their holidays. The social and demographical structures of tourists are also described. Furthermore, literature discusses marketing strategies and special politics for attracting more tourists to a destination. There are also analyses about the meaning of tourism for certain regions.

In some parts of the literature, maps in general are seen as an aid for analysing the ways tourists use a city or the places they visit, for example. With such maps it is possible to analyse which locations in a city are the centre for tourist activities and which are only border areas or which are even not visited at all (Steinbach 2003:20-22).

Furthermore, there is one particular problem that needs to be mentioned at this point. If we speak of tourist maps, it is important to note that technical literature does not always have the same understanding of tourist maps in the case of German vocabulary. The problem in the German language is that the term "Karte" for maps does not have just one meaning – it stands not only for the map but can also stand for tickets or cards. So if we look for the "Touristische Karte" (tourist map), we will not only find maps for tourists but also cards for tourists. These tourist cards are offered by the tourist offices of certain regions and give the tourist the possibility of access to particular tourist attractions at a reduced rate or even for free (Steinbach 2003:210, Bochert 2001:48). Even access to traffic infrastructure can be included in such cards (Steinbach 2003:210). The idea behind the tourist cards is of course a better and more active marketing of a certain region (Steinbach 2003:210). Those cards are given to tourists for free or can be bought at the tourist office (Bochert 2001:48). The more attractions can be visited with such a card, the more attractive the card becomes for different groups of tourists (Bochert 2001:48). One example for a tourist card is the BodenseeErlebniskarte (Lake Constance Adventure-Card) which was first established in 2000 (Bochert 2001:48) and is still a favourite marketing medium. It can be bought at the tourist office of Lake Constance and it is not for free. But with this card, the tourist is able to visit many museums, castles etc. for free (Internationale Bodensee Tourismus GmbH 2016).

The tourist maps we want to analyse in this paper are mentioned as well in some books about tourism. Steinbach claims in his book "Tourismus" (Tourism) that maps are a good method to guide the tourists in a particular direction (Steinbach 2003:55). Althof as well pays some attention to tourist maps in his book "Incoming-Tourismus" (Incoming-Tourism). He states that tourist maps are often sold by tourist informations (Althof 1996:113). Bochert on the other hand says that the tourist informations often give the tourist the tourist maps for free since they can be used as advertising material (Bochert 2001:66). The truth might be somewhere in between: some maps are sold by tourist information offices while others can be taken for free since maps can be good for placing advertisements. The tourist can usually buy different kinds of tourist maps in local bookshops, too (Bochert 2001:66). My personal observations coincide with these statements found in literature: tourist maps can be acquired in tourist informations

or in bookshops. Sometimes hotels (or other accommodation) offer maps for free to their guests, as well.

Literature of course not only mentions where those maps can be obtained from. Althof describes maps as a system for information and orientation to help tourists orient themselves in a foreign environment (Althof 1996:115). He also already specifies some norms for the design of such maps, claiming, e.g., that maps have to be easily readable and understandable, even for foreigners. Furthermore, the map should give the tourist the possibility to find all places of interest. That might be achieved by marking them in a special way or by developing a route through the city which passes all points of interest. (Althof 1996:115)

Althof also speaks about maps that can be found in regional advertising brochures (Althof 1996:329). According to Althof, maps should not be missing in such advertising brochures since their value of information is really high. Also at this point, the author states what might be important for designing such maps. For example, he mentions that a scale has to be included on every map, which fits to our own observations in chapter 3.1.2. (What has to be on the map?). Moreover he notes that maps should contain mainly information that is really important for tourists. Other information that is not so interesting for tourists can be left out so that the map is not overloaded. It might also be useful to develop special maps for special audiences like hikers who want contour lines in their maps, for example. (Althof 1996:329)

In addition, Althof also distinguishes the role tourist maps can have in marketing (Althof 1996:344). According to him, maps can be found in each guidebook, prospect or brochure for tourists. Due to this distribution, maps are a good medium for advertising. The advertising effect can be produced by playing with different signatures, font sizes, typefaces or colours. (Althof 1996:344) Maps as graphic advertising media are emphasized by Freyer. He points out that advertisements on maps can also serve the tourists as a source of information about local offerings. (Freyer 2004:589)

In their book "Schöne Ferien" [Nice Holidays] Burghoff and Kresta mention that special protected areas in the USA are not mentioned or are not visible on maps so that the interest of tourists in such areas is not raised (Burghoff 1995:88). The fact that some protected areas might not be mentioned in maps to make tourist not visit them is an interesting idea and should be investigated more during the following research.

In summary, it can be said that touristic technical literature does not consider tourist maps much. Most tourist books and articles try to explain what tourism means and who tourists are. They focus on the questions why tourists want to travel somewhere, how they decide which destination they want to visit and which expectations they have in their holidays. The social and demographical structures of the tourists are also described. Furthermore, literature talks about marketing strategies and special politics for winning more tourists for a destination. There are also analyses about the meaning of tourism for certain regions. Thus, it seems that tourist maps are more a problem of cartography than a problem of tourism science.

Nevertheless, literature about tourism is of special interest for this work because it gives information about the needs and expectations tourists have for their holidays. These facts can help to understand what the needs and expectations that tourists have in maps might be and how these maps might support them during their travels.

### 6.2.2. Tourist demands on their destination

Map content must be fitting the map's target group and the group's requirements. Tourist maps should mainly contain information that is interesting for tourists during their holidays. Since literature does not talk about information that must necessarily be included in tourist maps, this knowledge has to be derived from other facts.

What can be learnt from literature is which infrastructure is required by tourists during their stay, what the visitors prefer to do during their holidays and which sightseeing spots or natural phenomena are of special interest to them<sup>2</sup>.

This leads us to the question which infrastructure elements, sightseeing spots etc. are relevant for tourists exactly and should hence be mentioned in the map. Firstly, we should have a closer look at the basic facilities of tourist destinations. The main aim of the basic facilities is not to be a tourist attraction but to make the stay pleasant and comfortable – or to enable a longer stay. The basic facilities can be divided in the subcategories transportation, accommodation, catering, tourism services and general institutions. The category transportation covers locations such as train stations, parking lots, car rentals, airports or bus stops –everything that is necessary to arrive at the destination and that is needed locally for moving around. In this case it should not be forgotten that public transportation does not only serve as basic transportation service– it can also be a kind of special experience for tourists. For example, historic railways or bus lines passing sightseeing spots will catch the tourist's attention (Egger 2007:71). The right accommodation offers the possibility for visitors to stay at a destination longer than just one day. Accommodation can be, for example, hotels, apartments or camping sites. The category catering includes restaurants, cafés, bakeries or bars. Tourist informations, tourist guide services or tourist associations are established especially for tourists. Such institutions can be summed up as tourism services. Hospitals, police stations, post offices or churches are normally institutions for the residents. Since such institutions can be important for visitors as well, they should be mentioned here and be merged in the category "institutions".

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<sup>2</sup> The compilation of tourist demands on their destination presented here does not exist in this way in any of the literature used for this thesis. Consequently, this chapter does not have any concrete bibliographical references. The reader who is interested in more information about this topic will find them in, e.g., Bieger 2010:125-127, 134, 164-165, Egger 2007:62, 71, 265-268, Kosma 2009:27-30 or Steinecke 2011:108-109. This literature was part for the research for this chapter as well.

The second main category covers free time activities, amusement and (sightseeing) attractions. Such factors can attract tourists to a destination and will make them stay for a certain period of time. Firstly, we have the natural conditions in an area. Natural phenomena or the local culture can attract tourists. The term "culture" covers a wide range of themes and so it should be taken as a single category. Subjects of cultural interest can be archaeology, meaning archaeological excavations or museums, buildings with a special architecture such as castles, ruins and monasteries or musical attractions, an area which covers operas, festivals, concerts, musicals etc. Paintings in museums or exhibitions and readings can also be cultural properties. Since some tourists are interested in sports during their holidays this theme will be considered in its own category. Relevant sports venues can be golf courses, swimming pools, high rope courses, beach volleyball grounds and of course ski regions. Shopping is also a popular free time activity nowadays. This includes shopping malls, factory outlets or, of course, souvenir shops. Holidays might also be used for rest and recreation; thus places that fulfil this purpose shall be in one group, too. Resting places could be the beach, parks or playgrounds. Some music events, theatre performances or folk festivals often take place for only a limited time but are tourist attractions as well. They can be found in the category of "temporary events". Attractions that are thoroughly man-made can be called "sui generis" (Bieger 2010:127) and provide the final group. Examples in this case are theme parks like Walt Disney World Resort or piers.

The complete list for all categories can be seen in fig. 18, p. 67. It should also be mentioned that the given list fits (nearly) all type of tourists. The characteristics of city tourists and hiking tourists will be described in detail in the following chapter.

## Tourism facilities

### Basic facilities

#### Transportation

Airport  
Bus stops / busses  
Underground railway /  
suburban railway / train  
/ stations  
Harbour / ferries  
Petrol station  
Car park  
Car rental  
garage

#### Accommodation

Hotels  
Flats  
camping

#### Gastronomy

restaurants  
pubs  
Cafés  
Pastry shops  
bakeries

#### General institutions

Town hall  
Churches  
Banks  
Post offices  
Police station  
hospital

#### Tourism service

Travel agencies  
Tourist association  
Tourist information  
Tourist guide services

### Activities/amusement/(sightseeing) attractions

#### Natural conditions

##### Natural phenomena

location  
Landscape  
Climate  
Relief  
Flora  
Fauna  
Natural scenery  
Sightseeing spots  
**Local culture**  
Cultural monuments  
Local traditions  
Local trade

##### Sports

Sport centre  
Ski region  
Golf course  
Tennis court  
Swimming bath  
Bowling alley  
Fitness centre  
Miniature golf  
Beach volleyball  
Football ground  
High ropes course

#### Shopping

Shopping centre  
Souvenir shop  
Department stores  
Boutiques  
Factory outlets  
Pedestrian zones  
Shopping street

#### Rest & recreation

Beach  
Promenade  
Playground  
Zoo  
Park  
Disco  
Solarium  
Massage  
Spa  
Beauty culture

#### Temporary events

Music  
Theatre  
Sports  
fair

#### Culture

##### archaeology

Museum  
Archaeological excavation

##### Architecture

Castles  
Ruin  
Monastery  
Historical location

##### Music

Festival  
Opera  
Concerts  
Musical

##### Art

Workshop  
Museum  
Exhibition  
Vernissage

##### Literature

Reading  
Awards

##### National exhibitions

#### Sui generis

= Man-made attractions  
Amusement park  
City square  
pier

### 6.2.3. Being a city tourist

Since the focus of this paper is on city maps, we need to have a closer look at cities as a destination for tourists. At first, it can be determined that cities in general are attractive destinations for tourists since they usually offer a wide range of restaurants, museums, historical buildings, cultural offerings, freetime activities and shopping facilities (Steinecke 2011:124). So it should be possible for every tourist to find an activity that pleases him or her.

In literature, the group of city tourists and their expectations of cities as a travel destination in general has also been described. Motives for visiting a city can be cultural or sports events, fairs or exhibitions, sightseeing and shopping (Althof 1996:57). Other reasons for people to visit a city can be the desire for fun and entertainment. Such people are looking for exciting experiences while other people prefer to use their city trip for recreation and just to get away from everyday life. Besides, the wish to eat out and to go shopping is often a reason for such travels. (Steinecke 2011:125)

City tourists are often looking for guided tours of the city, a wide variety of gastronomy and a neat cityscape. It is important to understand that visitors are not interested in a city that is easily exchangeable with other cities. The city should have its own character and should display typical regional characteristics. City tourists do not like a great volume of traffic, high prices and shopping that is restricted through short opening hours. Limited opening hours of shops but also of sights and leisure facilities can be a problem since the length of a city tourist's stay is usually rather short and so the days are packed with an extensive program. (Althof 1996:57)

Althof also explains the important factors for enjoying free time in cities (Althof 1996:32). Such factors can be inner-city parks, shopping areas, a historic centre or a river or a lake where it is possible to do water sports. Pubs, beer gardens, cinemas or theatres can also be attractive places to pass one's free time in a city.

The definition of tourists given in chapter 3.2.1. concentrates on tourism in general. But we should also have a closer look at the typical city tourists and their characteristics.

Liebsch (Liebsch 2003:23) describes them in detail: Holidays spent in a city are usually just short trips. Most tourists do not have more than four overnight stays. Furthermore, cities are favoured destinations for day trips, so some visitors do not stay overnight at all. The preferred travel seasons for city trips are late spring, early summer and early autumn. Summer time is mostly used for longer travels and not for short trips. The favoured means of transportation is the car, although buses and trains are also important for city tourists. The city trip is normally arranged by the tourist him- or herself. Travel agencies are rarely used for planning a city trip and such trips are in most cases no package tour. Visiting cities is popular with all age classes. Beyond that, it is remarkable that the percentage of tourists coming from abroad to visit any given city is relatively high. Small towns with historical buildings are – beside large cities – particularly favoured by foreigners. (Liebsch 2003:23)

The typical city trip usually consists of a mixture of sightseeing, walks, eating in restaurants, visiting museums and exhibitions and of course shopping (Steinecke 2011:125).

#### 6.2.4. Being a hiker

The motives for hiking holidays differ from the ones for city trips. In case of hiking holidays, tourists like to enjoy some quality time in the nature and want to be active. In this context, they expect positive effects for their health and hiking is seen as de-stressing. Comparable to the motives of city tourists, hiking tourists also want to have new experiences away from everyday life. For some people, hiking means peace and quiet and enjoying time alone while others prefer hiking in groups because they are more sociably inclined. (Steinecke 2011:211)

Althof, who has described the expectations of city tourists during their stay specifies the preferences of hiking tourists during their holidays as well (Althof 1996:54). He claims that hikers usually favour simple accommodation which offers regional kitchen and rooms for get-togethers. Hiking trails should be varied, well looked after, signposted and equipped with benches and resting places. Luggage services can be useful for hikes that last several days. Naturally, a map cannot be responsible for hiking trails to be varied or well looked after but it can show hikers the position of the next resting place and where the best accommodation or restaurants with regional kitchen are. A map can also give information about the general state of the hiking trail, meaning whether it is steep, uneven etc. but it cannot react to short-term changes of hiking trails which can be, e.g., caused by storms. To fulfil the desire for varied hiking trails, a map can propose different routes.

The motives for hiking holidays differ from the one for city trips. In case of the hiking holidays, the tourists like to enjoy some quality time in the nature and want to be active. In this context, they are expecting to gain some positive effects for their health and hiking is seen as de-stressing. Comparable to the motives of the city tourists, the hiking tourists also wish to have some new experiences aside from everyday life. For some people, hiking means having some peace and quiet and enjoying time alone while other prefer to hike in groups because they appreciate sociality. (Steinecke 2011:211)

#### 6.2.5. Guidebooks

Mundt focuses on guidebooks in one chapter of his book (Mundt 2001:173-174). He describes guidebooks as "recipes" for discovering a country, a region or a city with little investment of time. According to Mundt, the content of guidebooks usually consists of information about the destination's typical leisure activities and places of interest. Guidebooks do not represent all possible activities of a region. Their main aim is to help the tourist concentrate on the most important sightseeing spots so that the tourist has the possibility to fill the (short) time he spends at the destination most efficiently. But: the use of guidebooks for discovering a region



has one great disadvantage – the visitor's field of vision is often narrowed. Sights that are not mentioned in the guidebook remain unnoticed. Tourists rush from one place of interest to the next and do not roam through the city. This should not give the impression that using guidebooks during holidays is not recommended. They tell tourists what to expect during their travel and also focus their attention on activities or places of interest that would otherwise maybe not be in the centre of attention. (Mundt 2001:173-174)

What Mundt tells us about guidebooks should be kept in mind during map creation. Places of interest mentioned in the map will automatically awake the tourist's interest. Objects that are not explicitly cited in the map will not get many visitors. So the map maker has to decide which sights and leisure activities he wants to put to the tourist's notice. The map making process also allows the mapper to shorten the tourist's field of vision consciously. Parts of the city that should not be visited by tourists (for example the locals' living environment) can be designed in a way that they do not attract attention or that they are not noticed as something special (and something worth visiting). Burghoff and Kresta talk about US maps where protected landscapes are not mentioned at all (Burghoff 1995:88) so that they do not raise the interest of possible visitors (cf. chapter 6.2.1.). So we can see that the idea of keeping tourists away from certain places is not only theory but is already practised in maps.

#### 6.2.6. The theory of orientation

A phenomenon that is described by Steinbach (Steinbach 2003:101) gives us a good example of the importance and relevance of tourist maps. This theory deals with the phase of the tourist's orientation and acclimatisation to his holiday environment.

Steinbach assumes that tourists possess two different kinds of information about their destination before they start their holidays: hard information and soft information. (Steinbach 2003:101) Hard information stands for safe knowledge about spatial patterns. The tourist knows exactly where to find all the facilities that are important to him and how much time it takes to get there. Thus, holiday activities can be planned without any difficulty. Soft information, on the other hand, represent elements of uncertainty. In this case the tourist does not have sufficient information about the destination's spatial patterns. Hence the orientation at the holiday destination cannot be planned in advance and may be problematic during the first days of holidays. This can lead to insecurities and stress.

Both hard and soft information have a spatial part and a temporal part. The spatial part refers to the spatial distribution of elements in a given area. The temporal part results from opening hours or the time that is required to cover a certain distance. (Steinbach 2003:101)

Another important aspect in this case is the question where the tourists get all this information from. Spatial information can usually be gained from maps, brochures or descriptions in guidebooks. Such information is objective. Spatial information can also be subjective (or

experiential). Mental maps are an example for this case. Objective temporal information is measurable with the help of clocks or calendars while subjective temporal information relates to the mental sense of time. (Steinbach 2003:103)

Normally, the first visit to a holiday destination means a lack of information and vague ideas of time and space. The tourist already has some information from guidebooks, maps, brochures or from reports by friends or family who have already been to the destination. This information is combined with the tourist's own observations on location and result in an image of the holiday environment. (Steinbach 2003:103)

Since, as already mentioned before, an impeded orientation at the holiday destination during the first days of vacation may cause the tourist stress, Steinbach advises hotels, tourist informations etc. to make the arrival at a destination easier for the tourist by offering brochures, handouts, maps or even by organising informative meetings. (Steinbach 2003:104)

To sum this up, we can say that tourists require information which eases their orientation in unfamiliar surroundings. One possibility to get such information is the use of maps. This again underlines the importance of maps. They can limit insecurities by telling the tourist where to find everything he needs. Temporal information cannot be derived from map as easily. With the help of scale and scale bars, it is possible to gather information about distance. Hence, it is possible to estimate the required time to reach the desired spot. But: a scale bar does of course not communicate the opening hours of museums, restaurants, etc. which are also part of the temporal information that is required by tourists. At best, this information can also be found on the map sheet.

Mundt (Mundt 2001:171) also mentions the fact that planning activities during the holiday means gathering temporal information (information about temporal structures) and dealing with them.

### 6.2.7. Which spots should really be added to the map?

As we can see, the list gives us a huge variety of spots that could be marked in a map. Surely, not every point that is mentioned in the scheme above is relevant for each tourist destination. Some destinations will be missing a beach, an opera or a castle and of course not every place can offer archaeological excavations or ski pistes. Nevertheless, we still have a wide range of information that can be possibly added to a map. Especially the things mentioned in the category of the basic facilities are normally to be found in every destination. So, if every institution, every restaurant, every sightseeing spot, every place for free time activities (and so on) which exists at a destination is marked on the map, this will consequently lead to a map slightly overloaded with information. Hence, this opens up the question whether really all points given in our list should be added to tourist maps or not. And, if not, which information is absolutely relevant and must be included and which information can be left out.

A first hint for answering this question comes from a field which maybe does not have that much to do with mapping at first glance: marketing. Freyer suggests for every tourist destination to consider whether they actually want to take part in each field of tourism meaning if the destinations wants to attract cycle tourists, hiking tourists, event tourists, shopping tourists etc. all at the same time (Freyer 2004:459). He and Althof point out that it can be a wise decision to focus only on one field of tourism (Freyer 2004:459, Althof 1996:21). This idea can easily be transferred to mapping: If the destination focuses on one type of tourists already, these tourists should also be the target group of the map. That would imply that the information which is marked in the map should mainly be useful for this group. If the destination does not have a clear target group yet, the mapper can nevertheless decide if he wants to design the map especially for a special group of tourists or not. Freyer recommends to list everything that the destination can offer to determine which of these offers represent the destination's profile best and then to decide on this basis how to present this information to the consumer. At best, a destination regularly tries to create new attractions for tourists and keep an eye on the existing attractions which do not attract visitors any longer in order to improve them or to even close them down completely. (Freyer 2004:459) In a similar way a map cannot always stay the same once it is produced. It always needs the map maker's attention: Does the information presented in the map still match the destination's reality? Is it still relevant or do the map users need other information that did not get attention in the map before?

Above all, one should not forget that we have many competing destinations. Therefore, it is necessary that a destination is able to develop its own special profile which sets itself apart from other destinations (Freyer 2004:462). This should also be expressed in the map.

## 6.2.8. Advertising and design for tourists

### **Principles for tourism advertising**

We also need to have a closer look at the principles of tourism advertising which Althof describes in his book "Incoming-Tourismus". First, he claims that advertisements for tourists need to have a simple and clear language. Secondly, the advertisement has to be sincere. It must not awake wrong expectations. Words like dream, paradise or sensation are to be avoided. The advertisement's focus is on the human being and not on palm trees, airplanes or hotels. Furthermore, Althof emphasises the use of simple language instead of an affected terminology. Also of importance for successful tourism advertising is harmony – which means harmony with the advertisement's target group, a harmonic content of the advertisement and of course harmony between the tourist's possible expectations and the advertisement's promises. Nevertheless, an advertisement must catch the tourist's eye and must not bore him or her. Still, it is recommended not to use too many different colours and fonts. Slogans or concepts which already exist should not be renewed too often – continuity leads to a high recognition value. At the end, Althof points out that successful advertisements are usually

made by advertising experts and not by ordinary persons even if they might have useful and creative ideas. (Althof 1996:327)

### **Principles for tourist information**

In this context, the principles for tourist information by Bieger are also of interest (Bieger 2010:100). According to him, information for tourists has to be exact to avoid frustration. They need up-to-dateness but also convenience. Tourist information of every kind should be fast and easily available and create confidence.

### **Corporate Identity and Corporate Design**

After talking about a tourist destination's profile, it is also useful to have a closer look at the topic "corporate identity".

Corporate identity can be defined as the appearance of an institution (Freyer 2004:347). One can say corporate identity is the institution's personality (Freyer 2004:347). Corporate identity should be homogeneous and consistent.

Corporate identity can be divided into corporate design, corporate behaviour and corporate communication. Corporate design describes the outward appearance of an organisation. Logos, lettering, etc. which are used in advertisements, on posters or maybe even for souvenirs should always appear the same to get imprinted in the customer's consciousness. At best, an organisation succeeds in developing a design which is always connected by the customers with this organisation.

Corporate behaviour refers to a company's principles and values which influence its actions. A popular example for such a principle would be: "The customer is always right".

Corporate communication is the communication with staff and especially the communication with the media. The important aspect here is to communicate and to transfer corporate identity inside the company but also outside of it. (Freyer 2004:347-350)

It is necessary for us to know whether a destination has a corporate identity or not because corporate design can be used for maps as well. Logos which represent a destination should of course be part of the map's design. Other elements of a corporate design can be integrated in maps, too.

### 6.3. Negative aspects of tourism

The previous explanations about tourism and tourists still lack a critical approach to the topic "tourism". Until now, the reader might have had the impression that tourism is something thoroughly positive and that the main aim of each and every potential destination should be to attract as many tourists as possible. But: tourism also has some negative aspects which will be summarized in short now.

Until the 1960s, the negative aspects of tourism had not been taken into consideration. At the end of the sixties and the beginning of the seventies, environmental awareness and critical thinking were first raised. Now, spatial consequences and other negative effects of tourism were discussed. (Wolf 1986:115)

The negative consequences of tourism are spread widely: they affect residents but also flora and fauna and nature in general. Municipal governments and urban planning are confronted by various problems but also by additional costs.

At first sight, tourism seems to be something very positive since it means that new jobs in the tourism industry are created and the tourists bring income to the destination. But: the jobs in the tourism industry are mostly only available during the holiday season and they are usually not well-paid (Wolf 1986:135). Such employment is mostly taken by unskilled and not highly qualified workers while management positions are reserved for non-locals (Steinecke 2011:98).

If the tourists bring money to the destination, increasing prices of consumer goods, services and properties are often a consequence. Properties are purchased by rich non-locals. Therefore, the life situation of locals might even get worse. (Steinecke 2011:104, Bieger 2010:100)

This means, as a result, that only a few people benefit from positive income effects. Hence, social unrest might arise. (Althof 1996:162) Social unrest and social disparities, on the other hand, may lead to increasing crime (Steinecke 2011:105).

A consequence of tourism can often also be the loss of cultural identity. Art and trade are adapted to the tourists' taste. (Althof 1996:162)

Furthermore, locals face noise pollution by an increasing volume of traffic or so-called overcrowding (Mundt 2001:458). Beside noise pollution, traffic also leads to air pollution (Wolf 1986:116) and traffic jams (Wolf 1986:127).

The number of tourists may be higher than the number of locals (Steinecke 2011:104) and therefore urban infrastructure is used by many more people which again means that the costs for maintenance and services are much higher (Steinecke 2011:133). The costs for city cleaning and wastewater treatment are also higher. Hence, financial resources for public institutions that are mostly used by local residents might be missing. (Steinecke 2011:104)

Furthermore, monuments, historical buildings and other sightseeing spots might get damaged – intentionally and non-intentionally - by the high numbers of visitors (Steinecke 2011:104).

But not only the locals and cities can suffer from (mass) tourism. Tourists also disturb nature. Animals' living spaces are destroyed, they are scared off or disturbed while brooding (1996:162). Plants are trampled on or picked up (Steinecke 2011:99), which is a great problem for protected plant species especially (Wolf 1986:119).

In addition, there are less and less different species because green areas are planted instead of allowing uncontrolled growth (Althof 1996:162).

Water pollution is also a great problem. This can happen because of missing sewage works (Mundt 2001:457), tourist boats (Freyer 2001:375) or excessive bathing activities (Wolf 1986:119). Of course, water consumption and the amount of sewage also rise because of the large number of visitors (Wolf 1986:118).

The loss of natural surroundings in general through escalating building activities is also a problem (Althof 1996:161). Even scenic areas which are still unspoiled are built on (Freyer 2001:375).

These explanations give just a short insight into the problems tourism might cause. Not taken into consideration here are, for example, the consequences ski tourism has on the natural environment of the mountains.

Consequently, one of the main tasks of tourism policy is to try to reduce negative effects. On the one hand, the landscape must be protected from being wrecked by visitors and on the other hand, locals must be protected from the noise and garbage of tourists. Spatial planning should not only concentrate on the needs of tourists but also think about the needs of the native population. To reach all this, it is essential that tourism industry, environmentalists and spatial planning work together. (Freyer 2001:376)

## 7. First theoretical results: How to design tourist maps

Our first research question has been focusing on the standards of tourist maps as found in technical literature. Working with literature has shown the relevance of the topic. Although a few technical articles deal with city maps or hiking maps, the topic is really underrepresented in books. If tourist maps are mentioned in cartographic or in tourist literature, it happens mainly only in short paragraphs. Taking this into account, it seems to be a good idea to dedicate this thesis to tourist maps and, as a first step, to sum everything up that has been said in literature about making tourist maps.

To sort our first results, we will go back to the concept of cartographic communication. The idea now is to transfer the results of existing research to the single steps of cartographic communication. Therefore, we will review who the participants in this communication process are, which information needs to be coded and how it can be coded to best communicate. The answer about the coding of information will consequently tell us how to design tourist maps, or more precisely, city and hiking maps.

Our first look goes to the participants of this communication process. As we have already seen, every communication process needs a sender of information and a recipient of information.

The **sender** of information is the **map maker**. Map makers can be professional mappers or, as already stated in the introductory chapter, nowadays also non-professionals. Examples for non-professionals in mapping are graphic artists, architects, local authorities, newspaper publishers or marketing agencies (DGFK 2019:94). The following evaluation will show, who the mappers of tourist maps are today.

Consequently, the tourist is the **recipient** of the information. Literature tells us much about tourists in general and also about city tourists and hikers in particular. Hence, we are able to precisely characterise the recipient of the information.

We have learnt that tourists are people who go to a place which is unknown to them. Therefore, they need help for orientation. Normally, tourists not only stay in their own country but often they even go to foreign places. This is especially typical of city tourists. Also typical is the short stay of city tourists at their main destination. It may be a challenge, that, apart from the mentioned facts about tourists, we have a very inhomogeneous group. So, for example, all age classes travel. Some people like to travel alone while others prefer to be with a group of people. For us, this means that we have to address a very large and diversified group of recipients. Also characteristic for them, according to literature, is a lack of knowledge about maps respectively about factors that make a map a good one. Hence, this is another challenge for the map maker.

After defining sender and recipient of **information**, the next step is to have a look at the information which needs to be coded by the map maker for the tourist. A list of information which could be marked in maps has been given in chapter 6.2.2. which talks about the demands

of tourists on their destination. The complete list can be seen on p. 67 and will not be repeated here in detail. Furthermore, a hiking map needs some additional information like viewpoints or alpine huts. In this case, it is also necessary to have a representation of the relief.

The most interesting question now is **how information can be communicated** to the map users. So, at this point, the abstract rules about how to design maps gathered from literature need to be recapped.

- The map title should briefly give information about the map's main topic. If necessary, a sub title can give additional explanation.
- The title should be placed on the map face's top to catch the tourists' attention.
- The map needs a legend which explains all signatures used in the map. For an easy readability of the legend, a hierarchical order or grouping of the signatures can help.
- Map users expect maps to be north-orientated. So the map should fulfil this expectation or, at least, add a north arrow to the map if the orientation is not as expected.
- Giving the scale helps to estimate distances. A scale bar is easier to use for inexperienced map users than a numeric scale. In hiking maps, distance markers besides the hiking trail are helpful. The scale is only an aid to the map reader and should not be in focus.
- The scale of a city map can be between 1:5.000 and 1:20.000. In cases of larger cities, the scale can even be smaller. Auxiliary maps should have a scale between 1:5.000 and 1:10.000.
- For hiking maps, a scale between 1:25.000 and 1:50.000 is recommended, also depending on the question whether it is a map for shorter or longer hikes. A map for short hikes will do better with a scale of 1:25.000 while the smaller scale of 1:50.000 is useful for long hike maps.
- A map needs to be generalised.
- All maps need lettering. In small scale maps, cities, rivers, lakes etc. have to be lettered while in large scale maps individual objects (castles, roads, public institutions etc.) should be named.
- The lettering can be varied by colour, type size etc. to indicate different types of objects. Really important information should be given in a larger font.
- For a good readability of the lettering, it must be large enough and, furthermore, the colour contrast between the map labelling and the base map's colour must be sufficient.
- The label placement has to be correct, meaning it must be clear which object belongs to which label.
- For an easy orientation, all streets, or at least all inner city streets, need to be labelled.
- In the case of streets which lead to parts outside of the map face, it should be noted where they lead to.



- A source statement can give the map user information about the map publisher, the map maker, the edition or the date of production. Therefore, the map user will be able to estimate, for example, the map's quality and up-to-dateness.
- Colour associations will lead to a faster understanding of the map.
- Pictorial signatures and front views of buildings are easier and faster to understand, even for foreigners.
- Similar to the lettering, the signatures must also be large enough and show enough contrast to the background colour to be recognizable.
- When planning the map's design, the concept of visual hierarchy needs to be taken into account. Thus, the differences in importance of the individual map elements can be worked out and the map user's eye can be lead.
- Auxiliary maps can give additional information which does not fit in the main map. Useful topics for inset maps are: public transportation network, schema of approaching roads, map of the main-through-roads or the city centre at a larger scale than the main map.
- A search grid can help find information faster. Objects which can be located with the help of a search grid are, for example, sightseeing spots or streets.
- The map's backside can be used for additional information. This can be, for example, a street directory, short texts about the city's or the region's history or about sightseeing spots and interesting buildings.
- Photos can make texts more interesting.
- Tourists often come from abroad. In the best case, the map makers react to this fact by offering the map in different languages or adding at least another language to the map. It would also be possible not to give the complete map in a second language but only the legend and information texts.
- Recommended walks through a city can help discover all important sightseeing spots in a short span of time.
- Relief information for hiking maps can be given by contour lines, hill shading, coloured hypsometric layers and height points. Height points are the easiest to read while hill shading is very vivid but does not give mathematically correct information. Reading contour lines needs some practice. However, it is recommended to use height points, contour lines and hill shading in combination in hiking maps to give the best relief information.
- Proposing themed tours or especially scenic hiking trails can help tourists decide which hiking trail to walk.
- Information about the quality of the hiking trail, distances and approximate walking time of tours is favourable for hikers with different experiences.
- The map sheet needs to be foldable. At best, it is pre-folded in pocket size.
- To remain manageable, the map should not be bigger than 80 x 60 cm.
- The paper has to be weatherproof and tear-resistant.
- The information on the map should be given in a clear and simple language.

### First theoretical results: How to design tourist maps

- The map must not awake wrong expectations.
- The given information has to be exact and up-to-date to avoid frustration.
- Continuity in design leads to a high recognition value. Therefore, slogans and design concepts should not be renewed too often.
- If the destination works with a corporate identity, especially a corporate design, it can be applied to the map as well.

As shown, tourism also has some negative aspects. So, some ideas to deal with that problem with the help of maps need to be summed up as well.

- Nature reserves or other protected areas cannot be mentioned at all in maps so as not to raise tourists' interest in such areas.
- The map does not need to show the whole city or the whole area. It would also be possible to have only those parts of the region or the city that are relevant for tourists in the map face (e.g. the inner city in the case of the city tourists) while other parts can be left out. Therefore, tourist interest in other places is not raised.
- Studies about tourists using guide books have shown, that sightseeing spots which are not mentioned in guide books remain unnoticed by tourists. This supports the idea that leaving out information about places or areas will make tourists stay away.
- While recommended walks or tours can be an aid to tourists, they can also help lead them in a favoured direction through the area.

## 8. Method: Evaluating maps

### 8.1. In general: evaluation as a method

Evaluation as a method can be found in many disciplines. So, for example, evaluation can be used to find the best supplier for a company (Winter 2014) or to analyse possible environmentally compatible innovations in agriculture (Deimer 2005). The method of evaluation is also known in cartography: Tyner deals with the evaluation of maps and the analysis of their design in a section of her book "Principles of map design" (Tyner 2014:213-214) while Salitschew gives an evaluation checklist for maps in "Einführung in die Kartographie" (Salitschew 1967:131). But before we have a closer look at the question how maps can be evaluated exactly, we should first look at the method of evaluation in general:

Deimer defines evaluation as the connection of information about a subject with personal values to get an opinion about this subject. As we can see, evaluation is not always completely objective. But this does, of course, not mean that evaluation is a totally random method. All available objective information must be always taken into account. (Deimer 2005:22)

Winter again presents the typical course of an evaluation, which will be related here in a shortened form which includes only the parts of the evaluation process that will find application in this paper:

1. Preparation of the evaluation; analysis of the initial situation
2. Determination of the evaluation criteria (aims, indicators)
3. Carrying out of the evaluation
4. Analysis and summary of the results (detailed information about single valuation parameters and general conclusion)

(Winter 2014:93-94)

Furthermore, Winter shows us eight questions which should be taken into account before the evaluation starts and which will help to determine the bigger picture of the evaluation:

1. Subject of the evaluation: What will be evaluated?
2. Aim of the evaluation: Why is the evaluation being performed?
3. Time of the evaluation: When will the evaluation take place?
4. Reference of the evaluation: What will the final results be compared to?
5. Evaluating person: Who will do the evaluation?
6. Addressee of the evaluation: For whom will the evaluation be performed?
7. Criteria of the evaluation: Based on which criteria will the evaluation take place?
8. Process of the evaluation: How will the evaluation be performed?

(Winter 2014:100)

Following Winter's instructions for the evaluation process and answering his questions before carrying out the evaluation means that a methodical approach to the topic of evaluation is being followed and therefore the greatest possible objectivity is gained.

Before setting the evaluation criteria and determining the bigger picture of the whole process, we need to have a look at cartography and what is said there about evaluation.

Salistschew postulates that the first draft of a map should be checked and, if required, corrected (Salistschew 1967:130). For this, he gives us a checklist which can also give us an idea what might be the important criteria that should be taken into account in the upcoming evaluation. He states, for example, that the map must include all necessary information, of course depending on the map's purpose. For that, it is indispensable that the applied source material is appropriate for the map's topic and, again, that this source material is reviewed correctly. Other criteria that Salistschew recommends should be checked in maps are the quality of the generalisation and the exactness of the signature placement. Furthermore, it needs to be checked whether the map contains all the basic elements, like title, subtitle, and also, if reasonable, additional charts, sketches etc. (Salistschew 1967:131)

When evaluating maps, Tyner advises us to look at the map as a whole and to always keep in mind the specific purpose and audience the map was made for (Tyner 2014:213). Furthermore, it is important not to forget that there usually is no perfect map (Tyner 2014:214). She also gives us a list of aspects that can be taken into account for choosing the evaluation criteria. These aspects are, for instance, the chosen symbols, design elements like title, legend, scale or the map's format (Tyner 2014:213-214).

As already mentioned before, Nebe also developed some evaluation criteria for tourist city maps (chapter 6.1.3.) which were information content, colour management, readability and handiness (Nebe 1985:207).

The authors mentioned above have thus already given us some ideas which criteria are relevant for analysing and evaluating (tourist) maps. The final criteria which will be of interest in this paper will be presented in chapter 8.3.. Before this, the next step is to prepare the evaluation as it is recommended by Winter (Winter 2014:100).

## 8.2. Preparing the evaluation – Answering some questions

This section of the paper aims to give all the basics necessary for the subsequent evaluation. To ensure a methodical and systematic course, the concept by Winter as introduced above will be followed. This chapter serves as the first step, i.e. is the preparation of the evaluation and the analysis of the initial situation. Here, we will also try to answer the eight questions posed by Winter which should help us to see the bigger picture of the planned evaluation. The determination of the evaluation criteria which is the second step will take place in the following chapter 8.3.. Information about the execution of the evaluation will be given in chapter 8.3. as

well and the last step, as recommended by Winter, which is the analysis and the summary of the results will be in focus in chapter 9 and 10.

So, as a start, the eight starting questions will be answered:

**Subject of the evaluation: What will be evaluated?**

Tourist maps are the subject of the evaluation. As already stated before, it is not possible to analyse all existing tourist maps. Therefore, this evaluation will be limited to city and hiking maps. The analysed city and hiking maps have been selected randomly.

**Aim of the evaluation: Why is the evaluation being performed?**

The evaluation will be performed in order to find out how the quality of tourist city maps and hiking maps is and to see what map makers in this field see as important.

**Time of the evaluation: When will the evaluation take place?**

The evaluation is part of the dissertation project and therefore has taken place during the period of this project.

**Reference of the evaluation: What will the final results be compared to?**

The final results will be compared only to each other. As far as the author knows, there is no other study about city and hiking maps to the same extent to which it would make sense to compare the results of the current study.

**Evaluating person: Who will do the evaluation?**

The evaluation is done by the author of this paper.

**Addressee of the evaluation: For whom will the evaluation be performed?**

In general, the evaluation will be performed for everyone who is interested in the topic. However, the author hopes to help the people who are involved in designing tourist city maps and hiking maps with the results.

**Criteria of the evaluation: Based on which criteria will the evaluation take place?**

The evaluation criteria will be explained in detail in the following chapter 8.3..

**Process of the evaluation: How will the evaluation be performed?**

We do not only have one method of evaluation. So, we have to choose the method which fits the given topic best. Generally, we can distinguish between qualitative and quantitative evaluation methods. Also, a combination of both methods, the so-called semi-quantitative method, would be a possibility. (Winter 2014:135)

In this paper, the method of checklists will be used. Checklists are a very systematic procedure and are counted among the qualitative methods. The checklist compiles different criteria for the evaluation of a subject. (Winter 2014:143) The easiest way of working with checklists would be just to note whether a criterion is fulfilled or not. Another possibility is to arrange the criteria in groups of "must-haves" and "nice-to-haves". Here, we will stay mostly with the easy way of

the checklist-method, meaning it will only be checked if a given criterion is fulfilled or not. (Winter 2014:144) The advantage of the checklist-method is that it is very quickly executed and moreover, it is very transparent (Winter 2014:168).

The idea behind the checklist method is normally to eliminate subjects that are not appropriate for a given topic or question. In the best case, at the end of the evaluation process, only one subject remains which answers the opening question best. (Winter 2014:144) But here, we just want to scan the criteria in the checklist and will not look for the best solution to a problem. Instead of choosing the best map in this evaluation, a next step could be a statistical evaluation to determine how many maps can fulfil which criteria and how many not.

After defining the basic frame for the evaluation, we will have a closer look at the criteria which will be in focus.

### 8.3. Map evaluation in detail - Creating a checklist

The next step is to determine the items which will be part of the checklist. At this point, it has to be remarked that it will not be possible in all cases to have only questions which can be answered with "yes" or "no". Sometimes it may also be necessary to add further notes. For instance, it is of course essential to write down the map's title and the place shown in the map to identify it. Also, the name of the cartographer or the publishing house may be of interest. But, so as not to jeopardise the basic idea of the checklist, the majority of the criteria will lead to simple "yes or no" decisions. For a better understanding of the checklist criteria, they will be explained in detail in the following section and, to have a better overview, they will be thematically grouped. After every section the relevant criteria will be summarised in a list and it will also be added whether a particular criterion requires a note or is a simple yes/no-question.

#### **General information**

Firstly, general map information will be noted, meaning the city or the region the map shows and to which country it belongs. Since two types of maps will be analysed, it is also necessary to note whether the map which is currently examined is a hiking map or a city map. This basic information will contribute to a better identification of the map. It also gives the opportunity of further research since it will be possible with this information to compare maps of different countries, e.g., with each other and identify similarities and differences in design.

Secondly, some basic map elements come into focus. As stated before, every map should have a title with information about the map and its content. So, if a map has a title, the full title will be noted to help identify the map.

Also of importance is the year in which the map was produced respectively any notation of a date of the map's immediacy that is given, e.g. in the publishing information. This date is essential for knowing whether the map or rather the information given in the map is still up-

to-date and the map can be used without any further considerations. In this case, it is also useful to always note the date when the map was bought to see if outdated maps are sold or distributed.

Noting the edition is also important for identifying the map and can answer the question whether a map is constantly updated or not. As we have seen before, outdated maps might cause the tourist frustration. It would also be an interesting idea for further research to collect different editions of the same map to compare them and to find out which things have been changed or improved and which not. The next question will be whether the map has a cover picture (or photo) or not. A carefully chosen cover picture leads to a map which is more interesting and attractive and invites to use it.

The name of the publishing house can also be seen as part of the basic map information which should be noted. Here, more questions arise: does the mentioned publishing house still exist? And: is the publishing house a company that primarily publishes maps? Or is it more a general publishing house which offers maps only as one of many products? This information is of relevance since the fact whether the publishing house still exists will give us an idea about the general situation of map publishers. Furthermore, those data are necessary for answering the question if non-cartographic publishing houses can offer high quality map products. In this context, the map maker should also be noted since map maker and publisher do not need to be the same entity. It is always a possibility that the final cartographic product is produced and released by a publishing house while the map itself has been drafted by a professional map maker.

The price of the map also needs to be considered: How much does the map cost? Or is it for free? If the map is available for free, this leads to the question how the production of the map has been financed. Do free or very cheap maps contain more advertisements than expensive maps? If known, it will be noted where the map was bought or picked up to get an impression where (especially free maps) are usually laid-out and to find out where the tourists get their maps from. The advertisements mentioned here will find more attention as a criterion for our checklist later.

