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## Wiener Straßendorf: a historical consideration of Vienna's pristine linear settlements

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Figure 1. Hütteldorf, Linzer Straße around 1898 (Carl Ledermann jun., Wien Museum Inv.-Nr. 234673)

### ABSTRACT

The paper deals with the genesis of the Viennese *Straßendorf* (street village, a special form of linear settlement). In general, it can be stated that the *Straßendorf* does indeed represent the archetype of an enclosed street space and can thus be described as the nucleus of urbanity and arguably also as one original form of a settlement of short distances. The following text refers to street villages that are located in moderate terrain, as opposed to longitudinal settlements that develop on slope ridges or narrow mountain valleys. In any case its linear growth is limited: when a certain length is reached, and further longitudinal expansion is no longer convenient, parallel or orthogonal streets are introduced to the system. Many street villages in formerly rural areas are now what can be considered the main street of an otherwise often scattered settlement. In other cases, such as in Vienna, expanding cities have incorporated the former villages into their metropolitan street network, where they now typically serve as an urban sub-centre, or represent an arterial road and a development axis for the city.

Regarding the city of Vienna, more than 150 medieval and early modern villages have been identified in today's municipal area, many of which are still recognisable in the townscape. To date, those patterns—their historical development and their current urban and functional structure—have not been studied systematically. This is what our paper aims for: A comprehensive research of historic literature and maps will allow a detailed description and localization of this special form of linear settlements in and around Vienna. The comparison of the form and functions of historical street villages with their contemporary counterparts serves as a basis for understanding the inner configuration of a Straßendorf and their overarching macro-structural incorporation into the urban body.

**Keywords:** Straßendorf, Vienna, linear settlement, street, public space, attached building development

## INTRODUCTION

The present work is the beginning of an intensive study of linear settlements in Vienna and subsequently in other European cities. This is undertaken in order to understand the settlement factors relevant for their emergence and the transformation processes that have taken place since then. This approach is embedded in a larger recently launched EU-funded study that will investigate the network structures of metropolitan peripheries in selected cities in order to assess their potential in relation to an implication of the 15-minute city model in peri-urban areas.

Linear settlements are being seen and examined as an archetypos. We recognise them as one possible basic module of urban network structures and we anticipate that by thoroughly understanding their growth and development, we will be able to gain a better comprehension of the entire network system and its functioning. For many of these originally rural settlements have gradually grown into today's urban structures. The way they are now integrated into these—whether their main street, for example, is a major or secondary axis in the current road network; or whether it has formed a local sub-centre—will provide information about the general functioning of the metropolitan network structures.

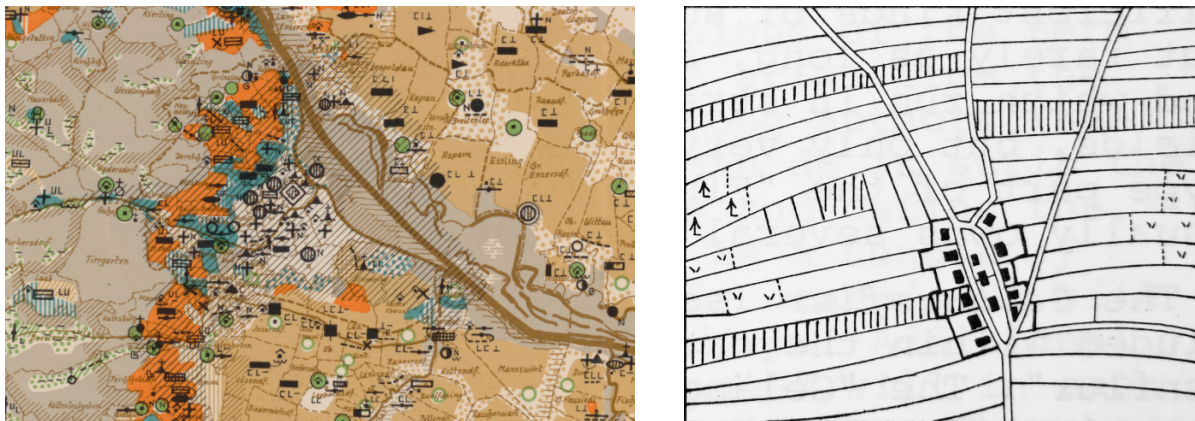
Against the background of ever-expanding cities and metropolitan areas and in light of the climate crisis the analysis of these settlements offers a unique opportunity to comprehend spatial and functional transformation processes in a peripheral context. This hopefully will aid in the development of concepts for urban peripheral structures that are connected and compact and prevent urban sprawl.

