



# HISTÓRIA DA ARQUITETURA PERSPETIVAS TEMÁTICAS (III) A RUA NA ESTRUTURA URBANA

COORD.  
MANUEL JOAQUIM MOREIRA DA ROCHA  
NUNO RESENDE



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# LIQUID STREETS: EARLY MODERN WATERWAYS IN URBAN SPACES

DAVIDE MARTINO\*

**Abstract:** *The image of urban canals is readily associated today with specific cities, such as Venice, Amsterdam, or Recife; in the early modern period, however, waterways were a commonplace feature of most urban landscapes. Focusing on Augsburg, Florence, and the Dutch Republic as examples, this article will compare urban highways and waterways. Similarities will be identified between their function, their location, and their administration. These similarities, together with a brief discussion of etymology, make «liquid streets» an interesting label with which to think about urban rivers and canals. This article will also show, however, that there was more than similarities to the comparison of highways and waterways: in early modern cities, rivers and canals often went beyond streets and roads in function, location, and administration.*

**Keywords:** *Waterways; Highways; Festivals; Transport; Administration.*

**Resumo:** *A imagem de canais urbanos é prontamente associada na atualidade a cidades específicas, como Veneza, Amsterdão ou Recife; no entanto, no período moderno inicial, vias navegáveis eram uma característica comum na maioria das paisagens urbanas. Ao se concentrar em Augsburg, Florença e na República Holandesa como exemplos, este artigo comparará rodovias e vias navegáveis urbanas. Semelhanças serão identificadas entre a sua função, localização e administração. Essas semelhanças, juntamente com uma breve discussão etimológica, tornam «ruas líquidas» um rótulo interessante para pensar sobre rios e canais urbanos. Este artigo também mostrará, no entanto, que havia mais do que semelhanças na comparação entre rodovias e vias navegáveis: em cidades do início da era moderna, rios e canais muitas vezes ultrapassavam ruas e estradas em função, localização e administração.*

**Palavras-chave:** *Vias navegáveis; Rodovias; Festivais; Transporte; Administração.*

## INTRODUCTION

The opening ceremony of the 2024 Olympic Games, hosted in Paris, France, is due to take place in an unusual setting. Rather than parading through a stadium, athletes from around the world will cross the breadth of the city centre on boats, navigating the waters of the river Seine. The audience will be accommodated on the embankments, which will hold many more spectators than a normal arena, and the official tribune will be on the steps of the Trocadéro, facing the Tour Eiffel<sup>1</sup>. The organisers will, in

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<sup>1</sup> LEPELTIER, 2021.



other words, use the Seine and its riverfronts as life-size stages on which to celebrate the beginning of the Olympic Games. Billed as an innovation, their plan can also be seen as the heir of a centuries-old tradition.

In early modern Europe, waterborne festivals were not uncommon. In Pisa in 1589, for example, a mock naval «Battle of the Galleon» between Christians and Moors was organised on the river Arno to celebrate the wedding of Grand Duke Ferdinando I de' Medici with Christine de Lorraine. The show took place at nightfall and included fireworks, with spectators gathered on the bridges, banks, and balconies of adjacent buildings to marvel at the sight. Days later, a more exclusive waterborne spectacle was held within the confines of the grand-ducal Palazzo Pitti, in Florence. The palace courtyard was flooded in order to host a *Naumachia*, a naval battle after the Roman tradition. Christians and Moors were again the opposing factions, with the predictable triumph of the former echoing the victory of the allied Christian forces at Lepanto eighteen years earlier, in 1571<sup>2</sup>. In London in 1613, it was the storming of Tunis by Charles V nearly a century earlier which was re-enacted with a mock naval battle on the river Thames. Along with fireworks, and the rescuing of a princess from a floating tower, the naval battle celebrated the wedding of Elizabeth Stuart, daughter of King James VI & I, and the Elector Palatine Frederick V<sup>3</sup>.

Early modern festivals did not, of course, take place on water only. For the very same 1589 wedding, for example, the French bride was welcomed into Florence in a triumphal procession which wound its way through the streets, squares, and bridges of several of the city's neighbourhoods<sup>4</sup>. The 1589 festivities were thus terraqueous, taking place partly on dry land and partly on the waters of the Arno. Both types of public space, the highway, and the waterway, were deemed appropriate sites to celebrate such a momentous occasion.