Furthermore, the size of the map in closed and opened state will be measured. The size is of interest to understand whether the map is handy, meaning whether it can be used easily on the way or carried in a pocket. Suggestions for a good map size as a point of reference can be found in chapter 6.1.1. and 6.1.2.. Measuring the size of the maps can also tell us the average size of all the analysed tourist maps. In this context, the attention will also be on the folding of the map: Is the map already pre-folded? Can it be folded easily and quickly? The folding is important for a fast use of the map and it is also useful to have the map folded in a way that the user can see important or the most relevant information at first view (for example the city centre). Also of interest is the material of the map. Is it simply "normal" paper, maybe thicker paper or even laminated paper? The importance of the quality of the paper results from the fact that strong paper of a high quality will make the map more durable. Laminated paper is

useful for maps that are used mostly outside, maybe even in difficult weather conditions (this can apply especially to hiking maps). The importance of high-quality paper has, by the way, also been discussed in chapter 6.1.2.

### **Criteria for the checklist:**

City (Note)  
Region (Note)  
Country (Note)  
Map type (Note)  
Title (Note)  
Date of production (Note)  
Date of purchase (Note)  
Edition (Note)  
Cover picture (yes/no + note)  
Publishing house (note)  
    Still exist (yes/no)  
    Cartographic publishing house (yes/no)  
Map maker (note)  
    Cartographer (yes/no)  
Price (note)  
Place of purchase (note)  
Size – folded (note)  
Size – open (note)  
Pre-folding (yes/no)  
High-quality paper (yes/no)

## **Design of the maps**

### **General map elements**

After having noted all general map information, this section will focus on the design of the map itself. First, the general map elements which were mentioned before in chapter 5.1. and their existence on the map will be analysed. The map's title has already been noted in the previous part of the evaluation process for further identification. Here, we will again take a look at the title. In this case, the question is whether the map has a **title** or not. The next interesting part is the scale, because it is needed to help the map user to estimate distances. So we will note here if the map has a **numeric scale** and/or a **scale bar**. A scale bar is seen as easier for inexperienced map users to work with, so it might be worth using this scale indication for tourist maps. Without any scale specification it is not possible for the map user to know whether he can walk a certain distance to a specific sightseeing spot or if he should better take his car or use public transport. The **north arrow** on the other hand is often seen as unnecessary, since most maps today are north orientated anyway. Regardless, it is still an important map element and so it will be noted whether the map has a north arrow or not. In this case, it is also important to find out if the map is **north orientated** or not because if the map is not north orientated and there is no north arrow, this is a serious deficit. Afterwards, the **legend** comes into focus. In the best case, the legend contains all signatures and all colours that are used in



the map. Again, the first note will be whether this map element does exist at all or not. If the map has a legend, a note has to be made if it is complete or not. The reason for this check is that it is not possible to understand every signature at first sight. So it is important to explain all signatures that are used in the legend to make the map easily understandable for everyone. Which type of signature is easily understandable and which not can be checked in chapter 5.2.. Hereafter, the source statement comes into focus. A complete **source statement** tells us when the map was produced, who produced it, who the map designer was, which edition it is, what the sources for the information are and what the base map is. Similarly to the legend, here again it will be noted if the map has a source statement and, if this is the case, whether it is complete or not. In chapter 6.1.2., it was pointed out that a search grid for the street index or for all sightseeing spots is very helpful, so this point will be added to our checklist as well. As we have already seen in chapter 5.6., a map can have **irregular borders** or can be limited by a **rectangular frame**. To see which type is favoured by the map makers, this will also be a criterion on our list.

### **Criteria for the checklist:**

Title (yes/no)  
Numeric scale (yes/no)  
Scale bar (yes/no)  
North arrow (yes/no)  
North orientated (yes/no)  
Legend (yes/no)  
Legend complete (yes/no)  
Source statement (yes/no)  
Source statement complete (yes/no)  
Search grid (yes/no)  
Irregular borders / rectangular frame (note)

### **Signatures**

Signatures are the next part to look at. Signatures are one of the most significant design elements in mapping. So the first step is to define the types of signatures that are used in the map. As we have already seen in chapter 5.2., a lot of different types of signatures exist, each one having its advantages and disadvantages. Secondly, we will turn to the design of the signatures themselves: Are they large enough to be identified easily? Is the colour of the signatures in a sufficient contrast to the base map? Since sightseeing spots and historical buildings are a really important part of the map's content, it will also be noted separately which signature type is used for them.

### **Criteria for the checklist:**

Signature type (note)  
Size: large enough (yes/no)  
Colour: sufficient contrast (yes/no)  
Signature type of sightseeing spots (note)

## The use of colours

The question which colours to choose for map design is also of high importance. One possibility is to select colours with regard to colour associations, like blue for water or green for green spaces (cf. chapter 5.4.). This can lead to a faster understanding of a map. So it will be noted whether such colour associations are used in the examined map or not.

The areal features mostly form the base map. So their colours must not attract too much attention because other map content like point signatures or labelling must still stand out and be readable.

We should also take into account that, usually, we have **different types of roads** in one map, like main roads, side roads, pedestrian zones or motorways. To indicate the different types of roads, various colours can be used – one colour always indicating one type of road. So it is possible for tourists to differentiate faster and easier between one type of road and another.

### Criteria for the checklist:

Colour associations (yes/no)

Inconspicuous base-map colours (yes/no)

Roads: different colours (yes/no)

## Lettering/Labelling

The importance of lettering and how to work with it in maps has been explained in chapter 5.5.. Lettering and the way it is used in tourist maps will of course be part of our checklist. The first step is to simply note whether the map has lettering or not. Furthermore, it will be noted which objects in the map are lettered (for example: important places, streets, interesting buildings, etc.). In the next step, the existing labelling and its design will be studied in detail: Are different fonts used in the map? Are they serif fonts or sans serif fonts? Do we have varying font colours to indicate different objects? And in this case (and similarly to the work with signatures): does the colour of the fonts contrast sufficiently with the base map's colour? The rules for label placement have also been explained in chapter 5.5. and therefore it should also be a criterion on our checklist.

Another interesting aspect in the context of labelling is the language. Does the map have only one language on it or is more than one language used? The use of several languages makes the map understandable for a greater variety of people from different countries which is relevant as we have already learnt in chapter 6.2.3. that especially city tourists often come from abroad. And: chapter 6.1.2. has shown us that it is recommended to label all streets (or at least the inner city streets) for an easier and faster orientation in an unknown area, so this will be checked as well. Here, it is also stated that it is useful to label roads leading to places outside of the map face with the direction they lead to.

### **Criteria for the checklist:**

Lettering (yes/no)  
Lettered objects (note)  
Different fonts (yes/no)  
Serif fonts / sans serif fonts (note)  
Different font colours (yes/no)  
Contrast font colours vs. base map (yes/no)  
Correctness of label placement (yes/no)  
Different languages (yes/no)  
(All) roads labelled (yes/no)  
Exit roads labelled (yes/no)

### **Visual hierarchy & map layout**

The idea of visual hierarchy has been explained in chapter 5.6.. A well-chosen visual hierarchy can contribute to a fast and easier understanding of the map. So we will check whether the available maps have a visual hierarchy or not. To determine whether a visual hierarchy is a good one or not, the explanations about visual hierarchy given in chapter 5.6. can be consulted.

In this context, the map's layout of which the rules have also been explained in chapter 5.6. is of interest. So our questions is whether the map has a well-planned and clearly arranged layout or not.

The possibility to add auxiliary maps to the map sheet has been mentioned in chapter 5.7.. Since inset maps can be very useful, their existence will of course also be checked.

### **Criteria for the checklist:**

Good visual hierarchy (yes/no)  
Good map layout (yes/no)  
Inset maps (yes/no)

### **Generalisation**

The principle of generalisation has been in focus of chapter 5.3.. So for us, it is also interesting to see whether the map is generalised or not and if the generalisation is well done and fulfils the requirements of the given type of map. A well thought-out generalisation will, in general, show only the information necessary for the map's target group and offer a base map which is adapted to the map's topic.

### **Criteria for the checklist:**

Generalisation (yes/no)  
Thought-out generalisation (yes/no)

## **Map's content – The map as a tourist map**

Since the focus of the thesis is not on maps in general but on one special type of maps, it is necessary to find out whether the content and the design of the map fits the map's main target group. In this part of the evaluation, it is appropriate to distinguish between information which should be added to the map face and information that is better to be found on the map's backside or surrounding the map face. Furthermore, there will be a distinction between information for city maps and information for hiking maps.

### **Map face**

Chapter 6.2.2. offers extensive information about the demands of tourists on their destination. To simplify the compilation of the checklist for the map face, the categories mentioned in this chapter and their existence in the map will be checked. So, the main category basic facilities, including transportation, accommodation, gastronomy, tourism services and general institutions, and the other main category free time activities, amusement and sightseeing attractions which contains the sub categories natural phenomena, local culture, culture (in general), sports, shopping, rest and recreation, temporary events and sui generis will be part of the list.

This part of the checklist will apply to both types of maps which are in focus of this paper.

### **Criteria for the checklist:**

Transportation (yes/no)  
Accommodation (yes/no)  
Gastronomy (yes/no)  
Tourism services (yes/no)  
General institutions (yes/no)  
Natural phenomena (yes/no)  
Local culture (yes/no)  
Culture (yes/no)  
Sports (yes/no)  
Shopping (yes/no)  
Rest and recreation (yes/no)  
Temporary events (yes/no)  
Sui generis (yes/no)

### **Special content of city maps**

As mentioned in chapter 6.2.7., it can be a good idea for cities to focus only on one field of tourism and/or to point out the typical regional characteristics. So another criterion will also be whether the city map displays typical regional characteristics or if we can determine a focus on one group of tourists. Since city trips are normally short trips (cf. chapter 6.2.3.), proposed tours for walks through the city which pass all interesting sightseeing spots can help tourists see everything that is important. Also of use is a search grid. With the help of a search grid, sightseeing spots or streets can be found more easily. Finding streets by means of a search

grid of course also presumes that a street directory naming all streets has been added to the map sheet.

**Criteria for the checklist:**

- Focus on one group of tourists (yes/no)
- Typical regional characteristics (yes/no)
- Proposed walks (yes/no)
- Search grid (yes/no)
- Street directory (yes/no)

**Content of hiking map**

The first thing to analyse in this case is the design of hiking maps. Since hiking happens mostly in mountainous areas, it is of great importance to have a good representation of the terrain. As we have seen in chapter 5.8., it is possible to combine different methods of terrain representation here. We will look at the most common methods for showing the relief, which are contour lines, hill shading, coloured hypsometric layers and height points. Hachuring is said to be outdated but nevertheless it might be of interest to see whether this is true or if we will still find maps containing hachures.

Information that is necessary for hikers are mountain huts, viewpoints or overnight accommodation (cf. chapter 6.1.4.). As mentioned in chapter 6.2.4., hikers look for diversified tours. To fulfil those requirements, the map can propose a selection of different tours of varying levels of difficulty. Knowing the level of difficulty of different routes is also important for inexperienced hikers who will look for shorter routes and routes which are easier to walk due of, for example, a lower inclination or flat underground. Experienced hikers, on the other hand, should also get information about more challenging tours. In addition to proposing tours of varying levels of difficulty, it would also be an idea to highlight especially scenic hiking trails or to give information about possible themed routes, as has been explained in chapter 6.1.4.. At best, the tours or some parts of the hiking trails in general, have distance markers. Information about the condition of the trails is also necessary.

**Criteria for the checklist:**

- Contour lines (yes/no)
- Hill shading (yes/no)
- Coloured hypsometric layers (yes/no)
- Height points (yes/no)
- Hachuring (yes/no)
- Huts (yes/no)
- Viewpoints (yes/no)
- Overnight accommodation (yes/no)
- Proposed tours (yes/no)
- Scenic hiking trails (yes/no)
- Themed routes (yes/no)
- Distance markers (yes/no)
- Hiking trail's condition (yes/no)

## **Backside**

The map's backside or the free space surrounding the map face can be used for additional information. This part of the checklist will also apply to both types of maps.

As mentioned in chapter 6.1.1., it might be a good idea to have some texts about the city and its history or maybe about particular sightseeing spots. Photos can be a nice supplement to the texts (cf. chapter 6.1.1.). Hiking maps could have texts about the hiking area and its natural phenomena or about proposed tours.

The map's backside would also be a good place to have a small additional map of the main-through roads (cf. chapter 6.1.2.).

Since the opening hours of sights or leisure facilities are of high importance to city tourists (cf. chapter 6.2.6.), such information could also be added to the map. Opening times of accommodation or restaurants are also important for hikers to plan their tours.

### **Criteria for the checklist:**

Texts (yes/no)

Photos (yes/no)

Map of the main-through roads (yes/no)

Opening times (yes/no)

## **Advertisement**

The fact that tourist maps might have advertisements has already been mentioned before (c.f. chapter 6.2.8.). Since many of the tourist maps we will be looking at are mostly distributed for free, it makes much sense to have a closer look at advertisements since they might offer a possibility to finance the print of the maps.

First, it will be noted whether the map contains advertisements or not. The second step is to check whether the advertisement takes too much space on the map sheet, meaning that there is more advertisement than useful information on the map. Another possibility would be that the advertisement is too striking and even hides the important information on the map.

### **Criteria for the checklist:**

Advertisement (yes/no)

Too much advertisement (yes/no)

Advertisement very striking (yes/no)

## **General design of tourist maps**

Chapter 6.2.8. talked about how to communicate with tourists and explained the concept of corporate identity. In this context, it was stated that tourists look for clear and simple language.

Furthermore, misleading information should be avoided. The last step is to see if the map uses the corporate design of a destination.

**Criteria for the checklist:**

Clear and simple language (yes/no)

Misleading information (yes/no)

Corporate design (yes/no)

The author is fully aware of the fact that there are more potential criteria which can be checked and the checklist created here does not compromise all the details which might be important for tourist maps. However, the checklist has been developed by using basic literature about cartography and tourism as well as articles by specialist journals and therefore gives a good summary of important details for tourist city maps and hiking maps and can also offer the possibility for more research in this area.

After the determination of the evaluation criteria, the next step in following the evaluation process presented by Winter is, to carry out the evaluation. The complete checklist with all evaluation criteria that are evaluated can be found on the CD added to the thesis. The following chapter will focus on the last step in the evaluation process, which is the analysis and summary of the results.

## 9. The evaluation and its results

### 9.1. General results

Altogether, 141 maps have been evaluated. 77 of them are city maps while 64 are hiking maps. The results of the evaluation will be presented for each group separately. Furthermore, in the following chapter 9.2. a small selection of maps with particularly interesting results will be shown and explained. In the following texts, not all numbers and findings will be presented in all details but there will be a focus on the most interesting results, including pictures of parts of the maps for visualisation. Whoever is interested in the details of the evaluation will find them in table "map\_evaluation" in the appendix.

#### 9.1.1. General results: City maps

##### **General information**

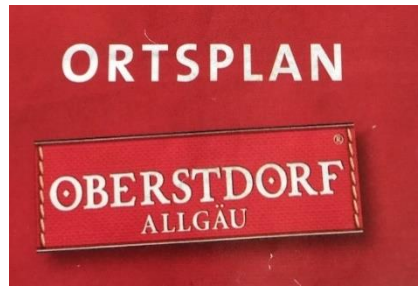
The city maps I was able to collect for my evaluation are mostly from Germany (52 maps). Other countries represented by maps in the evaluation are Austria, Croatia, France, Greece, Israel, Italy, Japan, Portugal, Switzerland and Great Britain. This means that the results presented here show mostly the status quo of German city maps for tourists. But it has to be remarked that the city maps from Germany include a great variety of maps: we have maps from big cities like Berlin or Frankfurt but also maps from small cities like Meersburg (Lake Constance). The maps also cover many German regions, for example East Friesland, Allgäu, Saxony, Lake Constance and the Palatinate. The study gives us a good impression of the tourist city maps of Germany, also including some facts about tourist maps from other, mostly European, countries. In the following explanations, we will not distinguish between German maps and maps from other countries but consider the results of the evaluation in its totality.

The idea for further identification of the maps was to note the map's title, if available. In seven cases it was not possible to note a title in our evaluation table since there was no title. The map's titles are mostly not very creative or in any way attention-catching. The common way to name the map seems to be to use the term "city map" in combination with the city name (cf. fig. 19, 20, 21, p. 94).





19 Title of Aachen's city map (Aachen 2015)



20 Oberstdorf's map's title (Oberstdorf 2015)



21 Also Unna's map has the combination of "city map" and the city's name as title (Unna no date)

However, some maps have a bit more interesting titles. Examples can be seen in the maps of Senj (Croatia) and Garmisch Partenkirchen (Germany), which tell us that the cities offer many experiences and much to discover, or in the map of Trento (Italy) which points out a distinctive feature of the city: the paintings (cf. fig. 22, 23, 24).



22 The title of Senj promises that there is so much to experience in the city (Senj no date)



23 This title describes Garmisch Partenkirchen as a marvellous town (Garmisch Partenkirchen no date)



24 The title of this map invites tourists to have a walk in the city (Trento no date)

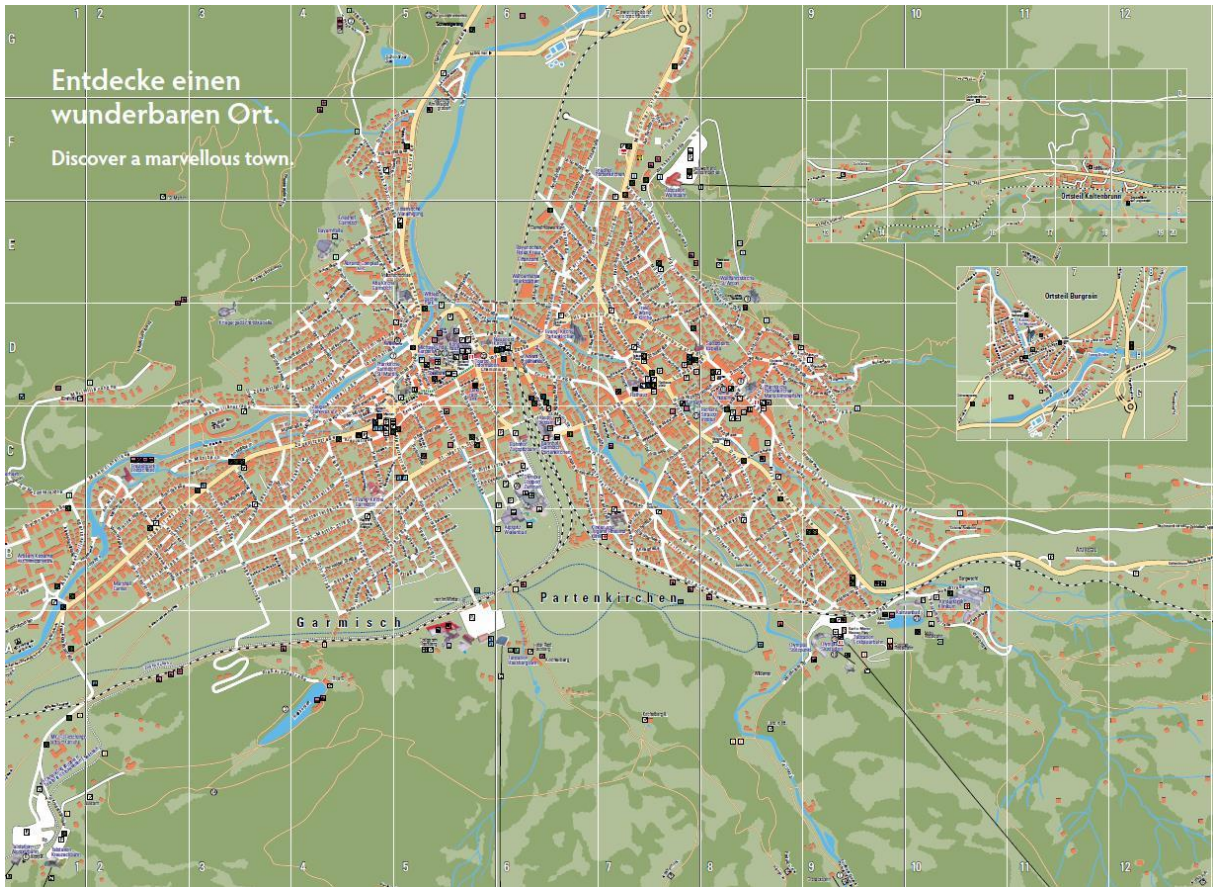
One main criterion for the evaluation of the maps was that they are not too old. The oldest map in our evaluation is from 2003 (Milan), the two most recent ones from 2018 (Wismar, Ulm). But: in this context, it has to be mentioned that it is not always possible to know how old (or recent) a map is since it has not always been noted on the map when it was published. 32 maps had no specification about the time of their publication. In the next step, the dates of publication were compared to the date of purchase, if known. This offered no big surprises

since nearly all maps were purchased in the year of publication or at least in the year after. This fact can be judged favourably because it shows us that no out-dated or very old maps are handed out.

Furthermore, the idea was to note the map's edition to see whether it is constantly updated. In practice, it was not possible to realise this idea. Almost no map gives any information about its edition. The seven maps which have an indication about their edition are of the 1<sup>st</sup> up to the 23<sup>th</sup> edition. The map published in its 23<sup>th</sup> edition is from Genova. According to the source statement, the map has been published since 2003 in various editions. Since the map was picked up in 2016 on a trip to Genova, this means the map is constantly updated each year. This expenditure is quite interesting since Genova is not a typical tourist destination. In fact, Genova is one of a few European major cities which have not been discovered by (mass) tourism yet (Becht 2013:226).

To identify the map further and since it is also a part of the map which will catch the map user's attention at first sight, it has also been noted whether the map has a cover picture or not and what the cover picture, if available, shows. 22 maps do not have a cover picture. The reasons for the lack of a cover picture will become clearer if we anticipate the evaluation point of the pre-folding. The maps without a cover picture are usually not pre-folded and so they do not offer many possibilities for a cover picture like folded maps and, because of that, are more like a kind of flyer or brochure in their outward appearance. The example (fig. 25, p. 96) below shows the city map of Garmisch Partenkirchen (as a whole) which is A3 paper size and not pre-folded. The map takes up the whole space of the page and there are no possibilities for adding a cover picture. The backside contains a panoramic map of the area, showing the city and the surrounding mountains.

## The evaluation and its results



25 City map of Garmisch Partenkirchen, not pre-folded. (Garmisch Partenkirchen no date)

The maps with a cover picture mostly show impressions of the city in photos, as we can see in the examples of Froendenberg (fig. 26, p. 97) and Rothenburg ob der Tauber (fig. 27, p. 97) which are, by the way, also instances of pre-folded maps.



26 Cover picture of Froendenberg's pre-folded map showing the Stiften Church which is situated near the city centre. (Fröndenberg 2008)



## Kleiner Stadt(ver)führer

- mit Stadtplan -

**Rothenburg**  
ob der Tauber

Schutzgebühr: 0,10 €

27 The cover picture of this map presents the tourists one of Rothenburg's most famous photo motif, a tower and a yellow half-timbered house, the so-called Ploenlein. (Rothenburg ob der Tauber 2014a)

Part of the basic map information is also the publishing house. Here again, it was not possible to note this specification for all evaluated maps. 20 maps came without this information. This means that 57 maps informed the map user about the publisher. 54, so nearly all, of those publishing houses are in business. But, what is remarkable, only 5 of them are cartographic publishing houses. The others are mostly the tourism agencies of the particular city or advertising agencies. The next step was to identify the map maker since it is still possible that the map itself has been created by a professional. Once more, missing indications are a problem for our investigation. Only 31 maps give information about the map maker. Here we can see that only a part of them are cartographers. Taking into account the maps published by non-cartographic publishing houses, the map has been made by a professional in nine instances. Since most maps do not indicate the map maker, this number is not very significant. We can only suspect that the map maker is not mentioned in many cases because publishing

house and mapper are identical and therefore, the publishers see no need to give special information about who made the map. If this is true, our findings prove the thesis from the introductory chapter of this paper which claims that less and less maps are produced by professionals.

Another point to be noted was the price of the map. Most of the collected maps were for free, only some cost money. Nevertheless, the paid maps were not very expensive: their prices fluctuate between 0.50 € and 1 €. They were mostly purchased in tourist informations but also in hotels, restaurants or cafés.

In some cases, it was not possible to note the price or the place of purchase of a map. This happened when I got the maps from other people who already had the maps for some time and did no longer remember where they got them from or if they had paid money for them.

The topic of pre-folding has already been touched upon above. So, at this point, it should only be mentioned briefly that nearly all evaluated maps are pre-folded ones.

The last step in the category of general map information is to answer the question of the high-quality paper. The paper was rated as a high-quality one if it was thicker than normal paper or had some kind of coating or lamination. Surprisingly, 50 maps were made of some kind of high-quality paper which makes them more durable when being used.

## **Design of the maps**

### **General map elements**

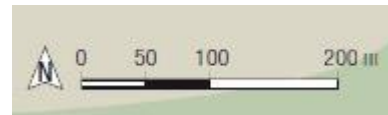
The checklist for the general map elements started with the question whether the map has a title or not. As we have already seen in the previous part of the evaluation, not every map has a title but the number of maps without a title is quite low. Also of interest is the numeric scale. It has only been possible to note the scale of eight maps. In those cases, the scale differs between 1:20:000 and 1:25.000 which fits to recommendations given in chapter 6.1.2.. Kraljevica stands out with a very large scale compared to the others. This city map is in 1:2.000 scale. But this Croatian city is only a very small one which of course offers the map maker the opportunity to use a larger scale and show more details than for larger cities. The cities with the smallest scales (only taking into account the maps where the scale is mentioned) are Berlin and Munich. But in this case, the map shows mainly the inner city and not the whole municipal area.

A scale bar is available with nearly half of the evaluated maps. So if the maps do not offer the tourist a numeric scale, some of them have at least this indication of scale. Since, as mentioned in chapter 5.1., most tourists prefer scale bars over numeric scales, their existence on maps can be seen as very helpful. Examples of the design of scale bars can be seen below (fig. 28, 29, 30, p. 99).

## The evaluation and its results



28 Scale bar (Friedrichshafen no date)



29 Scale bar (Rothenburg ob der Tauber 2014a)



30 Scale bar (Oberstdorf 2015)

The second example of a scale bar already shows the north arrow which is our next point of evaluation. 27 maps contain a north arrow. 7 of the maps without a north arrow are not north-oriented. Although literature states that nearly all maps are north-oriented today (see chapter 5.1.), our study shows that there are a few maps which do not have the north at the top. In combination with the missing north arrow, this is clearly a shortcoming. Again, we have two design examples below (fig. 31, 32).



31 North arrow  
Friedrichshafen no date)



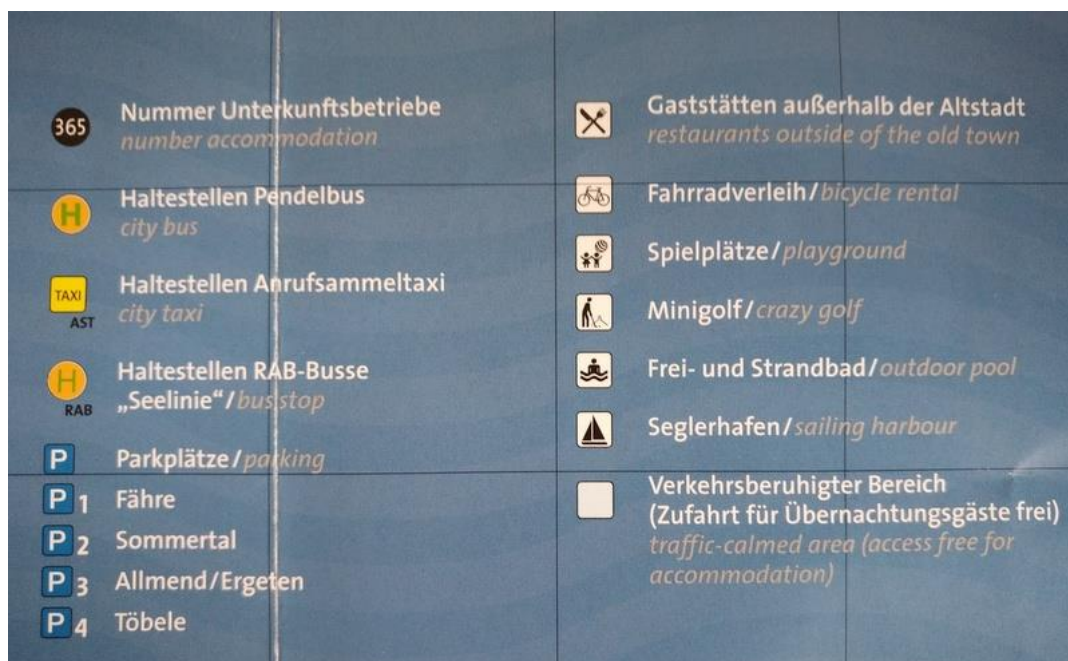
32 North arrow (Gemeinde Sylt 2013)

The importance of a legend has also been explained in the chapter about all essential map elements (chapter 5.1.). Regardless of the legend's importance, only 68% of the evaluated maps have one. What is more, only half of the existing legends are complete. Most legends contain only explanations for the point signatures. Line and area signatures and their meaning are missing there (cf. fig. 33, 34, 35, p. 100-101).

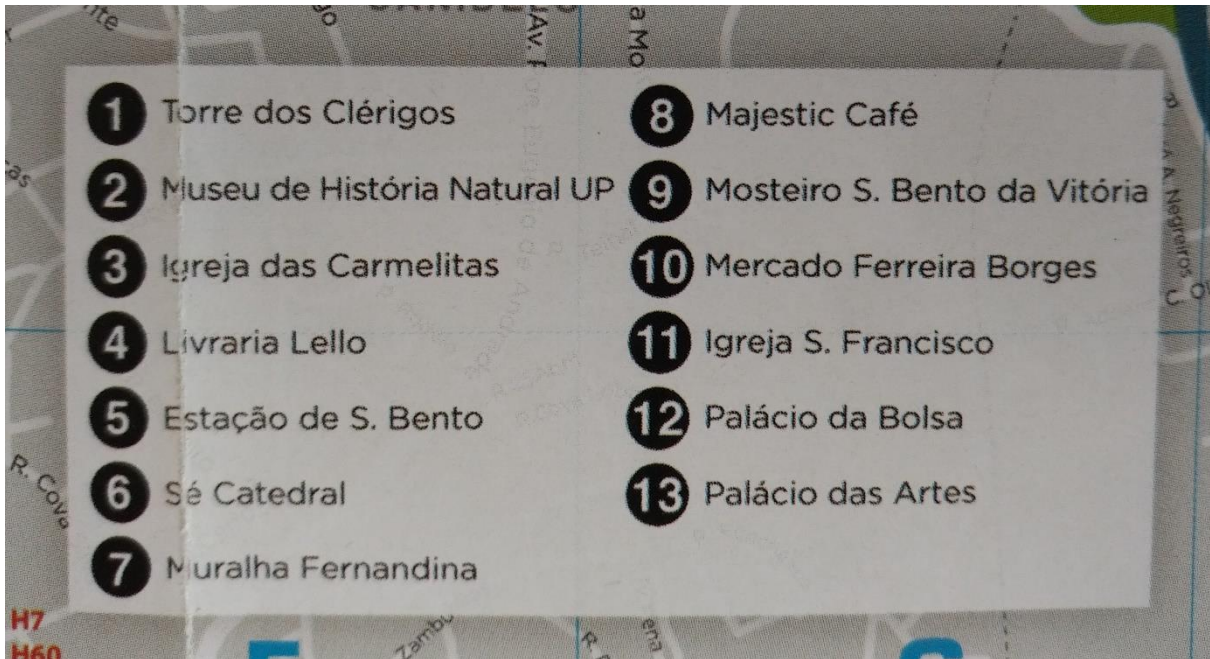
## The evaluation and its results



33 This legend is very detailed and contains all point signatures used. Line and area signatures are missing. A big advantage is that this legend is in different languages. (Dorf Tirol no date)

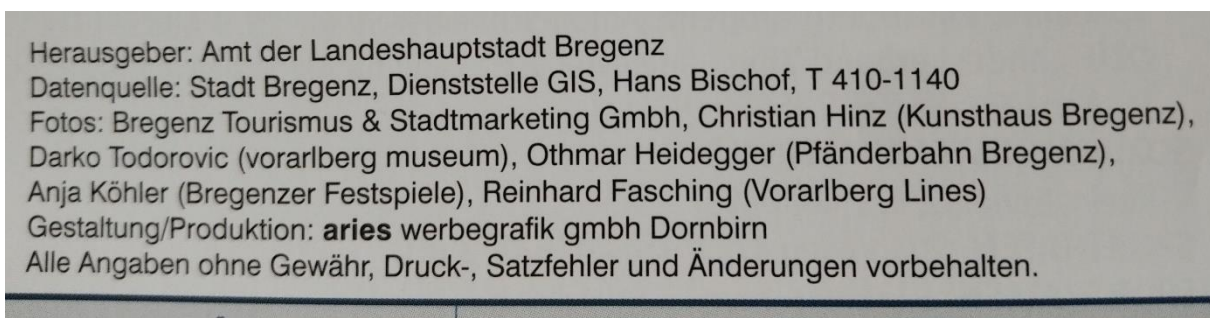


34 The legend of the map of Meersbug offers two languages as well. Tourists can find all signatures used in the map face here, except for line and area signatures. (Meersburg 2013)



35 This legend of Porto's map is very short. The map includes numbers which stand for a couple of sightseeing spots or other interesting places. Other signatures used in the map are not explained in the legend. (Porto no date)

The problem of incomplete source statements is even worse than the problem with incomplete legends. Although the part of maps with a source statement is greater than the part of maps with a legend, only a very small number of these source statements is complete and offers all necessary information. The attentive reader will not be very surprised about this fact because the source statement normally should contain the information about the year of production and the publisher or the map maker and since it was not possible to note all this information in the previous part of the evaluation, this of course means that the available source statements are not complete (cf. fig. 36, 37, 38, p. 101-102).



36 The imprint of the map of Bregenz is detailed, telling the map user the publisher, all sources for map and photos and also who is responsible for the design of the product. However, the information of the up-to-dateness of the map is missing. (Bregenz 2016)



## The evaluation and its results

**Herausgeber**  
Heilbronn Marketing GmbH, Kirchbrunnenstraße 3,  
74072 Heilbronn, Tel. +49 7131 562270  
**Stadtplan**  
Stadt Heilbronn / Vermessungs- und  
Katasteramt, 2016  
**Liniennetzplan**  
Heilbronner-Hohenloher-Haller Nahverkehr GmbH,  
Olgastraße 2, 74072 Heilbronn

**37** The source statements of the map of Heilbronn gives information about the map publisher, the map maker and also the additional public transport network map. (Heilbronn 2016)

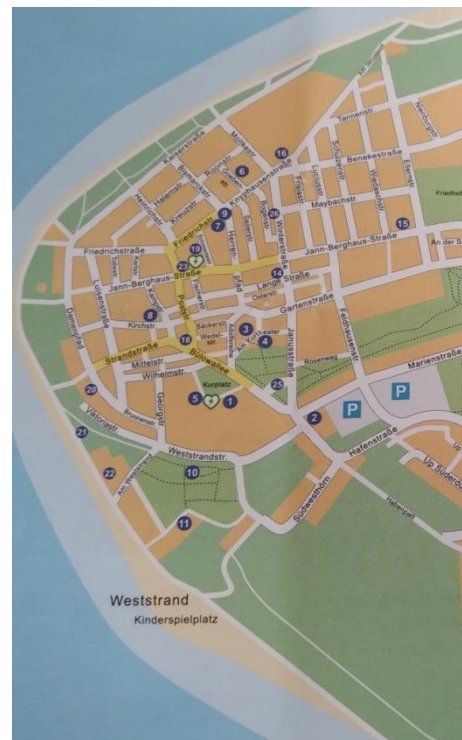
**Konzept und Design:** ais GmbH, Kaufering, www.werbeagentur-ais.de  
**Text:** Anton Lichtenstern, Landsberg am Lech  
**Fotografie:** Sabine Hauff-Grimm (ais GmbH), Tourist-Information LL

**38** This imprint lacks some information, for example, the date of production. (Landsberg no date)

The last step in this part of the evaluation was to note whether the map has irregular borders or is limited by a rectangular frame. The mappers' preferences in this case are very clear: only eight maps show irregular borders (cf. fig. 39, 40).



**39** The map of Strasbourg shows only the city centre. Other parts of the city are presented in very bright colours. Therefore, they are not recognizable any more. (Strasbourg 2016b)



**40** The map face of Norderney is outlined by the form of the island. (Norderney 2016)

## Signatures

After having looked at the basic map elements, the next sections of the evaluation will focus, as planned, on the map's signature design. All maps have line signatures, areal signatures and point signatures. As already stated before in the part about the legend, line and area signatures are usually not explained in the legend which might lead to some problems of understanding. Point signatures used in maps are pictorial signatures, vertical plans or number signatures. Geometric signatures do not seem to be very popular for city maps.

As we have already stated before, it is of course not enough to just put signatures in the map. The chosen signatures should have a certain quality, meaning they should be large enough to be identified without problems by the map user and also show a sufficient contrast to the base map. The size chosen for the map's signatures is problematic in some cases. Only 45 of the evaluated maps have a size which enables an easy and fast recognition of their signatures. The results of the analysed criterion of the sufficient colour contrast are better: 51 of 77 maps can fulfil this criterion.

The type of signatures chosen for the sightseeing spots is also a point of interest since they are among of the most important contents of tourist maps. In spite of the importance of sightseeing spots for tourists, nine maps do not contain any sightseeing spots at all. This is of course problematic because visiting all interesting sightseeing spots is one of the main activities of city tourists (cf. chapter 6.2.3.). Plus, city tourists normally do not stay at their destination for very long and therefore need to know straight away what is important to see in the chosen city and what not.

The signatures which are used mostly for sightseeing spots in city maps are vertical plans highlighting the most important buildings and number signatures. The following examples of maps show the variety of signatures in the evaluated city maps. The pictures will also give an impression of the signatures' quality, regarding to their size and colour contrast.

Examples for signatures can be seen in the following pictures (fig. 41 – 52, p. 104-109).

## The evaluation and its results



41 The sightseeing spots in this example of Strasbourg are marked in vertical plans. Some other interesting spots are also represented by number signatures. The number signatures are way smaller but still well recognizable because of the contrast between the black number signatures and the light-coloured background. Yellow coloured streets might indicate the pedestrian zone. But, since the different line signatures used, are not explained in the legend, this cannot be said for sure. (Strasbourg 2016a)



42 This example shows, again, the inner city of Strasbourg. Sights are marked with vertical plans and number signatures, too. This map as well has a strong contrast between signatures and base map. But in this example, the contrast is so huge, that the background information get nearly lost and the focus is only on the vertical plans. (Strasbourg 2016b)

## The evaluation and its results



**43** The map of Garmisch Partenkirchen works with number signatures, pictorial signatures and vertical plans. Here, the vertical plans are very small and do not really stick out of the map like in the examples of Strasbourg. Also, the number signatures and especially the pictorial signatures are way too small and hard to recognize. Furthermore, the map does not offer the tourists a legend so there might be problems in understanding some of the signatures. (Garmisch Partenkirchen no date)



**44** Frankfurt uses mostly number signatures for showing important spots. Although the signatures are not very large, they have a good colour contrast and therefore are well recognizable. The different colours of the number signatures indicate different categories of places of interest or freetime activities. So, for example, the blue circles represent museums while the pink ones stand for theatres. (Frankfurt 2017)

## The evaluation and its results



45 The map of Ulm has mostly vertical plans in it, representing the places of interest. Number signatures like in the maps we have seen before cannot be found at all. The pictorial signatures which are used here represent information interesting for car drivers like parking lots or gas stations. (Ulm 2018)



46 The map of Genoa is of interest because it shows some signatures that have not been an issue before: here, the logos of leisure facilities are shown instead of the “classical” mapping signatures. Since they are more complex than “normal” signatures, the smaller ones are not easy to recognize in the map. If the logo is familiar to the map users, it will make the map be understood faster. (Genoa 2015)

## The evaluation and its results



47 The map of Meran has some vertical plans but they do not stick out of the map since they are coloured in white and the background is also white coloured. Important spots are mostly represented by pictorial signatures which have a good colour contrast to the background. (Meran no date)



48 Landsberg am Lech shows the most interesting buildings in vertical plans, combined with number signatures. Some number signatures also represent other important spots. The signatures are large enough and well recognizable. However, the map is not very colourful in general. (Landsberg no date)

## The evaluation and its results

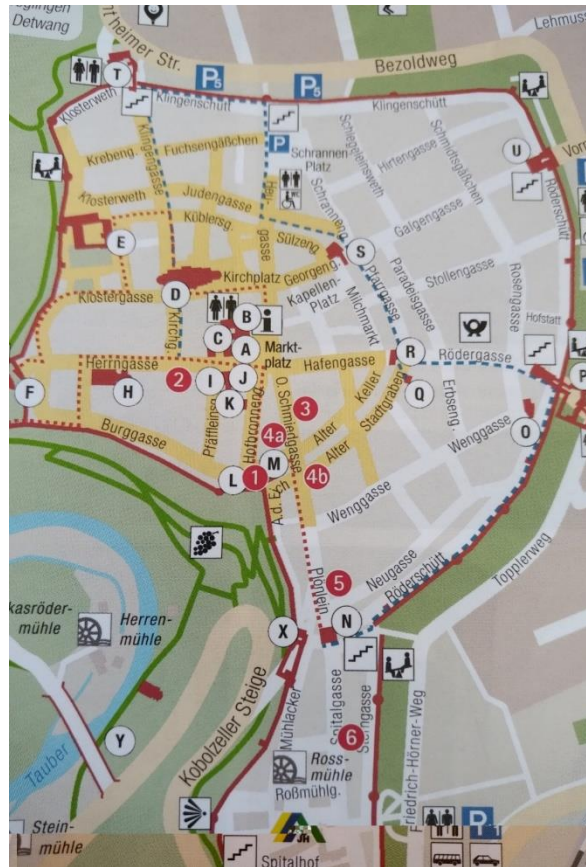


**49** Unna's map works with number signatures for the sightseeing spots. They do not give the tourists an impression of the interesting spots they can expect there. That means, the tourists always need to have a look at the legend to understand the signatures' meaning. (Unna 2014)



**50** The map of Aurich combines vertical plans and number signatures to show spots which might be interesting for tourists. In this case, the map's labelling leads to a faster understanding. It names, for example, the different museums in the city. However, the signatures are a bit too small and even the vertical plans do not really stick out of the map. (Aurich 2016)

## The evaluation and its results



**51** Rothenburg ob der Tauber's map uses letter signatures besides the number signatures we have already seen in many other maps. The map has also some pictorial signatures. The places of interest in the inner city are only represented by numbers and letters hence the tourists do not get an impression by only looking at the map what kind of sightseeing spot is to be expected there. The legend always needs to be consulted for understanding such signatures. (Rothenburg ob der Tauber 2014b)



**52** This map offers the tourists only some pictorial signatures, mostly representing parking places. Interesting or important places are given by text fields in the map. This way of representation is not very illustrative. Due to this representation, the parking places will catch more of the map user's attention than places of interest like the music hall or the thermal bath. (Bad Neuenahr-Ahrweiler no date)



## Colour

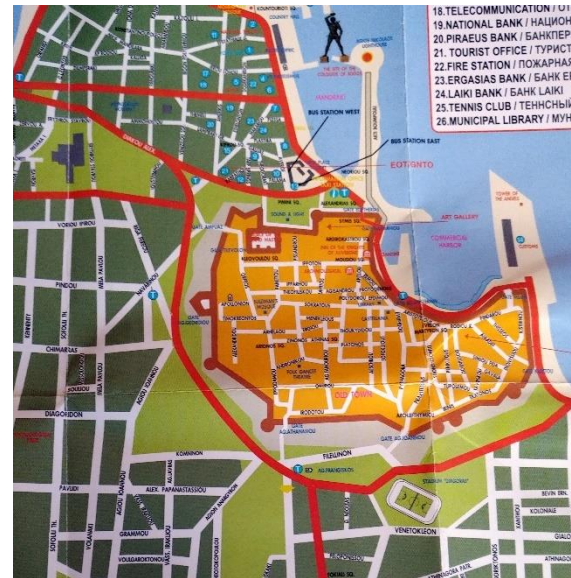
The evaluation also took a look to the colours chosen in the available maps. In the chapter about the use of colours (cf. chapter 5.4.), it has been pointed out that colour associations will lead to a faster understanding of the map. It is nice to see that most of the analysed maps work with colour associations. Examples of (parts of) maps without colour associations are shown below (fig. 53-55, p. 110-111).