### Historical context

Vienna is situated at the only place where the mountains of the Alps and Carpathians allow for easy passage and the topography becomes flatter, but there is still a good water supply via various rivers and streams from Wienerwald. (Oberhummer 1924: 113) For that reason settlements in and around Vienna existed since the neolithic period but starting from the 11<sup>th</sup> century the eastern colonization of Germans made the area a focal point for systematic settlement efforts. (Klaar, 1944: 215) Linear settlement types are the most notable form of settlements brought along with that migration and found widespread implementation. (Schwarz, 1966: 179)

The understanding of these villages, the circumstances of their origin, their structure and the pertinent factors influencing their continuing growth, draws on earlier studies on the settlements. Most notable in this context are the works of the Austrian architect and historian Adalbert Klaar. He conducted a thorough historical and geographic examination in his monography “Siedlungsformen Wiens” from 1971 and in his comprehensive cartography “Siedlungsformenkarte der Ostmark” from 1942 that comes with an accompanying supplement. In his works over 150 medieval and early modern villages have been identified in the current municipal area of Vienna, many of which are still recognisable as such. (Hauer and Hohensinner, 2019: 318 from Klaar 1971)

The Siedlungsformenkarte (Figure 2, left)– which he later also treated in more detail and deepened in extracts – portrays terrain, land use and settlement patterns as being related to one another and superimposes them on a map. For the area of Vienna Klaar identifies three distinct field patterns (Flurtypen), furlong strips (*Gewannflure*), strips for viticulture (*Weingartenflur*) and strips that are situated on cleared woodland (*Waldhufenflur*) and a clear tendency towards linear settlement types (like *Straßen-* and *Angerdörfer*). Therefore, a clear correlation between settlement forms, land use and field patterns is made which in turn are influenced by soil conditions, topography, cultivation techniques, societal and the political structure of the time of their formation.



**Figure 2.** left: “Siedlungsformenkarte” (Klaar, 1942); right: *Streifengemeengeverband* - Bundle of strips with a pattern of fragmented holdings (Uhlig and Lienau, 1967: E57)

Generally, in all its different manifestations, agricultural land in and around Vienna presents as bundles of long strips with a pattern of fragmented holdings (with reference to the categorisation in Uhlig and Lienau, 1967, see Figure 2, right), usually with one plot situated directly behind the farmstead providing either direct access to the farmland, or access through alleys - so-called *Hintausgassen* - with the typical rows of barns as transitions between the built-up area and the fields. (Moser et al. 1988, 62) A cooperatively organized three-field-system with compulsory field cultivation (*Flurzwang*) and crop rotation with fields for fallow, summer-crop, and winter-crop – as was prevailing in Austria from the Middle Ages until the 19<sup>th</sup> century – often results in these patterns of fragmented holdings. (Thiede 1937: 7) This is down to the reason that in this system, every one of the three crops is cultivated in one cohesive area of which each farmer has shares.

The farmland itself is divided into long and narrow strips. A frequently stated explanation for that shape is the ploughing technique: the widely used Germanic plough was able to draw deep, wide furrows into the soft ground, but at the ends of the strip where the plough was turned, the last piece had to be left untended. For the restriction of these areas and to reduce the number of times the

plough needs to be turned, long strips of land where much more favourable than block parcels. (Thiede 1937: 6)

The building types are of course also connected with the field patterns: strip holdings coincide with narrow, elongated farmhouses that – depending on the width of the plot – consist of one longitudinal structure (*Streckhof*), have a second transverse structure facing the back of the plot or the road (*Hakenhof* or *Zwerchhof*) or have transverse structures on both ends (*Doppelhakenhof*). (Moser et al. 1988:61) Depending on which crops were cultivated in the respective area, the farms were endowed with fruit chambers, stables and barns, press houses and wine cellars or cellar alleys. (Kleemaier-Wettl 2023: 157-158)

With changes in the influencing factors over time, of course also the respective structures underwent significant transformation. The termination of *Flurzwang* and the accompanying abandonment of cooperative organization of farmers, land consolidation and an increase in non-farming population left their mark in the further development of the villages. The ever-growing city incorporated and reshaped many of the settlements.