Starting from this similarity in function, this article will explore other parallels between urban highways and waterways. This will be done through a systematic comparison of streets and roads on the one hand, rivers, and canals on the other<sup>5</sup>. This comparative analysis will focus on three characteristics — one of which, function, has already received some consideration in this brief introduction. The next section will also consider highways' and waterways' function in transporting goods and people; it will then go on to discuss the similarities between their locations within urban space, as well as between the institutions and structures set up for their administration. As the third section will show, waterways did not merely share similarities with highways in early modern cities: they also went beyond them in function, location,

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<sup>2</sup> ELSE, 2018: 152-156, 163-179.

<sup>3</sup> PAGNINI, 2006: 246-256.

<sup>4</sup> ELSE, 2018: 156-163.

<sup>5</sup> In comparison, as a historical methodology, see CANFORA, 1983; KROM, GUYATT, 2021.

and administration. Turning to questions of etymology and terminology, this article will conclude that «liquid streets» might be a helpful way to conceive of urban waterways in early modern Europe.

## 1. SIMILARITIES

Urban stretches of rivers, like streets and roads, could be the setting of elaborate festivals, as we have seen. Outside of these extraordinary events, the principal function of both waterways and highways was one and the same: to serve as conduits for the transport of people, animals, and goods. The primacy of overland transport in the last two centuries, by rail first and then by car, has erased a lot of physical and architectural traces of the waterborne past of transport, and today the image of urban canals is only associated with specific cities, such as Venice, Amsterdam, or Recife. In the early modern period, however, even cities as dry as Milan or Brussels, which are neither on the coast nor on a major river, dug networks of artificial waterways to supplement their streets and roads<sup>6</sup>. In both Florence and Augsburg, urban growth in the 14<sup>th</sup> and 15<sup>th</sup> centuries was made possible by the shipping of building materials, chief among them timber, along the rivers Arno and Lech respectively<sup>7</sup>. The marble blocks sculpted by the likes of Michelangelo in both Florence and Rome were also waterborne, shipped on the Tyrrhenian Sea from their quarries and then towed up the Arno or the Tiber<sup>8</sup>.

This similarity in the function of waterways and highways as conduits of transport included a certain degree of interoperability between them. The herds of oxen which were brought to Augsburg every year to be slaughtered in large numbers, for example, travelled overland from modern-day Slovakia and Hungary — but cattle merchants had embarked on rafts which descended the Lech and the Danube to Vienna and beyond to go purchase them<sup>9</sup>. As Jan de Vries has famously showed, in the 17<sup>th</sup> century the northern Netherlands developed waterborne transport to a high degree of sophistication: all major cities were linked by means of purpose-built canals plied by regular, timetabled ferries — not unlike modern railway services. In the east of the Dutch Republic, however, the topography did not lend itself to canal-digging on a large scale, so funds were invested instead in the improvement of roads and the setting up of postal coaches<sup>10</sup>. Both waterways and highways thus fulfilled important transport functions in early modern Europe.

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<sup>6</sup> BELTRAME, CELONA, 1982; DELIGNE, 2003.

<sup>7</sup> GABRIELLI, SETTESOLDI, 1977; KLUGER, 2015: 56-109.

<sup>8</sup> FERRETTI, TURRINI, 2010: 86-100.

<sup>9</sup> HÄBERLEIN, 2020: 113-115.

<sup>10</sup> DE VRIES, 1981.



Fig. 1. KILIAN, Wolfgang (1626). *Großer Vogelschauplan von Augsburg*

Source: Wikimedia Commons

Similarities between waterways and highways extended beyond their common function as settings for festivals and conduits for transport. The location of canals and streets within early modern cities was often comparable, as can be shown in the case of Augsburg. Like many other urban centres, Augsburg was surrounded by moated walls, and the eastern half of these moats was filled with water. In addition, although the rivers Lech and Wertach remained outside the urban area, a multitude of canals crossed the city, running along several streets of the artisanal neighbourhood, where they turned a large number of waterwheels. Besides, a separate network of canals brought drinking water from woodland springs several kilometres to the south all the way to the municipal pumping works, which supplied underground wooden pipes distributing the water throughout the city<sup>11</sup>. Water could thus be found around, next to, and under the city's streets. Early modern Augsburg was, in other words, a terraqueous site, where land and water mingled<sup>12</sup>. This terraqueous character is captured in a detailed map of the city, engraved by Wolfgang Kilian in 1626 (Fig. 1).

If the example of Augsburg allows us to illustrate similarities in location between waterways and highways, we can turn to Florence to consider similarities in administration. In the Grand Duchy of Tuscany, indeed, responsibility for both

<sup>11</sup> RUCKDESCHEL, 2000; RAJKAY, 2018.