Another criterion given is the inconspicuous base map colour (cf. fig. 56, p. 111). In some of the collected maps the base map colour is a problem (cf. fig 54).

Varying colours for each type of street can also help to gather the information given in the map faster. This method is used in at least 59 maps out of 77.



53 The map of Aachen uses only blue and grey as base map colours. Therefore, it is not clear where, e.g. parks or buildings are. It can be assumed that the blue streets are pedestrian zones but the colour is not explained in the legend. Although it is very subjective which colours one likes and which not, the grey colour schema used is not very attractive to look at. (Aachen no date)



54 The map of Rhodes highlights the old town by using other colours than on the rest of the map face. The use of green colours might be problematic since they are often associated with green spaces but in this map are no green spaces where the green colour is. (Rhodes no date)



55 The map of Reichenau uses an orange colour for presenting the lake. (Reichenau no date)



56 The colours used in the map of Norderney are well distinguishable. It is clear, where green spaces, beaches or buildings are. (Norderney 2016)

## Lettering

The map's lettering is also an important part of map design. To begin with, we can state that all but one map include lettering.

Labelled objects are mostly the streets but also parts of town, public places or names of stations. Important spots like public institutions or even the sightseeing spots are often lettered either.

The use of different fonts for map lettering does not seem to be very popular. Only a fraction of the evaluated maps use different fonts. And: sans serif fonts dominate map design. My map collection does not contain a single map which has only serif fonts in it. Four maps have at least both types of font in them. But: this practice fits the guidelines in literature which states that sans serif fonts are to be preferred in map design (cf. chapter 5.5).

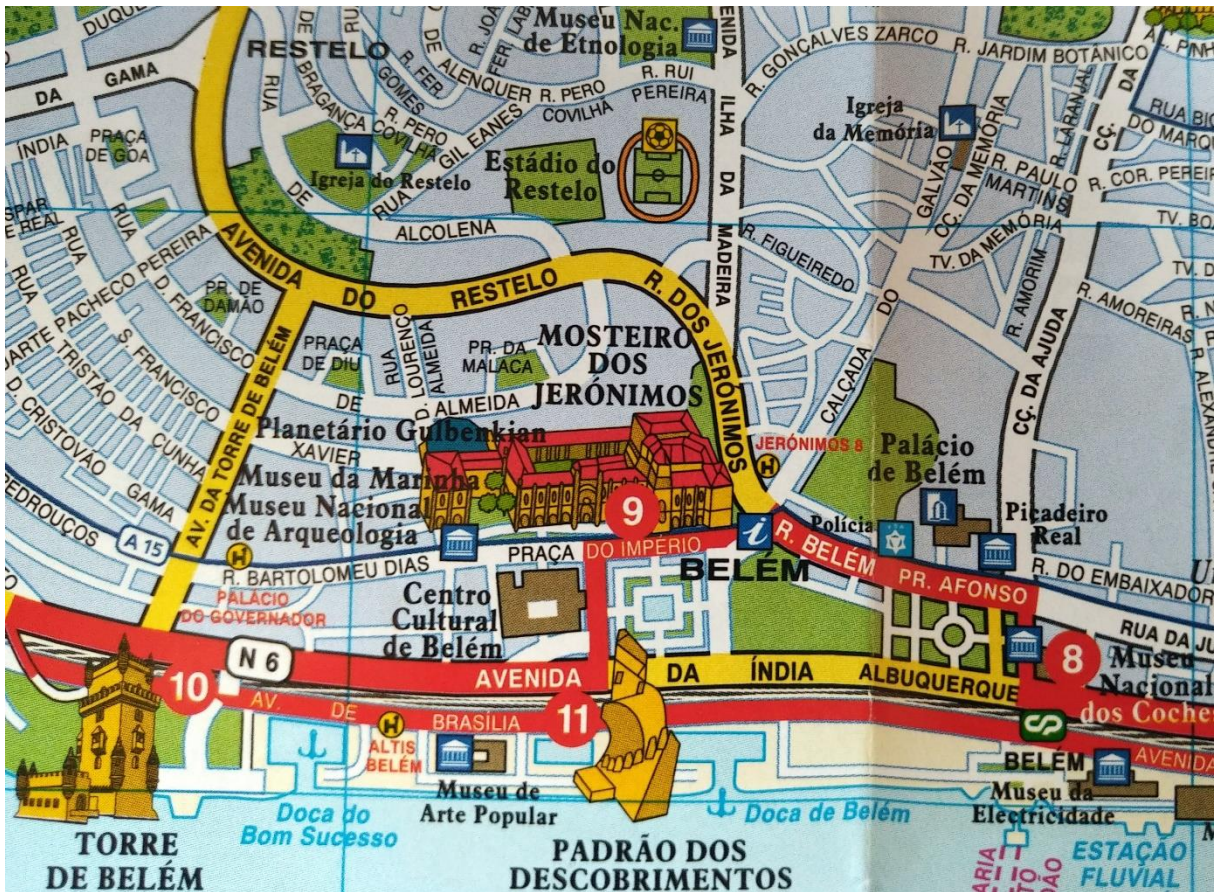
Thirty maps have different font colours.

Label placement is correct in nearly all maps. The lettering is placed near the object it represents and therefore can be attributed to it easily.

Examples for lettering on maps can be seen in the pictures below (fig. 57-60, p. 112-113).



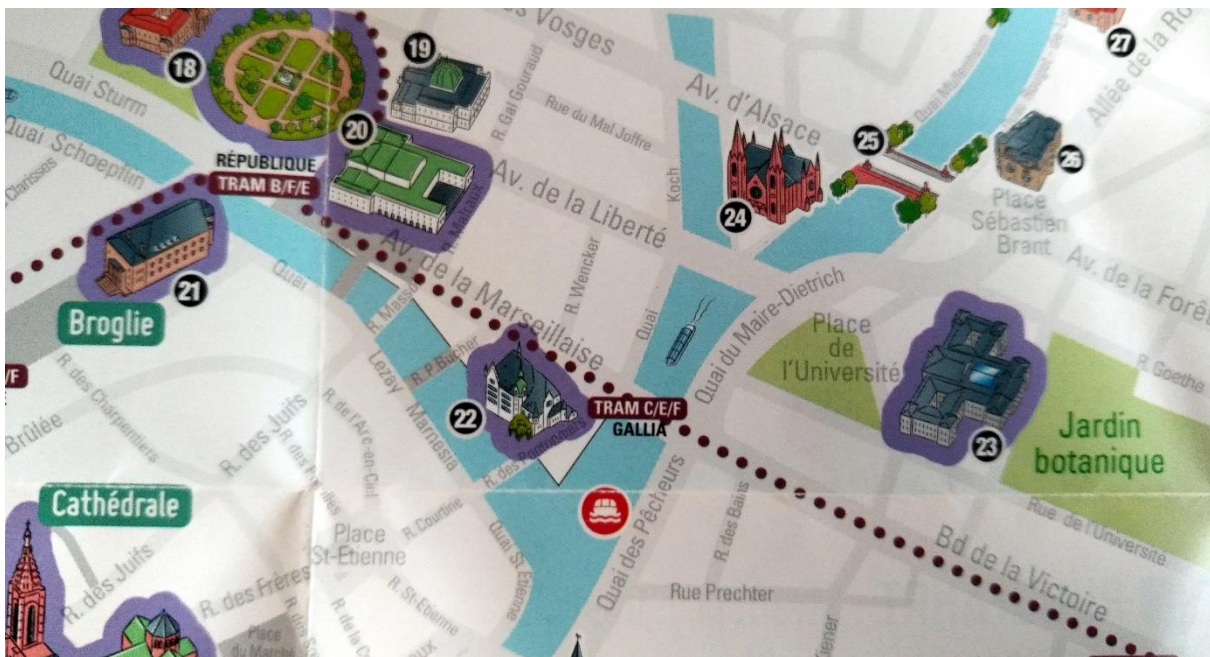
57 The map of Bad-Westernkotten uses different font colours. The label placement is problematic in some cases. The label “Zentrum” looks like a street labelling but in reality, the centre comprises a larger area and not only one street. Some street labels are very small and hard to read. (Bad Westernkotten 2013)



58 The map of Lisbon includes serif and sans serif fonts. We can also see different font colours. Some labels are written on other signatures. Therefore, they are hard to read. (Lisbon no date)



59 The map of Wasserburg uses different font colours to indicate different objects. E.g., the creek is labelled in blue. (Wasserburg no date)



60 The lettering in the map of Strasbourg is not well-readable. Lettering and street colours do not contrast very much. (Strasbourg 2016b)

## Visual hierarchy and map layout

A well-thought-out visual hierarchy will also help the map user to immediately get the most important information. But it seems that the concept of visual hierarchy is not well known to

## The evaluation and its results

all map makers (cf. fig. 61, 62, p. 114). Only a few maps show a good visual hierarchy (cf. fig. 63, p. 115).

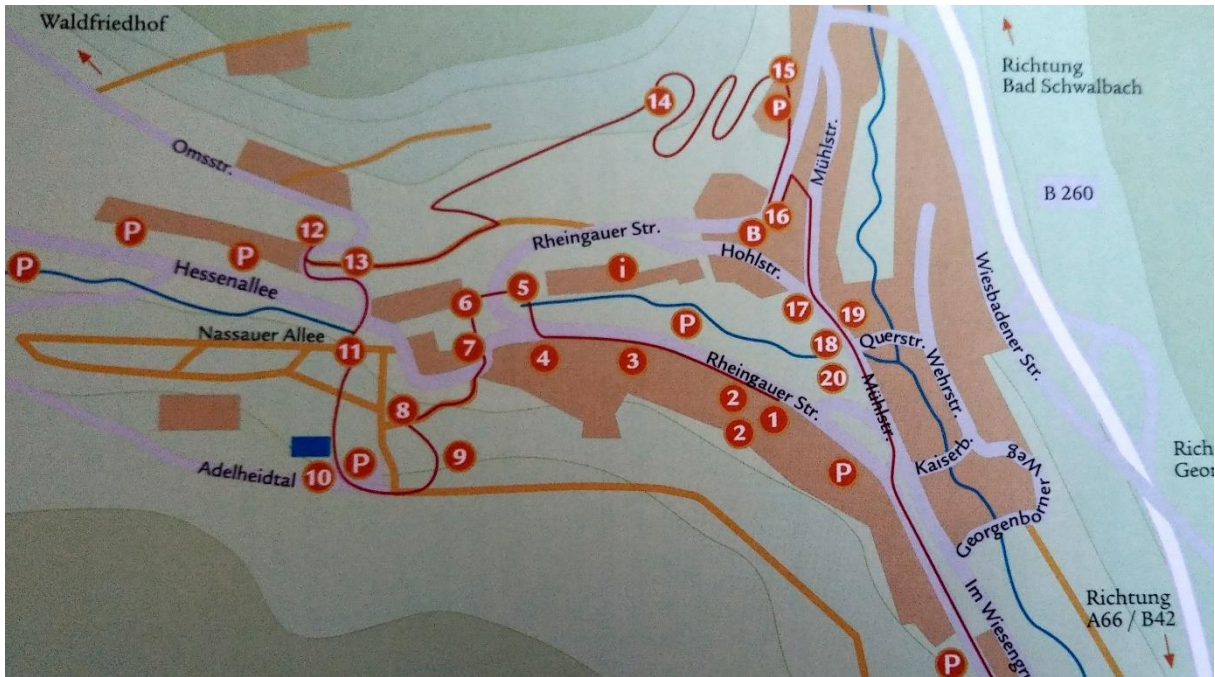


**61** The visual hierarchy of this map is not very good. The pictorial signatures are not in contrast to the background and too small and therefore had to recognize. (Groemitz no date)



**62** The visual hierarchy of the map of Friedrichshafen is also not very good. The main roads are well visible in the map. Information which is important for tourists, e.g., sightseeing spots do not stand out. (Friedrichshafen no date)

## The evaluation and its results



63 The sightseeing spots of Schlagenbad are marked in red circles. Therefore, tourists will see them immediately in the map. (Schlagenbad 2015)

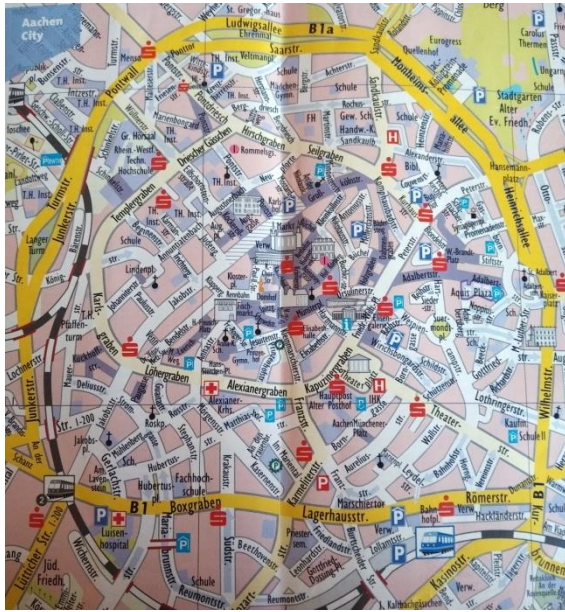
The evaluation results are better for the maps' layout. Here, we can say that most maps show well-arranged map elements.

Another interesting point for us was the question whether the map makers work with inset maps or not. Our observations show that working with auxiliary maps is quite common and the bigger part of the evaluated maps has inset maps (cf. fig. 64 – 67, p. 115-116).



64 Wasserburg's map sheet includes an inset map of Bodolz, a municipality bordering Wasserburg. (Wasserburg no date)

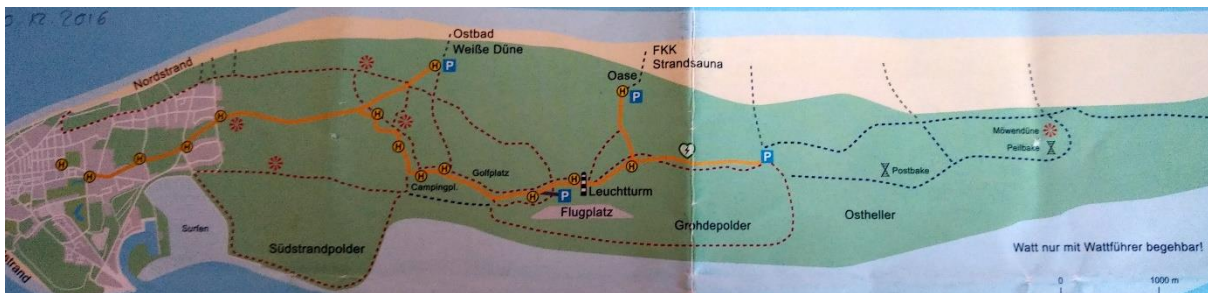
## The evaluation and its results



65 Aachen offers the tourists an inset map in a larger scale which shows the inner city while the main map represents the complete city in a much smaller scale. (Aachen 2015)



66 Meersburg's map has an auxiliary map in a larger scale which shows the part of the city offering most attractions. (Meersburg 2014)



67 The map of the inner city of Norderney has an auxiliary map on its backside which shows the whole island. Therefore, the tourists can discover the whole island with the help of this map. (Norderney no date)

## Generalisation

Before we start analysing the maps' contents, the last criterion for analysing map design is generalisation. During the evaluation process, four maps were rated as "not generalised". This valuation is not completely correct. If we go back to the chapter about generalisation, we will see that we can distinguish between two different types of generalisation: object generalisation and cartographic generalisation. The first process, the object generalisation, was actually accomplished for three of the four maps rated as "not generalised". But: these maps do not have a cartographic generalisation. In these cases, the map maker took an already existing map as a base map for his mapping project and made no changes to the map, except maybe adding some new signatures or further lettering. A good example is the map of Norderney. The map was taken completely out of OpenStreetMap, without any changes. The map even has all OpenStreetMap signatures in it which consequently also means that the map lacks the information that is really interesting for tourists like sightseeing spots or other attractions. Below, we can see the map of Norderney that is sold in comparison to a screenshot of the OSM website, also showing Norderney. (fig. 68,69, p. 117)

## The evaluation and its results



68 This map is the printed version of the Norderney map which can be bought at a bike rental. (Norderney 2016)



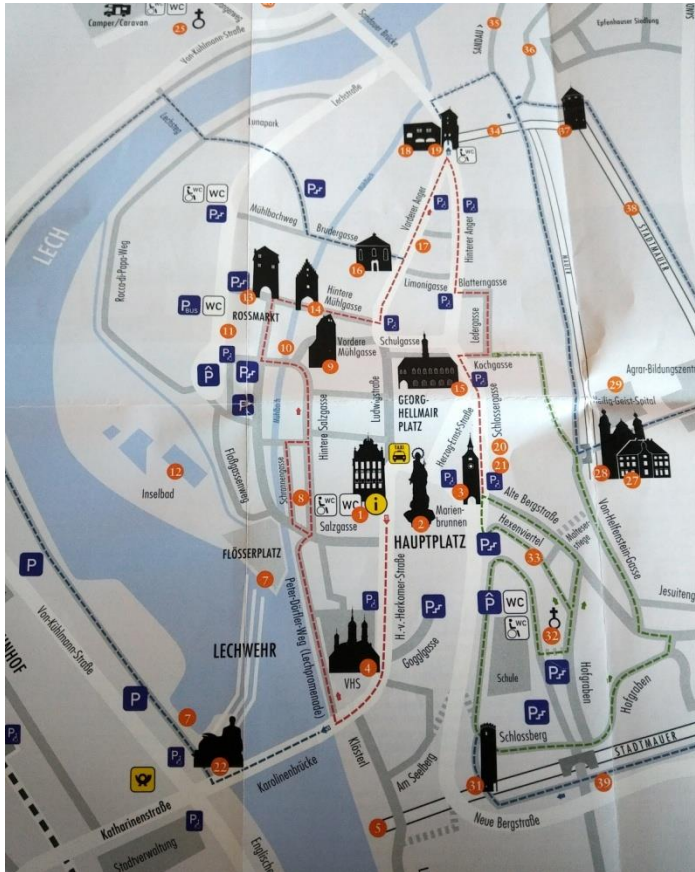
69 In comparison, a screenshot of OpenStreetMap, also showing Norderney. It is obvious that this map is not changed at all. Unfortunately, the map does not have a source statement which informs the tourists about the map's origin. (Screenshot OSM, 08.12.19)



70 The example of Nonnenhorn shows a map which even does not have the object generalisation. The map consists of an aerial photo which has some additional signatures. (Nonnenhorn no date)

Nevertheless, we can state that most maps do have a generalisation. The next question is whether the existing generalisation is really well-thought-out, i.e., if it concentrates on the necessary objects to show and leaves out unimportant objects or not. The evaluation shows that only a third of all city maps show a good generalisation. Negative examples can be seen below (fig. 71, 72, p. 118).





71 The map of Landsberg is an example for a map which is generalised too much. It shows only the main streets, stretches of water and some single buildings. Areal information are left out completely. Therefore, the tourists are not informed about the green spaces which exist near the inner city. (Landsberg am Lech no date)



72 The map of Bamberg could be generalised more. It shows every single building, including the backyards. Merging the single houses into blocks might lead to a clearer map face. (Bamberg 2015)

## Map Content

The first part of the checklist for map content referred to the list about demands of tourists on the destinations. The criterion "transportation" gets the best results in this part of the checklist. All but six maps offer the tourist information about different transportation possibilities (cf. fig. 73-76, p. 119-120).

## The evaluation and its results



73 This map shows bus stop for the public transportation but also parking spaces for tourists preferring to use their car. It would also be possible for visitors to rent a bike since a bike rental is marked in the map. (Neustadt 2015)



74 Here, tourists get to know where car parks are, the central bus stations or where to get a taxi. (Aurich 2016)

## The evaluation and its results

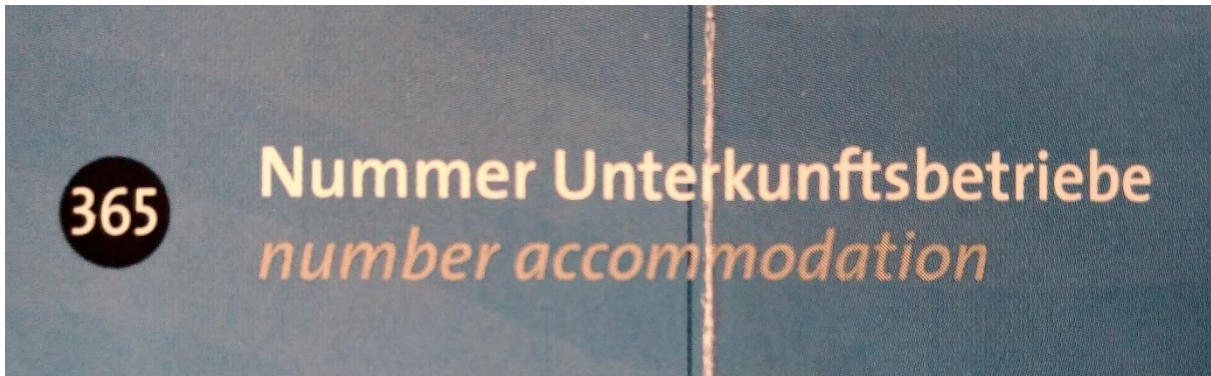


75 The map of Berlin includes suburban train and subway lines. (Berlin 2013)



76 The same map of Berlin offers the tourists also a public transport network map which surely is very helpful (Berlin 2013)

In contrast to the category transportation, only 20 maps offer the tourists information about accommodation (cf. fig. 77-78, p. 121).



77 Accommodations are marked by numbers in Meersburg's map. It is not explained in the map sheet which accommodation has which number. Consequently, the tourists only know where accommodations in general are situated in the city but will not get any further information about them, like, for instance, whether it is a hotel or a holiday flat. (Meersburg 2014)

**Hotels**

**Wichtiger Hinweis:**  
 \* Betriebe ohne Angabe haben an der freiwilligen Klassifizierung nicht teilgenommen.  
 Eine Bewertung des Betriebes ist damit nicht verbunden.  
 \*\* Mehrbettzimmer mit Schlafgelegenheiten für drei oder mehr Personen.  
 \*\*\* Qualitätssiegel vom Allgemeinen Deutschen Fahrradclub (ADFC) für fahrradfreundliche Gasgeber.

Klassifizierung*	Onlinebuchung	SpeyerCARD	Bettanzahl	Zimmeranzahl	Appartement	pro Zi mit U/F €		Familien-/Mehrbett-Zimmer**	Gastronomie	Biergarten	Tagungsmögl.	NK-Zimmer	rollstuhl-gesegnet	Hunde erlaubt	WLAN	Bett + Bille***
						Zi Einzel	Zi Doppel									
1	H	Hotel Alt-Speyer, Große Gallergasse 1a, Tel.: 06232 60280, Fax: 03212 4602828, www.hotelaltspeyer.de, E-Mail: info@hotelaltspeyer.de	***	@	25	10	1	64-75	85-105	110-135						
2	H	Hotel-Restaurant 1735, Rheintorstraße 5, Tel.: 06232 604610, Fax: 604630, www.hotel1735.de, E-Mail: info@hotel1735.de	***	@	35	21		70	90-95	115						
3	H	Hotel-Restaurant Amadeus, Gutenbergstraße 20, Tel.: 06232 74623, Fax: 26951, www.amadeus-speyer.de, E-Mail: info@amadeus-speyer.de			10	6		48	75-80	98-130						
4	HG	Hotel & Serviced Apartments Am Wartturm, Landwehrstraße 28, Tel.: 06232 64330, Fax: 643321, www.hotel-amwartturm.de, E-Mail: info@hotel-amwartturm.de	***	@	46	17	6	65-85	80-109	99-139						
5	H	Restaurant-Hotel Backmulde, Karmeliterstraße 11-13, Tel.: 06232 71577, Fax: 629474, www.backmulde.de, E-Mail: restaurant@backmulde.de		@	12	6		58-68	78-88	100						
6	H	Hotel Domhof, Bauhof 3, Tel.: 06232 13290, Fax: 132990, www.domhof.de, E-Mail: rezeption@domhof.de	*** Superior	@	92	49		99	121-136							
7	HG	Hotel Goldener Engel, Mühlturnstraße 5-7, Tel.: 06232 13260, Fax: 132695, www.goldener-engel-speyer.de, klimatisierte Zimmer	***	@	74	46	2	63-108	84-146	112-170						
8	H	Hotel ibis Styles Speyer, Karl-Leiling-Allee 6, Tel.: 06232 2080, Fax: 208333, www.ibisstyles.com, E-Mail: H8668@accor.com	***	@	173	87		59-160	79-180	99-220						
9	HG	Hotel Kurpfalz, Mühlturnstraße 26, Tel.: 06232 24168, Fax: 296651, www.hotel-kurpfalz-speyer.de, E-Mail: info@hotel-kurpfalz-speyer.de		@	20	10		67-80	87-110	115-135						
10	H	Hotel La Grotta, Gutenbergstraße 12, Tel.: 06232 79823, Fax: 8549499, www.la-grotta-speyer.de, E-Mail: la-grotta-speyer@gmx.de, Parkplatz im Hof		@	7	3		72-82	88-122							
11	H	Lindner Hotel & Spa Binshof, Binshof 1, Tel.: 06232 6470, Fax: 647199, www.lindner.de/binshof, E-Mail: info.binshof@lindner.de	**** Superior	@	240	133		109-359	149-399							
12	H	Hotel Löwengarten, Schwerdtstraße 14, Tel.: 06232 6270, Fax: 627222, www.hotel-loewengarten.de, E-Mail: info@hotel-loewengarten.de, klimatisierte Zimmer	****	@	125	63		100-150	120-250	105-150						
13	H	Hotel Residenz am Königsplatz, Ludwigstr. 6, Tel.: 06232 684990, Fax: 6849999, www.residenz-speyer.de, E-Mail: info@residenz-speyer.de	****	@	36	15		99-125	139-175							
14	H	Hotel Sperling, Im Neudeck 34 a, Tel.: 06232 41111, Fax: 440771, www.hotelsperling.de, E-Mail: info@hotelsperling.de		@	29	11	1	69-79	89-119							
15	HG	Hotel Speyer am TECHNIK MUSEUM, Am Technik Museum 1, Tel.: 06232 67100, Fax: 671020, www.hotel-speyer.de, E-Mail: info@hotel-speyer.de		@	181	108		60-99	90-119	115-159						
16	HG	Hotel Speyerer Hof, Maximilianstr. 8, Tel.: 06232 6021220, Fax: 6021223, www.hotel-speyerer-hof.de, E-Mail: info@hotel-speyerer-hof.de	***	@	50	20	1	60-90	90-120	110-150						
17	HG	Hotel Trutzpfaß, Webergasse 5, Tel.: 06232 292529, Fax: 292615, www.trutzpfaß-hotel.de, E-Mail: info@trutzpfaß-hotel.de		@	16	8		60-75	80-95							
18	HG	Hotel Zum Augarten, Rheinhäuserstraße 52, Tel.: 06232 75458, Fax: 61480, www.zum-augarten.de, E-Mail: info@zum-augarten.de		@	29	14	2	58-79	78-99	98-149						

78 Speyer gives information about hotels in a list, including also the price range and information about additional comforts like wi-fi. The map offers also lists about other forms of accommodation like holiday flats which are not in this picture. Therefore, the tourists have information about a wide range of accommodations were they can choose from the best for them. (Speyer 2013)

Similarly, only a few maps have information about foods and drinks in them (cf. fig. 79-81, 122).

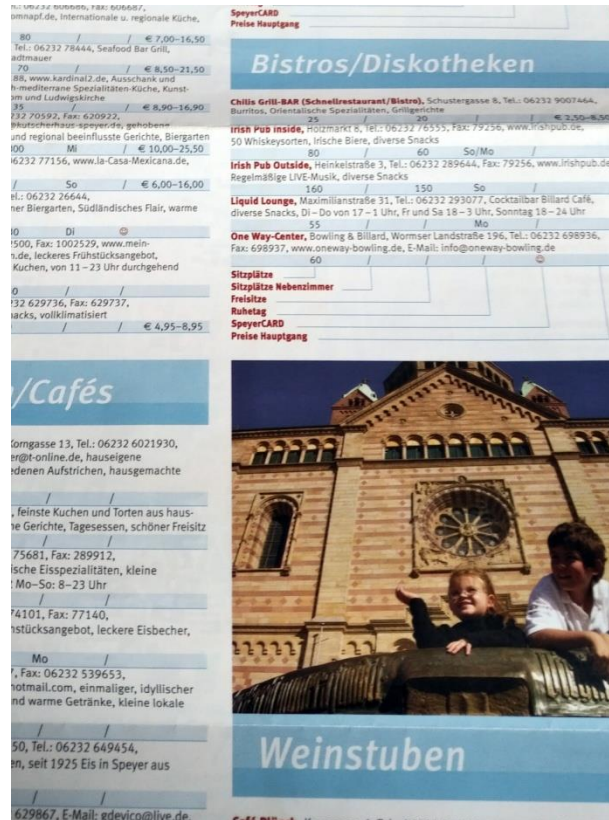
## The evaluation and its results



79 Emden's map has information about restaurants on its backside. Here, the tourists can see a photo of the restaurant, its address and also which kind of food is offered. (Emden 2014)



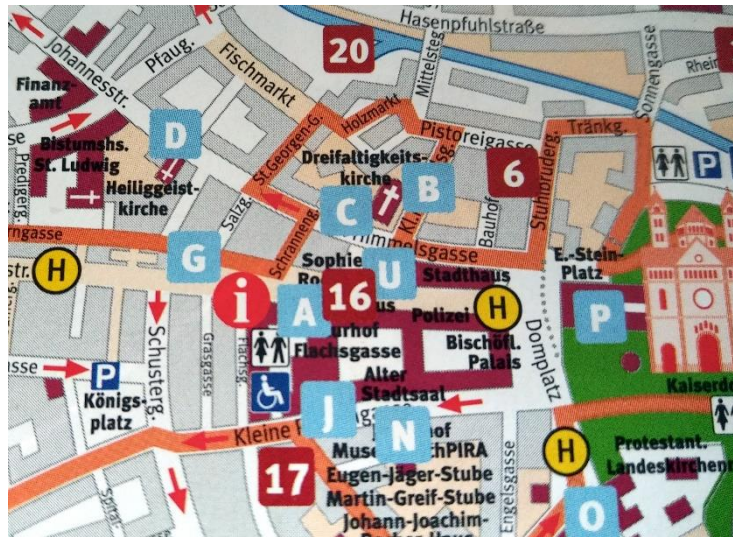
81 A narrow range of places of get food and drinks in Norderney are marked by numbers in the map. (Norderney 2016)



80 Speyer's map has, besides the detailed information about accommodation, also a long list of places to get food and drinks for the tourists. Here, the tourists can choose between restaurants, cafés, wine bars or bistros. (Speyer 2013)

It is also of great importance for tourists to know where the tourist information is since they will get all the information necessary for their stay there. The existence of a tourist information in the map is covered by the main category "tourism service". At least 74 percent of evaluated maps tell the tourists where they find tourism services (cf. fig. 82-84, p. 123). The tourist information is usually marked with the letter "i" in the maps. Some maps also give the whole address of the tourist information in text.

## The evaluation and its results



82 Speyer's map has the tourist information marked by a signature with the letter "i". (Speyer 2013)



83 Wasserburg as well is an example for a map marking the tourist information with the letter "i". (Wasserburg no date)

**Willkommen in der Käthchen-  
und Weinstadt am Neckar**

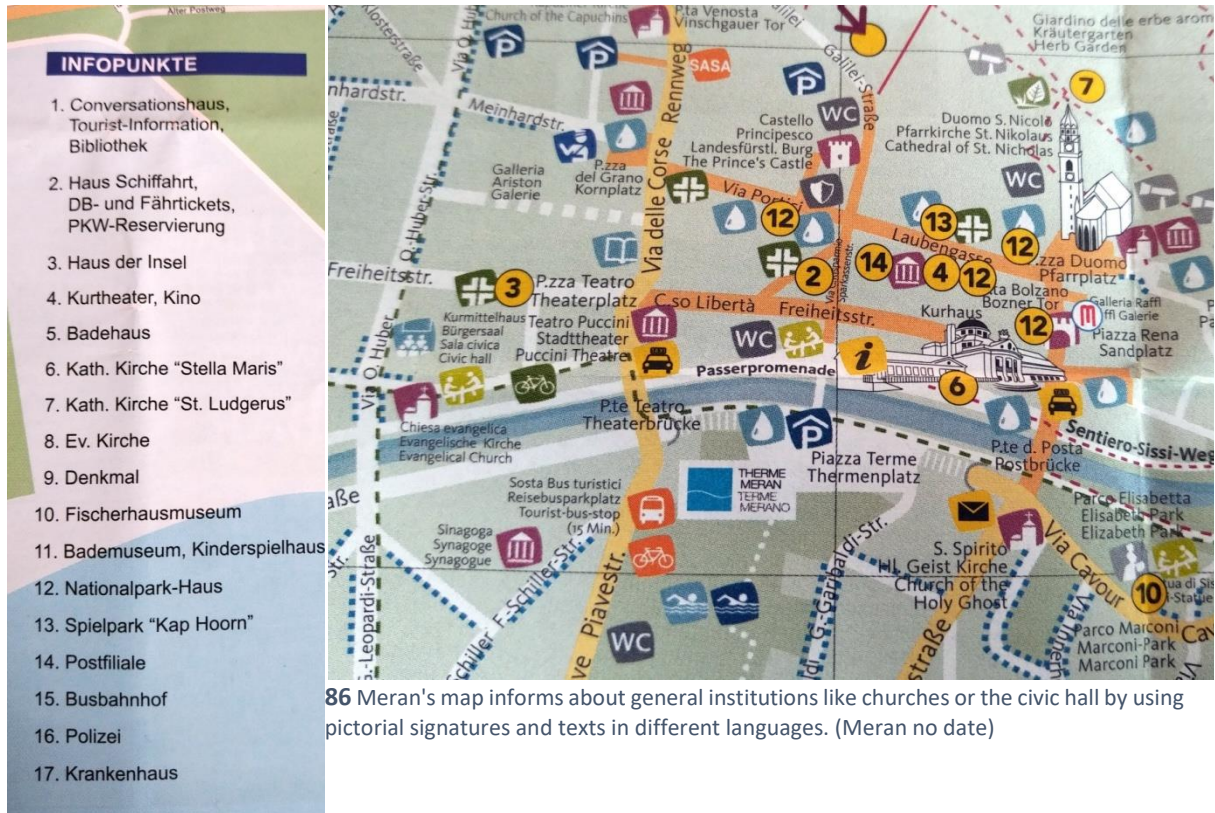
Weitere Informationen zu Heilbronn erhalten Sie in der Tourist-  
Information Heilbronn – Montag bis Freitag von 10 bis 18 Uhr,  
sowie Samstag von 10 bis 16 Uhr.

 Kaiserstraße 17, 74072 Heilbronn  
Tel. 07131 562270, Fax 563349  
info@heilbronn-marketing.de  
www.heilbronn-tourist.de

84 Heilbronn informs about its tourist information by a text which includes the complete address of the tourist information, opening times and contact information. (Heilbronn 2016)

Some more maps (77 percent) include general institutions like the town hall, churches or post offices (cf. fig. 85, 86, p. 124).

## The evaluation and its results

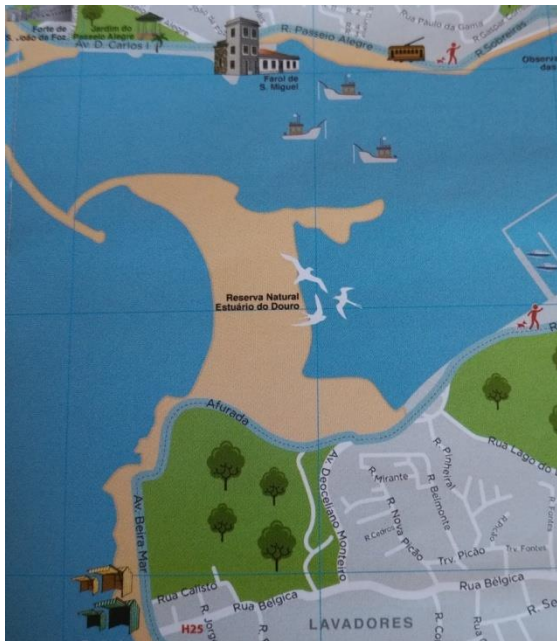


86 Meran's map informs about general institutions like churches or the civic hall by using pictorial signatures and texts in different languages. (Meran no date)

85 The legend of Norderney's map includes a list of general institutions like the post office, the police station or the hospital. These institutions are placed on the map by the use of numbers. (Norderney 2016)

Another criterion was whether the map shows natural phenomena the tourist might like to see. Surely, not all cities can offer the tourist natural phenomena but it was possible to find indications for them in at least 40 maps (cf. fig. 87-89, p. 125).

## The evaluation and its results



87 Porto's map shows the tourists where the city's nature reserve is situated. (Porto no date)



88 Wasserburg as well informs the tourists about nature reserves. (Wasserburg no date)



89 The auxiliary map of Norderney shows natural phenomena like beaches, dunes and the watt. (Norderney no date)

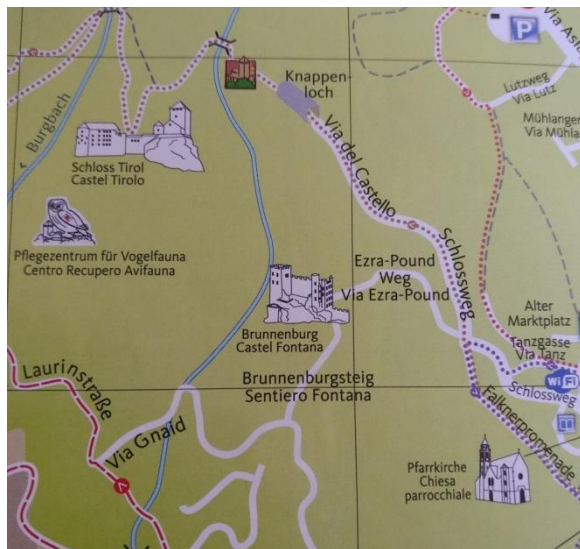
Since cities are often a hotspot of culture, we have included this category in our checklist, too. The main topic "culture" is divided into two subcategories. On the one hand, we are interested whether we can find information about culture in general in the map and on the other hand, the question is if the map also includes cultural features that are typical for the city or the region. As discussed in chapter 6.2.7., tourists love it if cities have their own special character which is not easy exchangeable with others. Pointing out the special local culture can therefore help (cf. fig. 90-92, p. 126).

Culture in general can be found in nearly all maps. Exceptions are the two city maps of Groemitz and one of Unna. The special local culture is pointed out in three-fourths of the evaluated maps.





90 Bamberg offers the tourists local culture in the form of, for example, a brewery museum and a crib museum. (Bamberg 2015)



92 On the map of Dorf Tirol, the tourists will find castles or a birds nursing centre. (Dorf Tirol no date)



91 Schmallenberg points out its best looking and most interesting houses. (Schmallenberg no date)

Since doing sports is also a favoured activity of some tourists, this point was a criterion as well. A big part of the analysed maps tell the tourists where sports facilities are (cf. fig. 93-95, p. 127).

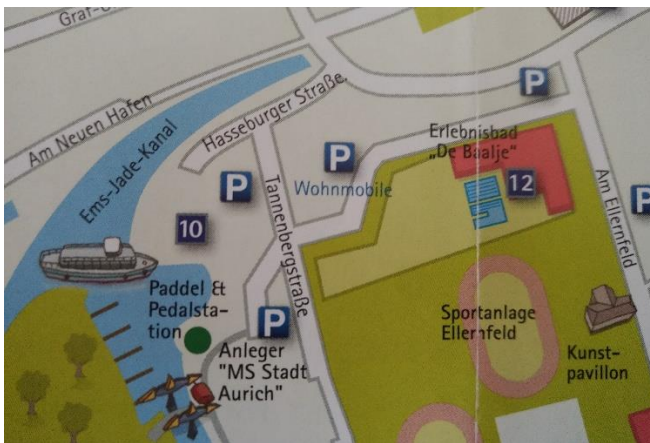
## The evaluation and its results



93 People visiting Groemitz have a lot of possibilities for doing sports. Here, they can go horse riding, play soccer or tennis. Since the city is situated at the seaside, swimming would also be possible. (Groemitz no date)



94 Tourists in Garmisch Partenkirchen can go swimming or ice skating. (Garmisch Partenkirchen no date)



95 In Aurich, the tourists have the possibility to paddle. But they could also visit the water park or the sports stadium. (Aurich 2016)

The results of evaluating the criterion "shopping" are quite surprising. Normally, cities can be seen as the right destination to do some shopping and, as we have seen before (chapter 6.2.3.), shopping is also a main reason for visiting cities. One could consequently expect the maps to give the tourist some more information about where to go for shopping. This can be done very easily by, for example, showing where the pedestrian zone, where most shops normally are, or by marking shopping centres in the map. But only a few maps do so (cf. fig. 96-98, p. 128). So, this leaves room for improvement for most maps.

The evaluation and its results



96 Jerusalem's map gives the tourists a list of shopping centers to choose from. (Jerusalem 2014)

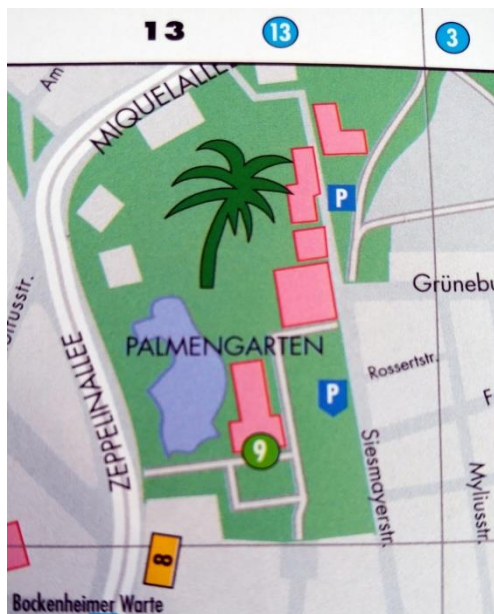


98 Tourists visiting Reichenau get information about where to go shopping for craft. (Reichenau no date)

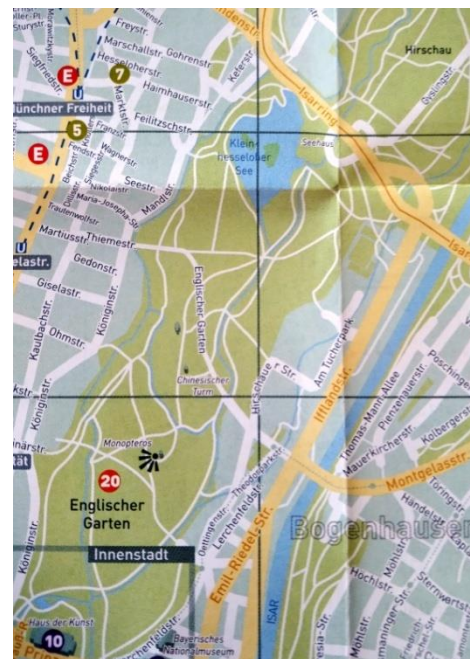


97 Albufeira's shopping center is marked in the map by text and signatures. (Albufeira no date)

Beside (exciting) activities like sports, shopping or sightseeing, rest and recreation is also seen as important for tourists. It is nice to see that the bigger part of the maps show tourists recreational areas like parks, beaches or spas (cf. fig 99 – 102, p. 128-129).