## METHODOLOGY

### Frame

The Austrian Empire's property cadastre, which was established at the start of the nineteenth century, is first fully documented in the Franciscan cadastre. Emperor Franz I. initiated it in 1817 with the intention of enabling equitable land taxation. Around 1829 the whole area depicted by Vienna's present-day city limits had been recorded, and until 1832, only minor extensions were made. Only the first district of today's Vienna was part of the municipality at the time the cadastre was established; districts 2 through 9 were not included until 1850 (first urban expansion with the incorporation of the so-called *Vorstädte*). The second urban expansion, which included the integration of the former outlying settlements (*Vororte*), occurred in 1890. The examination of the settlements in the Vienna area will be based on this map. Since the inner city and the suburbs were already largely urbanised at the time of the cadastral survey and their original settlement structure was often reshaped and consolidated, they are disregarded for this analysis of settlement forms. Consequently, this paper focuses on the villages outside of the outer line of fortifications (*Linienwall*) in the present-day districts 10-23. In an effort to identify all linear settlements, phase one collects all settlements in this area, which are then categorised according to their respective structures. In phase two all surveyed villages are analysed for various geographical, structural and demographic parameters. In phase three, five representative linear settlements are selected, their layouts are examined in more detail and in a comparison of the historic and the current structures, the transformation processes are addressed.

### Phase One

Based on the principle of the *Siedlungsformen Karte* by Adalbert Klaar, a settlement form map of the historical structures found in the Franciscan cadastre – sourced from the *arcanum* and *wien.gv* platforms (Arcanum, 2023; wien.gv, 2023) – is created. All identified settlements are then categorised according to their respective structures. Settlements that are corridor developments along paths or streets will hereby be categorised as *Straße*, settlements with a common land (*Allmende*) in their centre are assigned to the *Anger* type. The category *Other* collects all structures that do not clearly present as linear settlements.

A special focus in the survey of these structures lies in the mapping of the geographical orientation of the core of the settlement, in an effort to shine a light onto the relevant settlement



factors in Vienna. The recorded individual orientations are then divided into North-South, West-East, Northwest-Southeast and Northeast-Southwest for use in the next phases.

### Phase two

In phase two, the collected settlements are investigated further. In three categories - geographical aspects, spatial structure, and demography - various data points are collected. This enables an initial assessment of the relevance of different settlement factors and the transformation processes that occur.

*Table 1. Framework for the collection of data for the settlements in the research area*

Settlements in Vienna					
Geographical Orientation of the linear settlement		North-South	West-East	Northwest-Southeast	Northeast-Southwest
Geography	Stream or river nearby	yes	no		
	Position of the river or stream towards the settlement	centre	parallel	other	
	River or stream still on the surface today	yes	no		
	Historic length of the linear settlement	Recorded in 50-meter steps			
Spatial Structures	Current length of the linear settlement (if applicable)	Recorded in 50-meter steps			
	Incorporated into today's city	Yes	No		
	Characteristic special buildings (Castles, Estates, Other)	Yes	No		
	Historic population	Actual number recorded			
Demography	Historic number of houses	Actual number recorded			

In addition to the data listed in Table 1 descriptions of each settlement in their historical and current state are prepared, the names of streams and rivers and those of characteristic special buildings are recorded, this aids in the selection of individual settlements for a more in-depth analysis in phase 3.