<sup>12</sup> BASHFORD, 2017.

roads and rivers, within and outside cities, was entrusted to the *Capitani di Parte Guelfa* (Captains of the Guelph Party). This office, whose origins and name dated back to the late medieval Florentine Republic, was reformed by Grand Duke Cosimo I into a sort of Ministry of Public Works for his princely state in 1549. In addition to roads and rivers, the ten *Capitani* were also responsible for the erection and upkeep of fortifications, as well as for the approval of any private building works impinging in any way whatsoever over public properties<sup>13</sup>. This arrangement was not exclusively Florentine: magistrates responsible for both «acque e strade» (waters and roads) also existed in early modern Modena, Pisa, Pistoia, and Naples<sup>14</sup>. Similarly in the northern Netherlands, the agreements between two cities known as *beurtveren* (literally turn-ferries), which established regular transport links between the two urban centres, regulated fares, and entrusted the management of the system to specific individuals, could cover either overland or waterborne transport: usually, the fastest mode of travel in each specific case was chosen<sup>15</sup>. Whether governed by *beurtveren* in the Dutch Republic or magistrates for «acque e strade» in the Italian peninsula, thus, highways and waterways were similar in their administration as well as in their function and location.

## 2. DIFFERENCES

When comparing early modern waterways and highways, similarities are only one part of the story. In the case of transport, particularly of heavy goods and/or over long distances, rafts, barges, and boats were cheaper, faster, and more comfortable than overland carts and coaches<sup>16</sup>. Canals and rivers also had the added advantage of moving naturally, as a result of gravity. If highways were stairs, waterways would be escalators. This made it easier to transport people, animals, and goods in one direction — though admittedly it also made it harder to transport them in the other. Even more importantly, water flow in rivers and canals was one of the foremost sources of energy in pre-modern times. Citizens harnessed this by means of waterwheels, which could power anything from saws to fulling hammers, bellows to millstones. In Augsburg there were at least twenty-six waterwheels and mills in 1635, when they were listed on a map of the city's fortifications by the municipal building-master Elias Holl<sup>17</sup>. In Florence, artificial canals were dug either side of the Arno already in the late middle ages, for the sole purpose of installing mills along their course<sup>18</sup>. One of these artificial canals was prolonged in the mid 16<sup>th</sup> century all the way to the

<sup>13</sup> TOCCAFONDI, VIVOLI, 1987.

<sup>14</sup> For Naples, see GENTILCORE, 2019.

<sup>15</sup> DE VRIES, 1981: 17-21.

<sup>16</sup> MAŁCZAK, 1995: 11-14.

<sup>17</sup> StadtAAu. *Karten- und Plansammlung (KPS)*, 01361.

<sup>18</sup> TROTTA, 1988.



Fig. 2. BUONSIGNORI, Stefano (1584–94). *Nova pulcherrimae civitatis Florentiae topographia accuratissime delineata*. Firenze: Girolamo Franceschi  
Source: Wikimedia Commons

river Bisenzio, 15 km west of Florence. Grand Duke Cosimo I and his son Francesco hoped to use this new waterway for navigation; when this proved impossible, they built three milling complexes along its course instead. To this day, the watercourse is thus known as «fosso macinante» (milling ditch)<sup>19</sup>.

As for location, streets and waterways were not always coterminous in the urban structure. To this day in Florence there is no access to the south bank of the Arno between Ponte Vecchio and Ponte a Santa Trinita: the buildings lining Borgo San Jacopo jut directly on the water, without any embankment. Whereas today this arrangement is the exception in Florence, in medieval and early modern times it would

<sup>19</sup> MARTINO, 2023: 179-194.

have been the norm: several of the urban stretches of the Arno, on either side of the river, were devoid of embankments, as is visible on the map of the city engraved by Stefano Buonsignori in 1584 (Fig. 2). That was the case elsewhere, too: in London, embankments were only constructed along the Thames in the 19<sup>th</sup> century, from 1864 to 1874; before then, the gardens of noble houses had landings on the river bank, while small alleys ended in pontoons<sup>20</sup>. Without embankments, there was no street running next to a waterway, and thus the river or canal fulfilled all the functions of a waterway as well as all the functions of a street.