99 Frankfurt recommends its tourists to visit the "Palmengarten". The "Palmengarten" is a botanical garden with some greenhouses and an extensive parkland. (Frankfurt 2017)



100 In Munich, the English Garden is the most famous place for getting some rest and recreation in the city. (Munich no date)

## The evaluation and its results



101 Tourists in Bad Westernkotten could go for a walk in the gardens of a health resort... (Bad Westernkotten 2013)



102 ... or they could visit the local nature reserve. (Bad Westernkotten 2013)

Giving information about the next category, the temporary events, may be problematic in some cases because it normally means that a map that includes the dates of temporary events must be updated constantly, otherwise it will be outdated soon. Some map makers have solved the problem by mentioning only events which take place every year at the same time, like, for example "wine festival every September" (cf. fig. 103-104, p. 130). Other maps are updated each year. Hence, they can include all annual temporary events.

## The evaluation and its results



**103** Groemitz tells the tourists the most interesting events in each month. However, the tourists do not get an exact date. (Groemitz 2014)

**Kulinarische Höhepunkte**

- Mehr als Blüte
- Abendmärkte
- Fisch und Meer
- Komm und See
- Genuss und Herbst
- Apfelwochen am Bodensee
- Genussherbst am Lindauer Bodensee
- Genusswanderung

Führungen: Obstbauwanderungen, Schnapsdegustationen, Weinbergbegehungen, Beerenführungen und vieles mehr.

**Tipp:** **Willkommenstour**  
Mai bis September  
immer montags um 17 Uhr  
bei den Ausgrabungen auf der Halbinsel.

**104** Wasserburg informs about the most interesting events of the year but does not give a concrete date. Hence, the tourists who are interested in those events will need to do some research about them on their own. However, the map sheets also includes a note about a city tour which happens every Monday. Here, the tourists get all information which are necessary to know to attend the tour. (Wasserburg no date)

The last criterion is the sui generis or the man-made attractions which have been created in many cities to attract tourists. At least eleven cities have sui generis or at least show them in their maps (cf. fig. 105-107, p. 131).

A great example in this context is Genova because here we can see how urban planning tries to attract tourists by developing such sui generis. The map of Genova shows us (fig. 107) that tourists can find many attractions in the harbour area which are definitely not natural but man-made, like an aquarium, the Acquario di Genova, the so-called Biosfera, where tourists can admire tropical plants and animals, or the Galata Museo del Mare, one of the biggest maritime museums in the Mediterranean region (Becht 2013:255). All of these attractions and some more are highlighted in the map by showing their logotype and even adding small (advertising) texts. But, as we remember, Genova is not the typical tourist city. Even in Italy itself, the city has always had a bad reputation because of the derelict old town or the high crime rate (Becht

2013:228). By renovating historical buildings and creating all the attractions in the harbour area, Genova tries to change its image to become a magnet for tourists (Becht 2013:229).



105 Lisbon also has an aquarium, the so-called Oceanário. The Oceanário was built in 1988 in the course of the world exhibition (Schetar 2018:73-75). (Lisbon no date)



106 Groemitz offers its tourists a "Tauchgondel". Here, the tourists can dive in a kind of submarine to watch the underwater world. (Groemitz 2014)



107 This part of Genoa's city map shows the harbour area which includes some sui generis. (Genoa 2015)

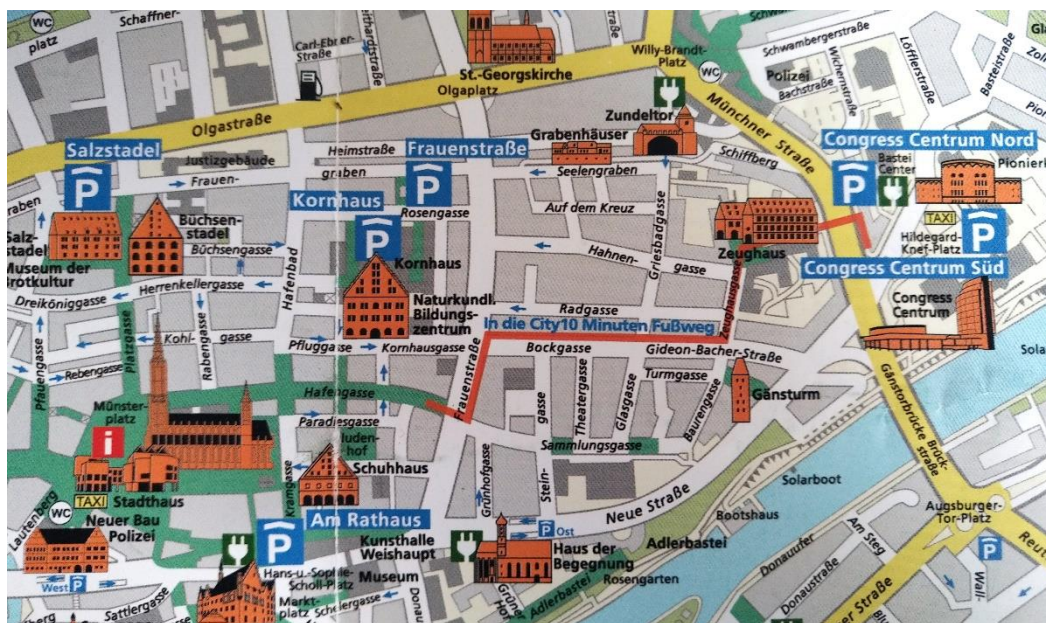
Furthermore, we also wanted to know whether the city map maybe focuses only on one group of tourists. This question can be answered positively for three analysed maps (cf. fig.108-110, p. 132): Bad Westernkotten, Ulm and Naumburg. Bad Westernkotten is a spa town and therefore gives mostly information necessary for spa tourists. Ulm's map focuses on tourists arriving by car, and shows car parks and footpaths from the car parks to the city. The map for Naumburg's inner city, on the other hand, addresses visitors interested mostly in art and history by showing where the interesting cultural points in the city centre can be found.



108 The cover picture of Ulm's map already tells the map users the map's main topic: it is about parking in Ulm. It also names a selection of parking lots in the city. (Ulm 2018)

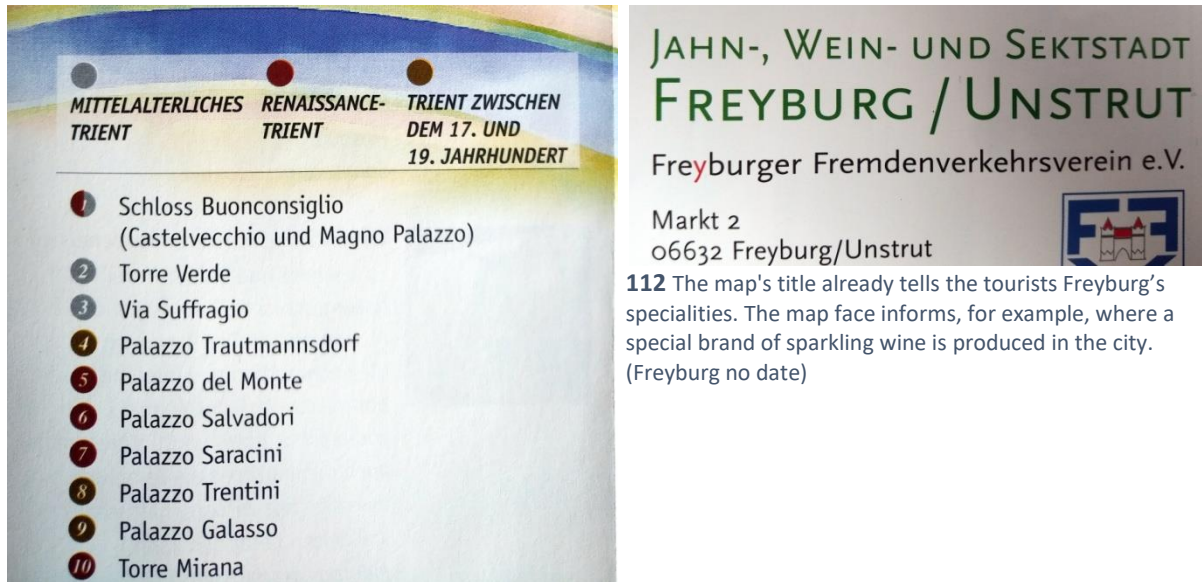


109 Bad Westernkotten is a typical health resort. Hence, the offers for tourists are mostly for health, relaxation and recreation. Spa tourists will find, for example, a thorn house or salt water thermal baths. (Bad Westernkotten 2013)



110 The map content itself also concentrates on the main target group which are car drivers. Therefore, the tourists coming by car get to know where parking lots or gas stations are. (Ulm 2018)

Beside focusing on one field of tourism or emphasizing local culture, it would also be a possibility to make regional characteristics in general. The idea again is to give the city a certain profile which make it stand out from the other tourist cities (cf. fig 111, 112). Some regional characteristics can be found in a lot of maps, so for example in the map of Freyburg (Unstrut) which highlights its wine culture.



**111** The map of trient points out the city's long history. The different historic epochs and their buildings which can be found in the city are marked in the map for the tourists. (Trento 2004)

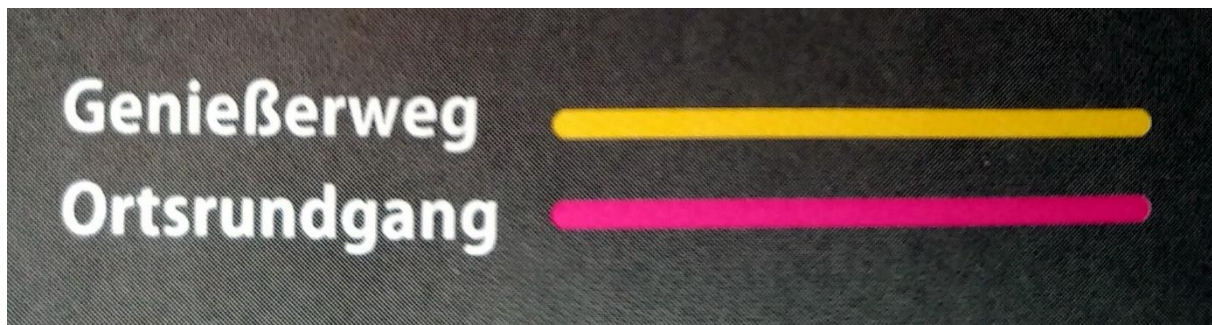
**112** The map's title already tells the tourists Freyburg's specialities. The map face informs, for example, where a special brand of sparkling wine is produced in the city. (Freyburg no date)

To discover a city as quickly as possible and pass all interesting sightseeing spots, it is recommended to propose a walking tour. But in reality, we do not find many maps which have recommendations for tours through the city in them (cf. fig. 113-115, p. 133-134).



**113** The map of Nonnenhorn includes two proposals for walks through the city. One walk leads through the inner city while the other walk also meets some outer parts of the city. (Nonnenhorn no date)





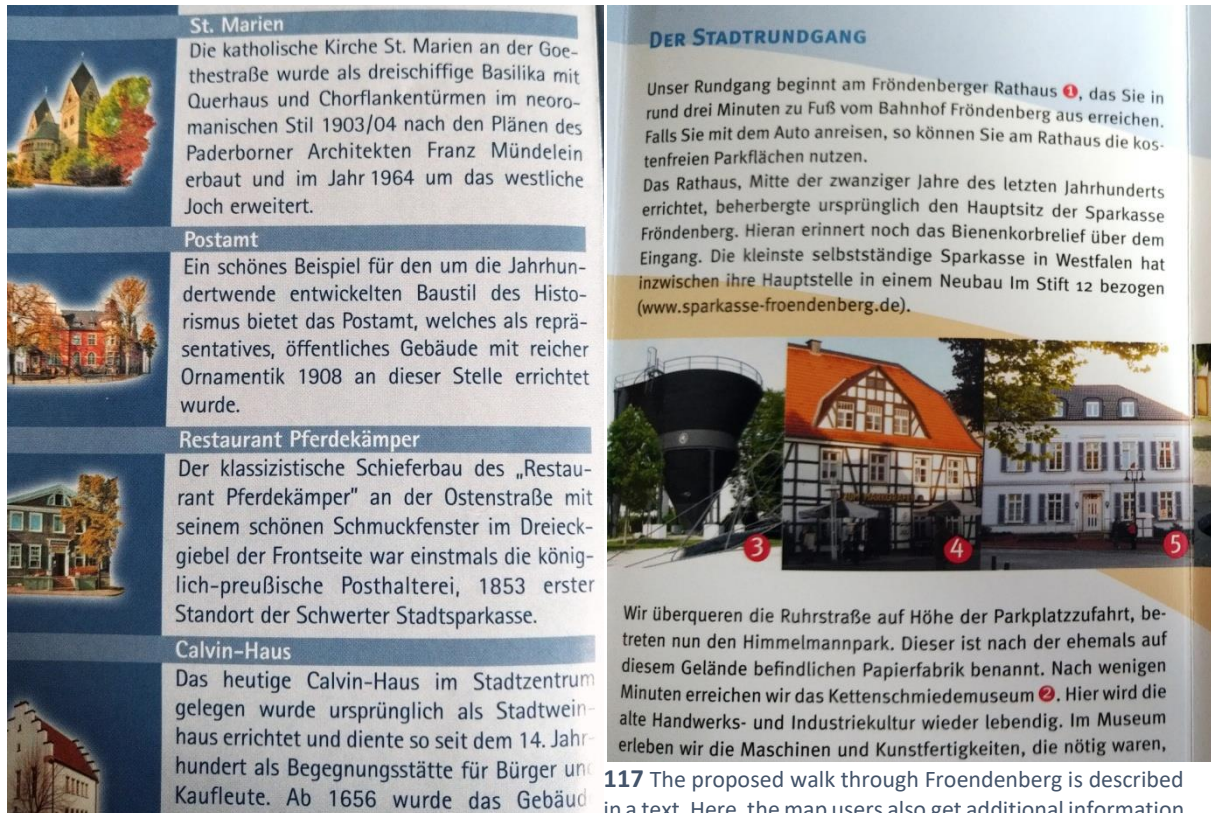
114 The map's legend names the two proposed routes. (Nonnenhorn no date)



115 Speyer's map proposes the tourists a walk which meets all the inner city's interesting spots. According to the legend, the walk will take 1-2 hours. (Speyer 2013)

A search grid can also be helpful in combination with a street directory to locate all streets or it can be used to find sightseeing spots and other important places faster. A search grid can be found in half of the evaluated maps while only 18 maps have a street directory.

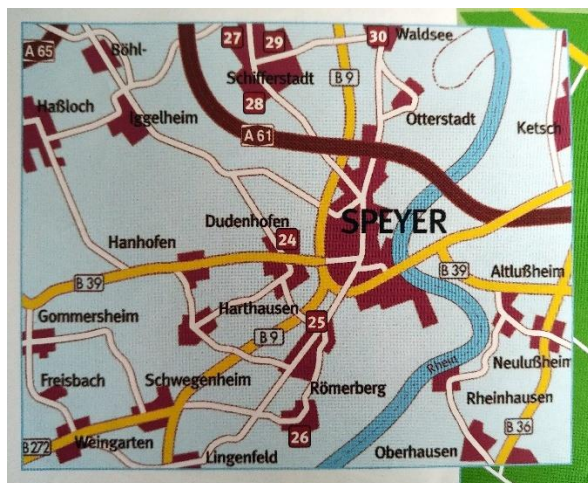
It is a possibility to fill the map's backside or free spaces around the map face with texts and/or photos about the city in the map. Both possibilities are employed by about half of the analysed maps (cf. fig. 116, 117, p. 135).



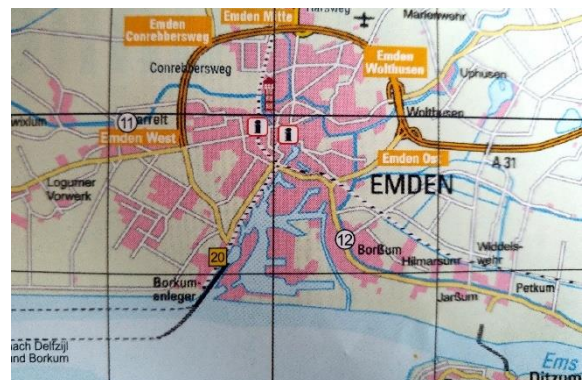
116 Schwerte shows the tourists the most beautiful buildings in photos. A text besides the photos informs about the buildings' histories. (Schwerte no date)

117 The proposed walk through Froendenberg is described in a text. Here, the map users also get additional information about the buildings they pass, including photos of them. (Froendenberg 2008)

Adding a map of the main-through roads or informing the tourists about opening times of sightseeing attractions or the tourist information has not been very popular on the maps evaluated here. Less than twenty maps have maps of the main-through roads and/or specifications of opening times (cf. fig. 118-121, p. 135-136).



118 Speyer offers an auxiliary map showing the main streets approaching and crossing the city. (Speyer 2013)



119 Emden's map shows the tourists the main streets through the city and also the different freeway exists which lead to the city. (Emden 2014)

### Naturkunde-Museum mit Vogelsaal

Das Naturkunde-Museum beherbergt einen der schönsten historischen Naturkundesäle weltweit. Die vornehme Raumschöpfung geht auf das Jahr 1791 zurück. In den klassizistischen Vitrinen sehen Sie über 2000 bunte Tierpräparate, vor allem Vögel. Dieses „Museum im Museum“ versetzt seine staunenden Besucher in eine andere Welt! Außerdem zeigt das Naturkunde-Museum Dauer- und Sonderausstellungen sowie eine Multimedia-schau zur Biosphäre.

April bis September, Di–So 9:00–17:00 Uhr, Oktober bis März Di–So 10:00–16:00 Uhr. Am 24., 25. und 31.12. sowie am 1.1., Faschingsdienstag u. an Allerheiligen geschlossen. Führungen nach vorheriger Anmeldung.

Erwachsene 3,50 €, ermäßigt 2,00 €  
Kinder ab 6 Jahren und Jugendliche bis 18 Jahre 1,50 €, Schüler im Klassenverband: 1,00 €  
Preisänderungen bei Sonderausstellungen vorbehalten.

**Fleischstraße 2  
96047 Bamberg**  
0951–8631248  
0951–8631250 (Fax)  
info@naturkundemuseum  
bamberg.de  
www.naturkundemuseum  
bamberg.de  
In BAMBERGcard inklusive

### TECHNIK MUSEUM SPEYER,

zwischen Dom und Flugplatz gelegen, 1991 eröffnet. In der denkmalgeschützten „Liller Halle“ und im großen Freigelände werden Exponate aus den Bereichen Luftfahrt, Eisenbahn, Feuerwehr und Schiffsbau präsentiert. Weitere Attraktionen: IMAX-Filmtheater, Modellbau Museum Wilhelmsbau, Boeing 747, Space-Shuttle Buran (Am Technik Museum 1, Tel.: 06232 67080, Mo–So: 9–18 Uhr).

### SEA LIFE Speyer,

tauchen Sie ab in die Faszination der heimischen und tropischen Unterwasserwelt. Vom Seepferdchen über Rochen, Haie und Krokodile bis hin zur grünen Meeresschildkröte – erfahren Sie „meer“ über die Bewohner unserer Flüsse, Seen und Meere (Im Haf Becken 5, Tel.: 01806 66690101, 20 Cent/Anruf aus dem dt. Festnetz, täglich ab 10 Uhr geöffnet). Bitte beachten Sie das -Leitsystem SEA LIFE Speyer.

### Archäologisches Schaufenster,

aktuelle Wechselausstellungen zur vor- und frühgeschichtlichen Archäologie in der Pfa „Gläserne Werkstatt“ für Einblicke in die tägliche Arbeit eines Restaurators (Gilgenstraße 13, Tel.: 06232 670 657, Di–So: 11–17 Uhr).

### Sophie-La-Roche-Haus,

Gedenkstätte für die Schriftstellerin Sophie La Roche (1731–1807), eröffnet 2005 anlässlich ihres 275. Geburtstages (Maximilianstraße 99, Mo–Fr: 10–18 Uhr, Sa: 10–16 Uhr, So: 13–18 Uhr).

### E.T.A. Hoffmann-Haus

Wohnung des Romantischen Literaten, Komponisten und Zeichners 1809–1813, mit Poetenstübchen, Spiegelkabinett, interaktiver Musikkommode und Zaubergarten. Lesungen.

Wechselausstellungen  
1. Mai bis 1. November  
täglich (außer Mo) 13:00–17:00 Uhr

Erwachsene 2,00 €  
ermäßigt 1,00 €

**Schillerplatz 26  
96047 Bamberg**  
info@etahg.de  
www.etahg.de  
In BAMBERGcard inklusive

121 Speyer's map informs about the opening times of museums or other attractions like the Sea Life aquarium. (Speyer 2013)

120 The map of Bamberg tells its users the opening times of, for example, museums, also including the entrance fees. (Bamberg 2015)

One of the final criteria to look at was the advertisement (cf. fig. 122, 123, p. 137). As we have seen at the start of our evaluation, most of the collected maps are available for free and so it might be a possibility that they are being financed by advertising. The results of our analysis show that 43 of 77 maps include advertisements. This seems much at first sight, but we also had a look at the question whether the map has many or very eye-catching advertisements. Here, we get much better results since the available advertisements are usually not very striking or only very small.

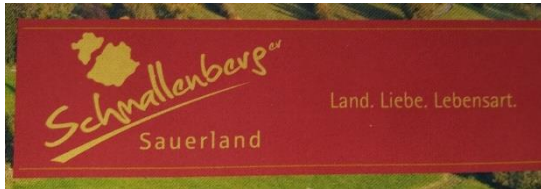


123 The map face of Groemitz is surrounded by advertisement, recommending restaurants, shops or pharmacies. (Groemitz 2014)

122 The cover picture of Rhodes' map is completely covered with advertisement, suggesting the tourists to visit a special restaurant. This restaurant is also highlighted in the map itself. (Rhodes no date)

The last part of the evaluation concerned itself with a clear and simple language and misleading information. But praxis showed that these criteria are not worth evaluating. No map had any language in it that was in any ways hard to understand or not understandable at all. One map can be seen as giving misleading information because its title says it will give information about the city as a shopping city but in fact the map does not give any information about shopping opportunities or where to find interesting shops at all.

On the other hand, the idea of a corporate design can be found on many maps. More than half of the analysed maps display logos and colours that are common for printed products of this city or their website (cf. fig. 124-126, p. 138).



124 The cover picture of this map has the logo and the motto of Schmollenberg on it. (Schmollenberg no date)



125 This map includes the city's logo and points to the city's characteristic, the location at lake Constance. (Meersburg 2013)



126 This map, again, shows the city's logo which includes the reference to the famous composer Haendel who was born in Halle. (Halle 2014)

## 9.1.2. General results: Hiking maps

### General information

After having presented the results of the city map evaluation, we now will have a look at the hiking maps and what their analysis shows.

As stated before, the evaluation of hiking maps covers 64 hiking maps. Comparable to the city map analysis, most of the maps are again from Germany (42 maps). The other maps are from Austria, Italy, Luxemburg, Slovakia and Spain. But the German maps, again, cover a lot of different German regions. We have maps from the Allgäu, Lake Constance, Eifel, Sauerland or Rheingau.

Before we start describing the concrete results of the evaluation, one observation must be mentioned first: the analysed hiking maps can mostly be grouped in two main categories which are hiking maps with a topographic base map and additional information fitting to the target group and panoramic hiking maps. Examples of both categories are shown below (fig. 127, 128, p. 139).

## The evaluation and its results



127 The map of the Hirzer hiking area is an example for a panoramic hiking map. (Hirzer no date)



128 The map of the Cinque Terre hiking area goes without a panoramic representation of the area. Instead, the terrain is represented by giving topographic information like height points, contour lines or hill shading. (Cinque Terre no date b)

During this evaluation also one of the first steps was to note the maps title for further identification but also to see whether there is a title at all. In the case of hiking maps, we get better results than in the case of the city maps before. Here, all maps have a title. But, again, we do not have very creative or by any means eye-catching titles. Most maps are only titled "hiking map" in combination with the region's name or "hiking trails", also in combination with the region's name (cf. fig. 129-131).



129 This map promises the hikers excursions to the best viewing points. (Rothaarsteig 2006)



130 The title of this map presents the region as the perfect starting point for hikes. (Marinzenalm no date)



131 This map's title combines the word "hiking" and the hiking area's name. (Altmuehltal no date)

28 of the hiking maps evaluated here have no specification of their date of production. The other maps which have information of this kind are from 1995 up to 2019. So here, we have some older maps but also maps from this year. Similar to the city maps, I was also interested in the question whether the maps are constantly up-dated and in this context, the edition was noted, if available. Nearly all maps have no specification of their edition. The maps which give this information move between the 1<sup>st</sup> and the 4<sup>th</sup> edition. One map which shows the course of the river Rhine and hiking trails in its vicinity is a 19<sup>th</sup> edition map. So it seems this map has a long tradition and is updated constantly.

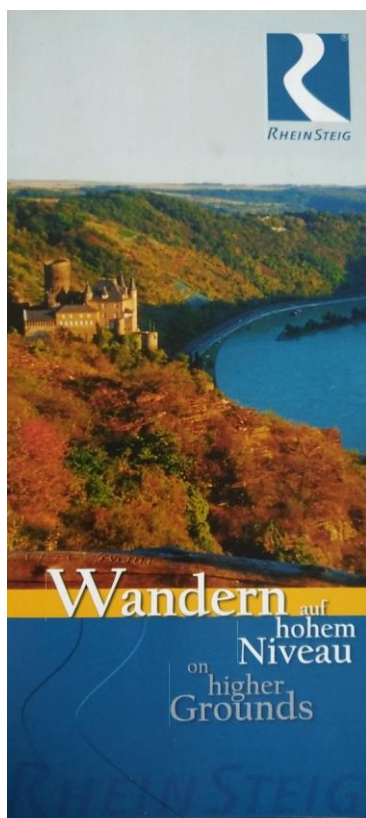
We also had a closer look at the maps' cover pictures. Here again, we get better results than with the city maps. All but four maps have a cover picture. Some of the maps without a cover picture are pre-folded, some not (cf. fig. 132, p. 141). In all cases, the map face and other map elements or additional information take in the whole map sheet and therefore leave no space for a cover picture.

The evaluation and its results

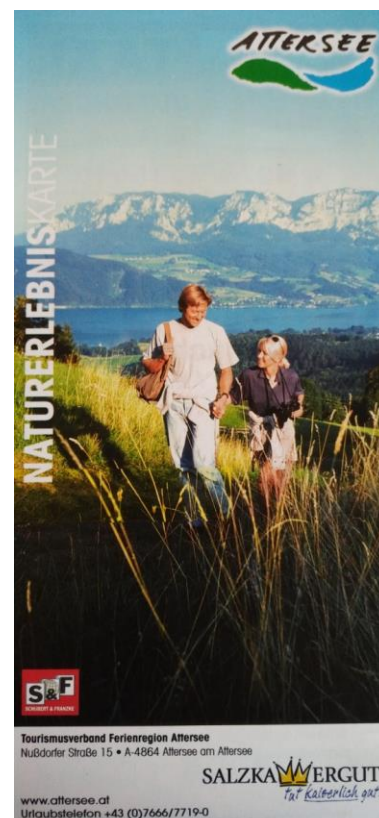


132 The map showing the hiking area around the Lake Garda does not have a cover picture. One side of the paper includes the topographic hiking map. The backside of this map has texts about the area and advertisement on it. (Lake Garda 2014)

Maps which have a cover picture mostly show hikers in it (fig. 134). Photos of the mountains or the landscape in general are also highly favoured cover pictures (fig. 133, 135, 136, p. 141-142).



133 The cover picture of the Rheinsteig hiking map shows a typical panorama of the area: the river and a castle. (Rheinsteig 2006)

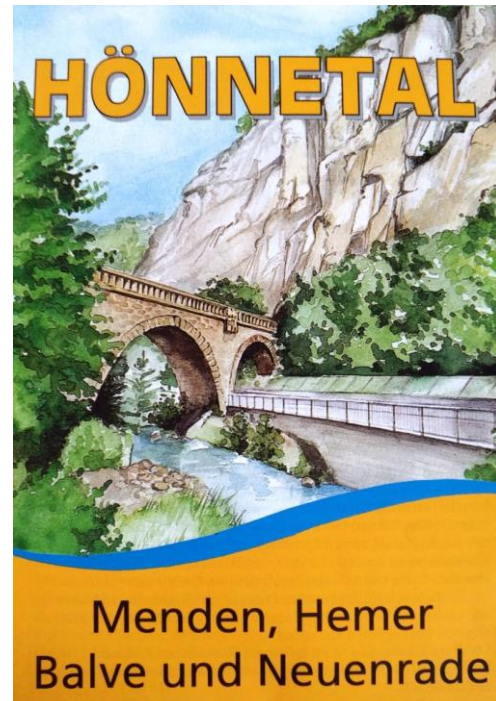


134 This cover picture presents two hikers in front of the Attersee's landscape. (Attersee 2005)





135 The cover picture of the hiking area around Scheidegg-Scheffau shows the landscape. (Scheidegg-Scheffau no date)



136 A drawing of a bridge and the landscape is the cover picture for the Hoennetal hiking map. (Hoennetal no date)

The publishing house is specified on most maps. Only little more than 10 maps do not tell the map user who the publisher is. The publishing houses which are named all still exist; three of them are cartographic publishing houses. Half of the evaluated maps do not give any information about the map maker. So, again, we can only speculate if the map maker is not mentioned because map maker and publisher are the same. Of the map makers which are indicated, twenty are cartographers.

The price and place of purchase was also noted for the hiking maps, if known. Here again, we have a lot of maps which are available for free. The price of the maps that one needs to pay for is between 1,00 € and 4,00 € which is not very expensive either. The places of purchase of the evaluated hiking maps are, as with the the city maps, tourist information, restaurants, souvenir or ticket shops.

The part about the cover pictures already implied that not all of the analysed maps are pre-folded. In fact, we have three maps that are not pre-folded. Since more hiking maps than city maps are pre-folded, it seems that the producers of this type of map see pre-folding as more important than the makers of city maps.

As we have seen in literature (chapter 6.1.1.), paper of a good quality is seen as really important especially for hiking maps which are usually mostly used outdoors. But: our analysis shows that not all of the maps are weatherproof and might last a rain shower. So with some maps, the hiker needs to be careful in which situations to use them.

## Design of the maps

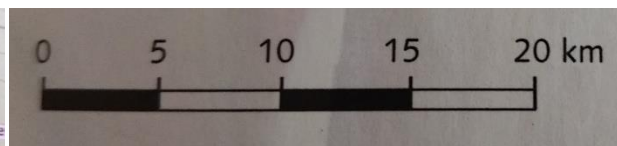
### General map elements

The next part of the map evaluation focuses, again, on the general map elements. As we have already seen before, all maps have a title which gives information about the map's content.

Most hiking maps do not have a numeric scale. Only ten of the evaluated maps have this form of scale indication. The difference between the smallest and the largest scale available is very big: We have maps with a scale of 1:25.000 but also maps with a scale of 1:200.000, which is the smallest scale in our evaluation. At least 22 maps give the map user a scale bar (cf. fig. 137, 138). So we see that in most cases the hikers will have some problems to estimate the distances and therefore to plan their hiking routes.



137 The scale bar is combined with the north arrow. (Gurgl 2019)



138 The scale bar of the Rennsteig map. (Rennsteig no date)

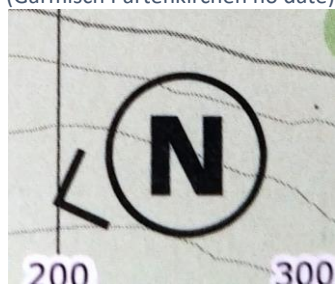
A north arrow does not seem to be very popular in hiking maps. Only one-third of the analysed maps have one (cf. fig. 139-142). Half of the maps which do not have a north arrow, are not north oriented.



139 Example for a north arrow (Garmisch Partenkirchen no date)



140 This map is not north-oriented (Pfelders 2018)



141 Another example for a map which is not north-oriented (Gurgl 2019)



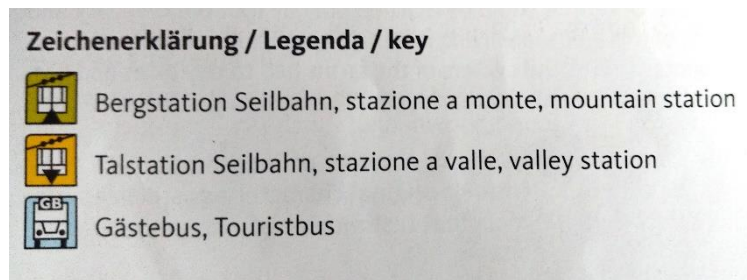
142 Example for a very colourful north arrow (Cinque Terre no date a)

A positive result of our evaluation is that most maps have a legend (cf. 143-145, p. 144). But only half of the given legends are complete, meaning that some legends are missing signatures.

## The evaluation and its results



143 The legend of this map is nearly complete. It includes all used point and line signatures. Areal signatures are missing. Very positive is the use of four different languages to explain the signatures. (Cinque Terre no date b)



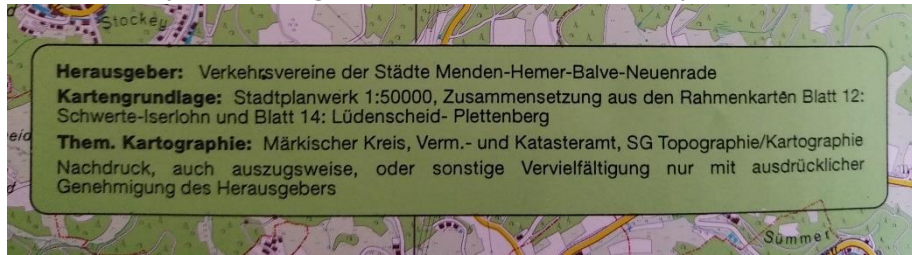
144 The legend of the Texelgruppe hiking map is very short. It explains only three point signatures used in the map. (Texelgruppe no date)



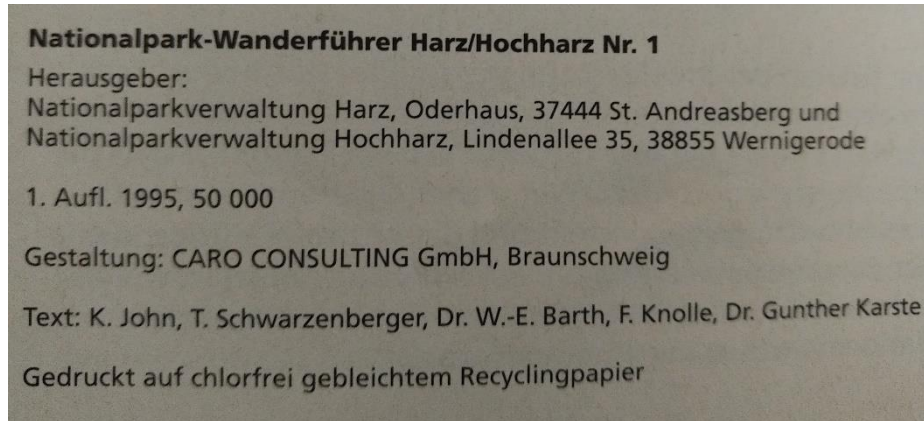
145 This legend is very detailed and contains all signatures used in the map, except of the areal signatures. (Hoennetal no date)

## The evaluation and its results

Most hiking maps include a source statement (cf. fig. 146, 147). Similar to the city maps, the source statement usually does not give all information necessary.



**146** The source statement gives information about the map publisher and the source of the base map. Information about the date of production is missing. (Hoennetal no date)



**147** This source statement is very detailed. The hiker gets to know, e.g. the map publisher, the date of production and the edition. (Harz 1995a)

We also had a look at the question whether hiking maps are mostly designed with irregular borders or with rectangular frames. The maps in our example mostly have a rectangular frame – only fifteen maps are limited by irregular borders (cf. fig. 148, 149, p. 146).

## The evaluation and its results



148 The Altmuehlal's map has irregular borders. (Altmuehlal no date)



149 This map offers another example for irregular borders. (Harz 1995c)

## Signatures

The first step in analysing the area of "signatures" was once more to note all the types of signatures used in the maps. In our hiking maps, we have line signatures, area signatures, symbols, sketches, numbers or vertical plans. So these results are comparable to those of the city maps and do not offer big surprises.

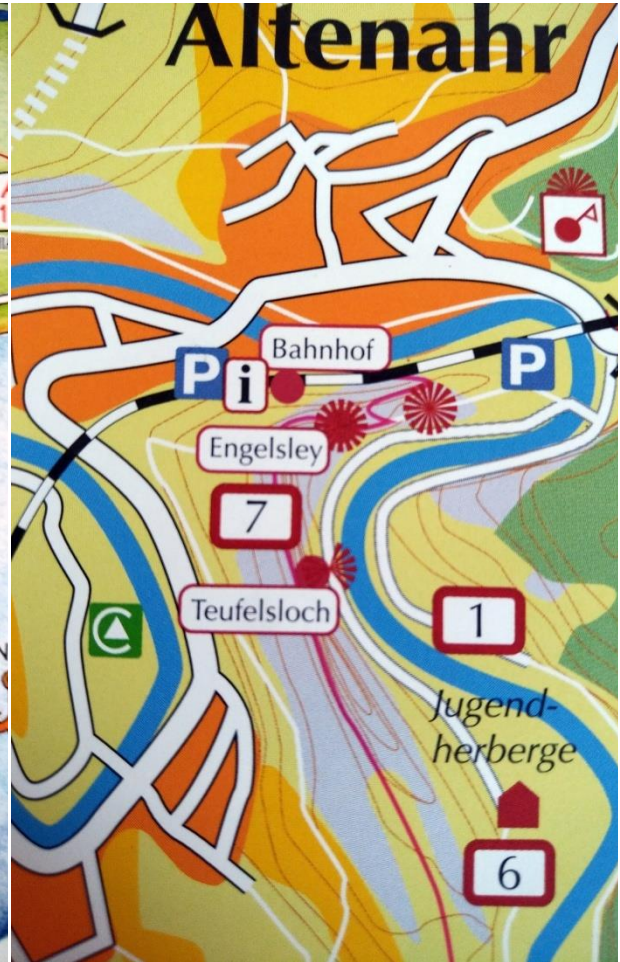
The quality of the signatures is mostly good. This means that the signatures are large enough and their contrast to the colour of the base map is sufficient.

Types of signatures used for sightseeing spots are sketches, texts, numbers, symbols or vertical plans. Twenty maps do not show the hikers any sightseeing spots at all. Surely, the main aim of a hiking map is to inform the hiker about all hiking paths but if the area offers other interesting spots which might be worth visiting, the map should give the hikers information about them so they can decide whether they want to have visit them or not.

Examples for signatures used on the maps can be seen below (fig. 150-155, p. 147-149).



150 The map of the Cinque Terre hiking area is very creative. The vertical plans of the buildings are accompanied by sketches of hikers. The signatures are well understandable and the map user will not need to always consult the legend. (Cinque Terre no date a)



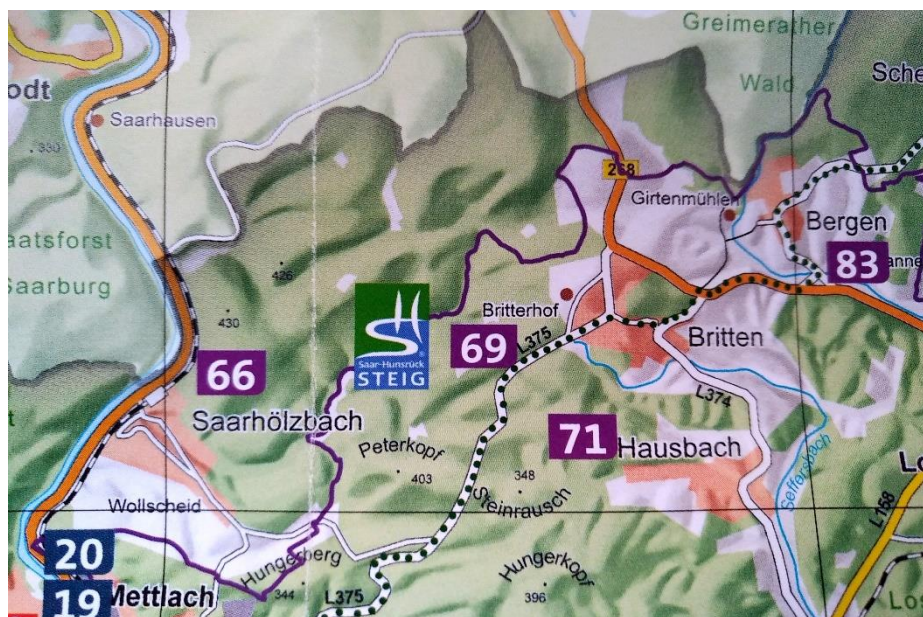
151 This map uses pictorial signatures. Important spots are also lettered. (Ahrtal no date a)



152 The trail to the mountain Broken in the Harz is accompanied by sketches. The sketches are fast understandable, even without reading the legend. (Harz 1995b)



153 Besides vertical plans of sightseeing attractions like buildings or the ski jumping hill, this map uses pictorial signatures. The signatures are large enough and have a sufficient colour contrast, so they are well recognizable. (Rotharsteig 2015)



154 To mark the different hiking trails shown in the map, the official logos of the prevailing hiking trail is used. In addition, this map has also number signatures. The numbers are not understandable without reading the legend. (Saarland 2011)

## The evaluation and its results



**155** This leisure map combines pictorial and number signatures. The pictorial signatures give an idea of which type of sightseeing attraction to expect; exact information about the attraction can be found out by reading the map's legend. (Bingen 2014)

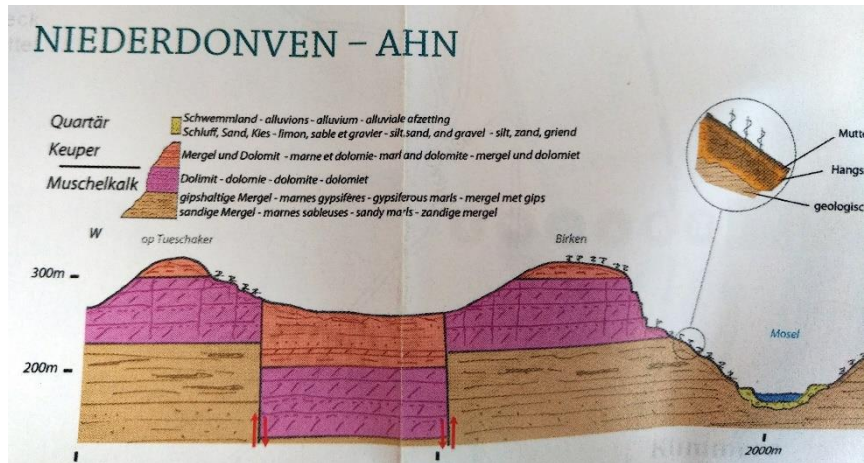
The evaluation of the use of the colour associations offers some interesting findings that we did encounter with city maps. Here again, most maps work with colour associations and some do not. But, what is surprising, is that we also have maps using colour conventions here (cf. fig. 156, 157, p. 149 - 150).