### Phase Three

With regards to phase one and two, a subset of 5 linear settlements (*Straße* and *Anger* type) is selected. A special focus hereby lies in the illustration of the great variety of relevant elements and different transformative states discerned by the data collected in phase one and two. The selected settlements are mapped in their historical and current form, their layout is analysed in more detail and important factors like the presence of water and elements like characteristic buildings are investigated and recorded in the map. A morphological analysis of both states is carried out and the remaining historic structures, as well as the elements that underwent transformation are discussed.

## RESULTS



*Figure 3. Settlement forms on a present-day map of Vienna © Tobisch, Löschenbrand, Psenner*

As illustrated in Figure 3, a total of 71 distinct settlements were identified. Two thirds of them (47 settlements) can be considered linear settlements, of which 32 were categorised as *Straße* and 15 as *Anger* type. The 24 settlements categorised as Other, can be roughly allocated into three groups. The first group are small villages (*Weiler*) that are located in topographically challenging areas that are not practical for the development of strictly linear settlements. The second group are structures that encompass multiple streets with different orientations (*Mehrgassendorf*, *Mehrstraßendorf*). The third group are structures that are urbanised to a high degree. These agglomerations have been reshaped and therefore their original settlement form was not ascertainable with certainty from the Franciscan cadastre. Some of these agglomerations could potentially be transformed linear settlements, but older map material would be needed to confirm that hypothesis.

While not depicted on the map three different *Anger* types were identified: *Längsanger* with a rectangular shaped Allmende, *Dreiecksanger* with a triangular Allmende, and *Linsenanger* with a lens-shaped Allmende.

### *Orientation*

With a total of 31 structures two thirds of the linear settlements have an East-West orientation, 8 are oriented from North to South, 3 from Northeast to Southwest and 5 from Northwest to Southeast. These results are corresponding with the main wind direction in the city. Due to Viennas location at

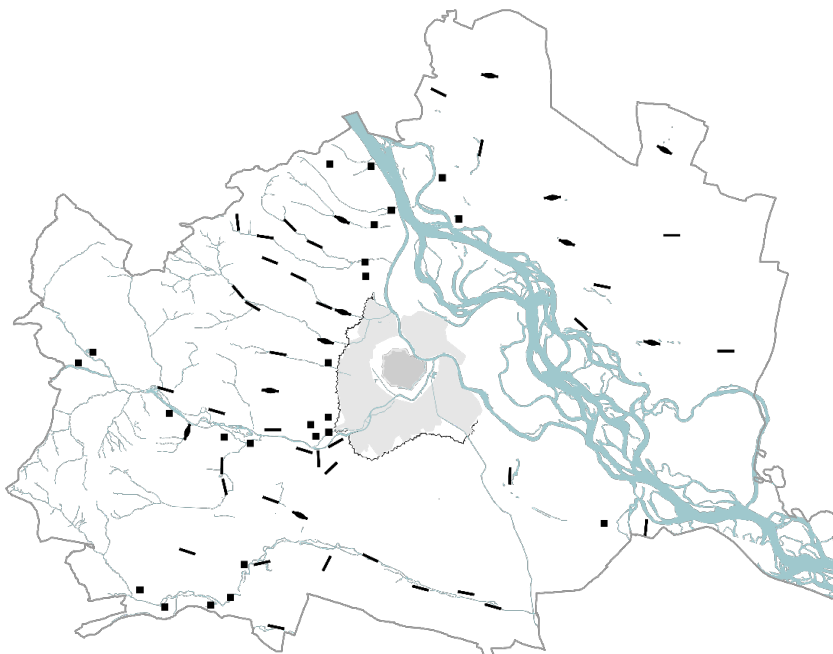
the eastern end of the alps at the transition to the alpine foothills in the east that lead into the pannonian basin, the prevailing wind direction is West and Northwest. The hills of the Vienna woods are additionally channelling these winds along the Danube and the Wienfluss.