Earlier, this article pointed to examples of cities where waterways and highways were administered by the same magistrates or the same institution. However, waterways also presented unique challenges, and the systems developed by cities in response to these challenges required large investments of time, money, and skills. In Augsburg, there was a dedicated municipal official to oversee the city's moats, the Grabenmeister; another for its rivers and canals, the Lechmeister; and a different one still for its drinking water network, the Brunnenmeister. Each of these three specialised officials headed a team of municipal employees who intervened on the hydraulic infrastructure of the city. Streets were, by contrast, under the oversight of a single official and his adjutants, whose chief job was to look after the paving stones<sup>21</sup>.

Waterways could indeed give rise to complex forms of administrative organisation in a way that streets did not. Perhaps the most famous example of this are Dutch «waterschappen» (water boards). The earliest «waterschappen» were of medieval foundation and functioned on a local scale. In 1248 the first «hoogheemraadschap» (regional water board) was established for the lower course of the Rhine, an area known as Rijnland. New local and regional water boards continued to be set up throughout the early modern period, particularly in connection with land reclamation projects<sup>22</sup>. These boards brokered compromises between landowners, city dwellers, fishers, skippers, and other stakeholders in and around the reclaimed areas, known as «polders»<sup>23</sup>. To this day, the verb «polderen» is used in Dutch as a synonym for compromise-seeking and consensual decision-making. The administration of waterways could thus be strikingly different from that of highways — just like in location and function rivers and canals often went beyond what streets and roads could offer.

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<sup>20</sup> STUART, 2000.

<sup>21</sup> VOIGT, 2018.

<sup>22</sup> KAIJSER, 2002; VAN DAM, VAN TIELHOF, 2006.

<sup>23</sup> VAN TIELHOF, 2021.

### 3. LIQUID STREETS

In his *Vocabulario portuguez e latino*, the 18<sup>th</sup> century Theatine Rafael Bluteau defined «rua» (street, in Portuguese) as:

*O espaço, que ha entre as casas de huna Cidade, para a passagem da gente. Deriva-se do Francez Rue, que significa o mesmo; & os Francezes derivão o seu Rue, do verbo Grego Ruo, ou Reo, que val o mesmo que Fluo em Latim, & em Portuguez Corro, (fallando em cousas liquidas) porque pelas ruas corre a agua da chuva, que cahe dos telhados, como tambem a dos poços, & das fontes, que se derrama nas ruas. Tambem corre a gente as ruas, & cada huna dellas he huna corrente do povo, que vay ao seu negocio<sup>24</sup>.*

Although this Greek etymology for the French «rue» is no longer accepted by linguists today<sup>25</sup>, Bluteau's entry is relevant here because it presents «rua», the street, as intrinsically terraqueous, as amphibious by definition. Described as a space between houses, a «rua» is filled with the flow of people, water, or both.

Similarly, the first part of this article has stressed similarities between highways and waterways: both could function as sites of festivals and conduits for transport; both were found in the same locations in the urban structure; and both were often administered by the same magistrates or the same institutions. Significant differences, however, have been identified in the second part of this article. In terms of function, waterways were more efficient conduits of transport than highways; their flow also represented a key source of energy in pre-modern times. Early modern urban rivers did not have embankments, and thus fulfilled in their location both the functions of a highway as well as those of a waterway. Finally, administering waterways was comparatively more complex than managing highways, leading to sophisticated forms of social and political organisation, such as «waterschappen».

The title of this article suggests that we ought to think of urban waterways as «liquid streets», given their similarities with highways<sup>26</sup>. However, this article has shown that there was more than similarities to the comparison between waterways and highways in early modern cities. While liquid streets might still be an apt metaphor, maybe we could (or should) go even further, and talk of «solid rivers» when thinking about streets?

<sup>24</sup> «The space, which is between the houses of a city, for the passage of people. It derives from the French *Rue*, which means the same; & the French derive their *Rue*, from the Greek verb *Ruo*, or *Reo*, which means the same as *Fluo* in Latin, & in Portuguese *Corro* (speaking of liquid things) because in the streets flows rainwater, which falls from the roofs, as well as the water of wells, & of fountains, which is shed on the streets. Similarly people flow in the streets, and each one of them has a stream of people, who go about their business.» BLUTEAU, 1712-1728: vol. 7, 390.

<sup>25</sup> *Rue*, [s.d.].

<sup>26</sup> The idea of «A Rua Líquida» was also present in the *Museu da Misericórdia do Porto* (MMIPO) exhibition *Rua das Flores: Passagem e Permanência*, with reference to Zygmunt Bauman's concept of «liquid modernity». See GANE, 2001.

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