**156** This map of the area around the Moselle shows the geological conditions of the ground. The cartographic representation follows geological standards. (Moselle no date)



## The evaluation and its results



**157** In addition to the geological representation in the map face, the map sheet includes a vertical plan, showing the geologic layers. (Moselle no date)

A base map colour which is too striking might cause some problems – lettering might be hard to read or signatures might be not easily recognizable. In the collected hiking maps most base maps have no problematic colouring. Two examples are provided (fig. 158, 159, p. 150-151).



**158** The map of the Rheinsteig has a light base map colour. Therefore, signatures in darker colours have a good contrast to the base map. But: some of the signatures used in this case are way too small. Hence, they are not well recognizable. (Rheinsteig 2009)



**159** Some base colours of this map are very light, while other parts of the map have dark base colour. The signatures and letters used for the dark base map colour are still well recognizable because they are white. However, the contrast between the light and the dark base map colour is way too much and therefore leads to an enharmonic impression. Furthermore, the map user's look will always drift to the right sight of the map since the darker colour catches more of the user attention than the brighter colour. (Nordkirchen no date)

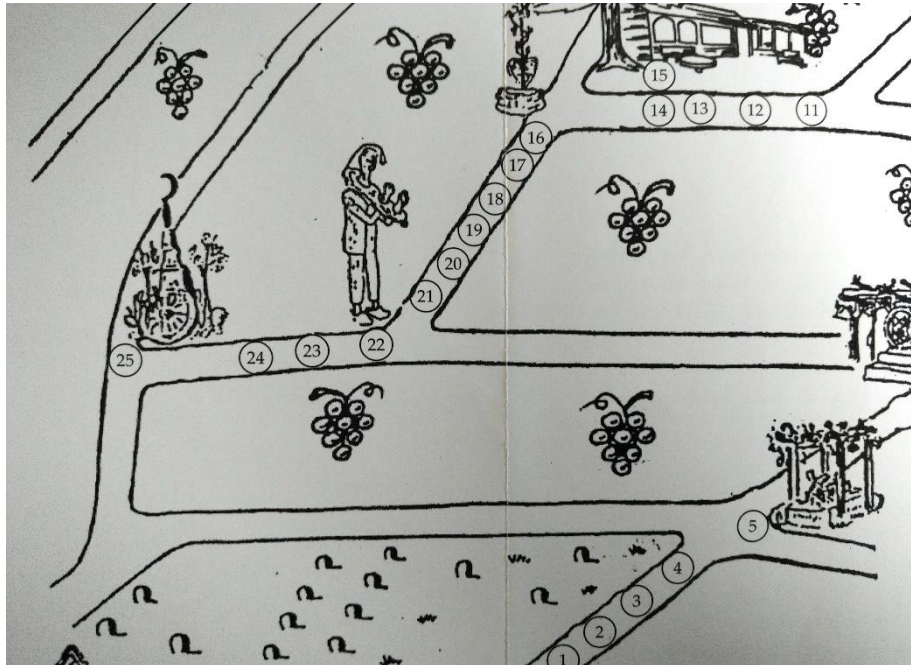
As already mentioned with the city maps, it might be helpful for the map user to have different types of streets in different colours. Only a bit more than half of our map collection uses this method to differentiate between street types. This means it is not recognizable for the hiker whether the streets in the map are main streets or smaller streets (cf. fig. 160).



**160** This map shows different types of roads, indicated by different colours. Unfortunately, the meaning of the colours used is not explained in the legend so this might lead to problems in understanding. (Saarland 2011)

## Lettering

The next area which was analysed and evaluated is the lettering. In the case of hiking maps, we actually have one map which does not have any lettering at all (fig. 161). To be correct, the map's backside is lettered and also some parts of the map sheet near the map face but the map face itself does not have any lettering at all.



**161** The map face of Schweigen-Rechtenbach does not have any lettering at all. The whole map does have a title and additional text, but the map face itself comes without any labelling. The numbers which can be seen in the picture are number signatures which are explained in the legend. For the orientation, it would have been very helpful to name the streets or label at least some important sightseeing spots or objects in the map. (Schweigen-Rechtenbach no date)

Objects that are labelled in maps with lettering are usually towns, mountain tops, important spots, rivers, lakes, hiking trails or streets. So we can already see some differences between the objects which are lettered in hiking maps and the ones which are labelled in city maps.

Different fonts are used in half of the maps. Again, the sans serif fonts are the fonts mostly used in maps. Nevertheless, we also find some hiking maps displaying only serif fonts and some hiking maps which use both kind of fonts.

Varying font colours can be found in half of the analysed maps.

To facilitate the legibility of all labelling, it is important that font colour and base map colour contrast with each other. At least four maps have some deficits regarding this criterion.

One of the last criteria of the section about lettering is correct label placement. The placement of all labels is normally no problem in the analysed hiking maps.

Examples for lettering in hiking maps can be seen below (fig. 162-165, p. 153-154).

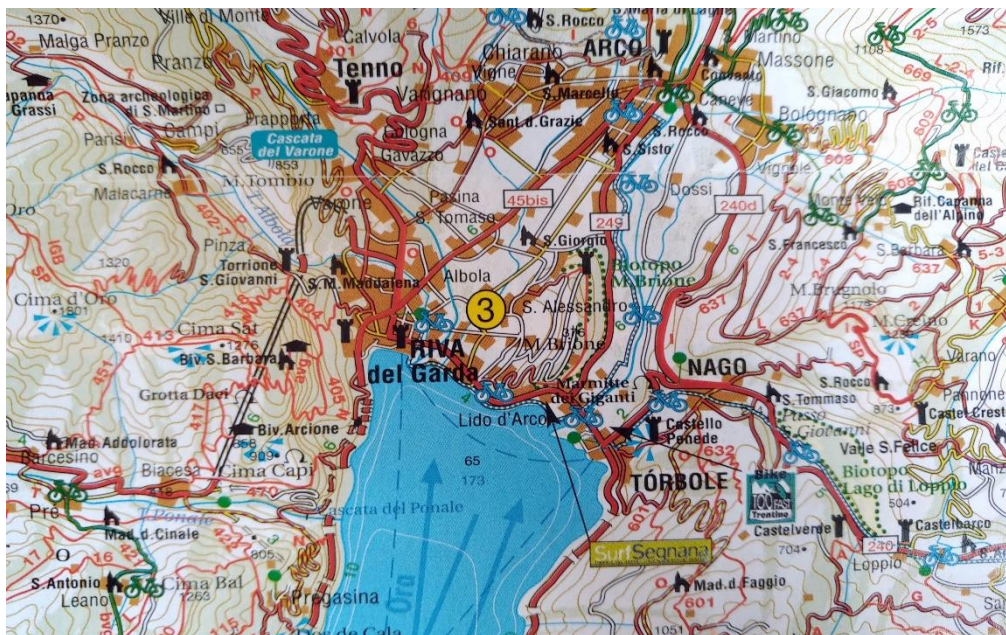
The evaluation and its results



162 The map uses different font colours, depending on the object type which should be lettered. The river is lettered in blue while sightseeing or other interesting objects are labelled in red. (Vulkaneifel 2005)

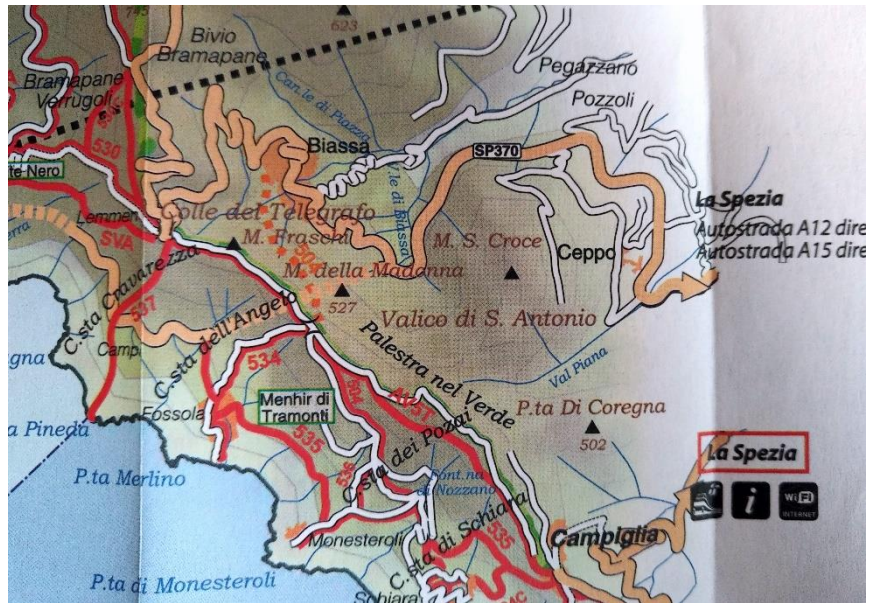


163 Although the map face offers enough free space for the labelling, the letters collide with other objects like the streets. Furthermore, the labels are not always placed where the named objects in reality are. (Harz 1995a)



164 The hiking map of Lake Garda includes serif and sans serif fonts, different font colours and also upper case letters. Although this variety of working with labelling could be seen as very positive, the lettering is hard to read. A reason for that is also the very detailed representation of the terrain with the help of contour lines and the different coloured streets which often cross with the lettering. (Lake Garda 2004)

## The evaluation and its results



**165** The map uses different font colours, indicating different objects. Furthermore, serif and sans serif fonts can be found in the map face. Labelling which meets streets or other objects is hard to read. Here is still room for improvement. (Cinque Terre no date b)

Since hikers might not always be originally from the country where they go hiking, the use of different languages is very helpful in maps. One-third of the collected maps uses more than one language (cf. fig. 166, 167, p. 155).



166 The text about the monument's history is available in English and German. However, the explanations for the signatures in the legend is only in German. This decision is not completely understandable since the legend is a very important map element and understanding it is of high importance. Hence, having it in another language would be very helpful. (Ruedesheim 2017)



167 legend of the Moselle-map is available in four different languages. This will make the language understandable to a large group of people. (Moselle no date)

To facilitate a fast and non-problematic orientation at the destination, it is very useful to have a map where all streets are labelled. Unfortunately, it seems that street labelling is something that is neglected by most producers of hiking maps. Only three hiking maps offer the map user a complete labelling of all streets.

The exit roads are labelled in one-third of the evaluated maps so the hiker will at least know where the streets that leave the area displayed in the map lead to (cf. fig. 168, 169, p. 156).



168 Here, exist roads are labelled in the map face. (Harz 1995c)



169 The map of Gastein labels exit roads outside of the map face. (Gastein 2007)

### Visual hierarchy and map layout

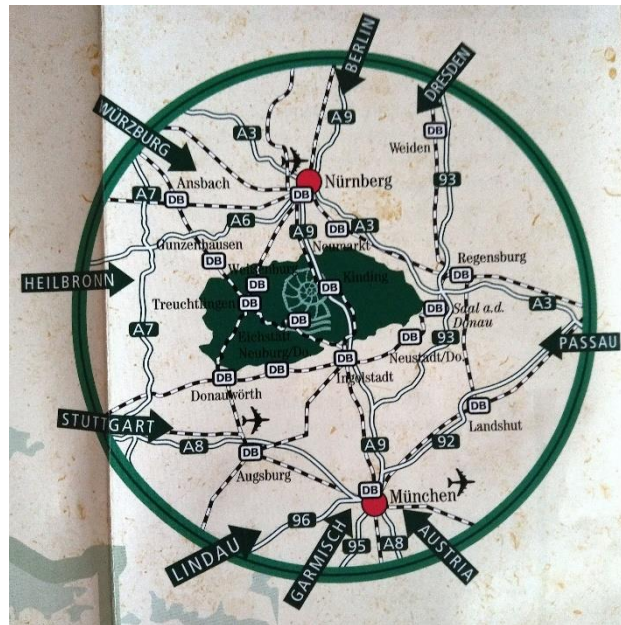
Visual hierarchy is a problem in most hiking maps. Only half of the analysed maps offer the map user good visual hierarchy and therefore emphasize the information that is really important and let the unimportant information step to the background.

It is very positive that most maps have a good map layout. Basic elements are placed on the maps in a way that makes it easy for hikers to find them.

Inset maps can be very useful to offer hikers additional information. 28 maps make use of this possibility (cf. fig. 170-171, p. 156-157).



170 The hiking map of Pfelders has on its backside an auxiliary map about the possible sports activities in Pfelders during the winter time. (Pfelders 2018)



171 The hiking map of the Altmuehltal has an auxiliary map showing the possibilities to get to the hiking area, including highways and railway lines. (Altmuehltal no date)

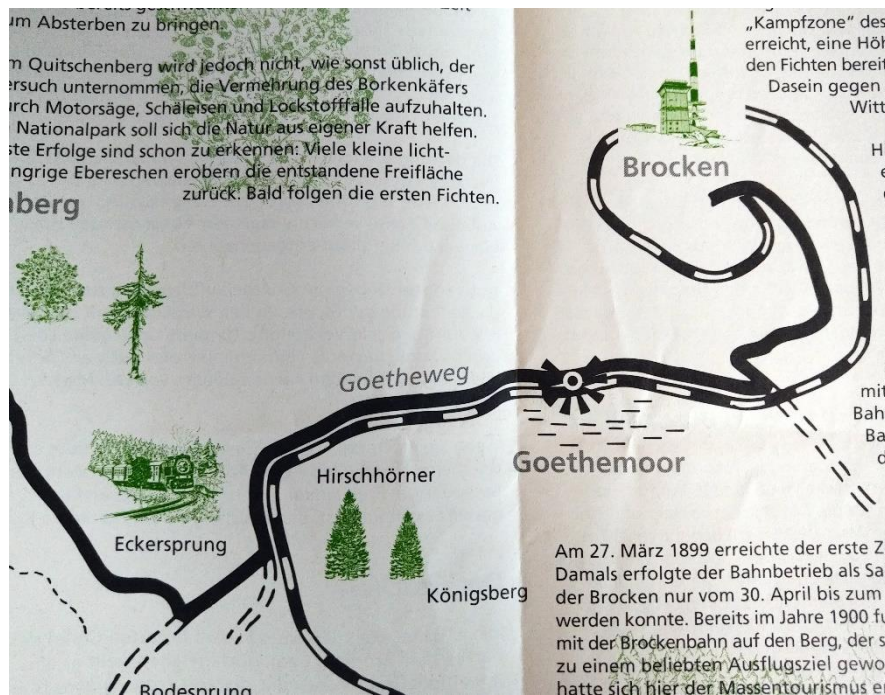
### Generalisation

We have more hiking maps without a generalisation than city maps without a generalisation. The “problem” here are the panoramic maps which often have a photo of the area as instead of a generalised map. This method of setting a map base cannot be rated as “generalised”. This explains the high share of non-generalised maps in the group of hiking maps.

The question for the generalised maps is whether the generalisation is well thought-out or not. Only half of the maps are really well generalised. Negative examples are shown below (fig. 172, 173, p. 158).



## The evaluation and its results



172 The map which shows the hiking trail “Goetheweg” which leads to the Brocken is generalised very much. It does not show many other trails which meet the main trail or gives much information about the surroundings of the hiking trail. Here, it would have been better to have some more details in the map face. (Harz 1995b)



173 Dahn’s map could be generalised a bit more. It offers the hikers much information but the main idea, to show the hiking trail “Dahner Felsenpfad” is a bit lost because of the high number of other information. The map shows, for example, a lot of other hiking trails besides the main trail which is the topic of the map. The idea to propose some other trails to the hiker which can be walked after having walked the main trail is quite understandable. Nevertheless, the map face would be clearer and the main trail better to identify if these other hiking trails were left out. (Dahn 2007)

### Map content

After having evaluated the design of hiking maps, the focus now is on their content. Before looking at the map content that is especially important for hiking tourists, we will first analyse the existence of the more general touristic facilities in maps.

Surely, hikers will, for example, need information about where to park their car while they go hiking or which public transportation will take them to the hiking trails. So transportation in

## The evaluation and its results

general is an important information for hiking tourists. In our case, 42 out of 64 maps offer this information (cf. fig. 174, 175). Accommodation can be found in 28 maps (fig.176).



174 Ruedesheim offers a lot of different transportation possibilities for hikers or tourists in general: The map shows the main station, the cable car and the ferry. For people arriving by car, the map offers information about parking lots and a car ferry. (Ruedesheim 2017)



175 Here, the map users get information about parking lots, bus stops or cable cars. (Hirzer no date)



176 The signature showing a bed gives the hikers to understand that they can find accommodations in the prevailing city. (Eifel 2016)

Tourists also ask for gastronomy where they can stop off after their hiking trip or take a break during the hiking tour. But they will find information about gastronomy only in half of the maps (cf. fig. 177, 178, p. 160).



178 The signature shows the hikers where to get food and drinks. (Pfelders 2018)

177 The map of the hiking area around the Moselle proposes the tourists restaurants but also, for the region typical, wine cellars and distilleries. (Moselle no date)

Even fewer maps show the hikers where to find tourism services (cf fig. 180, 181). General institutions are to be found in almost no maps. Only three maps contain indications of that kind (cf. fig. 179).



179 The map of Gurgl shows the hikers the police station, the post office and the hospital. (Gurgl 2019)



180 The tourist information is marked with an "i" which is similar to the way tourist information are shown in city maps. (Eifel 2016)

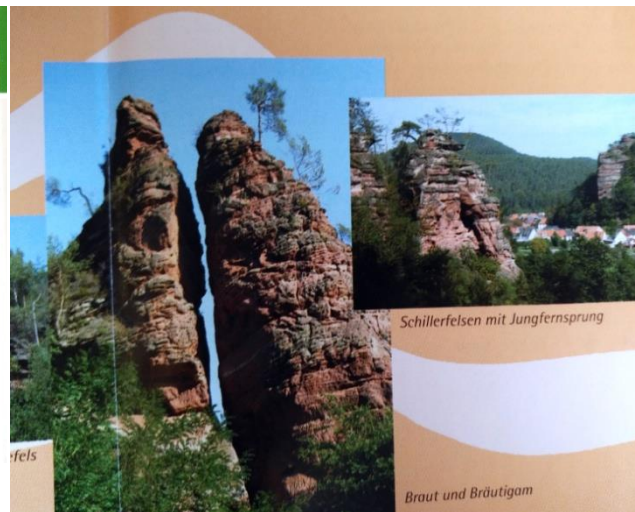


181 Here, the signature for the tourist information is an "i" as well. (Meran 2000 2017)

Natural phenomena are marked in nearly all maps (cf. fig 182, 183).



**182** The so-called geologic hiking trail leads the hiker past varying geologic phenomena like this weathered shale rock. Additional texts and photos on the map's backside give some further information about the area. (Ahrtal no date a)



**183** A hiker following the "Felsenpfad" in Dahn will also see different geologic and natural phenomena. Photos and texts on the maps backside give the tourists explanations about the special feature they see during their hiking tour. (Dahn 2007)

Also of importance is culture: culture in general and culture that is typical of the area shown in the map (cf. fig. 184, 185). Hikers will find general cultural spots to visit in more than half of the evaluated maps. The local culture is emphasized in nearly as many maps as general cultural spots.



**184** Types of wine that are typical for the region shown in the map are described in an additional text. (Pfalz 1997)



**185** This map invites the hikers and other tourists to visit a local celebration. (Hirzer no date)

The "sport" criterion is not really relevant for hiking maps since hiking can be seen as a kind of sport and therefore all maps showing hiking trails also give information about possibilities to do sports.

Shopping may also be a hiker's activity. One can imagine that it might be necessary for the hiker to go to, for example, some special hiking shop if he needs hiking equipment and therefore it would be good to know where to find such shops. But the hiker might be a bit disappointed if he uses one of the evaluated maps to look for shopping possibilities: only one these maps tells us where to go for shopping (fig. 168, 187).



**186** Gurgl's map tells the hikers where to find sport shops if the hikers need some additional equipment for their tours. The picture above shows a part of the legend and the signature used for sport shops. (Gurgl 2019)



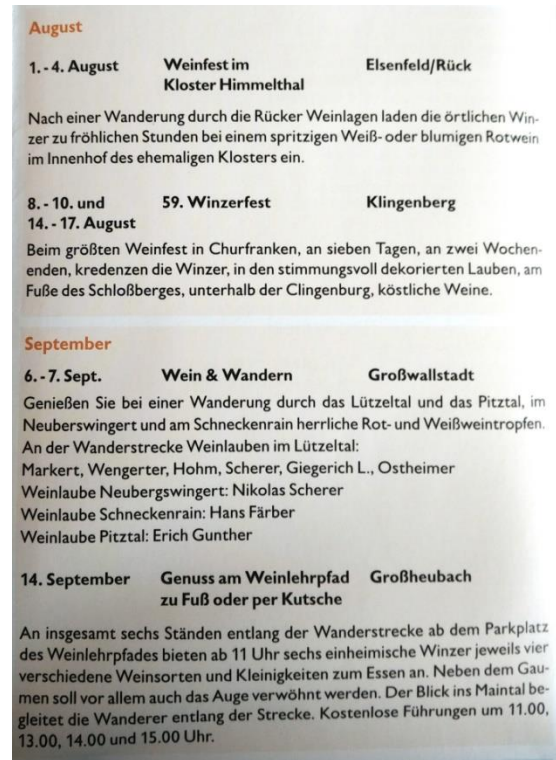
**187** Here, we can see a sport shop marked in the map face. (Gurgl 2019)

Rest and recreation is also seen as very important for tourists. Since going for a walk in the mountains or in nature in general is seen as a possibility for recreation, all hiking maps can easily fulfil this criterion.

Temporary events, on the other hand, are only to be found on six map sheets (cf. fig. 188, 189, p. 163). Sui generis are even marked in only two maps (cf. fig. 190, 191, p. 163).



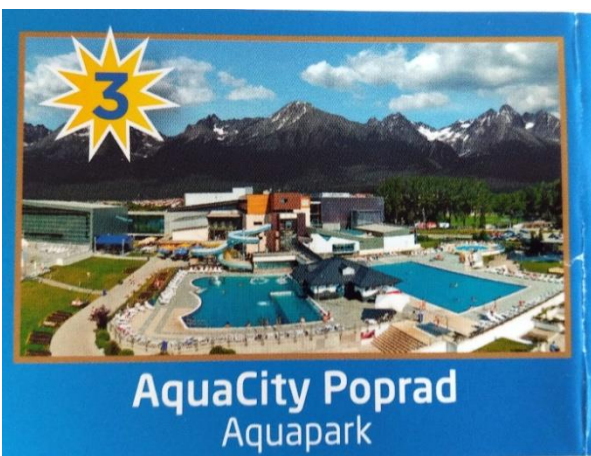
188 In this map, the hikers get information about different events which take place at varying locations. (Hirzer 2019)



189 Since viniculture is very typical for this region, the map informs the tourists about the local wine festivals. (Rotwein-Wanderweg 2008)



190 This hiking region offers its tourists several sui generis. Here, we can find, for example, a „normal“ zoo and a zoo especially for reptiles. (Pfalz 1997)



191 After hiking in the High Tatras, the tourists can also visit the so-called "AquaCity". (High Tatras no date)

## Design of hiking maps

After having talked about all the evaluation criteria which were relevant for city maps, too, we will now take a closer look at the special design and content norms of hiking maps to see whether these characteristics can be found in the hiking maps or not.

One way to show the relief are contour lines. But not many of the maps in this evaluation have contour lines. Only 16 of the 64 maps use this way of relief representation (cf. fig. 192, 193). Some more maps use the method of hill shading: it can be found in 22 maps (cf. fig. 194, 195, p. 165).



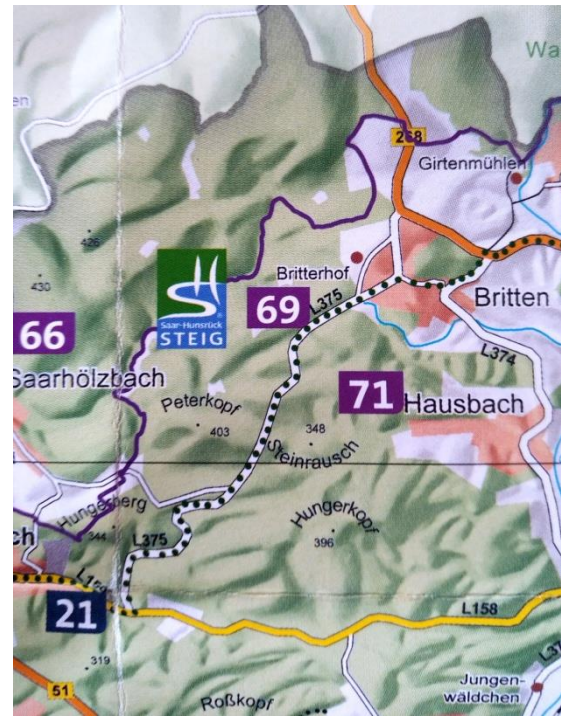
192 Scheidegg-Scheffau's hiking map uses contour lines in combination with hill shading and height points to give relief information. Contour lines with numbers are "index contours". (Scheidegg-Scheffau no date)



193 Kufstein's map also uses contour lines and height points to represent the relief. Here, every contour line is labelled with the prevailing height number. Hence, it will be easier for inexperienced map users to understand the relief information. (Kufstein no date)



194 Hill-shading illustrates the relief in this map. Height points can be found on mountain peaks. Contour lines are missing. (Eifel 2016)

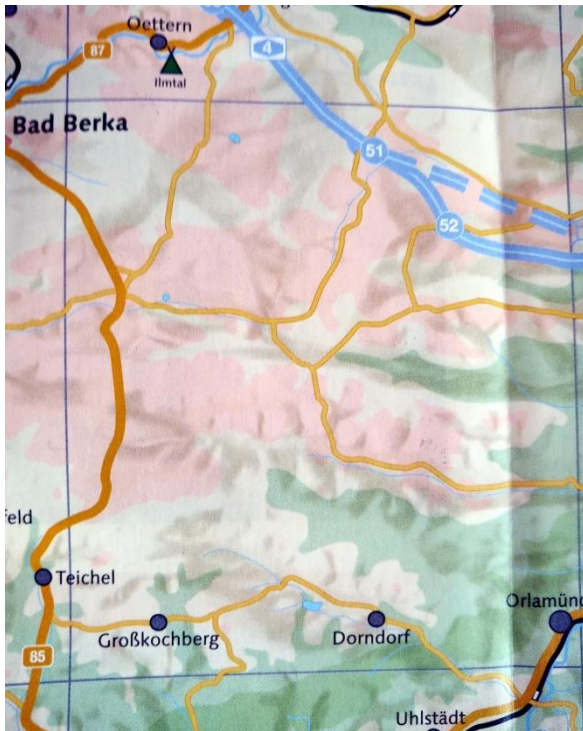


195 Again, we can find the combination of height points and hill shading in a map. Contour lines are missing here, too. (Saar-Hunsrueck 2015)

Even fewer maps have coloured hypsometric layers (cf. fig. 196, p. 166). The reason for this may also be the scale of the investigated maps. Coloured hypsometric layers are usually used for small scale maps and since we do not have that many small scale maps in our collection that may be the reason why we do not find many coloured hypsometric layers.

Height points can be found in half of the evaluated maps and therefore seem to be the favoured way of giving information about the terrain in our study (cf. fig. 197, 198, p. 166).





196 The map presenting the Rennsteig-hiking trail is one of few maps trying to give relief information by using coloured hypsometric layers. Contour lines or height points are not used. (Rennsteig no date)



197 This panoramic hiking map gives height points for towns or mountain peaks. (Texelgruppe no date)



198 On the map of Meran 2000, mountain peaks are provided with height points. (Meran 2000 2017)

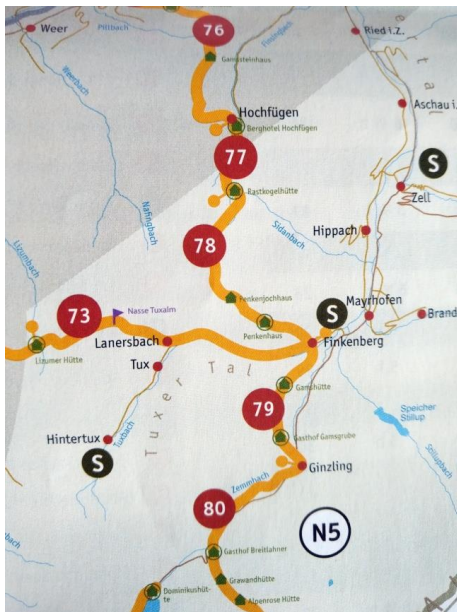
Although hachuring is said to be out-dated and not used anymore in maps nowadays, we have two maps which include this terrain information (cf. fig. 199, p. 167). This also shows us that it was worth making hachuring a criterion in our evaluation.

## The evaluation and its results



199 All in all, this map of the course of the river Rhine has an old-fashioned appearance. Since this seems to be the map's general style, it explains the use of hachuring instead of modern forms of relief representation. (Rheinlauf no date)

A very negative aspect is that 22 maps have no information about relief at all (cf. fig. 200, 201). Thus, the hiker will not know whether the hiking trail has steep parts or not or what to expect at all on the way.



200 This is an example for a map without any relief information (Adlerweg no date)

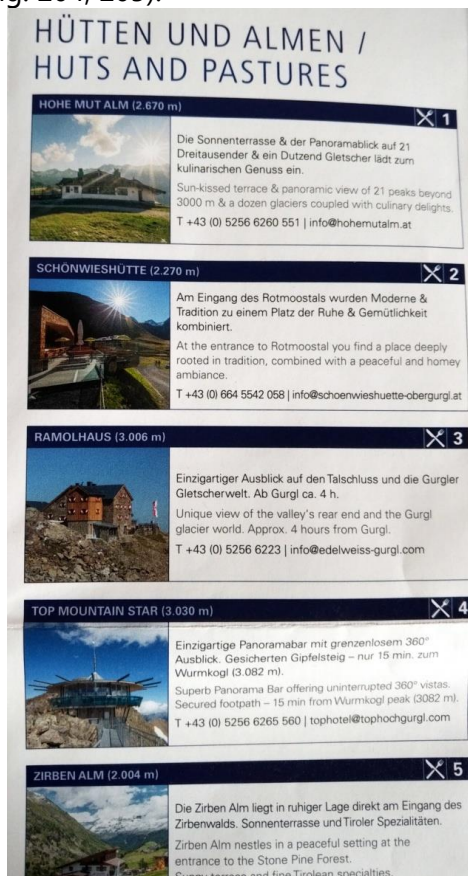


201 This map does not give any relief information as well. (Vulkaneifel 2005)

Also of interest is the question whether the map gives the hiker information about huts where he can take a rest during his hike or find shelter when the weather is bad. Marked huts can be found in one-third of the analysed maps (cf. fig. 202, 203, p. 168). The same applies to marked

## The evaluation and its results

view-points: one-third of maps tell the hiker where to stop for a particularly beautiful view (cf. fig. 204, 205).



202 Gurgl's map informs the hikers about huts by texts and photos. (Gurgl 2019)



203 This map of a hiking area in South Tyrol uses signatures to tell the tourists where huts are. (Hirzer no date)



204 The map of Meran 2000 uses binoculars as a signature to show viewpoints. (Meran 2000 2007)



205 Viewpoints are marked along the proposed by signatures in the form of red stars. (Ruedesheim 2017)

For longer hiking tours which take some days, overnight accommodation is of great relevance. However, only a few of the evaluated maps tell the map user where to find such places so most of the maps are no help in this case (cf. fig. 206, 207, p. 169).



206 The map of Altmuehltal gives the hikers a list of accommodations which are supposed to be very 'hiker-friendly'. (Altmuehltal no date)



207 The signatures show the tourists in which cities they will find overnight accommodations. (Lake Constance 2012)

Proposing tours can be also helpful for hikers new to the area or who do not want to plan a tour by themselves. We can state that nearly all investigated maps have proposed tours (cf. fig. 208, 209, p. 170). But some hikers do not only want proposed tours but also look for particularly scenic hiking trails (cf. fig. 210, 211, p. 170) or themed hiking trails like nature study paths (cf. fig. 212-214, p. 171). Those hiking trails are also highlighted in the larger part of the maps. As it can be seen in the chosen examples below, the proposed tours are usually described in a text, often accompanied by an elevation profile. Some tours are also marked in the map or only presented in notes, naming the most important places which will be passed during the walk.

## Wandervorschläge

### Die Genießertour

Compatsch > Gostner Schwaige > Hotel Ritsch > Sanonhütte

Die Tour beginnt bei Compatsch und führt gemütlich über den Weg Nr. 30 bis zum Hotel Steger-Dellai. Oberhalb des Hotels befindet sich die Gostner Schwaige und auf dem Weg links abbiegend steht das Hotel Ritsch. An der Kreuzung geht es rechts zur Sanonhütte. Ein gemütlicher Spaziergang, bei der die schöne Aussicht auf die nahen Dolomitengipfel genossen werden kann.

**Gehzeit: ca. 1 Std. · Schwierigkeit: leicht**

### Dolomiten hautnah

Compatsch > Saltner Schwaige > Schlern > Tierser Alpl > Sattler Schwaige > Compatsch

Diese Bergtour führt über den Weg Nr. 10 (Startpunkt in Compatsch) zur Saltner Schwaige und danach über den als Nr. 1 markierten „Touristensteig“ auf den Schlern (2.457 m). Von dort führt der Weg Nr. 4 zum Schutzhaus Tierser Alpl (2.440 m). Das Schutzhaus kann auch über den „Maximilian Klettersteig“ erreicht werden. Der Rückweg nach Compatsch führt entweder über die „Rosshahnscharte“ (Nr. 2) vorbei an der Sattler Schwaige oder über die Mahlknechtütte.

**Gehzeit: ca. 7 Std. · Schwierigkeit: anspruchsvoll**

### Die Schlernhexen

#### Familienrundwanderung auf dem Pufaltsch

Compatsch > Engelrast > Filln Kreuz > Hexenbänke > Goller Kreuz > Compatsch

Von Compatsch führt der Weg Nr. 14 oder die Gondelbahn Pufaltsch (Nr. 3) zur Aussichtsplattform „Engelrast“. Der „PU“ Weg führt zum Filln Kreuz, zu den Hexenbänken - eine vorzeitliche Kultstätte - und zum Goller Kreuz: drei faszinierende Aussichtspunkte. Bei der Rundwanderung gibt es mehrere Einkehrmöglichkeiten: die Arnikahütte, die Dibaita Pufaltschhütte, die Tschötsch Alm und das Bergrestaurant Pufaltsch.

**Gehzeit: ca. 2,5 Std. · Schwierigkeit: mittelschwer**

208 This map proposes the hiker tours of varying levels of difficulty. The walking duration also varies. The tours are not marked in the map; they are only explained by text. (Seiser Alm 2018)

The image shows three hiking route cards from a map. Each card includes an elevation profile graph, a list of route points, and key statistics like duration and distance.

- Almwanderung im Hirzergebiet:** Duration 3h, Distance 6.6 km. Route: Bergstation Klammeben - Hirzerhütte - Resseggeralm - E5 - Hintereggalm - Mahdalm - Rotmoos - Tallner Alm - Klammeben - Staz. a monte Klammeben - Rif. Hirzerhütte - M.ga Resegger - E5 - M.ga Hinteregg - M.ga Mahdalm - M.ga Tallner - Klammeben.
- Klammeben - Prenn:** Duration 3h, Distance 9.5 km. Route: Bergstation Klammeben - Hirzerhütte - Resseggeralm - E5 - Hintereggalm - Mahdalm - 4 - Gomp Alm - Gasth. Hochwies - Prenn. Klammeben - Rif. Hirzerhütte - M.ga Resegger - E5 - M.ga Mahdalm - M.ga Mahd - 4 - M.ga Gomp - Rif. Hochwies - Prenn.
- Almenweg im Hirzergebiet:** Duration 3h 30m, Distance 15.3 km. Route: Bergstation Klammeben - Hintereggalm - Mahdalm - Tallner Alm - Sonntagsweide - Stafell - Assenhütte - Videgg - Oberkim - Stazione a monte Klammeben - M.ga Hinteregger - M.ga Mahd - M.ga Tallner - Stafell - M.ga Assenhütte - Videgg - Oberkim.

209 The backside of this map shows ideas for hiking tours in the Hirzer Area, including information about differences in altitude and whether there is a hut to take a rest or not. The tours are not described in a text but only by using keywords. (Hirzer no date)

## Neue Sicht auf verborgene Schätze der Natur

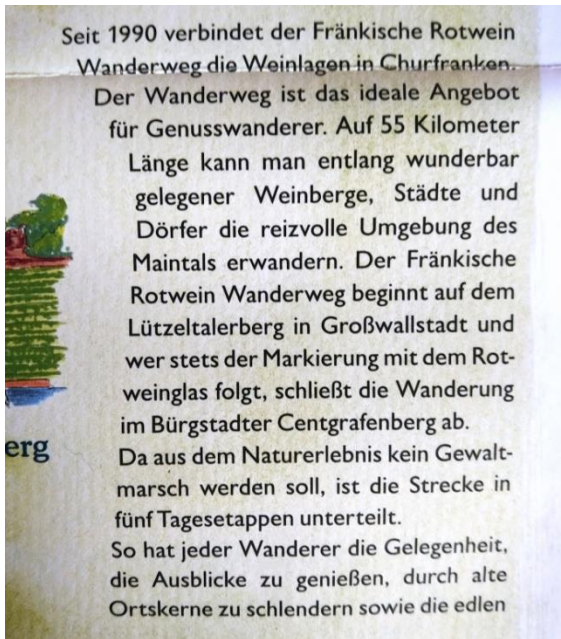
**DAHNER FELSENPfad**

Die Felsen rund um den Luftkurort Dahn sind überragend: mächtige, bizarre Steingebilde über den Baumwipfeln. Aber auch viele der Kleinsten gehören zum Feinsten, was diese wildromantische Landschaft zu bieten hat - und die sieht man nicht auf den ersten Blick. Der neue Felsenpfad erschließt jetzt den ganzen Zauber von Formen und Farben des roten Wasgauer Buntsandsteins. Der Wanderer betritt Neuland. Zwölf Kilometer lang ist der Rundweg, der zum großen Teil auf völlig neu angelegten, schmalen Trassen verläuft - meist weitab von ausgetretenen Wegen. Die Wanderung wird zur abwechslungsreichen Entdeckungstour zu Schätzen der Natur, die bisher im Verborgenen lagen. Sie verläuft über Berg Rücken und durch Täler, durch lichten Hochwald und über moosbedeckte, unberührte Lichtungen.

210 The text about the hiking trail in Dahn promises the hikers to see nature's treasures during the hiking tour. (Dahn 2007)

Die **grüne Panorama-Tour** (18 km) gibt es seit dem 65. SGV-Gebirgsfest 2008 in Unna. Sie verläuft auf ausgewählten, bewährten Wegen und bietet herrliche Weitsichten. Start ist am ersten Teich im Naherholungsgebiet Bornekamp. Einkehr ist möglich in Opherdicke, auf der Wilhelmshöhe und in Kessebüren.

211 The so-called „Panorama-Tour“ is said to offer a beautiful panorama. It is presented in a short text to the hikers, as we can see in the picture above, and also marked in the map. (Unna no date)



212 The main theme of this proposed hiking tour is the red wine. Hikers will see vineyards and beautiful villages. (Rotwein-Wanderweg 2008)



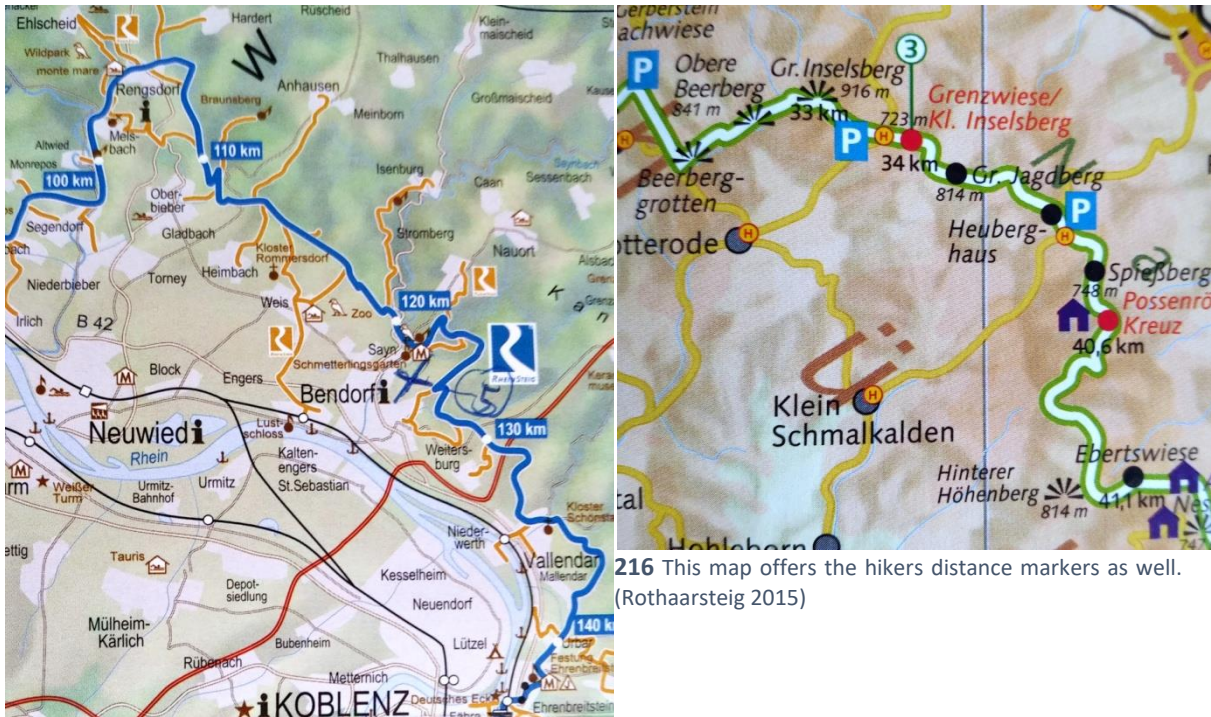
213 In Balve-Langenholthausen, tourists will find a hiking trail which follows the traces of the iron ore mining. The hiking trail is described in a text, as we can see above, and also marked in the map face. (Balve-Langenholthausen no date)



214 Dorf Tirol proposes its hikers a variety of themed tours: there are wine hiking trails, apple hiking trails or especially panoramic paths. (Dorf Tirol no date)

For a better planning of the hiking tour, it is very helpful to have distance markers on the trail (cf. fig. 215, 216, p. 172). Distances can be estimated by using the numeric scale or the scale bar but since many people are not used to working with such methods, distance markers can help to gather the necessary information faster.

## The evaluation and its results



215 The hiking map for the Rheinsteig has distance markers next to the marked trail. The distance markers are given each 10 km. (Rheinsteig 2006)

216 This map offers the hikers distance markers as well. (Rothaarsteig 2015)

Hikers also want to know how the general condition of the hiking trail is, whether it is, for example, very stony or easy to walk. Only a few maps give statements about the condition of hiking trails, also telling the hiker, for instance, if the trail is suitable for children's push chairs (cf. fig. 217, 218).



217 The map of the Pfelders hiking area includes forest tracks, marked parts and alpine tours. Alpine tours should be hiked only by experts. (Pfelders 2018)

218 The legend of the map of Meran 2000 tells the hikers whether the paths are suitable for people who are novice in hiking or whether they are only for experts. (Meran 2000 2017)

As was the case with the city maps, we also wanted to know whether the hiking maps have explanations about the region or photos of it on their backside. Most of the evaluated maps include texts and photos (cf. fig. 219-221, p. 173).