### *Distribution*

The majority of settlements are found in a circular arrangement around the city, with a high density of settlements immediately outside of the outer line of fortifications and decreasing density with increasing distance from the city centre. While this is the anticipated distribution, there are a few irregularities in that pattern: Towards the West, settlements are scattered only along the valley of the *Wienfluss* but further development was hindered by the steep hills of the *Wienerwald*. Similarly, from the city centre outwards following the river Danube to the South-East, settlements are sparse. This can be attributed to the constant threat of flooding, which led to the development of few settlements in this area and caused devastation to a number of them, for example the settlements of Jedlese and Stadlau. (Klaar, 1971: 122)

The last area that does not present the anticipated settlement pattern, is to be found to the South in nowadays tenth district. While the area was used for clay mining and had several brick factories, no settlements were found between the outer line of fortifications and *Liesingbach* – a stream close to today's borders of Vienna. This might be attributed both to the industrial use of the area and the lack of waterbodies in this area.

### *Water*



**Figure 4.** Settlement forms superimposed with the streams and rivers of 1829 © Tobisch, Löschenbrand, Psenner

In this study the presence of water was found to have the most direct correlation with settlements being present (Figure 4), therefore this is also likely to be a highly relevant settlement factor in and around Vienna. More than 70% of all villages have a watercourse integrated into their settlement

layout. Out of the 47 linear settlements 11 have a stream in their centre, and 20 have a stream or river parallel to their central linear element.

In a more general respect, many of the settlements that do not have an immediate proximity to water, still have a connection with this settlement factor: They are located in topographic depressions of former water bodies or are situated alongside stream or river beds that do not carry water continuously. This can be observed above all in Transdanubia, the villages of Leopoldau, Kagran and Hirschstetten for example are situated in troughs of former arms of the river Danube. (Huber, 1786)

### *Spatial Structure and Demography*

The longest settlement located in the research area extends over a length of around 1000 metres while the shortest structure is measured at just under 200 metres.

The demographic data was taken from a 1830 census that was performed in a majority (about 85%) of the settlements, if not available data from the closest year to that was used (ranging from 1818 to 1832). Two sets of data – the number of houses and the number of residents – were recorded and the resulting average occupancy rate was calculated. The number of houses ranges between 13 in Stadlau and 234 in Simmering. The village with the least number of permanent residents is Josephsdorf with 53 people, which also has the lowest occupancy rate of under 2 people per house. This is due to the fact that this settlement was mainly a summer retreat for wealthier families that did not reside there year-round but also multiple residencies in the city. The settlement with the highest number of residents at 4677 people and also the highest occupancy rate of almost 30 inhabitants per house is Neulerchenfeld. While 75% of occupancy rates were ranging between 5 and 11 inhabitants, 10 of the settlements had a rate of more than 15 people per house. This high value indicates an advanced level of urbanisation, which goes hand in hand with a deviation from agricultural building types and towards the directed developments of clusters of buildings that have more than one story and encompass several units.

Due to the wide dispersion of results illustrated in these examples, medians of each of the parameters were established. The median settlement is 550 metres long comprising 61 houses with 535 inhabitants, which results in an occupancy rate of 8. According to these numbers, the most representative settlement is Untersievering.

### *Transformation*

A majority of the evaluated settlements can today be considered integrated into the urban structure, only around a third continues to have rural characteristics. Since only two different plan statuses, 1829 and now, were used for this study for the time being, the recording of the transformation of the length of all the settlements analogous to the historical analysis was not feasible with this high percentage of structurally integrated settlements. In order to obtain reliable results for all settlements, the consultation of additional map material to cover the time between these two points in time is required.

The connection of settlements to water is a factor that underwent significant transformation: From 1837 onwards, starting with the Ottakringer Bach, systematic canalisation and vaulting work was carried out on the many streams coming from Wienerwald. (Figure 5, left) In addition to sanitary problems (the streams carried considerable amounts of sewage), the streams also posed a permanent threat of flooding for neighbouring settlements. A total of 54.6 km of streams have disappeared under ground in this way since (Gantner, 2019: 118-119) Today, with a few exceptions (Liesingbach, Wienfluss), essentially only the upper streams in sparsely populated areas run above ground. The Wienfluss and the Liesingbach have also been heavily regulated, thus at least significantly reducing

their destructive power in times of high water, while not completely preventing floods. (Figure 5, right) For this reason, all streams in the centre of settlements disappeared below ground. Some settlements with streams running parallel to their main structures have been able to maintain this direct connection to water.