## The evaluation and its results



### Teufelsturm

Der noch heute gut erhaltene, Anfang des 14. Jh. durch Erzbischof Walram von Köln errichtete Teufelsturm mit beidseitigen Bürgerhäusern beherbergt das „Heim der Westfälischen Fastnacht“ mit einer umfassenden Darstellung der Westfälischen Fastnacht in ihrer Geschichte, Entwicklung und heutigen Ausdrucksform.

Das „Heim der Westfälischen Fastnacht“ gibt jedem Interessierten einen umfangreichen Einblick in den ältesten Volksbrauch, der nichts anderes als ein Teil des heiteren Lebens unseres Landes mit seinen vielen, diesem Brauchtum verbundenen Menschen sein will.

219 The map of the Hoennetal hiking area gives the hikers texts about interesting buildings. (Hoennetal no date)

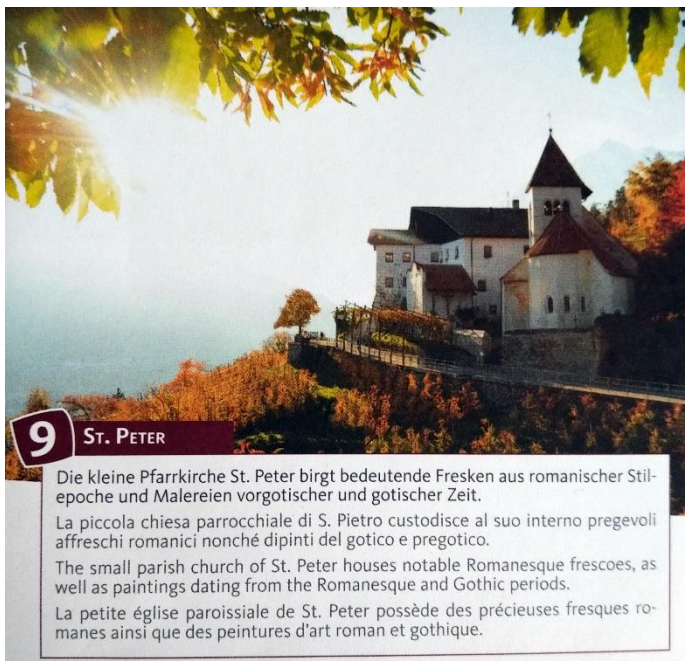
### Places of Interest | a focus on ceramics and Roman settlements

*No-one can ignore this location. Sublime and imposing, this mighty building stands majestically on the banks of the River Saar, almost as if it were keeping a keen eye on the calmly flowing river as it passes. In earlier times, prayer and monastic life took place behind the dark-red baroque façade.*

*Today, the former Benedictine abbey houses the Head Office of the Villeroy & Boch ceramics enterprise. In 1809 Jean François Boch-Buschmann purchased the empty building, which shortly before had been plundered by the French revolution troops, and set up a factory there.*



220 This map describes different culturally interesting sights (Saarland 2011).



221 The map of Dorf Tirol gives the texts about sightseeing spots in different languages. (Dorf Tirol no date)

Maps of the main-through roads can be useful to know how to cross the hiking region best or how to reach hiking trails easily by car. However, only a few maps give the hiker this additional information (cf. fig. 222, p. 174).



## The evaluation and its results



222 The auxiliary map shows hikers which main roads lead to the hiking area. (Monte Baldo Malcesine no date)

Since not all mountain restaurants are open over throughout the year, it may be a good idea to also give information in the map about such opening times. But, only seven of the maps evaluated include opening times of any kind (cf. fig. 223, 224).

**Saison 2017**

**Fahrbetrieb/Operation**  
18. März bis 5. November sowie vom 27. November bis 23. Dezember während des Weihnachtsmarktes der Nationen, Montag bis Sonntag  
18 March to 5 November and from 27 November to 23 December during the Christmas Market of Nations, from Monday to Sunday

**Betriebszeiten/Operating hours**

März/March	9:30 - 17:00 - Sa + So   Sat + Sun	9:30 - 18:00
April/April	9:30 - 17:00 - Sa + So   Sat + Sun	9:30 - 18:00
Mai/May	9:30 - 18:00	
Juni/June	9:30 - 18:00 - Sa + So   Sat + Sun	9:30 - 19:00
Juli/July	9:30 - 19:00	
August/August	9:30 - 19:00	
September/September	9:30 - 18:00 - Sa + So   Sat + Sun	9:30 - 19:00
Oktober/October	9:30 - 17:00 - Sa + So   Sat + Sun	9:30 - 18:00
November/November	9:30 - 16:00	
Weihnachtsmarkt/Christmas Market	11:00 - 18:00 - Sa + So   Sat + Sun	11:00 - 19:00

**Bitte beachten/Please note**  
Die Sesselbahn Assmannshausen hat andere Betriebszeiten.  
The chairlift Assmannshausen has other uptimes. Fon 06722-2765

223 Here, the tourists get information about the operating hours of the cable car in Ruedesheim. (Ruedesheim 2017)

### Luisenhütte in Balve-Wocklum

Die Luisenhütte ist die älteste bekannte Holzkohlenhochofenanlage Deutschlands mit vollständig erhaltener Inneneinrichtung.

1758 ist erstmalig an dem Standort eine Hüttenanlage in Betrieb gegangen, in der die in der Umgebung abgebauten Eisenerze eingeschmolzen wurden. Diese Altanlage wurde 1834 abgerissen und durch die neue Hochofenanlage Luisenhütte ersetzt. Die letzten technischen Modernisierungen gehen auf die Jahre 1854/55 zurück. Dieses in Deutschland einzigartige technische Kulturdenkmal wurde 2004 zum Denkmal von nationaler Bedeutung erklärt und liebevoll zu einem Technikmuseum ausgebaut.

### Öffnungszeiten: (1. Mai - 31. Oktober)

Di. - Fr.: 9.30 - 17.00 Uhr,  
Sa. / So. / Feiertag: 11.00 - 18.00 Uhr,  
Mo.: geschlossen

224 After the hiking tour, the tourists can also visit a museum of technology. The opening hours are noted on the map's backside. (Balve-Langenholtshausen no date)

The use of advertisement was also a criterion for our hiking maps. One-third of the analysed maps have advertisement (cf. fig. 225-227, p. 175) but only very few maps have too many or very striking advertisements.

## The evaluation and its results



225 The hiking map of the Marinenalm hiking region advertises the Kastelruther Spatzen shop. (Marinenalm no date)



226 The Ultental map sheet contains a lot of different advertisement. So, for example, we can find advertisements for shops, hotels or tour operators. (Ultental 2015)



227 On the map of the Rheinsteig hiking area, a tour operator advertises hiking holidays. (Rheinsteig 2006)

The criterion of clear and simple language was again, as with the city maps, not worth investigating since no map has too complicated or non-understandable language in it. We also do not have any maps giving misleading information. But we can find a corporate design in nearly all maps (cf. fig. 228-230, p. 176).



**228** The map of Pfelders uses the hiking region's logo and the logo of the "Alpine pearls" which stand for sustainable tourism. Furthermore, the region presents itself as especially family-friendly. (Pfelders 2018)



**229** This map of the Texelgruppe hiking area combines its own logo with the corporate design logo of South Tyrol. (Texelgruppe no date)



**230** Again, we can find a combination of different corporate designs: The Seiser Alm hiking region has its own logo but also shows the South Tyrol logo and one for the Dolomites. (Seiser Alm 2018)

## 9.2. Chosen examples

### 9.2.1. Example: city maps from Croatia

In the category of the city maps we will have a closer look at three selected maps. All maps are from cities in Croatia and all were purchased in the respective city in August 2015. So, the idea here is to have a closer look at city maps from the same country and the same time of purchase to compare their designs. The selected city maps are from Pula, Senj and Kraljevica. This selection is quite interesting since it means we have a map from a larger Croatian city which is very popular, a map from a smaller city which is also recommended for tourists to visit and one map from a city which is not mentioned in guide books at all. The evaluation results for the question which map has the best design and therefore which map needed the most effort to make may be a bit surprising. What also needs to be mentioned is that we will not describe all criteria and their evaluation results as in the chapter before but concentrate on the most interesting findings.

Before we have a look at the map design, the cities where the selected maps are from will be described in briefly.

Pula is the cultural and commercial centre of Istria (North Croatia) and also a very popular tourist destination. Guidebooks recommend visits to the amphitheatre (fig. 231, p. 177), the Roman square with its temple or the triumphal arch. (Marr-Bierger 2015:42-43)

The evaluated city map was purchased in Pula's tourist information.

## The evaluation and its results



**231** Amphitheatre Pula (Preuß 2015)

Senj is a small city by the Adriatic Sea which counts only 5500 inhabitants. The highlight to visit in Senj is the castle Tvrđava Nehaj from the 16<sup>th</sup> century (fig. 232). (Marr-Bierger 2015:86) The map used here is from a hotel in Senj.



**232** Senj Castle (Preuß 2015)

As already mentioned before, Kraljevica is not commonly described in guidebooks. The website Visit Rijeka claims that it is well known for its two forts (cf. fig. 233, p. 178) and also for being a seaside resort (Tourismusverband der Stadt Rijeka 2019). The evaluated map has been obtained from a hotel.



233 The fort of Kraljevica. (Uniline 2019)

All three maps were purchased for free.

The photo below shows all three folded maps (fig. 234). We can see the maps' cover photos and also their titles. What is striking is that the map of Kraljevica is the only one telling the tourist that this document contains a map. In the other cases, this is not apparent at first sight. In the chapter about the general results of the evaluation, it has been mentioned as something very positive if a map has a more creative title but now we see it might also cause the tourists confusion since they will not know immediately whether the folded document is the map they are in need of or not. But all maps have attractive cover pictures which show parts of the cities.



234 Cover pictures of Croatian maps (Senj no date, Kraljevica no date, Pula no date)

The next photo shows all maps when unfolded (fig. 235, p. 179). Here, we can already see some differences, especially the differences in size: the map of Pula is the smallest one while the other maps have the same size. Being the smallest map may not be a bad attribute since it of course also means handiness. But: it also means less space for giving map information. In the

case of Pula, the result is that only the inner city is shown in the map, leaving out most parts of the city.



235 Unfolded Croatian maps (Senj no date, Pula no date, Kraljevica no date)

All maps offer paper which is thicker than normally, so they were all rated with being made of high-quality paper. The paper of Senj and Kraljevica is even laminated.

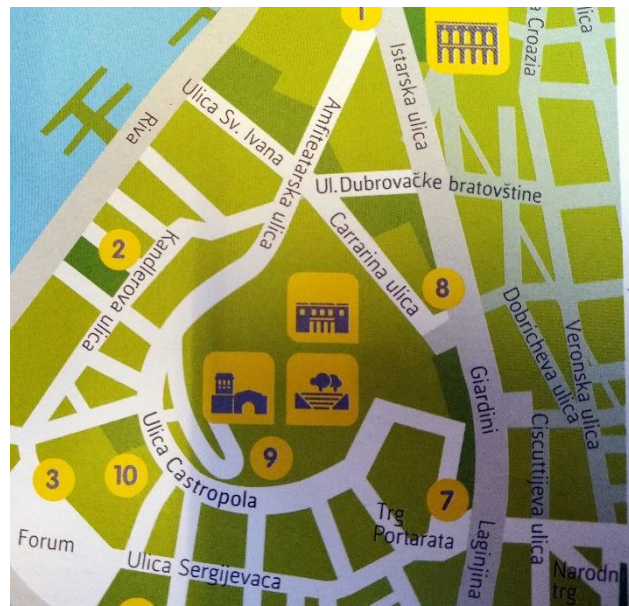
As for the basic map elements, Kraljevica gets the best evaluation results. It offers tourists a numeric scale and even a scale bar so there should be no problems in measuring distances. Both other maps do not offer any information of this kind so the map users will not know how far they have to walk to reach a certain point. All maps have a legend but none of the legends is complete so we might get some communication problems if tourists are not able to understand the unexplained signatures. Only the map of Senj has a source statement but which is also not complete. This means tourists will have problems in all three cases, e.g., in estimating the up-to-dateness since they do not get information about the date of production in any of the maps.

All maps use mostly only numbers to mark their sightseeing spots. Senj has a sketch of the castle mentioned above which is the most important sightseeing spot. Pula also offers map users some additional pictorial signatures but since they are not explained in the legend, their meaning is not quite clear. We also have some deficits regarding the quality of the chosen symbols. The signatures of both Kraljevica and Senj do not have a sufficient contrast to the background colour and are therefore hard to recognize. Furthermore, in the map of Kraljevica they are even way too small. Plus, the explanations for the numbers are on the map's backside so map users are forced to always turn the map around if they want to know what a number stands for.

So, to sum this up, we can see deficits in all maps in the question of how sightseeing spots and maybe other important spots are represented. Signatures which are not explained in the legend may be hard for tourists to understand, therefore we can say that we have some problems in

the communication with map users here. Also, the insufficient quality of the signatures can disturb communication.

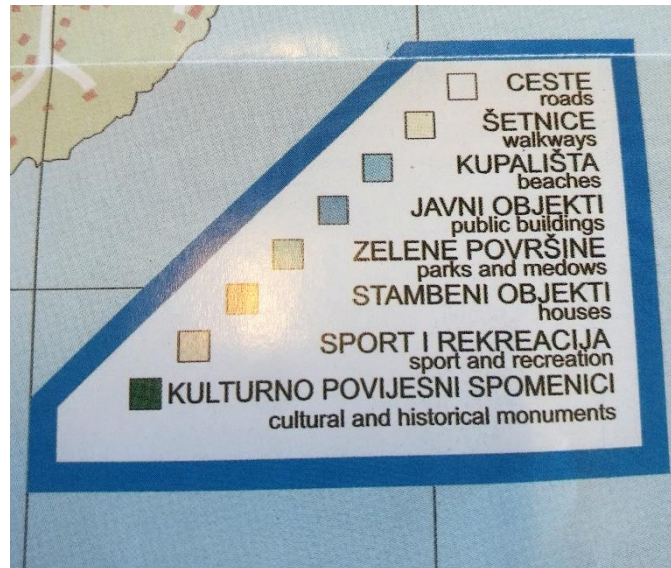
The map of Pula and the one of Kraljevica also – again – stand out because they do not use colour associations. In both cases, the background colour is mainly green although there are no parks, meadows, forests or other objects which could be associated with the colour green (cf. fig. 236). So the tourists might get the impression that both cities consist mainly of green spaces which is of course not true.



236 The map of Pula which is mainly in green colours (Pula no date)

All maps include lettering which, to start with, is to be seen very positively. The quality of the lettering is rated as good since it is large enough to be readable and the contrast to the background colour is also sufficient. As we have seen, city tourists are often from abroad so it is useful to have foreign languages in the map. The maps of Senj and Kraljevica are both in Croatian and English which is particularly surprising in the case of Kraljevica since it is not a typical tourist city visited by many people from abroad (cf. fig. 237, p. 181). The map of Pula even adds explanations in Italian, German and French to Croatian and English. Therefore, most tourists might find a language which they can understand.

## The evaluation and its results



237 The legend of the map of Kraljevica shows the use of different languages (Kraljevica no date)

The visual hierarchy of the maps of Senj and Kraljevica is a problem. This results mostly from the fact that the quality of the signatures is not as good as it should be. Consequently, the really important information does not stick out of the map and does not catch the map user's attention.

All our maps are generalised but the generalisation is not always well-thought out. The map of Pula is generalised way too much. It shows only a few of the streets that really exist. In addition, only a few of the streets shown in the map are labelled. Hence, the tourist might get big problems with orientation. The map of Senj, on the other hand, lacks generalisation in some parts. The inner city shows all details of the buildings' ground-plans which is definitely not the idea of generalisation if we follow the rules set in chapter 5.3. (fig. 238). Nevertheless, the non-generalised parts of the map are no problem for tourists' orientation.



238 The inner city of Senj, shown in an auxiliary map (Senj no date)

We will, of course, also have a closer look at the map content of the analysed Croatian maps. In this case, Pula gets the worst results. The map shows the tourist only a selection of sightseeing spots which can be considered a part of the category "culture" but gives no other



information on transportation, shopping or general institutions. One could argue that the map is reduced to the most important information, meaning the sightseeing spots. But, on the other hand, we have seen that tourists are also interested in other activities while visiting cities like, for example, shopping and so it would be better to add some more information to the map for the tourists to be able to plan the trip better. The maps of Senj and Kraljevica, on the other hand, offer the tourists some additional information, like, for example, hotels, tourist agencies, beaches, health institutions or places for sports like mini golf. All these objects are marked by the numbers in the map. Here, tourists will get many additional ideas for what to do while visiting the city and they also know where to go if they need some help from the tourist agency or if they are in need of health care. Therefore, we can say that those maps are much more helpful.

None of the city maps propose the tourists walks through the cities, who therefore will have to plan their walks themselves. Also, no map has a street directory but we have to admit that at least in the case of Pula, where only a few of the existing streets are shown at all, it makes no sense to add a street directory. Kraljevica offers its tourists a search grid. With the help of this search grid, tourists cannot find streets but all the important institutions and interesting spots which are named on the back of the map. This shows us that search grids cannot only be used for street indexes but also for helping to find other useful information.

The maps of Pula and Senj do not give visitors of the cities any additional information in the form of texts and photos. Both we can find in the map of Kraljevica. Here, tourists get written information about the city and also a first impression of what it looks like.

The category of "advertisement" is not of interest in the case of the chosen Croatian maps since none of the maps have advertisements despite the fact that they are all available for free.

All maps use some kind of corporate design by adding, at least, logos to the map.

In summary, some differences in design can be made out. The most obvious difference, at first sight, may be the fact that the map of Pula only shows the city centre while the other maps show the whole city. Showing only the city centre is definitely a possibility as we have seen in the explanations above. It can help tourists concentrate on the most essential sightseeing spots but it can also help keep tourists away from other parts of the city. However, locations outside of the inner city which might be interesting as well for tourists, are missing. So, for example, Pula has also an aquarium outside the town. Therefore, one could argue that showing locations and attractions outside the city centre might lead tourists there and keep some away from the inner city. Hence, this might relieve the city centre a bit from mass tourism.

As shown, the map of Pula is also a good example for too much generalisation. Here, so much information is left out that the orientation may become problematic. Furthermore, this part of the analysis has shown the importance of colour associations. The section discussing theoretical background on colours implied mainly that colour associations lead to a faster understanding of the map. But here, it was possible to show that not working with common colour associations

might even lead to a wrong impression of the area shown in the map (cf. the green background for Pula where no green spaces are). The disadvantage of numbers as signatures is also visible in the chosen examples. It is not clear at first glance what the numbers stand for. Tourists always have to consult the legend. In this context, the map of Kraljevica shows another problem which has not been in our focus yet: the explanations for the numbers used in the map face are on the paper's backside which is not very handy. It would be better to have only additional information on the map's backside but not facts that are necessary to understand the map itself.

All in all, the map of Pula has more deficits than the other Croatian maps. This might be surprising since Pula is the largest and most famous city in this compilation. Although it offers tourists many attractions and possibilities for free-time activities, the map shows only a few. The much smaller cities Kraljevica and Senj give tourists much more information about where to stay, where to spend their free-time or where to just relax.

### 9.2.2. Two hiking maps in comparison

In our second category, i.e. in the category of hiking maps, we will have a closer look at one very good and one very bad example for a hiking map. One map will represent a map which is very good according to the results of the evaluation and the other map is a very bad one measured by the standards of our evaluation. This means we have two maps which are in a great contrast to each other.

#### 9.2.2.1. Dorf Tirol: A great map

The map of Dorf Tirol is, according to the results of our evaluation, one of the best hiking maps in our collection which means it fulfils most criteria.

Dorf Tirol is situated in South Tyrol, near to the spa town of Meran. Dorf Tirol is said to be ideally located for hiking since the network of hiking trails around the town comprises 70 km. (Tourismusverein Dorf Tirol 2019) An impression of the hiking area in Dorf Tirol can be seen in the photo below (fig. 239, p. 184).

## The evaluation and its results



239 Hiking area around Dorf Tirol (Preuß 2019)

The map is named “Dorf Tirol und Umgebung – Tirolo e dintorni”, so we see already in the title that this map includes two different languages, German and Italian. The map’s cover picture shows a hiker, so this cover picture is comparable to the other hiking maps’ cover pictures and no surprise (fig. 240).



240 The cover picture of the map of Dorf Tirol (Dorf Tirol 2015)

The map was purchased in summer 2015. It has been published by Tappeiner which is a professional cartographic publishing house.

The folded map is 10 cm x 10,6 cm (width x height) in size. But: the unfolded map is 80 cm x 66 cm in size which is not very handy. The paper is of a high-quality which means it should be no problem to use while en-route.

The fact that the map includes a numeric scale and also a scale bar so measuring distances is possible is very positive. The scale of the map is 1:25.000 which can be rated as a good scale for hiking as it still shows enough detail. All signatures used are explained in the legend so the communication between map user and map maker should work here. But if we have a look at the signatures in general, we have to admit that they are very small. The colour contrast of the signatures to the background colour is sufficient but because of their small size it is still difficult to recognize them. The map does not contain any sightseeing spots marked by signatures. Some spots which might be interesting to visit as part of the hiking tour are marked in the map in the form of lettering.

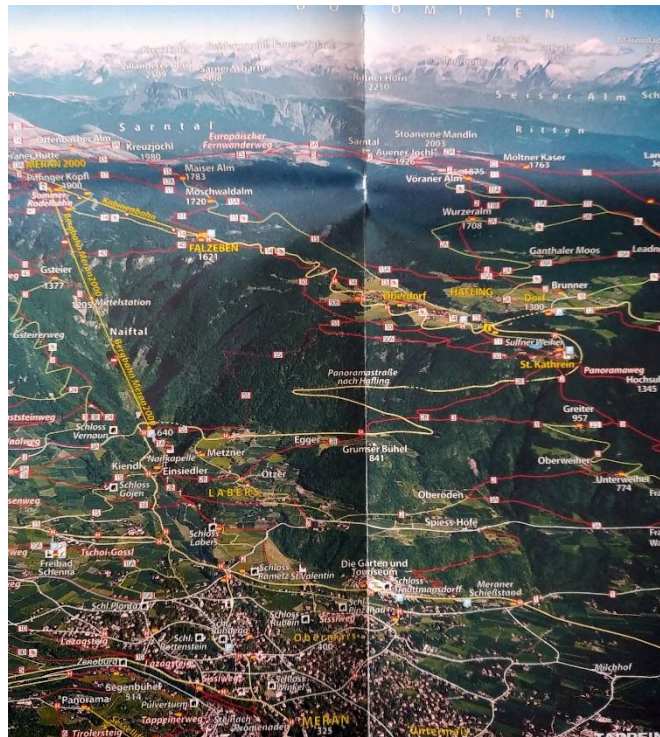
The map does not work with colour associations in the way we know from literature. The map consists of a green colour scheme which indicates flat areas with settlements on the one hand and higher, wooded areas on the other hand. So it seems that the map tries to combine colour associations with coloured hypsometric layers.

What is very striking about this map is that many variations of lettering are used, e.g. spacing or upper case letters, mixing serif and sans serif fonts. The map also works with different font colours. As we have already seen in the title of the map, this map includes different languages. The legend even includes English. Other explanations or texts are "only" in German and Italian.

The visual hierarchy of the map is not very good. As already explained before, the signatures are very small and therefore do not contribute to a good visual hierarchy. The chosen colour scheme accentuates mostly the higher mountainous regions. The information about hiking trails, which can be seen as the most important information for hiking maps, does not really stick out.

Something that is very positive about this map is that it includes several auxiliary maps. The map's backside offers the hiker three panoramic maps of the region (fig. 241, p. 186). So hikers who might be inexperienced in reading maps with relief representations like contour lines or hill shading will get a good impression of the hiking area by means of the panoramic maps.

## The evaluation and its results



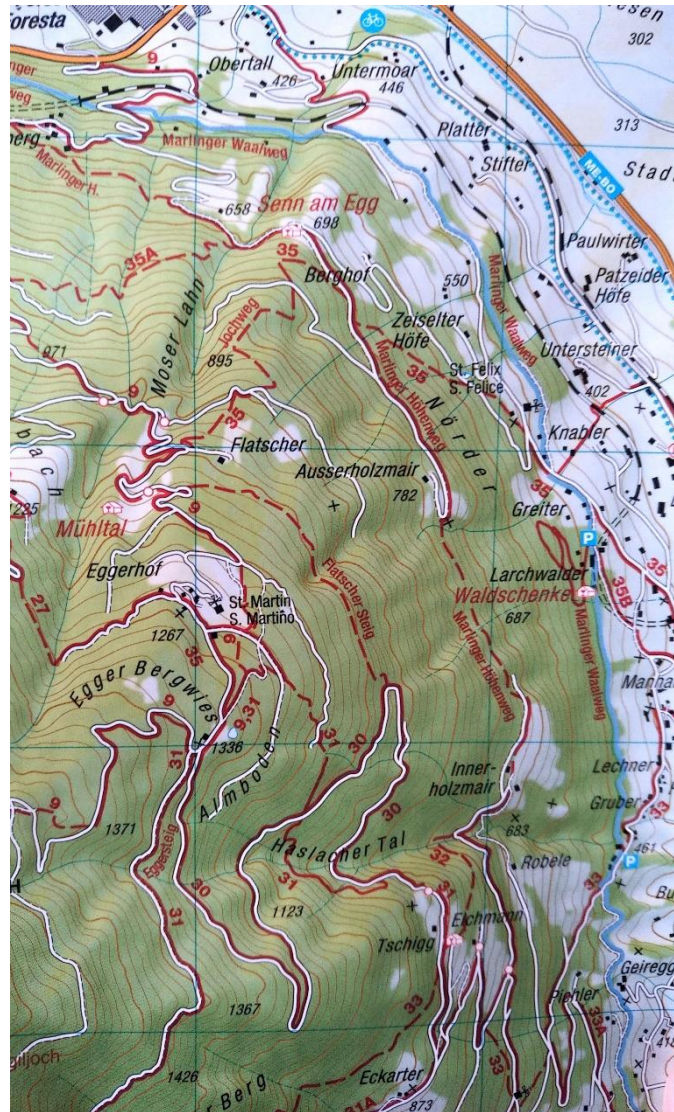
241 Example for an auxiliary panoramic map (Dorf Tirol 2015)

The main map is generalised and we can say that it fits the map's topic. Hikers will get all the information from the map that is necessary for their hiking trip.

Hikers or tourists in general will find a lot of useful map content. The content includes transportation like stops for public transport but also car parks so hikers should have no problem to get to the starting point of their hike. Also, accommodation or gastronomy are noted here so it will be possible to take a break from the hike or plan a longer hiking tour. Some cultural institutions like museums or castles are also marked. What is missing, is information about shopping destinations or temporary events. However, the map content is already very informative so this is just a minor deficit.

Another interesting aspect of this map is its way of showing relief. As we have already stated before, we can find a kind of coloured hypsometric layers here. Furthermore, the map has contour lines, hill shading and also gives height points (fig. 242, p. 187).

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**242** The picture shows the different ways of representing the relief used in the map. It gives an impression of the varied lettering as well. (Dorf Tirol 2015)

As we have seen in the section about map content in general, we have a map here which is very rich in content. This also applies to the aspect of huts, viewpoints or overnight accommodation for hikers. All those points are marked in the map. Furthermore, many different hiking tours are proposed. They are of varying lengths and duration and the degree of difficulty is described in the text so every hiker should find a tour which is for his or her hiking experience. Unfortunately, the map face does not include distance markers.

Additional texts and photos give the hikers an impression of the area. The map sheet does not include any advertisement which might annoy the map users. Instead, we can find corporate design in the form of logos.

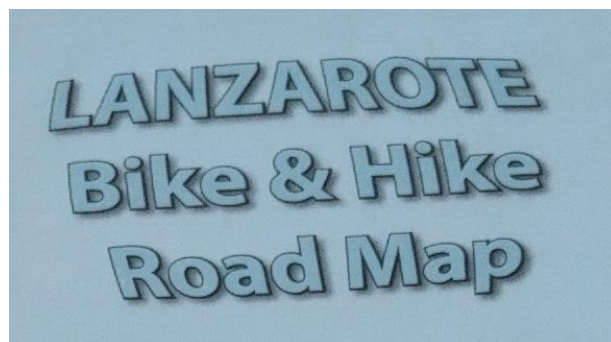
### 9.2.2.2. Lanzarote: Hiking with little information

Lanzarote is the fourth-largest of the seven Canary Islands (Weniger 2016:13). The island is regarded as very varied in terms of scenery: fields of ashes in the west, the dry south with its beautiful beaches and wine-growing areas in the middle (Weniger 2016:14). The ash fields of the Timanfaya national park can be seen in the photo below (fig. 243). Lanzarote is normally not a typical destination for hiking tourists. Nevertheless, hiking trails marked by signs exist and even guided hikes are offered (Weniger 2016:103).



243 A photo taken in the Timanfaya national park (Preuß 2017)

The map analysed here was obtained at a hotel in Lanzarote in April 2017. Its full title is "Lanzarote Bike & Hike Road Map" so its target group are not only hikers but also bikers (fig. 244).



244 The title of the hiking map (Lanzarote no date)

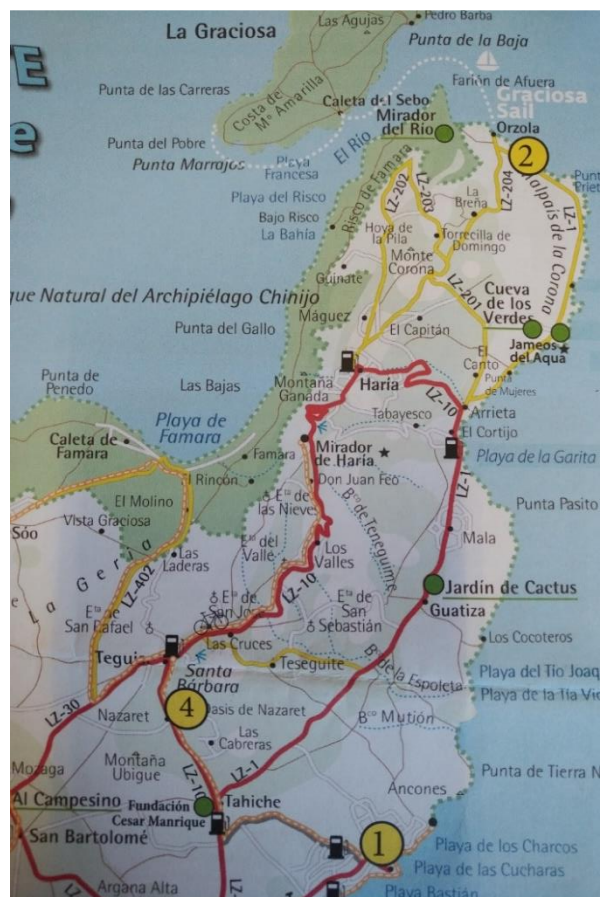
Since the map is not pre-folded, it does not have a cover picture. What is also missing is the source statement so we do not have any hint who the map maker is or by whom the map was published. Furthermore, we do not know the map's up-to-dateness because we have no date

## The evaluation and its results

of production. The map's size is 42 cm x 29,8 cm (width x height) which is still manageable. But the paper is of low quality and does not look like it is weatherproof which is not ideal for a hiking map that is used mostly outdoors.

The map does not include any basic information like a scale or a north arrow. A legend exists but is not complete. Tourists will face some problems while trying to work with this map. It will be difficult to estimate distance and also some signatures might not be understandable when they are not explained in the legend.

The signatures used are at least recognizable because they are mostly large enough and the colour contrast to the base map is sufficient. Sightseeing spots or attractions are marked by numbers which are explained by photo and short text boxes beside the map face and also on the backside. But at this point we should anticipate a criterion which normally stands at the end of the evaluation process: advertisement. All the points which are marked by numbers are more advertisements than neutral recommendations for sightseeing and free time activities. The map also includes, for example, the architectural highlights of César Manrique, the island's most famous artist (Weniger 2016:24). Those highlights are marked by green points which are way smaller than the numbers of the advertised highlights. (cf. fig. 245, 246, p. 189-190)



245 A part of the Lanzarote hiking map (Lanzarote no date)



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246 Some of the advertisements on the hiking map (Lanzarote no date)

The map has differently coloured streets. Unfortunately, their meaning is not explained in the legend so it might not be always clear for tourists what the meaning of the colour is and therefore, which streets are main streets and which not.

Objects which are lettered in the map face are mostly towns, mountains and beaches. We find sans serif fonts in different colours and, all in all, the lettering is well readable. The legend's heading is in three different languages (English, Spanish and German), but the rest of the map (including all advertisements) is only in English.

The visual hierarchy is acceptable. Proposed hiking trails are highlighted and also the sightseeing attractions stick out of the base map. The problem with the advertisements which catch more attention than, for example, cultural sightseeing spots has already been discussed above. Petrol stations are also very prominent in the map face. So this map would even be usable for motorists although the main target group are bikers and hikers.

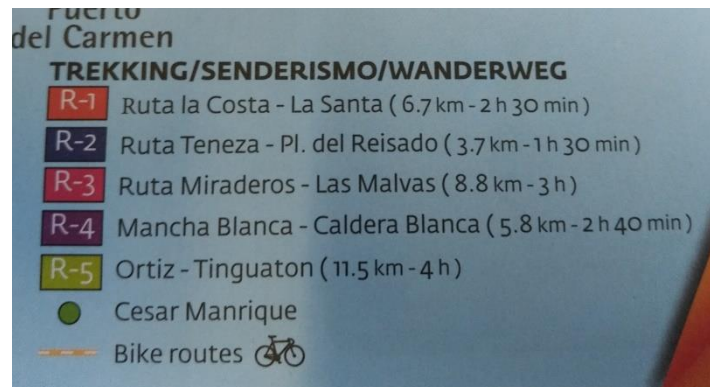
The map is generalised. The problem with this map is that it tries to show the whole island on a paper which is approximately DIN A3 format. Consequently, the map maker can only work with a small scale and this does not leave much room for detail. Keeping in mind that problem, the generalisation can be rated as acceptable.

What is missing are inset maps. They could compensate the lack of detail. It could be helpful, for example, to have an inset map of Lanzarote's largest city Arrecife or an auxiliary map of the area around the national park Timanfaya since most proposed hiking routes are located in that area.

All in all, the map does not have much additional content. We do not find information about transportation, accommodation or gastronomy here. Mentioning the art of César Manrique in the map can be rated as a contribution to the category "culture". Since Lanzarote is famous for Manrique and its art, we can even speak of local culture here. In addition, marking beaches and national parks in the map face means a contribution to the category "natural phenomena".

The most important criteria are surely the ones which focus on the map designed as a hiking map. However, this is the category where the given map shows most deficits: the map does not give any relief information. We do not have contour lines or hill shading. Even height points

which are normally the easiest way of giving information about differences in altitude (and which were to be found in most of the other evaluated maps) are missing. We have some proposed routes in the map but they are not themed or marked as especially scenic. At least their distances and the approximated walking time are mentioned, so the hikers can choose between longer and shorter routes. Bike routes are also marked in the map but without any distance markers. In combination with the missing information about heights and the relief, hikers will get some problems with planning their tours. (cf. fig. 247)



247 The legend of the hiking map which also proposes some tours (Lanzarote no date)

The map does not offer hikers any additional content in the form of texts or photos. The problem here again is advertisement. The free space beside the map face or at the backside of the map is occupied by advertisement. Hence, we can say that this map contains too much advertisement.

This map is also an example of a map which does not have any corporate design, even in the form of logos.

### 9.2.2.3. Short comparison of both hiking maps

Above, two different hiking maps were described in their design and content. One is an example for a well-designed hiking map while the other one has some deficits – in content as well as in design. It is interesting to see that the map with the better results in the evaluation is one published by a professional cartographic publishing house. The other map does not name a map publisher but since it was available for free at a hotel and contains many advertisements, it looks more like the product of a marketing agency than one made by professionals.

The hiking map of Lanzarote is missing many cartographic elements that were seen as essential in cartographic theory: there is no scale, the legend is incomplete and there is no representation of relief. Consequently, this might also lead to problems in communication. Without a complete legend, map users might not be able to understand some signatures. So, for example, as mentioned before, the map shows different types of streets by applying varying colours to them but the legend lacks an explanation of these colours. Also, the lack of a relief

representation is a clear deficit for a hiking map. Furthermore, there is not much additional information which might be relevant or interesting for hikers or tourists in general.

It definitely can be said that the map by the professional cartographic publishing house offers hikers a map of a high cartographic quality. All signatures used are explained in the legend and the map combines different forms of relief representation with each other to make the relief as vivid as possible. Furthermore, hikers who are not used reading maps get an additional panoramic map which visualizes the mountainous area even better. The small signatures can be seen as a deficit but, all in all, the map offers the hikers all the necessary information.

### 9.3. WestfalenWanderweg: Communicating by different media

The final chosen examples are maps for the WestfalenWanderWeg. The WestfalenWanderWeg will be in our focus – not because of the maps available about this hiking trail but because of the fact that we also have some other media such as a hiking guide or a website beside the map informing the tourists about the hiking trail. Of course, this is not something special only the WestfalenWanderWeg has – but it might be interesting to have a closer look at a hiking trail which is not part of one of the more typical hiking regions in the Alps or not as famous as the Rheinsteig. Furthermore, from the point of view of communication theory, it is quite interesting not to look only at maps but also at other media to compare how they try to communicate with the tourist.

#### **Facts about the WestfalenWanderWeg**

The WestfalenWanderWeg has a length of 210 km in total. The hiker of course does not have to walk the whole trail. It is divided in different stages and it is possible for the hiker to start or end the trail at every of this stages (Schampera 2010:5, Arbeitsgemeinschaft WestfalenWanderweg no year).

The WestfalenWanderWeg leads the hiker through Westphalia (Arbeitsgemeinschaft WestfalenWanderweg no year), crossing the Sauerland in the south and the Westphalian Bay (Westfälische Bucht) in the north (Schampera 2010:5). The hiking trail starts in Hattingen in the west and ends in Altenbeken in the east (Schampera 2010:5) where it encounters the European long distance path E1 (Europäischer Fernwanderweg E1, Arbeitsgemeinschaft WestfalenWanderweg no year).

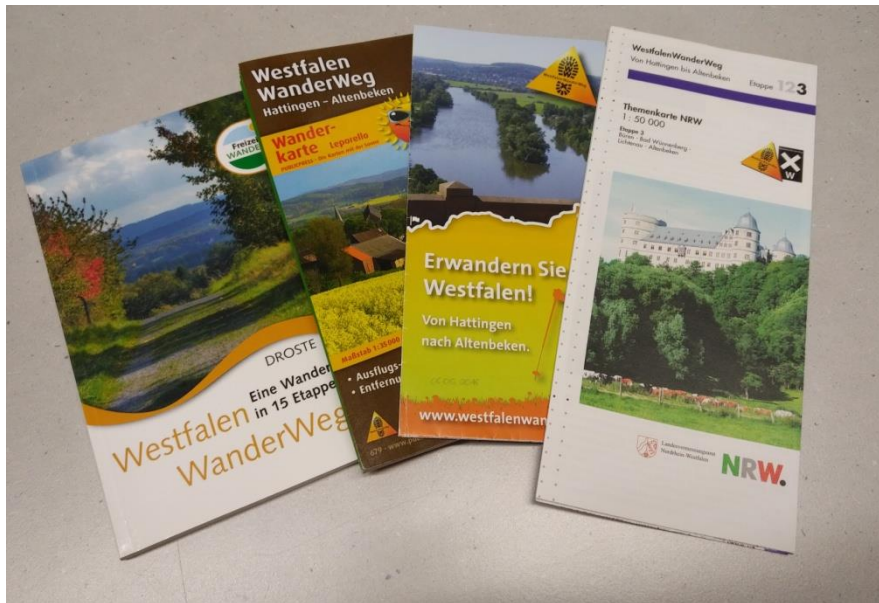
All in all, the trail crosses 18 cities and communes. It also leads through the four districts Ennepe-Ruhr, Unna, Soest and Paderborn (Arbeitsgemeinschaft WestfalenWanderweg no year).

The trail is culturally and naturally oriented (Schampera 2010:5) and wants to show the hiker landscapes that are typical for the region (Arbeitsgemeinschaft WestfalenWanderweg no year). It crosses landscapes that have been shaped by industry (Schampera 2010:5) but also the

floodplains of the river Moehne (Arbeitsgemeinschaft WestfalenWanderweg no year). The hiker will also see churches, castles, historical old towns and other memorials (Schampera 2010:5).

### 9.3.1. Short evaluation of the available media

The hiker gets information about the trail and can walk the trail with the help of different materials. The existing materials (fig. 248) will be described and analysed in the following text.



248 All media existing for the WestfalenWanderweg (Schampera 2010, WestfalenWanderWeg no date, Arbeitsgemeinschaft Westfalenwanderweg no date, WestfalenWanderWeg 2015 )

The first part of information can be gathered from the **flyer** "Erwandern Sie Westfalen! – Von Hattingen nach Altenbeken." (fig. 249). The flyer is distributed, for example, during events in the city, in the tourist information and can also be found on the homepage of the district Unna.



249 The cover picture of the flyer (Arbeitsgemeinschaft Westfalenwanderweg no date)

The front page shows the logo of the WestfalenWanderWeg and a photo of the landscape. Opening the flyer, the user sees a sketchy map of the whole hiking trail with the cities and communes that are crossed and the single stages of the hiking trail and their length. In this way the interested hiker already receives some information about the course of the trail and can decide whether the whole trail or some parts of it might be interesting for him. The flyer also gives some information in text from: the length of the whole trail, interesting landscapes it passes and the fact that the trail encounters the European long distance path E1. The hiker also gets contact addresses for additional information, information about the official WestfalenWanderWeg homepage and the hiking map that is available for this trail. Opening the flyer even more, hikers can see photos and texts concerning the four landscapes of Westphalia the WestfalenWanderWeg crosses (Middle Ruhr valley, Ardey, Haarstrang, Paderborner Land). This might also help increase interest in the hiking trail. (cf. fig 250, 251)



250 The flyer shows the whole length of the hiking trail as well (Arbeitsgemeinschaft Westfalenwanderweg no date)

**Die erlebnisreiche Wanderroute durch verschiedene Landschaften Westfalens**

### Mittleres Ruhrtal



**Burg Blankenstein**

Das Ruhrtal hat eine traditionsreiche Geschichte. Lange Zeit stand es für Bergbau und Industrialisierung, die Ruhr war im 19. Jh. der wichtigste Transportweg für die Kohle.

Auch wenn diese Zeiten längst vergangen sind und das Ruhrtal heute durch seine landschaftliche Schönheit besticht, kann sich der Wanderer zwischen Hattingen und Witten auf die Spuren des alten Kohlebergbaus und der Industriekultur Westfalens begeben, von der noch viele Relikte zeugen.

In Hattingen, dem Startpunkt des Westfalen-Wanderweges, erwartet den Wanderer zudem das Flair der historischen Altstadt mit liebevoll hergerichteten Fachwerkhäusern und gemächlicher Gastronomie.

**Sehenswürdigkeiten**

Historische Altstadt Hattingen mit verwinkelten Gassen und mehr als 140 malerischen Fachwerkhäusern. [www.hattingen.de](http://www.hattingen.de)

Historischer Ortsteil Hattingen-Blankenstein mit Burg und Freihalt. [www.hattingen.de](http://www.hattingen.de)

Wittener Müllental mit Bergbauwandweg um das Industriemuseum Zache Nachtigall. [www.zache-nachtigall.de](http://www.zache-nachtigall.de)

### Ardey



Der sanfte Höhenzug, der nördlich die Ruhrseen begleitet, ist einer der waldreichsten im Ruhrgebiet. Immer wieder wird der Blick vom steil aufragenden Hang des Ardey auf den Fluss gelenkt.

Herrsitze, Burgruinen, alte Kirchen, romantische Stadt- und Dorfkerne, ein monumentales Kaiser-Wilhelm-Denkmal, und sogar die größte Spielbank Europas liegen auf dem Weg zwischen Wette, Herdecke und dem bewaldeten Dortmunder Süden am Hengsteysee.

Nördlich von Schwerte verläßt der Weg den Wald bestanden Ardey und geht in den mit Feldfluren bedeckten Haarsrang über – mit Blick auf das tief gelegene Ruhrtal und die sauerländischen Gipfel.

**Sehenswürdigkeiten**

Wette  
Historische Burg und Freihalt Wette mit schönem Blick auf den Harkortsee.

Herdecke liegt malerisch zwischen den Ruhrseen Hengstey- und Harkortsee.

Hohensyburg  
Hoch über dem Ruhrtal ragt die Ruine der Burg Hohensyburg auf. [www.dortmund.de](http://www.dortmund.de)

### Haarsrang



**Möhnesee, Kreis Soest**

Der Höhenzug führt durch eine landschaftlich geprägte Umgebung, vorbei an idyllischen Dörfern und Gehöften. Weite Fernsichten bis nach Hamm, über die Börde und große Teile des Kreises Soest begleiten den Wanderer. Am Möhnesee geht es hinab zur gewaltigen Stauwehr mit der Schiffsanlegestelle. Wer mag, kann ab hier ein Stück der Strecke auf dem Wasser zurücklegen. Während der Wanderweg selbst die bewaldeten Silhouetten des Sauerlands im Süden folgt, verläuft er auf meist ebenen Pfaden weiter ostwärts zunächst am Nordufer des Möhnesees entlang und durch das sehenswerte Warsteiner Mohnetal, bis schließlich eine großartige Aussicht für den Aufstieg ins wehrhaft ummauerte Rülthen befoht.

**Sehenswürdigkeiten**

Historischer Ortskern Fröndenberg

Stättings Mühle, Warstein-Belecke

In der 800-jährigen Berg- und Hansestadt Rülthen bietet der 3 km lange Rundgang entlang der alten Stadtmauer herrliche Fernblicke.

### Paderborner Land



Oberhalb des Almetals erreicht der Weg das Paderborner Land. Nach wenigen Kilometern läßt im schönen Städtchen Bären die barocke Jesuitenkirche und das benachbarte -kolleg zu einem Besuch ein. Durch den Haarener Wald geht es zur bekanntesten Sehenswürdigkeit der Region, der mächtigen Wewelsburg – die Dreiecksburg in Deutschland. Weiter führt die Route am Südrand der Paderborner Hochfläche entlang und durchquert bei Hengeln das Tal des Flusses Altenau. Im nahen Saueretal kommt bald das Eggegebirge in Sicht.

Ab Hierbarn-Wald verläßt der Weg dann auf dem Kamm des Eggegebirges. Der Westfalen-Wanderweg endet schließlich in Altenbeken, bekannt durch seinen großen Eisenbahnviadukt.

**Sehenswürdigkeiten**

Die Bärenar Jesuitenkirche gilt als einzigartiges barockes Bauwerk in Westfalen. [www.buaren.de](http://www.buaren.de)

Der Spielker in Lichtenau-Altain ist ein restauriertes Fachwerkhaus im Stil der Weserrenaissance. [www.lichtenau.de](http://www.lichtenau.de)

Der große Eisenbahn-Viadukt in Altenbeken ist die größte Kalksteinbrücke Europas. [www.altenbeken.de](http://www.altenbeken.de)

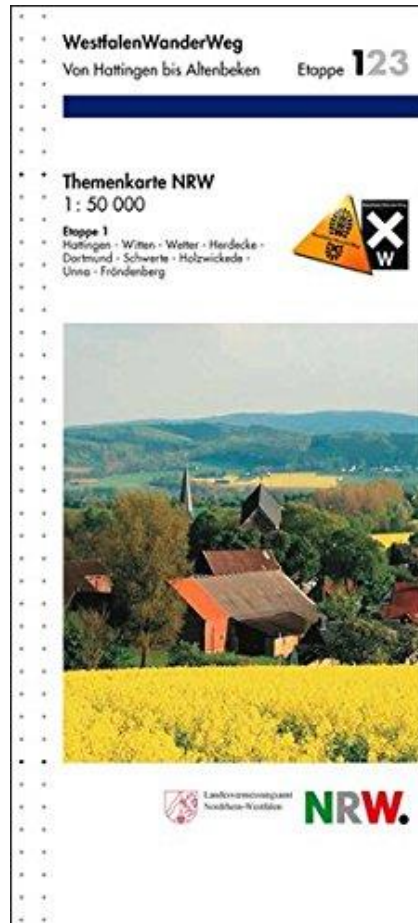
### Wewelsburg, Bären



251 Texts and photos on the flyer (Arbeitsgemeinschaft Westfalenwanderweg no date)

All in all, the flyer gives some short but useful information about the hiking trail and might raise the interest of hikers who do not know this trail yet. It also helps decide whether one wants to walk this trail or not and gives useful addresses and tips where the hiker can get more information that might help him with his decision whether this trail is worth walking or not. But: it is not possible to go hiking this trail only with this flyer. Here, the hikers will need some additional material.

## The evaluation and its results



252 The cover picture of the map published by the regional survey office (WestfalenWanderWeg 2015)

Hikers on this trail can use two different maps for their walk. One **map** is offered by the regional survey office of North Rhine Westphalia (fig. 252). It is divided into 3 maps, so the whole trail cannot be seen in just one map. This is understandable due to the west-east spread of the trail. Conveniently, all three maps are offered in one protective plastic cover so they can be carried along together in this cover or the user can take every map singly, depending which one is needed at the moment. All maps have the scale 1:50.000 and overlap at the attaching points. The first stage shown in the first map is from Hattingen to Froendenberg, the second map covers the route from Wickedede (Ruhr) to Ruethen and the last map shows the third stage from Bueren to Altenbeken which is also the endpoint of the WestfalenWanderWeg.

The map is the first edition from 2005. Each of the three maps has a different cover picture. It is always described in the source statement of the maps what the photos show. Every map has a height of 24 cm and a width of 121 cm (opened, width closed: 11cm). It is folded in such a way that makes it easily possible to see only short parts of the map and the user does not have to unfold the whole map. The base map is the official topographical map 1:50.000 (short: TK 50).

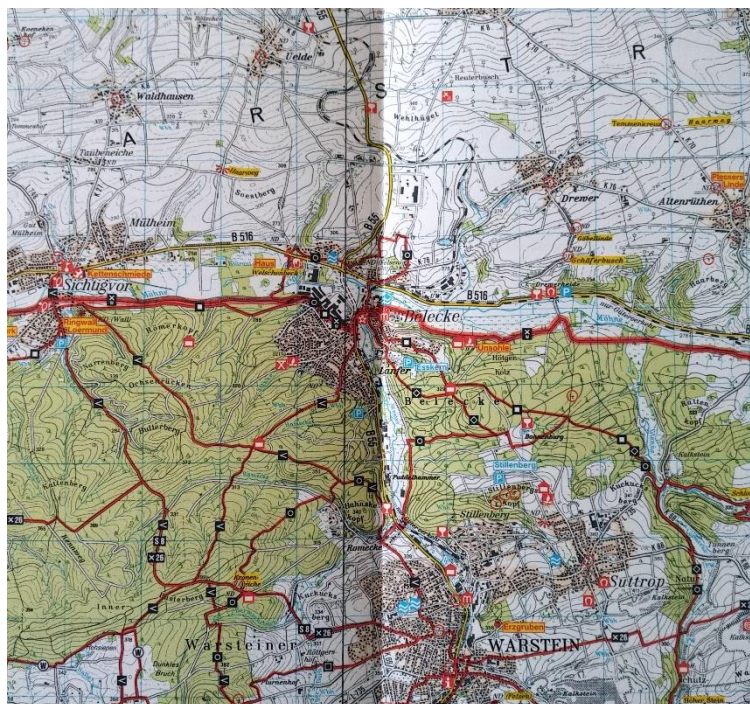
A problem is the fact that not one of the three map sheets has a complete legend. Parts of the legend can be found on sheet one and sheet two. Map sheet three does not have a legend at all. The legend on the first map covers the topic hiking and cycling, information and rest,

facilities for freetime and sports and places of interest while the second legend concentrates on borders, railway lines, streets and other traffic routes, vegetation and settlements and other topographic objects like cemeteries, churches etc. Consequently, map users need to be able to understand some signatures without a legend if they do not take all map sheets with them or they must always have the whole map series at hand. Furthermore, it is not quite practical to have to check the legend for one map on another map.

The WestfalenWanderWeg is marked in red on the map so it is well silhouetted against the base map. It is a bit irritating that other hiking trails are also marked in red, although their line thickness is slimmer. The official route markings of the WestfalenWanderWeg can also be found in the map. Other information that might be interesting or important for hikers is also marked in red in the map, like: places to rest, tourist information, parking lots, stations, restaurants... The places of interest are not only marked near the trail but on the whole map, so it is also possible to leave the trail for a break. Towns, parts of towns and sightseeing spots are lettered. Sightseeing spots are labelled by using red letters on a yellow rectangle. They do not have a special signature like vertical plans or a pictorial signature. However, the way they are lettered they still catch the hikers' attention.

It should be possible to follow the hiking trail with the help of this map since it is detailed enough to follow the course of the path and shows all the junctions. The hiking trail itself has of course the usual markers that help the hiker to determine that he is on the right path.

However, the map expects a user that has at least some knowledge about the use of maps. The map uses contour lines to show differences in altitude or inclinations so the hiker needs to have some experience in reading and understanding contour lines to find out whether he is walking in a steep or in a flat terrain. (cf. fig. 253, p. 198)



253 A part of the map face (WestfalenWanderWeg 2015)



The map shows train stations but it does not show bus stops which is a deficit since it is said in the corresponding book, flyer and on the website website that the hiker is flexible in starting or leaving the trail by bus at different places. Marked bus stops in the map might help plan the hiking tour in this case.

On each backside, we find information in text form as well as photos about the cities passed, giving hikers ideas for free time activities or places to visit near the hiking trail (fig. 254). There is also a short text about the trail in general.

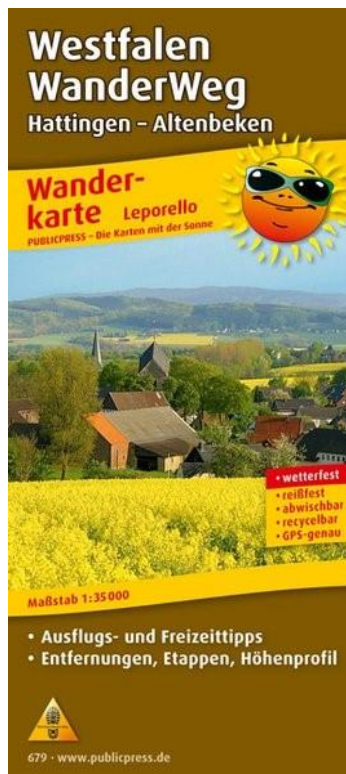


254 Text and photo on the backside of the map (WestfalenWanderWeg 2015)

The maps are offered in a protective plastic cover but the maps themselves are printed only on normal paper so they are neither waterproof nor very robust.

What is also missing is the subdivision of the whole hiking trail in different shorter stages. This subdivision can be found in the flyer and is, as we will see later, also part of the second map and the guide book about the WestfalenWanderWeg. The advantage here is that hikers are already informed about the stages which are suitable for a day-trip and do not need to plan this by themselves. Furthermore, the regional survey office's map does not have distance markers in it. This makes it more difficult to plan the single tours since all distances have to be measured with the help of the scale bar which might be really hard for inexperienced map users.

The **second map** of the WestfalenWanderWeg is also recommended in the information flyer about the hiking trail. The map's title is "WestfalenWanderWeg" and the cover picture is a photo of the landscape (fig. 255, p. 199). The front page also describes the map as weatherproof, tearproof and wipeable. The paper is laminated and, hence, this map can be used without problems on tour.



255 The cover picture of the second map available for the WestfalenWanderWeg (WestfalenWanderWeg no date)

What is special about this map is the folding: it is a so-called harmonica (or zig-zag fold). The consequence is that we do not have one sheet of paper showing the whole hiking trail. Here, the single parts of the trail are each shown in their own map. Those maps are continuously following each other. The map user can flick through the map like flicking through a book. The advantage of this folding is clearly its handiness. Hikers can take a look at only that part of the hiking trail which is interesting for them at the moment and are not forced to unfold the whole map.

The map is published by publicpress which is a cartographic publishing house. Unfortunately, the source statement does not give any information about the year of production so it is not clear if the map is up to date.

The map's scale is 1:35.000 which is still well usable. Beside the numeric scale, the map offers hikers a scale bar so estimating distances should be easy. What makes the estimation of distances even easier are the distance markers that can be found on the whole hiking trail: every 2,5 km are marked. The legend contains all signatures used.

Hikers get a general map which shows where all the single map faces are situated and also an elevation profile. In addition, there is textual information about the hiking trail in general and it is described how map users have to use this special type of map folding.

In this map, the hiking trail is divided into 11 stages. The shortest is 12,5 km and the longest 27,5 km.

Between the map faces, the leaflet offers hikers textual descriptions about the single stages of the trail, combined with photos and tips for sightseeing spots to be visited.

The map face itself is well readable. The hiking trail is marked in red and therefore in a good contrast to the base map (fig. 256). The most interesting sightseeing spots can be found by yellow flag-signatures. Other important spots like museums, castles or viewpoints have smaller pictorial signatures. They are still well recognizable since the contrast to the background colour is sufficient. The map gives information about gastronomy and overnight accommodation so it is no problem to know where one can take a break from hiking. Information about car parks and public transport helps the map users to know how to get to the trail. What is missing is the labelling of streets. Lettering is used only for towns or parts of towns and some sightseeing or free time spots. It would have been good to label at least the larger streets for better orientation. The relief is represented by height points, contour lines and hill shading. Auxiliary maps give information about some inner cities, for example the inner city of Werl, and the sightseeing attractions worth visiting there.

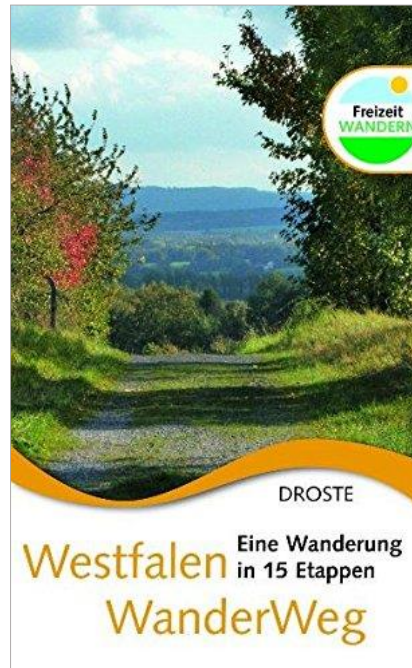


256 Part of the map face (WestfalenWanderWeg no date)

All in all, hikers should have no problems to walk this trail with the help of this map. The map face is very clear and easy to read. In addition, the texts about the single stages can help people

who are not good at reading maps. Furthermore, the hiker will find a lot of useful side information like where to take a rest or which sightseeing spots to visit.

The WestfalenWanderWeg cannot only be discovered with the help of maps but also with a whole **guide book**. The whole title of the guide book is: "WestfalenWanderWeg – Eine Wanderung in 15 Etappen" [WestfalenWanderWeg – A hike in 15 stages] (cf. fig. 257). The book was first published in 2010 by the Droste Verlag in Duesseldorf in their series "Freizeit Wandern" [Freetime hiking]. Texts and photos in the book are by the author Peter Schampera while the added maps were designed by a student of geography.



257 The cover picture of the guidebook for the hiking trail (Schampera 2010)

The book has 128 pages and is offered as paperback so it should be no problem take it along during the hike.

The book describes the whole hiking trail in detail, divided in 15 stages. The blurb of the guide tells the reader that the book describes the route in such a way that it is not possible to get lost, the distance profile is shown and tips for taking a rest are given. The different stages are said to be of varying levels of difficulty so that both inexperienced and practised hikers will find an attractive hiking route.

Each stage that is described in the book starts with a map showing the distance profile of the stage that will be described further in the following chapter. The map gives a first short impression whether the route leads through urban or rural areas and which cities are crossed. Points of interest, viewpoints, train stations and places to rest are also noted in the map. For the orientation, the bigger streets which cross the hiking trail are named in the map. The map does not give information about the inclination, differences in altitude or the quality of the trail. The walking direction is shown with arrows.

After showing the map, the chapter starts with an introduction that describes the stage of the hiking trail and the landscapes passed in a few short sentences. Following the short introduction, the hiker gets information about how to get to and off the trail (by car or by public transport), the length and duration of each stage and the quality of the trail. In addition, addresses of restaurants or cafés where the hiker can take a rest and information about places of interest near the trail are given – those are the same places of interest that are marked in the map as well. All information is offered on just one page in a compact way. This introductory page can be seen as very useful and important. Length, duration and quality of the described stage are given and so the hiker can decide immediately if he wants to walk the trail or not. Points of interest, places to rest and the possibilities for public transport and drive by car may help plan the tour. (cf. fig. 258)

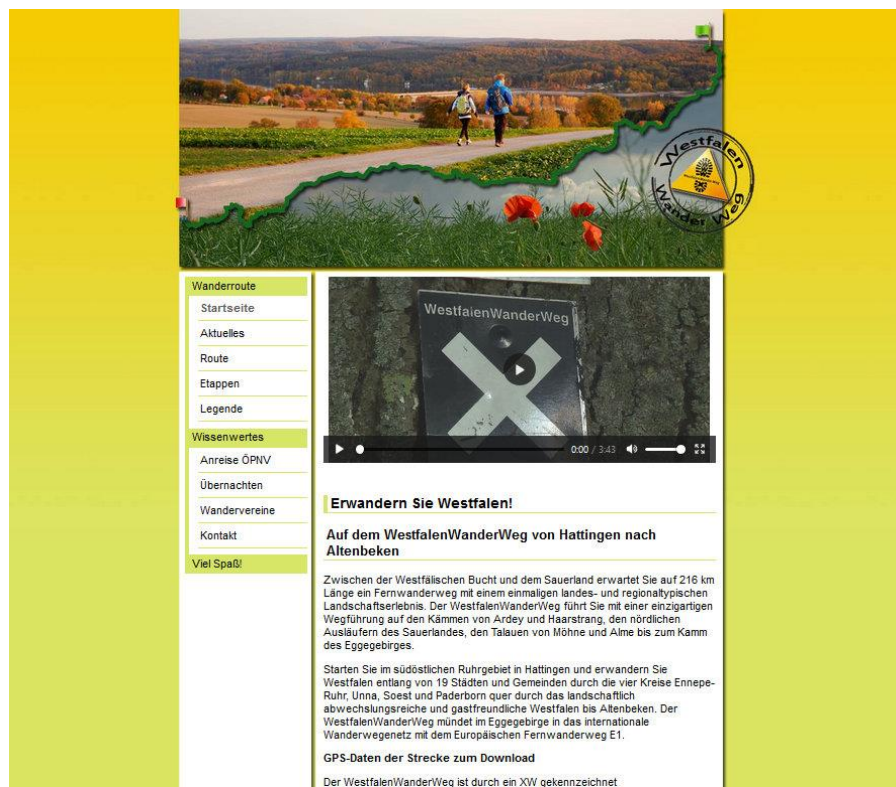


258 The introductory page for a part of the hiking trail (Schampera 2010:61)

Now the hiker gets detailed information about the hiking trail, by text and by photo. Every street passed and every turn-off of the route are described so it should be no problem for the hiker to stay on the right route. Places of interest are described in detail and the hiker gets all important background information about the sights he passes during his tour. This is definitely one point that gives the guide book a big advantage in comparison to the maps we have seen: the hiker does not only walk the trail and passes the sightseeing points but he also gets background information. Furthermore, the trail is described in so much detail that the hiker should not get lost. Plus, the hiker gets information on how to get on or off the trail which is missing in the map where only train stations and parking areas are marked. It has already been criticised that the map does not offer information on of bus stops and so the hiker does not know which bus to take to get to the hiking trail. The guide book compensates this lack since the bus lines that have to be used are explained here.

It should be added that people who just started hiking are maybe not experienced map users. For those people, the guide book and its detailed texts about the route might be very helpful and easier to use than a map. It also gives new hikers the possibility to start with a short and easy tour.

Another possibility to get information about the WestfalenWanderWeg is the official **homepage** (cf. fig. 259). The homepage gives general information about the hiking trail and also shows photo impressions. On the homepage, the WestfalenWanderWeg is divided into 11 stages, which does not correspond to the guide book where the hiking trail has 15 stages. But it fits the hiking map published by publicpress which gives 11 stages.



259 The website about the WestfalenWanderWeg (Screenshot 10.12.2019)

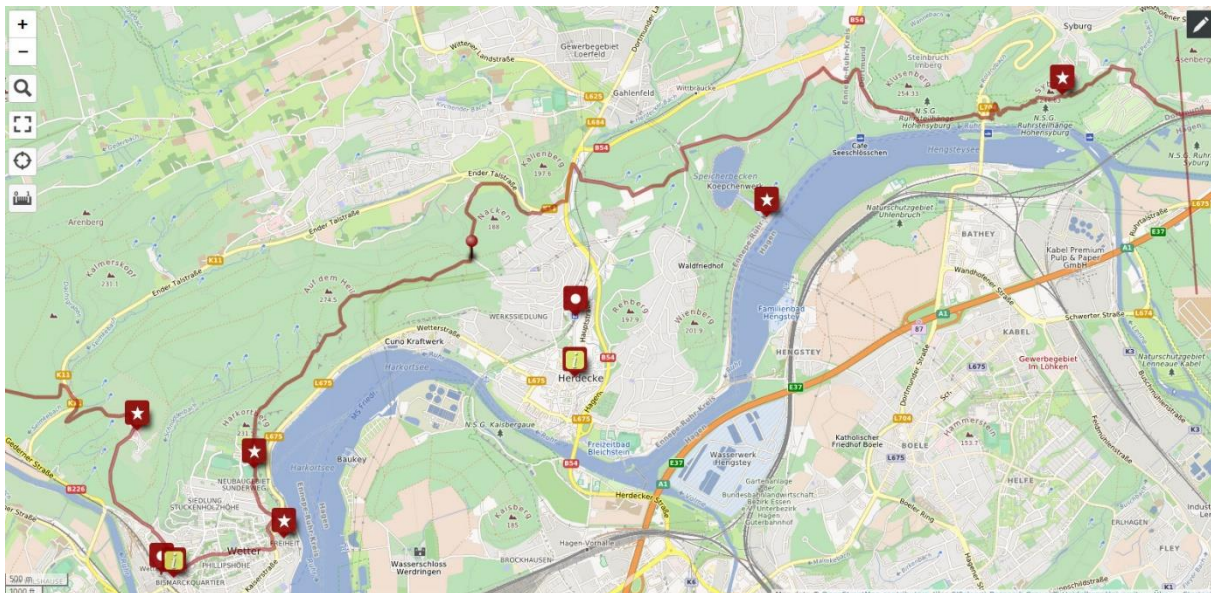
The stages given on the website are between 16 km and 27,5 km, so here the hiker again has the possibility to choose a tour which is suitable for him or to walk the whole trail. The website has one big advantage compared to the book: the 11 stages are mostly divided into two or even three subsections so that we get parts of the trail that are only 2 km, which opens up possibilities for untrained or new hikers. A profile shows the differences in altitude of the WestfalenWanderWeg (fig. 260, p. 204). Such a profile is missing in the guidebook on the hiking trail, although would have been very useful to give an overview of the inclination of the trail and the differences in altitude without trying to understand contour lines in maps.

## The evaluation and its results



260 The inclination profile of the hiking trail (Kreis Unna 2019)

The single stages of the hiking trail are also explained on the website so that it is possible to follow those instructions for walking the trail. The starting point and the destination are mentioned there, furthermore the approximate duration of the walk and interesting sightseeing points are added. The website also offers information about public transport to the towns the WestfalenWanderWeg passes. The hiker will also get information about hotels on the route. Contact addresses for the hiking clubs that are responsible for the WestfalenWanderWeg are added as well. The website offers an interactive map and the possibility to download free GPS-data – thus it is possible to walk the hiking trail with a GPS receiver.



261 The interactive map for the hiking trail (Screenshot 10.12.2019)

The website is kept up-to-date and gives information about changes or obstructions on the path. The map that is recommended on the page is the map by the private publishing house. The other map and the guide book are not mentioned at all.

### 9.3.2. Which medium communicates best with the hikers?

As shown, hikers who are interested in the WestfalenWanderWeg can choose between different media to get information about the hiking trail, to plan their hiking tour and to take with them while walking the trail.

The first available medium is the flyer. The flyer encourages the potential hikers' interest in the trail by providing them with texts and photos about the landscape and sightseeing spots along the trail. However, the information is not detailed enough to walk the trail. Therefore, the flyer will not be considered anymore in the following parts.

The website about the hiking trail helps to prepare the hiking tour. The hikers will get information about the single stages of the tour through texts and other useful notes on how to get to the trail by public transport or where to stay overnight. However, the website is not suitable for use on the trail. Either the necessary information has to be printed out before going hiking or the hikers have to check the website during the trip with the help of a smartphone which would need a constant internet connection. Another possibility is to download the GPS data from the website. So hikers who have a GPS receiver and use it on their trips can benefit from this offer.

That leaves two maps and a guide book to use for hiking.

The first map is the one from the regional survey office. The fact that the hiking trail is shown in three different map sheets of which none has a complete legend makes the map very impractical. Furthermore, the map is offered in a protective plastic cover but the map paper itself is not laminated so it would not be weatherproof. All in all, the map contains all necessary information but expects the map user to have some experience in working with maps since contour lines as relief information are not easy to read for everyone. Marking both the WestfalenWanderWeg which is the main hiking trail here in red and also all other hiking trails might cause the map users confusion. The hiking trail is not divided into different shorter stages as in the flyer or also in the website.

The second map by publicpress in many respects does better than the first map. Firstly, the map is weatherproof and shows the whole hiking trail on just one piece of paper. The zigzag-folding is very handy. Distance markers every 2,5 km make it easy for everyone to estimate distances. An additional elevation profile gives information about inclines. The most interesting sightseeing points and the main trail stand out of the base map. In addition, the map offers texts and photos about the single stages of the trail. Inexperienced map users thus also have the possibility to work with the texts.

It should have become clear in the discussion above that both maps have some differences in map design and therefore in their usability. It can be stated, that it is possible to walk the trail with both maps but the whole design of the second map is more thought-out and offers more information for inexperienced map users in the form of distance markers or texts than the first map.

The guide book, on the other hand, offers very detailed information about the hiking trail in text form. Here, the hiking trail is divided into 15 single stages. For each one, the approximate walking time is given and the route profile is described. So hikers who do not want to walk the



whole trail can decide which part of it suits them best. The map can be seen as additional information but it is not detailed enough to walk the hiking trail.

To sum this up, it must be said that the combination of map and textual descriptions seems to be a good solution to reach inexperienced map users as well as people who are good in working with maps. It might also be a bit of a personal preference whether one wants to go hiking with the guidebook or with the map. The book offers more detail in texts than the map while, on the other hand, its map has less detail than the cartographic product. Of course, it would also be possible to use the guidebook in combination with one of the two presented maps. A problem in this case is that the map by the private publishing house has divided the whole hiking trail into 11 stages while the guide book describes 15 different stages. This might cause tourists some confusion and one needs to be careful while using both products in combination. Since the map by the regional survey office does not divide the trail in stages, using it in combination with the guide book is no problem. However, the private publishing house's map is more thought-out in many aspects and is therefore better to use.

## 10. Answering research question two: conclusion of the evaluation

Chapter 7 has already answered the question how literature recommends to design tourist maps and has tried to combine the answer with the principles of cartographic communication. The idea at this stage is to also combine the results of map evaluation and cartographic communication. Thus, the statements of both chapters will be easier to compare.

The first question is who the **sender of information** is in reality. In chapter 1, I quoted from literature where it was claimed that nowadays maps are often made by non-professionals. After carrying out the analysis, it can be said that it is definitely true that the senders of information in the specific case of tourist maps are mostly non-professionals. In this field of mapping, city tourism offices or advertising and marketing agencies are the senders of information.

The **recipients of information** are still the tourists, respectively city tourists and hikers. As we have been able to see, some maps have a more specified group of information recipients. So, for example, one map tried to give information mainly for city tourists travelling by car while another map concentrated on patients at health resorts.

Chapter 7 has already stated which the **information is that should be communicated**. Now, at the end of the evaluation, it should be noted which information is really put into maps. The present evaluation has shown that in this case it is better to differentiate between the results for hiking maps and city maps since there are some differences in the information that is mapped for tourists.

City maps concentrate on sightseeing, transportation, tourism services and general institutions. Culture and local culture as well as sports and recreation facilities are also to be found in maps. Some maps also give information about temporary events, sui generis or regional characteristics.

Hiking maps focus on sightseeing spots, transportation, natural phenomena, culture in general and local culture. Furthermore, they offer information about sports, rest and recreation and gastronomy. In some maps accommodation facilities or tourism services are marked.

The next question is **how the information is communicated** in the evaluated maps and whether the cartographic rules are put into practice or not.

- The maps titles are short and precise. Usually, titles consist of the word "city map" and the name of the city or, in case of hiking maps, the word "hiking map" and the name of the hiking region.
- The maps' cover pictures show photos of the respective city or the landscape of the hiking area.
- The maps are pre-folded for handiness.
- The use of zigzag-folding is very handy.
- Giving more than one map sheet for one region is not very handy.

- Mostly, high-quality paper is used. In the case of hiking maps, some do not use weatherproof paper.
- The scales of the city maps' scales range between 1:2.000 and 1:25.000 while the hiking maps have scales between 1:25.000 and 1:200.000.
- A scale that is too small does not leave much space for information in the map face.
- A lot of maps in both categories have no scale indication at all.
- The larger cities like Berlin and Munich show only the inner cities in the map face.
- Most maps are north oriented.
- Some maps are not north oriented and do not have a north arrow which would show the change of direction.
- Nearly all maps use legends to explain to tourists the signatures used in the map. But half of the legends are not complete, meaning they do not contain all signatures used.
- Line and areal signatures are usually not explained in the legend at all.
- Not all maps have a source statement. Nearly all of the existing source statements do not contain all the necessary information.
- The types of signatures used in the map are line signatures, area signatures, pictorial signatures, sketches, numbers or vertical plans.
- Using numbers for marking objects means having signatures which are not understandable at first sight. Map users always have to read the legend to understand such signatures.
- The signatures used are in sufficient contrast to the background colour.
- All in all, the maps' signatures are also large enough in their size.
- The maps work with colour associations.
- Not using colour associations lead to wrong impressions concerning the appearance of cities or regions.
- The base maps' colours are restrained.
- Sightseeing spots are marked with sketches, texts, numbers, pictorial signatures or vertical plans.
- The streets shown in the maps have different colours. The problem in this case is that the colours used are mostly not explained in the legend and therefore it is not always clear which are the main streets and which are side streets.
- All maps have lettering.
- Labelled objects are: towns, parts of towns, streets, public places, names of stations, public institutions, sightseeing spots, rivers, lakes, hiking trails or mountain tops.
- Sans serif fonts are used in the maps.
- The maps do not have varying fonts.
- Different font colours are used for half of the maps.
- There is a sufficient colour contrast between lettering and base map.
- The placement of labels is correct. The relationship between lettering and labelled object is clear.
- Only some maps use more than one language.

- Exit roads are only sometimes labelled.
- The map layout is appropriate.
- The concept of visual hierarchy is not applied to the maps.
- Auxiliary maps are used for additional information. The topics of the auxiliary maps are: the inner city at a larger scale, general maps of the whole area at a smaller scale or – in the case of hiking maps – additional panoramic maps.
- Bigger cities offer a public transport network map.
- All maps – except for the panoramic maps – are generalised.
- Generalising too much and leaving out many streets might lead to orientation problems.
- For showing the relief in hiking maps, mostly height points are used. Some maps also have contour lines or hill shading. Maps do not use coloured hypsometric layers or hachuring.
- Some hiking maps do not contain any relief information at all.
- City maps mostly do not propose tours. However, proposing tours is popular for hiking maps.
- The suggested hiking tours are usually described in a text.
- The proposed hiking tours contain information about the approximate walking time or the elevation profile.
- A few hiking maps have distance markers on the hiking trails.
- The maps normally do not give information about the condition of the hiking trails.
- Half of the maps use search grids. With the help of such search grids, sightseeing spots or streets can be located.
- Some city maps have street directories.
- Additional photos and texts inform the tourists about the cities or regions.
- Events happening each year are mentioned on the map sheet by giving only the month in which they are held.
- In a few cases, the backside of the map is used for the legend or parts of it. Thus, the map users are always forced to turn the map around to read the legend.
- Opening hours of shops, restaurants, or other (cultural) facilities are not given.
- The evaluated maps do not contain much advertisement although most of the maps are available for free.
- Advertisements that are marked as highlights or sightseeing spots in the map distort the map's message.
- The combination of hiking trails in the map and written descriptions about the trail is very helpful.

## 10.1. Expectations meeting reality

After listing how cartographic information for tourists should be communicated from literature's point of view and how they are communicated in reality, it is necessary to compare the expectations drawn from literature with the evaluation's results from practice. On the other hand, the evaluation also has shown some aspects of practical map design which were not mentioned in the consulted literature. Such aspects will be noted in here, either.

The first difference that should be mentioned here is the sender of information. While literature told us that it is possible to have professionals as well as non-professionals as map makers, reality has shown that mappers in case of tourist maps are nowadays mostly non-professionals.

The biggest difference in the case of the map content is the fact that information about shopping is nearly nowhere to be found. So, although it is said in literature that shopping is a favoured tourist activity, especially for city tourists, it seems that map makers do not see that information as important enough to give it in maps. City maps are also lacking the marking of natural phenomena which seems reasonable since not all cities have any special natural phenomena. Therefore, natural phenomena are not an absolutely necessary information to have in city maps. In case of the hiking maps, it does not seem essential to have markings for the categories of sports and rest and recreation since hiking itself can be seen as a sport but also as an activity which contributes to recreation.

Another difference between expectations and reality that should be mentioned here is the scale. While literature tells us that it is necessary to add a scale indication to the map to enable the estimation of distances, in practice a lot of maps lack this information. Also the scale ranges used in the maps do not fit to the descriptions in literature. The evaluated city maps go from 1:2.000 till 1:25.000 while literature recommends 1:5.000 till 1:20.000. However, the differences here are not as serious as in case of the hiking maps. Here, literature tells us that the hiking maps should not be given in a smaller scale than 1:50.000 whereupon this scale is advised only for long distance hiking trails. The analysis, on the other hand, even revealed maps with a scale of 1:200.000. As it can be seen in the appropriate maps (e.g. Vulkaneifel 2005, Lake Constance 2012), this scale does not leave much possibilities for details like smaller side roads diverging from the main roads or single topographic forms. So, such a small scale is only useful for giving an overview of the area and maybe raising the potential tourists' interest for the hiking trail or the hiking area. Planning the hiking trip will need maps in a larger scale. Therefore, it can be stated that the literature's guidelines for the map's scale size are reasonable. Furthermore, the requirement of giving a scale indication in general on maps can be valued as wise. As already stated many times before in this paper, a scale is the necessary condition for measuring or, at least, estimating distances.

Furthermore, it was said in literature to use a scale between 1:5.000 and 1:10.000 for auxiliary maps. This recommendation is not very useful since we have seen that auxiliary maps have very

different topics. A large scale will not work for overview maps. The proposed scale will do better with more detailed maps, like, for example, inset maps featuring the inner city of a large town.

Besides the scale, literature recommends for maps to have a source statement. Literature also informs about the facts which should be included in the source statement to help the map user to judge, for example, the map's up-to-datedness. In reality, having a source statement on maps is not very popular. And, if source statements are available for the tourists, they are usually not complete, meaning, they do not contain all necessary information.

The requirement from literature to give a source statement seems to be making sense as well. Especially knowing the map's date of production and with that also the up-to-datedness is important. Naming the map maker or the source of the information given in the map can help to rate the map's quality. So, all in all, having such information in a source statement on the map is a good idea although it is not common practice in reality.

Some discrepancies also exist in the way literature talks about signatures and how they are used in the analysed maps. First of all, according to literature, all signatures should be explained in the legend. In general, the analysed maps use legends to explain signatures but those legends usually do not include all signatures which can be found in the respective map. This may be problematic since not all signatures are self-explanatory. Signatures which are advisable to use for sightseeing spots from literature's point of view are pictorial signatures or front views of buildings. The evaluated maps include pictorial signatures, vertical plans, texts or numbers to show the important sightseeing spots. This goes well with the recommendations from literature and also adds some possibilities for representing sightseeing spots in maps to the list given in literature. However, this does not mean that especially the use of numbers as signatures can be recommended without any further hesitation. The disadvantages in this case will be in focus in the following parts of this chapter.

The maps use mostly colour associations which fit to the recommendations from literature. However, the analysis could even underline the importance of working with colour associations respectively using colours in the way they are normally associated with areas or objects in reality. As we have seen, the noncompliance of common colour associations might lead to wrong impression of the appearance of cities or regions.

Literature also tells us that using different font colours, font sizes or perhaps varying fonts can indicate different objects. The evaluation shows that using varying fonts is not very popular in maps and even the application of diverse font colours does not occur in all maps. The same is true for the font size. Surely, if too many fonts or font colours are used it may lead to an overloaded map face. However, pointing out important objects by applying a conspicuous colour to the font or by enlarging the font size can contribute to a faster understanding of the map and should therefore not be neglected. The realization of this idea is also part of the visual hierarchy which will be discussed during this chapter as well.

Although the visitors often come from abroad, the analysed maps do not offer different languages. In this case, the maps from practice should not be taken as ideal and the rule taken from literature to offer tourists more than one language should be maintained.

The idea from literature to label the streets which lead to parts of the region or city not shown in the map is not put into practice often. Giving this information is helpful but not absolutely necessary to understand the whole map or to have a sufficient orientation in the area shown in the map face. Concluding, it can be stated that this information is not a must-have.

Literature also suggests some topics which can be nice for auxiliary maps. Here, it is said that such maps can be used to show the public transportation network, a schema of the approaching roads or the main-through-roads or also to have the city centre in a larger scale than in the main map. In practice, inset maps are not often used to convey the public transportation network, main-through-roads or approaching streets. However, the city centre in a larger scale than the main map is a popular topic for auxiliary maps in the evaluated examples. Other topics which can be found in this case are general maps of the whole area or panoramic maps. The last one are usually used as in addition for hiking maps. Personally, I think it cannot be said that the recommendations from literature for inset map topics are better or worse than the themes that are dealt with in practice. All possible topics mentioned here may be useful in one way or another, or, better said: some auxiliary maps fit better to a certain main map topic while other inset maps go better with other main maps. An example can be the map of a bigger city which shows the whole city area in a small scale and therefore will work well with an inset map showing the inner city zone in a larger scale. Since bigger cities usually have a well-developed public transportation network, this can also be presented in an auxiliary map.

A concept that is described in literature but is – nearly never – used in practice is the visual hierarchy. The advantages of applying a visual hierarchy to the map can be seen in chapter 5.6. and should not be repeated in this place. But it can be stated that having a visual hierarchy can make the tourists register map information faster and should therefore be taken into account when planning the map content and design.

Some discrepancies can also be found in the case of the relief representation. The evaluated maps use mostly height points which are said in literature to be easiest to read. Literature recommends to have them in combination with contour lines and hill shading. In practice, this combination does not happen very often. Height points alone do not give a very illustrative image of the earth surface. In that, it can be said that it would be better to follow literature's recommendations and combine several ways of relief representation with each other to get the best results. The coloured hypsometric layers which are also described by some authors are not used for hiking maps. But since coloured hypsometric layers are said to be used mainly in atlases or in very small scale maps in general, one does not need to expect them in hiking maps. Hachuring is also not used in practice to represent the relief. This is acceptable because, as already mentioned before, hachuring is outdated and not the best way of showing the relief.

What is missing in hiking maps but is expected to be there according to literature are information about the condition of the hiking trail. Only very few maps offer this information. It can be discussed whether this information is really necessary in maps. Printed maps cannot react fast to the latest changes in the conditions of hiking trails or to incidents which make trails inaccessible like rock falls. So here, hikers better get informed somewhere else.

Literature also tells us that it would be good to have tour proposals for city maps as well as hiking maps. In practice, proposed tours can be normally found on hiking maps but not on city maps. The explanation for proposing tours on city maps is that they can help to discover a city fast while passing all important sightseeing spots. Since city trips are usually very short, a recommended tour which meets all attractions can be very helpful, and, therefore, the demand for city tour proposals should remain. What literature also does not tell is how to give the proposed tours in the maps. In practice, the proposed tours for hiking maps are usually described in a text in combination with an elevation profile. The proposals for walks through the city, on the other hand, are always marked in the map. Some city maps offer, as an addition, texts about the tour.

In chapter 6.2.6., it is said that temporal information, like, for example, opening times, are very helpful for tourists because it can help planning the day and which places to visit when. However, the evaluated maps do not show any information of this kind. It can be discussed whether such information is really indispensable or if it is only a nice addition. Since the map paper's space is always limited and not all information which might be interesting can be added to the map, opening times and other temporal information should be added to the category of ancillary information which are not essential in any case.

An aspect that did not find attention in the literature consulted is the cover picture's style or how to choose a good cover picture for city maps or hiking maps. So in this case, it would be necessary to have some more research how an attractive cover picture for tourist maps can look like. But the common practice to show a photo of the city or the hiking area as cover picture seems to be a good way to handle the problem.

Also the exact way how to fold the map or which folding shows the best handiness is not explained in literature. The chapter about the WestfalenWanderWeg showed the advantages of a zig-zag-folding. However, this way of folding a map is not practicable for every hiking region or every city. The longish west-east-orientation of the hiking trail favours this way of map folding. It would not be possible for a map showing several hiking trails leading into different directions, like, for example, the presented hiking map of Dorf Tirol, to have a zig-zag-folding.

The evaluated maps often use different colours to indicate different types of streets like main roads, side roads or the pedestrian zone. This idea is not described in literature. Nevertheless, it seems to be helpful to colour streets differently, according to their type. So, the map user can distinguish the streets very fast. A problem with the evaluated maps is that the colours



used for the varying street types are often not explained in the legend. This may lead to uncertainties or communication difficulties. To sum it up, it can be stated that it would be a help for the map users to have different coloured streets, according to their type and/or importance. To prevent communication difficulties, the used colours must be explained in the legend.

A point that differs from recommendations in literature is the only use of numbers for sightseeing spots. The idea behind using numbers as signatures instead of the more self-explanatory pictorial signatures or vertical plans is that number signatures do not need as much space on the map as the other types of signatures (cf. chapter 5.2., 6.1.2.). But practice shows that, as one can imagine, such signatures are not understandable at first sight at all. So, there is always the need of a detailed legend. Especially impractical is the idea to put the explanations for the numbers on the map's backside because it forces the map user to always turn the map over to read the explanations. All in all, it can be stated that using numbers as signatures in maps make the communication process more complicated and should therefore be avoided.

Practice has shown that it is quite impractical to have the legend or parts of it on the map's backside. This was not described before when discussing the legend in general or the map's layout. Therefore, it should be now set as a design recommendation.