*Figure 5. left: Vaulting and canalisation of streams beginning in 1837. (Gantner, 2019: 119)  
 right: "Überschwemmung des Liesingbachs", Oberlaa 1951 (Unknown, Wien Museum Inv.-Nr. 245874)*

### Selected Settlements

Out of the 47 linear settlements five were chosen based on the outcomes of the first two research phases. The large number of factors recorded and wide dispersion within individual parameters made selecting a representative subset challenging. Therefore, the selection now focuses representing a great variety of relevant parameters and transformative states to illustrate the broad spectrum in Vienna's settlement structures. The five settlements selected are Ottakring, Penzing, Oberlaa, Speising and Stammersdorf (Figure 6).

### Transformation

The selection contains four settlements of the Straße type – three of them have an East-West and one a North-South orientation – and one settlement of the Anger type – also with an East-West orientation. The close connection to water that was present in four of the settlements has been preserved in two of them: The settlements Penzing and Oberlaa are situated at the two streams that have not been vaulted, the Wienfluss and the Liesingbach, still both have been regulated and received straightened and deepened riverbeds. The street layout of the original settlement is still perceivable in all of them, although some of them have been widened for example in Penzing and in the case of Ottakring a new square was introduced.



Figure 6. Selection of Settlement structures in their 1829 and current form © Tobisch, Löschenbrand, Psenner

Considering the settlement regarding the typical structural characteristics of a street village – narrow, deep plots orthogonal to the street and single-story elongated buildings – it can be concluded, that some villages have been completely transformed while others have been preserved almost in their entirety. The settlement of Ottakring, that is situated comparatively close to the inner districts has been heavily transformed with the introduction of the street grid and perimeter blocks of the Gründerzeit. Today only a hand full of characteristic plots and buildings remain. On the other end of this spectrum lies the village of Stammersdorf, where plots and buildings on the main street and Anger – and also on streets that were introduced later – still display these characteristics. Even very recent additions still adhere to the field patterns, even though the building structure is different. This can also be observed in Speising and Oberlaa. Special Buildings, likes churches, castles and estates are still located in the same spot in all villages that originally had them – Speising never had a church of its own – although in most cases these are not the original buildings, which were destroyed during wars or deliberately demolished and rebuilt later.

## DISCUSSION

The limitation of the research area to the current outlines of Vienna was found to be conflicting with historical contexts. The historical traffic networks and field patterns clearly show the strong connections between settlements inside and outside of the research area. Therefore, future works should take these relationships into consideration.

While many settlement factors could be identified and discussed, several others had to be left out of scope for this first assessment. For example, the correlation between waterways and settlements occurrence and orientation could be clearly established, but an equal level of certainty could not be achieved for other factors (i.e. sun). Another factor that could not be examined in this study is the respective building structure of the settlements. As already mentioned at the beginning, the agricultural settlements generally have the associated farmhouse structures but later developments feature more urban, multi-story buildings (i.e. Neulerchenfeld). Some settlements even have no agricultural origins, but have developed alongside important roads and are likely to have fulfilled functions of transport and trade (i.e. Neustift or Straßenhäuser) and display long and shallow buildings parallel to the street. Further analysis of these building structures could reveal a deeper understanding of the relationship between traffic networks and settlement development.

Follow-up studies will also make use of a wider range of map material that depicts a longer period, as looking at only two points in time makes aspects such as flooding, wars, abandonment of villages and the associated transformation as well as incorporation into urban structure difficult to observe.

## CONCLUSION

This first study into the linear settlements of Vienna already reveals the large extent to which this settlement type has been applied and its significance for the comprehension of transformation processes in the city. While many settlement factors, like orientation, wind and water, could already be described others like building structure and connection to traffic networks could not be conclusively determined. A profound understanding of the impact of these factors on the emergence and development of settlement structures can make an important contribution for future developments. The creation of a concept for new peripheral urban structures, that are still connected and compact is essential to address the ever-growing city, to create a liveable environment in peri-urban areas and to counter urban sprawl.

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