Literature speaks about maps as a medium for advertisement in general but does not give details about where to place the advertisement best. The analysis has shown that advertised attractions are marked as sightseeing spots in maps. This can be seen as giving misleading information because it might not be clear for everyone which attractions are the region's or city's typical ones and are recommended to visit in any case or which attractions are only advertisement. Of course, it is not advisable either to have more advertisement than real map information on the paper. Since advertisement is often used to finance the map, it can not always be avoided to have it on the map. But it should be taken care that the advertisements do not take too much space on the map paper and that they cannot be mistaken for being real and important information.

## **11. Where is the connection to spatial planning?**

Since this thesis is written at the faculty of spatial planning, the reader may wonder where the connection to spatial planning is. So, this chapters aims to illustrate the relationship between spatial planning and tourist maps and to describe the chances that may be found in this connection.

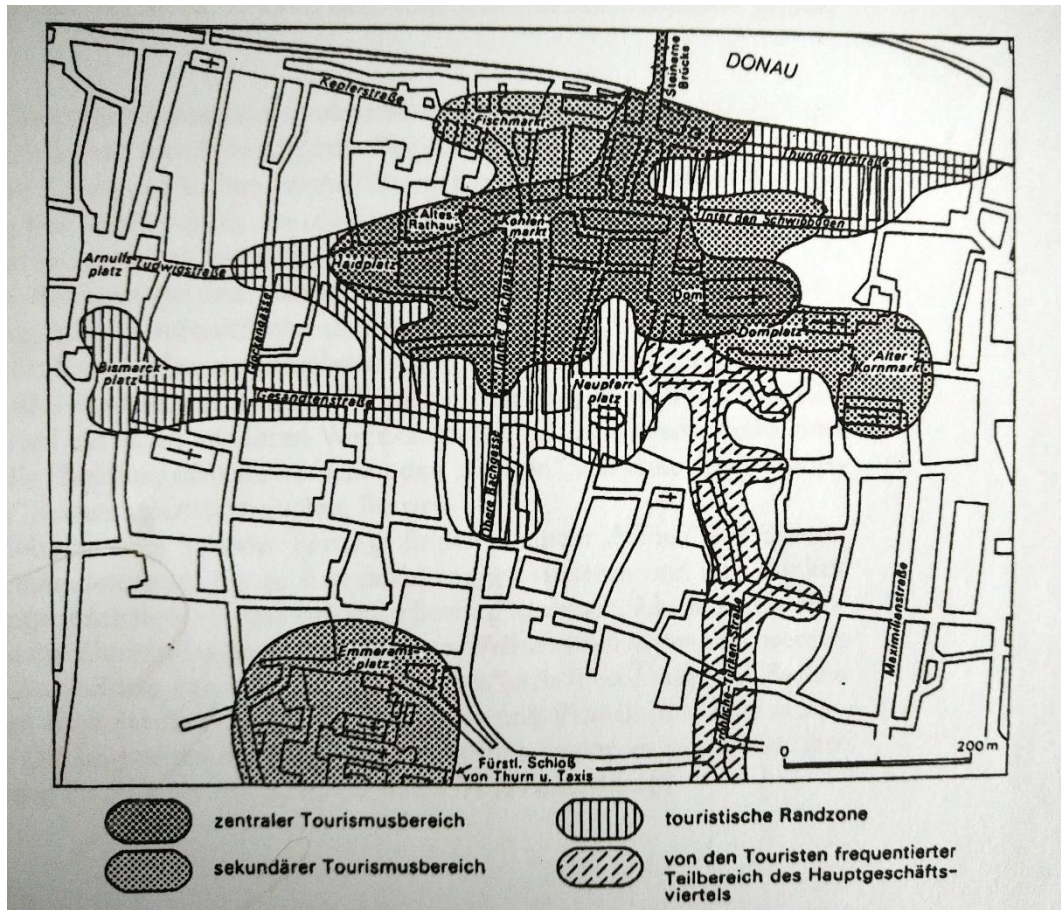
The chapter about the criticism on tourism has already given some impressions of the connections between spatial planning and tourism, respectively the fields where spatial planning faces challenges because of tourism. Before discussing spatial planning, tourism critics and tourists maps, we will glance briefly on city maps in general and their importance for planning.

City maps can meet a variety of interests: orientation in a – maybe unknown – surrounding, performing official tasks or answering scientific questions (Gorki 1985:12). They are a good way for understanding cities (or regions) and learning more about them and their history. Especially older maps can be of great interest for planning and, later, building. They can help to judge the ground that should be built on. Old maps can show where ponds or even gravel pits were that are filled up today or where former, now forgotten, creeks are. (Müller-Wille 1964:187) Settlement researchers can learn more about the city's development (Müller-Wille 1964:189), the functions of the different parts of town (Müller-Wille 1964:189) or the relationship between city and surrounding area (Müller-Wille 1964:189).

Steinbach suggests using maps to analyse which parts of the city are mostly visited by tourists. First, pedestrians have to be counted in different parts of the city. The results of the count can be noted in a map. Hence, the city can be divided in different areas, as we can see it in the picture below (fig. 262, p. 216). (Steinbach 2003:19-22)

The map shows which parts of the city are mostly visited by tourists and which parts are not in tourists' center of interest at all. Such a map gives useful information which can be used for further planning.

Where is the connection to spatial planning?



262 The map shows which parts of the city are mainly visited by tourists (Steinbach 2003:22)

The negative aspects of tourists where described in chapter 6.3.. As we have seen there, the nature might be disturbed by too many tourists, the locals might suffer from noise pollution caused by over-crowding or historical buildings or monuments can be damaged by a high number of visitors. Some ideas to deal with the problem have already been mentioned in chapter 7 where we talked about the first theoretical results of how to design tourist maps. Chapter 6.2.1. presented the idea to not show nature reserves in maps. So, such areas will not catch the tourists' attention and they maybe will not be visited by them. This theory is also supported by Mundt's observations about guide books which were summarised in chapter 6.2.5.. Here, it was said that tourists concentrate mostly on the attractions presented in guide books and do not take the time to discover the relatively unknown places. So, it seems that leaving out information about places in maps or, alternatively, representing them in a not very noticeable or eye-catching way, can help keeping tourists away.

Since city tourists concentrate mostly on the city centre, highlighting attractions or possibilities for free time activities outside the city centre may lead the tourists outside the inner city zone. The evaluation of Pula's city map has shown that the map contains only the city centre although Pula also offers attractions for visitors in other parts of the city. Therefore, if such information is given in the map, it might persuade tourists to leave the inner city and go to see other spots. Hence, the number of tourists in the inner city would be reduced.

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Proposing tours through cities or hiking areas in maps can also help to concentrate tourists on these routes and to keep them away from protected areas or housing areas.

Surely, not all problems coming with tourists can be solved by maps. Increasing prices of properties or the fact that properties are purchased by non-locals are definitely a problem of spatial planning but cannot be solved by the use of tourist maps. If maps contain information about hotels and other accommodations for tourists, the map can provide a picture about the spatial distribution of such facilities. Comparing city maps or hiking maps of different ages with each other may tell something about the development of the city or region in the field of tourism.

Besides the cities and regions which are affected by mass tourism and are definitely not interested in attracting more tourists, there are still cities and regions who want to gather new tourists. Those efforts are also reflected in maps. The example of Genoa has already been mentioned in chapter 9.1.1.. The map shows the city's redesigned waterfront. As explained before, Genoa tries to be a tourist destination by offering its visitors man-made attractions like the aquarium and therefore, those centres of attraction are explicitly highlighted in the map.

The map of Kraljevica (Croatia) can be seen as an effort to make the city attractive for tourists. The city is not a typical tourist destination although situated directly at the seaside. The map tries to list as many free time activities and attractions as possible. So when studying the map, visitors get the impression that the place is a very attractive one and it might be worth to spend some time there.

## 12. The “perfect” map – Guidelines for producing tourist maps

The last and probably most important step is to define guidelines for the design of tourist maps. These guidelines will also be the answer to the last research question which should be answered during this thesis: How does the perfect tourist map look like?

First, it has to be said that we need to be careful when talking about the “perfect” map. Normally, there is no “perfect map” (Tyner 2014:214). A map is always a combination of the decisions made before producing it. As we have seen in the starting chapters of this thesis about communication theory and theoretical map design, the map maker has a lot of decisions to make like the type of signatures used, how to generalise the map or whether inset maps are helpful for the map’s topic or not. And: those decisions cannot be made each on their own. When thinking about which colours to use for the base map, the type of signatures planned to apply to the map has also to be kept in mind.

What is more, it is still very subjective if one likes the design of a map or not.

Nevertheless, we can set some guidelines that can help to design future tourist maps. The idea here is to combine the results from literature research with the results from map evaluation. The evaluated maps have presented some ideas for map design that were not mentioned in the literature analysed before. Furthermore, the map evaluation has also shown which rules for mapping have to be followed in any case to get a map which is easy and fast to understand.

The idea is that the guidelines described here will help especially non-professional mappers when producing tourist maps.

The guidelines will follow the already well-known schema of the concept of cartographic communication.

The **sender of information** is still the map maker. As already mentioned before, we assume in this case that the map maker is a non-professional. This assumption is quite reasonable since the evaluation has shown that tourist maps are mostly made by non-professionals.

The **recipient of information** is the tourist, respectively, in our case, the city tourists or hiking tourists. The evaluation has shown that some maps address very specific target groups like city tourists visiting the city by car. Consequently, before planning the map, the map maker has to decide whether the map addresses a specific target group or tourists in general.

The most important **information to communicate** is in all cases the sightseeing spots. Also of interest is the tourist information, transportation, culture and general institutions. Informing in a special way about sports, rest and recreation or natural phenomena is not necessary for hiking maps since those things are normally part of the hiking trip. The city map has to show the tourists where to go shopping. Also, the sui generis or temporary events are interesting for both types of maps since they might tell the tourists where to spend some free time. For city maps, it may not be possible to show all accommodations or all possibilities to get food and

drinks. Consequently, it would be better to leave this information out. But for hiking maps, accommodations and places to rest in the form of huts are absolutely necessary to be marked. Apart from this, hiking maps will also need viewpoints.

The next part of the guidelines is to say how the information is communicated the best. Since the non-professional mappers may not be familiar with all the (basic) cartographic concepts presented in this part of the thesis, there will always be a reference to the chapter where the concept is described so it is possible to read up on the basics if desired. For clarity, the guidelines will be divided into categories.

### **Outward appearance of the map**

- The map has to be foldable.
- At best, the map is pre-folded in pocket size.
- The un-folded map should not be bigger than 80x60 cm.
- For maps with a large west-east-extent or north-south-extent, a zig-zag-folding can be very useful.
- The folding has to be planned before the map face is designed.
- Giving more than one map sheet for the same hiking region is not very handy.
- The paper needs to be weatherproof and tear-resistant; this applies particularly to the hiking maps.
- A map which is folded needs to have a cover picture.
- The cover picture can be a photo of the city or of a typical building of the city shown in the map.
- For hiking maps, the cover picture could show a typical photo of the hiking area.

### **Basic map elements**

#### Title

- The map title should inform in short about the map’s topic.
- If necessary, subtitles can be used for further explanations.
- A common way for naming the map is “city map” + the name of the city or “hiking map” + the name of the hiking area.
- The title has to be placed on top of the map sheet to catch the map user’s attention.
- If the map is foldable and has a title page, the map’s title should also be placed there.

#### Scale

- Every map needs a scale indication.
- Common ways for expressing the scale of a map are: graphically (bar or linear scale) and/or written (verbal statement or fraction)
- A scale bar is easier to use for inexperienced map readers. Since not all tourists can be expected to be experienced map users, the scale bar should be the favoured way to give a scale indication.

## The “perfect” map – Guidelines for producing tourist maps

- In hiking maps, distance next to the mapped hiking trail can help estimating distances.
- The scale is always only an aid to the map reader. Therefore, it should not be the focal point.
- The recommended scale size for maps depends on the extension of the city.
- For bigger cities, it may be a good idea to show only the city centre.
- It is recommended for city maps to have a scale not smaller than 1:25.000.
- The scale of hiking maps should not be smaller than 1:50.000.
- Scales smaller than 1:50.000 can be used for hiking maps which only want to give an overview about the hiking area. For the hiking tour itself, the scale is not suitable.
- In general, a too small scale does not leave much space for giving detailed information.
- There are no scale recommendations for auxiliary maps. It depends on the auxiliary map’s topic which scale to choose best. Possible topics for auxiliary maps are suggested on p. 223.

### Legend

- Every map needs a legend.
- In the legend, all signatures have to be explained.
- Although it seems to be the common way not to mention line and area signatures in the legend, even those signatures should be explained.
- Explaining line signatures in the legend is particularly necessary if the map shows different coloured line signatures to differentiate varying types of streets.
- If the map does not use colour associations, it is inevitable to explain all colours used in the legend.
- Dividing the signatures into groups can help reading the legend.
- Also, a hierarchical order of the signatures will lead to a faster understanding of the map.
- The legend must not be placed on the map’s backside. If the map’s backside is used for (parts of) the legend, it means that the map user always needs to turn the map around to read it. This is very unhandy.
- If the map is part of a map series, the legend has to be placed on every map.

### North arrow

- Maps users expect maps to be north-oriented. Hence, this expectations should be fulfilled.
- If the map is not north-oriented, it is absolutely necessary to add a north arrow to the map, showing the changed direction.

### Source statement

- Every map needs to have a source statement so that it is possible for the map user to estimate the map’s up-to-date nature or its quality.

## The “perfect” map – Guidelines for producing tourist maps

- The source statement needs to include information about the map publisher, the map maker, the edition, the date of production and the source of data.

*More information about the basic map elements can be found in chapter 5.1.*

### **Generalisation**

- All maps need to be generalised.
- Generalising too much information or leaving out too many streets may lead to orientation problems.
- Generalising too less (e.g. if single houses are still existing and are not grouped into a block of houses) may lead to an unclear map face.

*The concept of generalisation is explained in chapter 5.3.*

### **Signatures**

- Types of signatures that can be used in general for tourist maps are line signatures, area signatures, pictorial signatures, sketches, numbers or vertical plans.
- Pictorial signatures or front views of buildings are easy to understand, even for foreigners.
- Using number signatures is not advisable to do. They are not understandable at first sight and the map user will always have to consult the legend.
- Since the sightseeing spots are the most important map content, their signatures should stick out. This can be reached, for example, by the use of vertical plans which are usually very eye-catching.
- To enable a good readability of the signatures, they need to be large enough and have a good contrast to the base map's colour.
- It can also be an idea to use logos as signatures if they are well-known.

*Chapter 5.2. describes how to use signatures in maps*

### **Lettering**

- Every map needs to have lettering.
- Objects which should be lettered in small scale maps are: rivers, cities, lakes etc.
- Objects which should be lettered in large scale maps are individual objects (castles, roads, public institutions, names of stations etc.).
- The lettering can be varied in font colour, font size or font weight.
- The lettering's appearance can also be changed by using methods like spacing or capital letters.
- Different font sizes or font colours can be applied to the map to indicate different objects.
- Larger fonts can indicate important information.
- For a good readability, the lettering needs to be big enough and to have a sufficient colour contrast to the base map.



## The “perfect” map – Guidelines for producing tourist maps

- The lettering has to be placed near to the labelled object. It always has to be clear which object belongs to which labelling.
- To enable a good orientation, all streets should be labelled.
- If streets are leading to places outside of the map face, it should be noted next to the streets where they lead to.
- Sans serif fonts are to be preferred.

*Detailed information about how to use lettering on maps can be found in chapter 5.5.*

### **Colours**

- It is highly recommended to use colour associations for maps.
- If the common colour associations are not used for the map, it may lead to a wrong impression of the area or the city shown in the map face.
- If colour conventions are existing for the map’s topic, colour conventions should be used instead of colour associations.
- The base map colour has to be inconspicuous.
- Using different colours for different types of streets can help to differentiate them fast.

*Using colours on maps is described in chapter 5.4.*

### **Visual hierarchy**

- A visual hierarchy can help to show differences in importance of the map elements.
- Applying a visual hierarchy to the map can also help to lead the map users’ eyes.

*The concept of visual hierarchy is explained in chapter 5.6.*

### **Map Layout**

- It is necessary to have a well-balanced distribution of all map elements.
- The map’s title always needs to be placed on top of the other map elements.
- The legend should be to be found near the map face.
- Scale and source statement can be placed in the lower parts of the map.
- The map’s backside should only be used for additional information but not for the basic map elements.

*Chapter 5.6. deals with map layout in general*

### **Auxiliary maps**

- Auxiliary maps can be used for giving additional information.
- Possible topics for auxiliary maps are: a schema of approaching roads, a map of the main-through roads or the city centre in a larger scale.
- For bigger cities, it would be a good idea to add a public transport network map.

*More information about auxiliary maps can be found in chapter 5.7.*

### **Search grid**

- A search grid can be used to find information faster.
- Information which can be located with the help of a search grid are, for example, streets or sightseeing spots.

### **Map’s backside**

- The map’s backside can be used for additional information.
- Additional information are, for example, a street directory or texts about the city’s or the region’s history, sightseeing spots or interesting buildings.
- Including photos can make texts more interesting.
- Notes about events can also be useful additional information. If some events take place each year, it is a good idea to write only the month when they happen on the map. Therefore, the map does not need to be updated regularly.
- For a better planning of the trip, the opening times of the most important sightseeing spots can be given.
- In addition to marking the tourist information in the map, its address can also be given on the map’s backside.

### **Language**

- Since tourists often come from abroad, having different languages in the map might increase the comprehensibility.
- It is not necessary to have the complete map in more than one language. It is also possible to add a second language to at least the legend and the additional texts, if existing.
- In general, the language needs to be clear and simple.

### **Recommended walks for city maps**

- Recommending walks through the city can help to discover a city fast.
- The recommended walk should pass all important sightseeing spots.

### **Proposing tours for hiking maps**

- It is a good idea to propose tours of different levels of difficulty to the hiker. Hence, experienced as well as inexperienced hikers will find a tour suitable for them.
- Hikers wish for diversified and interesting tours. To fulfil those wishes, themed tours or especially scenic hiking trails can be proposed.
- The approximate walking time of the proposed tours and their length should be noted.
- An elevation profile for the proposed tours is also helpful.
- The suggested hiking tours can be marked directly in the map or be described in a text.
- It is necessary to know the general quality of the hiking trail.

- Maps cannot react to short-term changes of the hiking trail’s state. Therefore, it is useful to tell the hikers where to get such information (e.g. a website informing about the hiking trail’s current state).

### **Relief information**

- In hiking maps, it is absolutely necessary to have relief information.
- Relief information can be given by using contour lines, hill shading, coloured hypsometric layers or height points.
- Hachuring is out-dated and should not be used anymore. Hachuring could be merely used to give the map an old-fashioned appearance, if that is a wish.
- Coloured hypsometric layers are more suitable for small scale maps. Therefore, they are not appropriate to most hiking maps.
- Height points are easiest to read.
- Hill shading is very vivid.
- The best results can be achieved by a combination of height points, contour lines and hill shading.

*How to give relief information is explained in chapter 5.8.*

### **Advertisement**

- In the best case, the maps do not have advertisement at all.
- If advertisement is inevitable, it must not disturb the map’s message.
- Advertised objects should not be marked as special highlights or attractions in the map.

### **General map design**

- If the destination the map represents has a corporate identity respectively a corporate design, this corporate design should be applied to the map, too.
- Continuity in design leads to a high recognition value.
- If the map is part of a map series, its design should fit to the other maps of the series.
- Slogans and design concepts should not be renewed too often.
- The information given need to be always exact and up-to-date.
- The map must not awake deceptive information.
- If the city or the hiking area offers typical regional characteristics, those characteristics should be pointed out in the map, too.
- The map needs to be constantly updated.
- It has to be regularly checked whether the map information are still relevant or new information are needed to be added.
- If additional media like guidebooks for a hiking area or a city exist, the map can recommend them.

## The “perfect” map – Guidelines for producing tourist maps

Tourist maps can be of use in spatial planning or if the city or region struggles with the negative effects of tourism.

- Maps can be of use for learning more about cities or regions:
  - Maps can express the efforts of cities or regions to attract tourists or even to gather more tourists
  - Maps of different ages can tell more about the city’s history and its development
  - By counting visitors and transferring the results of this census to a map, the parts of the city mostly visited by tourists can be shown.
- Maps can lead tourists
  - Maps can show interesting parts outside of the city centre to send the tourists there.
  - Maps can leave out information to not raise the tourists’ interest (e.g. nature reserves or other protected areas)
  - Recommended walks or tours can lead tourists in a favoured direction and leave out parts which the tourists should not visit

### **13. Conclusion**

The idea of this thesis has been to find out how tourist maps can be designed best. For this research, three leading questions were formulated which could also be answered in the following research.

The first step was analysing the existing literature about cartography and tourism to find out what they claim about tourist maps and their design. The analysis of literature has also shown the relevance of the topic because literature gives a lot of information about mapping and tourism in general but it claims only a few information about tourist maps.

The concept of cartographic communication helped to systematically present the results of the analysis.

The next step was the evaluation of more than hundred tourist maps. The main idea was to compare the results of the analysis with existing tourist maps to see which of the design recommendations given in literature are also used in “reality” and which not. The evaluation has shown some details in map design that have not been considered in the literature analysed. But the evaluation has also demonstrated which design recommendations by literature are quite useful. If those recommendations are not followed, map users might get some problems in using maps.

The final step was to give design recommendations for tourist maps by using the results of the literature analysis and the evaluation. Here, the main idea is that especially non-professionals have guidelines for designing tourist maps.

The detailed description about mapping in general in the first chapters of this thesis can also help non-professionals to understand cartography and, thus, to produce well-understandable maps for tourists.

A step, which is still missing, is a survey in which tourists are actually questioned about their personal expectations in maps. Therefore, it can be said that the topic of tourist maps still leaves room for more research.

Furthermore, the present research only concentrates on two types of tourist maps. As we have seen in the starting chapters of this thesis, more types of tourist maps which have not found attention yet. Hence, it would also be possible to dedicate following researches on winter sport maps or cycling maps.

However, we have seen before that the topic of tourist maps lacks some research and this thesis gives an important contribution to close this research gap.

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- Wilhelmy, Herbert 1981: Kartographie in Stichworten, Kiel. 4<sup>th</sup> edition, revised.
- Winter Stefan 2014: Management von Lieferanteninnovationen, Wiesbaden.
- Witt, Reimer 1982: Die Anfänge von Kartographie und Topographie Schleswig-Holsteins 1475-1652, Heide in Holstein.

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Witt, Werner 1970: Thematische Kartographie, Hannover. 2<sup>nd</sup> edition.

Wolf, Klaus and Peter Jurczek 1985: Geographie der Freizeit und des Tourismus, Stuttgart.

### List of evaluated maps\*

\* Since for most of the maps listed here no publisher is specified, the normal method for identifying literature or other sources for texts or images by giving the author respectively the publisher and the publishing year does not work here. As a solution for identifying the map images shown in the chapter about the evaluation results, the city or area the map shows is given in combination with the year of production.

## City Maps

### Austria

#### Bregenz

Amt der Landeshauptstadt Bregenz (pub.) 2016: Offizieller Stadtplan, Bregenz.

Aries (pub.), no date: no title, Dornbirn.

### Croatia

#### Kraljevica

No pub., no date: Kraljevica – City plan, no place of pub.

#### Pula

No pub., no date: Pula+, no place of pub.

#### Senj

Senj Tourist Board (pub.), no date: Senj – so much to experience, Senj.

### France

#### Lourdes

No pub., no date: Walking in Lourdes, no place of pub.

#### Strasbourg

Aprime (pub.) 2016a: PlanduTouriste Strasbourg, Strasbourg.

Valblor Groupe Graphique (pub.) 2016b: Besuchen Sie Strassburg ganz anders, Levallois-Perret.

### Germany

#### Aachen

Ms-press GmbH (pub.) 2015: Stadtplan Aachen, Aachen.

Ruhnke Design (pub.) no date: Stadtplan, Selfkant.

#### Aurich

No pub. 2016: Aurich Cityplan – Stadtinformation 2016, no place of pub.

## Bibliography

### Bad Neunahr-Ahrweiler

Ahrtal-Tourismus Bad Neuenahr-Ahrweiler e.V. (pub.) no date: Bad Neuenahr-Ahrweiler, Bad Neuenahr-Ahrweiler.

### Bad Westernkotten

Tourist-Information Bad Westernkotten (pub.) 2013: no title, Bad Westernkotten.

### Bamberg

No pub. 2005: Stadtplan von Bamberg, no place of pub.

No pub. 2015: Bamberg Stadtplan 2017, no place of pub.

No pub., no date: no title, no place of pub.

### Berlin

No pub. 2013: no title, no place of pub.

### Emden

Werbeagentur Pepperbee (pub.) 2014: Seehafenstadt Emden Stadtplan, Emden.

### Frankfurt

Tourismus + Congress GmbH Frankfurt am Main (pub.) 2017: Frankfurt Information, Frankfurt am Main.

### Freyburg (Unstrut)

Freyburger Fremdenverkehrsverein e.V. (pub.) no date: Jahn-, Wein- und Sektstadt Freyburg/Unstrut, Freyburg (Unstrut).

### Friedrichshafen

Tourist-Information Friedrichshafen (pub.), no date: Einkaufen und Erleben am See, Friedrichshafen.

### Fröndenberg

Stadt Fröndenberg (pub.) 2008: Fröndenberger Stadtrundgang, 2nd edition, Fröndenberg.

### Garmisch-Partenkirchen

No pub., no date: Garmisch Partenkirchen – Entdecken Sie einen wunderbaren Ort, no place of pub.

### Gemeinde Sylt

Fluctus Media (pub.) 2013: no title, Kiel.

### Groemitz

AS Verlag Panker (pub.) 2014: Und rein ins Vergnügen!, Dannau.

No pub., no data: Ortplan, no place of pub.

### Halle (Saale)

Stadtmarketing Halle (Saale) GmbH (pub.) 2014: Innenstadtplan Halle (Saale), Halle (Saale).

### Heilbronn (Neckar)

Heilbronn Marketing GmbH (pub.) 2015: Heilbronn am Neckar – Stadtinformation – Innenstadtplan, Heilbronn am Neckar.

Heilbronn Marketing GmbH (pub.) 2016: no title, Heilbronn am Neckar.

### Konstanz

Tourist-Information Konstanz GmbH (pub.) no date: Stadtplan Konstanz & Vororte, Konstanz.

## Bibliography

### Landsberg (Lech)

Ais GmbH (pub.) no date: Landsberg am Lech – Sehenswürdigkeiten – Sights – Curiosités – Monumenti, Kaufering.

### Mainau

Mainau GmbH (pub.) 2014: Gäste-Information April, Mainau.

### Meersburg

d-werk (pub.) 2013: Stadtplan/City Map 2014: Gut finden, mehr erreichen, Ravensburg.

d-werk (pub.) 2014: Stadtplan – City Map, Ravensburg

### Munich

München Tourismus (pub.) 2013: Plan de la Ville, Munich.

Blanda media (pub.) no date a: no title, Taufkirchen.

Mux OHG (pub.), no date b: Stadtplan – München-Tipps, Munich.

### Naumburg

Vereinigte Domstifter zu Merseburg und Naumburg und des Kollegiatstift Zeitz (pub.) 2011: Der Naumburger Meister, Naumburg.

### Neustadt (Holstein)

Balticum-Verlagsgesellschaft und Werbeagentur GmbH (pub.) 2015: Stadtplan Neustadt in Holstein, Neustadt in Holstein.

### Nonnenhorn

Tourist-Information Nonnenhorn (pub.) no date: Nonnenhorn auf einen Blick, Nonnenhorn.

### Norderney

Medienagentur Kai Lahme (pub.) 2016: Inselplan Norderney, Norderney.

No pub., no date: Inselkarte Norderney – Großer Stadtplan, no place of pub.

### Oberstdorf

Tourismus Oberstdorf (pub.) 2015: Das Oberste im Allgäu – Ortsplan Oberstdorf Allgäu, Oberstdorf.

### Reichenau

Tourist-Information Reichenau (pub.), no date: Unesco-Welterbe Klosterinsel Reichenau, Reichenau.

### Rothenburg ob der Tauber

Rothenburg Tourismus Service (pub.) 2014a: Kleiner Stadtverführer – mit Stadtplan – Rothenburg ob der Tauber, Rothenburg ob der Tauber.

Rothenburg Tourismus Service (pub.) 2014b: Rothenburg ob der Tauber: Romantik erleben, Rothenburg ob der Tauber.

### Schlangenbad

Staatsbad Schlangenbad GmbH (pub.) 2015: Schlangenbad – Historischer Spaziergang, 3rd edition, Schlangenbad.

### Schmallenberg

Verkehrsverein Schmallenberg (pub.), no date: Historischer Stadtrundgang, Schmallenberg.

### Schwerte

Stadt Schwerte (pub.) no date: Historischer Stadtrundgang, Schwerte.

## Bibliography

### Speyer

Speyer (pub.) 2013: Treffpunkt Speyer – Infos, Hotels, Gastronomie, Stadtplan, Speyer.

No pub., 2014: Speyer – Dom- und Kaiserstadt, no place of pub.

### Ulm

Stadt Ulm (pub.) 2018: Parken in Ulm, Ulm.

### Unna

Media Print Verlagsgesellschaft mbH (pub.) 2005: Stadtplan Unna, Eschborn.

Intermediazone (pub.) 2013: Rundweg Alt-Unna – Ein schöner Spaziergang, 5th edition, Unna.

Stadthalle Unna – Gesellschaft für Veranstaltungen und Marketing mbH (pub.) 2014: Historischer Stadtrundgang Unna, Unna.

Verwaltungsverlag (pub.) no date: Stadtplan Unna, Mering.

### Wasserburg (Lake Constance)

No pub., no date: Wasserburg am Bodensee – Ortsplan mit "Genuss-Anlaufstellen", no place of pub.

### Wismar

BVB-Verlagsgesellschaft mbH (pub.) 2018/2019: Hansestadt Wismar, Nordhorn.

Hansestadt Wismar (pub.) 2017: Hansestadt Wismar – Eine Entdeckung wird zum Erlebnis, Wismar.

## **Great Britain**

### London

Time Out Group Ltd. (pub.) 2012: Welcome to London, London.

## **Greece**

### Rhodes

No pub., no date: Taverna Porto Antico – New Map of Rhodes, no place of pub.

## **Israel**

### Jerusalem

Israel Ministry of Tourism (pub.) 2014: Jerusalem – Tourist Map – Old City and City Center Map, Jerusalem.

## **Italy**

### Baveno

MLmonti & Laghinews (pub.) 2014: Baveno, 2<sup>nd</sup> edition, Baveno.

### Dorf Tirol

Medini design (pub.), no date: Dorfplan, Meran.

### Genoa

RHEM (pub.) 2015: Genova – Centro Città e Monumenti, Genoa.

### Limone Sul Garda

Grafiche Andreis Malcesine (pub.), no date: Limone Sul Garda – Useful Information – List of Hotels – Walks Map, Malcesine.

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### Meran

Kurverwaltung Meran (pub.), no date: no title, Meran.

### Milan

Regione Lombardia Turismo (pub.) 2003: Plante di città – City plans – Plans de ville – Stadtpläne, Milan.

### Trento

Ag – di pubblicità Trento (pub.) 2004: Trient – Ein Spaziergang in der Stadt Malereien, Trient  
No pub., no date: Centro città – City center, no place of pub.

## **Japan**

### Kyoto

Ace cube co., Ltd. (pub.) 2015: Explorer Kyoto, Japan.

## **Portugal**

### Albufeira

Supermapa (pub.) no date: City Map – Albufeira, Porto.

### Lisbon

No pub. 2018: Lisboa – Free City Map, no place of pub.

No pub., no date: Sightseeing Lisbon – Hop on, Hop Off, no place of pub.

### Porto

No pub., no date: Porto – El corte Inglés, no place of pub.

## **Switzerland**

### St. Gallen

No pub., no date: Stadtplan St. Gallen, no place of pub.

## Hiking Maps

### **Austria**

#### Adlerweg

Tirol Info (pub.) no date: Adlerweg-Karte – Wandern auf den Schwingen des Adlers , Innsbruck.

#### Attersee

Schubert & Franzke (pub.) 2005: Naturerlebniskarte, St. Pölten.

#### Gastein

Gasteinertal Tourismus GmbH (pub.) 2007: Sommer Information 2007 – Wander- und Bike Übersichtskarte, Gastein.

#### Gurgl

Ötztal Tourismus (pub.) 2019: Ortsinformation Sommer, Sölden.

#### Kufstein

Tourismusverband Ferienland Kufstein (pub.) no date: Wanderkarte, Kufstein.

## Germany

### Ahrtal

Touristinformation Ahrtal & Eifel (pub.) no date a: Geologischer Wanderweg, Bad Neuenahr-Ahrweiler.  
Touristinformation Ahrtal & Eifel (pub.) no date b: Wacholder-Wanderweg, Bad Neuenahr-Ahrweiler.

### Altmuehltal

Zentrale Tourist-Information Naturpark Altmühltal (pub.) no date: Wandern im Naturpark Altmühltal, Eichstätt.

### Balve-Langenholthausen

No pub., no date: Bergbauwanderweg, no place of pub.

### Baumberge

Naturschutzzentrum Kreis Coesfeld e.V. (pub.) no date: Naturschutzgebiet Baumberge – Entdecken Sie die Buchenwälder auf dem Höhenzug der Baumberge, Nottuln.

### Berlin

Tourismusverband Oder-Spree-Seengebiet e.V. (pub.) 2006: Der 66-Seen-Wanderweg – Zu den Naturschönheiten rund um Berlin, Bad Saarow.

### Bingen & Ruedesheim am Rhein

Rüdesheim Tourist AG (pub.) 2014: Freizeitkarte – Leisure Map – Bingen & Rüdesheim am Rhein, Rüdesheim am Rhein.

### Breckerfeld

Stadtmarketing Breckerfeld e.V. (pub.) no date a: Rundwanderweg über Brenscheid, Breckerfeld.  
Stadtmarketing Breckerfeld e.V. (pub.) no date b: Rundwanderweg zur Ennepetal-Sperre, Breckerfeld.  
Stadtmarketing Breckerfeld e.V. (pub.) no date c: Rundwanderweg zum Steinbachtal, Breckerfeld.

### Dahn

Stadt Dahn (pub.) 2007: Dahner Felsenpfad, Dahn.

### Eifel

Moseleifel Touristik e.V. (pub.) 2016: Eifelsteig – Lieserpfad – Moselsteig – Zwischen Maaren und Mosel, Wittlich.

### Ennepe-Ruhr-Kreis

Ennepe-Ruhr-Kreis (pub.) 2009: Wanderkarte mit Panorama-Poster 1:25.000, Schwelm.

### Garmisch-Partenkirchen

No pub., no date: Zugspitzland – Eschenlohe – Oberau – Farchant – Garmisch-Partenkirchen – Grainau, no place of pub.

### Harz

Nationalparkverwaltung Harz (pub.) 1995a: Rund um die Nationalparkgemeinde Lonau, Oderhaus.  
Nationalparkverwaltung Harz (pub.) 1995b: Auf dem Goetheweg zum Brocken, Oderhaus.  
Nationalparkverwaltung Harz (pub.) 1995c: Von Oderbrück zur Achtermannshöhe, 2<sup>nd</sup> edition, Oderhaus.



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### Hoennetal

Verkehrsvereine der Städte Menden – Hemer – Balve- Neuenrade (pub.) no date: Hönnetal – Menden, Hemer, Balve und Neuenrade, Balve.

### Lake Constance

Bodensee – Linzgau Tourismus e.V. (pub.) 2012: Jakobs-Pilgerwege zum Bodensee, 2nd edition, Salem.

### Lünen

Biologische Station Kreis Unna/Dortmund (pub.) 2015: Natur- und Kulturlandschaftserlebnis Lüner Lippeaue, 2<sup>nd</sup> Edition, Bergkamen.

### Meersburg

d-werk (pub.) 2014: Wanderführer – Hiking Map, Ravensburg.

### Moselle

Rahmel Verlag GmbH (pub.) no date: La Moselle avec description de Trèves à Coblenz et la vallée de la Sarre, Pulheim.

### Nordkirchen + Westerwinkel

Naturschutzzentrum Kreis Coesfeld e.V. (pub.) no date: Natur- und Kulturlandschaft in der Schlösserachse Nordkirchen und Westerwinkel, Nottuln.

### Pfalz

Pfalzwein e.V. (pub.) 1997: Panoramakarte des Weinlands Pfalz, Neustadt an der Weinstraße.

### Rennsteig

Regionalverbund Thüringer Wald e.V. (pub.) no date: Der Rennsteig – Naturerlebniskartemit Etappenvorschlägen und Höhenprofilen, Suhl.

### Rheinlauf

Stollfuss Verlag (pub.) no date: Rheinlauf mit Beschreibung, Bonn.

### Rheinsteig

Rheinland-Pfalz-Tourismus GmbH (pub.) 2006: Wandern auf hohem Niveau, 3rd edition, Koblenz.  
Landesamt für Vermessung und Geobasisinformation Rheinland-Pfalz (pub.) 2009: Rheinsteig – Topographische Freizeitkarte – Wandern auf hohem Niveau, 3rd edition, Koblenz.  
No pub. 2009: SteigRhein – Erlebniswandern am Rheinsteig im Neuwieder Becken, no place of pub.

### Rothaarsteig

Rothaarsteig e.V. (pub.) 2015: Der Rothaarsteig – Die beliebtesten Wanderangebote zu den schönsten Aussichten, Schmallebenberg.  
Rothaarsteig e.V. (pub.) 2001: Wanderkarte Rothaarsteig Blatt Süd + Blatt Nord, Schmallebenberg.

### Rotwein-Wanderweg

Mainland Miltenberg-Churfranken e.V. (pub.) 2008: Fränkischer Rotwein-Wanderweg, Miltenberg.

### Rüdesheim

No pub. 2017: Über den Reben schweben, no place of pub.

### Saar-Hunsrueck

Outdoorwelten GmbH (pub.) 2015: Traumschleifen – 111 Premiumwege – Die Übersichtskarte, 4th edition, Bonn.

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### Saarland

Saarschleifenland Tourismus GmbH (pub.) 2011: SaarSchleifenLand Discovery Map, Merzig.

### Scheidegg-Scheffau

Landratsamt Lindau (pub.) no date: Wanderkarte Scheidegg-Scheffau, Lindau.

### Schweigen-Rechtenbach

Verein Erster Deutscher Weinlehrpfad (pub.) no date: Erster Deutscher Weinlehrpfad, Schweigen-Rechtenbach.

### Unna

Kreis Unna (pub.) 2010: TouristMap – Sport, Kultur und Sehenswertes, Unna.

Sauerländischer Gebirgsverein und Heimatverein Unna e.V. (pub.) no date: Wanderwege Stadt Unna, Unna.

### Venner Moor

Naturschutzzentrum Kreis Coesfeld e.V. (pub.) 2013: Naturschutzgebiet Venner Moor, Nottuln.

### Vulkaneifel

Zweckverband SchienenPersonenNahverkehr Rheinland-Pfalz Nord (pub.) 2005: Wandern & Rad fahren im Vulkanland Eifel, Kaiserslautern.

### Wittgenstein

No pub., no date: WaldskulpturenWeg – Natur trifft Kunst, no place of pub.

## **Italy**

### Dorf Tirol

Tappeiner (pub.) 2015: Dorf Tirol und Umgebung, Bozen.

Tourismusverein Dorf Tirol (pub.), no date: Ein Tag in Dorf Tirol, Dorf Tirol.

### Cinque Terre

A.P.E. (pub.) no date a: Between Portofino and Cinque Terre, Genoa.

No pub., no date:b Parco Nazionale Cinque Terre – Map, no place of pub.

### Hirzer

No pub., no date: Hirzer Wanderparadies, no place of pub.

No pub., 2019: Tallner Sunntig im Hirzer Wanderparadies – nel centro escursioni Hirzer, no place of pub.

### Lake Garda

Promoprint S.r.l. Verona (pub.) 2004: Lago di Garda, Verona.

### Marinzenalm

No pub., no date: Marinzenalm – Alpe di Marinzen – Der ideale Ausgangspunkt für Wanderungen!, no place of pub.

### Meran 2000

Freiraum bz (pub.) 2017: Outdoor Experience, St. Martin.

### Monte Baldo Malcesine

Instituzione Malcesine Più (pub.) no date: Passeggiate ed Escursioni – Spaziergänge und Wanderkarte-Walking Map, Malcesine.

## Bibliography

### Pfelders

Büro Bergbahnen/Ufficio cabinovia (pub.) 2018: Ski- und Wandergebiet Pfelders – Zone exkursionistica e sciistica plan, Moos in Passeier.

### Seiser Alm

No pub. 2018: Living the Dolomites – Seiser Alm – Alpe di Siusi, no place of pub.

### Texelgruppe

Mendini design (pub.) no date: Von Dorf Tirol direkt ins Wanderparadies Texelgruppe 650 – 1400 m, Meran.

### Trauttmansdorff

No pub. 2019: Einzigartige Erlebniswelt – zwischen Natur, Kultur und Kunst, no place of pub.

### Ultental

Tourismusverein Ultental-Proveis (pub.) 2015: Wandern – Excursioni 2015, St. Pankraz.

## **Luxembourg**

### Moselle (Luxembourg)

Office Régional du Tourisme no date: Weintouristische Karte Luxemburger Mosel, Bech-Kleinmacher.

## **Slovakia**

### High Tatras

No pub., no date: TOP 6 trips in the High Tatras, no place of pub.

## **Spain**

### Lanzarote

No pub. No date: Lanzarote Bike & Hike Road Map, no place of pub.

## **Other maps\***

\*List of maps that are shown in the thesis but are not part of the general evaluation

## **Germany**

### Berlin

MairDumont (pub.) 2019: Falkplan Berlin, Ostfildern.

### Germany

Edco Eindhoven B.V. (pub.) no date: Roadmap Germany – Straßenkarte von Deutschland 1:825.000, Eindhoven.

### Germany West

Jübermann-Kartographie und Verlag (pub.) 2015: Wassersport-Wanderkarte Nr.2, Deutschland-West mit Gewässerkarte Ruhr, 6th edition, Uelzen.

## Bibliography

### Lake Constance

Radverlag c/o Bodensee-Tourismus Service GmbH (pub.) 2015: Bodensee-Radweg, Konstanz.

### Speyer

Tourist-Information Speyer (pub.) 2006: Radtouren rund um Speyer, Speyer.

### WestfalenWanderWeg

Landesvermessungsamt Nordrhein-Westfalen (pub.) 2015: WestfalenWanderWeg – Von Hattingen bis Altenbeken, Bad Godesberg.

Publicpress (pub.) no date: WestfalenWanderWeg Hattingen-Altenbeken, Geseke.

### Winterberg

Skigebiete (map). In: Winterberg Touristik und Wirtschaft GmbH 2016: so geht Winter, p. 22, Winterberg.

## **Switzerland**

Mairs Geographischer Verlag (pub.) 1996: Shell EuroKarte Schweiz 1:303.000, Ostfildern.

Selbstständigkeitserklärung

Hiermit erkläre ich, dass ich die vorliegende Dissertation ohne fremde Hilfe und ohne Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe. Die aus fremden Quellen direkt oder indirekt übernommen Gedanken sind ausnahmslos als solche kenntlich gemacht. Die Arbeit ist in gleicher oder ähnlicher Form oder auszugsweise im Rahmen einer anderen Prüfung noch nicht vorgelegt worden.

Declaration of Authorship

I hereby declare that I have written the present dissertation independently, without assistance from external parties and without use of other resources than those indicated. The ideas taken directly or indirectly from other sources are duly acknowledged in the text. The material, either in full or in part, has not been previously submitted for grading at this or any other institution.

Dortmund, 12.12.2019